TOWN OF GERALDINE

Preliminary Engineering Report

Water System Improvements

May 2022

GreatWest ENGINEERING

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1.0 EXECUTIVE SUMMARY

The Preliminary Engineering Report (PER) is authorized by, and prepared for, the Town of Geraldine. The report identifies and analyzes the existing facilities of the Town's water system. The PER also proposes improvements that would address any identified deficiencies of components of the water system. This document meets all the requirements of the PER Outline within the Uniform Application Supplement for Montana Public Facility Projects adopted by the federal and state funding agencies that are part of the Montana Water, Wastewater, and Solid Waste Action Coordination Team (W2ASACT).

1.1 Introduction and Background

Located in central Montana, Geraldine is a town of fewer than 300 people and is about 25 miles southeast of Fort Benton on Montana Highway 80. The Town's existing water system extends south over several miles between the source water spring and the Town. Over several decades, the water system has expanded and evolved from the use of a local spring and wood staved pipes in 1935, installing local wells near Town, installing asbestos cement (AC) piping in the 1950s, to developing the springs with a transmission main in the 1980s that are presently the Town's sole water source.

The Town of Geraldine's public water system currently serves a total of 153 connections which relates to an estimated 268 people on the entire water system. The population that receives water from Geraldine is not projected to grow beyond 300 people by 2042. According to the American Community Survey (ACS), the median household income (MHI), for the 2015-2019 American Surveys data, is $39,583, and the low to moderate income (LMI) rate is 77%.

Numerous components in the existing water system have reached or exceeded the end of their useful service life. Most the water mains in the Town limits are 4-inch or smaller asbestos cement (AC) pipe that was installed in the 1950s. Most of the Town's fire hydrants were also installed at this time. In the 1980s, the primary source of the water supply was moved from well in the Town to the current Geraldine/Meissner Ranch Springs located about 12 miles south of Town, and about 3.5 miles south of the Town of Square Butte. In the 2000s timeframe, several upgrades, such as the conversion of the treatment process to liquid chlorine and the construction of a new centrally located on-grade concrete storage tank were completed. Since no recent major water distribution system improvements have been undertaken, numerous sections of the water system

are leaking or are corroded to the point of significantly reduced operation and diminished level of service that the Town depends on.

The Town applied for an American Rescue Plan Act (ARPA) competitive grant in January 2022 which is administered through the Department of Natural Resources Conservations (DNRC). The grant application identified and included a Phase 1 project to replace up to 6,300 feet of 4-inch AC mains. At the time of this study, Geraldine's water project ranked No. 44 on the raking list, and the Town anticipates the award of a $2,000,000 ARPA grant to complete the Phase 1 project. The Phase 2 project scope is identified in this PER and is included in the associated state and federal grant applications.

For a community of fewer than 300 residents, the Town has been very engaged in the public process for the proposed water system improvements. The Town Council provides regular Facebook updates, hosted a well-attended public meetings and work sessions, and the community provided multiple comment letters. The Town has been proactive in planning for its infrastructure improvements; the Town and associated water improvements are listed in the Town's 2018 CIP, the Bear Paw 2020 Comprehensive Economic Development Strategy (CEDS), and the latest Chouteau County Growth Policy.

1.2 Problem Definition

A summary of the problems and deficiencies that were identified with the water system are listed in this section.

Distribution

- Leaking and Problematic AC Water Distribution Mains and Fittings – The Town's distribution system is comprised mostly of AC pipe that is 4- inches or smaller in diameter. These pipes and fittings were installed in the 1950s and some sections earlier, and the system is operating beyond its useful service life. The piping experiences significant leaks as well as water main breaks. The suspected causes for the leaking are the age and degrading condition of the pipes and weak points due to connections of AC and PVC pipe. Leaky water main piping presents a significant health hazard due to the potential for contamination from backflow events. There are areas in Town with petroleum saturated soils which provides a ready contaminant for the leaky distribution system in the event of

a backflow event. The potential for backflow is significant due to water breaks which commonly occur on the AC piping.

The material of the AC pipe can be extremely hazardous if exposed and broken because of the release of asbestos fibers. Not only is the pipe inadequate, but also the pipe material itself presents a hazard to the community.

- Undersized Mains – Not only is the water distribution system old, over half of the distribution pipe in Town is undersized and of AC piping. In several places, the 4-inch AC pipe connects to fire hydrants. According to DEQ, the minimum size for the pipe to connect to a fire hydrant is 6-inches in diameter.
- Corroded and Inoperable Water Valves – Another source of leaking in the water system are the old water valves that have corroded severely. In addition to leaking, many of the gate valves in the system no longer function to fully close the lines. The lack of useful valves has prevented the Town from being able to isolate small sections of the distribution system for maintenance and repair. Instead, large portions of the system, instead of the single Town block being worked on, need to be shut down during leak repairs and often with little or advanced notice to the residents due to emergency repairs. The inability to isolate specific portions of a system is out of compliance with DEQ standards and poses a higher risk for potential pathways for contaminants to enter the water system when larger sections of mains are depressurized.
- Corroded and Inoperable Fire Hydrants – Most of the fire hydrants in Geraldine are over 60 years old and have experienced significant corrosion damage. Like the valves, the fire hydrants are leaking and lack functionality. Since the fire hydrants are in poor condition and they are fed by undersized lines, the Town is unable to provide adequate fire flow through the hydrants, leaving the public at risk to fire. Several fire hydrants were field tested during the time of this PER, and only provide 500 gpm or less.
- Lack of fire hydrants. Currently the Town has fire hydrants located about every 4 to 5 blocks and this does not comply with DEQ standards stating, “Hydrants should be provided at each street intersection…” (DEQ-1 8.4.1.a)
- Lead Services – There are two known lead services in Town. The services each serve a residence at 226 Spring St. and 342 Main St. Lead services are a potential health hazard to the users who receive water through the service.

Source (Springs)

- Ground Movement - The springs occur within a mapped alluvial landslide deposit. Slow ground movement is observed to affect surficial spring collection features; valve boxes, vault structures and fencing are exhibiting dislocation and settling impacts. Ground movement has caused some valves to be inaccessible and has buried by-pass outfall pipes. It is unclear at this time to what extent ground movement may be affecting the sub-surface spring collector piping.
- Livestock Contamination Concerns - Significant cattle grazing activity in and around the springs poses a threat to spring water quality. The immediate area around each of the spring galleries is fenced, however, the fencing is in need of repair and provides inadequate protection from cattle-born fecal contamination of the larger springs footprint.
- Potential for Surface Water Infiltration - Spring water is considered groundwater not under the direct influence of surface water. The documentation suggests the spring collection galleries were not constructed with an upper membrane or impermeable materials to effectively inhibit surface water infiltration. Spring water not captured by the collection galleries flows overland across the spring development as surface water and can infiltrate groundwater. In addition, ground settling above the collection galleries has produced some surficial depressions which can retain surface water/snow melt, providing increased potential for surface water contamination of the spring collectors.
- Vegetation and Soil above Spring Galleries - The springs are relatively lush areas with abundant plant growth and a developed organic soil profile. Excessive vegetation provides habitat for rodents, and plant roots can cause clogging of spring collector piping over time. Organic-rich soils can increase concerns for bacterial contamination of the spring water collection system.
- Incomplete Collection System As-Builts - The records reviewed to date, particularly with respect to Spring 5 do not provide a clear understanding of the configuration of the spring water collection system. Spring 5 is reported to be connected to the Spring 4A/B piping, but the design and connection of Spring 5 are not well documented. Sketches of the planned Spring 5 development indicate vault lids were to be set at least 2-feet above grade, however those lids are now nearly covered by land movement/settling. Structural settling/movement poses a risk to the Spring 5 collection system and potentially Springs 4A and 4B piping, if connected.

- Limited Documentation of Spring Discharge Flow Monitoring – The Town records *production* of spring water using a totalizing meter at the chlorination station but has not historically monitored the actual individual *spring flows* at the collection system. The existing spring development includes valves that can be operated to manually measure or approximate spring flows. Long-term monitoring of spring discharges is important to proactively manage and maintain the performance of the collection galleries as well as evaluate any potential impacts of surface water influence.
- Lack of Suitable Redundant Water Sources. The Meissner Ranch/Square Butte Springs development, located approximately 3.5 miles south of Square Butte, is the sole supply for the system. The Town lacks any redundancies for sourcing water, and seasonal moisture in springtime can limit access to facilities due to adverse road conditions during inclement weather. The high-quality springs were developed using collection galleries in 1985 and expanded in 2000. The current inspection of the spring development confirms the concerns listed above. (Appendix R)

Treatment

- Unsafe Chlorination Station – The water system receives disinfection through a chlorination station using liquid sodium hypochlorite at an injection point located north of the springs. The vaults that contain the flow meter and injection equipment are in confined spaces, and the Town's workers are unable to easily and safely operate and maintain the equipment. Replacing the chlorine injectors can be extremely difficult in the existing tight working area within the 48-inch manhole vaults. Additionally, the building that houses the chlorination equipment has begun to deteriorate to a state which allows rodents and other vermin access to the chlorination equipment space.

Storage

- Leaking or Corroding Storage Tanks – Geraldine has two water storage tanks that provide operational, emergency and fire flow water storage. One tank is a 200,000-gallon rated partially buried concrete tank that is located south of Town, and the other is a 100,000-gallon rated elevated steel tank on the west edge of the Town. The concrete tank has a reduced capacity because of a perimeter longitudinal leak in the upper 3-feet.

Pitting corrosion has been revealed in a recent routine inspection of the in-Town elevated steel tank's interior. The corrosion in the steel tank is a risk for potential leaking in the future.

- Aging and insufficient buffer capacity for storage tank. The existing elevated steel tank in town is approaching 70-years old. The existing tank requires increasing maintenance and will likely need to be epoxy coated in the next approximately 10 to 15 years. The existing in-town elevated tank is located over 7-miles from the other concrete storage tank. Two other rural consecutive connections, which draw over 20% to 40% of the total water system demands, separate the two tanks. Sufficient buffer capacity is not provided within the existing 100,000-gallon storage tank at times of peak demands from the rural water users which places the Town at risk during potential times of high fire danger. A new tank located near town is considered to offer a larger tank with an extended useful life.
- Any tank failure (or loss of use) would reduce the water supply available to the system resulting in the system being unable to provide adequate fire flows for protection of critical facilities including the schools and businesses and lives would be at greater risk.

Transmission

- Corroded Pressure Reducing Valves (PRVs) – The system includes three PRV stations that regulate and reduce the pressure in the 6-inch PVC transmission line that extends between the springs and the Town. The PRV stations were installed in the 1980s and are experiencing observed corrosion and are operating beyond their useful design lives. The internal valve parts have never been rehabilitated. The PRV stations also do not include high-flow and low-flow bypass lines/valves that can provide redundancy and efficient operation. Additionally, the vaults that house the valves have notable issues with soil and water intrusion within the structures.
- Outdated Air Release Valves – The air release valves along the transmission line have reached the end of their service life. The age of the valves has led to the Town occasionally experiencing air locks in the transmission line between the springs and the chlorination station. Air locks can cause diminished flow capacity in a pipe and require operator attention to address. Moreover, some of the more accessible ARV locations have experienced water theft and should be secured.

Telemetry and Controls

- Outdated System Control and Data Acquisition (SCADA) System – The Town uses an outdated SCADA program, installed over 20 years ago, to monitor and operate its water system. The hardware and software platforms are both no longer supported. The SCADA system that the Town utilizes is vulnerable to failing and leaving Geraldine without any control of its system.
- Solenoid Control Valve Age and Malfunctions - The existing control valve located on North Main Street is connected to the existing SCADA system. The valve serves to open and close to fill the elevated tank in Town. This valve structure was constructed in the 1980 and is operating beyond its useful design life. Additionally, recent reports by the operator indicate that the valve has been sticking open or closed. Replacement of the valve and reconnection to the SCADA system should be considered to provide a reliable and safe system control valve.

1.3 Alternatives Considered

1.3.1 Supply Alternatives

S-1: No Action.

S-1: Phase 1 Spring Fencing Protection and Monitoring. This alternative includes measuring individual spring flows and replacing fencing to keep out livestock. This work is anticipated to be completed by the Town within the next year. The Town has commenced a monitoring program at the time of this study and will continue with the program.

S-3: Phase 2 Springs Evaluation and Spring 5 Restoration. This alternative includes a detailed hydrogeologic assessment of the site and a review the monitoring results of the individual spring measurements after about two (2) years of data collection described in Phase 1. Also, a more detailed assessment of Spring 5 will be completed along with the preparations of recommendations for rehabilitation. The Spring 5 rehabilitation site work and construction will be completed as determined by the findings of the Phase 2 hydrogeologic assessment.

S-4: Phase 3 Spring Collection Rehabilitation. This alternative is intended to potentially include the rehabilitation and preservation of the existing spring collection laterals. Work may include removing topsoil and vegetation over the collection galleries, installing an impervious protective

liner material to prevent surface water infiltration and capping with a surface seal. The scope of this work will be defined in more detail following the completion of the Phase 2 evaluation.

1.3.2 Treatment Alternatives

T-1: No Action. This alternative does not prevent access of rodents to the chlorination equipment and electrical components in the station. Also, this approach does not improve the ease of use so that one operator can safely operate and maintain the chlorination station.

T-2: Construct New Chlorination Station. This option consists of constructing a new chlorination building and moving all piping and equipment to the above-ground and enclosed area. This alternative would allow one Town employee to safely access all equipment for operation and maintenance. A new building would also protect the electrical and control equipment from the weather and rodents.

1.3.3 Storage Alternatives

R-1: No Action. The option of not repairing the tanks leaves the water system with reduced storage capacity and increases the chances of future leaking from the tanks.

R-2: Repair Storage Tanks. This alternative would include repairing the corrosion pitting with epoxy patch work in the elevated steel tank and applying an elastomeric water-tight lining the upper zone of the concrete tank. This alternative would also include recompacting the fill around the concrete tank and placing an erosion control mat. This approach would reduce leakage in the steel and restore the concrete tank to its original capacity.

R-3: New 210,000 gallon on-grade Concrete Storage Tank Near Town. This alternative includes constructing a new concrete storage tank on a hillside within 3,000 to 4,000 feet west of the Town of Geraldine. The new tank would be used to eventually replace the use of the existing elevated steel tank in Town. This tank, in addition to the capacity of the other concrete tank, would be used to provide the required average day and fire flow capacities for the entire system for up to 2,500 gpm for 2 hours.

1.3.4 Distribution Alternatives

D-1: No Action. This alternative does not fix any of the issues with the existing distribution system. The water system would continue to have substantial water loss, to be unable to provide fire flow,

and would continue to be susceptible to contaminated groundwater intrusion from backflow events.

D-2: Phase 1 – Replace 4" AC and Less Water Mains and 6" AC in contaminated soils. This alternative would replace up to 6,300 feet 4" and less AC water mains with 6" PVC mains. This alternative also includes replacing 6" AC piping that is located within known contaminated soils locations. The project would upgrade the valves, hydrants, and fittings. Improving the most deficient portions of the distribution system would significantly reduce leakage, reduce the threat of backflow contamination and provide improved flows for fire protection.

D-3: Phase 2 – Replace Remaining 4" AC Water Mains. This alternative would include replacement of nearly all remaining 4" AC pipe that had not been replaced in Phase 1. Like the first phase, the water main and appurtenances would be upgraded to 6" PVC and appurtenances. This alternative would bring the Town's system into compliance with DEQ standards, provide improved fire flows (to achieve up to 2,000 gpm fire flow) to the Town and reduce the threat of backflow contamination.

D-4: Phase 3 – Replace Remaining AC Water Mains in Town. The final phase for improving the distribution system would be replacing the remaining AC water mains within Geraldine. This alternative would eliminate the majority of leaking mains in the system, improve fire flows and remove the risk of AC pipe ruptures and leaks resulting from age and degradation.

D-5: Replace Corroded PRVs and Air Release Valves. Replacing the corroded PRVs and air release valves would ensure that the transmission main will be properly regulated and operated. Additionally, replacing the vaults would address the issue of soil and water intrusion which can contribute to corrosion. The air release vaults would be upgraded to new manual valves, and also automatic air release valves, where practicable.

D-6: Upgrade Water SCADA System. The software and hardware of the SCADA system software and hardware would be replaced to modern equipment. The existing telemetry and antenna infrastructure would continue to be used. This alternative would simplify operation of the system and reduce the risk of control system failures and aids in property management of the overall system.

1.3.5 Improvements Priority

Alternative solutions to the problems discussed above have been compiled into an overall improvement program for planning purposes. These priorities, although established by the Town at the time of this study, can be re-arranged and included into the Town's overall Capital Improvement Program (CIP). These projects would be completed as needed and as funding allows. Table 1-1 presents a prioritized list of recommended improvements. The Phase 1 project will be funded by the ARPA program. Grant and loan funding and associated applications in 2022, will be considered for the capital improvement projects described in priorities (#2 and #3) listed in the table.

Table 1-1 - Recommended Improvements Project Priority List

Project Priority List		
Priority	Alternative	Total Project Cost
1	D-2: Phase 1 – Replacement of Problematic 4" AC and 6" AC in contaminated soils	$2,660,000
2	D-3: Phase 2 – Replacement of Remaining 4" AC	$2,503,000
3	S-2: Phase 2 Springs Assessment, Spring 5 Rehab	$140,000
4	R-3: New 210,000 Concrete On Grade Storage Tank	$2,879,000
5	T-2: Construction of a New Chlorination Station	$378,000
6	D-5: Replacement of Pressure Reducing Valves and Air Release Valves	$408,000
7	R-2: Repairing the Existing Concrete and Steel Tanks	$186,000
8	D-4: Phase 3 – Replacement of Remaining Pipe in Town	$2,656,000
9	D-6: Replacing System Control and Data Acquisition (SCADA) System and New Solenoid Control Valve	$50,000
10	S-3: Phase 3 Spring Collection Rehabilitation	TBD ($150,000 - $200,000 Est.)

1.4 Preferred Alternative

The priority of water system improvements considers the need to replace the undersized AC mains, the need for improved fire flow, and the impacts of the substantial water loss in town. The 4-inch AC mains that pose the greatest risk to public health and safety would be replaced firsts. The Town is pursuing grant and loan funding to complete alternatives D-3 and S-2 as a Phase 2 Water Improvements project. The other improvements listed on the project priority list beyond priority No. 3 will be completed as funding allows.

The proposed project includes replacements of several components in the existing water distribution system. Within Geraldine, the distribution system will be upgraded to PVC water mains, new valves and hydrants at the appropriate locations. Also included in the proposed project Phase 2 scope is a detailed hydrogeologic assessment of the spring source and a review of the individual spring flow measurements after about two (2) years of data collection. A more detailed assessment of spring number 5 will be completed along with detailed recommendations for rehabilitation. The spring 5 rehabilitation site work and construction will be completed in accordance with the findings of the Phase 2 hydrogeologic assessment.

1.5 Project Costs and Budget

The estimated total project cost for the preferred combined alternatives (D-3 and S-2) is $2,643,000. Various funding sources for improvements are considered in Chapter 8 and outlined in Table 8-1. In order to reduce the rate impacts on the user's sewer rates, the recommended funding strategy utilizes the following funding:

- $500,000 Montana Coal Endowment Program (MCEP) Grant
- $125,000 Department of Natural Resources Conservation (DNRC) Grant
- $600,000 Community Development Block Grant (CDBG) Grant
- $780,000 Rural Development (RD) Loan
- $638,000 RD Grant

With the proposed funding strategy, the combined water and sewer rate after completion of the wastewater improvements project, described herein, is estimated to be at least $92.46 per month per user. This combined rate would be approximately 121% of the combined system target rate as determined by the Montana Department of Commerce (MDOC).

Before implementation of the project, all funding must be secured. As noted earlier, the proposed funding package for the Town would use MCEP, DNRC and CDBG grant funds along with an RD grant and loan package. Grant applications for DNRC and MCEP are due in May of 2022. The ranking for the MCEP/DNRC applications by MDOC is not expected to be known until the end of 2022, with funds not anticipated until June 2023 following the Montana legislative session.

The RD funds are available on an open cycle and do not have a strict deadline. However, an application should be initiated as soon as a PER and RD Environmental Report (ER) is completed. An RD application will be prepared and submitted following the MCEP application.

The CDBG program application deadlines vary from year to year. The program considers the applicant's readiness to implement the project if awarded CDBG funds, including the firm commitment of all non-CDBG funds and resources within 9-months of the grant award. The Town will need documented firm commitments for assistance from other local, state or federal funding sources. The firm commitment of funds must be demonstrated within 9-months of the award, but the Town may apply without commitment. The program desires to see that the project is “shovel ready” and can be completed in a timely manner and that other funding sources are viable. As such, the Town will plan on applying for a CDBG grant in the Fall of 2022 if applications are being accepted at that time.

If funding is in place by June 2023, then design can take place in the late summer/fall of 2023 to allow for DEQ reviews in late 2023 and bidding the project in early 2024. Construction would be anticipated to take place in the summer of 2024 with completion by the end of 2024.

2.0 PROJECT PLANNING

2.1 Location

Geraldine is a town of less than 300 people in central Montana and is 25 miles south of Fort Benton on Highway 80. The project area includes the Town of Geraldine and area south of the Town within Choteau County. A vicinity map of the project location is shown below in Figure 2-1 The project area is specifically located at:

Township/Range/Section: Township 21N, Range 11E, Sections: 01, 12

Township 21N, Range 12E, Sections: 06, 07, 17, 18, 20, 21, 26, 27, 28, 29, 33, 34, 35

Latitude/Longitude 47.60° N/110.27° W

Township 20N, Range 12E, Sections: 03, 10, 11, 15, 21, 22, 27, 28

Elevation: 3,150 ft.

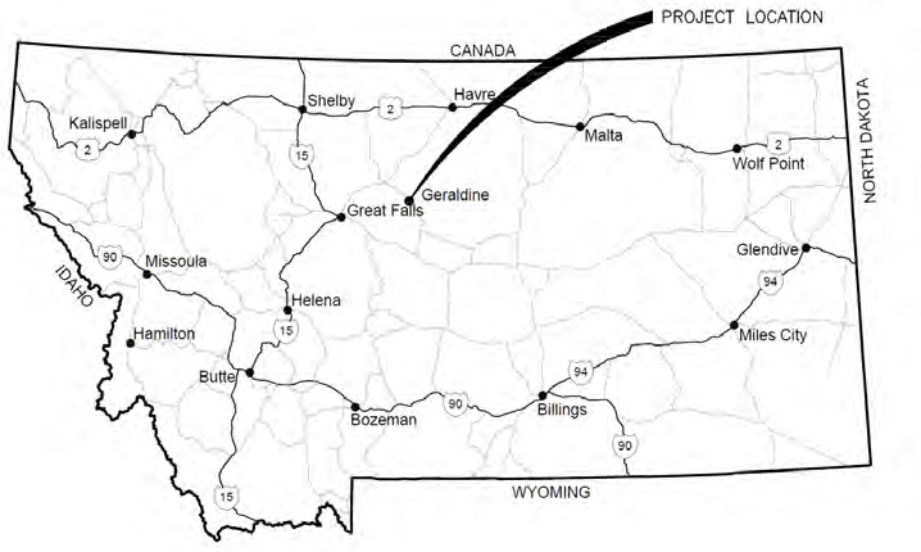

Figure 2-1 - Project Location Map

2.2 Environmental Resources Present

With any construction, there is a potential to damage the local environment and mitigation efforts must be considered to prevent or limit any negative impacts. The Uniform Application facilitates this process by providing a standardized procedure called the Uniform Environmental Checklist. The completed Uniform Environmental Checklist for the proposed water system improvements can be found in Appendix A.

In addition to the analysis, the Uniform Checklist process requires that local, state, and federal agencies be solicited for comments about potential negative impacts of the project. Copies of the sent letters and the agencies' responses are in Appendix B.

2.2.1 Land Resources

The land in and near the project area is mostly farmland, grasslands, and prairie. Besides the cultivated crops, the project area includes primarily Great Plains Mixedgrass Prairie. The bulk of the population served by the project area live in Geraldine with some rural consecutive connections out of the Town limits. There is no forestland within the project area. Maps of the land cover for the Town, transmission tank site and springs, from the Montana Natural Heritage Program are in Appendix C.

A search of the National Resources Conservation Service (NRCS) was conducted to determine the soil types and land resources in the area. The soils in the area include Macar loams, Bearpaw-Vida Clay loams, and other silty sand and loam soils. These soils typically have small slopes from 0 to 15 percent. There is prime farmland and farmland of statewide importance near the project area; however, the soils exist in areas have already been impacted by previous construction. The Town of Geraldine is built on a large section of Bearpaw-Vida clay loams of 0 to 4 percent slopes which are considered prime farmland. Since the Town has already been constructed on the prime farmland, no additional impacts will occur due to the proposed improvements. A copy of the Custom Soils Report for the project area can be found in Appendix D.

2.2.2 Biological Resources

A search of the Montana Natural Heritage Program (NHP) was done to identify all plant and animal species of concern within the proposed project area. The results of this search are in Appendix E.

Only one plant was identified as being a species of concern. The Slim-pod Venus'-looking-glass is a Bellflower that grows in Chouteau County and is listed by NHP as a species of concern.

Mammals, birds, and a lizard were listed as species of concern in the vicinity. The sole mammal that is a species of concern is the Black-tailed Prairie Dog, and the only lizard was the Greater Short-horned Lizard. The remaining species of concern are a variety of bird species such as the Bobolink, the Burrowing Owl, the Chestnut-collard Longspur, the Long-billed Curlew, and the Loggerhead Strike. The Greater Sage-Grouse is also a known species of concern in the area; however, a review of the Montana Sage Grouse Habitat Conservation Map shows that habitat of sage grouse does not conflict with the proposed construction area. A map showing the boundary of Sage Grouse habitat is in Appendix E.

2.2.3 Water Resources

A review of the Ground Water Information Center (GWIC) provided information about groundwater in the area. The results are shown in Appendix F. The depths of wells in the area vary greatly from shallow to deep (8 ft. to 2,730 ft.) below ground surface (bgs). Although the average well depth is 133 ft. bgs, the majority of the wells are less than 100 ft. The few deep wells, which range from a several hundred feet to a couple thousand feet, typically provide water for the public and livestock.

There are several naturally occurring springs that emerge at the ground's surface in the nearby area. The Town of Geraldine currently uses the springs several miles south of Square Butte as their public water supply. Although historically the Town had used wells for the public water supply, these have been disconnected from the distribution system and the Meissner Ranch/Square Butte Springs are now the Town's sole source of high-quality water supply. The in-Town wells are of poor water quality and only suitable for emergency use.

The notable surface waters in the area are Butte Creek, Flat Creek, and Cowboy Creek. Butte Creek is fed from the overflow reservoir from the springs and flows southeast into Spring Creek.

Flat Creek runs northeast through the project area approximately halfway between Geraldine and Square Butte. Cowboy Creek is south of Square Butte and runs southeast along Highway 80.

The project may encounter contaminated soils given the proximity to at least documented DEQ LUST site located on North Main Street. (Appendix M) Special provisions in the contract will instruct the contractor on the steps to take when/if contaminated soils are encountered.

2.2.4 Floodplains

A review of FEMA's available databases shows that there are no effective Flood Insurance Rate Maps (FIRM) for the project area. Flat Creek and Cowboy Creek are the only surface waters within the project area. Most of the anticipated construction will occur away from these waters. Work near either of these creeks will be carefully evaluated for flood plain disturbance. Periodic localized ponding and flooding can occur in town related to drainage conveyance issues. The Town will need to consider drainage improvements at some time in the future. To protect surface water, all appropriate permits including a Stormwater Pollution Prevention Plan (SWPPP) will be obtained prior to constructing any new improvements.

2.2.5 Wetlands

To locate and describe the wetlands in the project area, the U.S. Fish and Wildlife Service National Wetlands Inventory was accessed. Maps of the wetlands in the planning area are shown in Appendix G. At Meissner Ranch/Square Butte Springs, the riverine area of Butte Creek connects with the overflow reservoir of the springs. Along Butte Creek's alignment there is a long continuous freshwater emergent wetland. North of the springs, there is a freshwater emergent wetland near the chlorination station. The emergent wetland is located on the unnamed drainage that leads north to Cowboy Creek.

There are several freshwater emergent wetlands and freshwater ponds about two miles north of Square Butte. These wetlands are directly connected through an unnamed riverine wetland that connects to Flat Creek about a mile north of Square Butte. The current alignment for the transmission line between the springs and Geraldine passes through several of these wetland regions.

An unnamed drainage runs from the west to the east through the Town of Geraldine. There are several freshwater emergent wetlands associated with the drainage, and a small freshwater

forested/shrub wetland also exists at the west edge of the Town. As the drainage continues east past the highway there is a large cluster of freshwater emergent wetlands. The Town's sewer lagoons, which are listed as freshwater ponds, are just north of these wetlands.

Given the proposed pipeline work will take place within existing right of ways, none of the proposed water system improvements are expected to impact existing wetlands in the project area as work will take place within previously impacted areas.

2.2.6 Cultural Resources

Potential cultural resources of the area include historic and prehistoric archaeological sites, historic architecture, unique engineering structures, and any resource that holds significance to Native American culture. As part of the checklist process, the Montana State Historic Preservation Offices (SHPO) were contacted to comment on any important cultural resources in the region. The response from SHPO (Found in Appendix B) stated,

"If all new upgrades will be occurring within previously disturbed areas, we feel that there is a low likelihood cultural property will be impacted. We, therefore, feel that a recommendation for a cultural resource inventory is unwarranted at this time. However, should structures need to be altered or if cultural materials be inadvertently discovered during this project, we would ask that our office be contacted, and the site investigated."

No cultural resource is expected to be impacted by the proposed project; however, if any cultural materials are discovered during construction, the resident project representative (RPR) will contact SHPO for a site investigation.

2.2.7 Socio-economic and Environmental Justice Issues

The median income for the users in the system is $39,583, and the percent of users less than the poverty line is 77%. (Appendix H) The analysis and improvements across the entire water system provide benefits equally across the community by improving public health and reducing safety risks. The proposed improvements will not adversely impact the environment, and no demographic group will feel disproportionate effects of socio-economic or environmental justice.

2.3 Population Trends

To properly design improvements for the water system, understanding the number of water users and anticipated demand in the future is important. Projections for the future population are needed for design and planning purposes. Information used in this section was retrieved from the U.S. Census Bureau, the American Communities Survey (ACS), and Geraldine's Public Works. Appendix H shows the collected census data.

The population of Geraldine has been less than 300 people for the last 30 years and has steadily decreased over the same period. According to the U.S. Census Bureau, there are only 207 people who live in the Town of Geraldine as of 2020. Chouteau County, however, is not following the same trend as Geraldine. The County has experienced growth and shrinkage in the last thirty years. The public water system also serves an out-of-Town component of rural users who are on consecutive connections; the rural user population is not assumed to change. The estimated population of rural users is also shown. A summary of the population trends in Geraldine and Chouteau County is provided in Table 2-1.

Table 2-1 - Summary of the Population in Geraldine and Chouteau County

Year	Geraldine	% Annual Increase	Chouteau County	% Annual Increase
1990(1)	299	-	5,468	-
2000(1)	285	-4.5%	6,062	11.0%
2010(1)	261	-8.4%	5,818	-4.0%
2020(1)	207	-20.7%	5,895	1.4%
2020(2)	61			
Average	-	-11.2%	-	2.8%
2042(3)	231	0.50%	-	-
2042(4)	292	-	-	-

(1) US Census Bureau (In-Town Population)
(2) Out-of-Town usage population
(3) Population of Town at Design Year (2042) estimated from 2020 Census at 0.5% Annual Growth
(4) Design Population of Water System Service Area (In Town plus Out-of-Town)

To determine the population of the users for the design life of the water system improvements, several assumptions were made. A design life of 20 years is a standard design value; therefore, the end of the design life is 2042. According to the ACS, the average household is about 2 people/household, and the number of service connections in the water system is 134. The number of all residential users was estimated to be 268 which includes the Town of Geraldine

and the users outside of town. The number of rural users is about 61 using the estimated value and the Census Bureau's value for Geraldine residents. Assuming only growth in town of 0.5%, the population in 2042 for all water system users is estimated to be 292 people.

2.4 Community Engagement

For a small town of less than 300 people, the community has been very engaged and active about the proposed project throughout the entire planning process. Public comment from the Town's infrastructure website, "likes" and viewings on social media (Town Facebook site) and input from public meetings has been generally supportive of the water system improvements with a focus on fixing the pipelines.

Several council meetings and work sessions were completed with the Town Council and operations staff with documented meeting minutes where water system needs and improvements were discussed for the dates of July 13, 2021, October 12, 2021, December 14, 2021, February 8, 2022, March 8, 2022, March 29, 2022, and April 12, 2022, in addition to the public hearing on April 19, 2022. The work sessions and meetings provided further detailed analysis and water alternative projects costs. Funding options, more detailed costs and related rate impacts were also discussed as the PER findings progressed. The Town Council provided input regarding the overall project scope and project costs to present to the public. All Council meetings are open to and attended by the public.

On April 19, 2022, a public meeting was held to solicit specific input and comments on the findings of the PER and Environmental Assessment. The meeting was advertised in the local newspaper (River Press). The overall project cost of each project alternative was presented to the public. A proposed funding strategy was also presented along with the potential impacts to user rates. In general, the response to the proposed improvement alternatives were positive and several questions were asked by the Public and addressed by the engineer and grant specialist. The Council members and community concurred with the preferred alternatives presented in the PER. Overall, a total of 23 people were in documented attendance at the hearing. When asked for a show of hands who from the public is in support to the water project, all of the attending public expressed their support for the project.

A stand-alone project website for the water improvements can be found at http://geraldineinfrastructure.com/. This website was initially created in 2018 to provide information to the public about the recently completed sewer project. The local public was already

familiar with this website for the sewer project. This website's information was updated in 2021 for the purposes of the intended water project, and shows the intended schedules, available downloadable documents, the PER process funding information, and a method to provide public comment. As of April 26, 2022, the website was visited 1,090 times. Web traffic and website documentation, are found in Appendix I.

At the public meeting held on April 19, 2022, the Town formally passed resolutions to accept the findings of the PER and the EA. Meeting minutes, letters of support, Facebook posts, emails, public hearing, and other related resources from community outreach can be found in Appendix I.

3.0 EXISTING FACILITIES

The purpose of this chapter is to describe the entire existing water system in detail. Both the overall system and parts of the water system will be identified and analyzed for functionality and deficiencies.

3.1 Location Map

A map of the existing facilities of Geraldine's water system is shown in Figure 3-1. The entire public water system for the Town of Geraldine extends from the Town of Geraldine to just south of the Town of Square Butte where the springs are located.

3.2 History

Over several decades, the town of Geraldine has undergone several upgrades to the distribution and supply of water in the system. The original wood stave piping in the Town was constructed in about 1935. Water was originally supplied to the town by two wells within the Town limits and a spring located just west of Geraldine. In the 1950s, the wood stave pipe was replaced with asphalt cement (AC) pipe that ranges from 4 to 8 inches in diameter. In addition to the pipe upgrades, the majority of the existing fire hydrants were installed in the 1950s.

In the 1980s, the Town's water system underwent several major improvements. The Town developed the spring source, which is about 3.5 miles south of the Town of Square Butte, into the main water transmission for the system. The springs were initially treated with a chlorine gas system in line with the transmission line downstream from the springs. Along with the spring development, a transmission line made of 6-inch PVC, pressure reducing valves (PRVs), and air release valves were installed.

In 2002, the water treatment system was changed from gas chlorine treatment to liquid hypochlorite injection. The original treatment system was abandoned, and a new treatment building was constructed about half of a mile downstream from the first site. In 2004, a new 200,000 gallon on-grade concrete storage tank was constructed about 7 miles south of Town to provide fire flow capacity for the system and rural users. Copies of available record drawings and some photos of the existing system are included in Appendix N.

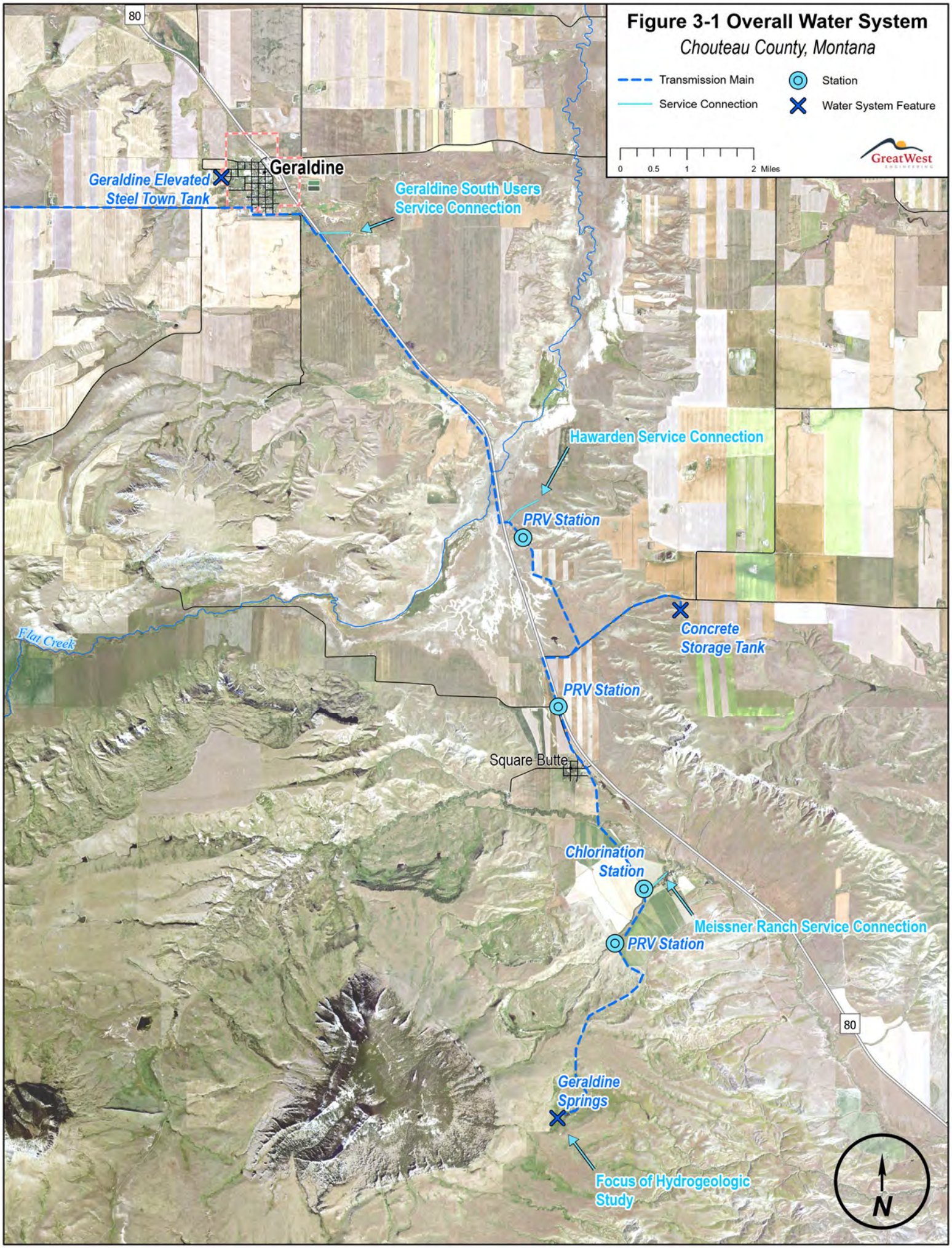
Figure 3-1 Overall Water System
Chouteau County, Montana
Transmission Main
Service Connection
Station
Water System Feature
0 0.5 1 2 Miles
GreatWest
80
Geraldine
Geraldine Elevated Steel Town Tank
Geraldine South Users Service Connection
Hawarden Service Connection
PRV Station
Concrete Storage Tank
Flat Creek
PRV Station
Square Butte
Chlorination Station
Meissner Ranch Service Connection
PRV Station
80
Geraldine Springs
Focus of Hydrogeologic Study
N

In 2018, the spring source had a corrective enforcement action completed for the detection of fecal coliforms. The corrective action included an engineering demonstration that 4-log virus inactivation was being achieved through chlorination with sufficient contact time for treatment. The DEQ's approval of this demonstration and supporting documentation is included in Appendix Q.

3.3 Condition of Existing Facilities

This section focuses on examining discrete portions of the water system. After identifying the pieces, their current condition is described, and any deficiencies are noted.

3.3.1 Supply

The Town of Geraldine's primary water source are the Meissner Ranch/Square Butte Springs located approximately 3.5 miles south of the Town of Square Butte. The springs were developed in the late 1980s to provide water to the system. Seven spring laterals were reportedly constructed to collect the water, and the water is then delivered by a 6-inch PVC transmission line to Town done entirely with gravity. Pressure reduction is needed in several locations. The upper and lower area of the springs include valves with piping to the surface that allow overflow into the nearby small reservoir. This piping at each spring can also be used to measure the production at each spring. The Town of Geraldine has an easement and water right for the springs from the Meissner Ranch that gives the Town first priority of water use of up to 250 GPM. See Appendix J for a copy of the water right, easement and supporting development files.

When the springs were initially developed in the 1980s, overall production was consistently around 100 gpm throughout the year. In years of drought, however, the springs produce closer to 45 GPM as a base flow. The spring site is located in a mapped landslide formation and is subject to surface movements. The sliding is evident from moving and out-of-plumb spring system vaults and structures. The Town completed a hydrogeologic assessment study of springs site concurrent with this PER. The assessment provides a more detailed description and evaluation of the spring site. (A copy of this document is found in Appendix R.) The Town has commenced a Long-Term Monitoring (LTM) program of spring discharge and water quality as recommended by this study. The results of the LTM will be evaluated in the future to inform potential corrective actions and improvements at the spring site.

The springs received enforcement action for fecal positive samples in 2018. This was subsequently satisfactorily addressed by the Town's engineering firm. (Appendix Q) However, this situation shows the susceptibility of bacterial intrusion into the source which is likely due to nearby livestock grazing.

The Town also has a well in town (GWIC ID: 2547) that can supply water to the system if absolutely needed. The well is located at the west end of Flagler St. near the intersection with Spring St. The well is just over 1,900 feet deep with a screened depth from 1858 to 1908 feet below ground surface (bgs). Because the water quality of the well is poor quality and does not meet public water secondary standards for high iron and sulfate/sulfur levels, the Town will only consider using this well in cases of emergency. A copy of the latest source water protection plan and also available water quality data information about the Town's available supply can be found in Appendix K. It is also noted that the current source water protection plan for the Town is over 20-years old and will likely need to be updated in the near-future.

Water Demand

The source water to the entire public system supplied by the springs is metered in the chlorination injection vault. The Town's existing flows are recorded in a supervisory control and data acquisition (SCADA) system which is viewable on a public works computer at the City hall. The SCADA system was queried for the total volumes of water metered by month to determine the monthly water demand from January of 2019 to November of 2021.

There are four major groups of water users in the system: Town of Geraldine, North Geraldine, Hawarden, and Square Butte. North Geraldine and Hawarden are separate consecutive public water supply (PWS) connections. The water meter monthly sales reports from the Town list North Geraldine's monthly usage; however, Hawarden and Square Butte are listed as the same user. To separate the usage of Square Butte from Hawarden, both communities are assumed to contribute equally to water demand.

Geraldine North's average percentage of total system demand was determined to be about 10%, and Hawarden-Square Butte's demand was about 21% of the system usage. The Town of Geraldine usage was determined by subtracting the individual community water demands from the overall water demand. A summary water demands of each community is shown in Table 3-1.

Table 3-1 - Summary and Breakdown of Water Demand by Community (2019-2021)

Total Source Water Average Daily Flows					
Month	Geraldine (Gal.)	Square Butte (Gal.)	Hawarden (Gal.)	Geraldine North (Gal.)	Overall (Gal.)
Jan-19	26,563	9,202	9,202	4,969	49,935
Feb-19	30,716	7,759	7,759	5,588	51,821
Mar-19	28,644	8,271	8,271	7,298	52,484
Apr-19	40,440	8,618	8,618	6,957	64,633
May-19	41,734	6,566	6,566	6,424	61,290
Jun-19	44,412	7,151	7,151	8,087	66,800
Jul-19	76,979	6,962	6,962	7,581	98,484
Aug-19	84,905	12,513	12,513	10,295	120,226
Sep-19	48,832	11,998	11,998	10,638	83,467
Oct-19	47,480	5,522	5,522	5,670	64,194
Nov-19	33,722	4,621	4,621	5,237	48,200
Dec-19	32,456	4,556	4,556	6,205	47,774
Jan-20	30,482	5,166	5,166	7,057	47,871
Feb-20	25,467	4,903	4,903	5,521	40,793
Mar-20	32,768	3,494	3,494	6,178	45,935
Apr-20	37,806	5,307	5,307	7,581	56,000
May-20	47,604	6,005	6,005	9,967	69,581
Jun-20	76,200	8,371	8,371	12,325	105,267
Jul-20	90,738	9,257	9,257	8,845	118,097
Aug-20	112,028	3,072	3,072	11,215	129,387
Sep-20	59,793	11,060	11,060	8,487	90,400
Oct-20	44,460	6,835	6,835	5,256	63,387
Nov-20	69,053	7,773	7,773	5,534	90,133
Dec-20	90,407	8,505	8,505	5,099	112,516
Jan-21	39,538	15,756	15,756	5,239	76,290
Feb-21	44,455	8,138	8,138	5,913	66,643
Mar-21	37,012	7,334	7,334	7,385	59,065
Apr-21	69,613	5,961	5,961	8,132	89,667
May-21	50,237	8,143	8,143	11,123	77,645
Jun-21	130,524	9,548	9,548	9,979	159,600
Jul-21	123,745	11,552	11,552	12,604	159,452
Aug-21	95,449	10,813	10,813	8,957	126,032
Sep-21	85,056	9,140	9,140	8,431	111,767
Oct-21	69,802	8,384	8,384	5,882	92,452
Nov-21	60,396	8,663	8,663	6,078	83,800
Average	58,800	7,900	7,900	7,600	82,200

The existing water demand, expressed in gallons-per-capita-per-day (gcpd) for the Town of Geraldine and the overall system, is 284 gpcd and 307 gpcd, respectively. This is based on the population of the Town presently at 207, and the population of all the users in the system is estimated to be 268. The 20-year design population is estimated to be 292.

In summary, the existing and design flows for the water system are summarized as:

- Existing Average annual demand = 82,200 gpd
- Existing Average annual per-capita demand = 307 gpcd
- 20-year design Average annual demand = 307 gpcd x 292 people = 89,640 gpd

3.3.2 Treatment

The only treatment that the water receives before being distributed is chlorination. About 2 miles north of the springs, a chlorination station constantly applies disinfection using liquid sodium hypochlorite (12.5% liquid chlorine solution) fed by a positive displacement chemical pump. The chlorination station is comprised of a small vault that holds the chlorine injector quill, and a small vault with a flow meter and a small building/enclosure that houses the chlorine and also telemetry and control equipment. The existing flow meter is not flow-paced. Images showing the confined nature of the injection vault are shown below in Figure 3-2 and Figure 3-3.

Figure 3-2 - Chlorine Injection Vault with the Flow Meter (Left) and the Injection Quill (Right)

Figure 3-3 - Main Meter Vault

The building structure at the chlorination station are undersized and have begun to degrade. The vaults for the chlorine injection and flowmeter are in confined and tight spaces that make maintenance and operation difficult as well as unsafe for the operators. The building (shack) that holds the chlorine equipment has degraded to a state which has allowed rodents and other vermin to access inside the building. Figure 3-4, below, shows the lower left corner of the building where the Town has used spray foam insulation to seal building from vermin. This also occurs in other corners of the building.

Figure 3-4 - Picture of Chlorine Treatment Building with Sealant Applied to Stop Rodents

The chlorination treatment building is located downstream of the first water service for the Meissner Ranch. As a result, the ranch's water is not disinfected with chlorine; however, the ranch has a release to the Town of Geraldine for providing non-chlorinated water. A copy of this release can be found in Appendix J. This release has been approved by the Montana DEQ.

3.3.3 Storage

There are two storage tanks in the Town's existing water system. The first tank is a 200,000-gallon concrete storage tank that is approximately 7 miles southeast of Geraldine. The concrete tank was constructed in 2004 along with the drilling of an intended new supply well. (A well-constructed near the tank did not obtain safe water quality and was never connected to the system at this time.) The floor and the lower wall joint were lined in 2016 using liquid applied urethane coating to stop the tank from leaking. However, the tank's upper walls were not coated with water proofing. The tank's capacity has been diminished to 188,000 gallons because of observed leakage along a perimeter construction joint about 2-feet from the tank's top. In addition to the leakage, backfill around the tank has been sloughing off and has caused concern for the tank's structural integrity. Pictures showing the exterior and interior of the concrete tank are shown below in Figure 3-5. The picture of the exterior shows the tank leaking and the saturated soil which has shifted.

Figure 3-5 - Pictures of the Exterior (left) and Interior (right) of the Concrete Tank

The second tank in the system is the older elevated steel tank in Geraldine. The 100,000-gallon tank sits at the northwest corner of the Town and is filled by operating a solenoid valve as needed to keep the tank full. This steel tank underwent an underwater inspection in 2020 and several deficiencies were identified. There were several locations of pitted corrosion and weld patches from previous damage. A copy of the inspection report can be found in Appendix L. Patch epoxy to the pitted areas can be applied at this time and is recommended by the underwater inspector. The tank should also be video inspected regularly to verify the rate of corrosion.

At some point in the future, the entire tank will need to be re-coated at a significant cost. As such, the Town has expressed its desire to consider potentially constructing a new concrete tank, similar to the other concrete tank, to provide emergency and additional fire flow capacity to eventually replace the aging elevated tank.

Water storage can generally be thought of as satisfying three needs, including: operational storage, emergency storage, and fire suppression storage. Operational storage supplements water supply during peak periods. Whenever peak hourly demands exceed available flows from the supply, the difference must be provided with flows from storage. Emergency storage is not

based on any formula but rather on a judgment regarding the perceived vulnerability of the community's water supply. Given the separation between the two tanks and rural user demands pulling from transmission main south of Town, having available emergency storage is considered very important for the Town. Fire suppression storage is dependent upon the community's firefighting capabilities, recommendations from the local fire authority, and Uniform Fire Codes. In Geraldine, the recommended absolute minimum recommended fire flow is 1,000 gpm over a two-hour period and additional flows up to 2,500 for the commercial and school facilities, if pumping capacity and storage is available. Note that several sections of Town are not currently able to provide even up to 500 gpm verified by recent hydrant testing. This diminished flow is considered a function of the undersized mains.

Circular DEQ 1, Section 7.0.1 requires that "storage facilities must be sufficient, as determined from engineering studies to supplement source capacity to satisfy all system demands occurring on the maximum day, plus fire flow demands where fire protection is provided". Section 7.01.b in Circular DEQ 1 requires "the minimal allowable storage must be equal to the average daily demand for a 24-hr period plus fire flow demand where fire protection is provided". The Geraldine storage requirements are summarized in Table 3-2.

Table 3-2 - Storage Requirements

Storage Requirements			
Storage Need	Year 2022 Demand (gallons)	Year 2042 Demand (gallons)	Year 2042 Demand w/ 2,500 gpm fire flow (gallons)
Operational (average day demand)	82,200	89,600	89,600
Fire Suppression (1,000 gpm for 2 hrs.)	120,000	120,000	300,000[2]
Total Required	202,200	209,600	389,600
Storage Surplus (+) or Deficit (-) [1]	+86,000	+78,400	(-101,600)

(1) Based on existing available storage capacity of 288,000 gallons.
(2) Future demand using 2,500 gpm for 2 hrs.

Between the two tanks, the Town's cumulative existing storage capacity is 288,000 gallons. Under existing conditions, the Town theoretically has adequate storage, including an excess of approximately 86,000 gallons now and 78,400 gallons in the future that could be used for emergency storage. In the event that the in-Town elevated tank becomes depleted due to a fire, the existing concrete storage tank would need to produce emergency demands beyond 100,000 and will need to be drawn from this tank and through over 7-miles of 6-inch transmission main.

To provide 2 hours at 2,500 gpm fire flow capacity, the current system has a deficiency of nearly 102,000 gallons and no emergency capacity would be provided. These demands can be satisfied by adding a new 200,000 gallon or larger tank that would allow the Town to eventually take the existing older elevated tank offline.

If distribution system improvements are made first before tank improvements and reduce system leakage, water use could then be reevaluated along with the need for additional storage capacity. The highest priority at this time is to address the undersized and leaking water mains. However, the need for a new tank is listed on the Town's project priority list and is something that will need to be reevaluated after distribution system improvements are completed.

3.3.4 Distribution System

Transmission Water Line

The overall piping distribution system for Geraldine has two main components: the 6" PVC transmission line and the water mains within the Town. The 6" transmission line comprises total length of over 14 miles. The transmission line was installed in the 1980s and runs north following HWY-80 to Geraldine. The transmission main connects the springs, concrete storage tank, Geraldine, and the rural water systems. The pressure of the transmission line is regulated by the three PRV stations. The 6" PVC line is in relatively good condition and still likely has decades left in service life. The Town does not report addressing leaks and ruptures with the 6-inch PVC transmission main.

Geraldine's entire water system is gravity fed from the springs that supply the water and fill the storage tanks. Although there are no pumping stations, there are three pressure reducing valves (PRV) stations along the transmission line. The first valve is located about 1 mile north of Square Butte, the second PRV is about 3 miles north of the first valve and the third valve is located on the transmission main prior to the Hawarden connection. The PRVs have become corroded and are at risk of failing. If one of the PRV's were to fail, the transmission main could be over-pressurized and cause a transmission main break. The PRV assemblies also are not equipped with a bypass and low flow connections which allow for redundancy.

The concrete vaults which house the PRVs are small, confined spaces and this makes operating and maintaining the valves difficult. Additionally, these vaults have earth intruding in from the top

and bottom of the structure which restricts access to the PRVs. A photograph of the soil intrusion into a PRV vault is shown in Figure 3-6.

Figure 3-6 - Soil Intrusion into PRV Vault

In addition to the PRVs on the transmission line, there are several air release valve (ARV) vaults between Geraldine's springs and the Town. According to as-built plans from the 1980s, there are 14 ARV assemblies which includes both automatic and manual air relief valves. Like other components of the system, the air relief valves have reached the end of their service life with over 40 years in operation.

The supervisory control and data acquisition (SCADA) system for the Town's existing water system is outdated at over 20 years old. The radio telemetry infrastructure including the existing antennas, are still in relatively good and usable condition however, the software and control hardware are now over 20 years old (outdated for software and hardware standards) and no longer receive technical support. Consideration for updates to the SCADA system is recommended.

The existing control valve located on North Main Street is connected to the existing SCADA system. The valve serves to open and close to fill the elevated tank in Town. This valve structure was constructed in the 1980's and is operating beyond its useful design life. Additionally, recent reports by the operator indicate that the valve has been sticking open or closed. Replacement of

the valve and reconnection to the SCADA system should be considered in order to provide a reliable and safe system.

Distribution System

The distribution within the Town of Geraldine is comprised of mostly 4" AC piping that was installed in the 1950s. The remaining water mains in Town are made up of AC and some portions of PVC pipe, and a small diameter polyethylene (PE) pipe. The 2-inch PE line provides service to the commercial users on the east side of the tracks with the largest water user being CHS at the time of this study. A 6-inch extension would be needed if fire flow is to be provided this commercial location.

Two lead water services are also known to exist in the Town at 226 Spring St. and 341 Main St. The existing PVC pipe was installed and connected into the distribution in the 1980s and early 2000s, and each residential connection is metered except for a couple of flat-rate nonprofits and connections used for livestock usage. A summary of the existing water mains that includes pipe size, material, and estimated linear footage in the Town is in Figure 3-3. A map of the existing distribution system in Geraldine is shown in 3-7. Available record drawings of the water system can be found in Appendix N.

Table 3-3 - Summary of the existing water mains in Geraldine

Summary of the Existing Water Mains in Geraldine	
Pipe Size and Material	Approximate Existing Length (ft.)
2" PE	1,430
3" AC	790
4" AC	11,590
6" AC	5,350
8" AC	1,000
6" PVC	2,000
8" PVC	1,710
Total	23,870

Documented petroleum contaminated soils, where a 6-inch AC water is located, were encountered during the recent construction of Geraldine's latest sewer project in 2021. The source of the contamination is from a documented leaking underground storage tank on the former Bob's Exxon service station. A copy of the soil removal and sampling report can be found in Appendix M.

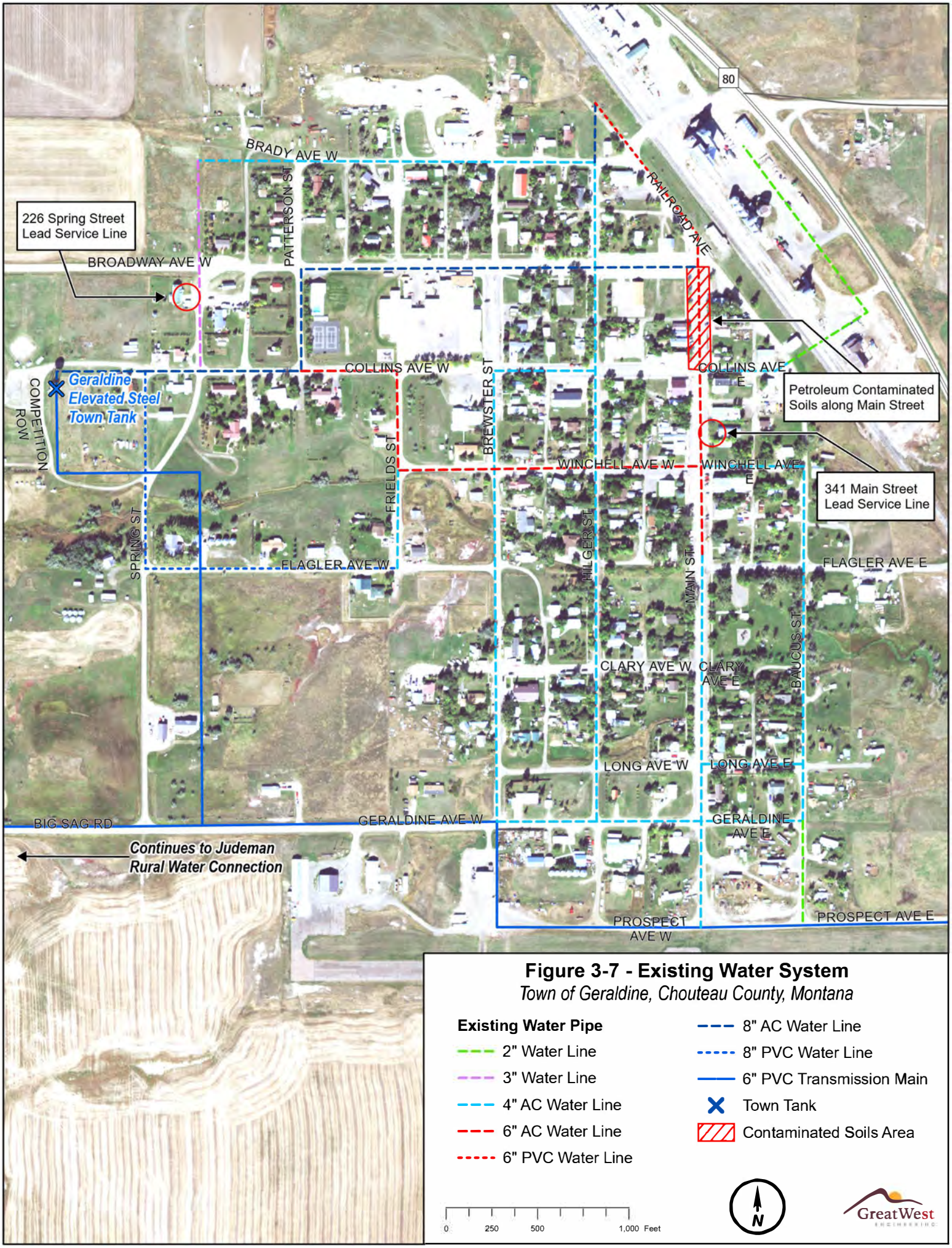

Figure 3-7 - Existing Water System

Town of Geraldine, Chouteau County, Montana

Existing Water Pipe

- 2" Water Line
- 3" Water Line
- 4" AC Water Line
- 6" AC Water Line
- 6" PVC Water Line
- 8" AC Water Line
- 8" PVC Water Line
- 6" PVC Transmission Main
- Town Tank
- Contaminated Soils Area

0 250 500 1,000 Feet

N

GreatWest ENGINEERING

The water mains in the Town of Geraldine are considered to have significant leakage throughout the system. The total water loss in the system is estimated to exceed up to 60% and an average of over 38% of all the water provided from the springs to users in Geraldine.

Some of the existing water mains are buried with less than 4-feet below the ground surface. The recommended frost depth burial for water pipe in Montana is 6.5 feet. At least 1,000 feet of shallow mains are known to exist in the northwest part Town, and they have frozen and burst periodically in below freezing temperatures.

Recently in 2022, the Town had to repair a ruptured water main on Long Avenue. The Town discovered that the water main has begun to fracture longitudinally along the outside of the pipe, and this condition is suspected to be typical of nearly all the AC water mains in Town. Repairs on this condition of pipe will be ongoing and full replacement of larger sections of pipe is recommended. A picture of a fractured AC water main, with the evident longitudinal crack, is shown below in Figure 3-8.

Figure 3-8 - Typical AC Water Main with Fractures

In addition to water loss, leaks and ruptures will lead to a negative pressure within portions of the distribution system that will act to draw in petroleum contaminated, pesticide impacted, or other backflow contaminated water. This scenario poses a great risk to public health by distributing contaminated water through the system. The issue is compounded by the fact that the Town has an insufficient number of isolation gate valves to isolate areas of repairs. When maintenance and

repair work is completed, large sections of the Town require shutting down water. This often must occur with little advanced notice to the residents.

Distribution System Modeling

A water model was constructed to evaluate the hydraulics of the potable water system using the WaterCAD computer modeling package provided by the Bentley Systems program. The computer model is used to identify any specific problem areas and to assist in determining the most effective modifications to improve the system. The WaterCAD program uses an iterative computational procedure, similar to the Hardy Cross calculation method. The model uses standard loop equations to arrive at solutions for pipe network hydraulics and determines resulting pressures at the system nodes (pipe junctions) using the relationship between flow and head loss defined by the Hazen-Williams equation. The Hazen-Williams equation uses a coefficient "C", which is based on the roughness of the pipe interior. Standard values can be assumed and assigned for different types of materials based, on years of pipe service, and the associated resistance and supported by actual conditions and field verification.

The demands scenarios were established for the water demands of the Hawarden, North Geraldine, and Geraldine from Table 3-1 and Section 3.3.1, peaking factor of 3 was assumed based on AWWA guidance, and a minimum fire flow requirement of 1,000 GPM for 2 hrs. DEQ Circular 1 (8.2.1) requires that *"the system must be designed to maintain a minimum normal working pressure of 35 psi and minimum pressure under all conditions of flow (e.g., fire flows, hydrant testing, and water main flushing) must be 20 psi."* During the fire demand scenario, the DEQ Circular 1 (8.2.1) requires that the minimum pressure at any location in the system is 20 psi.

Fire hydrant flow testing was done in Geraldine in June of 2021. The static pressure before opening the hydrant and the water flows from the open hydrant were recorded. Three tests were completed throughout the system. The static pressure of the system ranged from 38 to 45 psi and the flows ranged from 500 to 550 GPM. During the testing, one of the engineers noted that a hydrant was leaking from several places.

Computer model results and exhibits referenced in this section are included in Appendix P.

The WaterCAD computer modeling was conducted to evaluate system hydraulics of the existing and proposed systems with the following assumptions and parameters:

- An existing system model was created by importing the existing system piping (shown on Figure 3-7) into the WaterCAD hydraulic modeling software. The model extents also include the two storage tanks and transmission piping in between, including the PRV station just upstream of the Hawarden Service Connection. The spring source and piping between the spring and concrete storage tank was not represented in the model. Available as-built information was used to verify system piping sizes, materials, and connectivity. Records and Town input confirm that the 6-inch transmission main only ties into the distribution system at the intersection of Main Street and Geraldine Avenue.
- The water elevation in the elevated steel tank controls the initial hydraulic grade line of the water system. The ground elevation at this tank is 3,172 feet. The tank is approximately 91 feet high. Water level in the tank can fluctuate between 91 feet (upper capacity) to 70 feet (lower capacity). For modeling purposes, a water elevation of 81 feet was selected as the starting elevation in the tank. This tank level equates to an initial hydraulic grade of 3,252 and represents the tank at approximately half full.
- The existing concrete tank, located southeast of Town, sits at an elevation approximately 170 feet higher than the maximum height of the elevated steel tank. This tank can supply water to the Town through approximately 7 miles of 6-inch transmission main and a PRV located approximately 2.8 miles downstream of the tank. The downstream pressure setting of this PRV, and a solenoid valve that opens near the elevated tank, controls how much water comes from the concrete tank into Town. For modeling purposes, the downstream pressure setting on this PRV was set to the same hydraulic grade as the water level in the elevated steel tank (HGL = 3,252). This technique allows the elevated steel tank to control the hydraulics and is a conservative approach when analyzing fire flow within the Town.
- Hydrant flow test data was available to use for model calibration. Flow tests were completed for hydrants on Brady Avenue and on Hilger/Flagler intersection in June of 2021. Static pressures were consistent with model static pressures. Residual pressures were not taken due to leaking hydrants and extensive spacing between hydrants.
- Due to the lack of hydrant flow data, existing C factors were estimated. A textbook C factor value for asbestos cement pipe is 140. However, textbook values represent new pipe and the asbestos cement pipe in Geraldine is approximately 70 years old. The existing C factors can be expected to be must less due to factors such as sedimentation, scaling, and biofilm formation that can occur over time. AWWA Manual M28 states “although scaling is most pronounced in cast-iron pipes, it is also commonly found in unlined steel pipes, copper pipes, concrete, and asbestos-cement pipes.” Table 1-1 within AWWA Manual M28 specifies C

factors for new pipe in the range of 130-140, fair to normal pipes with clean interior as 100, and significant reductions in pipe capacity as 70. Based on this information, the existing asbestos cement pipes within the Geraldine water model were given a C factor of 85. PVC pipes were assigned a C factor of 135.

- Average day demands were assigned throughout the model:
    - 7,900 gpd to Hawarden
    - 7,600 gpd to North Geraldine
    - 58,800 gpd allocated throughout the Town limits of Geraldine

The existing system was analyzed under three domestic demand scenarios:

- Average day domestic demand: 52 gpm
- Maximum day domestic demand (PF = 3): 155 gpm
- Peak hour domestic demand (PF = 4): 206 gpm

Per DEQ requirements, pressure must remain at 35 psi or above at all service locations in the system under domestic demand conditions. Appendix P displays the existing system peak hour water model results. Peak hour pressures within the town generally range from 30 to 51 psi. The figures in Appendix P also illustrate the pressure zone boundaries based on ground elevation and a half full tank elevation of 3,252'. The upper limit of the pressure zone is at elevation 3,172', above which pressures would be less than 35 psi. The southwest corner of Town is at a higher elevation than can adequately be served by the elevated tank. This area of Town is largely undeveloped with one or two homes possibly connected to the system.

DEQ requirements also state the water system must be able to provide adequate fire flow while keeping all pressure in the system at or above 20 psi. Fire flow availability is calculated during a domestic maximum day demand condition. The figure in Appendix P displays the existing system fire flow availability. There are multiple areas of Town with less than 1,000 gpm fire flow availability and several areas with less than 500 gpm. Low fire flow availability within the Town can be attributed to small diameter water lines (4-inch and less) coupled with aging water lines with reduced C factors.

The figures in Appendix P displays fire flow results assuming projected 2042 maximum day demands with proposed distribution system improvements. Assumed improvements include:

- Replacement of all asbestos cement lines with PVC (C factor equal to 135).

- Upsizing all 4-inch or less to 6-inch.

Fire flow availability increases substantially with the proposed improvements and the benefit will be that the majority of the system would be able to provide upwards of 2,000 gpm.

Water Valves and Fire Hydrants

The substantial water leakage is suspected to be caused by several factors including connections between AC pipe and PVC pipe, corroded valves, fittings, and hydrants, and deteriorating AC pipe. An example of this corrosion is illustrated below in 3-9. This metallic fitting is estimated to be less than 20-years old. Given the corrosive nature of the local soils, older metallic fittings in the ground are assumed to be in worse shape.

Figure 3-9 - Corroded Water Coupler to AC Main

Most of the existing fire hydrants in Geraldine were installed in the 1950s and are connected to 4" AC pipe. There are multiple deficiencies that are associated with the aging hydrants. The existing hydrants are leaking because of corrosion. A picture showing a dilapidated fire hydrant typical of the Town's system is shown in 3-10. Record drawing showing hydrants connected to 4-inch AC mains is found in Appendix N.

Figure 3-10 - Corroded and Leaking Hydrant in Geraldine

The Town's fire hydrants do not comply with DEQ standards based on the number of hydrants, and the size of the mains and hydrant leads feeding the hydrant. DEQ requires fire hydrants to be located at the corner of every block and to have at least a 6-inch line connected to the hydrant. Geraldine's water system does not meet either of these requirements. Record drawing showing hydrants connected to 4-inch AC mains is found in Appendix N.

The combination of outdated hydrants, undersized water mains, and severe water loss from the system has impacted the community's ability to produce adequate fire flow. During flow testing of hydrants, it was demonstrated that several hydrants were unable to produce flows over 500 gpm. A fire broke out in the Town on a hot day in 2021 which destroyed two homes. Luckily this fire occurred next to the sewer project crews who had an available water truck to respond and put out the flames. Otherwise, the situation could have been much worse. This fire took place in a location where there was a hydrant that produces 500 gpm.

Not only have the pipes and hydrants in the system decayed to a state of low functionality, but many gate valves within the system are not operational. In addition to being another weak point where leaks can occur, the lack of usable valves prevents the Town from isolating smaller portions of the distribution system for maintenance and repair. Recently, any repairs to the water system during the sewer system project (for sewer/water crossings, etc) required large sections of town to be without water during work. This often occurs with little notice to the users that their water is to be shut down.

Water Loss

The leaks in Geraldine's distribution system are a substantial loss of a valuable resource and a significant risk to public health and safety. The unaccounted water in the system is the difference between the produced water measured at the chlorination treatment vault and the total water measured by water meters in the system. The Town has provided data on their metered sales and water supplied. Figure 3-11 below shows the last three years' water usage for the Town's water system. Additionally, Table 3-4 summarizes the water loss in the same period, and the average water loss in the system was 38% and can approach 60% water loss.

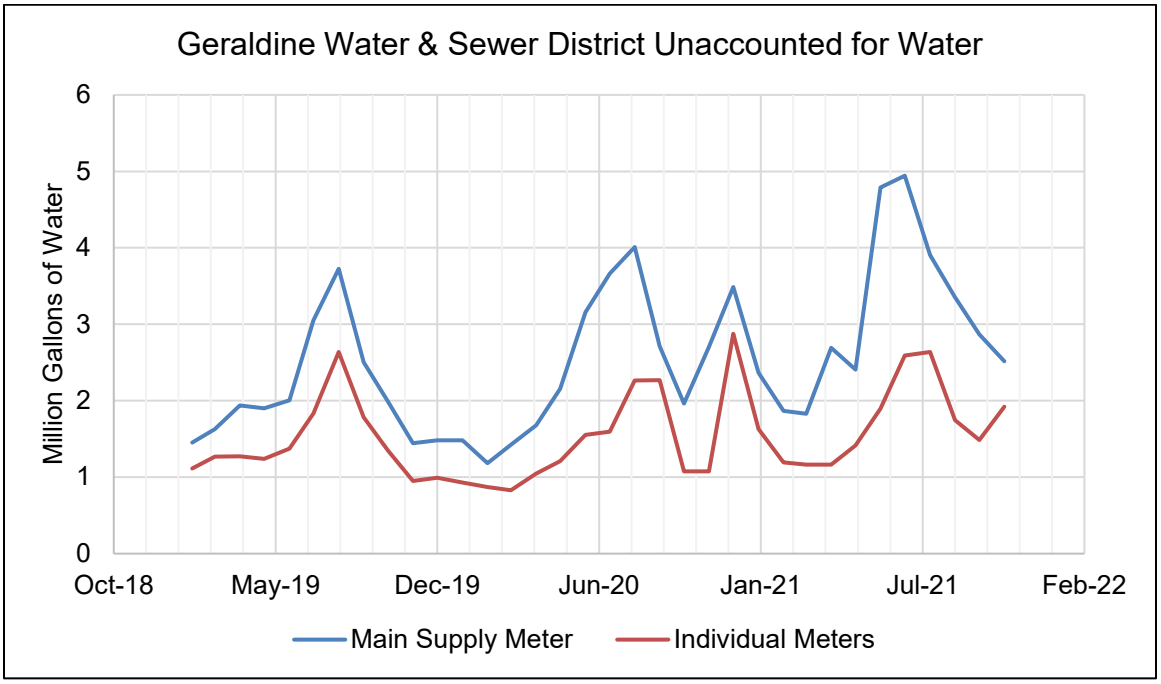

Figure 3-11 - Plot of Unaccounted/Leakage Water in Geraldine's System

Table 3-4 - Monthly Unaccounted Water of Geraldine from 2019-2021

2019-2021 Source Water VS. Metered Sales				
Date	Total Source Water (Gal.)	Total Metered Sales (Gal.)	Difference (Gal.)	Unaccounted Water (%)
19-Feb	1,451,000	1,111,790	339,210	23%
19-Mar	1,627,000	1,267,570	359,430	22%
19-Apr	1,939,000	1,272,040	666,960	34%
19-May	1,900,000	1,238,830	661,170	35%
19-Jun	2,004,000	1,374,590	629,410	31%
19-Jul	3,053,000	1,835,750	1,217,250	40%
19-Aug	3,727,000	2,639,190	1,087,810	29%
19-Sep	2,504,000	1,783,330	720,670	29%
19-Oct	1,990,000	1,348,450	641,550	32%
19-Nov	1,446,000	951,620	494,380	34%
19-Dec	1,481,000	992,480	488,520	33%
20-Jan	1,484,000	930,905	553,095	37%
20-Feb	1,183,000	869,330	313,670	27%
20-Mar	1,424,000	828,840	595,160	42%
20-Apr	1,680,000	1,045,080	634,920	38%
20-May	2,157,000	1,212,110	944,890	44%
20-Jun	3,158,000	1,555,150	1,602,850	51%
20-Jul	3,661,000	1,593,780	2,067,220	56%
20-Aug	4,011,000	2,263,000	1,748,000	44%
20-Sep	2,712,000	2,270,860	441,140	16%
20-Oct	1,965,000	1,077,770	887,230	45%
20-Nov	2,704,000	1,076,680	1,627,320	60%
20-Dec	3,488,000	2,875,860	612,140	18%
21-Jan	2,365,000	1,629,220	735,780	31%
21-Feb	1,866,000	1,193,350	672,650	36%
21-Mar	1,831,000	1,165,160	665,840	36%
21-Apr	2,690,000	1,165,540	1,524,460	57%
21-May	2,407,000	1,416,340	990,660	41%
21-Jun	4,788,000	1,897,630	2,890,370	60%
21-Jul	4,943,000	2,589,760	2,353,240	48%
21-Aug	3,907,000	2,639,190	1,267,810	32%
21-Sep	3,353,000	1,747,300	1,605,700	48%
21-Oct	2,866,000	1,485,910	1,380,090	48%
21-Nov	2,514,000	1,919,670	594,330	24%
			Average Water Loss from 2019 to 2021	38%

3.4 Operational and Management Practices and Capabilities

The Town's management and operational practices are relatively good. The Town of Geraldine has the administrative, managerial, and field operational skills needed to operate and maintain

the existing water and supply water to the community. The Town currently has a full-time licensed operator and a licensed backup operator available and liming within the Town limits. Both of the operators are very knowledgeable and qualified to maintain the needs of the water system and community.

The major deficiencies in the system are because of aging system components and limited financial resources of the Town. Many of the components of Geraldine's existing water system are over 50-70 years old and are operating beyond their useful service lives. Additionally, there are specific parts of the water system that require two operators; however, the Town is unable to staff two full-time operators.

3.5 Financial Status of any Existing Facilities

The Town of Geraldine maintains its financial records using a Black Mountain accounting system. Geraldine is currently paying on two 40-year term loans from Rural Development (RD) and a 20-year term SRF that were used for water system improvements. The 20-year term loan will be paid off in 2025 and will likely coincide with the upcoming improvements. Table 3-5 shows a summary of the loans and the amount that the Town has paid to date on the loans. A summary of the Town's revenues and expenses is summarized below in Table 3-6.

Geraldine's base rate for water is $36.04/month. The average water rate per connection is about $50/month considering metered sales annual revenue of about $90,000/year for 153 billing statements sent out as recently as March of 2022. The Town currently charges for 128 residential, 2 schools, 10 businesses, 2 (2-3" service line) rural water consecutive PWS connections, and a few others nonprofit connections. The rate structure per connection-type varies. The Town also sells bulk water to the community at the rate of $0.50 / 250 gallons. Consideration to raise the rate of the bulk fill station is recommended to account for the high demands on the system and extensive wear and tear on the roads and equipment. In 2021, Geraldine sold 1,209,000 gallons of bulk water for a revenue of $2,418.

A detailed evaluation of the current and future rates is beyond the scope of this study. The existing rates will be evaluated with the development of the project funding, and in consultation with the funding agency providing the loan, and with the aid of bond counsel.

Table 3-5 - Summary of Current Water Loans

Town of Geraldine's Water Loans						
Loan	Date Issued	Interest Rate	Term of Years	Loan Amount	Annual Payment	Outstanding
Water Loan #1	7/1/2003	4.250%	40	$140,200.00	$7,380.00	$100,472.64
Water Loan #2	6/15/2005	4.250%	20	$103,500.00	$7,704.00	$17,954.08
Water Loan #3	4/5/2006	4.375%	40	$95,000.00	$5,040.00	$32,989.82
Totals				$338,700.00	$20,124.00	$151,416.54

When loan number 2 is paid off in 2025, then an additional $7,700 will be available in the water system budget for the Town for a potential water project. Table 3-6 shows a summary of the latest revenues and expenses.

Table 3-6 - Summary of Water Systems Revenues and Expenses

Existing Water System Revenues and Expenses			
Line Item	2018	2019	2020
Revenues ($)			
Metered Sales	87,898.00	88,355.00	92,347.00
Bulk Water Sales	2,340.00	2,386.00	2,418.00
Installation Charges		120.00	110.00
Miscellaneous Revenue	6,923.00	1,754.00	1,737.00
Total Revenues	97,161.00	92,615.00	96,612.00
Expenses ($)			
Materials and Services	36,147.00	26,414.19	30,699.62
Employee Wages	29,406.14	27,856.57	23,399.70
Debt Payment	20,124.00	20,124.00	20,124.00
Total Expenses	85,677.14	74,394.76	74,223.32
Net Reserve	11,483.86	18,220.24	22,388.68

3.6 Water/Energy/Waste Audits

There have not been any recent audits of energy, water, or waste for Geraldine's water system other than the preliminary water usage and loss audit completed with this study.

4.0 NEED FOR PROJECT

4.1 Health, Sanitation and Security

Health and safety of the public is the most important concern for a community water system. The Town of Geraldine experiences nearly 40 percent water loss on average, although water loss has been as high as 60% in some months. This water loss can likely be attributed to the leaking AC distribution system appurtenances and piping dating back to the 1950s. Aside from large quantities of lost water, the leaking pipes and the lacking number of functioning gate valves increase the threat and large areas of the Town are susceptible to backflow contamination. Main breaks result in a loss of pressure, which increases the potential for backflow and contamination of the water system. Backflow is recognized by the Environmental Protection Agency (EPA) as one of the most significant public health and safety issues facing water systems today.

The Geraldine water system is also not compliant with several current Montana DEQ standards for water distribution system and as a result, the condition of the system presents a significant threat to public health and safety including the following:

- Circular DEQ-1 states “the minimum size of water main for providing fire protection and serving fire hydrants must be six-inch diameter”. Nearly 60 percent of the distribution system is 4-inch diameter or less that is AC piping. Undersized lines limit flows that could be critical in an emergency fire situation, creating a severe safety hazard for the residents of Geraldine. Fire protection is a high priority for the Town with the memory of the recent fire in Town in 2021 and the significant fire in the nearby community of Denton.
- Leaky water main piping presents a significant health hazard due to the potential for contamination from backflow events. There are areas in Town with documented petroleum spills which provides a ready contaminant for the leaky distribution system in the event of a backflow event. The potential for backflow is significant due to water breaks which commonly occur on the AC piping.
- The lack of useful valves has prevented the Town from being able to isolate smaller sections of the distribution system for maintenance and repair. Instead, large portions of the system, instead of the block being worked on, need to be shut down during leak repairs and often with little or no advanced notice to the residents due to emergency repairs. The inability to isolate specific portions of a system is out of compliance with DEQ standards

and poses a higher risk for potential pathways for contaminants to enter the water system when larger sections of mains are depressurized.

- Most of the fire hydrants in Geraldine are over 60 years old and have experienced significant corrosion damage. Like the valves, the fire hydrants are leaking and lack functionality. Since the fire hydrants are in poor condition and they are fed by undersized lines, the Town is unable to provide adequate fire flow through the hydrants, leaving the public at risk to fire. Several fire hydrants were field tested and only provide 500 gpm or less.
- Currently, the Town has fire hydrants located every 4 to 5 blocks and this does not comply with DEQ standards stating, "Hydrants should be provided at each street intersection…" (DEQ-1 8.4.1.a)

The EPA Cross-Connection Manual states, *"Cross connections, which are defined as actual or potential connections between a potable and non-potable water supply, constitute a serious public health hazard."*

The public health significance of cross-connections is very well documented. Chapter 2 of the EPA Cross Connection Control manual is included in Appendix S of this PER and includes examples of drinking water contamination from cross-connections, many of which resulted from the main de-pressurization during main breaks and leaks. These examples include,

- Human blood in the water system,
- Heating system anti-freeze in the potable water,
- Paraquat in the water system,
- Propane gas in the water mains,
- Chlordane and heptachlor at a Housing Authority,
- Boiler water entering high school drinking water,
- Pesticides in drinking water,
- Etc.

Many of the above-cited examples specifically involved a main break repair.

Potential health and safety risk also exists in Geraldine's spring source, including:

- The springs occur within a mapped alluvial landslide deposit. Slow ground movement is observed to affect surficial spring collection features; valve boxes, vault structures and

fencing are exhibiting dislocation and settling impacts. Ground movement has caused some valves to be inaccessible and has buried by-pass outfall pipes. It is unclear at this time to what extent ground movement may be affecting the sub-surface spring collector piping.

- Significant cattle grazing activity in and around the springs poses a threat to spring water quality. The immediate area around each of the spring galleries is fenced, however, the fencing is in need of repair and provides inadequate protection from cattle-born fecal contamination of the larger springs footprint.
- Spring water is considered groundwater not under the direct influence of surface water. The documentation suggests the spring collection galleries were not constructed with an upper membrane or impermeable materials to effectively inhibit surface water infiltration. Spring water not captured by the collection galleries flows overland across the spring development as surface water and can infiltrate to groundwater. In addition, ground settling above the collection galleries has produced some surficial depressions which can retain surface water/snow melt, providing an increased potential for surface water contamination of the spring collectors.
- The springs are relatively lush areas with abundant plant growth and a developed organic soil profile. Excessive vegetation provides habitat for rodents and plant roots can cause clogging of spring collector piping over time. Organic-rich soils can increase concerns for bacterial contamination of the spring water collection system.
- The records reviewed to date, particularly with respect to Spring 5 do not provide a clear understanding of the configuration of the spring water collection system. Spring 5 is reported to be connected to the Spring 4A/B piping, but the design and connection of Spring 5 is not well documented. Sketches of the planned Spring 5 development indicate vault lids were to be set at least 2-feet above grade, however those lids are now nearly covered by land movement/settling. Structural settling/movement poses a risk to the Spring 5 collection system and potentially Springs 4A and 4B piping, if connected.
- The Geraldine Springs system, located approximately 3.5 miles south of Square Butte, is the main supply for the system. The Town lacks any redundancies for sourcing water, and seasonal moisture in springtime can limit access to facilities due to adverse road conditions during inclement weather. The high-quality springs were developed using collection galleries in 1985 and expanded in 2000. Current inspection of the spring development confirms the concerns listed above. (Appendix R)

Health and safety risk also exists in Geraldine's treatment site. The water system receives disinfection through a chlorination station using liquid sodium hypochlorite at an injection point north of the springs. The vaults that contain the flow meter and injection equipment are in a confined space, and the Town's workers are unable to easily and safely operate and maintain the equipment. Additionally, the building that houses the chlorination equipment has begun to deteriorate to a state which allows rodents and other vermin access to the chlorination equipment. The chlorination system is not presently set up to "flow pace" injection doses consistent with the supply flows which could leave the system under or over chlorinated at times.

In addition to the issues identified in the distribution system, issues with the total system storage facilities have also been identified. The existing elevated steel storage tank in Town is over 60-years old. Geraldine's existing storage tank is separated from the second larger tank by over 7 miles of transmission piping. The in-Town storage tank capacity is inadequate for future demands and fire flows within the Town limits, and the Town relies on additional capacity from the second tank for any emergency flow. Consecutive rural water connections existing between the south tank and Town have demands exceeding over 20%-40% of the total system demands. The analysis in Chapter 3 determines that Geraldine does not provide emergency storage capacity from the tank within the Town limits and will on the other tank to meeting emergency situations. The current tank volumes do not provide fire flow for commercial and schools at 2,500 gpm for 2 hours. Ensuring firefighters have sufficient fire flow availability is key for them to be able to better control the fire, improve their safety, and increase their ability to save lives.

4.1.1 Water Regulatory Requirements

The health and safety of the public is the paramount concern for operating and maintaining a community water system. The United States enacted the Safe Drinking Water Act (SDWA) which set standards for public water systems (PWSs) to provide all persons in the U.S. with safe and reliable drinking water. The Act was amended once in 1986 and again in 1996.

The regulatory responsibilities of the State of Montana are to meet the requirements established by the EPA and to ensure that state design criteria is met in public water systems. Public water systems in Montana are legally defined as entities that provide water to 25 or more people for more than 60 days a year or have 15 or more service connections. Since the State has passed equally stringent as the SDWA, Montana has satisfied the primacy requirements set by the federal government. The EPA has granted the Montana Department of Environmental Quality (MDEQ)

the ability to enforce the SDWA within Montana. Some rules set by the SDWA and are applicable to the Town's water system are described below.

National Primary Drinking Water Regulations

The National Primary Drinking Water Regulations are enforceable standards that set limits of potentially harmful constituents that may exist in a public water supply. The regulations set maximum contaminant levels (MCL) and maximum contaminant level goals (MCLG). The MCL values are the maximum concentration of a contaminant that can be present in a public water system before the system is in violation of the standards. The MCLG is the goal concentration of water in a public supply, but exceedance of the MCLG does not necessarily constitute a violation of the regulation. The MDEQ has been given primacy for enforcing the maximum contaminant levels. A list of contaminants and their MCLs can be found on the EPA's web page (http://www.epa.gov).

The Town's public water system currently complies with the primary drinking water regulations.

National Secondary Drinking Water Regulations

The National Secondary Drinking Water Regulations are non-enforceable standards that regulate limits on contaminants that affect the palatability and appearance of water. The secondary standards are only recommendations by the EPA; however, individual states may choose to adopt these standards as enforceable. Several contaminants listed on the Secondary Drinking Water Regulations also appear on the primary standards. If the concentrations of these constituents are elevated, the MCLs of the primary regulations may apply. A list of the contaminants and their limits for the secondary standards is available at (http://www.epa.gov).

The Town's public water system currently complies with the secondary drinking water regulations.

Montana Department of Environmental Quality Circular DEQ 1

The State has established design and construction criteria for public water works that must be met for new facilities. The requirements are described in MDEQ's Circular DEQ 1. The State reviews and approves the design before construction on new water facilities can begin.

While much of the distribution system does not comply with the latest DEQ standards, the design of alternatives and recommended improvements in this PER will comply with MDEQ's Circular 1. All improvement plans, specifications and design reports will be reviewed by DEQ.

Stage 1 Disinfectants and Disinfection By-Products Rule:

The Stage 1 Disinfectants and Disinfection By-Products Rule (Stage 1 DBPR) took effect in 1998. The purpose of the Stage 1 DBPR was to reduce the public's exposure from disinfection byproducts via public water supplies. Disinfection by-products (DBPs) have been shown to cause cancer and effects on reproduction in lab animals. Research of DBPs also suggests bladder cancer and reproductive effects in humans.

The rule established seven new contaminant standards and a treatment technique of enhanced coagulation or softening to further reduce DBP exposure. The regulations of Stage 1 DBPR did not take effect in systems with populations under 10,000 until 2004, and Geraldine's water system falls under this designation. Below in Table 4-1, a summary of the regulated contaminants is shown.

Table 4-1 - Stage 1 DBPR - Regulated Contaminants/Disinfectants

Stage 1 DBPR – Regulated Contaminants/Disinfectants		
Regulated Contaminants	MCL (mg/L)	MCLG (mg/L)
Total Trihalomethanes (TTHM)	0.080	
Chloroform		-
Bromodichloromethane		0
Dibromochloromethane		0.06
Bromoform		0
Five Haloacetic Acids (HAA5)	0.0060	
Monochloroacetic acid		-
Dichloroacetic acid		0
Trichloroacetic acid		0.3
Bromoacetic acid		-
Dibromoacetic acid		-
Bromate	0.010	0
Chlorite	1.0	0.8
Regulated Disinfectants	MRDL (mg/L)	MRDLG (mg/L)
Chlorine	4.0 as Cl_2	4
Chloramines	4.0 as Cl_2	4
Chlorine dioxide	0.8	0.8

The Town's public water system currently complies with Stage 1 DBPR.

Stage 2 Disinfectants and Disinfection By-Products Rule:

The Stage 2 Disinfectants and Disinfection By-Products Rule (Stage 2 DBPR) became effective in 2006. The purpose of Stage 2 DBPR is to further reduce the risk that DBRs have on public health in a public water system. Stage 2 builds on Stage 1 DBPR by focusing on monitoring for and reducing the concentrations of two classes of DBPs – Total Trichloromethanes (TTHM) and Five Haloacetic Acids (HAA5). The Stage 2 DBPR applies to all community water systems that either apply or deliver water that has been treated with primary or residual disinfectant other than ultraviolet light.

Since Geraldine's water system serves under 10,000 persons, the water system is classified as Schedule 4 under Stage 2 DBPR. The requirement for testing Geraldine's water system is two monitoring locations that are sampled annually. Compliance with Stage 2 DBPR is based on

locational running annual average (LRAA), which is calculated at each monitoring location, for the contaminant levels listed below in Table 4-2.

Table 4-2 - Stage 2 DBPR - Regulated Contaminants

Stage 2 DBPR – Regulated Contaminants/Disinfectants		
Regulated Contaminants	MCL (mg/L)	MCLG (mg/L)
Total Trihalomethanes (TTHM)	0.080 LRAA	
Chloroform		0.07
Bromodichloromethane		0
Dibromochloromethane		0.06
Bromoform		0
Five Haloacetic Acids (HAA5)	0.0060 LRAA	
Monochloroacetic acid		0.07
Dichloroacetic acid		0
Trichloroacetic acid		0.02
Bromoacetic acid		-
Dibromoacetic acid		-

The Town's public water system currently complies with Stage 2 DBPR.

Arsenic Rule

The Arsenic and Clarifications to Compliance and New source Monitoring Rule went into effect at the beginning of 2001. The purpose of the new rule was to improve public health by reducing the exposure to arsenic in drinking water. Scientific studies have linked arsenic exposure to bladder and lung cancer, skin damage, and circulatory system issues. The Arsenic Rule changed the MCL from 50 µg/L to 10 µg/L. The new regulation also established new requirements for monitoring new systems and drinking water sources and clarified procedures for determining compliance with MCL for IOCs, SOCs, and VOCs.

By implementing the Arsenic Rule, the EPA expects to avoid 16-26 non-fatal bladder and lung cancers per year, to avoid 21 to 30 fatal bladder and lung cancers per year, and to reduce the frequency of non-carcinogenic diseases. The new MCL for arsenic became effective at the beginning of 2006.

The Town's public water system currently complies with the Arsenic rule.

Lead and Copper Rule

The Lead and Copper Rule went into effect in A1991 with the purpose of reducing the public's exposure to lead and copper. Since the source of most lead and copper in public water systems is corrosion in plumbing materials, the regulation focuses primarily on reducing corrosivity. Examples of potential lead and copper sources are plumbing fixtures and pipe fittings.

The Lead and Copper Rule established action levels for lead and copper based on the 90th percentile level of tap water samples. The action level for lead is 0.015 mg/L and 1.3 mg/L for copper. An exceedance of the action level is not a violation; however, the exceedance triggers additional requirements that include water quality parameter monitoring, corrosion control treatment, source water monitoring/treatment, public education, and lead service line replacement.

The Town has not exceeded the action level for lead and copper. As a result, no additional action is required by the Town.

Although there is no violation, two lead services exist in Town. These water services could potentially contribute to future violations if no action is taken.

Radionuclides Rule:

The Radionuclides Rule went into effect at the end of 2000 and applies to community water systems regardless of size. The goal of the rule is to reduce the public's exposure to radionuclides in drinking water is to reduce the risk of cancer. The EP expects the exposure reduction to radionuclides will improve public health by reducing uranium exposure for 620,000 persons, protecting against toxic kidney effects of uranium, and reducing cancer risk.

The rule retains the exiting MCLs for combined radium-226 and radium-228 (5 pCi/L), gross alpha particle radioactivity (15 pCi/L), and beta particle and photon activity (4 mrem/yr). The rule set the uranium MCL for the first time at 30 µg/L.

The Geraldine water system complies with the Radionuclides Rule.

Revised Total Coliform Rule

Published in 2013, the Revised Total Coliform Rule (RTCR) the RTCR is the revision of the 1989 Total Coliform Rule (TCR). The purpose of the RTCR is to increase public health protection by

reducing potential pathways of entry for fecal contamination into distribution systems. The RTCR accomplishes its goal by establishing a MCL for *Escherichia coli* and uses *E. coli* and total coliforms (TC) to initiate a "find and fix" approach to address fecal contamination that could enter the distribution system. The rule requires all PWSs to perform assessments to identify sanitary defects and undertake subsequent action to correct deficiencies. The EPA expects that the implementation of the RTCR will decrease the pathways by which fecal contamination can enter a drinking water system and a reduction in fecal contamination. With less fecal contamination, the potential risks from all waterborne pathogens such as pathogenic bacteria, viruses, parasitic protozoa, and their associated illnesses.

Since Geraldine's water system is fed by groundwater and serves less than 1000 persons, routine samples are required to be taken monthly. If a routine sample has a positive result for total coliforms, the sample must be tested for the presence of *E. coli*. Additionally, a repeat sample from three locations is required to be taken within 24 hours from the TC positive site and within 5 services upstream and downstream of the TC positive site. If any of the repeat samples are positive for TC, the positive samples must be tested for *E. coli,* and any positive results must be reported to the State. Unless an assessment was triggered and the PWS has notified the state, repeat samples must be collected on any TC positive repeat samples.

The results of routine and repeat samples are used to determine whether or not the Town is in compliance with RTCR. A monthly MCL violation is triggered if one routine or repeat sample tests positive for TC. An acute MCL violation is triggered if the system has an *E. coli* positive repeat sample, or an *E. coli* positive sample followed by a positive TC repeat sample.

In 2018 the spring source which is the primary supply of the system underwent enforcement action to correct positive fecal coliform detections. This included engineering certification that the system meets 4-log virus inactivation by the dose administered and the available contact time. The Town also retested for TC and there were no further detections. The DEQ subsequently closed the enforcement action. This situation also shows the need for and importance of protecting the source springs from any surface water and livestock.

4.2 Aging Infrastructure

There are numerous deficiencies through Geraldine's water system including the water source, transmission system, and distribution systems. Each problem poses a potential risk to public health and safety and requires corrective measures.

Currently, the Town of Geraldine uses Meissner Ranch/Square Butte Springs, located approximately 3.5 miles south of Square Butte, as the sole supply for the municipal water system. There are several known issues with the source. The Town lacks any redundancies for sourcing water, and seasonal moisture in springtime can limit access to facilities due to adverse road conditions during inclement weather. The springs are also on a slow-moving landslide. The combination of restricted access and potential environmental threat puts the system's source water under threat of becoming contaminated. The Town also draws some water from a well in town only when needed and in rare cases of extreme emergency due to the poor water quality (GWIC ID: 2547).

The chlorination station for the water system is about 2 miles downstream of the springs. The equipment building is reaching the end of its service life and lacks functionality for a single operator. The building that houses the chlorine equipment is over 40 years old, and the structure's walls have begun to decay to the point that rodents and other vermin can access the interior. The vault which holds the chlorine injectors and flow meters is a confined access space that makes maintenance work like replacing chemical injector quills extremely difficult and unsafe for the operator. The current treatment system requires two operators for safe operation; however, the Town is unable to employ two operators because of staffing limitations.

The water from the springs is conveyed from the springs to the Town using a gravity fed 6-inch PVC transmission line. There are no known issues with the transmission piping; however, many of the air release valves and the pressure reducing valves have corroded severely. Additionally, the vaults that contain the PRVs have soil intrusion and settlement issues. The age of these valves and their vaults have led to air locking in the transmission line and are difficult for the operators to maintain. Failure of a PRV valve could result in either shutting down the sole water transmission main or causing over-pressurization of the main causing a pipe break. In either case the Town would be shut off from its primary source of water until repairs could be made.

The Town's current system is deficient to an extent in several areas, but the distribution system specifically is a weakness in the water system. Most water mains are undersized and have significant leakage due to age and structural defects. Continuing to repair leaks and ruptures on the water distribution system is unsustainable.

The Town is currently under great risk to fire because of the limited ability of the existing system to provide adequate fire flows throughout the Town. About half of the water mains in town are 4"

asphalt cement (AC) piping which connects to the fire hydrants. According to MDEQ, "The minimum size of water main for providing fire protection and serving fire hydrants must be six-inches in diameter." Not only are the current hydrants underserved, but the number does not meet MDEQ's standards. There should be fire hydrants at every street intersection to comply with Circular DEQ 1. The existing hydrants in Town were installed in the 1950's, are habitually leaking and have severe corrosion. The combination of small diameter mains, outdated fire hydrants, and leaks in the system from age and retrofits result in poor flows from hydrants. During flow testing, the available flows from hydrants were only 500 GPM or less. The undersized pipe and condition of fire hydrants pose a risk to the community by not providing needed fire flows.

The AC water mains themselves are a potential risk to Geraldine. Any cutting, drilling, or alterations to the existing AC pipe could release airborne asbestos into the local environment which could expose the public via inhalation. When asbestos particles are inhaled, a person has an increased risk of cancer and lung diseases. A cause that may contribute to this hazard to public health is private residences hiring local or small-scale contractors who would be typical of the rural setting and may not consistently follow OSHA guidelines when working with AC pipe. Replacing the AC water mains would remove the risk of the public being exposed to this hazardous material.

The deterioration of pipes, valves, and hydrants have led to significant water loss and control of water throughout the distribution system. Water loss estimates from preliminary data provided by the Town estimate that 20-60% of the water supplied to the distribution system is loss. This leakage indicates that there are significant deficiencies with the distribution system which make it very susceptible to backflow contamination. There are portions of Town which have petroleum contaminated soils and groundwater which is a major threat in the event of a backflow incident.

Corrosion of water valves has also resulted in the inability for the Town to isolate sections of the town for maintenance work or pipe repair. During the recent sewer project in Geraldine, 30-40% of water valves in town were learned to be unusable first-hand. As a result, major portions of Town needed to be shut down to affect the repairs leaving a large portion of the Town's residents without water. This represents a significant public health and safety threat to the Town's residents. Circular DEQ 1 requires the design of water valves in a distribution system to meet the following criteria,

> *"Sufficient valves must be provided on water mains so that inconvenience and sanitary hazards will be minimized during repairs. Valves should be located at not more than 500-foot intervals in commercial districts and at not more than one block or 800-foot intervals in other districts."*

The existing distribution system in Geraldine has a major problem with water loss and lacks the ability to isolate sections of the system for repair and maintenance. As a result, the health and safety of the public are at risk with the existing dilapidated system.

4.3 Reasonable Growth

The population of Geraldine and the rural users of the water system is not expected to increase significantly in the next 20 years. The current number of service users of Geraldine's water system is 268 persons. Assuming a growth rate of 0.5% in the town and no growth in rural users, the number of persons connected to the water system in 2042 is estimated to be 292. Population growth is not expected to drive design.

5.0 ALTERNATIVES CONSIDERED

5.1 Alternative Screening

This section evaluates several of the available alternatives and lists those for further analysis.

5.1.1 Supply

- Do nothing – No Action:
  This option does not provide sustainable improvements to the spring source system to protect, restore and preserve the Town's springs as the most important water asset.
- Protecting spring fencing and monitoring of individual spring flow measurements. This alternative includes installing new fencing to better protect the springs from livestock impacts. This also include performing at least monthly monitoring of and recording of the individual spring flows. This work can be completed by the Town and can be used to inform future improvements and the impacts due to drought conditions.
- Detailed Spring Assessment and Spring 5 Restoration Plan.
  This alternative would include completing a more detailed assessment of the springs site given the benefit of having more available flow data and records from individual springs once it becomes available. This alternative also includes performing a detailed plan and construction for the restoration of Spring 5.
- Spring Collector Rehabilitation and Preservation.
  This alternative would include more intensive improvements to the spring site including the removal of pervious topsoil and vegetation material and installing a protective liner to prevent water infiltration on all laterals deemed necessary.

The detailed spring assessment and the Spring 5 restoration plan will be considered for further evaluation in the PER as a Phase 2 spring project following a couple years of data collection and monitoring of the springs. The Phase 2 spring project is capital project that will require funding assistance to complete. The spring collector rehabilitation and preservation alternative described above is considered a Phase 3 spring project. The scope and cost of this potential project would be further defined and characterized following the completion of the Phase 2 project. The estimated cost of a Phase 3 springs project may be in the range of $150,000 to $200,000 or more.

A PER amendment may needed to be completed in the future following the Phase 2 project to update the project scope and cost to pursue funding sources.

5.1.2 Treatment

The alternatives for the treatment process for the public water supply includes the replacement of aging equipment, constructing a new piping and chemical building, and moving all process piping, valves, and equipment to a safer and more accessible above-ground environment. The purpose of constructing a new building and moving all treatment into the building would be to protect the treatment supply process from rodents that have been able to access the existing building, and to improve accessibility so that one operator can safely and effectively use the equipment.

- Do nothing – No Action:
  This alternative does not improve the usability of the treatment equipment or protect the water supply and public health by preventing access of rodents to treatment and electronic equipment. It also continues to put the operators at risk when entering the confined space for maintenance.

- Construct a new treatment building with new valves, piping, and injectors inside the building:
  The treatment process of the supply water would not change with this alternative; however, the process would be moved to be more accessible and safer space. Efficiencies and safety to the disinfection process can result from installing flow pacing chemical pumps where the dosage of the chemical is paced with a new flow meter. A small, insulated, and more permanent building would be constructed to house all the chlorine equipment, valves, and process piping.

5.1.3 Storage

The storage capacity of the Town's water system is comprised of the partially buried concrete storage tank south of town and the elevated steel tank in Town. Both structures require some level of repair as identified in Chapter 3. The upper zone of the concrete tank leaks, so the tank's capacity is reduced because the tank cannot be filled completely. The storage tank in Town has corrosion pitting on the interior that could lead to leaking if not addressed. The available capacity in Town does not provide sufficient emergency capacity and relies on the conveyance of over 7-

miles of transmission main to provide additional capacity in the event of a fire in Town or other emergency uses.

- Do nothing – No Action:
  Allowing the tanks to continue service without repair will not protect the Town's storage capacity in the future. The partially buried tank already has reduced capacity, and no action will not improve the tank's condition. Although the steel tank in town is not leaking, no repair efforts may contribute to the tank developing a leak and losing water in the future.

- Repair the aboveground steel tank and reline the upper zone of the partially buried zone tank:
  Repairing the pitting corrosion in the raised steel tank would be a preventative measure that would extend the service life of the storage tank and reduce the risk of leakage in the future.

  Lining the upper zone of the concrete storage tank would restore the storage capacity for the Town's water system and protect the water from potential contamination. Recompacting earthwork and placing an erosion control matting system will aid to limit further erosion.

- Construct a new on grade storage tank
  The Town in interested in constructing a new storage tank near the core of the Town that is sized to meet (in combination with the other tanks) the capacity of the entire system plus fire flows. The existing elevated steel tank is nearing the end of its useful life and the other system storage tank is located over 7 miles away via an existing 6-inch transmission main. Two rural water systems, which take as much as 30-40% of the total demands, draw water from the transmission main before the Town. The following new tank options are considered:

  Glass Lined Steel Tank Option

  - Typically, the least costly method of tank construction, in the 200,000 to 500,000-gallon capacity range, is a ground level steel tank. However, operation and maintenance costs for steel tanks can be considerable with welded and epoxy coated bolted steel tanks, which require periodic recoating to extend the service life. Relatively recent improvements to the applied coatings on these tanks,

including glass-lined interior and/or exterior coatings reduce the cost of maintenance. Glass-lined bolted steel tanks have a typical design life of around 40 years (or more) and do not require recoating. The initial tank coating is applied in a controlled environment at the factory. The glass coating forms a hard, chemically inert layer, which protects the steel surface from corrosion. Glass-lined steel tanks can be expanded if needed in the future and generally have lower life cycle costs than other types of steel tanks. In glass-lined tanks, vertical and horizontal seams must be resealed every 20 years.

One concern with glass lined tanks is potential damage to the glass surface during shipping and installation. The glass lining is fused to the steel at very high temperatures in a factory, a process that cannot be replicated in the field. If the glass lining is compromised, it must be repaired with a putty mastic that can peel off over time. Additionally, it is not uncommon for bolted tanks to leak, and the operator often must spend time each year managing those leaks. Lastly, freezing can be a problem for steel tanks, but can usually be controlled through design, mixing and operations.

On-Grade Concrete Tanks

- On-grade or partially buried concrete tanks offer many advantages over steel tanks, including their 100-year design life, protection from freezing, no need for painting, low visibility, and very little, if any, exposure for vandalism. The only anticipated operation and maintenance would include regular tank cleaning and an inspection every few years by a dive team to examine the tank for cracks and periodic removal of sediment buildup.
- Concrete tanks of similar capacity typically cost over 30-40% more to construct then equivalently sized glass-lined steel tanks. This is based on recent bid tabs on similar sized tank projects. Often tank projects are bid with both concrete and glass lined steel options for a community's consideration based on the actual bid price.
- The design of buried concrete storage tanks is based on the hoop stresses realized around the circumference of the tank. Generally, the actual strength of the tank is determined by the steel within the walls, as concrete works well under compression while steel works well under tension. Concrete tanks typically use pre-tensioned (or pre-stressed) steel wires to wrap the tank and provide this strength.

Given that the Town already owns and is familiar with the use of a concrete storage tank, and the Town expressed an interest in this alternative, the use of an on-grade concrete tank will be further evaluated in the PER. However, the project design and bidding documents can be developed to solicit bids of each tank alternative with little additional engineering costs to the project.

5.1.4 Distribution System

- Do nothing – No Action:

  The current distribution is plagued with issues of corroded and leaking hydrants, valves, and pipes. Not performing any improvements on the distribution would continue to allow for substantial water loss and poses a threat to public health. The risks to the public include the potential for negative pressure to pull in contaminated groundwater into the system, inadequate fire flows for fire suppression, and damage to any AC pipe could expose the public to toxic material. Without action, the Town will continue to expend ongoing resources, and time away from other important duties, in dealing with and repairing recurring leaks and ruptures.

- Replacement of 4" AC water and less mains, and 6" water main in petroleum contaminated soil area with 6" PVC and fittings (Phase 1)

  This alternative would replace the selected pipe of reduced size and performance issues, valves, and hydrants. The areas of main replacement include portions of Spring St., Frields St., Brewster St., Hilger St., Main St., Baucus St., Winchell Ave., Brady Ave., and Collins Ave. The 6" AC on Main St. is in soil contaminated with petroleum products and is a priority section to protect public health.

  The replacement of the 4" and smaller pipe will improve the system's ability to distribute water, provide fire flows, and drastically reduce water loss. Additionally, the replacement of corroded valves and hydrants will address the issues of being able to isolate pressure zones, provide fire protection, and further reduce leaking from the system. This will also reduce the risk of backflow contamination of the system.

- Replacement of all remaining 4" AC water main with 6" PVC and fittings (Phase 2)

  The Phase 2 replacement of water main focuses on the remaining 4-inch undersized AC pipe in the Town. This alternative includes the replacement not only pipe but also the fittings, valves, and hydrants in the selected areas. The streets in this phase would include

portions of Spring St., Brewster St., Hilger St., Baucus St., Brady Ave., and Geraldine Ave. The increase in diameter and new pipe will reduce water loss, allow isolation of pressure zones, and improve fire flows.

- Replacement of all remaining AC water main with 6" PVC and fittings (Phase 3)
  The Phase 3 replacement of pipe would include improving all the remaining AC pipe, valves, and hydrants in Town with 6" PVC and fittings. These improvements would include sections of Springs St., Main St., Railroad Ave., Broadway Ave., Collins Ave., and Winchell Ave. All of the existing water mains in this phase are 6" or larger, so the main goals of this phase are to reduce leaking and remove the hazardous AC pipe.

- Replacement of pressure reducing valves (PRVs) and air release valves on transmission line
  The PRVs and air release valves on the transmission line have reached the end of their service life. The PRVs have severely corroded, and their vaults have experienced ground soil intrusion. Replacing the valves and vaults would return the transmission line's functionality and reliability.

  The air release valves are currently not functioning effectively. The Town occasionally has air locks that occur between the springs and treatment building. Replacing the old air releases valves with new automatic air release valves would improve the Town's ability to relieve air from the system, so water service is not disrupted to any user.

- Replacement of systems existing system controls and data acquisition (SCADA) systems:
  The software and hardware that controls the water system are outdated. The SCADA system would be upgraded to newer versions that are more efficient and use- friendly than the current program.

5.2 Supply Alternatives

This section describes alternatives for rehabilitating the existing spring water site to extend the useful life of this very important source asset.

5.2.1 Alt. S-1: No Action

This option does not provide sustainable improvements to the spring source system to protect, restore and preserve the Town's spring is the most important water asset.

5.2.2 Alt. S-2: Phase 2 Spring Assessment and Spring 5 Restoration

This alternative would be completed following the Phase 1 Spring project scope described above that included installing new fencing to better protect the springs from livestock impacts and performing monitoring and recording of the individual spring flows. The Phase 1 Spring project has commenced for the ongoing monitoring and fencing is anticipated to be completed by the Town.

The Phase 2 Spring project includes completing and a more detailed assessment of the springs site with more available flow data from individual spring. This alternative also includes performing a detailed plan followed by construction work for restoring Spring 5.

Work on Spring 5 and associated lateral collectors would include replacing the existing spring box and valve and resetting new structures plumb to the surface. The construction work would be done in a very systematic and careful approach to limit impacts and disruptions to the entire spring system. Construction work is timed appropriately so the volume of flows to the users are within the demands of the system. (See Appendix R)

Design Criteria

The proposed spring system improvements will be designed to comply with DEQ Circular-1 Chapter 3 – Source Development and DEQ Circular-10 for Springs.

Map

A map of the general springs location and the general lateral locations can be found on Figure 3-1. Also, more detailed maps found in Hydrogeologic Assessment, found in Appendix R.

Environmental impacts

A wetland delineation will be completed to determine the location, boundary and area of any classified wetlands and potential impacts to wetlands. A wetland permit will be completed if necessary for the project.

Land Requirements

All spring work will take place within the existing easement with the current Ranch property Owner. The owner and all the users will be notified of any planned work. (See Appendix J).

Potential Construction Problems

The timing and the process of the construction methods will need to be done with careful planning between the Town, contractor and engineer. All work will need to be done by a qualified contractor with experience in working developing and rehabilitating springs. Consideration will be given to preselection of qualified contractors that have specialized in spring work.

Sustainability Considerations

Having a reliable and dependable spring source that reduces the operational demands of the Town and limits the potential occurrence of catastrophic failures of the spring system is a sustainable practice.

Water and Energy Efficiency

Maximizing the yield and dependability of the existing springs will reduce the need to potentially perform more costly emergency improvements at a later date. Having a reliable spring system that is fed entirely by gravity saves significant energy verses developing a new well with a pump.

Green Infrastructure

Maximizing the yield potential of the existing developed springs limits the need to dig in new areas and develop new spring laterals.

During construction of the improvements, stormwater management practices of temporary erosion and sediment control will be done to prevent erosion and stormwater pollution. This

methods for stormwater protection will include the installation and maintenance of temporary structural control measures to prevent erosion and transport of soil from the site.

Cost Estimates

The cost estimates for the water main replacement phases are shown below in Table 5-1.

Table 5-1 - Estimated Cost Phase 2 Spring Assessment and Spring 5 Rehabilitation

S-2 Springs Phase 2 Assessment and Spring 5 Restoration					
#	BID ITEM	QTY	UNITS	UNIT PRICE [1]	TOTAL
	Spring Street (Replace 3-inch AC)				
1	Spring 5 Restoration	1	LS	$ 60,000.00	$ 60,000
	Subtotal				$ 60,000
	Direct Construction Subtotal				$ 60,000
	Mobilization			10%	$ 6,000
	Construction Subtotal				$ 66,000
	2024 Construction Cost [2]			8.0%	$ 71,000
	Contingency			20%	$ 14,000
	Engineering Basic Services				$ 15,000
	RPR				$ 5,000
	Grant admin				$ 5,000
	Phase 2 - Hydrogeologic Study & Assessment				$ 30,000
	TOTAL				$ 140,000

[1] Estimated unit costs are based upon estimates from suppliers and bid tabs for similar projects throughout Montana.

[2] The ENR 20-year average Construction Cost Index is +8% (as of January 2022), so capital costs are projected to an anticipated construction date in 2024 using an 8% inflation rate.

5.3 Treatment Alternatives

The alternatives for treatment for the water system are to do nothing or construct a new building that will contain all the equipment. The purpose of upgrading is to improve the ease of operation and protect the public water supply from vermin. The two alternatives will be compared to determine the need for the project.

5.3.1 Alt. T-1: No Action

The alternative of No Action does not address the issues with the existing chlorination station. Letting the building to remain in disrepair will continue to allow rodents and other potential contamination sources from reaching the equipment. Additionally, the treatment equipment will still be difficult and unsafe for a single operator to use.

5.3.2 Alt. T-2: Construction of a Chlorination Station

This alternative includes the construction of a new weatherproof building with new equipment. The equipment and piping including the flow meter, injection quills, and all process piping will be moved above ground. The treatment process will remain effectively unchanged from the current system. Liquid sodium hypochlorite will be injected into the transmission line where mixing and disinfection will occur. The chemical injection will be accomplished by flow pacing using a 4-20 mA signal and a new magnetic flow meter. Sufficient upstream and downstream pipe lengths will be provided on each side of the meter to allow for accurate measurement.

Design Criteria

The proposed spring system improvements will be designed to comply with DEQ Circular-1 Chapter 4 – Treatment.

The disinfection requires adequate disinfectants to have sufficient time and be present in a large amount to inactivate pathogens throughout the entire distribution system. The required disinfection of the water supply is a 4-log removal of viruses before the first user's service. The minimum residual chlorine for the last user is 0.2 mg/L. According to measurements taken in 2018, the pH of the spring water was 8.2, and the temperature was 5°C. Given these conditions, a contact time (CT) of 16 minutes is required according to Table E-7 of "Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources." The CT provided is over 216 minutes. (Appendix Q)

Map

The new treatment building would be constructed entirely within the Town's existing water easement. See Figure 3-1 for a map of the existing system and location of the chlorination station. A conceptual plan of a new treatment building is shown below in Figure 5-1.

Environmental impacts

Little to no impact will be done to the environment because the work will take place on land that has been previously disturbed and excavated.

Land Requirements

The existing vaults, storage building, and the transmission line are all on private land. The Town has an easement with Meissner Ranches, Inc. to allow their infrastructure to be on the land and to access the equipment.

Potential Construction Problems

No construction problems are anticipated.

Sustainability Considerations

Water and Energy Efficiency

The replacement of outdated equipment will have a lower energy demand than the existing equipment. The increased equipment efficiency will decrease the power usage.

Green Infrastructure

During construction of the improvements, stormwater management practices of temporary erosion and sediment control will be done to prevent erosion and stormwater pollution. These methods for stormwater protection will include the installation and maintenance of temporary structural control measures to prevent erosion and transport of soil from the site.

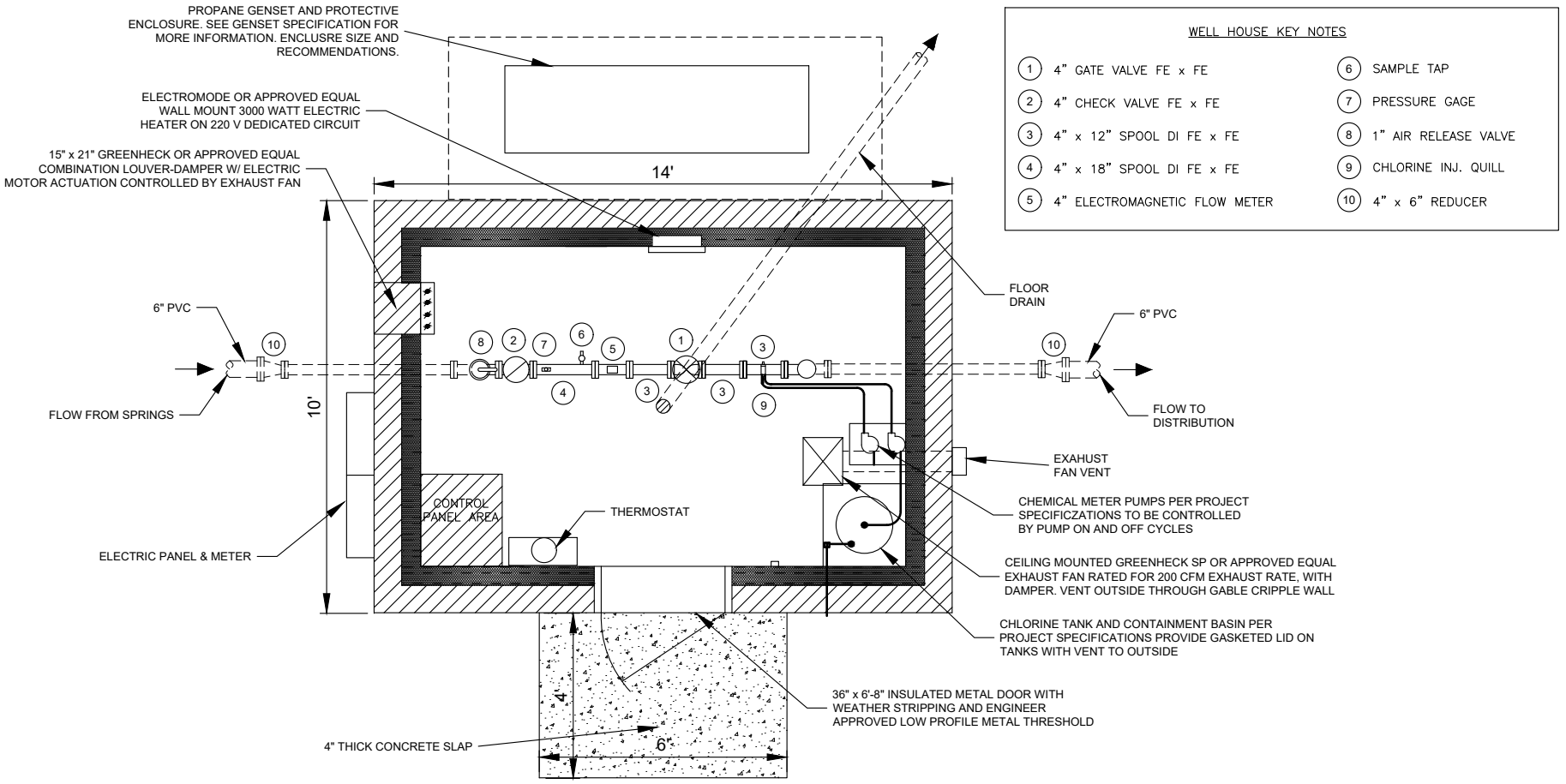

Figure 5-1
Treatment Building Floor Plan

TOWN OF GERALDINE
WATER IMPROVEMENTS - PRELIMINARY ENGINEERING

GreatWest ENGINEERING

Operational Ease

The Town of Geraldine is limited by only having one primary operator for its water system. Moving all the equipment into an aboveground building would allow the Town to have a single employee safely perform all operation and maintenance.

Cost Estimates

The cost estimate for the new chlorine treatment building and equipment is shown below in Table 5-2.

Table 5-2 - Estimated Cost for New Chlorination Treatment Building

Opinion of Probable Cost T-2: New Chlorination Treatment Building					
#	BID ITEM	QTY	UNITS	UNIT PRICE [1]	TOTAL
1	New Equipment Building	140	SF	$ 425.00	$ 59,500
2	Sitework & Grading	1	LS	$ 10,000.00	$ 10,000
3	4" DI Pipe	30	LF	$ 40.00	$ 1,200
4	6" 90° elbows	4	EA	$ 1,000.00	$ 4,000
5	6" x 18" Spool	1	EA	$ 1,000.00	$ 1,000
6	6" x 12" Spool	2	EA	$ 1,000.00	$ 2,000
7	6" to 3" Reducer	2	EA	$ 1,000.00	$ 2,000
8	6" Check Valve	1	EA	$ 1,500.00	$ 1,500
9	6" Gate Valve	2	EA	$ 2,000.00	$ 4,000
10	1 1/2" Pressure Relief Valve	1	EA	$ 1,500.00	$ 1,500
11	1" Air Vacuum Valve	1	EA	$ 1,500.00	$ 1,500
12	Sample Tap	1	EA	$ 500.00	$ 500
13	4" Flow Meter	1	EA	$ 5,000.00	$ 5,000
14	Backup Generator & Transfer Switch	1	EA	$ 40,000.00	$ 40,000
15	Furnish and Install Chlorination System & Safety Equipment	1	LS	$ 25,000.00	$ 25,000
16	HVAC	1	LS	$ 5,000.00	$ 5,000
17	Electrical	1	LS	$ 20,000.00	$ 20,000
18	Telemetry & Controls Integration to System	1	LS	$ 15,000.00	$ 15,000
	Direct Construction Subtotal				$ 199,000
	Mobilization			10%	$ 20,000
	Construction Subtotal				$ 219,000
	2024 Construction Cost [2]			8.0%	$ 255,000
	Contingency			20%	$ 51,000
	Boundary Survey, Easement Services				$ 8,000
	Basic Engineering Services - Preliminary Design, Final Design, Bidding, Construction, Post Construction			15%	$ 38,000
	RPR			5%	$ 13,000
	Legal & Administrative			5%	$ 13,000
	TOTAL				$ 378,000

[1] Estimated unit costs are based upon estimates from suppliers and bid tabs for similar projects throughout Montana.

[2] The ENR 20-year average Construction Cost Index is +8% (as of January 2022), so capital costs are projected to an anticipated construction date in 2024 using an 8% inflation rate.

5.4 Storage Alternatives

The alternatives discussed in this section consist of repairs to the storage tanks and also constructing a new concrete tank. There are three alternates considered: no action, tank repairs and also constructing a new storage tank near town.

5.4.1 Alt. R-1: No Action

The no action alternative does not stop the leaking of the concrete tank and fails to reduce the risk of failure in the steel tank. Allowing the leak to persist in the storage tank will perpetually reduce the storage capacity of Geraldine's water system. Not installing a new storage tank will reduce the available fire and emergency storage capacity available to the system.

5.4.2 Alt. R-2: Repairing the Concrete and Steel Tanks

This alternative includes repairing both the elevated steel tank and the partially buried concrete tank. The interior of the steel tank would be repaired with patch epoxy to eliminate the pitting and reduce the risk of failure.

The concrete tank would require some minor interior and exterior improvements. The upper zone of inside of the concrete tank would be lined with an elastomeric coating to stop the leaking and to restore the capacity of the tank. The backfill around the tank would be regraded and compacted and erosion prevention measures would be installed to prevent future settlement.

Design Criteria

All repair materials and components will need to conform to NSF-61 requirements and have a design life of at least 20 years. All design criteria presented in Circular DEQ 1 is applicable to each alternative considered, yet consideration will include requirements in Chapter 7 – Finished Water Storage.

Map

See Figure 3-1 – A Map of Existing Water System Facilities for the location of the two tank sites.

Environmental impacts

Little to no impact will be done to the environment because the work will take place on land that has been previously disturbed and excavated.

Land Requirements

No additional land is required for the alternatives.

Potential Construction Problems

No major construction problems are anticipated. However, each tank would need to be placed temporarily out of service. The timing of this work should be done to avoid periods of high fire hazard seasons.

Sustainability Considerations

Water and Energy Efficiency

Repairing the tanks will stop current leaking and reduce the risk of future leaking. This action will reduce the amount of water wasted from the system.

Green Infrastructure

During construction of the improvements, stormwater management practices of temporary erosion and sediment control will be done to prevent erosion and stormwater pollution. These methods for stormwater protection will include the installation and maintenance of temporary structural control measures to prevent erosion and transport of soil from the site.

Cost Estimates

The cost estimate for the repairs for both tanks, as described above, is shown below in 5-3.

Table 5-3 - Estimated Cost for Tank Repairs

Opinion of Probable Cost R-2: Repair of Water Tanks					
#	BID ITEM	QTY	UNITS	UNIT PRICE [1]	TOTAL
1	Lining Concrete Storage Tank	1	LS	$ 50,000.00	$ 50,000
2	Installing Erosion Mats, Recompacting Fill	2,000	SF	$ 15.00	$ 30,000
3	Earthwork	1	LS	$ 10,000.00	$ 10,000
4	Epoxy Repairing Elevated Storage Tank	1	LS	$ 10,000.00	$ 10,000
	Direct Construction Subtotal				$ 100,000
	Mobilization			10%	$ 10,000
	Construction Subtotal				$ 110,000
	2024 Construction Cost [2]			8.0%	$ 128,000
	Contingency			20%	$ 26,000
	Basic Engineering Services - Preliminary Design, Final Design, Bidding, Construction, Post Construction				$ 13,000
	RPR				$ 13,000
	Legal & Administrative			5%	$ 6,000
	TOTAL				$ 186,000

[1] Estimated unit costs are based upon estimates from suppliers and bid tabs for similar projects throughout Montana.

[2] The ENR 20-year average Construction Cost Index is +8% (as of January 2022), so capital costs are projected to an anticipated construction date in 2024 using an 8% inflation rate.

5.4.3 Alt. R-3: New 210,000 gallon on grade concrete tank

This alternative would construct a new concrete storage tank within approximately 3,000 to 4,000 feet west of Town. The tank would be set on the local hillside and set to an elevation to provide an average static pressure of about 60 psi in town; this is a beneficial increase from the current 38-45 psi pressures provided. A new 8-inch transmission main would need to be extended from the existing transmission line to the new tank location. The new tank site would require an access road and a new power connection for telemetry and control equipment.

The design of buried concrete storage tanks is based on the hoop stresses realized around the circumference of the tank. Generally, the actual strength of the tank is determined by the steel within the walls, as concrete works well under compression while steel works well under tension. Concrete tanks typically use pre-tensioned (or pre-stressed) steel wires to wrap the tank and

provide this strength. A geotechnical evaluation would be required to properly assess the local subsurface conditions and design the tank foundation.

Design Criteria

All design criteria presented in Circular DEQ 1 are applicable to each alternative considered, but specifically, the storage tank alternatives will meet the requirements in Chapter 7 – Finished Water Storage. All proposed improvements will receive MDEQ approval prior to the commencement of any construction activity.

Map

See Figure 5-2 for a conceptual location of a potential new concrete storage tank. The existing location would depend on land acquisition and more precise hydraulic computations.

Environmental impacts

Given that a new tank would require the installation of about 3,500 feet of new water main and a new tank in locations that were not previously impacted, there are some potential temporary impacts to the environment. However, careful consideration will be given to the route for a new transmission main. A new tank would be sited likely on a hillside and out of the existing farmland. The intended pipeline route is not within a floodplain or any wetland areas.

Land Requirements

A permanent and temporary construction easement will be required for up to 3,500 feet of new main. The easement should be 15-20 feet from the centerline of the pipe. It is recommended that the Town consider purchasing land for a new tank site sufficient to allow access around the perimeter for maintenance – at least 20 to 30-feet from the outer tank walls

Potential Construction Problems

A geotechnical evaluation will be required for a new tank to verify the suitability of the subsurface and impacts to the tank foundation design.

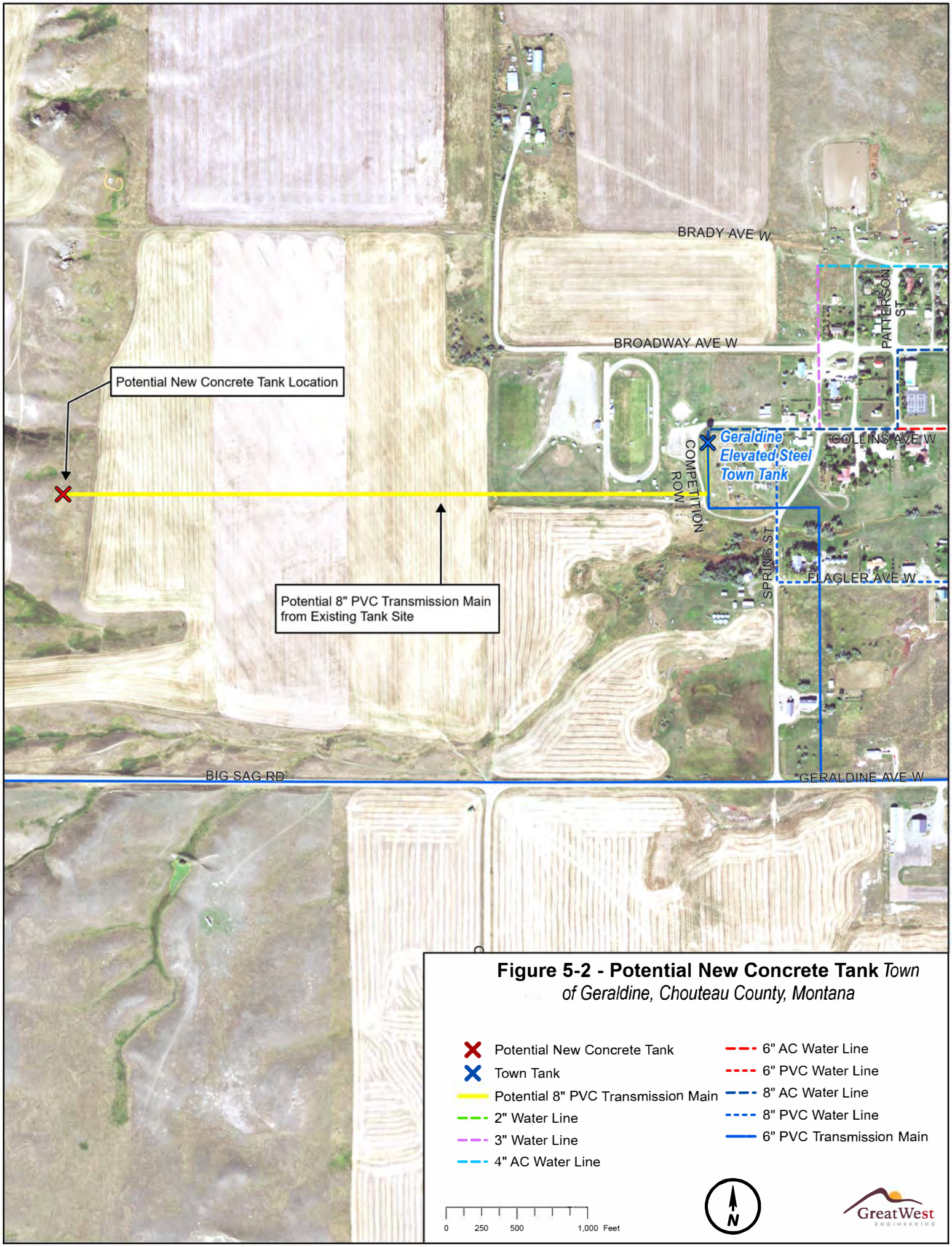

Figure 5-2 - Potential New Concrete Tank *Town of Geraldine, Chouteau County, Montana*

Sustainability Considerations

Water and Energy Efficiency

While most of this loss likely occurs in the distribution system, the existing tank has the potential for leaks due to its old age. Leakage in the tank and pipes throughout the system wastes a valuable community resource and increases treatment costs. Replacing the aging tank will reduce the potential for leaks which will ultimately result in reduced energy consumption.

Green Infrastructure

During construction of the improvements, stormwater management practices of temporary erosion and sediment control will be done to prevent erosion and stormwater pollution. These methods for stormwater protection will include the installation and maintenance of temporary structural control measures to prevent erosion and transport of soil from the site.

Cost Estimates

The cost estimate to construct a new concrete is shown below in Table 5-4. Table 5-5 shows the estimated O&M costs related to a new concrete tank.

Table 5-4 - Estimated Cost new On Grade Concrete Tank

Opinion of Probable Cost Alternative R-3 New 210,000 Gallon Buried Concrete Storage Tank Near Town					
#	BID ITEM	QTY	UNITS	UNIT PRICE [1]	TOTAL
1	Water Storage Tank Sitework	1	LS	$ 100,000.00	$ 100,000
2	Water Storage Tank Access Road (8' wide, 6" gravel)	1,300	LF	$ 25.00	$ 32,500
3	Concrete Water Storage Tank	1	LS	$ 800,000.00	$ 800,000
4	Tank Foundation	1	LS	$ 125,000.00	$ 125,000
5	8" PVC Transmission Main	3,100	LF	$ 60.00	$ 186,000
6	8" PVC Distribution Main	3,100	LF	$ 60.00	$ 186,000
7	Chain Link Fencing around Tank Site	300	LF	$ 50.00	$ 15,000
8	Telemetry and Control System	1	LS	$ 25,000.00	$ 25,000
	Direct Construction Subtotal				$ 1,470,000
	Mobilization			10%	$ 147,000
	Construction Subtotal				$ 1,617,000
	2024 Construction Cost [2]			8.0%	$ 1,886,000
	Contingency			20%	$ 377,000
	Land Acquisition and Easements				$ 50,000
	Single Phase Power Extension				$ 25,000
	Geotechnical Investigation				$ 20,000
	Engineering Basic Services			10%	$ 226,300
	RPR			10%	$ 226,300
	Grant Admin, Legal, & Administrative			3%	$ 67,900
	TOTAL				$ 2,878,500

[1] Estimated unit costs are based upon estimates from suppliers and bid tabs for similar projects throughout Montana.

[2] The ENR average Construction Cost Index is +8.0% (as of January 2022), so capital costs are projected to an anticipated construction date in 2024 using an 8% inflation rate.

Table 5-5 - Estimated O&M Cost New On Grade Concrete Tank

Alternative R-3 New 210,000 Gallon Buried Concrete Storage Tank Near Town					
#	ITEM	QTY	UNITS	UNIT PRICE	TOTAL
1	Labor	80	HR	$25.00	$ 2,000.00
2	Spare Parts/Repair/Maintenance	1	LS	$500.00	$ 500.00
3	Administration/Office Supplies	1	LS	$250.00	$ 250.00
4	Training	1	LS	$250.00	$ 250.00
5	Vehicle Operation and Maintenance	1	LS	$250.00	$ 250.00
6	Tank Cleaning	1	LS	$1,000.00	$ 1,000.00
7	Patching/Repair Concrete	1	LS	$300.00	$ 300.00
8	Reserve	1	LS	$2,275.00	$ 2,275.00
	TOTAL				$ 6,800.00

5.5 Distribution System Alternatives

The alternatives described in this section are designed to address the aging infrastructure of the distributive system, increase the flow provided for fire suppression, reduce the water loss and reduce the threat of backflow contamination. All pipe replacements will be completed with PVC piping.

5.5.1 Alt. D-1: No Action

Keeping the existing pipe in the system in service does not provide a solution to any of the Town's problems. The substantial water loss in the system would continue and potentially worsen in subsequent years due to corrosion and unidentified leaking sections. The corrosion of valves and other appurtenances would also continue to be a risk to public health and safety. The Town would not be able to provide adequate flows during fires without improvements. Additionally, the potential for contaminated ground water to backflow into the distribution system remains.

5.5.2 Alt. D-2: Phase 1 – Replacement of Problematic 4" AC and 6" AC in Petroleum Contaminated Soils

The most deficient sections of pipe in Town were identified in this PER. In this alternative, sections of 4" AC and a portion of 6" AC in petroleum contaminated soil would be replaced with 6" PVC. The total amount of pipe to be replaced in this phase would be approximately 6,330 lineal feet. In addition to the pipe replacement, new hydrant, valves, and fittings would be furnished in the upgraded sections. The lead services at 226 Spring St. and 341 Main St. would

be replaced during this phase. This alternative focuses on the improvement of water mains that pose the greatest risk to public health.

Upgrading the pipe size and the installation of new pipe would address the issues of leakage and limited flows. The 6" PVC and new hydrants would bring portions of the Town's system into compliance with DEQ standards of minimum pipe size for fire protection. The new valves would also help sections of the system meet compliance and improve the operation of the distribution system. A sufficient number of new valves would be furnished to allow the Town to isolate portions of the system which meet DEQ requirements, improves the operation of the system, and helps protect public health. Additionally, the risk of contaminated groundwater or soil entering through leaking sections of pipes would be greatly reduced.

5.5.3 Alt. D-3: Phase 2 – Replacement of Remaining 4" AC

The second phase of improving water mains in Geraldine would be consist of replacing the remaining 4" AC pipe. Like Phase 1 improvements, pipe in Phase 2 will be replaced with 6" PVC and new hydrants, fittings, and valves would be furnished. The benefits from these improvements would be the same as those gains in Phase 1. The estimated length of pipe to be replaced in this alternative would be 6,700 feet.

5.5.4 Alt. D-4: Phase 3 – Replacement of Remaining Pipe in Town

This alternative would include replacing any AC water mains and related components that were not improved in either Phase 1 or Phase 2. The benefits would be the same in this phase as the previous ones; however, the complete removal of AC pipe would eliminate the risk of the public being exposed to asbestos.

Design Criteria

The proposed water system improvements will be designed to comply with DEQ Circular-1 Chapter 8 – Distribution System. The existing and projected demands are listed in Section 3.

Map

See Figure 5-3 for a map of the proposed phased water system distribution improvements.

Environmental impacts

Little to no impact will be done on the environment because the work will take place on land that has been previously disturbed and excavated.

Land Requirements

None of the alternatives described in this section will require additional land. All improvements are within the Town's rights-of-way.

Potential Construction Problems

No construction problems are anticipated.

Sustainability Considerations

Water and Energy Efficiency

Since water loss is a significant problem of the existing system, replacement of the leaking water mains would reduce wasted water.

Green Infrastructure

During the construction of the improvements, stormwater management practices of temporary erosion and sediment control will be done to prevent erosion and stormwater pollution. These methods for stormwater protection will include the installation and maintenance of temporary structural control measures to prevent erosion and transport of soil from the site.

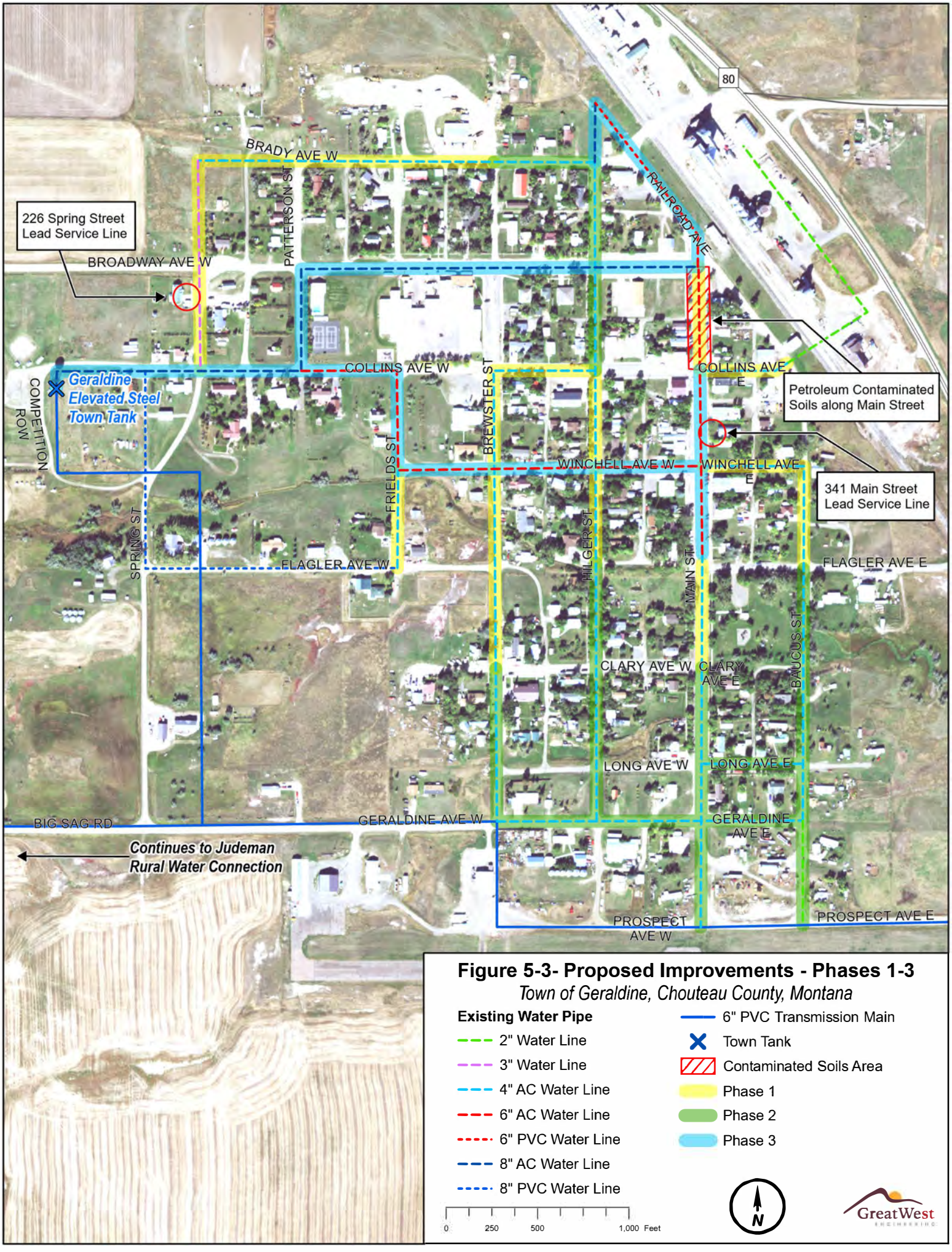

Figure 5-3- Proposed Improvements - Phases 1-3

Town of Geraldine, Chouteau County, Montana

Existing Water Pipe

- 2" Water Line
- 3" Water Line
- 4" AC Water Line
- 6" AC Water Line
- 6" PVC Water Line
- 8" AC Water Line
- 8" PVC Water Line

- 6" PVC Transmission Main
- Town Tank
- Contaminated Soils Area
- Phase 1
- Phase 2
- Phase 3

0 250 500 1,000 Feet

N

GreatWest ENGINEERING

Cost Estimates

The cost estimates for the phased water main replacement phases are shown below in Table 5-6, Table 5-7, and Table 5-8.

Table 5-6 - Estimated Cost for Phase 1 Water Distribution System Improvements

Opinion of Probable Cost D-2 Phase 1 Replacement of AC Pipe in Town					
#	BID ITEM	QTY	UNITS	UNIT PRICE [1]	TOTAL
Spring Street (Replace 3-inch AC)					
1	Connect to Existing Water	1	EA	$ 2,500.00	$ 2,500
2	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
3	6" PVC Water and Fittings	790	LF	$ 90.00	$ 71,100
4	6" Gate Valve	3	EA	$ 2,500.00	$ 7,500
5	6" Fittings	4	EA	$ 1,200.00	$ 4,800
6	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
7	Water Service Connection	8	EA	$ 1,500.00	$ 12,000
8	3/4" PE Water Service	160	LF	$ 60.00	$ 9,600
9	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
10	Type B (Gravel) Surface Restoration	450	SY	$ 25.00	$ 11,250
11	Type C (Grass) Surface Restoration	450	SY	$ 15.00	$ 6,750
Subtotal					$ 132,500
Brady Ave. (Replace 4-inch AC main)					
12	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
13	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
14	6" PVC Water and Fittings	750	LF	$ 90.00	$ 67,500
15	6" Gate Valve	3	EA	$ 2,500.00	$ 7,500
16	6" Fittings	6	EA	$ 1,200.00	$ 7,200
17	6" Fire Hydrant with gate valve	2	EA	$ 6,000.00	$ 12,000
18	Water Service Connection	12	EA	$ 1,500.00	$ 18,000
19	3/4" PE Water Service	240	LF	$ 60.00	$ 14,400
20	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
21	Type B (Gravel) Surface Restoration	800	SY	$ 25.00	$ 20,000
22	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 152,600

Hilger St. (Replace 4-inc AC Main, Collins to Flagler)					
23	Connect to Existing Water	4	EA	$ 2,500.00	$ 10,000
24	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
25	6" PVC Water and Fittings	750	LF	$ 90.00	$ 67,500
26	6" Gate Valve	4	EA	$ 2,500.00	$ 10,000
27	6" Fittings	6	EA	$ 1,200.00	$ 7,200
28	6" Fire Hydrant with gate valve	3	EA	$ 6,000.00	$ 18,000
29	Water Service Connection	18	EA	$ 1,500.00	$ 27,000
30	3/4" PE Water Service	360	LF	$ 60.00	$ 21,600
31	Type A (Asphalt) Surface Restoration	850	SY	$ 55.00	$ 46,750
32	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
33	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 209,050
Frields St. (Replace 4-inch AC Main)					
34	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
35	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
36	6" PVC Water and Fittings	400	LF	$ 90.00	$ 36,000
37	6" Gate Valve	2	EA	$ 2,500.00	$ 5,000
38	6" Fittings	5	EA	$ 1,200.00	$ 6,000
39	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
40	Water Service Connection	5	EA	$ 1,500.00	$ 7,500
41	3/4" PE Water Service	100	LF	$ 60.00	$ 6,000
42	Type A (Asphalt) Surface Restoration	500	SY	$ 55.00	$ 27,500
43	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
44	Type C (Grass) Surface Restoration	0	SY	$ 15.00	
Subtotal					$ 100,000
Brewster St. (Replace 4-inch AC, Collins to Clary)					
45	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
46	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
47	6" PVC Water and Fittings	1,200	LF	$ 90.00	$ 108,000
48	6" Gate Valve	3	EA	$ 2,500.00	$ 7,500
49	6" Fittings	6	EA	$ 1,200.00	$ 7,200
50	6" Fire Hydrant with gate valve	2	EA	$ 6,000.00	$ 12,000
51	Water Service Connection	16	EA	$ 1,500.00	$ 24,000
52	3/4" PE Water Service	320	LF	$ 60.00	$ 19,200
53	Type A (Asphalt) Surface Restoration	500	SY	$ 55.00	$ 27,500
54	Type B (Gravel) Surface Restoration	900	SY	$ 25.00	$ 22,500
55	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 233,900

Main St. (Replace 6-inch AC within petroleum contaminated area-Broadway to Winchell)					
56	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
57	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
58	6" PVC Water and Fittings	500	LF	$ 90.00	$ 45,000
59	6" Gate Valve	2	EA	$ 2,500.00	$ 5,000
60	6" Fittings	6	EA	$ 1,200.00	$ 7,200
61	6" Fire Hydrant with gate valve	2	EA	$ 6,000.00	$ 12,000
62	Water Service Connection	8	EA	$ 1,500.00	$ 12,000
63	3/4" PE Water Service	400	LF	$ 60.00	$ 24,000
64	Type A (Asphalt) Surface Restoration	600	SY	$ 55.00	$ 33,000
65	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
66	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 144,200
Winchell Ave.					
67	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
68	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
69	6" PVC Water and Fittings	360	LF	$ 90.00	$ 32,400
70	6" Gate Valve	3	EA	$ 2,500.00	$ 7,500
71	6" Fittings	6	EA	$ 1,200.00	$ 7,200
72	6" Fire Hydrant with gate valve	2	EA	$ 6,000.00	$ 12,000
73	Water Service Connection	10	EA	$ 1,500.00	$ 15,000
74	3/4" PE Water Service	200	LF	$ 60.00	$ 12,000
75	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
76	Type B (Gravel) Surface Restoration	400	SY	$ 25.00	$ 10,000
77	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 102,100
Baucus St. (Replace 4-inch AC Main Winchell to Flagler)					
78	Connect to Existing Water	1	EA	$ 2,500.00	$ 2,500
79	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
80	6" PVC Water and Fittings	400	LF	$ 90.00	$ 36,000
81	6" Gate Valve	2	EA	$ 2,500.00	$ 5,000
82	6" Fittings	5	EA	$ 1,200.00	$ 6,000
83	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
84	Water Service Connection	10	EA	$ 1,500.00	$ 15,000
85	3/4" PE Water Service	200	LF	$ 60.00	$ 12,000
86	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
87	Type B (Gravel) Surface Restoration	450	SY	$ 25.00	$ 11,250
88	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 94,750

Collins Ave (Replace 4-inch AC Main Brewster to Hilger)					
89	Connect to Existing Water	1	EA	$ 2,500.00	$ 2,500
90	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
91	6" PVC Water and Fittings	400	LF	$ 90.00	$ 36,000
92	6" Gate Valve	2	EA	$ 2,500.00	$ 5,000
93	6" Fittings	5	EA	$ 1,200.00	$ 6,000
94	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
95	Water Service Connection	10	EA	$ 1,500.00	$ 15,000
96	3/4" PE Water Service	200	LF	$ 60.00	$ 12,000
97	Type A (Asphalt) Surface Restoration	450	SY	$ 55.00	$ 24,750
98	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
99	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 108,250
Collins Ave (Replace 2-inch AC Main Brewster to Hilger)					
100	Connect to Existing Water	1	EA	$ 2,500.00	$ 2,500
101	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
102	6" PVC Water and Fittings	380	LF	$ 90.00	$ 34,200
103	6" Gate Valve	2	EA	$ 2,500.00	$ 5,000
104	6" Fittings	4	EA	$ 1,200.00	$ 4,800
105	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
106	Water Service Connection	8	EA	$ 1,500.00	$ 12,000
107	3/4" PE Water Service	160	LF	$ 60.00	$ 9,600
108	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
109	Type B (Gravel) Surface Restoration	400	SY	$ 25.00	$ 10,000
110	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 85,100
Main St. (Replace 4-inch AC Main, Flagler to Clary)					
111	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
112	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
113	6" PVC Water and Fittings	400	LF	$ 90.00	$ 36,000
114	6" Gate Valve	2	EA	$ 2,500.00	$ 5,000
115	6" Fittings	4	EA	$ 1,200.00	$ 4,800
116	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
117	Water Service Connection	5	EA	$ 1,500.00	$ 7,500
118	3/4" PE Water Service	250	LF	$ 60.00	$ 15,000
119	Type A (Asphalt) Surface Restoration	450	SY	$ 55.00	$ 24,750
120	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
121	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 105,050

Collins Ave (Replace 4-inch AC Main Brewster to Hilger)					
122	Replace Service In Ground (226 Spring St.)	60	LF	$ 80.00	$ 4,800
123	Replace Service In Ground (241 Main St.)	60	LF	$ 80.00	$ 4,800
Subtotal					$ 9,600
	Direct Construction Subtotal				$ 1,477,100
	Mobilization			10%	$ 147,700
	Temporary Water				$ 30,000
	Construction Subtotal				$ 1,654,800
	2023 Construction Cost [2]			8.0%	$ 1,787,000
	Contingency			25%	$ 447,000
	Basic Engineering Services - Preliminary Design, Final Design, Bidding, Construction, Post Construction			10%	$ 178,500
	RPR			10%	$ 178,500
	Geotechnical Evaluation				$ 20,000
	Hydrogeologic Study				$ 25,000
	Audit				$ 20,000
	Legal & Administrative				$ 34,000
	TOTAL				$ 2,690,000

[1] Estimated unit costs are based upon estimates from suppliers and bid tabs for similar projects throughout Montana.

[2] The ENR 20-year average Construction Cost Index is +8% (as of January 2022), so capital costs are projected to an anticipated construction date in 2024 using an 8% inflation rate.

Table 5-7 - Estimated Cost of Phase 2 Distribution System Improvements

Opinion of Probable Cost D-3: Phase 2 Replacement of AC Pipe in Town					
#	BID ITEM	QTY	UNITS	UNIT PRICE [1]	TOTAL
Brady Avenue (Replace 4" AC)					
1	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
2	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
3	6" PVC Water and Fittings	730	LF	$ 90.00	$ 65,700
4	6" Gate Valve	3	EA	$ 2,500.00	$ 7,500
5	6" Fittings	4	EA	$ 1,200.00	$ 4,800
6	6" Fire Hydrant with gate valve	2	EA	$ 6,000.00	$ 12,000
7	Water Service Connection	14	EA	$ 1,500.00	$ 21,000
8	3/4" PE Water Service	280	LF	$ 60.00	$ 16,800
9	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
10	Type B (Gravel) Surface Restoration	810	SY	$ 25.00	$ 20,250
11	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 154,050

Brewster Street (Replacement of 4" AC)					
12	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
13	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
14	6" PVC Water and Fittings	500	LF	$ 90.00	$ 45,000
15	6" Gate Valve	2	EA	$ 2,500.00	$ 5,000
16	6" Fittings	3	EA	$ 1,200.00	$ 3,600
17	6" Fire Hydrant with gate valve	2	EA	$ 6,000.00	$ 12,000
18	Water Service Connection	8	EA	$ 1,500.00	$ 12,000
19	3/4" PE Water Service	160	LF	$ 60.00	$ 9,600
20	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
21	Type B (Gravel) Surface Restoration	560	SY	$ 25.00	$ 14,000
22	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 107,200
Hilgers Street (Replacement of 4" AC, Brady Ave to Collins Ave)					
23	Connect to Existing Water	1	EA	$ 2,500.00	$ 2,500
24	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
25	6" PVC Water and Fittings	750	LF	$ 90.00	$ 67,500
26	6" Gate Valve	2	EA	$ 2,500.00	$ 5,000
27	6" Fittings	4	EA	$ 1,200.00	$ 4,800
28	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
29	Water Service Connection	8	EA	$ 1,500.00	$ 12,000
30	3/4" PE Water Service	160	LF	$ 60.00	$ 9,600
31	Type A (Asphalt) Surface Restoration	830	SY	$ 55.00	$ 45,650
32	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
33	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 154,050
Hilger Street (Replacement of 4" AC, Flagler Ave to Prospect Ave)					
34	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
35	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
36	6" PVC Water and Fittings	950	LF	$ 90.00	$ 85,500
37	6" Gate Valve	4	EA	$ 2,500.00	$ 10,000
38	6" Fittings	6	EA	$ 1,200.00	$ 7,200
39	6" Fire Hydrant with gate valve	3	EA	$ 6,000.00	$ 18,000
40	Water Service Connection	18	EA	$ 1,500.00	$ 27,000
41	3/4" PE Water Service	360	LF	$ 60.00	$ 21,600
42	Type A (Asphalt) Surface Restoration	1,060	SY	$ 55.00	$ 58,300
43	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
44	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 233,600

Main Street (Replacement of 4" AC)					
45	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
46	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
47	6" PVC Water and Fittings	980	LF	$ 90.00	$ 88,200
48	6" Gate Valve	4	EA	$ 2,500.00	$ 10,000
49	6" Fittings	5	EA	$ 1,200.00	$ 6,000
50	6" Fire Hydrant with gate valve	2	EA	$ 6,000.00	$ 12,000
51	Water Service Connection	15	EA	$ 1,500.00	$ 22,500
52	3/4" PE Water Service	300	LF	$ 60.00	$ 18,000
53	Type A (Asphalt) Surface Restoration	1,090	SY	$ 55.00	$ 59,950
54	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
55	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 222,650
Baucus Street (Replacement of 4" AC from Flagler Ave to Prospect Ave)					
56	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
57	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
58	6" PVC Water and Fittings	1,350	LF	$ 90.00	$ 121,500
59	6" Gate Valve	4	EA	$ 2,500.00	$ 10,000
60	6" Fittings	6	EA	$ 1,200.00	$ 7,200
61	6" Fire Hydrant with gate valve	3	EA	$ 6,000.00	$ 18,000
62	Water Service Connection	12	EA	$ 1,500.00	$ 18,000
63	3/4" PE Water Service	240	LF	$ 60.00	$ 14,400
64	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
65	Type B (Gravel) Surface Restoration	1,500	SY	$ 25.00	$ 37,500
66	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 232,600
Long Avenue (Replacement of 4" AC)					
67	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
68	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
69	6" PVC Water and Fittings	400	LF	$ 90.00	$ 36,000
70	6" Gate Valve	1	EA	$ 2,500.00	$ 2,500
71	6" Fittings	2	EA	$ 1,200.00	$ 2,400
72	6" Fire Hydrant with gate valve	0	EA	$ 6,000.00	$ -
73	Water Service Connection	0	EA	$ 1,500.00	$ -
74	3/4" PE Water Service	0	LF	$ 60.00	$ -
75	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
76	Type B (Gravel) Surface Restoration	440	SY	$ 25.00	$ 11,000
77	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 57,900

Geraldine (Replacement of 4" AC)					
78	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
79	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
80	6" PVC Water and Fittings	1,140	LF	$ 90.00	$ 102,600
81	6" Gate Valve	6	EA	$ 2,500.00	$ 15,000
82	6" Fittings	6	EA	$ 1,200.00	$ 7,200
83	6" Fire Hydrant with gate valve	0	EA	$ 6,000.00	$ -
84	Water Service Connection	8	EA	$ 1,500.00	$ 12,000
85	3/4" PE Water Service	160	LF	$ 60.00	$ 9,600
86	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
87	Type B (Gravel) Surface Restoration	1,270	SY	$ 25.00	$ 31,750
88	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
	Subtotal				$ 184,150
	Direct Construction Subtotal				$ 1,346,000
	Mobilization		10%		$ 135,000
	Construction Subtotal				$ 1,481,000
	2024 Construction Cost [2]		8.0%		$ 1,727,000
	Contingency		20%		$ 345,000
	Basic Engineering Services - Preliminary Design, Final Design, Bidding, Construction, Post Construction				$ 205,000
	RPR				$ 140,000
	Legal & Administrative		5%		$ 86,000
	TOTAL				$ 2,503,000

[1] Estimated unit costs are based upon estimates from suppliers and bid tabs for similar projects throughout Montana.

[2] The ENR 20-year average Construction Cost Index is 8% (as of Jan 2022), so capital costs are projected to an anticipated construction date in 2024 using an 8% inflation rate.

Table 5-8 - Estimated Cost for Phase 3 Distribution System Improvements

Opinion of Probable Cost D-4: Phase 3 Replacement of AC Pipe in Town					
#	BID ITEM	QTY	UNITS	UNIT PRICE [1]	TOTAL
Hilger Street (Replacement of 6" AC)					
1	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
2	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
3	6" PVC Water and Fittings	200	LF	$ 90.00	$ 18,000
4	6" Gate Valve	1	EA	$ 2,500.00	$ 2,500
5	6" Fittings	2	EA	$ 1,200.00	$ 2,400
6	6" Fire Hydrant with gate valve	0	EA	$ 6,000.00	$ -
7	Water Service Connection	5	EA	$ 1,500.00	$ 7,500
8	3/4" PE Water Service	100	LF	$ 60.00	$ 6,000
9	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
10	Type B (Gravel) Surface Restoration	220	SY	$ 25.00	$ 5,500
11	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 47,900
Broadway Avenue (Replacement of 6" AC, from Patterson St to Railroad Ave)					
12	Connect to Existing Water	4	EA	$ 2,500.00	$ 10,000
13	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
14	6" PVC Water and Fittings	1,600	LF	$ 90.00	$ 144,000
15	6" Gate Valve	6	EA	$ 2,500.00	$ 15,000
16	6" Fittings	6	EA	$ 1,200.00	$ 7,200
17	6" Fire Hydrant with gate valve	3	EA	$ 6,000.00	$ 18,000
18	Water Service Connection	21	EA	$ 1,500.00	$ 31,500
19	3/4" PE Water Service	420	LF	$ 60.00	$ 25,200
20	Type A (Asphalt) Surface Restoration	1,780	SY	$ 55.00	$ 97,900
21	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
22	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 349,800

Patterson Street (Replacement of 6" AC, from Broadway Ave to Collins Ave)					
23	Connect to Existing Water	1	EA	$ 2,500.00	$ 2,500
24	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
25	6" PVC Water and Fittings	400	LF	$ 90.00	$ 36,000
26	6" Gate Valve	2	EA	$ 2,500.00	$ 5,000
27	6" Fittings	1	EA	$ 1,200.00	$ 1,200
28	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
29	Water Service Connection	3	EA	$ 1,500.00	$ 4,500
30	3/4" PE Water Service	60	LF	$ 60.00	$ 3,600
31	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
32	Type B (Gravel) Surface Restoration	440	SY	$ 25.00	$ 11,000
33	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 70,800
Collins Avenue (Replacement of 8", from Competition Row to Patterson St)					
34	Connect to Existing Water	3	EA	$ 2,500.00	$ 7,500
35	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
36	6" PVC Water and Fittings	1,000	LF	$ 100.00	$ 100,000
37	6" Gate Valve	6	EA	$ 2,500.00	$ 15,000
38	6" Fittings	6	EA	$ 1,200.00	$ 7,200
39	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
40	Water Service Connection	6	EA	$ 1,500.00	$ 9,000
41	3/4" PE Water Service	120	LF	$ 60.00	$ 7,200
42	Type A (Asphalt) Surface Restoration	1,110	SY	$ 55.00	$ 61,050
43	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
44	Type C (Grass) Surface Restoration				
Subtotal					$ 213,950
Collins Avenue (Replacement of 6", from Patterson St to Frields St)					
45	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
46	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
47	6" PVC Water and Fittings	350	LF	$ 90.00	$ 31,500
48	6" Gate Valve	2	EA	$ 2,500.00	$ 5,000
49	6" Fittings	2	EA	$ 1,200.00	$ 2,400
50	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
51	Water Service Connection	5	EA	$ 1,500.00	$ 7,500
52	3/4" PE Water Service	100	LF	$ 60.00	$ 6,000
53	Type A (Asphalt) Surface Restoration	390	SY	$ 55.00	$ 21,450
54	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
55	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 85,850

Frields Street (Replacement of 6" AC, from Collins Ave to Winchell Ave)					
56	Connect to Existing Water	1	EA	$ 2,500.00	$ 2,500
57	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
58	6" PVC Water and Fittings	360	LF	$ 90.00	$ 32,400
59	6" Gate Valve	2	EA	$ 2,500.00	$ 5,000
60	6" Fittings	1	EA	$ 1,200.00	$ 1,200
61	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
62	Water Service Connection	3	EA	$ 1,500.00	$ 4,500
63	3/4" PE Water Service	60	LF	$ 60.00	$ 3,600
64	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
65	Type B (Gravel) Surface Restoration	400	SY	$ 25.00	$ 10,000
66	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 66,200
Winchell Avenue (Replacement of 6" AC, from Frields St to Main St)					
67	Connect to Existing Water	1	EA	$ 2,500.00	$ 2,500
68	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
69	6" PVC Water and Fittings	1,150	LF	$ 90.00	$ 103,500
70	6" Gate Valve	3	EA	$ 2,500.00	$ 7,500
71	6" Fittings	4	EA	$ 1,200.00	$ 4,800
72	6" Fire Hydrant with gate valve	2	EA	$ 6,000.00	$ 12,000
73	Water Service Connection	4	EA	$ 1,500.00	$ 6,000
74	3/4" PE Water Service	80	LF	$ 60.00	$ 4,800
75	Type A (Asphalt) Surface Restoration	0	SY	$ 55.00	$ -
76	Type B (Gravel) Surface Restoration	1,280	SY	$ 25.00	$ 32,000
77	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 174,100
Main Street (Replacement of 6" AC, from Broadway Ave to Railroad Ave)					
78	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
79	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
80	6" PVC Water and Fittings	150	LF	$ 90.00	$ 13,500
81	6" Gate Valve	1	EA	$ 2,500.00	$ 2,500
82	6" Fittings	2	EA	$ 1,200.00	$ 2,400
83	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
84	Water Service Connection	4	EA	$ 1,500.00	$ 6,000
85	3/4" PE Water Service	80	LF	$ 60.00	$ 4,800
86	Type A (Asphalt) Surface Restoration	170	SY	$ 55.00	$ 9,350
87	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
88	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 50,550

Main Street (Replacement of 6" AC, from Collins Ave to Flagler Ave)					
89	Connect to Existing Water	2	EA	$ 2,500.00	$ 5,000
90	Exploratory Excavation	4	HR	$ 250.00	$ 1,000
91	6" PVC Water and Fittings	740	LF	$ 90.00	$ 66,600
92	6" Gate Valve	4	EA	$ 2,500.00	$ 10,000
93	6" Fittings	4	EA	$ 1,200.00	$ 4,800
94	6" Fire Hydrant with gate valve	1	EA	$ 6,000.00	$ 6,000
95	Water Service Connection	10	EA	$ 1,500.00	$ 15,000
96	3/4" PE Water Service	200	LF	$ 60.00	$ 12,000
97	Type A (Asphalt) Surface Restoration	820	SY	$ 55.00	$ 45,100
98	Type B (Gravel) Surface Restoration	0	SY	$ 25.00	$ -
99	Type C (Grass) Surface Restoration	0	SY	$ 15.00	$ -
Subtotal					$ 165,500
	Direct Construction Subtotal				$ 1,225,000
	Mobilization		10%		$ 123,000
	Traffic Control		1%		$ 12,000
	Construction Subtotal				$ 1,360,000
	2026 Construction Cost [2]		8.0%		$ 1,713,000
	Contingency		20%		$ 343,000
	Basic Engineering Services - Preliminary Design, Final Design, Bidding, Construction, Post Construction				$ 300,000
	RPR				$ 130,000
	Legal & Administrative		5%		$ 86,000
	TOTAL				$ 2,572,000

[1] Estimated unit costs are based upon estimates from suppliers and bid tabs for similar projects throughout Montana.

[2] The ENR 20-year average Construction Cost Index is 8% (as of Jan 2022), so capital costs are projected to an anticipated construction date in 2024 using an 8% inflation rate.

5.5.5 Alt. D-5: Replacement of Pressure Reducing Valves and Air Release Valves

The three PRVs stations including the associated vaults on the transmission line would be replaced in this alternative. The valves have reached the end of their service life, and corrosion has impacted the ability to operate and maintain the valves. Additionally, intrusion of soil and water into the vaults poses a risk to maintaining the system. The new vaults in this alternative would be larger than the existing structures, and ARVs would be replaced along the transmission line.

Design Criteria

The proposed water system improvements will be designed to comply with DEQ Circular-1 Chapter 8 – Distribution System. The new structures would be designed to meet the flows and required pressures of the system for the 20-year design conditions.

The vaults that are part of this alternative will be designed so that soil and water intrusion would not occur, and that the operator of the water system can easily use access the PRVs without requiring help. The new PRV stations would include low flow and high flow bypass PRV valves to provide redundance as per the latest standard care of the industry

Map

See Figure 3-1 for the location of the current PRV stations. The ARV stations are located throughout the transmission main and are indicated on the available record drawings found in Appendix N.

A schematic diagram of typical PRV stations as part of the proposal provided by a supplier is found in Appendix U.

Environmental impacts

Little to no impact will be done on the environment because the work will take place on land that has been previously disturbed and excavated.

Land Requirements

No additional land is required.

Potential Construction Problems

No construction problems are anticipated.

Sustainability Considerations

Water and Energy Efficiency

There is no anticipated change in electrical or water demand.

Green Infrastructure

During the construction of the improvements, stormwater management practices of temporary erosion and sediment control will be done to prevent erosion and stormwater pollution. These methods for stormwater protection will include the installation and maintenance of temporary structural control measures to prevent erosion and transport of soil from the site.

Cost Estimates

The cost estimate to replace all the PRVs and ARV assemblies is shown below in Table 5-9. The cost will most likely be reduced after the review of the ARVs' conditions. See Appendix U for a proposal of a typical PRV station that meets the latest standards.

Table 5-9 -Estimated Cost of Replacement of PRVs and ARVs

Opinion of Probable Cost D-5: Replacement of PRVs and ARVs					
#	BID ITEM	QTY	UNITS	UNIT PRICE [1]	TOTAL
1	Pressure Reducing Station	3	EA	$ 50,000.00	$ 150,000
2	Automatic Air Release in Vault	14	EA	$ 5,000.00	$ 70,000
	Direct Construction Subtotal				$ 220,000
	Mobilization			10%	$ 22,000
	Construction Subtotal				$ 242,000
	2024 Construction Cost [2]			8.0%	$ 282,000
	Contingency			20%	$ 56,000
	Basic Engineering Services - Preliminary Design, Final Design, Bidding, Construction, Post Construction			15%	$ 42,000
	RPR			5%	$ 14,000
	Legal & Administrative			5%	$ 14,000
	TOTAL				$ 408,000

[1] Estimated unit costs are based upon estimates from suppliers and bid tabs for similar projects throughout Montana.

[2] The ENR 20-year average Construction Cost Index is 8% (as of Jan 2022), so capital costs are projected to an anticipated construction date in 2024 using an 8% inflation rate.

5.5.6 Alt. D-6: Replacing System Control and Data Acquisition (SCADA) System

The SCADA system would be updated to a modern program that is easier to use and has more technical support than the current system. The upgrade will consist of replacing the hardware and software that controls the water system processes. This alternative assumes that the current

telemetry equipment infrastructure would not be changed for any of the existing facilities currently in use. However, the software, hardware and programming on the existing computer for better HMI would be included to fully update the system to today's standards. Preference would be given to a local integrator that can be readily available for support and/or site visits to the Town when needed.

Design Criteria

The design criteria for the SCADA system include ease of use and availability of technical support. The Town currently uses an outdated system that is difficult to use and has little technical support. To ensure that the Town can properly monitor and operate their water system, the new SCADA system must be accessible to the operators and be able to receive ongoing technical support.

Environmental impacts

Little to no impact will be done on the environment because the work will take place on land that has been previously disturbed and excavated.

Land Requirements

No additional land requirements are needed.

Potential Construction Problems

No construction problems are anticipated.

Sustainability Considerations

Water and Energy Efficiency

The new computer hardware will be more efficient in electrical power consumption. The upgrade of SCADA equipment is an improvement in electrical efficiency.

Green Infrastructure

The control system will be on a new computer inside an existing Town hall building.

Operational Ease

The new SCADA system will be more user friendly than the existing system. The Town will have an easier method of operating and monitor its water system.

Cost Estimates

The cost for purchasing and installing the new SCADA upgrades for hardware and software and installing a new solenoid control valve is estimated to be $50,000. This budgetary cost is developed from experience on similar systems using similar equipment. A detailed proposal from a control integrator will be obtained during the preliminary design phase.

6.0 SELECTION OF AN ALTERNATIVE

Each of the technically feasible alternatives considered meets the design criteria and applicable regulations identified in the alternative description. This section will examine the advantages and disadvantages of each in terms of life cycle costs, operational and maintenance considerations, permitting concerns, social impacts, environmental impacts, and ease of operation.

6.1 Life Cycle Cost Analysis

The cost of capital improvements for small communities to protect public health and safety, avoid causing substantial environmental impacts, and conform to government regulations can be overwhelming for small communities with limited resources and money. Although an alternative may have a low capital cost, the annual cost to operate and maintain an alternative may increase the overall cost to exceed others. A life cycle cost analysis was done using the net present values of each alternative.

The components that contribute to the overall cost includes the capital cost, the annual operation and maintenance (O&M), and the salvage value. The capital cost is in present day dollars, so no adjustments to this value were made. The net present value of the annual O&M cost for the next 20 years was found. The salvage value of each alternative was determined using straight line depreciation and converting that amount to the net present value. Finally, the initial cost and O&M costs were summed, and the salvage value was subtracted from this sum. A summary of the life cycle analysis of each alternative is shown below in Table 6-1.

Table 6-1 - Life Cycle Cost Analysis for Proposed Alternatives

Life Cycle Cost Analysis						
Alternative	Capital Cost	Annual Increase to O&M	Present Worth of O&M Increase	20-year Salvage Value	Present Worth of Salvage	Net Present Value
Supply						
S-2	$ 140,000	$ -	$ -	$ 30,000	$ 9,400	$ 130,600
Treatment						
T-2	$ 378,000	$ -	$ -	$ 71,000	$ 22,100	$ 355,900
Storage						
R-2	$ 186,000	$ -	$ -	$ -	$ 71,000	$ 22,100
R-3	$ 2,878,500	$ 6,800	$ 143,410	$ 949,000	$ 295,900	$ 2,726,000
Distribution						
D-2	$ 2,690,000	$ -	$ -	$ 582,000	$ 181,000	$ 2,509,000
D-3	$ 2,503,000	$ -	$ -	$ 539,000	$ 168,000	$ 2,335,000
D-4	$ 2,572,000	$ -	$ -	$ 534,000	$ 167,000	$ 2,212,000
D-5	$ 408,000	$ -	$ -	$ 132,000	$ 41,000	$ 367,000
D-6	$ 40,000	$ -	$ -	$ -	$ -	$ 40,000

6.2 Ranking Criteria

A matrix to compare each alternative objectively against the other will be developed to select the preferred alternative. Each alternative will be given a score ranging from 0 to 10 for a number of criteria, with 0 representing a negative impact and 10 representing the maximum benefit to the community. The alternatives will begin with a score of 5 for each criterion, and then the score will be adjusted up or down relative to the benefit of the particular alternative in relation to the other alternatives.

In addition to scoring each alternative, the criteria themselves with being weighted in relation to one another. Weighting factors ranging from 1 to 10 will be used to give greater importance to items such as cost. This is appropriate, as often times higher investments are made to overcome many other problems such as reliability or to mitigate problems with technical feasibility or environmental concerns.

6.2.1 Life Cycle Costs

The cost of extensive capital improvements to meet minimum health and safety requirements, applicable regulations, and environmental impacts is a great concern to small communities with limited budgets and resources. Life cycle costs also include anticipated increases to ongoing O&M costs.

Accordingly, this criterion will be provided with a maximum weighting factor of 10. This represents over 30% of the total weighting, and Public Opinion is closely tied to cost also, giving the cost for each alternative even more weight.

In addition to providing the maximum emphasis on costs, a method must be utilized to provide an objective comparison of costs for each alternative relative to one another and not just an overall comparison. Given a range of costs for various alternatives, the relative cost of any alternative can be determined using the lowest cost and the highest cost from the range of costs and the following equation.

$$5 \times [(\text{Lowest Cost}) / (\text{Cost}) + (\text{Highest Cost} - \text{Cost}) / (\text{Highest Cost})]$$

For example, if a number of alternatives were compared having costs of $500,000, $1,000,000 and $2,000,000, the above equation would provide scores of 8.8, 5.0, and 1.3, respectively. The

utilization of a formula to score the 20-year life cycle costs in the matrix eliminates any subjectivity and provides a consistent, relative comparison of costs.

6.2.2 Operational and Maintenance Considerations

Operation and maintenance are an important issue when considering any large capital improvements within a small community. The costs for O&M associated with the alternatives is included in the 20-year life cycle costs compared under the financial feasibility, but there are other considerations that must be weighed for the O&M associated with each alternative.

The Town has limited resources and manpower, and some alternatives may have O&M requirements that drastically tax those limited resources creating deficiencies in other areas. Town personnel also have much more intrinsic knowledge of the system than the average resident or even Council members. Priorities identified by the operators to facilitate the efficient operation of the system must be given some weight.

This criterion will be provided with a weighting factor of 7.

6.2.3 Permitting Issues

Some alternatives may encounter permitting issues that would significantly delay the project and/or result in additional expenses for the community. Consideration for these concerns will be given under this criterion.

This criterion will be provided with a weighting factor of 4.

6.2.4 Social Impacts

Social impacts will be considered in the final alternative selection as a project poorly supported by the community will have a limited chance of success. Efforts such as public hearings are ways to identify public opinion and perceptions. Costs are always a concern with consumers, but the health and safety of their families is just as important.

This criterion will be provided with a weighting factor of 10.

6.2.5 Environmental Impacts

Environmental impacts for each alternative, whether detrimental or beneficial, need to be considered in the final selection of a preferred alternative.

This criterion will be provided with a weighting factor of 5.

6.2.6 Sustainability Considerations

Sustainable utility management practices can greatly benefit a community and result in cost savings. Consideration will be given to alternatives benefitting the sustainability of the utility.

This criterion will be provided with a weighting factor of 4.

6.2.7 Public Health and Safety

Public health and safety are paramount in the design of drinking water systems. All alternatives proposed will meet the requirements for safety set by state and federal regulations. Since all alternatives will meet the minimum safety requirements, every alternative will have a high score. The maximum weighting is assigned in this section because the primary purpose of this proposed project is to address public health and safety concerns.

This criterion would be provided with a weighting factor of 10.

6.2.8 Land Acquisition

Issues with land acquisition often supersede the black-and-white world of engineering. This ranking category will include the feasibility of acquiring sufficient land in terms of lease, right-of-way, and/or land purchases. Although these are not strict engineering issues, problems with land acquisition can greatly impact a project's overall feasibility and require that land issues be given a very serious consideration.

This criterion will be provided with a weighting factor of 5.

6.3 Scoring of Supply Alternatives

Only S-2: Phase 2 Spring Assessment and Spring 5 Rehabilitation is considered for a funded project at this time. The Phase 3 spring assessment and collector rehabilitation project cost and

scope will be further defined after the completion of the Phase 2 assessment. The other alternatives for storage treatment are considered stand-alone alternatives and are not compared to each other.

6.4 Scoring of Distribution System Alternatives

There are three alternatives considered to improve the distribution system in Geraldine. The alternatives each propose to replace sections of pipe in Geraldine that are outdated, undersized, or leaking. The specific alternatives for the distribution system include:

- Alternative D-2: Phase 1 – Replacement of Problematic 4” AC and 6” AC in Petroleum Contaminated Soils
- Alternative D-3: Phase 2 – Replacement of Remaining 4” AC
- Alternative D-4: Phase 3 – Replacement of Remaining Pipe in Town

6.4.1 Life Cycle Costs

The life cycle costs calculated for each alternative were entered into the equation presented in Section 6.2.1. Alternatives D-2 through D-4 received the following scores:

- Alternative D-2 4.4
- Alternative D-3 6.7
- Alternative D-4 3.3

6.4.2 Operational and Maintenance Considerations

None of the alternatives presented are expected to increase the annual O&M. The Town will still maintain the distribution system as they have previously. Alternatives D-2 through D-4 received the following scores:

- Alternative D-2 7
- Alternative D-3 7
- Alternative D-4 7

6.4.3 Permitting Issues

All alternatives would require construction permits like stormwater pollution prevention. Since Phase 3 is the largest pipe improvement, the permitting may be more complex than Phase 1 or Phase 2. Alternatives D-2 through D-4 received the following scores:

- Alternative D-2 8
- Alternative D-3 8
- Alternative D-4 7

6.4.4 Social Impacts

The public's acceptance of alternatives is expected to correlate to the need of each phase. The replacement of water mains that pose the greatest risk to public health and safety. Alternatives D-2 through D-4 received the following scores:

- Alternative D-2 9
- Alternative D-3 7
- Alternative D-4 5

6.4.5 Environmental Impacts

All work in each alternative will occur in locations that have been previously disturbed. These alternatives will also work to eliminate water loss from the system. Phase 3, however, will include the largest portion of pipe improvements, so this alternative will inherently pose the greatest risk to the environment. Alternatives D-2 through D-4 received the following scores:

- Alternative D-2 8
- Alternative D-3 8
- Alternative D-4 6

6.4.6 Sustainability Considerations

The sustainability of each distribution alternative is dependent on the alternative's ability to reduce the water loss in the system. The phases were chosen in the order as to focus on eliminating leaks in the system and promoting public health and safety. Alternatives D-2 through D-4 received the following scores:

- Alternative D-2 10
- Alternative D-3 7
- Alternative D-4 7

6.4.7 Public Health and Safety

The primary purpose of the proposed project is to protect public health and safety. Phase 1 and 2 received the highest possible scores because these phases directly address immediate threats to Geraldine's public health. Phase 3 also addresses risks to public health and safety, but this alternative addresses issues that have a much less significant chance of occurring. Alternatives D-2 through D-4 received the following scores:

- Alternative D-2 10
- Alternative D-3 10
- Alternative D-4 9

6.4.8 Land Acquisition

No land acquisition is needed for any of the alternatives because any improvements will be made within existing rights-of-way. As a result of no new land or easements required, each alternative achieved the highest score. Alternatives D-2 through D-4 received the following scores:

- Alternative D-2 10
- Alternative D-3 10
- Alternative D-4 10

6.5 Decision Matrix and Selection of Preferred Alternative

The scores, weighted scores, and totals for each alternative are shown below in Table 6-2 to provide a comparative analysis of the alternatives focusing on the distribution alternatives. The other alternatives are stand-alone, and the decision is to either proceed or not proceed with the improvements.

The priority for the alternatives is shown below in Table 6-3. The priorities were also completed with the Town's input. The projects do not need to be completed in the ranked order but can be completed as funding becomes available and as the need arises.

Table 6-2 - Decision Matrix

Decision Matrix																	
Alternative	Life Cycle Costs		Operation and Maintenance		Permitting		Social Impacts		Environmental Impacts		Sustainability		Public Health and Safety		Land Acquisition		TOTAL
	Weight:	10	Weight:	7	Weight:	4	Weight:	10	Weight:	5	Weight:	4	Weight:	10	Weight:	5	
	Score	Wtd.	Score	Wtd.	Score	Wtd.	Score	Wtd.	Score	Wtd.	Score	Wtd.	Score	Wtd.	Score	Wtd.	
Treatment Alternatives																	
T-2	5.0	50	9.0	63	10.0	40	7.0	70	5.0	25	7.0	28	10	100	10.0	50	426
Storage Alternatives																	
R-2	5.0	50	5.0	35	10.0	40	6.0	60	10.0	50	10.0	40	10	100	10.0	50	425
Distribution Alternatives																	
D-2	4.3	43	7.0	49	8.0	32	9.0	90	8.0	40	10.0	40	10	100	10.0	50	444
D-3	4.8	48	7.0	49	8.0	32	7.0	70	8.0	40	7.0	28	10	100	10.0	50	417
D-4	5.7	57	7.0	49	7.0	28	5.0	50	6.0	30	7.0	28	9	90	10.0	50	382
It is important to note that the above scoring and weighting are subjective. Alternatives that score overall within 10 pts of each other may essentially hold the same degree of preference.																	

Table 6-3 - Project Priority List

Project Priority List		
Priority	Alternative	Total Project Cost
1	D-2: Phase 1 – Replacement of Problematic 4" AC and 6" AC in contaminated soils	$2,660,000
2	D-3: Phase 2 – Replacement of Remaining 4" AC	$2,503,000
3	S-2: Phase 2 Springs Assessment, Spring 5 Rehab	$140,000
4	R-3: New 210,000 Concrete On Grade Storage Tank	$2,879,000
5	T-2: Construction of a New Chlorination Station	$378,000
6	D-5: Replacement of Pressure Reducing Valves and Air Release Valves	$408,000
7	R-2: Repairing the Existing Concrete and Steel Tanks	$186,000
8	D-4: Phase 3 – Replacement of Remaining Pipe in Town	$2,656,000
9	D-6: Replacing System Control and Data Acquisition (SCADA) System and New Solenoid Control Valve	$50,000
10	S-3: Phase 3 Spring Collection Rehabilitation	TBD ($150,000 - $200,000 Est.)

7.0 PROPOSED PROJECT

7.1 Preliminary Project Design

Chapter 6 discusses the alternatives considered to resolve the noted deficiencies with Geraldine's existing water system. Aging infrastructure results in major problems for several components of the Town's water system. These issues include significant water loss in the Town's distribution system, lack of protection for treatment equipment from the environment, and inability to operate pieces of the system like valves and hydrants.

The priority improvements for the Town are to improve the distribution system in Geraldine. Up to 60% of the water that the springs produce and enter the system becomes lost, and the aging AC water mains are suspected to be the source of the water loss. The improvements in Town would include upgrading the aging water mains to larger PVC and installing new valves, new hydrants and replacing services to the property lines. These improvements would bring the system into compliance with DEQ requirements.

Replacing the water main throughout the entire system has a very high capital cost. To address the distribution system's deficiencies, the alternatives were divided into three phases. Phase 1 focuses on improving the water mains that pose the greatest risk to the Town. This phase includes replacing sections of 4-inch AC water main and replacing 6-inch water main that is in soil contaminated with petroleum products. Phase 2 would be the replacement of the remaining 4-inch AC water main. The final phase would include improving the remaining water main in the Town.

The Phase 2 Spring project includes completing and a more detailed assessment of the springs site with more available flow data from individual spring. This alternative also includes performing a detailed plan followed by construction work for restoring spring 5. Work on spring 5 and associated lateral collectors would include replacing the existing spring box and valve and resetting new structures plumb to the surface. The construction work would be done in a very systematic and careful approach to limit impacts and disruptions to the entire spring system. Construction work be timed appropriately so the volume of flows to the users is within the system's demands. (See Appendix R)

Several other improvements in the proposed project priority list focus on problems that are not associated with the distribution system. The other projects related to treatment, transmission, and storage while important, are not considered as a high priority as replacing the 4-inch AC mains and will be completed separately as funding allows.

7.1.1 Water Supply

After two years of data collection of each spring collection laterals, the project will include reviewing and assessing the springs for further recommendations. Also, a detailed review of Spring 5 will be completed, and a specific upgrade will be designed including replacing the valves and spring collector box.

The proposed spring system improvements will be designed to comply with DEQ Circular-1 Chapter 3 – Source Development and DEQ Circular-10 for Springs. A map of the general springs location and the general lateral locations can be found in Figure 3-1 and also more detailed maps found in Hydrogeologic Assessment, found in Appendix R.

7.1.2 Distribution System

The proposed project includes the replacement of pipe in the Town over serval phases. All the pipe in the town would be replaced with 6” PVC pipe. In addition to the replaced pipe, new valves, hydrants, and fittings would be installed. The proposed phases of the distribution system are shown in 3. The priority is to replace the pipe that is undersized and that is presently in petroleum contaminated soils. The first phase would replace approximately 6,300 feet of water main.

The second phase of the project would involve the replacement of the undersized 4” AC mains. Phase two would replace approximately 6,700 feet of pipe. The third phase of the project would include the replacement of the remaining AC pipe in Town. The phased pipeline improvements would also include the installation of new fire hydrants, valves, and fittings.

7.2 Project Schedule

If the Town of Geraldine successfully secures ARPA funding for Phase 1 of the proposed project, the design for this project is anticipated to begin by the Fall of 2022. After the design is finished, the plans would be submitted to MDEQ by the end of 2022 and approval obtained by the beginning of 2023 with bid and construction in 2023.

The Phase 2 water distribution system project and Phase 2 spring assessment (with Spring 5 work) will commence design following securing funding in about July of 2023. Submission to MDEQ will be anticipated by October of 2023, and MDEQ approval by December 2023 or January 2024. Bidding could take place by early in 2024 with construction taking place in the summer of 2024.

7.3 Permit Requirements

A stormwater pollution prevention plan (SWPPP) would be required during construction; however, this permit would be the responsibility of the Contractor. DEQ approval of the project is required.

A wetland assessment and potential detailed delineation may be completed to determine the existence of an area of potential wetland impacts at the spring site. A wetland permit may be completed if required.

7.4 Sustainability Considerations

Creating a sustainable utility requires the replacement of aging and outdated infrastructure to generate social, environmental, and economic benefits. Replacing the leaking water mains would also reduce the public's risk of exposure to potential pathogens.

7.4.1 Water and Energy Efficiency

Water loss in the existing distribution is a significant problem. As much as 60% of the water that comes from the springs is lost in the system. Replacing the leaking water mains provides a method for the Town to conserve water from their source and reduce the amount of water that needs to be treated to meet demand.

7.5 Total Project Cost Estimate

The preferred alternative for the project is Phase 2 of the distribution system improvements and the Phase 2 springs assessment and spring 5 rehabilitation. A summary of these costs is shown in Table 7-1.

Table 7-1 - Estimated Cost Summary of D-2 and R-2

Combined Alternatives: D-2, R-2 Opinion of Probable Cost			
#	Bid Item	Source	Total
1	Alt D-2: Phase 2 Distribution System Improvements	Table 5-6	$1,727,000
2	Alt S-2: Repairing the Concrete and Steel Tanks	Table 5-2	$71,000
	Direct Construction Subtotal		$1,798,000
	Contingency		$359,000
	Engineering Basic Services		$220,000
	RPR		$145,000
	Phase 2 Hydrogeologic Assessment		$30,000
	Legal, Administrative, Professional Services		$91,000
	Total		$2,643,000

7.6 Annual Operating Budget

Table 7-1 presents the projected annual operating budget for the Town of Geraldine incorporating the proposed project. The average revenues and expenses values were derived from the Town's last 3 years of financial records. The budget also accounts for projected increases to revenues and expenses as a result of the project loan and rate increases. Appendix O contains the most recent detailed financial information.

Table 7-2 - Water System Annual Operating Budget

Water System Annual Operating Budget	
Water Revenues	Amount Budgeted
Metered Sales (with a rate increase)	$ 107,000
Bulk Water Sales	$2,500
Miscellaneous Revenue	$2,500
Total Revenues	$112,000
Water Expenses	Amount Budgeted
Existing Loan Payments	$21,000
Estimated New Loan Payments	$28,000
Employee Wages	$27,000
Materials and Services	$31,000
Reserves	$5,000
Total Expenses	$112,000

7.6.1 Income

The current water base rate for the Town of Geraldine is $36.04 per month and the current average water rate factoring in metered water sales is about $50/mo. with 153 connections. From the information provided by the Town, the current number of EDUs is about 213, derived as:

- ¾" Service - (122 homes + 39 businesses) x 1 = 161 EDU
- 1" Services - 12 x 1.79 = 21.48
- 2" Services (North Geraldine and Square Butte) - 2 x 7.14 = 14.28
- 3" Services (Hawarden) - 16 x 1 = 16
- Total = 213 EDU

The total EDUs is shown for reference. However, it is noted that the Town charges for direct billed services and not charge for services using the EDU method. The actual number of billed services is used in the preliminary rate analysis.

Any rate increases to the Town will vary and will depend on a more detailed review of the rate structures, final grant and loan package received, and review by the bond counsel. The Town was made aware of a potential rate increase at the public hearing and at several project work sessions.

In summary, the Town may need to raise its water rate by about $9.50 to service the project debt. The estimated metered sales revenue after the completion of the project would be approximately $107,000 to $110,000.

7.6.2 Annual O&M Costs

The cost for annual operation and maintenance of the water system is not expected to increase. There may actually be a decrease due to a reduction in emergency water leak and rupture repairs. To be conservative in budgeting, no change in the cost of operation is assumed. The past three years have had O&M expenses of $85,677.14 in 2019, $74,394.76 in 2020, and $74,223.32 in 2021.

7.6.3 Debt Repayments

The Town currently has three outstanding loans for its water system. The Town pays $20,124 annually towards these loans. One of the loans will be paid off in 2025 and will free up about $7,000 per year in debt service.

7.6.4 Reserves

Debt Service Reserve

The Town currently retains a bond reserve of $24,903 for the loans for the water system.

Short-Lived Asset Reserve

The pipe replacement project will not require short lived asset reserves.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The previous sections described the need for the project, the environmental and socio-economic characteristics of the project area, the individual and overall costs, and the technical viability of the proposed project. The financial strategy and implementation schedule will be described in detail in this section. A primary goal for this document is to provide a feasible funding plan for the recommended improvements presented in the Preferred Alternative. Specific available funding sources will be described, and the Town's eligibility for funds will be analyzed. Additionally, multiple funding scenarios will be developed, and a preferred scenario will be selected. The preferred funding methods will be examined closely and an implementation

8.1 Funding

To pay for the high cost of the proposed project, Geraldine plans to seek outside funding through grants and loans to pay for the project. Before different funding options can be considered, the "Target Rate" for the water service for the Town must be determined. The Montana Department of Commerce (MDOC) established the target rate to ensure that a municipality is paying an equitable portion of a project's cost. For the Town to apply for loans or grants through MDOC, the users' rates after completion of the project must meet or exceed the target rate.

The target rates are calculated as a percentage of the median household income (MHI) from the American Community Survey (ACS) for the municipality. According to MDOC, the appropriate amount that each user must pay of the MHI as the target rate should be 1.4% for water service only, 0.9% for sewer service only, or 2.3% for water and sewer services combined.

From MDOC's website, the MHI for the Town of Geraldine was $39,583. Using the MHI and the 2.3% requirement, the target rate for water is $75.87 per user per month. The base water rate is $36.04 per user per month, and the base sewer rate for sewer is $33.00 per user per month. The average water rate per connection, including metered usage, is approximately $50 per month. The combined rate is approximately $83.00, which is 109% of the target rate. The combined rate is planned to be increased to a total of $92.46 and be at 121% of the target by the end of the project.

8.1.1 Funding Sources

The following sections provide a brief description of the potential funding sources and whether or not the Town of Geraldine would be eligible for those funds.

American Rescue Plan Act (ARPA)

The American Rescue Plan Act (ARPA) is a new program in 2021. It was passed by Congress and signed into law in March of 2021 (PUB. L. NO 117-2 SEC 602 (c)(1)(d)). The act was primarily focused on covid-19 relief for communities. As part of the ARPA funding package, the federal government allotted funds to be used for eligible water and wastewater improvements as considered critical infrastructure. The act allowed for each individual state to determine how the funds for each state were to be distributed. The American Rescue Plan Act of 2021 provides state and local aid to make necessary investments in water and sewer infrastructure. The 67th Montana Legislature passed HOUSE BILL 632 which directed the federal funds available under the American Rescue Plan Act for use in Montana. Section 1 – Section 5 address how the federal funds will be distributed to necessary water and sewer infrastructure projects. House Bill 632 created the Infrastructure Advisory Commission which oversees spending on water and sewer infrastructure projects along with the Governor of Montana. Funds were directed to Counties and Cities in Montana for the use of water and sewer infrastructure with direct treasury funds and minimum allocation (non-competitive grants). There is also a competitive grant option.

ARPA funding was made available to Montana communities through March 11, 2021, American Rescue Act (H.R. 1319). The act provided assistance to Montana communities in three different ways:

1) ARPA Local Fiscal Recovery Funds (LFR) – The act provided direct assistance from Treasury to towns, cities, and counties. Direct assistance was given to local governments in two tranches. The first tranche became available in June 2021, and the second will be available in June 2022. The funds can be used for various purposes, including water and sewer infrastructure.
2) ARPA Minimum Allocation Grants (MAG) – The act appropriated $463 million to the State of Montana. The State of Montana, through House Bill 632, allocated $150 million of the appropriation to towns, cities, districts, and counties through the Minimum Allocation grant process that was developed in Montana's 2021 legislative session through House Bill 632. Minimum Allocation Grants can be used for water and sewer

infrastructure and must be committed by January 1, 2023. A commitment of funds requires local governments to have all matching funds for the proposed project in place by January 1, 2023.

3) ARPA Competitive Grants – Montana House Bill 632 allocated $315 million to towns, cities, districts, and counties through a competitive grant process. The grants could be used for water and sewer infrastructure projects providing a necessary investment in water or sewer infrastructure as defined by the American Rescue Plan Act. The first round of applications for competitive grants was due July 2021, and the second round of applications was due January 14, 2022.

The Town has dedicated nearly all of its Local Fiscal Recovery Funds to the Phase 1 project identified in the water system PER and also all of the Minimum Allocation Grant funds in addition to a competitive grant anticipated to be awarded for Phase 1.

As of January 2021, two rounds of competitive grant applications have been carried out. The first round of competitive grants was due July 15, 2021, and the round two applications were due January 14, 2022. The Town of Geraldine applied for the second round of competitive grant funding. Ranking results for the second round were made available and the Geraldine's water project is #44 on the list. Based on these preliminary rankings it appears the water project should receive the $2,000,000 ARPA grant that was applied for on the Town's behalf to fund the Phase 1 project.

There has been discussion with DNRC that a competitive round three grants might occur. The Town is not basing its funding package on a competitive round three option as there is no indication that it will occur. If a competitive round three grant option occurs, the Town will apply for additional funding.

Montana Coal Endowment Program (MCEP)

MCEP is a state funded grant program, which is administered by the Montana Department of Commerce (MDOC). MCEP provides financial assistance to local governments for infrastructure improvements. Grants can be obtained from MCEP for up to $500,000 if the projected user rates are less than 125% of the target rate, for up to $625,000 if projected user rates are between 125% and 150% of the target rate, and for up to $750,000 if the projected user rates are over 150% of

the target rate. MCEP grant recipients are required to match the grant dollar for dollar, but the match may come from a variety of sources including other grants, loans, or cash contributions.

Currently, Geraldine is eligible for the MCEP grant given the combined user rates exceed the target rate.

Renewable Resource Grant and Loan Program (RRGL)

RRGL is a state program that is funded through interest accrues on the Resource Indemnity Trust Fund and the sale or Coal Severance Tax Bonds and is administered by the Montana Department of Natural Resources and Conservation (DNRC). The primary purpose of the RRGL is to enhance Montana's renewable resources. For public facilities projects that conserve, manage, develop, or protect renewable resources, grants of up $125,000 are available.

The RRGL program is competitive; however, the proposed project will be promoting water conservation efforts by eliminating severe leaks in the water system. The aging water mains in the Town are the suspected source for the 38% average water loss in the system. Addressing the springs source for rehabilitation and better protection is an activity that is consistent with the program goals. Replacing these outdated pipes would reduce the water loss substantially. Addressing the water loss in the system improves Geraldine's competitiveness in their application for a grant of up to $125,000 from the DNRC-RRGL program.

Community Development Block Grant (CDBG)

CDBG is a federally funded program that is also administered by the Montana Department of Commerce (MDOC). The primary purpose of CDBG funds is to benefit low to moderate income (LMI) families. Hence, a municipality must have an LMI of 51% or greater. This is usually determined by the current Census. However, under certain circumstances, the MDOC may allow an income survey to be completed (such as there have been major economic changes since the Census or if a community is only slightly under the required LMI percentage).

The CDBG grant funds can be applied for in an amount of up to $600.000 with a limit of $20,000 per LMI household, so a community needs 30 LMI households to apply for the maximum grant funds. The use of CDBG funds requires a 25% local match that can be provided through cash funds, loans, or a combination thereof.

From ACS data on Geraldine, the LMI rate is 77%. As a result, the number of LMI households is 74 households which is more than the required 30. The Town is eligible for a CDBG grant. The Town was successful in obtaining a CDBG grant for the recently completed wastewater project.

State Revolving Fund (SRF)

SRF provides low-interest loan funds for both water and wastewater projects through the Drinking Water State Revolving Fund (DWSRF) and the Water Pollution Control State Revolving Fund (WPCSRF), respectively. The SRF program is administered by the Montana Department of Environmental Quality. Current loan terms include an interest rate of 2.50% or lower for a 20-year period. In some cases, a longer term can be applied to the loan.

SRF also has a limited amount of "principal forgiveness" funds available for projects. For water projects, up to 50% or $500,000 may be obtained depending on the availability of fund.

The Town is eligible for an SRF loan and will consider as backup option to RD funding.

USDA Rural Development (RD)

RD provides grant and loan funding to municipalities for water and wastewater projects that improve the quality of life and promote economic development in Rural America. Municipalities with a population of less than 10,000 are eligible to apply, though; priority is given to those with a population of less than 5,500.

Grant eligibility and loan interest rates are based on the community's median household income (MHI) and user rates. If the area to be served has a MHI of $38,205 or lower and the project is necessary to alleviate a health and/or sanitation concern, up to 75% of the project costs are grant eligible along with a poverty interest rate. Up to 45% of the project costs are grant eligible if the planning area has an MHI between $38,205 and $47,757 along with an intermediate rate. The loan rates at the time of this study are 1.5% for poverty rate, 2.0% for intermediate rate, and 2.5% for market rate.

The Town has a MHI of $39,583 and qualifies for the intermediate rate and is also eligible to receive grant funding. The RD funding will assume 45% RD grants with the understanding that the final grant given could be higher given the health and safety needs of the project. Concurrence from RD is provided on this approach and included in Appendix W.

Also note that RD may also require a local match for proposed new projects. The following formula was provided by RD to determine if and how much of a local match is required:

- Cash – Current Liabilities – 90 days O&M – Fund Restricted = Local Cash to Project

The local contribution will be determined at the time of the application and letter of conditions (LOC).

Montana Coal Board

The Coal Board provides grant funding to municipalities to adequately provide for the expansion of public services or facilities needed as a direct consequence of coal development activities. There is no maximum limit to the amount the Coal Board can fund, but available funding is very limited, so it can be difficult to receive any funds from the Coal Board, especially large sums.

Funding through this program is not anticipated.

Economic Development Administration (EDA)

EDA provides grant funding for projects that are demonstrated to be needed for the placement of a new business. The amount of grant is dependent on the number of jobs created.

The improvements to be made in the proposed project are not anticipated to create a significant number of long-term jobs. However, one local metal fabrication business located less than a mile from Town is interested in connecting to the water distribution. This business currently uses a well. This business is in need of a reliable water source in order to support the expansion of the business and for safe operation.

An EDA grant is being considered and will be explored for this situation in a potential separate funding application.

INTERCAP

INTERCAP provides loan funds at a low cost, the variable interest rate to local governments. INTERCAP is administered by the Montana Board of Investments and is very flexible in the variety of funding which would include both water and wastewater projects. There is no funding cycle (funds are always available), however, the maximum loan term is 15 years.

Since there is a large amount of funding required, the maximum loan term of 15 years would result in high user rates. The INTERCAP loan is not recommended for funding the project in its entirety as there are better long-term loan options. However, INTERCAP will be considered for interim funding in conjunction with the RD program. This was done with the water project, given how streamlined the processes are with INTERCAP.

8.1.2 Funding Strategy

Table 8-1 shows various funding strategies for the proposed project. The potential funding scenarios are:

- Scenario 1 – DNRC, MCEP, CDBG, RD Grant, RD Loan (2.0% for 40 years)
- Scenario 1 – DNRC, MCEP, CDBG, RD Grant, RD Loan (2.0% for 40 years), RD Grant (45%)
- Scenario 3 – DNRC, MCEP, and SRF Loan (2.5% for 20 years)
- Scenario 4 – DNRC, MCEP, SRF Loan Forgiveness, and SRF Loan (2.5% for 20 years)

As shown in Table 8-1, the lowest monthly costs to the Town's users will be realized under Scenario 2 by applying for DNRC, MCEP, and RD grants supplemented with an additional loan from RD. The City's preferred funding package and that recommended by this PER includes:

- DNRC Grant: $125,000
- MCEP Grant: $500,000
- CDBG Grant: $600,000
- RD Grant: $638,000
- RD Loan: $780,000

Using the preferred Scenario 2 as a basis, a detailed project budget is presented in Table 8-2, which provides a breakdown of each of the line item costs by funding source.

Table 8-1 - Funding Scenarios for Water System Improvements

ITEM	SCENARIO #1 MCEP, RRGL, CDBG, RD Loan (40-yrs, 2.0%[4])	SCENARIO #2 MCEP, RRGL, CDBG, RD Loan (40-yrs, 2.0%[4]), RD Grant	SCENARIO #3 MCEP, RRGL, CDBG, SRF Loan (20-yrs, 2.5%)	SCENARIO #4 MCEP, RRGL, CDBG, SRF Loan (20-yrs, 2.5%), 50% SRF Forgiveness
D-3: Phase 2 Distribution Improvements	$2,503,000	$2,503,000	$2,503,000	$2,503,000
S-2: Phase 2 Spring Assessment and Spring 5 Rehabilitation	$140,000	$140,000	$140,000	$140,000
Rounded Total	$2,643,000	$2,643,000	$2,643,000	$2,643,000
DNRC Grant	$125,000	$125,000	$125,000	$125,000
MCEP Grant	$500,000	$500,000	$750,000	$500,000
RD Grant/SRF Forgiveness		$638,000		$677,000
CDBG Grant	$600,000	$600,000	$600,000	$600,000
RD Loan /SRF Loan	$1,418,000	$780,000	$1,168,000	$741,000
Total Project Funds	$2,643,000	$2,643,000	$2,643,000	$2,643,000
SRF Bond Reserve (1/2-year payment)			$37,493	$23,786
RD - Interim Interest (loans > $500,000, check rate with RD Staff)	$21,000	$12,500		
Total Loan Amount	$1,439,000	$792,500	$1,205,493	$764,786
Annual Loan Payment	$51,230	$28,220	$77,400	$36,560
Total Loan Payments Over Life of Loan	$2,049,200	$1,128,800	$1,548,000	$1,096,800
Total Interest Paid Over Life of Loan	$610,200	$336,300	$342,507	$332,014
Annual Loan Coverage	$5,123	$2,822	$7,740	$3,656
TOTAL ANNUAL CAPITAL DEBT SERVICE COST	$56,353	$31,042	$85,140	$40,216
User Capital Cost/Month[2]	*$30.69*	*$16.91*	*$46.37*	*$21.90*
Current Annual O&M [1]	$58,000	$58,000	$58,000	$58,000
Current Annual Debt Service[1]	$20,124	$20,124	$20,124	$20,124
Additional O&M Due To Project				
TOTAL ANNUAL O&M COSTS	$78,124	$78,124	$78,124	$78,124
User O&M Cost/Month[2]	*$42.55*	*$42.55*	*$42.55*	*$42.55*
USER COST/MONTH[2]	$73.24	$59.46	$88.92	$64.46
Existing Average User Cost/Month/EDU	$50.00	$50.00	$50.00	$50.00
COST/MONTH INCREASE/EDU	$23.24	$9.46	$43.01	$14.46
Existing Other System Cost/Month	$33.00	$33.00	$33.00	$33.00
Total Proposed Water & Sewer Cost/Month	$106.24	$92.46	$121.92	$97.46
Combined Systems Target Rate[3]	$75.87	$75.87	$75.87	$75.87
PERCENT OF COMBINED TARGET RATE	140.0%	121.9%	160.7%	128.5%

[1] Based on Water Financials Provided by the Town (less debt service

[2] Based on 153 connections (Town doesn't using EDU billing method)

[3] https://comdev.mt.gov/Resources/Target-Rate

[4] https://www.rd.usda.gov/programs-services/water-environmental-programs/water-waste-disposal-loan-grant-program/mt

Table 8-2 - Project Budget

Completed by: Great West Engineering	Geraldine Water System Improvements					Date: 4/29/22
ADMINISTRATIVE/FINANCIAL COSTS	Source: MCEP Grant	Source: DNRC Grant	Source: CDBG Grant	Source: RD Loan	Source: RD Grant	Total
Personnel Costs	$ 1,000					$ 1,000
Office Costs	$ 1,000					$ 1,000
Grant & Loan Administration Services	$ 25,000			$ 25,000		$ 50,000
Legal Costs	$ 2,000					$ 2,000
Audit Fees					$ 15,000	$ 15,000
Interim Interest					$ 10,000	$ 10,000
Bond Counsel and Related Costs					$ 12,000	$ 12,000
TOTAL ADMINISTRATIVE/FINANCIAL COSTS	$ 29,000	$ -	$ -	$ 25,000	$ 37,000	$ 91,000
ACTIVITY COSTS:						
Engineering- Basic Services	$ 125,000	$ 95,000				$ 220,000
Engineering- Resident Project Representative Services	$ 145,000					$ 145,000
Phase 2 Hydrogeologic Assessment		$ 30,000				$ 30,000
Construction	$ 201,000		$ 600,000	$ 755,000	$ 242,000	$ 1,798,000
Contingency					$ 359,000	$ 359,000
TOTAL ACTIVITY COSTS	$ 471,000	$ 125,000	$ 600,000	$ 755,000	$ 601,000	$ 2,552,000
TOTAL PROJECT COSTS	$ 500,000	$ 125,000	$ 600,000	$ 780,000	$ 638,000	$ 2,643,000

8.2 Implementation

The proposed implementation for the Phase 2 project is listed below in Table 8-3.

Table 8-3 - Project Implementation Schedule

Project Implementation Schedule	
Action	Date
Public Hearing on Draft PER & EA, Adopt PER Findings and EA	April 19, 2022
Draft PER Complete	April 20, 2022
Prepare Final PER	May 2022
Apply for DNRC and MCEP Grants	May 2022
Apply for CDBG and RD Grant Funding	Fall 2022
DNRC and MCEP Awards	May 2023
Finalize Grant Startup and Contracting	July 2023
Begin Design	August 2023
Preliminary Design Basis Report/Cost Estimates to the Town of Geraldine	September 2023
Submit Design Plans and Specifications to MDEQ	October 2023
MDEQ Review & Approval	December 2023
Advertise for Bids	January 2023
Start Construction	April 2024
Complete Construction	October 2024

9.0 REFERENCES

Montana Bureau of Mines and Geology, Montana Tech of the University of Montana, Groundwater Information Center 2021, http://mbmggwic.mtech.edu/

Montana Department of Commerce, Census and Economic Information Center, http://ceic.mt.gov/

Montana Department of Environmental Quality, *Circular DEQ 1*

Montana Department of Environmental Quality, *Source Water Protection Plan for Geraldine, Montana,* June 2001

Montana Natural Resources Information System, http://nris.msl.mt.gov/

National Flood Insurance Program, Federal Emergency Management Agency, Flood Map Service Center, https://msc.fema.gov/portal/home

Office of Water, United States Environmental Protection Agency, *Radionuclides Rule: A Quick Reference Guide*, June 2001

Office of Water, United States Environmental Protection Agency, *Arsenic and Clarifications to Compliance and New Source Monitoring Rule: A Quick Reference Guide*, January 2001

Office of Water, United States Environmental Protection Agency, *Lead and Copper Rule: A Quick Reference Guide*, June 2008

Office of Water, United States Environmental Protection Agency, *Comprehensive Disinfectants and Disinfection Byproducts Rules (Stage 1 and Stage 2): A Quick Reference Guide*, August 2010

Office of Water, United States Environmental Protection Agency, *Revised Total Coliform Rule*, September 2013

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture, Web Soil Survey, https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

U.S. Census Bureau, Census Data, https://data.census.gov/cedsci/

U.S. Fish and Wildlife Service, National Wetlands Inventory,
https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/

APPENDIX A

Uniform Environmental Checklist

Environmental Checklist

Environmental Checklist Prepared by: On: Click or tap to enter a date.

Matthew Mudd, PE	Great West Engineering
Name of Person 1 Click or tap here to enter text.	Organization mmudd@greatwesteng.com
Phone Number Click or tap here to enter text.	Email Click or tap here to enter text.
Name of Person 2 Click or tap here to enter text.	Organization Click or tap here to enter text.
Phone Number	Email

Click or tap here to enter text.

List additional people above. Include organization, phone number and email for all.

As the engineer that prepared the preliminary engineering report, I _Matthew Mudd_____,

(print name of engineer)

have reviewed the information presented in this checklist and believe that it accurately identifies the environmental resources in the area and the potential impacts that the project could have on those resources. In addition, the required state and federal agencies were provided with the required information about the project and requested to provide comments on the proposed public facility project. Their comments have been incorporated into and attached to the Preliminary Engineering Report.

Engineer's Signature:_____

Date: 05/19/2022

Physical Environment			
Impact Code	**Impact Type**	**Permits/ Mitigation Required?**	**Explanation of Impact to Resource**
1. Soil Suitability, Topographic and/or Geologic Constraints (example: soil slump, steep slopes, subsidence, seismic activity)			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The proposed project will most likely disturb soils throughout the project area. Soils in the project area, however, have already been disturbed to previous construction and urbanization. NRCS Soil Reports; PER Chapter 2 Preferred Alternative Environmental Narrative: Click or tap here to enter text.

2. Hazardous Facilities (example: power lines, hazardous waste sites, acceptable distance from explosive and flammable hazards including chemical/petrochemical storage tanks, underground fuel storage tanks, and related facilities such as natural gas storage facilities and propane storage tanks)			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There are no National Priority Sites near Geraldine or any of the project area. All design and construction will not conflict with existing powerlines. At the intersection of Broadway Ave. and Main St. in Geraldine, soil contaminated with petroleum was encountered during 2020 construction of the new sewer. Although some remediation efforts were performed, any petroleum that may be encountered will be removed. The removal of hazards from the soil may provide benefit to the community's safety. https://www.epa.gov/superfund/superfund-national-priorities-list-npl, Soil Removal and Sampling Report for Geraldine Sewer Project (2021)Click or tap here to enter text. Preferred Alternative Environmental Narrative: Click or tap here to enter text.
3. Surrounding Air Quality (example: dust, odors, emissions)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☐Permit ☒Mitigation ☐ NA	The project area is not in or near a nonattainment area. Any dust or emissions produced during the construction of the proposed project will be temporary. Additionally, the Contractor will be required to utilize dust control methods to minimize any dust produced. PER Chapter 2; https://www3.epa.gov/airquality/greenbook/phistory_mt.html
4. Groundwater Resources and Aquifers (example: quantity, quality, distribution, depth to groundwater, sole source aquifers)			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Several wells, and and naturally occurring springs in the surrounding area. Preferred Alternative Environmental Narrative: The groundwater will be better protected with new underground infrstructure.
5. Surface Water/Water Quality, Quantity and Distribution (example: streams, lakes, storm runoff, irrigation systems, canals)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	The proposed project will not occur within 2,500 ft. of any surface water. No impact is expected any surface water near the project. The Contractor will be required to develop and implement a stormwater pollution prevention plan (SWPPP) during construction. PER Chapter 2

6. Floodplains and Floodplain Management (Identify any floodplains within one mile of the boundary of the project.)

☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☒ Cumulative	☒Permit ☐Mitigation ☐ NA	Current Conditions: There are no published flood maps of the project area provided by FEMA. No floodplains are anticipated to be impacted because any construction will occur away from any drainages or surface waters. https://msc.fema.gov/portal/home Preferred Alternative Environmental Narrative: A floodplain permit will be required in accordance with County FP ordinances.

7. Wetlands (Identify any wetlands within one mile of the boundary of the project and state potential impacts.)

☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There are several clusters of freshwater emergent wetlands throughout the project area. There are wetlands associated with the Town's springs, Flat Creek, and riverines near the Town. None of these wetlands are planned to be disturbed with the design and construction of the proposed project. PER Chapter 2, PER Appendix G Preferred Alternative Environmental Narrative: Click or tap here to enter text.

8. Agricultural Lands, Production, and Farmland Protection (example: grazing, forestry, cropland, prime or unique agricultural lands) Identify any prime or important farm ground or forest lands within one mile of the boundary of the project.

☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: Large portions of the area within and surrounding project area include agricultural lands, but no forest land is within the region. Several soils in the area have been identified as prime farmland. These soils include Nishon clay loam (0 to 1 percent slopes), Savage silty clay loam (0 to 4 percent slopes), Macar loam (0 to 4 percent slopes), and the Bearpaw-Vida clay loams (0 to 4 percent slopes). These lands are not anticipated to be impacted by the project because the soils are in areas of previous disturbance or not in direct conflict with the proposed Improvements. For example, the Town of Geraldine has been built on large sections of Bearpaw-Vida clay loams. Since the soil is within an area that has been developed, the soil will not be impacted by this project more than the effects that urbanization has already caused. PER Chapter 2 Appendix D, Custom Soil Reports Preferred Alternative Environmental Narrative: Click or tap here to enter text.

9. Vegetation and Wildlife Species and Habitats, Including Fish (example: terrestrial, avian and aquatic life and habitats)

☐ No Impact ☐ Beneficial ☒ Adverse	☐ Direct ☐ Indirect ☒ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The habit for vegetation and wildlife in the proposed project area is mostly grasslands and prairie. This land provides habitats for habitat for large mammals such as deer, pronghorn, and coyotes. Many small mammals, insects, and various bird species also use the land as habitat. The only aquatic environment is Flat Creek which provides habitat for reptiles, amphibians, birds, and several other animal species. Neither the terrestrial nor aquatic habitat will be impacted by the proposed project. Construction will occur on land that has already been disturbed by development, so the habitat will not be disturbed more than the land previously has been. There may be some species of animals that are disturbed temporarily by the noise produced by construction. PER Chapter 2 Preferred Alternative Environmental Narrative: Click or tap here to enter text.

10. Unique, Endangered, Fragile, or Limited Environmental Resources, Including Endangered Species (example: plants, fish or wildlife)

☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There are several animal and plant species that are listed as species of concern on the Montana Natural Heritage Program. Animals include the black-tailed prairie dog, the greater short-horned lizard, the bobolink, the burrowing owl, the chestnut-collard longspur, the long-billed curlew, the loggerhead strike, and the greater sage-grouse. A search of the Sage Grouse Conservation Program showed that none of the project area is within conservation or habitat lands. The only plant species of concern in the area is the slim-pod Venus'-looking-glass. The proposed project will only occur on lands that have previously been disturbed by development, so little to no impact is expected on the species of concern or their habitat. PER Chapter 2 Appendix E, Montana Natural Heritage ProgramClick or tap here to enter text. Preferred Alternative Environmental Narrative: Click or tap here to enter text.

11. Unique Natural Features (example: geologic features)

☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The Square Butte, which is 3.5 miles south east of the town of Square Butte, is a unique land feature of the area. The Square Butte is a large laccolith that was formed by the same magma that created the High wood Mountains east of the area. After several millennia, erosion stripped away the soil between the mountains and the butte which left Square Butte higher than the surrounding area. The proposed project will not impact Square Butte because none of the proposed project will occur near the formation.

			Source Water Protection Plan for Geraldine Montana (2001)Click or tap here to enter text. Preferred Alternative Environmental Narrative: Click or tap here to enter text.
12. Access to, and Quality of, Recreational and Wilderness Activities, Public Lands and Waterways (including Federally Designated Wild & Scenic Rivers), and Public Open Space			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: The project area is primarily comprised of private land, but there are several sections of state-owned land. The proposed project will not restrict access to these public lands. The vast majority improvements will be the installation of new water main underground and the connected valves and hydrants. Since these improvements will be constructed underground or in areas away from public access, no access to public lands will be blocked by the project. PER Chapter 7, http://svc.mt.gov/msl/mtcadastral/Click or tap here to enter text. Preferred Alternative Environmental Narrative: Click or tap here to enter text.
Human Environment			
Impact Code	**Impact Type**	**Resource**	
1. Visual Quality – Coherence, Diversity, Compatibility of Use and Scale, Aesthetics			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: There will be minor impacts to improve the visual quality of the system. Since most of the improvements are pipe that will be installed underground, most improvements will not be visually apparent to the public. The replacement of corroded fire hydrants and the decrepit treatment building will result in a benefit to visual appearance. New facilities and components will be free of rust and damage, so the system will have an improved visual quality. PER Chapter 3, Engineer's Opinion. Preferred Alternative Environmental Narrative: Click or tap here to enter text.
2. Nuisances (example: glare, fumes)			
☐ No Impact ☐ Beneficial ☒ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: There may be temporary nuisances during the construction of the improvements like dust and noise. These effects, however, will be temporary, and the Contractor will be required to implement means and follow rules to minimize these nuisances. Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.

3. Noise – Suitable Separation Between Housing and Other Noise Sensitive Activities and Major Noise Sources (example: aircraft, highways and railroads.)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: There will most likely be increased noise during the construction of the proposed project. This noise, however, will be limited and should have little impact to the Town. The Contractor will be required to work between the hours of 7 AM and 7 PM when working in Town or near residences. Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
4. Historic Properties, Cultural, and Archaeological Resources			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	Current Conditions: A response from the Montana State Historic Preservation Office (SHPO) stated, "If all new upgrades will be occurring within previously disturbed areas we feel that there is a low likelihood cultural properties will be impacted." No historic, cultural, or archaeological resources are anticipated to be encountered. If any resources that is historically or culturally significant is discovered during construction, the resident project representative (RPR) will have construction stopped and SHPO contacted to review the findings before construction can continue. PER Chapter 2 Appendix B Preferred Alternative Environmental Narrative: Click or tap here to enter text.
5. Changes in Demographic (Population) Characteristics (example: quantity, distribution, density)			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: None of the project elements will result in any change in demographic characteristics. Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
6. General Housing Conditions – Quality, Quantity, Affordability			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The project focuses on upgrading the aging infrastructure of the existing water system. The project is not anticipated to disproportionately affect any group in the community. Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
7. Businesses or Residents (example: loss of, displacement, or relocation)			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The proposed project is not anticipated to affect the general housing conditions of Geraldine. Replacement of lead service lines, however, may provide some benefits to individual households.

			Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
8. Public Health and Safety			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: None of the project elements is expected to displace any businesses. All construction will occur within the public right-of-way or on land with existing easements. No user will be excluded from service after the project. Engineer's Opinion, PER Chapter 7 Preferred Alternative Environmental Narrative: Click or tap here to enter text.
9. Local Employment – Quantity or Distribution of Employment, Economic Impact			
☐ No Impact ☒ Beneficial ☐ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☒ NA	The project will benefit health and safety by reducing the risk of pathogens from entering the water system and providing adequate capacity for the system to carry fire flows. Upgrading the aging distribution to 6-inch PVC will provide increased capacity and remove leaking where contaminants can enter the system. PER Chapter 7, Engineer's Opinion
10. Income Patterns – Economic Impact			
☐ No Impact ☒ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: Many of the current water mains in Geraldine of asphalt cement (AC) which contains asbestos. The proposed project will eventually remove all AC main from being in service. Abandoning the AC pipe allows the community and individuals from needing to uncover the AC pipe for maintenance or repair. PER Chapter 7, Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
11. Local and State Tax Base and Revenues			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The proposed project is not expected to affect employment or income patterns. Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
12. Community and Government Services and Facilities (example: educational facilities; health and medical services and facilities; police; emergency medical services; and parks, playgrounds and open space)			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The proposed project is not expected to affect employment or income patterns. Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.

13. Commercial and Industrial Facilities – Production and Activity, Growth or Decline			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The existing water system currently serves the schools in Town. Any improvements done to the system will be an improvement in the schools by providing safer and more reliable water. PER Chapter 4, Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
14. Social Structures and Mores (example: standards of social conduct/social conventions)			
☐ No Impact ☒ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The existing water system currently serves the schools in Town. Any improvements done to the system will be an improvement in the schools by providing safer and more reliable water. PER Chapter 4, Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
15. Land Use Compatibility (example: growth, land use change, development activity, adjacent land uses and potential conflicts)			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: No change to land use is expected because of the project. Engineers Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
16. Energy Resources – Consumption and Conservation			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: No change to land use is expected because of the project Preferred Alternative Environmental Narrative: Click or tap here to enter text.
17. Solid Waste Management			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The proposed project does not include any modifications to the sewer system Engineers Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
18. Wastewater Treatment – Sewage System			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The proposed project does not include any modifications to the sewage system Preferred Alternative Environmental Narrative: Click or tap here to enter text.

19. Storm Water – Surface Drainage			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The proposed project will not change the terrain or drainage pathways of the Town. Preferred Alternative Environmental Narrative: Click or tap here to enter text.
20. Community Water Supply			
☐ No Impact ☒ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The proposed project's purpose is to identify and address deficiencies of the existing water system. The project will increase capacity of the system, reduce water loss, and limit the pathways which pathogens can enter the water system. All of these improvements will help the Town build a resilient utility that is reliable and safe.. Preferred Alternative Environmental Narrative: Click or tap here to enter text.
21. Fire Protection – Hazards			
☐ No Impact ☒ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The increase in capacity and upgrade to the pipe size will greatly improve the Town's ability to provide fire flows. The proposed project is anticipated to benefit the Town's fire protection. PER Chapter 4, Engineer's Opinion. Preferred Alternative Environmental Narrative: Click or tap here to enter text.
22. Cultural Facilities, Cultural Uniqueness and Diversity			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: None of the elements of the proposed project are expected to impact cultural facilities, uniqueness, or diversity. Engineers Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
23. Transportation Networks and Traffic Flow Conflicts (example: rail; auto including local traffic; airport runway clear zones – avoidance of incompatible land use in airport runway clear zones)			
☐ No Impact ☐ Beneficial ☒ Adverse	☐ Direct ☒ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The proposed project is not anticipated to conflict with any roads, railways, or airports. There may be some traffic delays in Town during construction. These impacts would be minimal and temporary. Most of Town can be accessed by several routes, so traffic would not be expected to be impacted severely. Engineers Opinion. Preferred Alternative Environmental Narrative: Click or tap here to enter text.

24. Consistency with Local Ordinances, Resolutions, or Plans (example: conformance with local comprehensive plans, zoning, or capital improvement plans.)			
☐ No Impact ☒ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: Click or tap here to enter text. Preferred Alternative Environmental Narrative: Click or tap here to enter text.
25. Private Property Rights (example: a regulatory action or project activity that reduces, minimizes, or eliminates the use of private property.)			
☒ No Impact ☐ Beneficial ☐ Adverse	☒ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: Some components of the wayer system are currently built on private property using easements. The existing easements will be continued to be utilized in order to prevent the need for land acquisition. No impacts to any individual's access to his or her property is expected because of the project will occue in the public right-of-way and on existing easements. PER Chapter 3, Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.
26. Environmental Justice (example: does the project avoid placing lower income households in areas where environmental degradation has occurred, such as adjacent to brownfield sites?)			
☒ No Impact ☐ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☐ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: The project focuses on upgrading the again infrastructure of the exiting water system. The project is not anticipated to disproportionately affect any group in the community. Engineer's Opinion. Preferred Alternative Environmental Narrative: Click or tap here to enter text.
27. Lead Based Paint and/or Asbestos (example: does the project replace asbestos-lined pipes? Do any structures qualify as containing lead-based paint?)			
☐ No Impact ☒ Beneficial ☐ Adverse	☐ Direct ☐ Indirect ☒ Cumulative	☐Permit ☐Mitigation ☐ NA	Current Conditions: Many of the current water mains in Geraldine of asphalt cement (AC) which contains asbesetos. The proposed project will eventually remove all AC main from being in service. Abandoning the AC pipe allows the community and individuals from need to uncover the AC pipe for maintenance or repair. PER Chapter 7, Engineer's Opinion Preferred Alternative Environmental Narrative: Click or tap here to enter text.

Additional Information

List all sources of information used to complete the Environmental Checklist. Sources may include studies, plans, documents, or the individuals, organizations, or agencies contacted for assistance. For individuals, groups, or agencies, please include a contact person and phone number. List any scoping documents or meetings and/or public meetings during project development.

Click or tap here to enter text.

Below is a list of electronic resources available for data gathering to aid in the development of the Environmental Checklist:

Abandoned Mines (DEQ): https://deq.mt.gov/cleanupandrec/Programs/aml

Agricultural Statistics (USDA): USDA - National Agricultural Statistics Service - Data and Statistics

Air Quality

- Nonattainment Areas: Plan and Rule Development | Montana DEQ (mt.gov)
- Opening Burning Guidelines: Open Burning | Montana DEQ (mt.gov)

Army Corps of Engineers: http://www.usace.army.mil/Home.aspx

Bureau of Business and Economic Research, UM: http://www.bber.umt.edu/

Cadastral (for property ownership info): http://svc.mt.gov/msl/mtcadastral

Census Information, MT Dept. of Commerce: http://ceic.mt.gov

Conservation Districts, MT: http://macdnet.org/

Cultural Records

- Montana Historical Society: https://mhs.mt.gov/Shpo/CulturalRecords

DEQ data search tools: Montana DEQ's GIS Portal (mt.gov)

- Including Clean Water Act Info Center, Hazardous Waste Handlers, Petroleum Release Fund Claims, Unpermitted Releases, Underground Storage Tanks, Source Water Protection

EPA Enforcement and Compliance History Online http://echo.epa.gov/

Farmland Classification: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Fish (Also See Wildlife)

- Montana Fisheries Information System: Montana Fish, Wildlife & Parks GIS Data (arcgis.com)
- Aquatic Invasive Species: Montana FWP AIS Surveys Dashboard 2021 (arcgis.com)

Floodplain Maps, FEMA: https://msc.fema.gov/portal

Geographic Information, Natural Resources Information System: http://nris.mt.gov/gis

Geologic Information - MBMG - Publications - Download Geologic Maps (mtech.edu)

Maps of Montana for species observations, land cover, wetland and riparian areas, land management: Montana Natural Heritage Program (mtnhp.org); http://mtnhp.org/mapviewer/?t=6

Montana Department of Transportation: https://www.mdt.mt.gov/

- Environmental Manual: http://www.mdt.mt.gov/publications/docs/manuals/env/preface.pdf

- Environmental Manual - Chapter 29, Permits Required: https://www.mdt.mt.gov/publications/docs/manuals/env/Chapter%2029%20PERMITS%20REQUIRED.pdf

Montana Board of Oil and Gas Conservation Information System:

- http://bogc.dnrc.mt.gov/webApps/DataMiner/

Plants

- Plant database, USDA Natural Resources Conservation Service: http://plants.usda.gov/java
- Plant Species, MT Field Guide: http://fieldguide.mt.gov/default.aspx
- Plant Species of Concern: http://mtnhp.org/SpeciesOfConcern/Default.aspx?AorP=p
- Threatened, Endangered and Rare Plants, USDA: https://plants.usda.gov/home/raritySearch

Soils

- USDA Natural Resource Conservation Service database: https://websoilsurvey.nrcs.usda.gov/app/
- Montana soil and water conservation districts: http://swcdmi.org/

State Historic Preservation Office: http://mhs.mt.gov/Shpo

Tourism, UM – Institute of Tourism & Recreation Research: http://www.itrr.umt.edu

Tribal Resources:

- Blackfeet Tribal Environmental Permits: http://www.blackfeetenvironmental.com
- CSKT Natural Resources Department: http://nrd.csktribes.org/
- Montana Office of Indian Affairs: http://tribalnations.mt.gov/
- Tribal Historic Preservation Officer List: Search - NATHPO
- Tribal Directory Assessment Tool (TDAT): https://egis.hud.gov/tdat/

Vehicle Traffic Count (MDT): http://www.mdt.mt.gov/publications/datastats/traffic.shtml

Water

- Stream Record Extension Facilitator, USGS: USGS | National Water Dashboard
- Streamstats basin characteristics, USGS: http://water.usgs.gov/osw/streamstats/
- Water Resources Division, DNRC: http://dnrc.mt.gov/divisions/water ; ArcGIS Web Application (mt.gov)
- Water Rights Bureau, DNRC: http://dnrc.mt.gov/divisions/water/water-rights
- Water Right Query System, DNRC: DNRC Water Right Query System (mt.gov)
- Wetlands database, USFWS: http://www.fws.gov/wetlands/Data/mapper.html

Wild and Scenic Rivers: http://www.rivers.gov/montana.php

Wildlife

- Animal Species, MT Field Guide: http://fieldguide.mt.gov/default.aspx
- Animal Species of Concern: http://mtnhp.org/SpeciesOfConcern/Default.aspx?AorP=a
- Aquatic Invasive Species: Montana FWP AIS Surveys Dashboard 2021 (arcgis.com)
- Critical Habitat Mapper, USFWS: http://ecos.fws.gov/crithab/
- Crucial Areas Planning System/Habitat Assessment Tool: Habitat MT (HB 526) Funded Lands (arcgis.com)
- FWP Contact Map: http://fwp.mt.gov/gis/maps/contactUs/ (includes biologist responsibility areas)
- Maps and GIS Data, FWP: Montana Fish, Wildlife & Parks GIS Data (arcgis.com)
- Sage grouse management, FWP: Montana Fish, Wildlife & Parks GIS Data : Sage-grouse Habitat/Current Distribution (Montana) : Sage-grouse Habitat/Current Distribution (Montana) (arcgis.com)
- Sage grouse habitat conservation program, DNRC: http://sagegrouse.mt.gov/
- Sage grouse habitat map: https://sagegrouse.mt.gov/ProgramMap

Environmental Review Form

On a separate piece of paper, please answer the following as they apply to your proposed project:

1. **Alternatives:** Describe reasonable alternatives to the project.

2. **Mitigation:** Identify any enforceable measures necessary to reduce any impacts to an insignificant level.

3. **Is an EA or Environmental Impact Statement (EIS) required?** Describe whether or not an EA or EIS is required and explain in detail why or why not.

4. **Public Involvement:** Describe the process followed to involve the public in the proposed project and its potential environmental impacts. Identify the public meetings -- where and when -- the project was considered and discussed, and when the applicant approved the final environmental assessment.

5. **Person(s) Responsible for Preparing:** Identify the person(s) responsible for preparation of this checklist.

6. **Other Agencies:** List any state, local, or federal agencies that have over-lapping or additional jurisdiction or environmental review responsibility for the proposed action and the permits, licenses, and other authorizations required; and list any agencies or groups that were contacted or contributed information to this Environmental Assessment (EA).

5/10/22

(1) Matthew Mudd, PE, Engineer, Date

Town of Geraldine

Kathy L Bond

(2) Mayor

Date: 5/12/22

* If an authorized representative (1) completes the checklist and this form, a chief elected official (2) must also sign authorizing acceptance of the review process. Explanation or statement of how/why that representative was authorized should also be included.

Environmental Review Questions

1. **Alternatives:** Describe reasonable alternatives to the project.
   For the proposed water distribution pipe projects, the reasonable alternatives are to simply complete the work or not complete the work. For pipe projects, since new pipe and services generally follow the same locations and alignments of the existing improvements, no major alternatives that would deviate from this are explored for this project. Spring improvements would only be completed following a detailed review of the spring flows and a review of available project records. Construction work at the springs, if completed, would be done very carefully and with proper planning and construction by a qualified contractor with experience working with springs.

2. **Mitigation:** Identify any enforceable measures necessary to reduce any impacts to an insignificant level.
   According to the MEPA, If it is unclear whether the proposed action may generate impacts that are significant, then an agency may prepare an EA in order to determine the potential significance (MEPA Model Rule III (3)). If the EA determines that the proposed action will have significant impacts, then either an EIS must be prepared or the effects of the proposed action must be MITIGATED below the level of significance and documented in a mitigated EA (MEPA Model Rule III(4)).
   Mitigation measures are minimal for this project since the majority of work will take place within previously impact public right of ways.
   Those items considered for the project include:
   The project may encounter contaminated soils given the proximity to documented DEQ LUST site in town. Special provisions in the contract will instruct the contractor on the steps to take when/if contaminated soils are encountered.
   Wetlands may be encountered at the spring site. A wetlands delineation and permit will be completed, if deemed necessary, by a potential springs improvement project.

3. **Is an EA or Environmental Impact Statement (EIS) required?** Describe whether or not an EA or EIS is required and explain in detail why or why not. *According to the MEPA, An EIS is a detailed environmental review that is required whenever an agency proposes a major action significantly affecting the quality of the human environment (section 75-1-201(1)(b)(iv), MCA).*

   For the proposed project an Environmental Checklist was completed and agency comments have been solicited in accordance to the PER and MEPA guidelines. No major actions that would significantly affect the quality of the human environment is anticipated and no EIS is required as determined by the engineer.

4. **Public Involvement:** Describe the process followed to involve the public in the

proposed project and its potential environmental impacts. Identify the public meetings -- where and when -
- the project was considered and discussed, and when the applicant approved the final environmental assessment.

For a small town of less than 300 people, the community has been very engaged about the proposed project throughout the entire planning process and has been active throughout the project planning process. Public comment from the Town's infrastructure website, "shares" and viewings on social media (Town facebook site) and from public meetings has been in support of completing Phase I water distribution improvements (D-2, $2.66 mil) and applying for Phase 2 (D-3, $2.5 mil) improvements.

Several council meetings and work sessions were completed with the Town Council and operations staff on the dates with documented meeting minutes where water system needs and improvements were discussed for the dates of July 13, 2021, October 12, 2021, December 14, 2021, February 8, 2022, March 8, 2022, March 29, 2022, and April 12, 2022, in addition to the public hearing on April 18, 2022. The work sessions and meeting provided further detailed analysis and water alternative projects costs. Funding options, more detailed costs and related rate impacts were also discussed as the PER findings progressed. The Town Council provided input regarding the overall project scope and project costs to present to the public. All Council meetings are open to and attended by the public.

On April 19, 2022, a public meeting was held to solicit specific input and comments on the findings of the PER and Environmental Assessment. The meeting was advertised in the local newspaper (River Press). The overall project cost of each project alternative was presented to the public. A proposed funding strategy was also presented along with the potential impacts to user rates. In general, several questions were asked by the Public and addressed by the engineer, and the Town was in favor of proceeding with Phase I improvements and applying for Phase 2 improvements as identified in the hearing. The Council members and community concurred with the preferred alternatives presented in the PER. Overall, a total of 23 people were in documented attendance.

A stand-alone project website for the water improvements can be found at http://geraldineinfrastructure.com/. This website was initially created in 2018 to provide information to the public about the recently completed sewer project. The local public was already familiar with this website for the sewer project. This website's information was updated in 2021 for the purposes of the intended water project, and shows the intended schedules, available downloadable documents, the PER process funding information, and a method to obtain public comment. As of April 26, 2022 the website was visited 1,090 times.

At the public meeting held on April 19, 2022, the Town formally passed resolutions to accept the findings of the PER and the EA.

5. **Person(s) Responsible for Preparing:** Identify the person(s) responsible for preparation of this checklist.

The environmental checklist was prepared by: Matthew Mudd, PER (Great West Engineering)

6. **Other Agencies**: List any state, local, or federal agencies that have over-lapping or additional jurisdiction or environmental review responsibility for the proposed action and the permits, licenses, and other authorizations required; and list any agencies or groups that were contacted or contributed information to this Environmental Assessment (EA).

   The agencies contacted for the EA include:

   - Department of Commerce, Census and Economic Information Center
   - Department of Labor and Industry
   - Department of Environmental Quality
   - Department of Fish, Wildlife and Parks
   - Department of Natural Resources and Conservation
   - Department of Transportation
   - State Historic Preservation Office
   - Chouteau County
   - US Environmental Protection Agency
   - US Fish and Wildlife Service
   - US Forest Service
   - US Army Corps of Engineers
   - National Park Service
   - Federal Aviation Administration
   - Bureau of Land Management
   - Bureau of Indian Affairs
   - Natural Resource Conservation Service
   - Occupational Safety and Health Administration
   - US Department of Transportation
   - Department of Natural Resources and Conservation Water Resources Regional Office

APPENDIX B

Agency Letters and Correspondence

From: Martin, Jacob
To: Paul Karcher
Subject: Geraldine Public Water System
Date: Wednesday, January 26, 2022 3:35:33 PM

Dear Mr. Karcher:

Thank you for your January 13, 2022, letter, requesting U.S. Fish and Wildlife Service (USFWS) comment on the subject project at Geraldine, Chouteau County, Montana. The proposed project would replace and improve components of the drinking water system of the Town of Geraldine, which is dispersed from the Town southward approximately 8 miles to source springs (as depicted on the map included with your letter).

The USFWS reviewed your letter. Based on the information provided, we have no comments regarding federally listed or proposed threatened or endangered species or other trust species. Additional information regarding listed species that may occur within the project footprint may be obtained using the IPaC project-planning tool, which streamlines the USFWS environmental review process at https://ecos.fws.gov/ipac/.

Thank you for the opportunity to comment. If you have any questions or comments about this correspondence, please contact me via reply email or at the address or phone numbers, below.

Sincerely,

Jacob M. (Jake) Martin
Assistant Field Supervisor
Montana Ecological Services Office
585 Shephard Way, Suite 1
Helena, Montana 59601
(406) 422-8524 (cell, preferred, I'm teleworking)
(406) 430-9007 (office)
jacob_martin@fws.gov

From:	Murdo, Damon
To:	Paul Karcher
Subject:	GERALDINE PUBLIC WATER SYSTEM PER
Date:	Wednesday, January 19, 2022 2:16:44 PM
Attachments:	2022011902.pdf Reports.pdf Sites.pdf

Big Sky. Big Land. Big History.
Montana
Historical Society

January 19, 2022

Paul Karcher
Great West Engineering
2501 Belt View Drive
Helena MT 59601

RE: GERALDINE PUBLIC WATER SYSTEM PER. SHPO Project #: 2022011902

Dear Mr. Karcher:

I have conducted a file search for the above-cited project. According to our records there have been a few previously recorded sites within the designated search locales. In addition to the sites there have been a few previously conducted cultural resource inventories done in the areas. I've attached a list of these sites and reports. If you would like any further information regarding these sites or reports, you may contact me at the number listed below.

It is SHPO's position that any structure over fifty years of age is considered historic and is potentially eligible for listing on the National Register of Historic Places. If any structures are within the Area of Potential Effect, and are over fifty years old, we would recommend that they be recorded, and a determination of their eligibility be made prior to any disturbance taking place.

In any areas that have not had previous ground disturbance we would recommend that a cultural resource inventory be conducted in order to determine whether or not sites exist and if they will be impacted. If all new upgrades will be occurring within previously disturbed areas we feel that there is a low likelihood cultural properties will be impacted. We, therefore, feel that a recommendation for a cultural resource inventory is unwarranted at this time. However, should structures need to be altered or if cultural materials be inadvertently discovered during this project, we would ask that our office be contacted, and the site investigated.

If you have any further questions or comments, you may contact me at (406) 444-7767 or by e-mail at dmurdo@mt.gov. I have attached an invoice for the file search. Thank you for consulting with us.

STATE HISTORIC PRESERVATION OFFICE
Montana Cultural Resource Database
CRABS Township,Range,Section Results
Report Date:1/19/2022

Township:21 N Range:11 E Section: 1

WOOD GARVEY C.

10/25/1987 CULTURAL RESOURCE MANAGEMENT REPORT U.S. POSTAL SERVICE - GERALDINE POST OFFICE 59446

CRABS Document Number: CH 6 2165 Agency Document Number:

Township:21 N Range:12 E Section: 28

ALTAMONT GAS TRANSMISSION COMPANY

4/1/1993 REVISED INVENTORY AND EVALUATION REPORT FOR CULTURAL RESOURCES ON THE PROPOSED ALTAMONT GAS PIPELINE PROJECT MONTANA SEGMENT

CRABS Document Number: ZZ 6 13755 Agency Document Number:

Township:21 N Range:11 E Section: 1

RENNIE PATRICK J., ET AL.

5/2/1994 FORT BENTON TO MOORE BURIED FIBER OPTIC CABLE

CRABS Document Number: CH 6 15881 Agency Document Number:

Township:21 N Range:12 E Section: 28

RENNIE PATRICK J., ET AL.

5/2/1994 FORT BENTON TO MOORE BURIED FIBER OPTIC CABLE

CRABS Document Number: CH 6 15881 Agency Document Number:

Township:21 N Range:12 E Section: 28

ETHNOSCIENCE ANONYMOUS

2/1/1995 PROPOSED ALTAMONT GAS PIPELINE PROJECT - MONTANA SEGMENT: REVISED VERSION

CRABS Document Number: ZZ 6 16123 Agency Document Number:

Township:21 N Range:11 E Section: 1

DEAVER KEN

10/1/1995 PROPOSED EXPRESS PIPELINE PROJECT - WITH ADDENDUM 6/95 AND PALEONTOLOGICAL LOCATIONS (**SEE ALSO REPORT# 16123 FOR ADDITIONAL PROPERTIES AND LEGAL LOCATIONS)

CRABS Document Number: ZZ 2 17350 Agency Document Number:

Township:21 N Range:12 E Section: 28

PETERSON LYNELLE A., ET AL.

5/16/1996 EXPRESS PIPELINE ADDENDUM

CRABS Document Number: ZZ 2 17773 Agency Document Number:

STATE HISTORIC PRESERVATION OFFICE
Cultural Resource Information Systems
CRIS Township, Range, Section Report
Report Date:1/19/2022

Site #	Twp	Rng	Sec	Qs	Site Type 1	Site Type 2	Time Period	Owner	NR Status
24CH0579	21N	12E	28	NW	Historic Vehicular/Foot Bridge		1940-1949	No Data	Undetermined*
24CH0643	20N	12E	10	NE	Historic Railroad		Historic More Than One Decade	Private	Eligible
24CH0643	21N	12E	28	Comb	Historic Railroad		Historic More Than One Decade	Private	Eligible
24CH0643	21N	11E	1	Comb	Historic Railroad		Historic More Than One Decade	Private	Eligible
24CH0688	21N	11E	1	SE	Historic Misc. Industrial		Historic More Than One Decade	Private	Undetermined*
24CH0986	21N	11E	12	Comb	Historic Road/Trail		Historic More Than One Decade	Combination	Unresolved
24CH0986	21N	11E	1	Comb	Historic Road/Trail		Historic More Than One Decade	Combination	Unresolved
24CH1038	21N	11E	1	NE	Historic Railroad, Stage Route, Travel		Historic Period	State Owned	Ineligible
24CH1047	21N	11E	1	SE	Historic Railroad, Stage Route, Travel	Historic Railroad Building/Structure	Historic More Than One Decade	Other	NR Listed
24CH1220	21N	11E	1	SE	Historic Commercial Development	Historic Architecture	Historic More Than One Decade	Private	NR Listed

Sincerely,

Damon Murdo
Cultural Records Manager
State Historic Preservation Office

File: DEQ/AWWM/2022

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
HELENA REGULATORY OFFICE
100 NEILL AVENUE, SUITE 200
HELENA, MONTANA 59601

REPLY TO
ATTENTION OF

January 26, 2022

Subject: Town of Geraldine - Water System Improvements; USACE File Number: **NWO-2022-00122-MTH**

Attn: Mr. Paul Karcher
Great West Engineering
2501 Belt View Drive
Helena, Montana 59601

Dear Mr. Karcher:

We are responding to your request for comments regarding the above-referenced project. Specifically, you are proposing water system improvements for the town of Geraldine. The project is located at Latitude 47.602600°, Longitude -110.265900°, on or near tributaries of Flat Creek and possible wetlands, within Sections 10 and 27, Township 20 N, Range 12 E; Sections 28 and 35, Township 21 N, Range 12 E; and Sections 1 and 12, Township 21 N, Range 11 E, Geraldine, Chouteau County, Montana.

The mission of the U.S. Army Corps of Engineers (USACE) Regulatory Program is to protect the Nation's aquatic resources while allowing reasonable development through fair, flexible and balanced permit decisions. In particular, under Section 404 of the Clean Water Act, we work to protect the biological, physical, and chemical integrity of the Nation's aquatic resources. Projects are evaluated on a case-by-case basis to determine the potential benefits and detriments that may occur as a result of the proposal. In all cases an applicant must avoid and minimize impacts to aquatic resources to the greatest extent practicable.

Under the authority of Section 404 of the Clean Water Act (CWA), DA permits are required for the discharge of fill material into waters of the U.S. Waters of the U.S. include the area below the ordinary highwater mark of stream channels and lakes, or ponds connected to the tributary system, and wetlands adjacent to these waters. Isolated waters and wetlands, as well as man-made channels, may be waters of the U.S. in certain circumstances, which must be determined on a case-by-case basis.

Based on the information provided in your submittal, we are unable to ascertain if regulated activities are proposed or if jurisdictional waters of the U.S. are present within the project area. If your final design includes the placement of fill material in any jurisdictional area described above, or otherwise requires authorization by a DA permit, please submit a Montana Joint Permit Application to this office prior to starting any

work. After a review of the materials submitted, we will determine what type of permit, if any, will be required. You can obtain a Montana Joint Permit Application Form at the following address: http://www.dnrc.mt.gov/licenses-and-permits/stream-permitting. If you do not have internet access, please contact our office at the address below to obtain more information.

Note that this letter is not a DA authorization to proceed. It only informs you of your need to obtain a DA permit if waters of the U.S. will be affected. If waters of the U.S. will not be affected by a jurisdictional activity a DA permit will not be required for the project.

Please refer to identification number NWO-2022-00122-MTH in any correspondence concerning this project. If you have any questions, please contact Jerin Borrego at 100 Neill Avenue, Suite 200, Helena, MT 59601, by email at Jerin.E.Borrego@usace.army.mil, or telephone at 406-441-1364.

Sincerely,

Jerin E. Borrego
Regulatory Project Manager

From:	Moritz, Anthony
To:	Paul Karcher
Cc:	Sears, Traci; Brugger, Douglas
Subject:	RE: Geraldine Public Water System, Water System Preliminary Engineering Report
Date:	Monday, January 31, 2022 4:41:46 PM

Paul,

The Geraldine Public Water System is in Choteau County, MT which does not currently participate in the National Flood Insurance Program (NFIP). There is no effective FIRM map or Floodplain administrator to regulate potential development in the project area.

Please let me know if you have any questions.

Thank you,

Anthony Moritz, Engineering Analyst
Montana DNRC, Water Resources Division
Havre Regional Office
Anthony.Moritz@mt.gov
Office: 406 265-5516
Direct: 406 808-7127

DEQ
Montana Department
of Environmental Quality

February 2, 2022

Paul Karcher
Great West Engineering, Inc.
2501 Belt View Drive
Helena, MT 59601

Re: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Paul:

Thank you for the information and request for comments regarding the above referenced proposed project. Since the Department of Environmental Quality (DEQ) will be reviewing environmental documents, the engineering report, plans, and specifications for the proposed project and issuing an approval to construct the new facilities, those reviews will serve as DEQ's comments.

The reviews will be performed by either the Public Water Supply Program or, if DEQ funding is also proposed, the Drinking Water State Revolving Fund Program (SRF). Both of these programs are in DEQ's Engineering Bureau. Please keep in mind that other DEQ permits associated with construction of the project may be required.

If you decide to use SRF and have questions, please contact me at (406) 444-5325 or marks@mt.gov. If you do not plan to use SRF and have questions please contact Margarite Juarez Thomas, Section Supervisor, Public Water Supply Engineering, at (406) 755-8956 or MJuarezThomas@mt.gov.

Sincerely,

Mark A. Smith, P.E.
DWSRF Engineering Mgr.
Engineering Bureau

the project. These improvements would be completed within existing rights-of-way, on property owned by the Town, and on existing easements that the Town has.
We would appreciate feedback and comments from Chouteau County. Please send your response back to me by February 7, 2022, at pkarcher@greatwesteng.com or the following address:

Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

☒ Chouteau County has reviewed the enclosed information and has no comment on the project at this time.

Signature _____ Date 2/7/22

See what's possible.

HELENA
PO Box 4817
2501 Belt View Drive
Helena, MT 59604
Ph: (406) 449-8627
F: (406) 449-8631

BILLINGS
6780 Trade Center Avenue
Billings, MT 59101
Ph: (406) 652-5000
F: (406) 248-1363

BOISE
3050 N Lakeharbor Lane
Suite 201
Boise, ID 83703
Ph: (208) 576-6646

GREAT FALLS
702 2nd Street S, #2
Great Falls, MT 59405
Ph: (406) 952-1109

SPOKANE
9221 N Division Street
Suite F
Spokane, WA 99218
Ph: (509) 413-1430

GreatWest ENGINEERING

January 13, 2022

Department of Commerce, Census and Economic Information Center
PO Box 200505
Helena MT 59620-0505

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Department of Commerce, Census and Economic Information Center:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

- Township 20 North, Range 12 East, Sections: 10 & 27
- Township 21 North, Range 12 East, Sections: 28 & 35
- Township 21 North, Range 11 East, Sections: 1 & 12

The existing water system is fairly dispersed relative the number of users of the system. To help visualize the proposed project area a map of the existing water system and the proposed improvements is enclosed with the letter.

The Town of Geraldine has made several major capital improvements since the implementation of the water system in 1935. Originally, the distribution system was wood stave piping, and water from nearby wells and a spring supplied the Town. In the 1950s, the wood piping was replaced with asphalt concrete (AC) piping, and most of the existing fire hydrants were installed. In the 1980s, the Town of Geraldine switched their primary source water to Geraldine Springs, which is about 4 miles south of the Town of Square Butte. The gravity fed transmission system also contain a chlorination station, storage tanks, and pressure reducing valves. Some minor distribution system upgrades were completed in the early 2000s. Currently, there are 134 residential service connections to the system.

The goal of this project is to review the existing water system, identify deficiencies, and make improvements to correct the inadequacies. The primary concerns of the current system are the undersized and leaking AC mains in the distribution system, corroded valves and hydrants, the substantial water loss in the distribution system, and the aging chlorination station that is unsafe to use. Additionally, the pressure reducing valves in the transmission line are beyond useful design life, and the storage tanks in the system require minor improvements including the partial lining of the tank interior to keep them operational. Professional hydrogeologists are also currently reviewing the springs, which are the primary source of water to the Town, to ensure that this source can be continued to be safely used.

The proposed improvements, as indicated on the attached map, include pipeline replacements within Town, PRV station replacements, potential upgrades to the spring collector system, and replacement of the chlorination treatment building. Additionally, some air release valves assemblies deemed faulty may be replaced along the transmission during

the project. These improvements would be completed within existing rights-of-way, on property owned by the Town, and on existing easements that the Town has.
We would appreciate feedback and comments from Department of Commerce, Census and Economic Information Center. Please send your response back to me by February 7, 2022, at pkarcher@greatwesteng.com or the following address:

Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Department of Commerce, Census and Economic Information Center has reviewed the enclosed information and has no comment on the project at this time.

Signature _____ Date _____

See what's possible.

HELENA
PO Box 4817
2501 Belt View Drive
Helena, MT 59604
Ph: (406) 449-8627
F: (406) 449-8631

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6780 Trade Center Avenue
Billings, MT 59101
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Ph: (406) 952-1109

SPOKANE
9221 N Division Street
Suite F
Spokane, WA 99218
Ph: (509) 413-1430

GreatWest ENGINEERING

January 13, 2022

Department of Labor and Industry
PO Box 1728
Helena MT 59624

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Department of Labor and Industry:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

- Township 20 North, Range 12 East, Sections: 10 & 27
- Township 21 North, Range 12 East, Sections: 28 & 35
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the project. These improvements would be completed within existing rights-of-way, on property owned by the Town, and on existing easements that the Town has.
We would appreciate feedback and comments from Department of Labor and Industry. Please send your response back to me by February 7, 2022, at pkarcher@greatwesteng.com or the following address:

Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Department of Labor and Industry has reviewed the enclosed information and has no comment on the project at this time.

_____ _____

Signature Date

See what's possible.

HELENA
PO Box 4817
2501 Belt View Drive
Helena, MT 59604
Ph: (406) 449-8627
F: (406) 449-8631

BILLINGS
6780 Trade Center Avenue
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F: (406) 248-1363

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Ph: (208) 576-6646

GREAT FALLS
702 2nd Street S, #2
Great Falls, MT 59405
Ph: (406) 952-1109

SPOKANE
9221 N Division Street
Suite F
Spokane, WA 99218
Ph: (509) 413-1430

GreatWest ENGINEERING

January 13, 2022

Department of Environmental Quality
Permitting and Compliance Division
PO Box 200901
Helena MT 59620-0901

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Department of Environmental Quality:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

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We would appreciate feedback and comments from Department of Environmental Quality. Please send your response back to me by February 7, 2022, at pkarcher@greatwesteng.com or the following address:

Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Department of Environmental Quality has reviewed the enclosed information and has no comment on the project at this time.

_____ _____
Signature Date

See what's possible.

HELENA
PO Box 4817
2501 Belt View Drive
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SPOKANE
9221 N Division Street
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Spokane, WA 99218
Ph: (509) 413-1430

GreatWest ENGINEERING

January 13, 2022

Department of Fish, Wildlife and Parks
1420 E. 6th Ave.
Helena MT 59620

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Department of Fish, Wildlife and Parks:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

- Township 20 North, Range 12 East, Sections: 10 & 27
- Township 21 North, Range 12 East, Sections: 28 & 35
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Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Department of Fish, Wildlife and Parks has reviewed the enclosed information and has no comment on the project at this time.

_____ _____
Signature Date

See what's possible.

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GreatWest ENGINEERING

January 13, 2022

Department of Natural Resources and Conservation
Attn: Resource Development Bureau Engineer
PO Box 201601
Helena MT 59620-1601

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Department of Natural Resources and Conservation:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

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Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Department of Natural Resources and Conservation has reviewed the enclosed information and has no comment on the project at this time.

_____ _____

Signature Date

See what's possible.

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GreatWest ENGINEERING

January 13, 2022

Department of Transportation
PO Box 201001
Helena MT 59620

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Department of Transportation:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

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Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Department of Transportation has reviewed the enclosed information and has no comment on the project at this time.

_____ _____
Signature Date

See what's possible.

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GreatWest ENGINEERING

January 13, 2022

State Historic Preservation Office
PO Box 201202
Helena MT 59620

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear State Historic Preservation Office:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

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We would appreciate feedback and comments from State Historic Preservation Office. Please send your response back to me by February 7, 2022, at pkarcher@greatwesteng.com or the following address:

Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] State Historic Preservation Office has reviewed the enclosed information and has no comment on the project at this time.

Signature _____ Date _____

SHPO Project #:

File Search Request Form

Contact Name:	Mathew Mudd		
Organization:	Great Westing Engineering, Inc.		
Address:	2501 Belt View Drive		
City:	Helena		
State:	MT	**Zip Code:**	59604
Telephone:	**(406) 495-6196**		
Email:	mmudd@greatwesteng.com		

Big Sky. Big Land. Big History.
Montana Historical Society

Montana State Historic Preservation Office
1301 E. Lockey, PO Box 201202
Helena MT 59620

SEND TO:

Damon Murdo dmurdo@mt.gov (406) 444-7767

Project Name:	Geraldine 2021 Water System Improvements
Project Description:	The Town of Geraldine has contracted Great West Engineering to review the current water system, identify defeciences, and recommend improvements. The Geraldine is a relatively decentralized water system relative to the amount of users. The project area includes the Town of Geraldine, the pipe alignment along Highway 80, the Town of Square Butte, and Geraldine Springs about 4 miles south of Square Butte. The scope of the project includes the source water of Geraldine Springs, the chlorination station, about 2 miles north of the springs, the transmission line and associatied pressure relief valves and storage tanks, and the distribution system within the Town of Geraldine.
Land Use:	Roads, Grazing Land, Farmland, Undeveloped **County:** **Chouteau County**
Agency Involved: (Private,FWP,BLM)	MDEQ **Land Ownership:** **Government Property/Public Land**

Project Area Location Information

Township(N/S)	Range (E/W)	Section(s)
20 N	12 E	10, 27
21 N	11 E	1, 12
21 N	12 E	28, 35

File Search Fee Structure

$25 / section

Please complete this form and attach a copy of the appropriate quad map showing the project location. Feel free to attach additional project information if available.

All fields must be completed in order to process your request.

All sections must be added up and entered in to the box below before a file search will take place.

An invoice will be sent with your file search results.

Total Sections to be searched:	6
Total amount to be paid to SHPO:	**$150.00**

See what's possible.

HELENA
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GreatWest ENGINEERING

January 13, 2022

Chouteau County
Department of Public Health
1020 13th St.
Fort Benton MT 59442

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Chouteau County:

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Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Chouteau County has reviewed the enclosed information and has no comment on the project at this time.

_____ _____
Signature Date

See what's possible.

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GreatWest ENGINEERING

January 13, 2022

US Environmental Protection Agency
Montana Office
Federal Building
10 West 15th Stree, Suite 3200
Helena MT 59625

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear US Environmental Protection Agency:

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Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] US Environmental Protection Agency has reviewed the enclosed information and has no comment on the project at this time.

_____ _____

Signature Date

See what's possible.

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GreatWest ENGINEERING

January 13, 2022

US Fish and Wildlife Service
Ecological Services
585 Shepherd Way
Helena MT 59601

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear US Fish and Wildlife Service:

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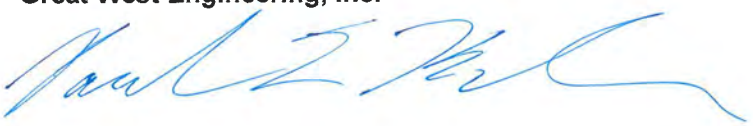
Sincerely,

Great West Engineering, Inc.



Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] US Fish and Wildlife Service has reviewed the enclosed information and has no comment on the project at this time.

_____ _____

Signature Date

See what's possible.

HELENA
PO Box 4817
2501 Belt View Drive
Helena, MT 59604
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F: (406) 449-8631

BILLINGS
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SPOKANE
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Ph: (509) 413-1430

GreatWest ENGINEERING

January 13, 2022

US Forest Service
Region 1
26 Fort Missoula RD
Missoula MT 59804-7203

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear US Forest Service:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

- Township 20 North, Range 12 East, Sections: 10 & 27
- Township 21 North, Range 12 East, Sections: 28 & 35
- Township 21 North, Range 11 East, Sections: 1 & 12

The existing water system is fairly dispersed relative the number of users of the system. To help visualize the proposed project area a map of the existing water system and the proposed improvements is enclosed with the letter.

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The goal of this project is to review the existing water system, identify deficiencies, and make improvements to correct the inadequacies. The primary concerns of the current system are the undersized and leaking AC mains in the distribution system, corroded valves and hydrants, the substantial water loss in the distribution system, and the aging chlorination station that is unsafe to use. Additionally, the pressure reducing valves in the transmission line are beyond useful design life, and the storage tanks in the system require minor improvements including the partial lining of the tank interior to keep them operational. Professional hydrogeologists are also currently reviewing the springs, which are the primary source of water to the Town, to ensure that this source can be continued to be safely used.

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We would appreciate feedback and comments from US Forest Service. Please send your response back to me by February 7, 2022, at pkarcher@greatwesteng.com or the following address:

Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] US Forest Service has reviewed the enclosed information and has no comment on the project at this time.

Signature _____ Date _____

See what's possible.

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GreatWest ENGINEERING

January 13, 2022

US Army Corps of Engineers
10 West 15th Street
Suite 2200
Helena MT 59626

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear US Army Corps of Engineers:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

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Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] US Army Corps of Engineers has reviewed the enclosed information and has no comment on the project at this time.

_____ _____

Signature Date

See what's possible.

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GreatWest ENGINEERING

January 13, 2022

National Park Service
PO Box 25287
Denver CO 80225-0287

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear National Park Service:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

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We would appreciate feedback and comments from National Park Service. Please send your response back to me by February 7, 2022, at pkarcher@greatwesteng.com or the following address:

Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] National Park Service has reviewed the enclosed information and has no comment on the project at this time.

Signature _____ Date _____

See what's possible.

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GreatWest ENGINEERING

January 13, 2022

Federal Aviation Administration
Airport District Office
2725 Skyway Drive
Suite 2
Helena MT 59602

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Federal Aviation Administration:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

- Township 20 North, Range 12 East, Sections: 10 & 27
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We would appreciate feedback and comments from Federal Aviation Administration. Please send your response back to me by February 7, 2022, at pkarcher@greatwesteng.com or the following address:

Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Federal Aviation Administration has reviewed the enclosed information and has no comment on the project at this time.

Signature _____ Date _____

See what's possible.

HELENA
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Ph: (509) 413-1430

GreatWest ENGINEERING

January 13, 2022

Bureau of Land Management
5001 Southgate Drive
Billings MT 59101

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Bureau of Land Management:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

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Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Bureau of Land Management has reviewed the enclosed information and has no comment on the project at this time.

_____ _____

Signature Date

See what's possible.

HELENA
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Helena, MT 59604
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GreatWest ENGINEERING

January 13, 2022

Bureau of Indian Affairs
2021 4th Ave N.
Billings MT 59101

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Bureau of Indian Affairs:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

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Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

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Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

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Signature _____ Date _____

See what's possible.

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GreatWest ENGINEERING

January 13, 2022

Natural Resource Conservation Service
10 E. Babcock St.
Bozeman MT 59771

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Natural Resource Conservation Service:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

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Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

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Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Natural Resource Conservation Service has reviewed the enclosed information and has no comment on the project at this time.

_____ _____

Signature Date

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GreatWest ENGINEERING

January 13, 2022

Occupational Safety and Health Administration
2900 4th Ave. N
Billings MT 59101

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear Occupational Safety and Health Administration:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

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Sincerely,

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Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Occupational Safety and Health Administration has reviewed the enclosed information and has no comment on the project at this time.

_____ _____

Signature Date

See what's possible.

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6780 Trade Center Avenue
Billings, MT 59101
Ph: (406) 652-5000
F: (406) 248-1363

BOISE
3050 N Lakeharbor Lane
Suite 201
Boise, ID 83703
Ph: (208) 576-6646

GREAT FALLS
702 2nd Street S, #2
Great Falls, MT 59405
Ph: (406) 952-1109

SPOKANE
9221 N Division Street
Suite F
Spokane, WA 99218
Ph: (509) 413-1430

GreatWest ENGINEERING

January 13, 2022

US Department of Transportation
585 Shephard Way
Helena MT 59601

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

Dear US Department of Transportation:

The Town of Geraldine is proposing to review and upgrade their current public water system. The purpose of this letter is to solicit comments of any concerns about construction within the project area. The Town of Geraldine is located in central Montana about 25 miles south east of Fort Benton on Highway 80. The project area will be specifically located within:

- Township 20 North, Range 12 East, Sections: 10 & 27
- Township 21 North, Range 12 East, Sections: 28 & 35
- Township 21 North, Range 11 East, Sections: 1 & 12

The existing water system is fairly dispersed relative the number of users of the system. To help visualize the proposed project area a map of the existing water system and the proposed improvements is enclosed with the letter.

The Town of Geraldine has made several major capital improvements since the implementation of the water system in 1935. Originally, the distribution system was wood stave piping, and water from nearby wells and a spring supplied the Town. In the 1950s, the wood piping was replaced with asphalt concrete (AC) piping, and most of the existing fire hydrants were installed. In the 1980s, the Town of Geraldine switched their primary source water to Geraldine Springs, which is about 4 miles south of the Town of Square Butte. The gravity fed transmission system also contain a chlorination station, storage tanks, and pressure reducing valves. Some minor distribution system upgrades were completed in the early 2000s. Currently, there are 134 residential service connections to the system.

The goal of this project is to review the existing water system, identify deficiencies, and make improvements to correct the inadequacies. The primary concerns of the current system are the undersized and leaking AC mains in the distribution system, corroded valves and hydrants, the substantial water loss in the distribution system, and the aging chlorination station that is unsafe to use. Additionally, the pressure reducing valves in the transmission line are beyond useful design life, and the storage tanks in the system require minor improvements including the partial lining of the tank interior to keep them operational. Professional hydrogeologists are also currently reviewing the springs, which are the primary source of water to the Town, to ensure that this source can be continued to be safely used.

The proposed improvements, as indicated on the attached map, include pipeline replacements within Town, PRV station replacements, potential upgrades to the spring collector system, and replacement of the chlorination treatment building. Additionally, some air release valves assemblies deemed faulty may be replaced along the transmission during

the project. These improvements would be completed within existing rights-of-way, on property owned by the Town, and on existing easements that the Town has.
We would appreciate feedback and comments from US Department of Transportation. Please send your response back to me by February 7, 2022, at pkarcher@greatwesteng.com or the following address:

Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] US Department of Transportation has reviewed the enclosed information and has no comment on the project at this time.

Signature _____ Date _____

See what's possible.

HELENA
PO Box 4817
2501 Belt View Drive
Helena, MT 59604
Ph: (406) 449-8627
F: (406) 449-8631

BILLINGS
6780 Trade Center Avenue
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GreatWest ENGINEERING

January 13, 2022

Department of Natural Resources and Conservation Water Resources Regional Office
Attn: Regional Engineering Specialist
PO Box 1828
Havre MT 59501-1828

RE: Geraldine Public Water System, Water System Preliminary Engineering Report

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Great West Engineering, Inc.
Attn: Paul Karcher
2501 Belt View Drive
Helena, MT 59601
406-495-6155

Sincerely,

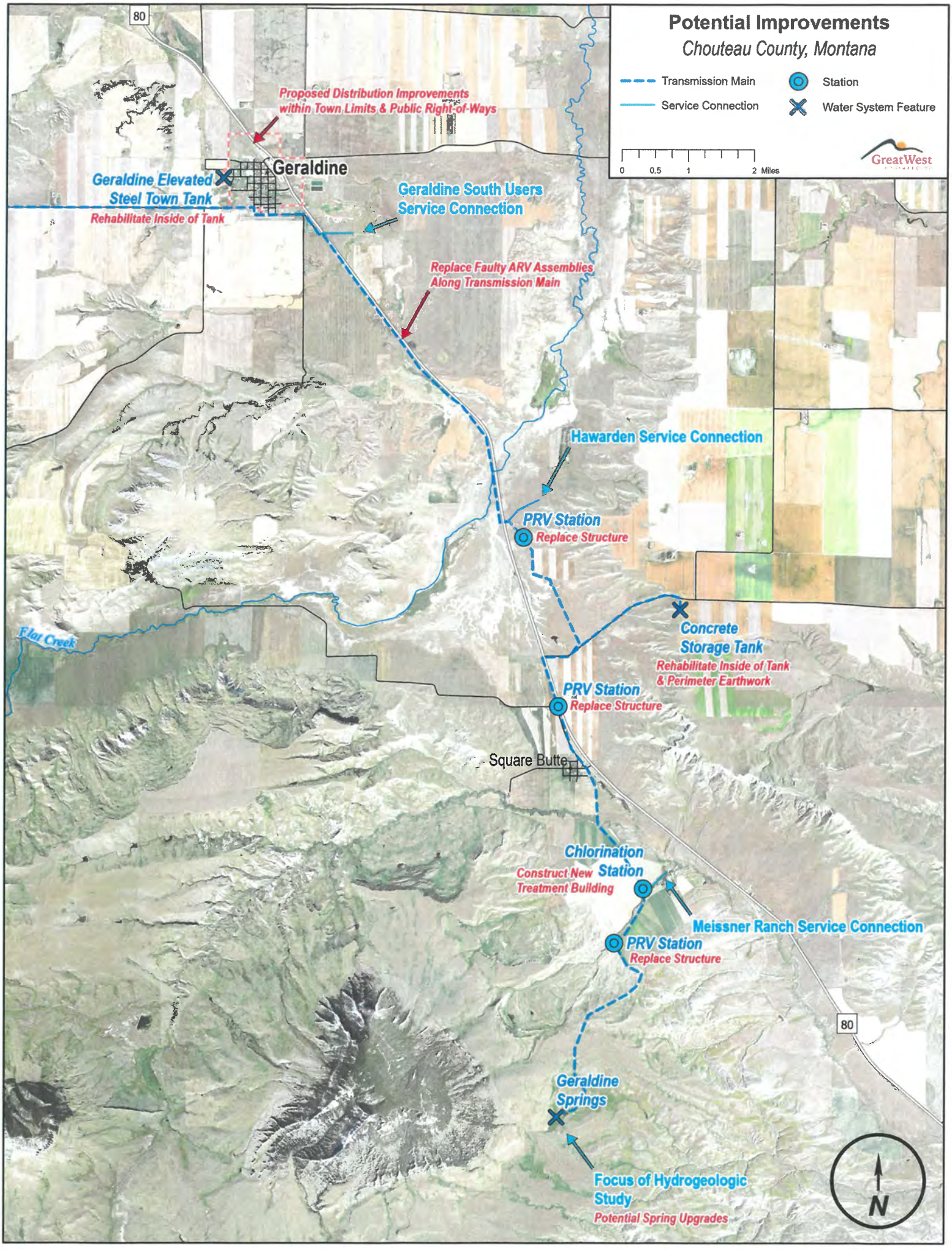
Great West Engineering, Inc.

Paul T. Karcher, EI
Project Engineer

Attached: Map of Potential Water System Improvements

[ ] Department of Natural Resources and Conservation Water Resources Regional Office has reviewed the enclosed information and has no comment on the project at this time.

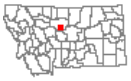
_____ _____
Signature Date


Potential Improvements
Chouteau County, Montana
Transmission Main
Service Connection
Station
Water System Feature
0 0.5 1 2 Miles
GreatWest
80
Proposed Distribution Improvements within Town Limits & Public Right-of-Ways
Geraldine
Geraldine Elevated Steel Town Tank
Rehabilitate Inside of Tank
Geraldine South Users Service Connection
Replace Faulty ARV Assemblies Along Transmission Main
Hawarden Service Connection
PRV Station
Replace Structure
Concrete Storage Tank
Rehabilitate Inside of Tank & Perimeter Earthwork
Flat Creek
PRV Station
Replace Structure
Square Butte
Chlorination
Construct New Station
Treatment Building
Meissner Ranch Service Connection
PRV Station
Replace Structure
80
Geraldine Springs
Focus of Hydrogeologic Study
Potential Spring Upgrades
N

APPENDIX C

Land Cover

MONTANA Natural Heritage Program
A program of the **Montana State Library's Natural Resource Information System**



Latitude	Longitude
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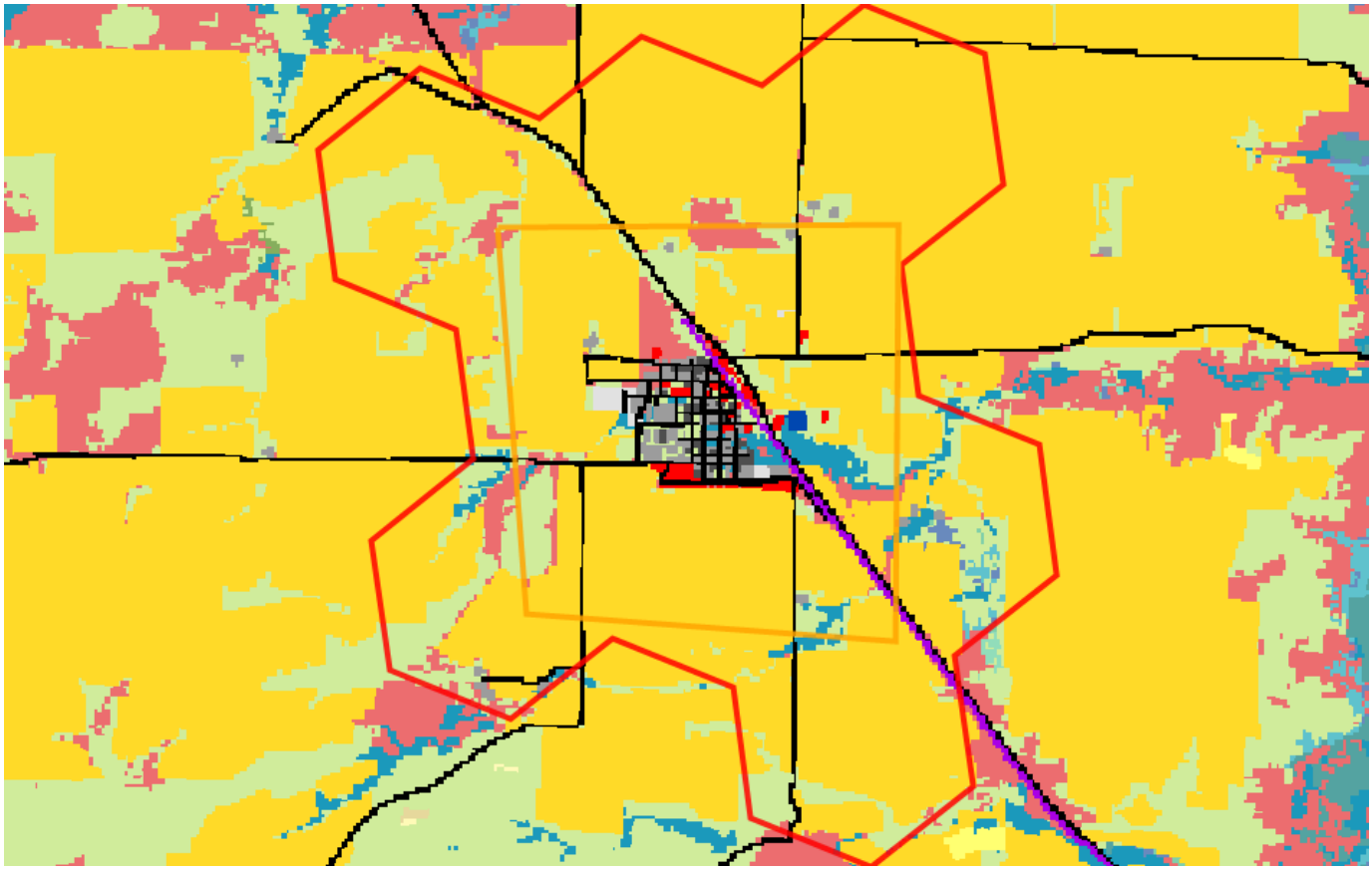
Land Cover

Summarized by: *(Custom Area of Interest)*



71% (*4,112 Acres*)

Human Land Use
Agriculture
Cultivated Crops

These areas used for the production of crops, such as corn, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.

14% (*821 Acres*)

Grassland Systems
Lowland/Prairie Grassland
Great Plains Mixedgrass Prairie

The system covers much of the eastern two-thirds of Montana, occurring continuously for hundreds of square kilometers, interrupted only by wetland/riparian areas or sand prairies. Soils are primarily fine and medium-textured. The growing season averages 115 days, ranging from 100 days on the Canadian border to 130 days on the Wyoming border. Climate is typical of mid-continental regions with long severe winters and hot summers. Grasses typically comprise the greatest canopy cover, and western wheatgrass (*Pascopyrum smithii*) is usually dominant. Other species include thickspike wheatgrass (*Elymus lanceolatus*), green needlegrass (*Nassella viridula*), blue grama (*Bouteloua gracilis*), and needle and thread (*Hesperostipa comata*). Near the Canadian border in north-central Montana, this system grades into rough fescue (*Festuca campestris)* and Idaho fescue (*Festuca idahoensis*) grasslands. Remnants of shortbristle needle and thread *(Hesperostipa curtiseta)* dominated vegetation are found in northernmost Montana and North Dakota, and are associated with productive sites, now mostly converted to farmland. Forb diversity is typically high. In areas of southeastern and central Montana where sagebrush steppe borders the mixed grass prairie, common plant associations include Wyoming big sagebrush-western wheatgrass (*Artemisia tridentata* ssp. *wyomingensis/ Pascopyrum smithii*). Fire and grazing are the primary drivers of this system. Drought can also impact it, in general favoring the shortgrass component at the expense of the mid-height grasses. With intensive grazing, cool season exotics such as Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), and Japanese brome (*Bromus japonicus*) increase in dominance; both of these rhizomatous species have been shown to markedly decrease species diversity. Previously cultivated acres that have been re-vegetated with non-native plants have been transformed into associations such as Kentucky bluegrass (*Poa pratensis*)/western wheatgrass *(Pascopyrum smithii)* or into pure crested wheatgrass (*Agropyron cristatum)* stands.

4% (*240 Acres*)

Recently Disturbed or Modified
Introduced Vegetation
Introduced Upland Vegetation - Annual and Biennial Forbland

Land cover is significantly altered/disturbed by introduced annual and biennial forbs. Natural vegetation types are no longer recognizable. Typical species that dominate these areas are knapweed, oxeye daisy, Canada thistle, leafy spurge, pepperweed, and yellow sweetclover.

No Image

3% (*189 Acres*)

Human Land Use
Developed
Other Roads

County, city and or rural roads generally open to motor vehicles.

2% (*121 Acres*)

Wetland and Riparian Systems
Floodplain and Riparian

Great Plains Riparian

This system is associated with perennial to intermittent or ephemeral streams throughout the northwestern Great Plains. In Montana, it occurs along smaller tributaries of the Yellowstone and Missouri rivers, as well as tributaries to the large floodplain rivers that feed them (e.g. the Milk, Marias, Musselshell, Powder, Clarkâ€™s Fork Yellowstone, Tongue, etc). In areas adjacent to the mountain ranges of central and southeastern Montana, and near the Rocky Mountain Front, it grades into Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland systems. This system is found on alluvial soils in highly variable landscape settings, from confined, deep cut ravines to wide, braided streambeds. Channel migration occurs in less-confined areas, but within a more narrow range than would occur in broad, alluvial floodplains. Typically, the rivers are wadeable by mid-summer.

The primary inputs of water to these systems include groundwater discharge, overland flow, and subsurface interflow from the adjacent upland. Flooding is the key ecosystem process, creating suitable sites for seed dispersal and seedling establishment, and controlling vegetation succession. Communities within this system range from riparian forests and shrublands to tallgrass wet meadows and gravel/sand flats. Dominant species are similar to those found in the Great Plains Floodplain System. In the western part of the systemâ€™s range in Montana, the dominant overstory species is black cottonwood (*Populus balsamifera ssp. trichocarpa*) with narrowleaf cottonwood *(Populus angustifolia)* and Plains cottonwood (*Populus deltoides)* occurring as co-dominants in the riparian/floodplain interface near the mountains. Further east, narrowleaf cottonwood and Plains cottonwood become dominant. In wetter systems, the understory is typically willow (*Salix spp*.) and redosier dogwood (*Cornus stolonifera*) with graminoids such as western wheatgrass (*Pascopyrum smithii*) and forbs like American licorice (*Glycyrrhiza lepidota*). In areas where the channel is incised, the understory may be dominated by big sagebrush (*Artemisia tridentata*) or silver sagebrush (*Artemisia cana*). Like floodplain systems, riparian systems are often subjected to overgrazing and/or agriculture and can be heavily degraded, with salt cedar (*Tamarix ramosissima*) and Russian olive (*Eleagnus angustifolia*) replacing native woody vegetation and regrowth. Groundwater depletion and lack of fire have resulted in additional species changes.

Additional Limited Land Cover

1% (*79 Acres*) Low Intensity Residential
1% (*52 Acres*) Major Roads
1% (*37 Acres*) Commercial / Industrial
1% (*37 Acres*) Railroad
<1% (*19 Acres*) Developed, Open Space
<1% (*18 Acres*) High Intensity Residential
<1% (*12 Acres*) Great Plains Saline Depression Wetland
<1% (*10 Acres*) Emergent Marsh
<1% (*6 Acres*) Open Water
<1% (*1 Acres*) Great Plains Closed Depressional Wetland

Introduction to Land Cover

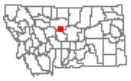
Land Use/Land Cover is one of 15 Montana Spatial Data Infrastructure framework layers considered vital for making statewide maps of Montana and understanding its geography. The layer records all Montana natural vegetation, land cover and land use, classified from satellite and aerial imagery, mapped at a scale of 1:100,000, and interpreted with supporting ground-level data. The baseline map is adapted from the Northwest ReGAP (NWGAP) project land cover classification, which used 30m resolution multi-spectral Landsat imagery acquired between 1999 and 2001. Vegetation classes were drawn from the Ecological System Classification developed by NatureServe (Comer et al. 2003). The land cover classes were developed by Anderson et al. (1976). The NWGAP effort encompasses 12 map zones. Montana overlaps seven of these zones. The two NWGAP teams responsible for the initial land cover mapping effort in Montana were Sanborn and NWGAP at the University of Idaho. Both Sanborn and NWGAP employed a similar modeling approach in which Classification and Regression Tree (CART) models were applied to Landsat ETM+ scenes. The Spatial Analysis Lab within the Montana Natural Heritage Program was responsible for developing a seamless Montana land cover map with a consistent statewide legend from these two separate products. Additionally, the Montana land cover layer incorporates several other land cover and land use products (e.g., MSDI Structures and Transportation themes and the Montana Department of Revenue Final Land Unit classification) and reclassifications based on plot-level data and the latest NAIP imagery to improve accuracy and enhance the usability of the theme. Updates are done as partner support and funding allow, or when other MSDI datasets can be incorporated. Recent updates include fire perimeters and agricultural land use (annually), energy developments such as wind, oil and gas installations (2014), roads, structures and other impervious surfaces (various years): and local updates/improvements to specific ecological systems (e.g., central Montana grassland and sagebrush ecosystems). Current and previous versions of the Land Use/Land Cover layer with full metadata are available for download at the Montana State Library's Geographic Information Clearinghouse

Within the report area you have requested, land cover is summarized by acres of Level 1, Level 2, and Level 3 Ecological Systems.

Literature Cited

Anderson, J.R. E.E. Hardy, J.T. Roach, and R.E. Witmer. 1976. A land use and land cover classification system for use with remote sensor data. U.S. Geological Survey Professional Paper 964.

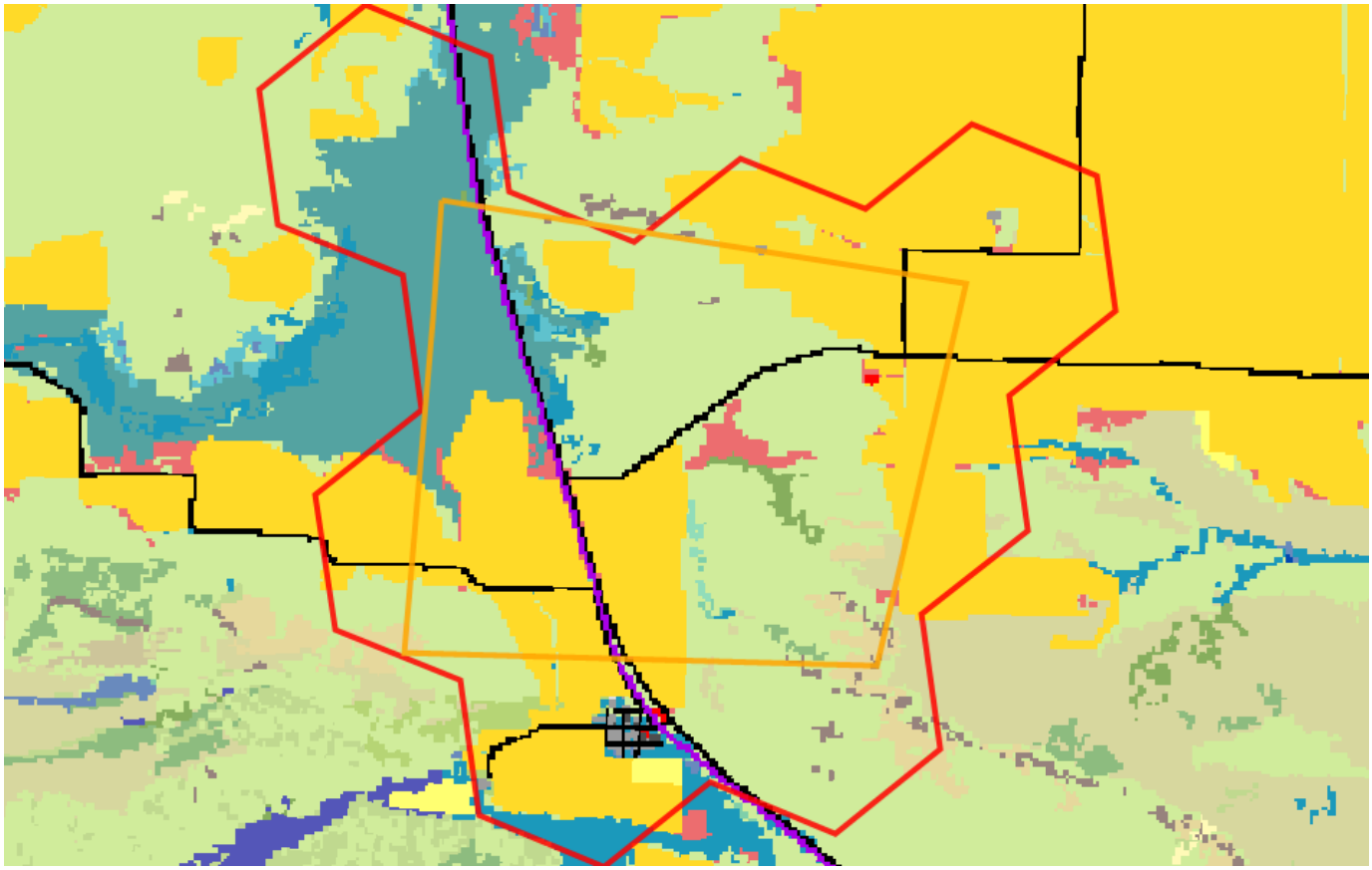
Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. Ecological systems of the United States: A working classification of U.S. terrestrial systems. NatureServe, Arlington, VA.



Latitude	Longitude
47.50660	-110.15243
47.56417	-110.23537

Land Cover

Summarized by: *(Custom Area of Interest)*



40% (*2,314 Acres*)

Human Land Use
Agriculture
Cultivated Crops

These areas used for the production of crops, such as corn, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.

35% (*2,026 Acres*)

Grassland Systems
Lowland/Prairie Grassland
Great Plains Mixedgrass Prairie

The system covers much of the eastern two-thirds of Montana, occurring continuously for hundreds of square kilometers, interrupted only by wetland/riparian areas or sand prairies. Soils are primarily fine and medium-textured. The growing season averages 115 days, ranging from 100 days on the Canadian border to 130 days on the Wyoming border. Climate is typical of mid-continental regions with long severe winters and hot summers. Grasses typically comprise the greatest canopy cover, and western wheatgrass (*Pascopyrum smithii*) is usually dominant. Other species include thickspike wheatgrass (*Elymus lanceolatus*), green needlegrass (*Nassella viridula*), blue grama (*Bouteloua gracilis*), and needle and thread (*Hesperostipa comata*). Near the Canadian border in north-central Montana, this system grades into rough fescue (*Festuca campestris)* and Idaho fescue (*Festuca idahoensis*) grasslands. Remnants of shortbristle needle and thread *(Hesperostipa curtiseta)* dominated vegetation are found in northernmost Montana and North Dakota, and are associated with productive sites, now mostly converted to farmland. Forb diversity is typically high. In areas of southeastern and central Montana where sagebrush steppe borders the mixed grass prairie, common plant associations include Wyoming big sagebrush-western wheatgrass (*Artemisia tridentata* ssp. *wyomingensis/ Pascopyrum smithii*). Fire and grazing are the primary drivers of this system. Drought can also impact it, in general favoring the shortgrass component at the expense of the mid-height grasses. With intensive grazing, cool season exotics such as Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), and Japanese brome (*Bromus japonicus*) increase in dominance; both of these rhizomatous species have been shown to markedly decrease species diversity. Previously cultivated acres that have been re-vegetated with non-native plants have been transformed into associations such as Kentucky bluegrass (*Poa pratensis*)/western wheatgrass *(Pascopyrum smithii)* or into pure crested wheatgrass (*Agropyron cristatum)* stands.

11% (*646 Acres*)

Wetland and Riparian Systems
Floodplain and Riparian
Greasewood Flat

This system occurs in central, north-central and eastern Montana and as a minor occurrence in southwestern Montana. Elsewhere, it occurs throughout the western U.S. including the Intermountain Basin states, the Columbia Plateau, the Rocky Mountains and the western Great Plains. It is found on nearly level, older alluvial terraces on broad or narrow floodplains and coalescing alluvial fans in valleys. It may also occur on broad expanses along lake shores and playas. Sites typically have saline soil and a shallow water table. They flood intermittently, but the surface is dry for most of the growing season. The water table remains high enough to maintain vegetation, despite salt accumulations. Sites occur where overland flow or soils or a combination of both allow for greater than normal moisture regime. In many cases, fine textured soils result in a perched water table. The structure of this system usually consists of open to moderately dense shrubs dominated by greasewood (*Sarcobatus vermiculatus*) with a sparse graminoid understory most commonly consisting of western wheatgrass (*Pascopyrum smithii*).

2% (*123 Acres*)

Wetland and Riparian Systems
Floodplain and Riparian
Great Plains Riparian

This system is associated with perennial to intermittent or ephemeral streams throughout the northwestern Great Plains. In Montana, it occurs along smaller tributaries of the Yellowstone and Missouri rivers, as well as tributaries to the large floodplain rivers that feed them (e.g. the Milk, Marias, Musselshell, Powder, Clarkâ€™s Fork Yellowstone, Tongue, etc). In areas adjacent to the mountain ranges of central and southeastern Montana, and near the Rocky Mountain Front, it grades into Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland systems. This system is found on alluvial soils in highly variable landscape settings, from confined, deep cut ravines to wide, braided streambeds. Channel migration occurs in less-confined areas, but within a more narrow range than would occur in broad, alluvial floodplains. Typically, the rivers are wadeable by mid-summer.

The primary inputs of water to these systems include groundwater discharge, overland flow, and subsurface interflow from the adjacent upland. Flooding is the key ecosystem process, creating suitable sites for seed dispersal and seedling establishment, and controlling vegetation succession. Communities within this system range from riparian forests and shrublands to tallgrass wet meadows and gravel/sand flats. Dominant species are similar to those found in the Great Plains Floodplain System. In the western part of the systemâ€™s range in Montana, the dominant overstory species is black cottonwood (*Populus balsamifera ssp. trichocarpa*) with narrowleaf cottonwood *(Populus angustifolia)* and Plains cottonwood (*Populus deltoides)* occurring as co-dominants in the riparian/floodplain interface near the mountains. Further east, narrowleaf cottonwood and Plains cottonwood become dominant. In wetter systems, the understory is typically willow (*Salix spp*.) and redosier dogwood (*Cornus stolonifera*) with graminoids such as western wheatgrass (*Pascopyrum smithii*) and forbs like American licorice (*Glycyrrhiza lepidota*). In areas where the channel is incised, the understory may be dominated by big sagebrush (*Artemisia tridentata*) or silver sagebrush (*Artemisia cana*). Like floodplain systems, riparian systems are often subjected to overgrazing and/or agriculture and can be heavily degraded, with salt cedar (*Tamarix ramosissima*) and Russian olive (*Eleagnus angustifolia*) replacing native woody vegetation and regrowth. Groundwater depletion and lack of fire have resulted in additional species changes.

2% (*105 Acres*)

Sparse and Barren Systems
Bluff, Badland and Dune
Great Plains Badlands

The Western Great Plains Badlands ecological system occurs within the mixed grass and sand prairie regions of eastern and southeastern Montana, where the land lies well above or below its local base level, shaped by the carving action of streams, erosion, and erosible parent material. It is easily recognized by its rugged, eroded, and often colorful land formations, and the relative absence of vegetative cover. In those areas with vegetation, species can include scattered individuals of many dryland shrubs or herbaceous taxa, including curlycup gumweed (*Grindelia squarrosa*), threadleaf snakeweed (*Gutierrezia sarothrae*) (especially with overuse and grazing), greasewood (*Sarcobatus vermiculatus*), Gardnerâ€™s saltbush (*Atriplex gardneri*), buckwheat (*Eriogonum* species), plains muhly (*Muhlenbergia cuspidata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and Hookerâ€™s sandwort (*Arenaria hookeri*). Patches of sagebrush (*Artemisia* spp.) can also occur. Climate is typical of mid continental regions with long severe winters and warm summers. Precipitation ranges from 7 to 14 inches per year, with two-thirds of the precipitation falling during the summer, and a third falling in the spring. The sedimentary parent material of exposed rocks and the resultant eroded clay soils are derived from Cretaceous sea beds and are often fossil-rich. Dominant soil types are in the order Entisols. These mineral soils are found primarily on uplands, slopes, and creek bottoms and are easily erodible. The growing season is short, averaging 115 days, with a range from 100 days on the Canadian border to 130 days on the Wyoming border. Land use is limited, except for off-highway vehicle recreation and incidental grazing.

No Image

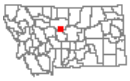
2% (*101 Acres*)

Human Land Use
Developed
Other Roads

County, city and or rural roads generally open to motor vehicles.

Additional Limited Land Cover

1% (*78 Acres*) Great Plains Sand Prairie
1% (*75 Acres*) Introduced Upland Vegetation - Annual and Biennial Forbland
1% (*57 Acres*) Railroad
1% (*48 Acres*) Major Roads
1% (*33 Acres*) Great Plains Wooded Draw and Ravine
1% (*29 Acres*) Rocky Mountain Lower Montane, Foothill, and Valley Grassland
1% (*29 Acres*) Great Plains Saline Depression Wetland
<1% (*29 Acres*) Great Plains Cliff and Outcrop
<1% (*17 Acres*) Pasture/Hay
<1% (*15 Acres*) Low Intensity Residential
<1% (*9 Acres*) Great Plains Open Freshwater Depression Wetland
<1% (*8 Acres*) Rocky Mountain Foothill Woodland-Steppe Transition
<1% (*4 Acres*) Great Plains Closed Depressional Wetland
<1% (*3 Acres*) Commercial / Industrial
<1% (*3 Acres*) Emergent Marsh
<1% (*3 Acres*) High Intensity Residential
<1% (*0 Acres*) Developed, Open Space



Latitude	Longitude
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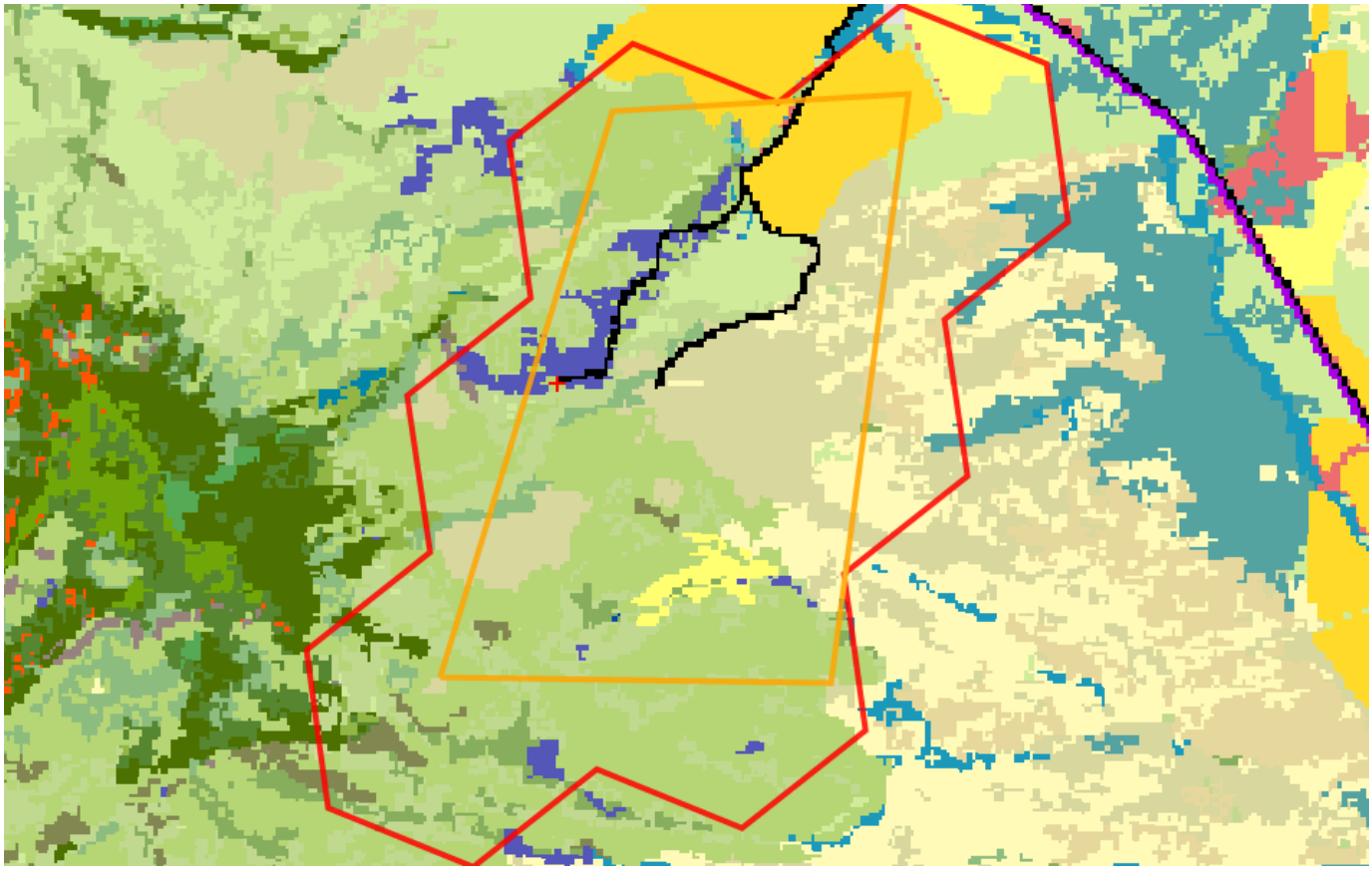
47.50028	-110.22656

Land Cover

Summarized by: *(Custom Area of Interest)*



33% (*1,265 Acres*)

Grassland Systems
Montane Grassland
Rocky Mountain Lower Montane, Foothill, and Valley Grassland

This grassland system of the northern Rocky Mountains is found at lower montane to foothill elevations in mountains and valleys throughout Montana. These grasslands are floristically similar to Big Sagebrush Steppe but are defined by shorter summers, colder winters, and young soils derived from recent glacial and alluvial material. They are found at elevations from 548 - 1,650 meters (1,800-5,413 feet). In the lower montane zone, they range from small meadows to large open parks surrounded by conifers; below the lower treeline, they occur as extensive foothill and valley grasslands. Soils are relatively deep, fine-textured, often with coarse fragments, and non-saline. Microphytic crust may be present in high-quality occurrences. This system is typified by cool-season perennial bunch grasses and forbs (>25%) cover, with a sparse shrub cover (<10%). Rough fescue (*Festuca campestris*) is dominant in the northwestern portion of the state and Idaho fescue (*Festuca idahoensis*) is dominant or co-dominant throughout the range of the system. Bluebunch wheatgrass (*Pseudoroegneria spicata*) occurs as a co-dominant throughout the range as well, especially on xeric sites. Western wheatgrass (*Pascopyrum smithii*) is consistently present, often with appreciable coverage (>10%) in lower elevation occurrences in western Montana and virtually always present, with relatively high coverages (>25%), on the edge of the Northwestern Great Plains region. Species diversity ranges from a high of more than 50 per 400 square meter plot on mesic sites to 15 (or fewer) on xeric and disturbed sites. Most occurrences have at least 25 vascular species present. Farmland conversion, noxious species invasion, fire suppression, heavy grazing and oil and gas development are major threats to this system.

16% (*613 Acres*)

Grassland Systems
Lowland/Prairie Grassland
Great Plains Sand Prairie

The sand prairies constitute a very unique system within the western Great Plains. The unifying and controlling feature for this system is that coarse-textured soils predominate and the dominant grasses are well-adapted to this condition. In the northwestern portion of the systemâ€™s range, stand size corresponds to the area of exposed caprock sandstone, and small patches predominate, but larger patches are found embedded in the encompassing Great Plains Mixed Grass Prairie, and usually occupy higher positions in local landscapes where former caprock formations have eroded into more subdued and planar topography. In most of eastern Montana, substrates supporting this system have weathered in place from sandstone caprock. Soils can be relatively thin or deep due to varying amounts of downslope movement of weathered sands. Needle and thread (*Hesperostipa comata*) is the dominant grass species. Other frequent species include little bluestem (*Schizachyrium scoparium*), often occurring with threadleaf sedge (*Carex filifolia*) and dominating both sandy sites and actively eroding sites. Prairie sandreed (*Calamovilfa longifolia*), sand bluestem (*Andropogon hallii*) and big bluestem (*Andropogon gerardii*) are sporadically distributed and found generally on the coarsest-textured sands. Other graminoids include bluebunch wheatgrass (*Pseudoroegneria spicata*), sun sedge (*Carex inops ssp. heliophila*), and purple threeawn (*Aristida purpurea*). Characteristic forbs differ by occurrence, but species of scurf pea (*Psoralidium* species) and Indian breadroot (*Pediomelum*) species are common. Communities of silver sage (*Artemisia cana* ssp. *cana*) or skunkbush sumac (*Rhus trilobata*) can occur within this system. Wind erosion, fire and grazing constitute the other major dynamic processes that can influence this system.

13% (*495 Acres*)

Shrubland, Steppe and Savanna Systems
Deciduous Shrubland

Great Plains Shrubland

This ecological system is found from southern Alberta through northern Montanaâ€™s glaciated and unglaciated plains, typically at elevations ranging from 1,220 to 1,524 meters (4,000-5,000 feet). It can occur on all aspects but is more common on mesic sites with moderately shallow or deep, fine to sandy loam soils. Often it is located on slopes near breaklands and on the edge of coulees, or on upper terraces of rivers and streams. It differs from the Northwestern Great Plains Mixedgrass Prairie in that shrub cover is more than 10%, although the grass component is similar, and may occur where fire suppression in grasslands has allowed shrubs to establish. Dominant shrubs include serviceberry (*Amelanchier alnifolia*), skunkbush sumac (*Rhus trilobata*), snowberry (*Symphoricarpos* species), silver buffaloberry (Sheperdia argentea), shrubby cinquefoil (*Dasiphora fruticosa ssp. floribunda*), silverberry (*Elaeagnus commutata*) and horizontal rug juniper (*Juniperus horizontalis*). Silver sage (*Artemisia cana ssp. cana*) shrublands may occur on flat alluvial deposits on floodplains, terraces or benches, and alluvial fans.

8% (*297 Acres*)

Shrubland, Steppe and Savanna Systems
Sagebrush Steppe

Big Sagebrush Steppe

This widespread ecological system occurs throughout much of central Montana, and north and east onto the western fringe of the Great Plains. In central Montana, where this system occurs on both glaciated and non-glaciated landscapes, it differs slightly, with more summer rain than winter precipitation and more precipitation annually. Throughout its distribution, soils are typically deep and non-saline, often with a microphytic crust. This shrub-steppe is dominated by perennial grasses and forbs with greater than 25% cover. Overall shrub cover is less than 10 percent. In Montana and Wyoming, stands are more mesic, with more biomass of grass, and have less shrub diversity than stands farther to the west, and 50 to 90% of the occurrences are dominated by Wyoming big sagebrush with western wheatgrass (*Pascopyrum smithii*). Japanese brome (*Bromus japonicus*) and cheatgrass (*Bromus tectorum*) are indicators of disturbance, but cheatgrassis typically not as abundant as in the Intermountain West, possibly due to a colder climate. The natural fire regime of this ecological system maintains a patchy distribution of shrubs, preserving the steppe character. Shrubs may increase following heavy grazing and/or with fire suppression. In central and eastern Montana, complexes of prairie dog towns are common in this ecological system.

7% (*255 Acres*)

Grassland Systems
Lowland/Prairie Grassland

Great Plains Mixedgrass Prairie

The system covers much of the eastern two-thirds of Montana, occurring continuously for hundreds of square kilometers, interrupted only by wetland/riparian areas or sand prairies. Soils are primarily fine and medium-textured. The growing season averages 115 days, ranging from 100 days on the Canadian border to 130 days on the Wyoming border. Climate is typical of mid-continental regions with long severe winters and hot summers. Grasses typically comprise the greatest canopy cover, and western wheatgrass (*Pascopyrum smithii*) is usually dominant. Other species include thickspike wheatgrass (*Elymus lanceolatus*), green needlegrass (*Nassella viridula*), blue grama (*Bouteloua gracilis*), and needle and thread (*Hesperostipa comata*). Near the Canadian border in north-central Montana, this system grades into rough fescue (*Festuca campestris)* and Idaho fescue (*Festuca idahoensis*) grasslands. Remnants of shortbristle needle and thread *(Hesperostipa curtiseta)* dominated vegetation are found in northernmost Montana and North Dakota, and are associated with productive sites, now mostly converted to farmland. Forb diversity is typically high. In areas of southeastern and central Montana where sagebrush steppe borders the mixed grass prairie, common plant associations include Wyoming big sagebrush-western wheatgrass (*Artemisia tridentata* ssp. *wyomingensis/ Pascopyrum smithii*). Fire and grazing are the primary drivers of this system. Drought can also impact it, in general favoring the shortgrass component at the expense of the mid-height grasses. With intensive grazing, cool season exotics such as Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), and Japanese brome (*Bromus japonicus*) increase in dominance; both of these rhizomatous species have been shown to markedly decrease species diversity. Previously cultivated acres that have been re-vegetated with non-native plants have been transformed into associations such as Kentucky bluegrass (*Poa pratensis*)/western wheatgrass *(Pascopyrum smithii)* or into pure crested wheatgrass (*Agropyron cristatum)* stands.

6% (*248 Acres*)

Human Land Use
Agriculture

Cultivated Crops

These areas used for the production of crops, such as corn, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.

3% (*117 Acres*)

Human Land Use
Agriculture

Pasture/Hay

These agriculture lands typically have perennial herbaceous cover (e.g. regularly-shaped plantings) used for livestock grazing or the production of hay. There are obvious signs of management such as irrigation and haying that distinguish it from natural grasslands. Identified CRP lands are included in this land cover type.

3% (*111 Acres*)

Wetland and Riparian Systems
Floodplain and Riparian

Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland

This ecological system is found throughout the Rocky Mountain and Colorado Plateau regions. In Montana, it ranges from approximately 945 to 2,042 meters (3,100 to 6,700 feet), characterristically occuring as a mosaic of multiple communities that are tree-dominated with a diverse shrub component. It is dependent on a natural hydrologic regime, especially annual to episodic flooding. Occurrences are found within the flood zone of rivers, on islands, sand or cobble bars, and on immediate streambanks. It can form large, wide occurrences on mid-channel islands in larger rivers or narrow bands on small, rocky canyon tributaries and well-drained benches. It is also typically found in backwater channels and other perennially wet but less scoured sites, such as floodplains swales and irrigation ditches. In some locations, occurrences extend into moderately high intermountain basins where the adjacent vegetation is sage steppe. Dominant trees may include boxelder maple (*Acer negundo*), narrowleaf cottonwood (*Populus angustifolia*), Plains cottonwood (*Populus deltoides*), Douglas-fir (*Pseudotsuga menziesii*), peachleaf willow (*Salix amygdaloides*), or Rocky Mountain juniper (*Juniperus scopulorum*). Dominant shrubs include Rocky Mountain maple (*Acer glabrum*), thinleaf alder (*Alnus incana*), river birch (*Betula occidentalis*), redoiser dogwood (*Cornus sericea*), hawthorne (*Crataegus spp.*), chokecherry (*Prunus virginiana*), skunkbush sumac (*Rhus trilobata*), Drummondâ€™s willow (*Salix drummondiana*), sandbar willow (*Salix exigua*), Pacific willow (*Salix lucida*), rose (*Rosa* species), silver buffaloberry (*Shepherdia argentea*), or snowberry (*Symphoricarpos* species). Exotic trees of Russian olive (*Elaeagnus angustifolia*) and saltcedar (*Tamarix* species) may invade some stands in southeastern and south-central Montana.

2% (*92 Acres*)

Sparse and Barren Systems
Bluff, Badland and Dune

Great Plains Badlands

The Western Great Plains Badlands ecological system occurs within the mixed grass and sand prairie regions of eastern and southeastern Montana, where the land lies well above or below its local base level, shaped by the carving action of streams, erosion, and erosible parent material. It is easily recognized by its rugged, eroded, and often colorful land formations, and the relative absence of vegetative cover. In those areas with vegetation, species can include scattered individuals of many dryland shrubs or herbaceous taxa, including curlycup gumweed (*Grindelia squarrosa*), threadleaf snakeweed (*Gutierrezia sarothrae*) (especially with overuse and grazing), greasewood (*Sarcobatus vermiculatus*), Gardnerâ€™s saltbush (*Atriplex gardneri*), buckwheat (*Eriogonum* species), plains muhly (*Muhlenbergia cuspidata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and Hookerâ€™s sandwort (*Arenaria hookeri*). Patches of sagebrush (*Artemisia* spp.) can also occur. Climate is typical of mid continental regions with long severe winters and warm summers. Precipitation ranges from 7 to 14 inches per year, with two-thirds of the precipitation falling during the summer, and a third falling in the spring. The sedimentary parent material of exposed rocks and the resultant eroded clay soils are derived from Cretaceous sea beds and are often fossil-rich. Dominant soil types are in the order Entisols. These mineral soils are found primarily on uplands, slopes, and creek bottoms and are easily erodible. The growing season is short, averaging 115 days, with a range from 100 days on the Canadian border to 130 days on the Wyoming border. Land use is limited, except for off-highway vehicle recreation and incidental grazing.

2% (*90 Acres*)

Forest and Woodland Systems
Deciduous dominated forest and woodland

Great Plains Wooded Draw and Ravine

This system is typically associated with highly intermittent or ephemeral streams. It may occur on steep northern slopes or within canyon bottoms where soil moisture and topography produce higher moisture levels than are common throughout most of the area. In some areas of the western Great Plains, in higher elevation draws and ravines, Rocky Mountain juniper (*Juniperus scopulorum)* can dominate the canopy. Aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), or boxelder maple (*Acer negundo*) are commonly present in portions of the northwestern Great Plains. In central and eastern Montana, green ash (*Fraxinus pennsylvanicus*) or chokecherry (*Prunus virginiana*) are the usual dominants. Douglas hawthorne (*Crataegus douglasii*) is occasionally seen as a dominant in south-central Montana, especially around the Pryor Mountains. This system is found in ravines formed by ephemeral and intermittent streams, and on toeslopes and north-facing backslopes. Generally, these systems are less than 50 meters (165 feet) wide, although the linear extent may be considerable. Soils are usually deep and loamy. Flooding is very short in duration when it occurs, as water is rapidly channeled downslope.

2% (*63 Acres*)

Forest and Woodland Systems
Conifer-dominated forest and woodland (xeric-mesic)

Rocky Mountain Foothill Woodland-Steppe Transition

This inland Pacific Northwest ecological system occurs in the foothills of the Montana Rocky Mountains, where it forms a broad ecotone between true forests ad true steppe, shrublands, or grasslands, typically on warm, dry, exposed sites too droughty to support a closed tree canopy. This is not a fire-maintained system. The "steppe" character results from a climate-edaphic interaction that results in a graminiod-dominated landscape with widely scattered trees; even in the absence of fire, a "woodland" or "forest" structure will not be obtained. Occurrences are found on all slopes and aspects; however, moderately steep to very steep slopes or ridgetops on southerly or western aspects are most common. They can be found on glacial till, glacio-fluvial sand and gravel, dune, basaltic rubble, colluvium, deep loess or volcanic ash-derived soils, with characteristic features of good aeration and drainage, coarse texture, and an abundance of mineral material. Ponderosa pine (*Pinus ponderosa*) or Douglas-fir (*Pseudotsuga menziesii*)are the predominant conifers. Limber pine (*Pinus flexilis*)may be present in some occurrences. In fire-protected transition areas with big sagebrush steppe systems, antelope bitterbrush (*Purshia tridentata*), Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis),* big sagebrush (*Artemisia tridentata* ssp. *tridentata*), and three-tip sagebrush (*Artemisia tripartita*) may be common. Deciduous shrubs such as common ninebark (*Physocarpus malvaceus*), commonsnowberry (*Symphoricarpos albus*), or birch leaf spiraea (*Spiraea betulifolia)may* be abundant in occurrences west of the Continental Divide. Important grass species include bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandbergâ€™s bluegrass (*Poa secunda*), needle and thread (*Hesperostipa comata*), needlegrass (*Achnatherum*species), and bottlebrush squirreltail (*Elymus elymoides*). This system is very similar to Northern Rocky Mountain Ponderosa Pine Woodland and Savanna, but with more widely scattered trees.

Additional Limited Land Cover

1% (*50 Acres*) Other Roads
1% (*42 Acres*) Aspen Forest and Woodland
1% (*33 Acres*) Greasewood Flat
1% (*25 Acres*) Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest
<1% (*13 Acres*) Great Plains Riparian
<1% (*8 Acres*) Great Plains Ponderosa Pine Woodland and Savanna
<1% (*6 Acres*) Rocky Mountain Montane-Foothill Deciduous Shrubland
<1% (*4 Acres*) Great Plains Cliff and Outcrop
<1% (*3 Acres*) Introduced Upland Vegetation - Annual and Biennial Forbland
<1% (*3 Acres*) Developed, Open Space
<1% (*1 Acres*) Emergent Marsh
<1% (*1 Acres*) Commercial / Industrial
<1% (*1 Acres*) Great Plains Closed Depressional Wetland
<1% (*0 Acres*) Open Water
<1% (*0 Acres*) Great Plains Open Freshwater Depression Wetland

Introduction to Land Cover

Land Use/Land Cover is one of 15 Montana Spatial Data Infrastructure framework layers considered vital for making statewide maps of Montana and understanding its geography. The layer records all Montana natural vegetation, land cover and land use, classified from satellite and aerial imagery, mapped at a scale of 1:100,000, and interpreted with supporting ground-level data. The baseline map is adapted from the Northwest ReGAP (NWGAP) project land cover classification, which used 30m resolution multi-spectral Landsat imagery acquired between 1999 and 2001. Vegetation classes were drawn from the Ecological System Classification developed by NatureServe (Comer et al. 2003). The land cover classes were developed by Anderson et al. (1976). The NWGAP effort encompasses 12 map zones. Montana overlaps seven of these zones. The two NWGAP teams responsible for the initial land cover mapping effort in Montana were Sanborn and NWGAP at the University of Idaho. Both Sanborn and NWGAP employed a similar modeling approach in which Classification and Regression Tree (CART) models were applied to Landsat ETM+ scenes. The Spatial Analysis Lab within the Montana Natural Heritage Program was responsible for developing a seamless Montana land cover map with a consistent statewide legend from these two separate products. Additionally, the Montana land cover layer incorporates several other land cover and land use products (e.g., MSDI Structures and Transportation themes and the Montana Department of Revenue Final Land Unit classification) and reclassifications based on plot-level data and the latest NAIP imagery to improve accuracy and enhance the usability of the theme. Updates are done as partner support and funding allow, or when other MSDI datasets can be incorporated. Recent updates include fire perimeters and agricultural land use (annually), energy developments such as wind, oil and gas installations (2014), roads, structures and other impervious surfaces (various years): and local updates/improvements to specific ecological systems (e.g., central Montana grassland and sagebrush ecosystems). Current and previous versions of the Land Use/Land Cover layer with full metadata are available for download at the Montana State Library's Geographic Information Clearinghouse

Within the report area you have requested, land cover is summarized by acres of Level 1, Level 2, and Level 3 Ecological Systems.

Literature Cited

Anderson, J.R. E.E. Hardy, J.T. Roach, and R.E. Witmer. 1976. A land use and land cover classification system for use with remote sensor data. U.S. Geological Survey Professional Paper 964.

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. Ecological systems of the United States: A working classification of U.S. terrestrial systems. NatureServe, Arlington, VA.

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APPENDIX D

NRCS Soil Survey

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 Chouteau County Area, Montana

Overall Project Area

January 11, 2022

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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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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.

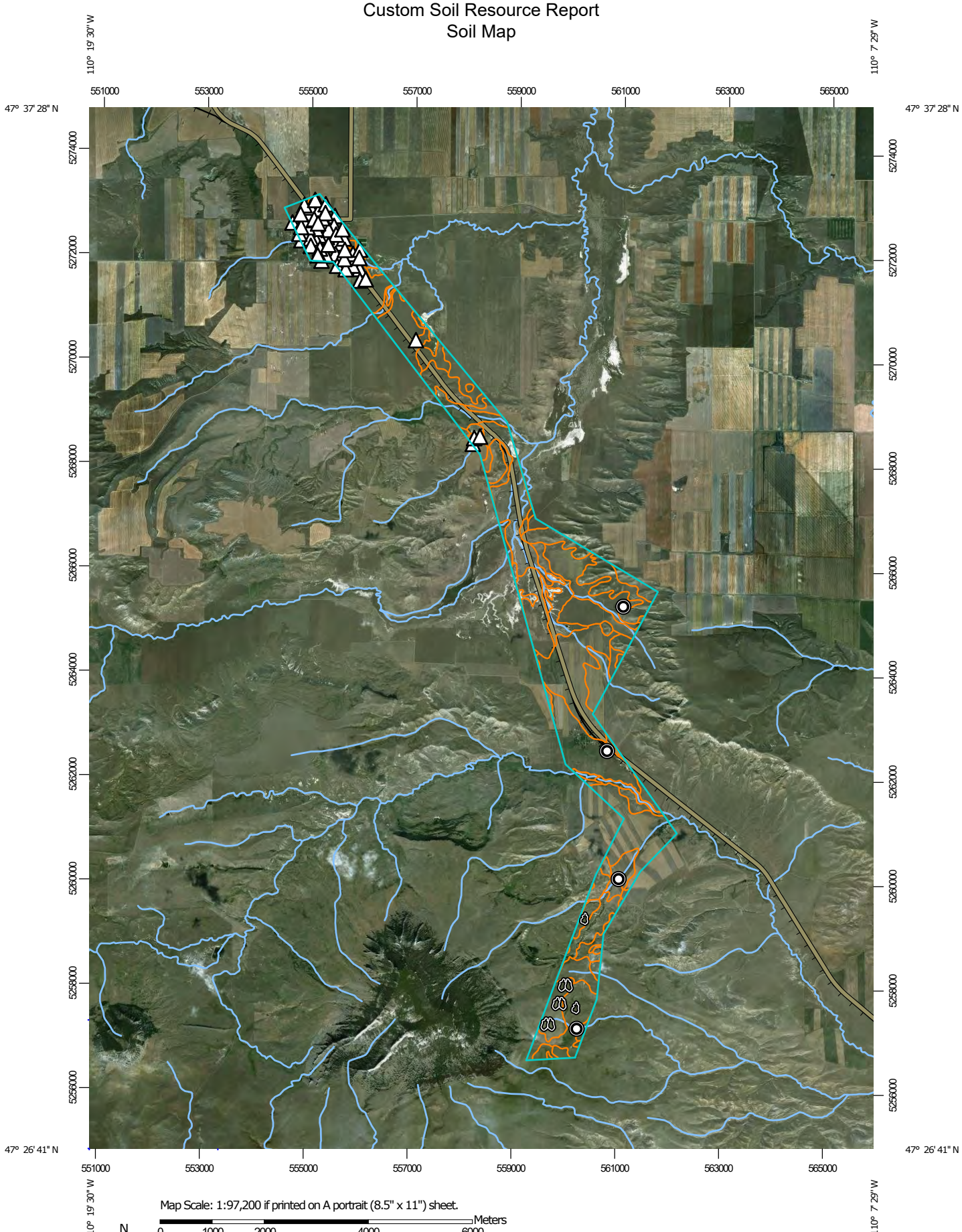
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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 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: Chouteau County Area, Montana
Survey Area Data: Version 18, Sep 2, 2021

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

Date(s) aerial images were photographed: Aug 28, 2014—Nov 7, 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
2B	Marcott-Bigsandy complex, 0 to 4 percent slopes	166.9	3.8%
28	Nishon clay loam, 0 to 1 percent slopes	4.5	0.1%
63	Lardell silty clay, 0 to 1 percent slopes	70.6	1.6%
69C	Vida-Zahill clay loams, 2 to 8 percent slopes	10.1	0.2%
75C	Farnuf loam, 4 to 8 percent slopes	6.0	0.1%
82B	Savage silty clay loam, 0 to 4 percent slopes	201.5	4.6%
96B	Macar loam, 0 to 4 percent slopes	444.2	10.1%
96C	Macar loam, 4 to 8 percent slopes	36.4	0.8%
301C	Marvan-Vanda clays, 2 to 8 percent slopes	160.5	3.7%
303A	Flatcreek-Nobe silty clays, 0 to 2 percent slopes	307.7	7.0%
323B	Sagedale silty clay loam, 0 to 4 percent slopes	355.2	8.1%
323C	Sagedale silty clay loam, 4 to 8 percent slopes	301.3	6.9%
324B	Marcott silty clay loam, 0 to 3 percent slopes	297.7	6.8%
411D	Farnuf-Reeder loams, 4 to 15 percent slopes	21.2	0.5%
411E	Reeder-Farnuf loams, 8 to 25 percent slopes	35.8	0.8%
481A	Bigsag silty clay, 0 to 2 percent slopes	179.7	4.1%
493A	Enbar-Straw-Eagleton loams, 0 to 2 percent slopes	11.4	0.3%
511C	Martinsdale loam, 2 to 8 percent slopes	31.1	0.7%
512C	Martinsdale stony loam, 4 to 15 percent slopes	71.8	1.6%
621E	Sagedale-Wayden silty clay loams, 8 to 25 percent slopes	43.6	1.0%
621F	Wayden-Sagedale silty clay loams, 25 to 60 percent slopes	279.3	6.4%
671B	Bearpaw-Vida clay loams, 0 to 4 percent slopes	549.0	12.5%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
671C	Bearpaw-Vida clay loams, 2 to 8 percent slopes	49.6	1.1%
674B	Bearpaw-Waltham complex, 0 to 4 percent slopes	1.8	0.0%
701E	Work-Absarokee clay loams, 8 to 25 percent slopes	4.0	0.1%
721E	Zahill-Vida clay loams, 8 to 25 percent slopes	17.7	0.4%
722F	Zahill-Sagedale-Wayden complex, 15 to 45 percent slopes	105.2	2.4%
745F	Shambo-Amor-Cabba loams, 15 to 45 percent slopes	176.7	4.0%
911F	Belain-Whitlash-Hedoes complex, 15 to 45 percent slopes	104.1	2.4%
943C	Tally fine sandy loam, 2 to 8 percent slopes	97.0	2.2%
943E	Tally-Vebar fine sandy loams, 8 to 25 percent slopes	36.6	0.8%
943F	Tally-Cohagen fine sandy loams, 25 to 60 percent slopes	3.9	0.1%
965F	Cabba-Macar loams, 15 to 60 percent slopes	195.5	4.5%
M-W	Miscellaneous water	5.2	0.1%
Totals for Area of Interest		**4,383.2**	**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.

Chouteau County Area, Montana

2B—Marcott-Bigsandy complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cmqp
Elevation: 2,900 to 3,400 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Marcott and similar soils: 50 percent
Bigsandy and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marcott

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: silty clay loam
Bw - 4 to 15 inches: silty clay
Bk - 15 to 30 inches: silty clay
Bkg - 30 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 4 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: D
Ecological site: R046XC597MT - Saline Lowland (SL) RRU 46-C 15-19" p.z.
Hydric soil rating: No

Description of Bigsandy

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: loam
C - 3 to 11 inches: stratified fine sandy loam to silty clay loam
Cg1 - 11 to 32 inches: stratified fine sandy loam to silty clay loam
Cg2 - 32 to 60 inches: stratified fine sand to clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: R046XN262MT - Wet Meadow (WM) RRU 46-N 15-19" p.z.
Hydric soil rating: Yes

Minor Components

Gravelly substratums

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

Poorly drained, sandy soils

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Savage

Percent of map unit: 3 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Shambo

Percent of map unit: 2 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

28—Nishon clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2vyqt
Elevation: 2,000 to 4,590 feet
Mean annual precipitation: 10 to 17 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 90 to 140 days
Farmland classification: Prime farmland if drained

Map Unit Composition

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

Description of Nishon

Setting

Landform: Closed depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium

Typical profile

Ap - 0 to 6 inches: clay loam
Btg - 6 to 16 inches: clay
Bt - 16 to 28 inches: clay
Bk - 28 to 41 inches: clay
C - 41 to 79 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 14 percent

Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R052XY071MT - Recharge Closed Depression (Cdr)
Hydric soil rating: Yes

Minor Components

Ethridge

Percent of map unit: 5 percent
Landform: Closed depressions
Landform position (three-dimensional): Rise
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R052XY062MT - Swale (Se) Dry Grassland, R052XY730MT - Swale (Se) Dry Shrubland
Hydric soil rating: No

Dimmick

Percent of map unit: 3 percent
Landform: Closed depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R052XY071MT - Recharge Closed Depression (Cdr)
Hydric soil rating: Yes

Gerdrum

Percent of map unit: 2 percent
Landform: Closed depressions
Landform position (three-dimensional): Rise
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R052XY165MT - Thin Claypan (Tcp) Dry Grassland, R052XY731MT - Thin Claypan (Tcp) Dry Shrubland
Hydric soil rating: No

63—Lardell silty clay, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: cmy5
Elevation: 2,500 to 3,600 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 125 days

Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Lardell

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

Az - 0 to 4 inches: silty clay
Bz - 4 to 38 inches: silty clay
BCz - 38 to 60 inches: stratified fine sandy loam to silty clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Strongly saline (16.0 to 50.0 mmhos/cm)
Sodium adsorption ratio, maximum: 80.0
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): 7s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R052XN170MT - Saline Upland (SU) 10-14" p.z.
Hydric soil rating: Yes

Minor Components

Bigsag

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R052XN171MT - Saline Overflow (SOv) 10-14" p.z.
Hydric soil rating: Yes

Poorly drained, ponded soils

Percent of map unit: 3 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Slightly saline soils

Percent of map unit: 2 percent
Ecological site: R052XN162MT - Clayey (Cy) 10-14" p.z.
Hydric soil rating: No

69C—Vida-Zahill clay loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cmz3
Elevation: 3,000 to 3,800 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 100 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Vida and similar soils: 50 percent
Zahill and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vida

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 5 inches: clay loam
Bt - 5 to 9 inches: clay loam
Bk - 9 to 37 inches: clay loam
BCy - 37 to 60 inches: 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Zahill

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: clay loam
Bk - 3 to 18 inches: clay loam
C - 18 to 60 inches: 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Bearpaw

Percent of map unit: 10 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Very gravelly surface layers

Percent of map unit: 2 percent
Hydric soil rating: No

Williams

Percent of map unit: 2 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.

Hydric soil rating: No

Very gravelly sandy loam soils

Percent of map unit: 1 percent
Hydric soil rating: No

75C—Farnuf loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cmzr
Elevation: 3,000 to 4,800 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Farnuf

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: loam
Bt - 6 to 18 inches: clay loam
Bk1 - 18 to 46 inches: loam
Bk2 - 46 to 60 inches: loam

Properties and qualities

Slope: 4 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: 15 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Savage
Percent of map unit: 7 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Calcareous surface layers
Percent of map unit: 5 percent
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Sandy loam substratums
Percent of map unit: 3 percent
Hydric soil rating: No

82B—Savage silty clay loam, 0 to 4 percent slopes

Map Unit Setting
National map unit symbol: cn0t
Elevation: 3,000 to 4,000 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: All areas are prime farmland

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

Description of Savage

Setting
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile
A - 0 to 6 inches: silty clay loam
Bt - 6 to 16 inches: silty clay loam
Bk - 16 to 30 inches: silty clay loam
BCk - 30 to 60 inches: silty clay loam

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 low to moderately high (0.06 to 0.20 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 very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Minor Components

Savage

Percent of map unit: 3 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Calcareous surface layers

Percent of map unit: 3 percent
Ecological site: R052XN162MT - Clayey (Cy) 10-14" p.z.
Hydric soil rating: No

Farnuf

Percent of map unit: 3 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Slopes of 4 to 8 percent

Percent of map unit: 2 percent
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Saline and sodic soils

Percent of map unit: 2 percent
Hydric soil rating: No

Acel

Percent of map unit: 2 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R052XN162MT - Clayey (Cy) 10-14" p.z.
Hydric soil rating: No

96B—Macar loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cn2n
Elevation: 3,000 to 4,000 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 120 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Macar

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: loam
Bw - 6 to 15 inches: clay loam
Bk1 - 15 to 45 inches: clay loam
Bk2 - 45 to 60 inches: stratified sandy clay loam to silt loam

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: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Macar, calcareous
Percent of map unit: 8 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Sagedale
Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Tally
Percent of map unit: 2 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

96C—Macar loam, 4 to 8 percent slopes

Map Unit Setting
National map unit symbol: cn2p
Elevation: 3,000 to 4,000 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 120 days
Farmland classification: Farmland of statewide importance

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

Description of Macar

Setting
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile
A - 0 to 6 inches: loam

Bw - 6 to 15 inches: clay loam
Bk1 - 15 to 45 inches: clay loam
Bk2 - 45 to 60 inches: stratified sandy clay loam to silt loam

Properties and qualities

Slope: 4 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: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Macar, calcareous

Percent of map unit: 8 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Sagedale

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Tally

Percent of map unit: 2 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

301C—Marvan-Vanda clays, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cmqs
Elevation: 2,500 to 4,000 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Marvan and similar soils: 50 percent
Vanda and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marvan

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: clay
Bss - 3 to 18 inches: silty clay
Bssy - 18 to 46 inches: silty clay
Bnyz - 46 to 60 inches: silty clay

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): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 38.0
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: R052XN162MT - Clayey (Cy) 10-14" p.z.
Hydric soil rating: No

Description of Vanda

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

E - 0 to 1 inches: clay
Bw - 1 to 6 inches: clay
Bnyz - 6 to 60 inches: clay

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): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R052XN172MT - Dense Clay (DC) 10-14" p.z.
Hydric soil rating: No

Minor Components

Benz

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R052XN170MT - Saline Upland (SU) 10-14" p.z.
Hydric soil rating: No

Slightly saline soils

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

Bascovy

Percent of map unit: 3 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R052XN162MT - Clayey (Cy) 10-14" p.z.
Hydric soil rating: No

Clay loam till substratums
Percent of map unit: 2 percent
Hydric soil rating: No

303A—Flatcreek-Nobe silty clays, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: cmqw
Elevation: 3,000 to 3,300 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition
Flatcreek and similar soils: 60 percent
Nobe and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Flatcreek

Setting
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile
A - 0 to 3 inches: silty clay
By - 3 to 11 inches: silty clay
Byz - 11 to 20 inches: silty clay
BCyz - 20 to 60 inches: stratified silty clay to clay

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): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 42 to 60 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: D
Ecological site: R052XN170MT - Saline Upland (SU) 10-14" p.z.
Hydric soil rating: No

Description of Nobe

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

E - 0 to 2 inches: silty clay
Byz - 2 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 6 percent
Maximum salinity: Strongly saline (16.0 to 30.0 mmhos/cm)
Sodium adsorption ratio, maximum: 70.0
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R052XN171MT - Saline Overflow (SOv) 10-14" p.z.
Hydric soil rating: No

Minor Components

Bigsag

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R052XN171MT - Saline Overflow (SOv) 10-14" p.z.
Hydric soil rating: Yes

Sagedale

Percent of map unit: 3 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Macar

Percent of map unit: 2 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

323B—Sagedale silty clay loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cmrg
Elevation: 3,000 to 3,600 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Sagedale

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: silty clay loam
Bw - 4 to 15 inches: silty clay
Bk - 15 to 30 inches: silty clay
BCky - 30 to 60 inches: silty clay

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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 7 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 3.9 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Minor Components

Sagedale

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Macar

Percent of map unit: 3 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Calcareous surface layers

Percent of map unit: 3 percent
Ecological site: R052XN162MT - Clayey (Cy) 10-14" p.z.
Hydric soil rating: No

Moderately saline/sodic soils

Percent of map unit: 2 percent
Hydric soil rating: No

Sandy or gravelly substratums

Percent of map unit: 2 percent
Hydric soil rating: No

323C—Sagedale silty clay loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cmrh
Elevation: 3,000 to 3,600 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Sagedale and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sagedale

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: silty clay loam
Bw - 4 to 15 inches: silty clay
Bk - 15 to 30 inches: silty clay
BCky - 30 to 60 inches: silty clay

Properties and qualities

Slope: 4 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 7 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 3.9 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Minor Components

Macar

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Calcareous surface layers

Percent of map unit: 5 percent
Ecological site: R052XN162MT - Clayey (Cy) 10-14" p.z.
Hydric soil rating: No

Sandy or gravelly substratums

Percent of map unit: 3 percent
Hydric soil rating: No

Moderately saline/sodic soils

Percent of map unit: 2 percent
Hydric soil rating: No

324B—Marcott silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: cmrj
Elevation: 3,000 to 4,000 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Marcott

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: silty clay loam
Bw - 4 to 15 inches: silty clay
Bk - 15 to 30 inches: silty clay
Bkg - 30 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: R046XC512MT - Subirrigated (Sb) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Strongly saline soils
Percent of map unit: 5 percent
Ecological site: R052XN170MT - Saline Upland (SU) 10-14" p.z.
Hydric soil rating: No

Klayent
Percent of map unit: 3 percent
Landform: Channels
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC512MT - Subirrigated (Sb) RRU 46-C 13-19" p.z.
Hydric soil rating: Yes

Soils with loamy profiles
Percent of map unit: 3 percent
Hydric soil rating: No

Areas that rarely flood
Percent of map unit: 2 percent
Ecological site: R046XC512MT - Subirrigated (Sb) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Stratified loam to sand soils
Percent of map unit: 2 percent
Hydric soil rating: No

411D—Farnuf-Reeder loams, 4 to 15 percent slopes

Map Unit Setting
National map unit symbol: cmty
Elevation: 3,200 to 4,800 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition
Farnuf and similar soils: 50 percent
Reeder and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Farnuf

Setting
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: loam
Bt - 6 to 18 inches: clay loam
Bk1 - 18 to 46 inches: loam
Bk2 - 46 to 60 inches: loam

Properties and qualities

Slope: 4 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: 15 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Reeder

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: loam
Bt - 7 to 12 inches: clay loam
Bk - 12 to 34 inches: clay loam
Cr - 34 to 60 inches: weathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
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: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Cabba
Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Vebar
Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Rock outcrop
Percent of map unit: 2 percent
Hydric soil rating: No

Tally
Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Cohagen
Percent of map unit: 1 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Whitlash
Percent of map unit: 1 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

411E—Reeder-Farnuf loams, 8 to 25 percent slopes

Map Unit Setting
National map unit symbol: cmtz

Elevation: 3,200 to 4,800 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Reeder and similar soils: 50 percent
Farnuf and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Reeder

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: loam
Bt - 7 to 12 inches: clay loam
Bk - 12 to 34 inches: clay loam
Cr - 34 to 60 inches: weathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
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: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Farnuf

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: loam
Bt - 6 to 18 inches: clay loam
Bk1 - 18 to 46 inches: loam
Bk2 - 46 to 60 inches: 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): 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: 15 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Vebar

Percent of map unit: 3 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Cabba

Percent of map unit: 3 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Stony surface layers

Percent of map unit: 3 percent
Ecological site: R044BC471MT - Silty (Si) 15-19" p.z.
Hydric soil rating: No

Tally

Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

Whitlash

Percent of map unit: 2 percent
Landform: Hills

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

481A—Bigsag silty clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cmvx
Elevation: 2,600 to 3,600 feet
Mean annual precipitation: 11 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Bigsag

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

Anyz - 0 to 4 inches: silty clay
Bnyzg1 - 4 to 15 inches: silty clay
Bnyzg2 - 15 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Strongly saline (16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 40.0
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: D
Ecological site: R052XN171MT - Saline Overflow (SOv) 10-14" p.z.
Hydric soil rating: Yes

Minor Components

Somewhat poorly drained soils
Percent of map unit: 5 percent
Hydric soil rating: No

Very poorly drained soils
Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Moderately saline soils
Percent of map unit: 2 percent
Hydric soil rating: No

493A—Enbar-Straw-Eagleton loams, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: cmw2
Elevation: 3,100 to 4,600 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition
Enbar and similar soils: 35 percent
Straw and similar soils: 30 percent
Eagleton and similar soils: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Enbar

Setting
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile
A - 0 to 18 inches: loam
C - 18 to 30 inches: stratified silt loam to clay loam
Cg - 30 to 52 inches: stratified sandy loam to silty clay loam
2C - 52 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: Somewhat poorly 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: About 30 to 60 inches
Frequency of flooding: OccasionalNone
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 supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B
Ecological site: R046XC512MT - Subirrigated (Sb) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Straw

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 8 inches: loam
Bk - 8 to 56 inches: loam
2C - 56 to 60 inches: stratified loam to 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
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Eagleton

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A1 - 0 to 6 inches: loam
A2 - 6 to 38 inches: stratified sandy loam to clay loam
Cg - 38 to 60 inches: stratified sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly 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: About 12 to 24 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R046XC512MT - Subirrigated (Sb) RRU 46-C 13-19" p.z.
Hydric soil rating: Yes

Minor Components

Nesda

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC507MT - Shallow to Gravel (SwGr) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Very gravelly loam soils

Percent of map unit: 3 percent
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Soils with sandy loam profiles

Percent of map unit: 3 percent
Hydric soil rating: No

Slopes more than 2 percent

Percent of map unit: 2 percent
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Very gravelly sandy loam soils

Percent of map unit: 2 percent
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

511C—Martinsdale loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cmwg
Elevation: 3,300 to 4,200 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 120 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Martinsdale

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: loam
Bt - 4 to 18 inches: clay loam
Bk - 18 to 40 inches: clay loam
BCk - 40 to 60 inches: gravelly 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: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Turner

Percent of map unit: 10 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Tally

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

512C—Martinsdale stony loam, 4 to 15 percent slopes

Map Unit Setting

National map unit symbol: cmwj
Elevation: 3,600 to 4,800 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Martinsdale

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 8 inches: stony loam
Bt - 8 to 20 inches: clay loam
Bk - 20 to 42 inches: clay loam
BCk - 42 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 4 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): 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: 35 percent
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Slopes more than 15 percent

Percent of map unit: 5 percent
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Very stony surface layers

Percent of map unit: 4 percent
Hydric soil rating: No

Turner

Percent of map unit: 3 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Very cobbly soils

Percent of map unit: 2 percent
Hydric soil rating: No

Bouldery surface layers

Percent of map unit: 1 percent
Hydric soil rating: No

621E—Sagedale-Wayden silty clay loams, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: cmy2
Elevation: 3,300 to 4,000 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Sagedale and similar soils: 50 percent
Wayden and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sagedale

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: silty clay loam
Bw - 4 to 15 inches: silty clay
Bk - 15 to 30 inches: silty clay
BCky - 30 to 60 inches: silty clay

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 7 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 3.9 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Description of Wayden

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: silty clay loam
Bky - 3 to 18 inches: silty clay loam
Cr - 18 to 60 inches: weathered bedrock

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Gypsum, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R046XC598MT - Shallow Clay (SwC) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Macar

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC516MT - Silty Steep (SiStp) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Cabba

Percent of map unit: 4 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Very gravelly soils

Percent of map unit: 3 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

Poorly drained soils (slumps)

Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC512MT - Subirrigated (Sb) RRU 46-C 13-19" p.z.
Hydric soil rating: Yes

621F—Wayden-Sagedale silty clay loams, 25 to 60 percent slopes

Map Unit Setting

National map unit symbol: cmy3
Elevation: 3,300 to 4,000 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Wayden and similar soils: 50 percent
Sagedale and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wayden

Setting

Landform: Escarpments
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: silty clay loam
Bky - 3 to 18 inches: silty clay loam
Cr - 18 to 60 inches: weathered bedrock

Properties and qualities

Slope: 25 to 60 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Gypsum, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R046XC598MT - Shallow Clay (SwC) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Sagedale

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: silty clay loam
Bw - 4 to 15 inches: silty clay
Bk - 15 to 30 inches: silty clay
BCky - 30 to 60 inches: silty clay

Properties and qualities

Slope: 25 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 7 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 3.9 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Minor Components

Cabba

Percent of map unit: 5 percent
Landform: Escarpments
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Macar

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC516MT - Silty Steep (SiStp) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Rock outcrop

Percent of map unit: 3 percent
Hydric soil rating: No

Stony surface layers
Percent of map unit: 1 percent
Hydric soil rating: No

Bouldery surface layers
Percent of map unit: 1 percent
Hydric soil rating: No

671B—Bearpaw-Vida clay loams, 0 to 4 percent slopes

Map Unit Setting
National map unit symbol: 2vyqr
Elevation: 2,430 to 4,590 feet
Mean annual precipitation: 13 to 17 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 90 to 130 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Bearpaw and similar soils: 50 percent
Vida and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bearpaw

Setting
Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey till

Typical profile
Ap - 0 to 6 inches: clay loam
Bt1 - 6 to 12 inches: clay
Bt2 - 12 to 16 inches: clay loam
Btk - 16 to 22 inches: clay loam
Bk - 22 to 44 inches: clay loam
BCyz - 44 to 65 inches: clay loam
Cz - 65 to 79 inches: clay loam

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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 14 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R052XY740MT - Loamy (Lo) Moist Grassland
Hydric soil rating: No

Description of Vida

Setting

Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 9 inches: clay loam
Bk1 - 9 to 23 inches: clay loam
Bk2 - 23 to 41 inches: clay loam
BCyz - 41 to 57 inches: clay loam
Cz - 57 to 79 inches: clay loam

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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 14 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R052XY740MT - Loamy (Lo) Moist Grassland
Hydric soil rating: No

Minor Components

Zahill

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R052XY738MT - Limy (Ly) Moist Grassland
Hydric soil rating: No

Waltham

Percent of map unit: 3 percent
Landform: Ground moraines
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R052XY755MT - Thin Claypan (Tcp) Moist Grassland
Hydric soil rating: No

Zeeland

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R052XY754MT - Swale (Se) Moist Grassland
Hydric soil rating: No

Gerber

Percent of map unit: 3 percent
Landform: Ground moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R052XY754MT - Swale (Se) Moist Grassland
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Ground moraines
Microfeatures of landform position: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R052XN166MT - Overflow (Ov) 10-14" p.z., R052XY071MT - Recharge Closed Depression (Cdr)
Hydric soil rating: Yes

671C—Bearpaw-Vida clay loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2vyqs
Elevation: 2,430 to 4,590 feet
Mean annual precipitation: 13 to 17 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 90 to 130 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Bearpaw and similar soils: 45 percent
Vida and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bearpaw

Setting

Landform: Moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt1 - 6 to 12 inches: clay
Bt2 - 12 to 16 inches: clay loam
Btk - 16 to 22 inches: clay loam
Bk - 22 to 44 inches: clay loam
BCyz - 44 to 65 inches: clay loam
Cz - 65 to 79 inches: 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 14 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0

Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R052XY740MT - Loamy (Lo) Moist Grassland
Hydric soil rating: No

Description of Vida

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 9 inches: clay loam
Bk1 - 9 to 23 inches: clay loam
Bk2 - 23 to 41 inches: clay loam
BCyz - 41 to 57 inches: clay loam
Cz - 57 to 79 inches: 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 14 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R052XY740MT - Loamy (Lo) Moist Grassland
Hydric soil rating: No

Minor Components

Zahill

Percent of map unit: 6 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex

Across-slope shape: Linear
Ecological site: R052XY738MT - Limy (Ly) Moist Grassland
Hydric soil rating: No

Zeeland

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R052XY754MT - Swale (Se) Moist Grassland
Hydric soil rating: No

Waltham

Percent of map unit: 3 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R052XY755MT - Thin Claypan (Tcp) Moist Grassland
Hydric soil rating: No

Gerber

Percent of map unit: 2 percent
Landform: Moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R052XY754MT - Swale (Se) Moist Grassland
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Moraines
Microfeatures of landform position: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R052XN166MT - Overflow (Ov) 10-14" p.z., R052XY071MT - Recharge Closed Depression (Cdr)
Hydric soil rating: Yes

674B—Bearpaw-Waltham complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2vyqp
Elevation: 2,430 to 4,590 feet
Mean annual precipitation: 13 to 17 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 90 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Bearpaw and similar soils: 50 percent
Waltham and similar soils: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bearpaw

Setting

Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt1 - 6 to 12 inches: clay
Bt2 - 12 to 16 inches: clay loam
Btk - 16 to 22 inches: clay loam
Bk - 22 to 44 inches: clay loam
BCyz - 44 to 65 inches: clay loam
Cz - 65 to 79 inches: clay loam

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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 14 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R052XY740MT - Loamy (Lo) Moist Grassland
Hydric soil rating: No

Description of Waltham

Setting

Landform: Ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

E - 0 to 3 inches: loam
Btn - 3 to 6 inches: clay
Btkn - 6 to 10 inches: clay loam
Bknz - 10 to 28 inches: clay loam
BCyz - 28 to 43 inches: clay loam
Cz - 43 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: 2 to 4 inches to natric
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Very low (about 0.5 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R052XY755MT - Thin Claypan (Tcp) Moist Grassland
Hydric soil rating: No

Minor Components

Vida

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R052XY740MT - Loamy (Lo) Moist Grassland
Hydric soil rating: No

Absher, high precipitation

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R052XN172MT - Dense Clay (DC) 10-14" p.z., R052XY145MT - Panspot (Pn) Dry Grassland, R052XY716MT - Panspot (Pn) Dry Shrubland
Hydric soil rating: No

Noonan

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave

Across-slope shape: Linear
Ecological site: R052XY735MT - Claypan (Cp) Moist Grassland
Hydric soil rating: No

Zahill

Percent of map unit: 2 percent
Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R052XY738MT - Limy (Ly) Moist Grassland
Hydric soil rating: No

Gerber

Percent of map unit: 2 percent
Landform: Ground moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R052XY754MT - Swale (Se) Moist Grassland
Hydric soil rating: No

Auchard

Percent of map unit: 2 percent
Landform: Ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R052XY755MT - Thin Claypan (Tcp) Moist Grassland
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Ground moraines
Microfeatures of landform position: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R052XY071MT - Recharge Closed Depression (Cdr)
Hydric soil rating: Yes

701E—Work-Absarokee clay loams, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: cmz4
Elevation: 3,500 to 5,000 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Work and similar soils: 50 percent
Absarokee and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Work

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: clay loam
Bt - 6 to 22 inches: clay
Bk - 22 to 48 inches: clay loam
BCk - 48 to 60 inches: clay 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): 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
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Absarokee

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: clay loam
Bt - 7 to 18 inches: clay loam
Bk - 18 to 34 inches: clay loam
Cr - 34 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
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
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Cabba

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Stony surface layers

Percent of map unit: 5 percent
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Whitlash

Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Perma

Percent of map unit: 2 percent
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC599MT - Thin Breaks (TB) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No

721E—Zahill-Vida clay loams, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2vyt6
Elevation: 2,430 to 4,590 feet
Mean annual precipitation: 13 to 17 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 90 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Zahill and similar soils: 45 percent
Vida and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Zahill

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

A - 0 to 3 inches: clay loam
Bk1 - 3 to 14 inches: clay loam
Bk2 - 14 to 29 inches: clay loam
BCyz - 29 to 41 inches: clay loam
Cz - 41 to 79 inches: clay loam

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 12 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R052XY739MT - Limy-Steep (Lystp) Moist Grassland
Hydric soil rating: No

Description of Vida

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 9 inches: clay loam
Bk1 - 9 to 23 inches: clay loam
Bk2 - 23 to 41 inches: clay loam
BCyz - 41 to 57 inches: clay loam
Cz - 57 to 79 inches: clay loam

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 14 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R052XY741MT - Loamy-Steep (Lostp) Moist Grassland
Hydric soil rating: No

Minor Components

Zahill, gravelly surface

Percent of map unit: 6 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Linear

Ecological site: R052XY738MT - Limy (Ly) Moist Grassland
Hydric soil rating: No

Bearpaw

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R052XY740MT - Loamy (Lo) Moist Grassland
Hydric soil rating: No

Zeeland

Percent of map unit: 2 percent
Landform: Hillslopes
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R052XY754MT - Swale (Se) Moist Grassland
Hydric soil rating: No

Wayden

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Nose slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R052XY749MT - Shallow Clay (Swc) Moist Grassland
Hydric soil rating: No

Cabba

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Nose slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R052XY751MT - Thin Breaks (TB) Moist Grassland
Hydric soil rating: No

722F—Zahill-Sagedale-Wayden complex, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: cmz9
Elevation: 3,100 to 3,600 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 125 days

Farmland classification: Not prime farmland

Map Unit Composition

Zahill and similar soils: 40 percent
Sagedale and similar soils: 25 percent
Wayden and similar soils: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Zahill

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: clay loam
Bk - 3 to 18 inches: clay loam
C - 18 to 60 inches: clay loam

Properties and qualities

Slope: 15 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R046XC516MT - Silty Steep (SiStp) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Sagedale

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: silty clay loam
Bw - 4 to 15 inches: silty clay
Bk - 15 to 30 inches: silty clay
BCky - 30 to 60 inches: silty clay

Properties and qualities

Slope: 15 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 low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 7 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 3.9 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Description of Wayden

Setting

Landform: Escarpments
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: silty clay loam
Bky - 3 to 18 inches: silty clay loam
Cr - 18 to 60 inches: weathered bedrock

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Gypsum, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R046XC598MT - Shallow Clay (SwC) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Tally

Percent of map unit: 8 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.

Hydric soil rating: No

Moderately deep, clayey soils
Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop
Percent of map unit: 2 percent
Hydric soil rating: No

745F—Shambo-Amor-Cabba loams, 15 to 45 percent slopes

Map Unit Setting
National map unit symbol: cmzh
Elevation: 3,300 to 5,000 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition
Shambo and similar soils: 35 percent
Amor and similar soils: 30 percent
Cabba and similar soils: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shambo

Setting
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile
A - 0 to 6 inches: loam
Bw - 6 to 15 inches: loam
Bk - 15 to 42 inches: loam
BCk - 42 to 60 inches: loam

Properties and qualities
Slope: 15 to 35 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: 20 percent
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R046XC599MT - Thin Breaks (TB) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Amor

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 5 inches: loam
Bw - 5 to 14 inches: loam
Bk - 14 to 34 inches: loam
Cr - 34 to 60 inches: weathered bedrock

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
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: 10 percent
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R046XC599MT - Thin Breaks (TB) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Cabba

Setting

Landform: Escarpments
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: loam
Bk - 3 to 15 inches: loam
Cr - 15 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
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: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Tally

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

Absarokee

Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Cohagen

Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Whitlash

Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Stony surface layers

Percent of map unit: 2 percent
Hydric soil rating: No

911F—Belain-Whitlash-Hedoes complex, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: cn1t
Elevation: 3,200 to 5,600 feet
Mean annual precipitation: 15 to 22 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Belain and similar soils: 45 percent
Whitlash and similar soils: 25 percent
Hedoes and similar soils: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Belain

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: loam
Bw - 6 to 18 inches: loam
Bk - 18 to 26 inches: gravelly sandy loam
R - 26 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
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: 10 percent
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R046XC599MT - Thin Breaks (TB) RRU 46-C 13-19" p.z.

Hydric soil rating: No

Description of Whitlash

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: channery loam
Bw - 6 to 15 inches: extremely channery loam
R - 15 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
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
Available water supply, 0 to 60 inches: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Hedoes

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 5 inches: loam
Bw1 - 5 to 20 inches: loam
Bw2 - 20 to 31 inches: sandy loam
Bk - 31 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 15 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: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R046XC599MT - Thin Breaks (TB) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Perma

Percent of map unit: 5 percent
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC599MT - Thin Breaks (TB) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Rock outcrop

Percent of map unit: 3 percent
Hydric soil rating: No

Slopes more than 45 percent

Percent of map unit: 2 percent
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

943C—Tally fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cn25
Elevation: 3,100 to 4,000 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Tally

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 5 inches: fine sandy loam
Bw - 5 to 24 inches: fine sandy loam
Bk - 24 to 60 inches: fine 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 (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: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Very deep sandy soils

Percent of map unit: 5 percent
Ecological site: R052XN175MT - Sands (Sa) 10-14" p.z.
Hydric soil rating: No

Slopes less than 2 percent

Percent of map unit: 5 percent
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Shambo

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC508MT - Silty (Si) RRU 46-C 13-19" p.z.
Hydric soil rating: No

943E—Tally-Vebar fine sandy loams, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: cn26
Elevation: 3,100 to 4,000 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Tally and similar soils: 50 percent
Vebar and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tally

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 5 inches: fine sandy loam
Bw - 5 to 24 inches: fine sandy loam
Bk - 24 to 60 inches: fine sandy loam

Properties and qualities

Slope: 8 to 25 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: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Vebar

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: fine sandy loam
Bw - 7 to 12 inches: fine sandy loam
BCk - 12 to 31 inches: fine sandy loam
Cr - 31 to 60 inches: weathered bedrock

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
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: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Cohagen

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Cabba

Percent of map unit: 3 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Slopes more than 25 percent

Percent of map unit: 3 percent
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Macar

Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC516MT - Silty Steep (SiStp) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

943F—Tally-Cohagen fine sandy loams, 25 to 60 percent slopes

Map Unit Setting

National map unit symbol: cn27
Elevation: 3,100 to 3,600 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Tally and similar soils: 45 percent
Cohagen and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tally

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 5 inches: fine sandy loam
Bw - 5 to 24 inches: fine sandy loam
Bk - 24 to 60 inches: fine sandy loam

Properties and qualities

Slope: 25 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): 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: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Cohagen

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: fine sandy loam
C - 4 to 15 inches: sandy loam
Cr - 15 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 60 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
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: 5 percent
Available water supply, 0 to 60 inches: Very low (about 1.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Vebar

Percent of map unit: 4 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Amor

Percent of map unit: 3 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC599MT - Thin Breaks (TB) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Rock outcrop

Percent of map unit: 3 percent
Hydric soil rating: No

Whitlash

Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Cabba

Percent of map unit: 2 percent
Landform: Escarpments
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Tinsley

Percent of map unit: 1 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R052XN592MT - Gravel (Gr) 10-14" p.z.
Hydric soil rating: No

965F—Cabba-Macar loams, 15 to 60 percent slopes

Map Unit Setting

National map unit symbol: cn2l
Elevation: 3,100 to 4,800 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Cabba and similar soils: 45 percent
Macar and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cabba

Setting

Landform: Escarpments
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: loam
Bk - 3 to 15 inches: loam
Cr - 15 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 60 percent

Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
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: 15 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Description of Macar

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: loam
Bw - 6 to 15 inches: clay loam
Bk1 - 15 to 45 inches: clay loam
Bk2 - 45 to 60 inches: stratified sandy clay loam to silt loam

Properties and qualities

Slope: 15 to 35 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: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R046XC516MT - Silty Steep (SiStp) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 3 percent
Hydric soil rating: No

Vebar

Percent of map unit: 3 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC505MT - Sandy (Sy) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Sagedale

Percent of map unit: 3 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XN247MT - Clayey (Cy) RRU 46-N 13-19" p.z.
Hydric soil rating: No

Wayden

Percent of map unit: 3 percent
Landform: Escarpments
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC598MT - Shallow Clay (SwC) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Cohagen

Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

Whitlash

Percent of map unit: 1 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R046XC506MT - Shallow (Sw) RRU 46-C 13-19" p.z.
Hydric soil rating: No

M-W—Miscellaneous water

Map Unit Composition

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

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APPENDIX E

Species of Concern

Montana Natural Heritage - SOC Report

Plant Species of Concern

Species List Last Updated **02/19/2021**

1 Species of Concern
Filtered by the following criteria:
Township = 020N012E (based on mapped Species Occurrences)

MONTANA Natural Heritage Program
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Introduction

Species of Concern

Species of Concern
1 Species
Filtered by the following criteria:
Township = 020N012E (based on mapped **Species Occurrences**)

FLOWERING PLANTS - DICOTS (MAGNOLIOPSIDA) — 1 SPECIES
TOWNSHIP = 020N012E (based on mapped **Species Occurrences**)

SCIENTIFIC NAME COMMON NAME TAXA SORT	OTHER NAMES	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	MNPS THREAT CATEGORY	HABITAT
Triodanis leptocarpa Slim-pod Venus'-looking-glass	Specularia leptocarpa	Campanulaceae Bellflower Family	G5?	S3				3	
			Species Occurrences verified in these Counties: Big Horn, Carter, Cascade, Chouteau, Custer, Park, Petroleum, Phillips, Powder River, Rosebud, Stillwater, Sweet Grass, Valley **State Rank Reason:** Triodanis leptocarpa is common in the southern Great Plains and extends into eastern and central Montana. It occurs in grasslands, grass-dominated rocky slopes, and sagebrush-dominated grasslands. It has been found in grazed and ungrazed lands and appears to tolerate some disturbance. Approximately 14 locations were documented prior to 1958 and occur in central Montana. Approximately 14 locations were documented since 1974 and mostly occur in eastern Montana. Re-visits to known locations and current population data is greatly needed.					

Potential Species of Concern

Special Status Species

Additions To Statewide List

Species Removed From Statewide List

Citation for data on this website:
Montana Plant Species of Concern Report. Montana Natural Heritage Program. Retrieved on 12/27/2021, from mtnhp.org/SpeciesOfConcern/?AorP=p

Montana Natural Heritage - SOC Report

Species List Last Updated **02/19/2021**

Plant Species of Concern

0 Species
Filtered by the following criteria:
Township = 021N011E (based on mapped Species Occurrences)

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- Introduction
- Species of Concern

Species of Concern

0 Species
Filtered by the following criteria:
Township = 021N011E (based on mapped **Species Occurrences**)

- Potential Species of Concern
- Special Status Species
- Additions To Statewide List
- Species Removed From Statewide List

Citation for data on this website:
Montana Plant Species of Concern Report. Montana Natural Heritage Program. Retrieved on 12/27/2021, from mtnhp.org/SpeciesOfConcern/?AorP=p

Montana Natural Heritage - SOC Report

Species List Last Updated **02/19/2021**

Plant Species of Concern

0 Species
Filtered by the following criteria:
Township = 021N012E (based on mapped Species Occurrences)

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- Introduction
- Species of Concern

Species of Concern

0 Species
Filtered by the following criteria:
Township = 021N012E (based on mapped **Species Occurrences**)

- Potential Species of Concern
- Special Status Species
- Additions To Statewide List
- Species Removed From Statewide List

Citation for data on this website:
Montana Plant Species of Concern Report. Montana Natural Heritage Program. Retrieved on 12/27/2021, from mtnhp.org/SpeciesOfConcern/?AorP=p

Montana Natural Heritage - SOC Report

Animal Species of Concern

Species List Last Updated **02/19/2021**

2 Species of Concern
Filtered by the following criteria:
Township = 020N012E (based on mapped Species Occurrences)

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Introduction

Species of Concern

Species of Concern
2 Species
Filtered by the following criteria:
Township = 020N012E (based on mapped **Species Occurrences**)

BIRDS (AVES) — 2 SPECIES — TOWNSHIP = 020N012E (based on mapped **Species Occurrences**)

SCIENTIFIC NAME / COMMON NAME / TAXA SORT	FAMILY (SCIENTIFIC) / FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Centrocercus urophasianus Greater Sage-Grouse	Phasianidae Upland Game Birds	G3G4	S2		Sensitive - Known on Forests (BD) Sensitive - Suspected on Forests (CG)	SENSITIVE	SGCN2	17%	75%	Sagebrush
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Gallatin, Garfield, Golden Valley, Hill, Madison, Mccone, Meagher, Musselshell, Park, Petroleum, Phillips, Powder River, Prairie, Rosebud, Silver Bow, Stillwater, Sweet Grass, Treasure, Valley, Wheatland, Wibaux, Yellowstone									
Lanius ludovicianus Loggerhead Shrike	Laniidae Shrikes	G4	S3B	MBTA		SENSITIVE	SGCN3	4%	100%	Shrubland
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Jefferson, Liberty, Madison, Mccone, Meagher, Musselshell, Petroleum, Phillips, Pondera, Powder River, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Valley, Wheatland, Wibaux, Yellowstone									

Potential Species of Concern

Special Status Species

Additions To Statewide List

Species Removed From Statewide List

Species of Greatest Inventory Need

Citation for data on this website:
Montana Animal Species of Concern Report. Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. Retrieved on 12/27/2021, from mtnhp.org/SpeciesOfConcern/?AorP=a

Montana Natural Heritage - SOC Report Species List Last Updated **02/19/2021**

Animal Species of Concern

7 Species of Concern
Filtered by the following criteria:
Township = 021N011E (based on mapped Species Occurrences)

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Introduction

Species of Concern

Species of Concern
7 Species
Filtered by the following criteria:
Township = 021N011E (based on mapped **Species Occurrences**)

MAMMALS (MAMMALIA) — 1 SPECIES
TOWNSHIP = 021N011E (based on mapped **Species Occurrences**)

SCIENTIFIC NAME / COMMON NAME / TAXA SORT	FAMILY (SCIENTIFIC) / FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Cynomys ludovicianus Black-tailed Prairie Dog	Sciuridae Squirrels	G4	S3		Sensitive - Known on Forests (CG)	SENSITIVE	SGCN3	15%	71%	Grasslands
	Species Occurrences verified in these Counties: Big Horn, Blaine, Carbon, Carter, Cascade, Chouteau, Custer, Fallon, Fergus, Garfield, Golden Valley, Hill, Jefferson, Judith Basin, Lewis and Clark, Liberty, Mccone, Musselshell, Petroleum, Phillips, Powder River, Prairie, Richland, Rosebud, Stillwater, Sweet Grass, Toole, Treasure, Valley, Wheatland, Yellowstone **State Rank Reason:** Across much of eastern Montana this species occurs in areas with suitable soil and topography. However sylvatic plague has caused the species to decline and has affected colony size and dynamics. Ongoing threats from disease and persecution due to perceived competition with grazing make long-term status of this species uncertain.									

BIRDS (AVES) — 5 SPECIES
TOWNSHIP = 021N011E (based on mapped **Species Occurrences**)

SCIENTIFIC NAME / COMMON NAME / TAXA SORT	FAMILY (SCIENTIFIC) / FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Athene cunicularia Burrowing Owl	Strigidae Owls	G4	S3B	MBTA; BCC17	Sensitive - Known on Forests (CG)	SENSITIVE	SGCN3	2%	82%	Grasslands
	Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawson, Fallon, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Jefferson, Lewis and Clark, Liberty, Madison, Mccone, Musselshell, Petroleum, Phillips, Pondera, Powder River, Prairie, Ravalli, Roosevelt, Rosebud, Sheridan, Stillwater, Teton, Toole, Treasure, Valley, Wheatland, Yellowstone **State Rank Reason:** Species has a negative short-term population trend.									
Calcarius ornatus Chestnut-collared Longspur	Calcariidae Longspurs and Snow Buntings	G5	S2B	MBTA; BCC11; BCC17		SENSITIVE	SGCN2	32%	67%	Grasslands
	Species Occurrences verified in these Counties: Big Horn, Blaine, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Garfield, Glacier, Golden Valley, Hill, Judith Basin, Lewis and Clark, Liberty, Mccone, Musselshell, Petroleum, Phillips, Powder River, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Valley, Wheatland, Wibaux, Yellowstone **State Rank Reason:** Species has a negative short-term population trend and faces threats from loss of native prairie grassland habitats and altered frequency, intensity, and spatial distribution of grazing and fire regimes it is dependent on.									
Dolichonyx oryzivorus Bobolink	Icteridae Blackbirds	G5	S3B	MBTA; BCC10; BCC11; BCC17			SGCN3	9%	100%	Moist grasslands
	Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Mccone, Meagher, Missoula, Musselshell, Park, Petroleum, Phillips, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Valley, Wheatland, Wibaux, Yellowstone **State Rank Reason:** Species has undergone recent large population declines in Montana and a patchwork of declines and increases have been documented in surrounding states and provinces.									
Lanius ludovicianus	Laniidae	G4	S3B	MBTA		SENSITIVE	SGCN3	4%	100%	Shrubland

Loggerhead Shrike	Shrikes	**Species Occurrences verified in these Counties:** Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Jefferson, Liberty, Madison, Mccone, Meagher, Musselshell, Petroleum, Phillips, Pondera, Powder River, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Valley, Wheatland, Wibaux, Yellowstone								
Numenius americanus Long-billed Curlew	Scolopacidae Sandpipers	G5	S3B	MBTA; BCC11		SENSITIVE	SGCN3	19%	100%	Grasslands
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Madison, Mccone, Meagher, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone								

REPTILES (REPTILIA)

1 SPECIES

TOWNSHIP = 021N011E (based on mapped **Species Occurrences**)

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Phrynosoma hernandesi Greater Short-horned Lizard	Phrynosomatidae Sagebush / Spiny Lizards	G5	S3		Sensitive - Known on Forests (CG)	SENSITIVE	SGCN3, SGIN	19%	66%	Sandy / gravelly soils
		Species Occurrences verified in these Counties: Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawson, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Lewis and Clark, Liberty, Mccone, Musselshell, Petroleum, Phillips, Pondera, Powder River, Prairie, Richland, Roosevelt, Rosebud, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone								

Potential Species of Concern

Special Status Species

Additions To Statewide List

Species Removed From Statewide List

Species of Greatest Inventory Need

Citation for data on this website:
Montana Animal Species of Concern Report. Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. Retrieved on 12/27/2021, from mtnhp.org/SpeciesOfConcern/?AorP=a

Montana Natural Heritage - SOC Report Species List Last Updated **02/19/2021**

Animal Species of Concern

5 Species of Concern
Filtered by the following criteria:
Township = 021N012E (based on mapped Species Occurrences)

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Introduction

Species of Concern

Species of Concern
5 Species
Filtered by the following criteria:
Township = 021N012E (based on mapped **Species Occurrences**)

MAMMALS (MAMMALIA)

1 SPECIES
TOWNSHIP = 021N012E (based on mapped **Species Occurrences**)

SCIENTIFIC NAME / COMMON NAME / TAXA SORT	FAMILY (SCIENTIFIC) / FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Cynomys ludovicianus Black-tailed Prairie Dog	Sciuridae Squirrels	G4	S3		Sensitive - Known on Forests (CG)	SENSITIVE	SGCN3	15%	71%	Grasslands
		Species Occurrences verified in these Counties: Big Horn, Blaine, Carbon, Carter, Cascade, Chouteau, Custer, Fallon, Fergus, Garfield, Golden Valley, Hill, Jefferson, Judith Basin, Lewis and Clark, Liberty, Mccone, Musselshell, Petroleum, Phillips, Powder River, Prairie, Richland, Rosebud, Stillwater, Sweet Grass, Toole, Treasure, Valley, Wheatland, Yellowstone **State Rank Reason:** Across much of eastern Montana this species occurs in areas with suitable soil and topography. However sylvatic plague has caused the species to decline and has affected colony size and dynamics. Ongoing threats from disease and persecution due to perceived competition with grazing make long-term status of this species uncertain.							

BIRDS (AVES)

4 SPECIES
TOWNSHIP = 021N012E (based on mapped **Species Occurrences**)

SCIENTIFIC NAME / COMMON NAME / TAXA SORT	FAMILY (SCIENTIFIC) / FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	FWP SWAP	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Calcarius ornatus Chestnut-collared Longspur	Calcariidae Longspurs and Snow Buntings	G5	S2B	MBTA; BCC11; BCC17		SENSITIVE	SGCN2	32%	67%	Grasslands
		Species Occurrences verified in these Counties: Big Horn, Blaine, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Garfield, Glacier, Golden Valley, Hill, Judith Basin, Lewis and Clark, Liberty, Mccone, Musselshell, Petroleum, Phillips, Powder River, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Valley, Wheatland, Wibaux, Yellowstone **State Rank Reason:** Species has a negative short-term population trend and faces threats from loss of native prairie grassland habitats and altered frequency, intensity, and spatial distribution of grazing and fire regimes it is dependent on.							
Centrocercus urophasianus Greater Sage-Grouse	Phasianidae Upland Game Birds	G3G4	S2		Sensitive - Known on Forests (BD) Sensitive - Suspected on Forests (CG)	SENSITIVE	SGCN2	17%	75%	Sagebrush
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Gallatin, Garfield, Golden Valley, Hill, Madison, Mccone, Meagher, Musselshell, Park, Petroleum, Phillips, Powder River, Prairie, Rosebud, Silver Bow, Stillwater, Sweet Grass, Treasure, Valley, Wheatland, Wibaux, Yellowstone							
Lanius ludovicianus Loggerhead Shrike	Laniidae Shrikes	G4	S3B	MBTA		SENSITIVE	SGCN3	4%	100%	Shrubland
		Species Occurrences verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Jefferson, Liberty, Madison, Mccone, Meagher, Musselshell, Petroleum, Phillips, Pondera, Powder River, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Valley, Wheatland, Wibaux, Yellowstone							
Numenius americanus	Scolopacidae	G5	S3B	MBTA; BCC11		SENSITIVE	SGCN3	19%	100%	Grasslands

Long-billed Curlew	Sandpipers	**Species Occurrences verified in these Counties:** Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Madison, Mccone, Meagher, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone

Potential Species of Concern

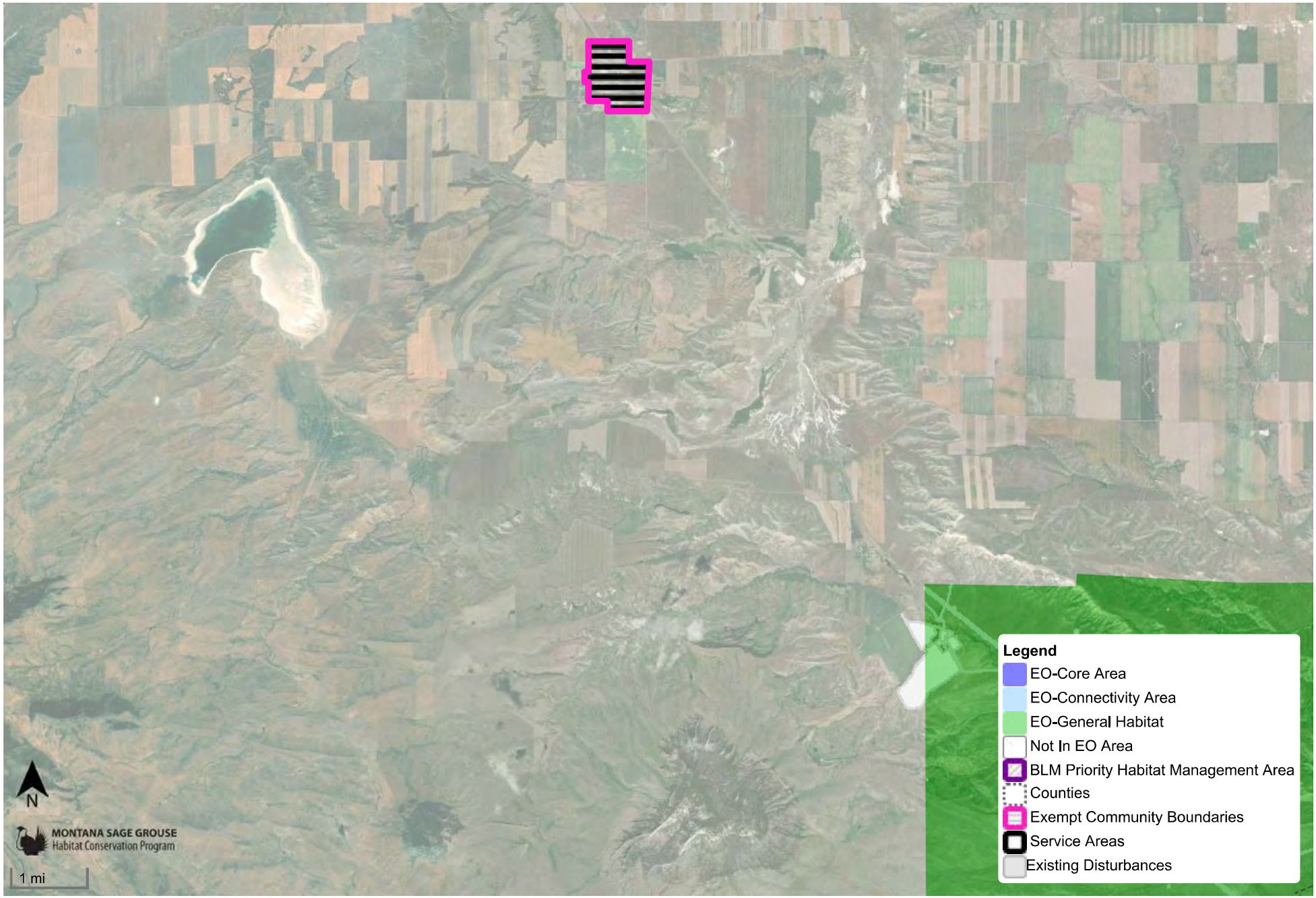
Special Status Species

Additions To Statewide List

Species Removed From Statewide List

Species of Greatest Inventory Need

Citation for data on this website:
Montana Animal Species of Concern Report. Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. Retrieved on 12/27/2021, from mtnhp.org/SpeciesOfConcern/?AorP=a


Legend
EO-Core Area
EO-Connectivity Area
EO-General Habitat
Not In EO Area
BLM Priority Habitat Management Area
Counties
Exempt Community Boundaries
Service Areas
Existing Disturbances
N
MONTANA SAGE GROUSE
Habitat Conservation Program
1 mi

APPENDIX F

Groundwater Information

Ground Water Information Center | MBMG Data Center
Montana Bureau of Mines and Geology
Montana Technological University
1300 West Park Street - Natural Resources Building Room 329
Butte Montana 59701-8997
Ph: (406) 496-4336 Fx: (406) 496-4343

GWIC Data > Well Construction Data > Township: 20N Range: 12E Sec: 3, 10, 11, 15, 21, 22, 28, 27

The following data were returned from the GWIC databases for the area you requested. For a more detailed description of the data view the GWIC Metadata report. If you notice data entry errors or have questions please let us know by sending us an Email at **GWIC@mtech.edu**. If you wish to view a one page report for a particular site, click the hyperlinked **Gwic Id** for that well. Scroll to the right of your screen to view all the data. All data displayed on the screen may not show up when printed.

Retrieval Statistics*

Field	Max	Min	Avg
Total Depth (ft)	2,730.00	1,072.00	1,901.00
Static Water Level (ft)	-404.25	-404.25	-404.25
Yield (gpm)	4.00	1.30	2.65

* These statistics do not take any geographic, topographic, or geologic factors into consideration. Negative swl values are reported for water levels that are above land surface.

Did you know about...

Other GWIC data

GWIC has 6 water quality sample(s) for this area.
GWIC has 6 field visit(s) for this request area.

Thanks, Just take me back to the menu.

Other MBMG data

MBMG has 423 publications available for CHOUTEAU county.
MBMG has 0 abandoned mine record(s) for this request area.

Gwic Id	PDF	DNRC WR	Site Name	Twn	Rng	Sec	Q Sec	Ver?	Type	Td	Swl	Pwl	Rwl	Yield	Test	Date	Use
33687			STRAND DEAN	20N	12E	10	BB	No	WELL	2,730.00	-404.25			4.00	OTHER	7/3/1978	STOCKWATER
900676			D. STRAND 13-10	20N	12E	10	CC	No	PETWELL								
2457		30037386	SCHMIDT LLOYD	20N	12E	10	CCCA	Yes	WELL	1,072.00		100.00		1.30	OTHER	7/2/1969	STOCKWATER
897623			D. STRAND IN E 15X-22	20N	12E	22	DCAC	No	PETWELL								
2459			BUTTE CREEK SPRING * SQUARE BUTTE	20N	12E	27	BBAA	Yes	SPRING								
2463			BUTTE CREEK SPRING * SQUARE BUTTE	20N	12E	27	BBAC	Yes	SPRING								
2461			BUTTE CREEK SPRING - NORTH * SQUARE BUTTE	20N	12E	27	BBAC	Yes	SPRING								

End of Report.
7 record(s) listed.

Items of Note:
[1]This report is restricted to site types of **WELL, BOREHOLE, SPRING, COAL BED METHANE WELL, PETWELL, PIEZOMETER.**
[2]A single well record (a distinct GWIC Id) may be represented by more than one line in this report if more than one performance test was conducted on the well at the time of drilling.

Explanation of Columns:
GWIC Id = Key field for the GWIC database. Links to one page reports.
PDF = Are scanned documents available through the Document Manager?

- = Yes, click on the icon to download the PDF file.

- = No, well was submitted electronically. No paper record exists.
- = No, record does have a known well log but it is not scanned yet.
- = No, record may or may not have a document to scan. Metadata is unclear.
- = No, record was created from a source other than a well log. No paper record exists.

DNRC WR = Water right number assigned to this site by Department of Natural Resources and Conservation.
Site Name = Current owner name assigned to GWIC record.
Location = Location of site in Montana township, range, section, and quarter-section coordinates.
Ver? = Has this location been verified by field staff?
Type = Type of site assigned to GWIC record.
Td = **T**otal **d**epth of well in feet below ground.
Swl = **S**tatic **w**ater **l**evel in feet above/below ground - Negative values are reported for water levels that are above land surface.
Pwl = **P**umping **w**ater **l**evel in feet below ground.
Rwl = **R**ecovery **w**ater **l**evel in feet below ground.
Yield = Yield in gallons per minute.
Test = Type of performance test reported.
Date = Completion date of well/borehole.
Use = Reported use of water.

Ground Water Information Center | MBMG Data Center
Montana Bureau of Mines and Geology
Montana Technological University
1300 West Park Street - Natural Resources Building Room 329
Butte Montana 59701-8997
Ph: (406) 496-4336 Fx: (406) 496-4343

GWIC Data > Well Construction Data > Township: 21N Range: 11E Sec: 1, 12

The following data were returned from the GWIC databases for the area you requested. For a more detailed description of the data view the GWIC Metadata report. If you notice data entry errors or have questions please let us know by sending us an Email at **GWIC@mtech.edu**. If you wish to view a one page report for a particular site, click the hyperlinked **Gwic Id** for that well. Scroll to the right of your screen to view all the data. All data displayed on the screen may not show up when printed.

Retrieval Statistics*

Field	Max	Min	Avg
Total Depth (ft)	1,965.00	8.00	150.50
Static Water Level (ft)	1,200.00	-323.40	17.89
Yield (gpm)	65.00	5.00	37.53

* These statistics do not take any geographic, topographic, or geologic factors into consideration. Negative swl values are reported for water levels that are above land surface.

Did you know about...

Other GWIC data

GWIC has 16 water quality sample(s) for this area.
GWIC has 18 field visit(s) for this request area.
GWIC has 88 water level(s) for this request area.

Thanks, Just take me back to the menu.

Other MBMG data

MBMG has 423 publications available for CHOUTEAU county.
MBMG has 0 abandoned mine record(s) for this request area.

Gwic Id	PDF	DNRC WR	Site Name	Twn	Rng	Sec	Q Sec	Ver?	Type	Td	Swl	Pwl	Rwl	Yield	Test	Date	Use
250906			GENERAL MILLS, INC. (MW-9)	21N	11E	1		No	WELL	14.00	4.30					4/16/2007	MONITORING
212920			MSCA * JOHN AND ROBERT MOGSTAD	21N	11E	1	AACC	No	WELL	38.00					OTHER	4/23/2003	MONITORING
34682			GERALDINE OBS. M-9	21N	11E	1	ABD	No	WELL	13.00					OTHER	5/7/1985	MONITORING
271943			JOYCE FUEL AND FEEDS * MW-5	21N	11E	1	AC	No	BOREHOLE	12.00						4/24/2013	MONITORING
273506			JOYCE FUEL AND FEEDS*MW-6	21N	11E	1	AC	No	BOREHOLE	12.00						5/20/2013	MONITORING
271946			JOYCE FUEL AND FEEDS*MW-7	21N	11E	1	AC	No	BOREHOLE	12.00						4/24/2013	MONITORING
273507			MSCA *JOYCE FUEL AND FEED/ PERRY JOYCE *SPCH-07 *MW-09	21N	11E	1	AC	No	BOREHOLE	13.00						5/30/2013	MONITORING
212986			MSCA *JOYCE FUEL AND FEED/ PERRY JOYCE *SPCH-07 *MW-09	21N	11E	1	AC	No	WELL	13.00					OTHER	6/11/2003	MONITORING
212988			MSCA *JOYCE FUEL AND FEED/ PERRY JOYCE *SPCH-07 *MW-10	21N	11E	1	AC	No	WELL	13.00					OTHER	6/11/2003	MONITORING
273508			MSCA *JOYCE	21N	11E	1	AC	No	BOREHOLE	13.00						5/30/2013	MONITORING

		FUEL AND FEED/ PERRY JOYCE *SPCH-07 *MW-10													
271948		MSCA *JOYCE FUEL AND FEED/ PERRY JOYCE *SPCH-07 *MW-11	21N	11E	1	AC	No	BOREHOLE	13.00					4/24/2013	MONITORING
212989		MSCA *JOYCE FUEL AND FEED/ PERRY JOYCE *SPCH-07 *MW-11	21N	11E	1	AC	No	WELL	13.00				OTHER	6/11/2003	MONITORING
34683		TOWN OF GERALDINE	21N	11E	1	ACA	No	WELL	1,400.00	1,200.00		35.00	OTHER	5/1/1931	PUBLIC WATER SUPPLY
34684		TOWN OF GERALDINE	21N	11E	1	ACB	No	WELL	300.00			60.00	OTHER	5/1/1963	PUBLIC WATER SUPPLY
34685		STOOS JOHN	21N	11E	1	BBC	No	WELL	30.00			5.00	OTHER	1/1/1948	DOMESTIC
34686		GERALDINE OBS. S-1	21N	11E	1	BBCB	No	WELL	48.00				OTHER	12/9/1982	MONITORING
34687		TOWN OF GERALDINE	21N	11E	1	BC	No	WELL	350.00			60.00	PUMP	6/1/1940	PUBLIC WATER SUPPLY
34688		GERALDINE OBS. G-5	21N	11E	1	BCAD	No	WELL	45.00				OTHER	11/7/1974	MONITORING
191203		MSCA*CH-59-G3	21N	11E	1	BCBB	No	WELL	38.00				OTHER	8/23/2001	
250902		GENERAL MILLS, INC. (MW-5)	21N	11E	1	CA	No	WELL	14.00	2.60				4/16/2007	MONITORING
185509		JOYCE FUEL AND FEEDS * MW-6	21N	11E	1	CA	No	WELL	12.20				OTHER	9/26/2000	MONITORING
185503		JOYCE FUEL AND FEEDS * MW-5	21N	11E	1	CA	No	WELL	17.50				OTHER	9/26/2000	MONITORING
212991		JOYCE FUEL AND FEEDS *MW-1	21N	11E	1	CA	No	WELL	25.00	7.20			OTHER	6/2/2003	MONITORING
212993		JOYCE FUEL AND FEEDS *MW-2	21N	11E	1	CA	No	WELL	15.00	4.90			OTHER	6/2/2003	MONITORING
212995		JOYCE FUEL AND FEEDS *MW-4	21N	11E	1	CA	No	WELL	20.00	5.31			OTHER	6/2/2003	MONITORING
185507		JOYCE FUEL AND FEEDS*MW-7	21N	11E	1	CA	No	WELL	12.10				OTHER	9/27/2000	MONITORING
185511		JOYCE FUEL AND FEEDS*MW-8	21N	11E	1	CA	No	WELL	22.80	10.00			OTHER		MONITORING
245494		MSCA * CHOUTEAU COUNTY SHOP - GERALDINE * WELL #6	21N	11E	1	CAAA	No	WELL	23.00					7/8/2008	MONITORING
245495		MSCA * CHOUTEAU COUNTY SHOP -	21N	11E	1	CAAA	No	WELL	20.00					7/8/2008	MONITORING

			GERALDINE * WELL #7												
245496			MSCA * CHOUTEAU COUNTY SHOP - GERALDINE * WELL #8	21N	11E	1	CAAA	No	WELL	23.00				7/8/2008	MONITORING
245493			MSCA * CHOUTEAU COUNTY SHOP- GERALDINE * WELL #5	21N	11E	1	CAAA	No	WELL	23.00				7/8/2008	MONITORING
211121			MSCA *CHOUTEAU COUNTY SHOP- GERALDINE *SPCH-09 *WELL 1	21N	11E	1	CAAA	No	WELL	18.00			OTHER	5/26/2004	MONITORING
2546			CITY WELL #4* WEST OF G-2 GERALDINE MT	21N	11E	1	CBDC	Yes	WELL			9.40	OTHER		PUBLIC WATER SUPPLY
2547			CITY OF GERALDINE * WELL #2	21N	11E	1	CBDD	Yes	WELL	1,908.00	-277.10	10.90	OTHER	4/10/1959	PUBLIC WATER SUPPLY
2552			TOWN OF GERALDINE - WINCHELL SPRING	21N	11E	1	CCAB	Yes	SPRING						PUBLIC WATER SUPPLY
34690			GERALDINE OBS. G-2	21N	11E	1	CDBB	No	WELL	40.00			OTHER	11/6/1974	MONITORING
34691			GERALDINE OBS. G-3	21N	11E	1	CDCC	No	WELL	45.00			OTHER	11/6/1974	MONITORING
34692			GERALDINE OBS. P-1	21N	11E	1	DAA	No	WELL	68.00			OTHER		MONITORING
34693			GERALDINE OBS. 8-84	21N	11E	1	DACD	No	WELL	58.00			OTHER	10/11/1984	MONITORING
235557			GENERAL MILLS, INC.	21N	11E	1	DB	No	WELL	8.00	5.00			9/29/2006	MONITORING
235555			GENERAL MILLS, INC.	21N	11E	1	DB	No	WELL	14.50	5.00			9/28/2006	MONITORING
235554			GENERAL MILLS, INC.	21N	11E	1	DB	No	WELL	10.40	5.00			9/28/2006	MONITORING
235556			GENERAL MILLS, INC.	21N	11E	1	DB	No	BOREHOLE	14.00	5.00			9/29/2006	MONITORING
250903			GENERAL MILLS, INC. (MW-6)	21N	11E	1	DB	No	WELL	14.00	3.50			4/16/2007	MONITORING
250904			GENERAL MILLS, INC. (MW-7)	21N	11E	1	DB	No	WELL	14.00	9.80			4/16/2007	MONITORING
250905			GENERAL MILLS, INC. (MW-8)	21N	11E	1	DB	No	WELL	14.00	3.40			4/16/2007	MONITORING
2553		30046811	CITY OF GERALDINE * WELL #1	21N	11E	1	DBDA	Yes	WELL	1,877.00	-277.10	27.50	OTHER	3/24/1959	PUBLIC WATER SUPPLY
2554			MBMG RESEARCH WELL * AT GERALDINE MT.	21N	11E	1	DBDD	Yes	WELL	70.00	2.50		OTHER	11/5/1974	RESEARCH
298582			SPENCER, DAVE * MW3	21N	11E	1	DC	No	WELL	20.00	7.52			10/10/2017	MONITORING
298583			SPENCER, DAVE * MW4	21N	11E	1	DC	No	WELL	20.00	6.65			10/10/2017	MONITORING
298585			SPENCER, DAVE * MW5	21N	11E	1	DC	No	WELL	20.00	4.49			10/10/2017	MONITORING
2556			CITY OF GERALDINE * WELL #3	21N	11E	1	DCCC	Yes	WELL	1,965.00	-323.40	65.00	OTHER	1/1/1960	PUBLIC WATER SUPPLY

34697		GERALDINE OBS. 7-84	21N	11E	1	DCCC	No	WELL	48.00			OTHER	10/9/1984	MONITORING
190822		MSCA *BOBS EXXON SPCH-05-02	21N	11E	1	DD	No	WELL	13.00			OTHER	4/10/2001	MONITORING
190820		MSCA *SPCH-05-01	21N	11E	1	DD	No	WELL	18.00			OTHER	4/10/2001	MONITORING
897680		TOWNSITE #1	21N	11E	1	DD	No	PETWELL						
34726		GERALDINE OBS. 11-84	21N	11E	12	AAAC	No	WELL	28.00			OTHER	10/10/1984	MONITORING
34727		GERALDINE OBS. G-4	21N	11E	12	AAAD	No	WELL	25.00			OTHER	11/7/1974	MONITORING
2560		TOWN OF GERALDINE AIRPORT WELL NO. 11	21N	11E	12	AACA	Yes	WELL	28.00	4.63		OTHER		RESEARCH
34728		GERALDINE OBS. 10-84	21N	11E	12	ABAC	No	WELL	43.00			OTHER	10/10/1984	MONITORING
2561		AIRPORT WELL NO. 10 * GERALDINE MT	21N	11E	12	ABCA	Yes	WELL	43.00	5.11		OTHER		RESEARCH
34729		GERALDINE OBS. 4-84	21N	11E	12	BAAB	No	WELL	33.00			OTHER	8/8/1984	MONITORING
2562		AIRPORT WELL NO. 9 * GERALDINE MT	21N	11E	12	BADA	Yes	WELL	43.00	5.14	65.00	OTHER		RESEARCH
34730		GERALDINE OBS. 9-84	21N	11E	12	BADA	No	WELL	43.00			OTHER	10/10/1984	MONITORING

End of Report.
64 record(s) listed.

Items of Note:

[1]This report is restricted to site types of **WELL, BOREHOLE, SPRING, COAL BED METHANE WELL, PETWELL, PIEZOMETER**.

[2]A single well record (a distinct GWIC Id) may be represented by more than one line in this report if more than one performance test was conducted on the well at the time of drilling.

Explanation of Columns:

GWIC Id = Key field for the GWIC database. Links to one page reports.
PDF = Are scanned documents available through the Document Manager?

- = Yes, click on the icon to download the PDF file.
- = No, well was submitted electronically. No paper record exists.
- = No, record does have a known well log but it is not scanned yet.
- = No, record may or may not have a document to scan. Metadata is unclear.
- = No, record was created from a source other than a well log. No paper record exists.

DNRC WR = Water right number assigned to this site by Department of Natural Resources and Conservation.
Site Name = Current owner name assigned to GWIC record.
Location = Location of site in Montana township, range, section, and quarter-section coordinates.
Ver? = Has this location been verified by field staff?
Type = Type of site assigned to GWIC record.
Td = **T**otal **d**epth of well in feet below ground.
Swl = **S**tatic **w**ater **l**evel in feet above/below ground - Negative values are reported for water levels that are above land surface.
Pwl = **P**umping **w**ater **l**evel in feet below ground.
Rwl = **R**ecovery **w**ater **l**evel in feet below ground.
Yield = Yield in gallons per minute.
Test = Type of performance test reported.
Date = Completion date of well/borehole.
Use = Reported use of water.

Disclaimer:

The preceding materials represent the contents of the GWIC databases at the Montana Bureau of Mines and Geology at the time and date of the retrieval. The information is considered unpublished and is subject to correction and review on a daily basis. The Bureau warrants the accurate transmission of the data to the original end user at the time and date of the retrieval [12/27/2021 9:23:33 AM]. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted. There may be wells in the request area that are not recorded at the Information Center.

Ground Water Information Center | MBMG Data Center
Montana Bureau of Mines and Geology
Montana Technological University
1300 West Park Street - Natural Resources Building Room 329
Butte Montana 59701-8997
Ph: (406) 496-4336 Fx: (406) 496-4343

GWIC Data > Well Construction Data > Township: 21N Range: 12E Sec: 6, 7, 18, 17, 20, 21, 29, 28, 27, 26, 33, 34, 35

The following data were returned from the GWIC databases for the area you requested. For a more detailed description of the data view the GWIC Metadata report. If you notice data entry errors or have questions please let us know by sending us an Email at **GWIC@mtech.edu**. If you wish to view a one page report for a particular site, click the hyperlinked **Gwic Id** for that well. Scroll to the right of your screen to view all the data. All data displayed on the screen may not show up when printed.

Retrieval Statistics*

Field	Max	Min	Avg
Total Depth (ft)	2,629.00	8.00	114.70
Static Water Level (ft)	65.00	2.00	20.65
Yield (gpm)	350.00	0.30	53.54

* These statistics do not take any geographic, topographic, or geologic factors into consideration. Negative swl values are reported for water levels that are above land surface.

Did you know about...

Other GWIC data

GWIC has 9 water quality sample(s) for this area.
GWIC has 10 field visit(s) for this request area.

Thanks, Just take me back to the menu.

Other MBMG data

MBMG has 423 publications available for CHOUTEAU county.
MBMG has 0 abandoned mine record(s) for this request area.

Gwic Id	PDF	DNRC WR	Site Name	Twn	Rng	Sec	Q Sec	Ver?	Type	Td	Swl	Pwl	Rwl	Yield	Test	Date	Use
34755			GERALDINE OBS. JK-4	21N	12E	6	AADB	No	WELL	73.00					OTHER	4/24/1984	MONITORING
2587			GOLDHAHN LYNN * WELL GO-21 * GERALDINE	21N	12E	6	ACCC	Yes	WELL	54.50	9.30				OTHER		RESEARCH
34756			GERALDINE OBS. GO-22	21N	12E	6	ADDD	No	WELL	53.00					OTHER	9/27/1983	MONITORING
34757			GERALDINE OBS. JK-5	21N	12E	6	BBBB	No	WELL	53.00					OTHER	4/25/1984	MONITORING
2588			KNEDLER JIM * WELL JK-5 * GERALDINE MT	21N	12E	6	BBBC	Yes	WELL	53.00	13.34				OTHER		RESEARCH
34758			GERALDINE OBS. GO-19	21N	12E	6	BDCC	No	WELL	49.00					OTHER	6/23/1983	MONITORING
34759			GERALDINE OBS. GO-21	21N	12E	6	BDDD	No	WELL	54.50					OTHER	6/27/1983	MONITORING
171974			MT SALINITY CONTROL ASSOC * CH-46 #4	21N	12E	6	CBAA	No	WELL	28.00					OTHER	2/2/1999	MONITORING
171973			MT SALINITY CONTROL ASSOC * CH-46 #3	21N	12E	6	CBDC	No	WELL	18.00					OTHER	2/2/1999	MONITORING
34760			GERALDINE OBS. GO-18	21N	12E	6	CDBD	No	WELL	23.00					OTHER	6/23/1983	MONITORING
2589			GOLDHAHN LYNN * WELL GO-18 * GERALDINE	21N	12E	6	CDDB	Yes	WELL	25.00	4.56				OTHER		RESEARCH
34761			GERALDINE OBS. GO-23	21N	12E	6	DADA	No	WELL	28.00					OTHER	12/10/1985	MONITORING
125741			ROSENBERG DONALD AND DOROTHY	21N	12E	7		Yes	WELL	60.00	30.00			10.00	OTHER	1/1/1929	DOMESTIC
2591			GOLDHAHN LYNN * 1 MI EAST OF GERALDINE	21N	12E	7	ABAB	Yes	SPRING								
2592			GOLDHAHN LYNN * HOUSE WELL * GERALDINE	21N	12E	7	ABDC	Yes	WELL	14.00					OTHER	1/1/1914	DOMESTIC

34763		GERALDINE OBS. GO-11	21N	12E	7	ACB	No	WELL	33.00				OTHER	8/4/1981	MONITORING
2594		GOLDHAHN LYNN * GERALDINE	21N	12E	7	ACBB	Yes	WELL	14.00			0.30	OTHER	1/1/1932	STOCKWATER
34765		GERALDINE OBS. GO-16	21N	12E	7	ACCA	No	WELL	23.00				OTHER	9/3/1981	MONITORING
34766		GERALDINE OBS. GO-9	21N	12E	7	ACCA	No	WELL	18.00				OTHER	8/3/1981	MONITORING
34767		GERALDINE OBS. GO-1	21N	12E	7	ACDB	No	WELL	13.00				OTHER	7/29/1981	MONITORING
2595		OBSERVATION WELL GO-17 * GERALDINE	21N	12E	7	BBDD	Yes	WELL	35.00	4.00			OTHER	9/3/1981	MONITORING
34769		GERALDINE OBS. GO-4	21N	12E	7	CCAB	No	WELL	28.00				OTHER	7/30/1981	MONITORING
34770		GERALDINE OBS. GO-2	21N	12E	7	DABC	No	WELL	13.00				OTHER	7/29/1981	MONITORING
34771		GERALDINE OBS. GO-14	21N	12E	7	DBDA	No	WELL	15.00				OTHER	8/4/1981	MONITORING
34772		GERALDINE OBS. GO-15	21N	12E	7	DCA	No	WELL	23.00				OTHER	9/3/1981	MONITORING
34773		GERALDINE OBS. GO-10	21N	12E	7	DCAB	No	WELL	28.00				OTHER	8/3/1981	MONITORING
34774		GERALDINE OBS. GO-20	21N	12E	7	DCCB	No	WELL	28.00				OTHER	6/27/1983	MONITORING
34775		GERALDINE OBS. GO-13	21N	12E	7	DDB	No	WELL	23.00				OTHER	8/4/1981	MONITORING
34776		GERALDINE OBS. GO-12	21N	12E	7	DDCC	No	WELL	13.00				OTHER	8/4/1981	MONITORING
34785		BELL CHARLES H.	21N	12E	17	C	No	WELL	10.00	2.00		50.00	OTHER	5/1/1940	STOCKWATER
171981		MT SALINITY CONTROL ASSOC * CH-50 #7	21N	12E	17	CCDB	No	WELL	18.00				OTHER	2/3/1999	MONITORING
171979		MT SALINITY CONTROL ASSOC * CH-50 #5	21N	12E	17	DCDC	No	WELL	18.00				OTHER	2/3/1999	MONITORING
171980		MT SALINITY CONTROL ASSOC * CH-50 #6	21N	12E	17	DDBB	No	WELL	8.00				OTHER	2/3/1999	MONITORING
171983		MT SALINITY CONTROL ASSOC * CH-50 #3	21N	12E	18	ADCC	No	WELL	28.00				OTHER	2/3/1999	MONITORING
171985		MT SALINITY CONTROL ASSOC * CH-50 #1	21N	12E	18	CBDD	No	WELL	18.00				OTHER	2/3/1999	MONITORING
171984		MT SALINITY CONTROL ASSOC * CH-50 #4	21N	12E	18	DADA	No	WELL	13.00				OTHER	2/3/1999	MONITORING
171982		MT SALINITY CONTROL ASSOC * CH-50 #8	21N	12E	18	DDDB	No	WELL	33.00				OTHER	2/3/1999	MONITORING
191210		MSCA*CH-57-24	21N	12E	20	ACAD	No	WELL	28.00				OTHER	8/21/2001	MONITORING
191211		MSCA*CH-57-25	21N	12E	20	ACCC	No	WELL	43.00				OTHER	8/23/2001	MONITORING
191212		MSCA*CH-57-23	21N	12E	20	BDCA	No	WELL	28.00				OTHER	8/21/2001	MONITORING
191213		MSCA*CH-57-20	21N	12E	20	CABD	No	WELL	35.00				OTHER	8/21/2001	MONITORING
191214		MSCA*CH-57-21	21N	12E	20	CDDB	No	WELL	12.00				OTHER	8/21/2001	MONITORING

191215			MSCA*CH-57-22	21N	12E	20	DBCC	No	WELL	20.00				OTHER	8/21/2001	MONITORING
34787			ELMER DOSTAL & MARY P. DOSTAL	21N	12E	26	AB	No	WELL	97.00			5.00	OTHER		DOMESTIC
163463		104382	DOSTAL PAUL	21N	12E	27	ACA	No	WELL	160.00	37.00	160.00	10.00	AIR	5/15/1997	DOMESTIC
34788			HOBART D. MYRICK AND MABEL J. B. MYRICK	21N	12E	27	ACDB	No	WELL	90.00	65.00		2.00	OTHER	1/1/1916	DOMESTIC
34789		30037384	STRAND DEAN	21N	12E	28	CDAC	No	WELL	1,210.00			1.00	OTHER	4/28/1964	STOCKWATER
231681			TOWN OF GERALDINE	21N	12E	34	BB	No	WELL	2,629.00			350.00	FLOW	11/3/2006	PUBLIC WATER SUPPLY

End of Report.
48 record(s) listed.

Items of Note:

[1]This report is restricted to site types of **WELL, BOREHOLE, SPRING, COAL BED METHANE WELL, PETWELL, PIEZOMETER**.

[2]A single well record (a distinct GWIC Id) may be represented by more than one line in this report if more than one performance test was conducted on the well at the time of drilling.

Explanation of Columns:
GWIC Id = Key field for the GWIC database. Links to one page reports.
PDF = Are scanned documents available through the Document Manager?

- = Yes, click on the icon to download the PDF file.
- = No, well was submitted electronically. No paper record exists.
- = No, record does have a known well log but it is not scanned yet.
- = No, record may or may not have a document to scan. Metadata is unclear.
- = No, record was created from a source other than a well log. No paper record exists.

DNRC WR = Water right number assigned to this site by Department of Natural Resources and Conservation.
Site Name = Current owner name assigned to GWIC record.
Location = Location of site in Montana township, range, section, and quarter-section coordinates.
Ver? = Has this location been verified by field staff?
Type = Type of site assigned to GWIC record.
Td = **T**otal **d**epth of well in feet below ground.
Swl = **S**tatic **w**ater **l**evel in feet above/below ground - Negative values are reported for water levels that are above land surface.
Pwl = **P**umping **w**ater **l**evel in feet below ground.
Rwl = **R**ecovery **w**ater **l**evel in feet below ground.
Yield = Yield in gallons per minute.
Test = Type of performance test reported.
Date = Completion date of well/borehole.
Use = Reported use of water.

Disclaimer:
The preceding materials represent the contents of the GWIC databases at the Montana Bureau of Mines and Geology at the time and date of the retrieval. The information is considered unpublished and is subject to correction and review on a daily basis. The Bureau warrants the accurate transmission of the data to the original end user at the time and date of the retrieval [12/27/2021 9:25:54 AM]. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted. There may be wells in the request area that are not recorded at the Information Center.

APPENDIX G

Wetlands

U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands near Geraldine

December 27, 2021

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

U.S. Fish and Wildlife Service
National Wetlands Inventory

Geraldine Springs

December 27, 2021

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands near Chlorination Station

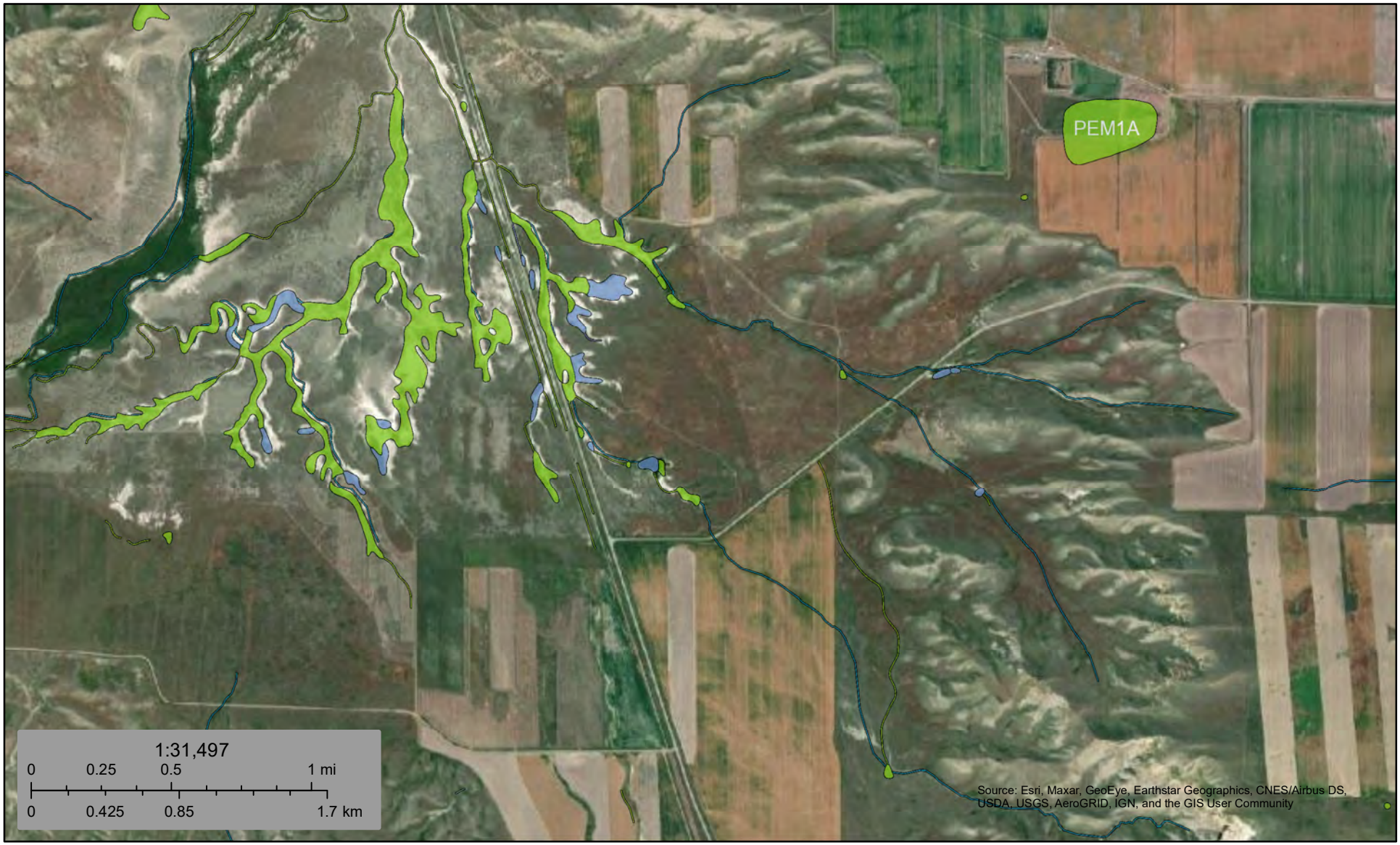
December 27, 2021

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands near PRVs and Storage Tank



December 27, 2021

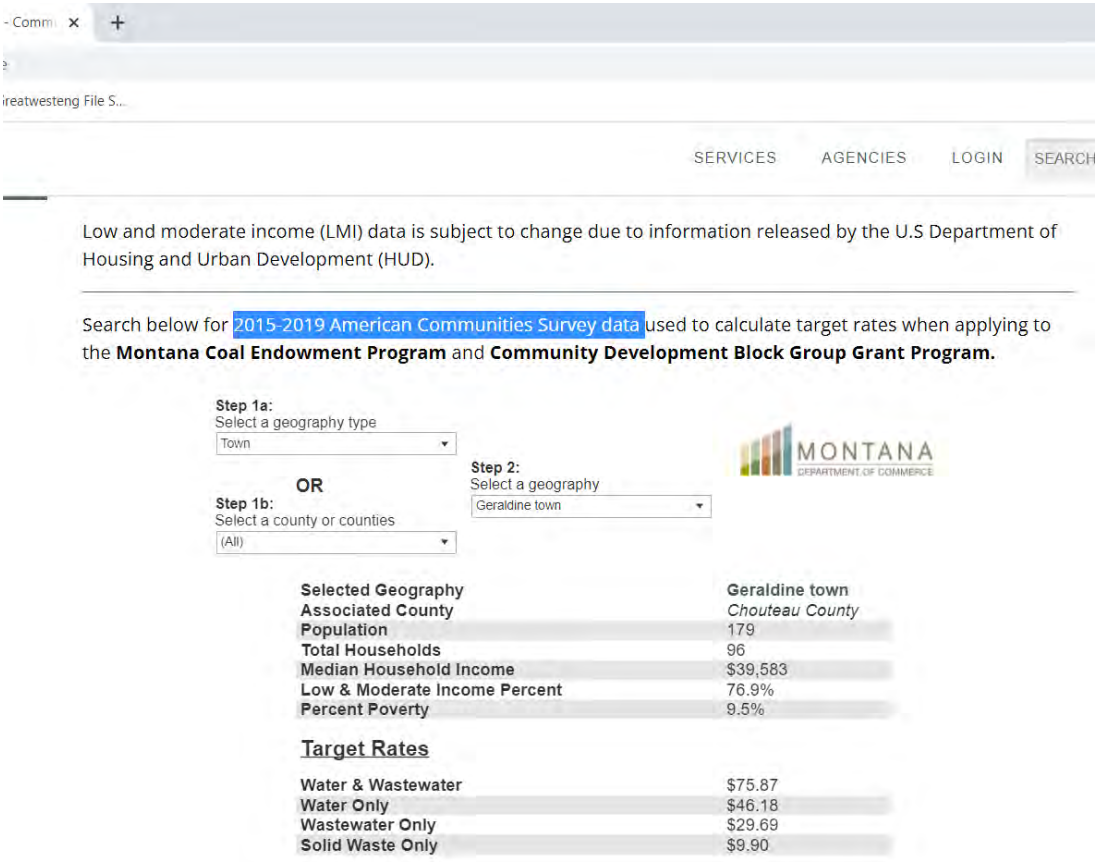
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

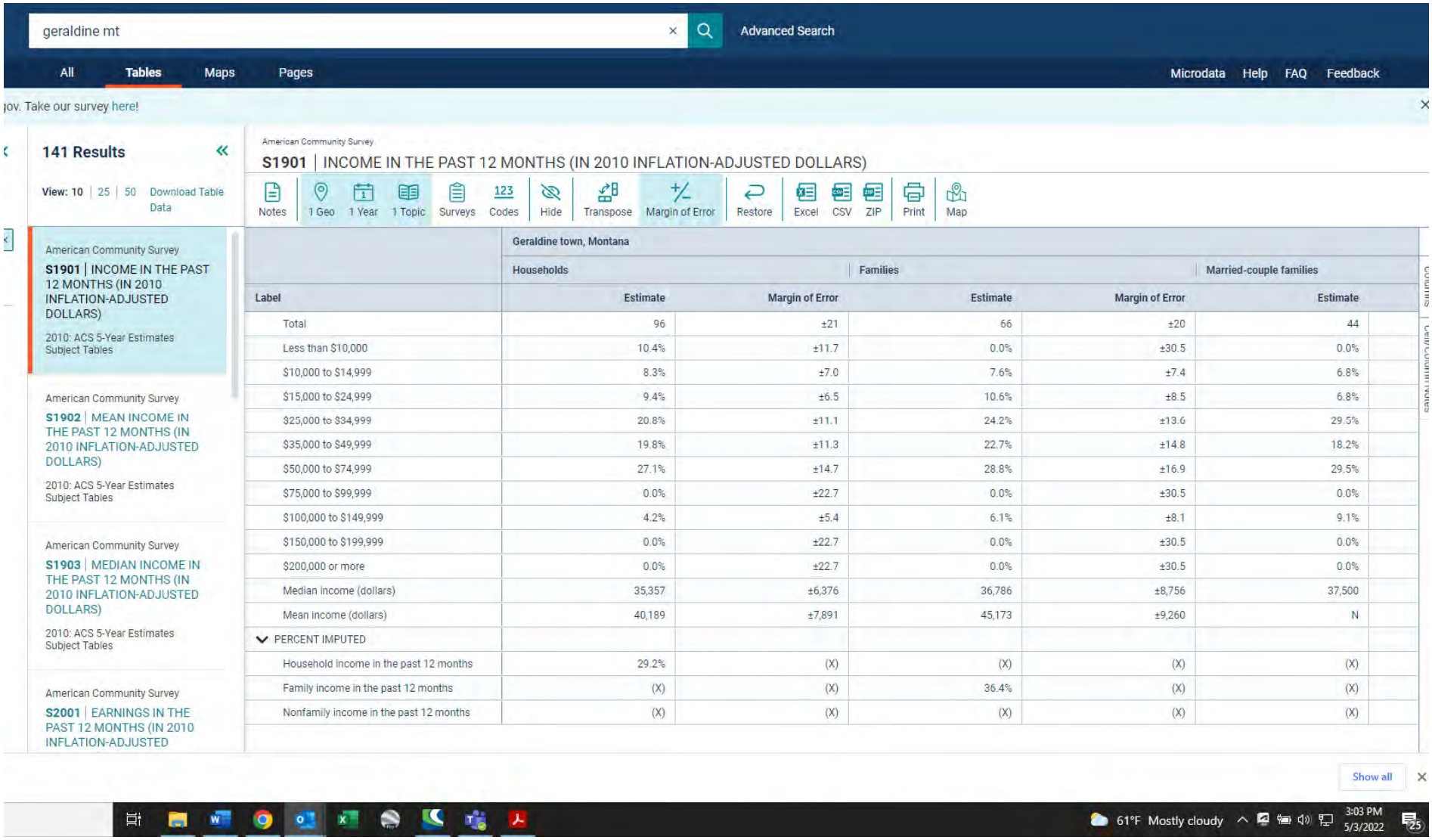
APPENDIX H

Census and Target Rate Data

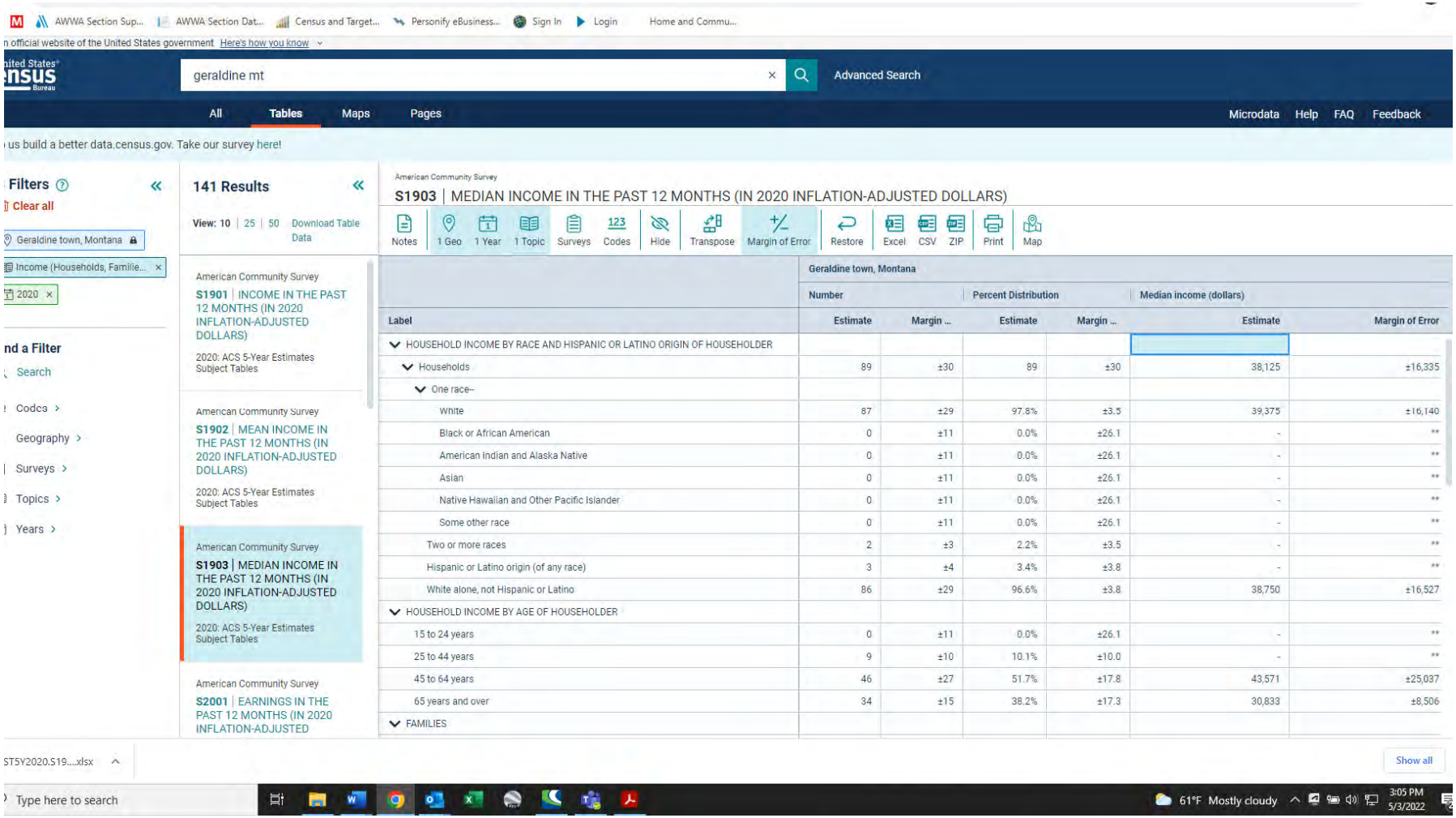
Tow of Geraldine Target Rate and MHI data (ACS Data from https://comdev.mt.gov/Resources/Target-Rate)



2010 Census Data and MHI

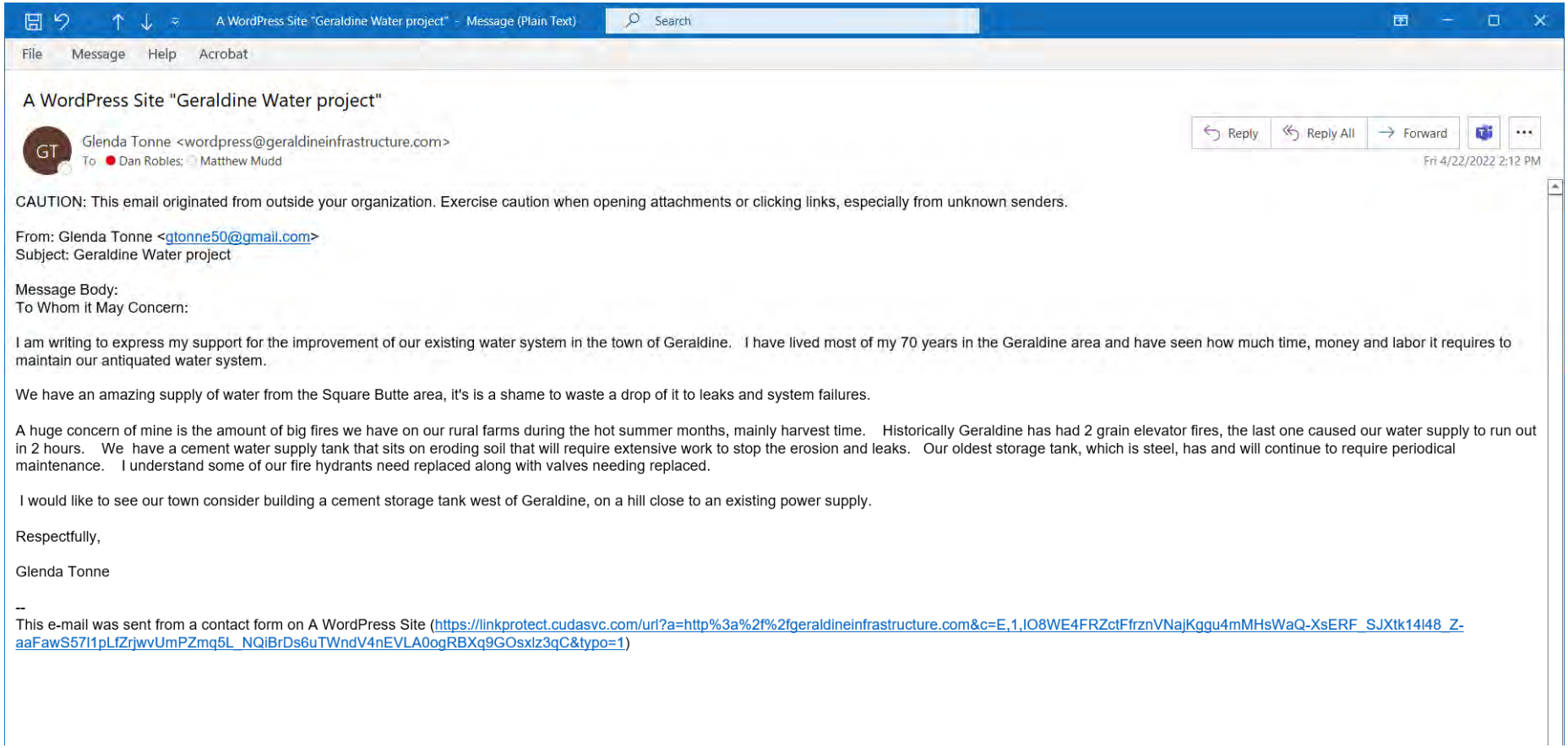


2020 Census Data and MHI



APPENDIX I

Public Engagement



A WordPress Site "Geraldine Water project" - Message (Plain Text)

Search

File Message Help Acrobat

A WordPress Site "Geraldine Water project"

GT

Glenda Tonne <wordpress@geraldineinfrastructure.com>
To Dan Robles; Matthew Mudd

Reply Reply All Forward

Fri 4/22/2022 2:12 PM

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

From: Glenda Tonne <gtonne50@gmail.com>
Subject: Geraldine Water project

Message Body:
To Whom it May Concern:

I am writing to express my support for the improvement of our existing water system in the town of Geraldine. I have lived most of my 70 years in the Geraldine area and have seen how much time, money and labor it requires to maintain our antiquated water system.

We have an amazing supply of water from the Square Butte area, it's is a shame to waste a drop of it to leaks and system failures.

A huge concern of mine is the amount of big fires we have on our rural farms during the hot summer months, mainly harvest time. Historically Geraldine has had 2 grain elevator fires, the last one caused our water supply to run out in 2 hours. We have a cement water supply tank that sits on eroding soil that will require extensive work to stop the erosion and leaks. Our oldest storage tank, which is steel, has and will continue to require periodical maintenance. I understand some of our fire hydrants need replaced along with valves needing replaced.

I would like to see our town consider building a cement storage tank west of Geraldine, on a hill close to an existing power supply.

Respectfully,

Glenda Tonne

--
This e-mail was sent from a contact form on A WordPress Site (https://linkprotect.cudasvc.com/url?a=http%3a%2f%2fgeraldineinfrastructure.com&c=E,1,lO8WE4FRZctFfrznVNajKggu4mMHsWaQ-XsERF_SJXtk14l48_Z-aaFawS57l1pLfZrjwvUmPZmq5L_NQiBrDs6uTWndV4nEVLA0ogRBXq9GOsxlz3qC&typo=1)

Matthew Mudd

From: Calvin Clousing <wordpress@geraldineinfrastructure.com>
Sent: Wednesday, January 26, 2022 7:16 PM
To: Dan Robles; Matthew Mudd
Subject: A WordPress Site "Water project"

From: Calvin Clousing <cakbinclousing@gmail.com>
Subject: Water project

Message Body:
Water project
I am glad that you're finally going to update the water system here Geraldinen. You have my support in this Project.

--
This e-mail was sent from a contact form on A WordPress Site (https://linkprotect.cudasvc.com/url?a=http%3a%2f%2fgeraldineinfrastructure.com&c=E,1,BpGyk91cku3ggN4bkGfOxMCoKeWGglu5oL_x_LegpgCz0fpXkM1bOf6_hdqtGRe8o9xWG3cTiTu4YYq4xd4WORoSOnsbQ4gALqwEK66LuII,&typo=1)

Matthew Mudd

From: Myrna Stone <wordpress@geraldineinfrastructure.com>
Sent: Friday, April 1, 2022 8:00 AM
To: Dan Robles; Matthew Mudd
Subject: A WordPress Site "Thankful"

From: Myrna Stone <myrnalen@gmail.com>
Subject: Thankful

Message Body:
our community is so grateful for this project. Thanks for the continuing updates!

--
This e-mail was sent from a contact form on A WordPress Site (https://linkprotect.cudasvc.com/url?a=http%3a%2f%2fgeraldineinfrastructure.com&c=E,1,DazSslDx3JmTeMsoX1ZGOUA-SUUZoSTYyZGhOMzEIPKOQ5OQr-o87Kq3ghbFULa1gPNb0aJGtCZn5uoWmdNdIkonZzuKYs3UATFbd0pr-tMIVJM8spE,&typo=1)

Letter Of Support For Geraldine Water Infrastructure

April 22, 2022

Matthew Mudd, PE
Great West Enginering
Helena,Mt

Dear Matt,

I was pleased to learn of efforts by the Town Council and your Firm, to study and upgrade the potable water infrastructure for the town of Geraldine MT.

As a long-time resident and formal Councilman, I have seen firsthand the shortcomings of our pre-1960's era water distribution system. I am aware of an increasing amount of failures in the asbestos concrete pipe that is currently in use. Often these failures go unnoticed, causing further damage and wasting a very precious resource for this area. In addition, the current system does not meet modern-day requirements for fire suppression.

With increasingly severe and long droughts in recent years, and the increased wild land fire danger that is associated with these droughts. Being able to provide adequate safe potable water and fire suppression water, is increasingly important to the well-being of the residents of the town of Geraldine. Without water, we do not have a community.

Sincerely yours,

Will Muir

(406) 590-5195
PHONE

P.O. BOX 92 GERALDINE, MT 59446
ADDRESS

Matthew Mudd

From: Town of Geraldine <gertown1914@gmail.com>
Sent: Tuesday, January 18, 2022 3:04 PM
To: Matthew Mudd
Subject: Water system is in trouble!

Phillip and Marjam Thomas have been filling in for our water testing this last week and have found some serious water system issues.
Please make time to talk to Phillip, he is very willing to share what he found. Phillip is very knowledgeable in our whole system. He has years of experience.
Phillip Thomas: 406-217-6341.

Kathy Bond
Mayor
Town of Geraldine
PO Box 211
Geraldine, MT 59446
406-737-4361 (office)

Matthew Mudd

From: Town of Geraldine <gertown1914@gmail.com>
Sent: Wednesday, April 6, 2022 3:27 PM
To: Matthew Mudd
Subject: Re: Geraldine Meeting on 12th

Hello Matt,

The Town Council meeting on the 12th will be at the Town Hall at 6:00pm. I do want to add that we talked with some residents and with members of the fire department and have come to the conclusion that there really needs to be a new concrete tank built in town to support the town.

Thank you,

Kathy Bond
Mayor
Town of Geraldine
PO Box 211
Geraldine, MT 59446
406-737-4361 (office)

On Wed, Apr 6, 2022 at 3:18 PM Matthew Mudd <mmudd@greatwesteng.com> wrote:

> Hi Kathy:
>
> I just wanted to confirm what time your meeting is next week on the 12th? I can come out to further discuss your water project, priorities, more about some funding considerations, the ARPA grant status, and state grant application process, etc. I think it would be good to come away with what are the Town's highest priorities and "project" to apply for in state grants.
>
> Here is a draft priority list to give you an idea to think about. I talked about general costs and potential rate impacts at your last work session meeting.

Project Priority List	
Priority	Alternative
1	D-2: Phase 1 – Replacement of Problematic 4" AC and 6" AC in Petroleum Contaminated Soils
2	D-3: Phase 2 – Replacement of Remaining 4" AC

3	T-2: Construction of a Chlorination Station
4	R-2: Repairing the Concrete and Steel Tanks
5	D-5: Replacement of Pressure Reducing Valves and Air Release Valves
6	D-4: Phase 3 – Replacement of Remaining Pipe in Town
7	D-6: Replacing System Control and Data Acquisition (SCADA) System

Also, I will check with Bear Paw, but we should have another wastewater project draw coming. It can be our final invoice for the sewer project, but there may be another draw for the audit.

Thanks,

GreatWest ENGINEERING

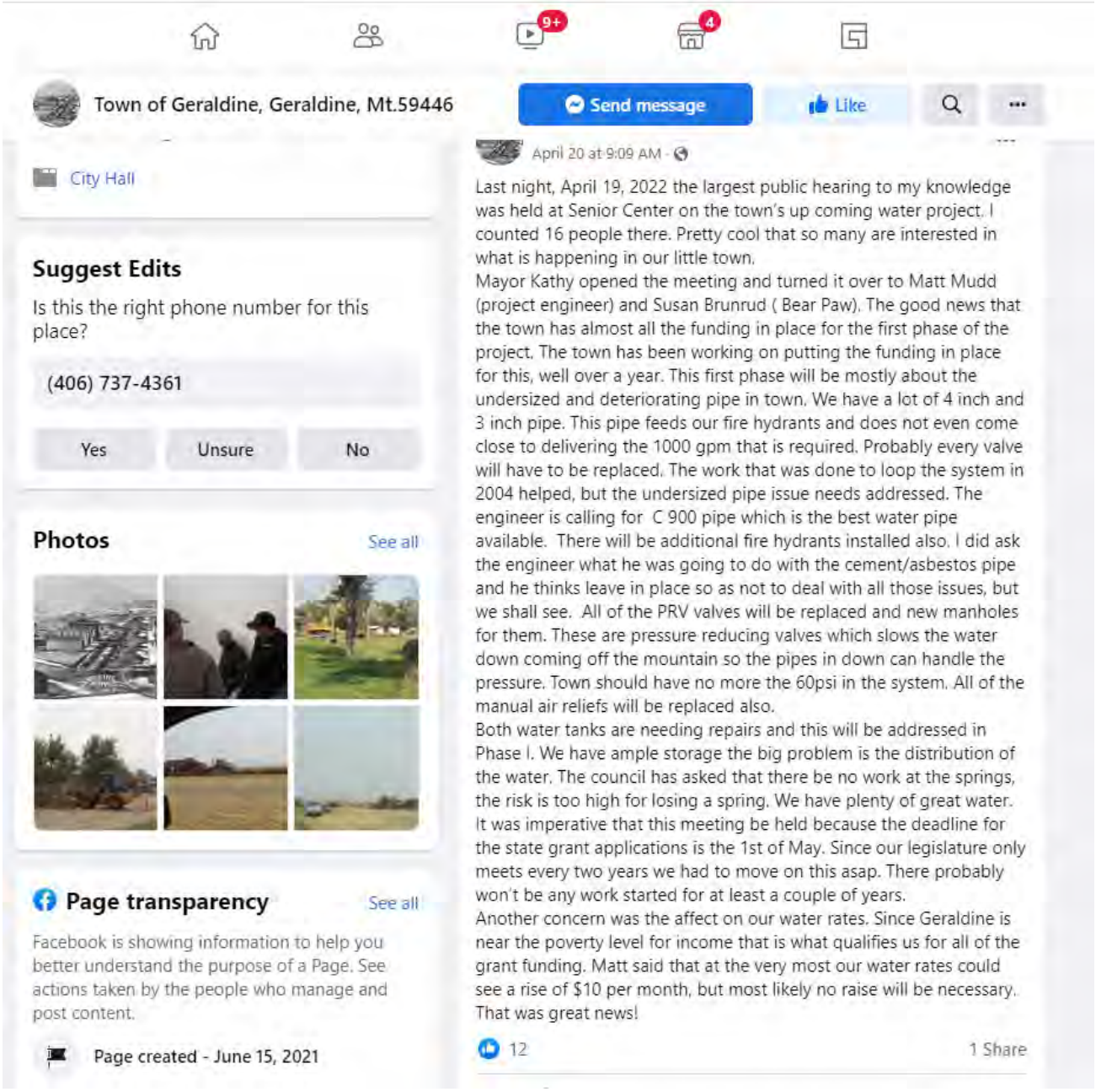
Matthew Mudd, PE
Project Manager

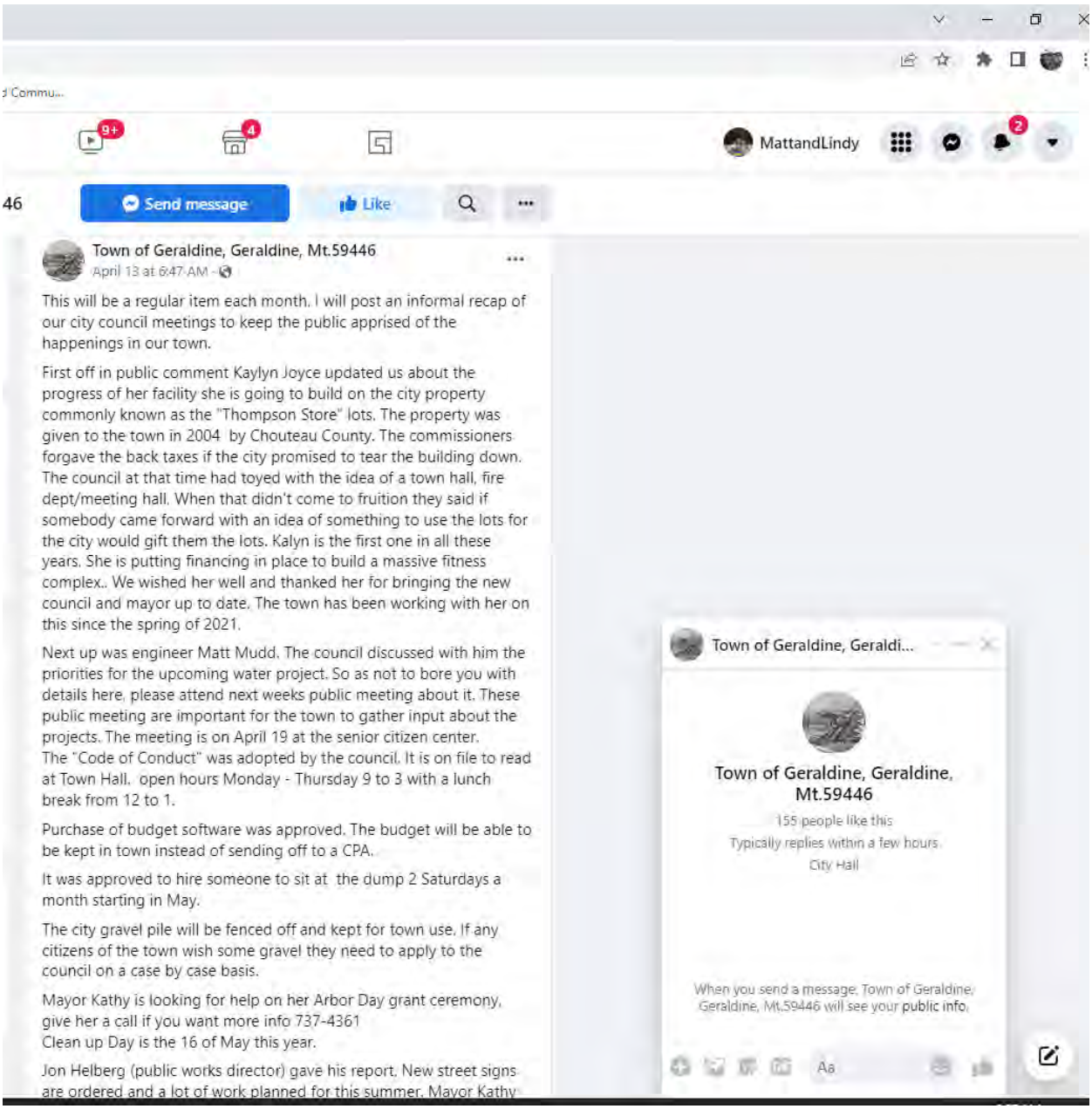
d: (406) 495-6196
c: (406) 490-3909

2501 Belt View Drive
Helena, MT 59601

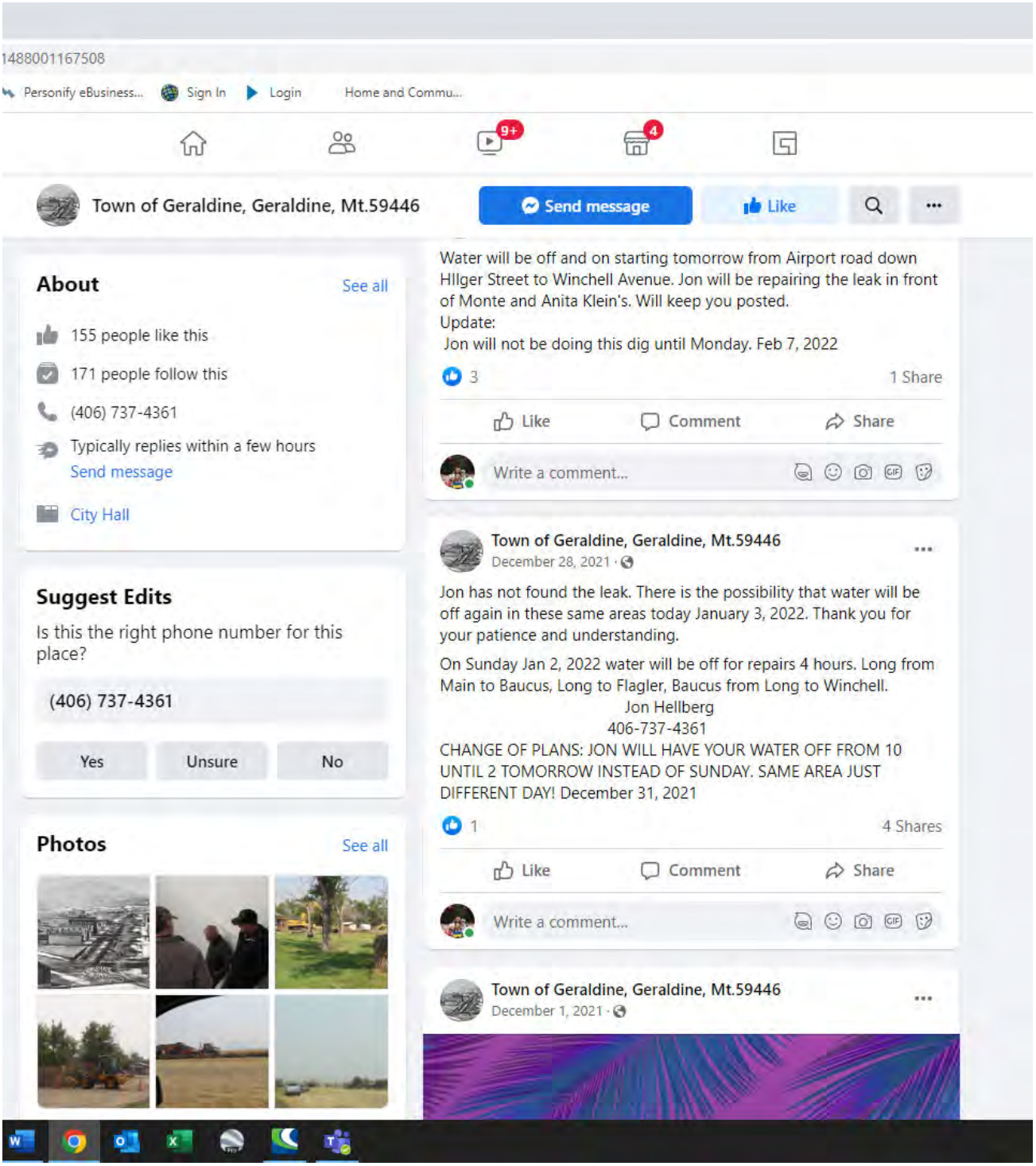
We're Hiring!

Town of Geraldine Facebook posts with mention of Water Project (April 19, 2022, April 13, 2022)




MattandLindy
Send message
Like
Town of Geraldine, Geraldine, Mt.59446
April 13 at 6:47 AM
This will be a regular item each month. I will post an informal recap of our city council meetings to keep the public apprised of the happenings in our town.
First off in public comment Kaylyn Joyce updated us about the progress of her facility she is going to build on the city property commonly known as the "Thompson Store" lots. The property was given to the town in 2004 by Chouteau County. The commissioners forgave the back taxes if the city promised to tear the building down. The council at that time had toyed with the idea of a town hall, fire dept/meeting hall. When that didn't come to fruition they said if somebody came forward with an idea of something to use the lots for the city would gift them the lots. Kalyn is the first one in all these years. She is putting financing in place to build a massive fitness complex.. We wished her well and thanked her for bringing the new council and mayor up to date. The town has been working with her on this since the spring of 2021.
Next up was engineer Matt Mudd. The council discussed with him the priorities for the upcoming water project. So as not to bore you with details here, please attend next weeks public meeting about it. These public meeting are important for the town to gather input about the projects. The meeting is on April 19 at the senior citizen center.
The "Code of Conduct" was adopted by the council. It is on file to read at Town Hall. open hours Monday - Thursday 9 to 3 with a lunch break from 12 to 1.
Purchase of budget software was approved. The budget will be able to be kept in town instead of sending off to a CPA.
It was approved to hire someone to sit at the dump 2 Saturdays a month starting in May.
The city gravel pile will be fenced off and kept for town use. If any citizens of the town wish some gravel they need to apply to the council on a case by case basis.
Mayor Kathy is looking for help on her Arbor Day grant ceremony, give her a call if you want more info 737-4361
Clean up Day is the 16 of May this year.
Jon Helberg (public works director) gave his report. New street signs are ordered and a lot of work planned for this summer. Mayor Kathy
Town of Geraldine, Geraldi...
Town of Geraldine, Geraldine, Mt.59446
155 people like this
Typically replies within a few hours
City Hall
When you send a message, Town of Geraldine, Geraldine, Mt.59446 will see your public info.
Aa

Town facebook post (below 12/28/22) with a water leak. Also indicative of an area where AC mains have been leaking and showing the extent of shut downs, etc.



Matthew Mudd

From: Matthew Mudd
Sent: Wednesday, December 15, 2021 10:59 AM
To: Monica Rice
Subject: RE:

Hi Monica:

So we had this website that we used throughout the PER process for the wastewater project and grant applications.

http://geraldineinfrastructure.com/

We will keep the same domain and still have to update for the water PER specific language. It still has all sewer PER language.

I'm glad to hear that the Town can use the facebook throughout the PER/grant application phases. This will score public outreach points for sure. Having both the website and the facebook will be good to refer back and forth and the website can keeps drawings, estimates, meeting minutes, etc. The more the information gets out there, the better.

I'm pretty busy working on Round 2 ARPA applications right now, so I'm not sure I can get to the wetbsite update until after new years.

I will be in touch – I'll put a reminder on my calendar to circle back with you and the Town on this.

Thanks,

GreatWest ENGINEERING

Matthew W Mudd
Project Manager

d: (406) 495-6196
c: (406) 490-3909

2501 Belt View Drive
Helena, MT 59601

We're Hiring!

From: Monica Rice <ricemonica8@gmail.com>
Sent: Wednesday, December 15, 2021 7:50 AM
To: Matthew Mudd <mmudd@greatwesteng.com>
Subject:

Hey Matt, could you email me those links to the water project so I can post them to the Facebook page? I would certainly appreciate it. The meeting was calmer after you left, thank goodness!

Monica

4/19/22

Carole Locquiao – need good pipes to keep residents healthy + fight fires.

Patricia Martin – I support this project for our city + to help fight fires.

"Dear Geraldine Support this project!

I've lived in Geraldine all my life and have no plans of moving. So I support this project for the young people in our town. Delores Spencer

I Support Ph 1 + applying for Ph 2 to Repair the distribution Pipes in City of Geraldine.
Ilene Mills

GreatWest ENGINEERING

TOWN OF GERALDINE
Public Hearing
April 19, 2022
Sign-In Sheet

Name	Company	email	Telephone
Glenda Tonne	Rancher	gtonne50@gmail.com	737-4351
Chuck Tonne	"	" "	"
Buck Goldhahn	Rancher	buckgoldhahn@yahoo.com	737-4293
David DeWoman	Rusty's Bar		737-4411
Patricia Jo Martin	Rusty's Bar	daveandpjsplace@gmail.com	737-4411
Ben L Lind	Retired	Lund1907@hotmail.com	737 4341
Ken Mills	Gainfully Unemployed	Kamstc28@yahoo.com	406-737-4316
Loren Wombold	NaturSync	loren.wombold@Umontana.edu	406-622-9006
Will Muir		will.willmuir@gmail.com	406-590-5795
Stephanie Baker	City	stebak78@gmail.com	406-929-8702

GreatWest ENGINEERING

TOWN OF GERALDINE

Public Hearing
April 19, 2022
Sign-In Sheet

Name	Company	email	Telephone
Ben Carthright			406-737-4251
Carole Longmire			808-391-0766
Mike Baker			(406) 929-8702
Levi Clark	Hybrid Steel	LeviClark@Hybridsteeldesign.com	406-737-4484
Kreig Meeks			737 4312
Monette Rea	Alderman		
Shaya Clark	"	Gertowncouncil3@gmail.com	737 4296
Peny Joyce	"		737-4561
[illegible]			737-4292
Kathy Bird	Town		737-4407

TOWN OF GERALDINE
Public Hearing
April 19, 2022
Sign-In Sheet

Name	Company	email	Telephone
Riley Joyce		rileyscottjoyce@gmail.com	
Delores Spencer			
	Great West		

Geraldine Public Meeting

April 18, 2022
6:30

PER - MCEP & RRGL Planning
RD SEARCH 30,000 Grants 15,000

ARPA - American Rescue Plan Act

Emphasis on Public comment and input.

- Ground Water System -
- Treatment System - treat for viral & bacterial - DEQ Compliance
- Distribution - over half is under 4"
- Low PSI in areas under 30
  50-60 PSI preferable.

Springs Alternatives -
Phase I - Monitor & Protect -
10-15,000 - to fence area
Phase II -
Analysis - Restore Springs

Phase III - Preserve

Transmission - Alternatives
R-1- No Action
R-2 - Replace PRV's & ARV's
3 PRV - 14 ARV

Geraldine Community Meeting

Storage - Alternatives Evaluation

R-1 - No Action
R-2 - Repair Tanks - $186K
R-3 - New 210,000 gal. on grade concrete Storage Tank 2.9M -
Location, Trans. Pipe, Concrete vs Steel

* Fire Flow -
Flow is pipe related
Capacity -

Treatment Alternatives ~

T-1 - No Action
T-2 - New Chlorination Station $378K

Distribution - Alternatives

D-1 - No Action
D-2 - Phase 1 2.6 M
replace 4 in & lead service
- services to main
- hydrants

D-3 - Phase 2 - 4 in 2.5 M
D-4 - Phase 3 - All rem. 2.5M

Geraldine Meeting Cont

Phase - 1 Grant funded w/ ARPA & Community & Co. ARPA

Phase - 2 - 4" AC - 2.6

EA - Send letters to State Agencies -
- Some mitigation
- Temp Traffic, Noise, dust

Decision - EA is Acceptable Environmental Impact Statement

Public Comment -

How much is lost - 40-60% - Matt

Is there a standard - Matt as low as possible - back flow when there is low pressure - can cause

Monica - Chlorination Shed was done in 2004

Is loss in Main Line?

- it is between Main meter & distribution and Usage.

Monica - Does that include Stock tanks?

Matt - Not Measured

Comment
What does Phase 1 include?
- replacement of 4" in 6 inch

Matt -- update to CIP could show additional items such as using well for stock etc.
- fill station
-

Sue: - additional funds may be available to fund more MCER & RRGL awards

Matt - additional

Public 20 -

Geraldine Water Con't

Perry -

Monica - is the Asbestos Pipe left in ground -

Matt - may leave in place.

~ Do Letters of support help if it documents tank needs to be replaced?

Cement tank -

Rural water users ~

Matt - letters in application

NOTICE OF PUBLIC HEARING

The Town of Geraldine will hold a public hearing on Tuesday, April 19, 2022. The public hearing will begin at 6:30 p.m. at the Senior Citizens Center, 420 Main Street, in Geraldine Montana. The District has scheduled the hearing to obtain public comments regarding the proposed improvements to Town's water system. With assistance from Great West Engineering and Bear Paw Deveopment, the Town is preparing a water preliminary engineering report (PER) and is preparing applications for funding from the Montana Department of Commerce's Montana Coal Endowment Program (MCEP), the Community Development Block Grant Program (CDBG), and also the Montana Department of Natural Resources and Conservation (DNRC) and USDA Rural Development (RD) programs.

At the public hearing, representatives of the Town, Great West Engineering and Bear Paw will explain the purpose of the project, the project area, the scope of work, budget, possible sources of funding, and any costs that may result for local citizens because of the project. An assessment of the project's potential impact on the environment will also be presented. Copies of the draft environmental assessment are available upon request and at the hearing. During the public hearing; residents may ask questions and express their opinions regarding the project and its impact on the District.

Residents can submit written comments and questions about the project by contacting Great West Engineering's Project Manager Matt Mudd, PE, at (406) 495-6196 or mmudd@greatwesteng.com or logging on to www.geraldineinfrastructure.com.

Publish Two (2) Times: The River Press

April 6, 2022
April 13, 2022

See What's *Possible*.

www.greatwesteng.com

WATER PRELIMINARY ENGINEERING REPORT

TOWN OF GERALDINE
PUBLIC HEARING – APRIL 19, 2022

Sue Brurud
Bruce Lauerman, PG, CHG
Matthew Mudd, PE

Bear Paw Development Corporation of Northern Montana

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1

WHY ARE WE HERE & OUTLINE

- Town Identified Water System Needs
- ARPA Grant Applied
- Planning Grants Obtained
- Explain the PER Process
- Show Water Problems & Alternatives
- Summarize Environmental Assessment (EA) Potential Impacts
- Go over Funding and Potential Rate Impacts
- Take Public Comment

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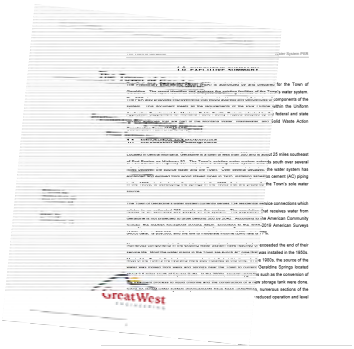
PRELIMINARY ENGINEERING REPORT

- **What is a PER**
  - Technical and Planning
  - Required by Funding Agencies to Apply for Grants
  - Defines Current and Future Projects
  - Looks at Entire System
- **Evaluates Alternatives to Remedy Issues**
- **Establishes Costs and Funding Scenarios**
- **Develops Implementation Schedule**



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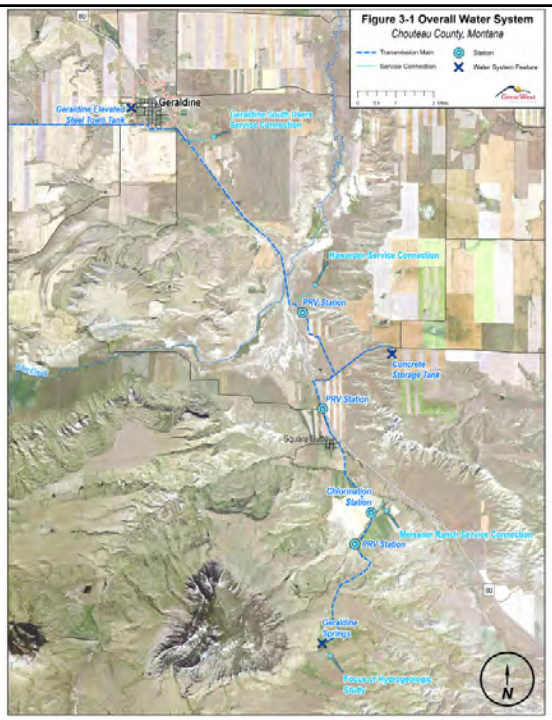
PLANNING AREA

- **Study Area:**
  - Source through Distribution



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EVALUATION OF EXISTING SEWER SYSTEM
POPULATION

Year	Geraldine	% Annual Increase	Chouteau County	% Annual Increase
1990(1)	299	-	5,468	-
2000(1)	285	-4.5%	6,062	11.0%
2010(1)	261	-8.4%	5,818	-4.0%
2020(1)	207	-20.7%	5,895	1.4%
2020(2)	61			
Average	-	-11.2%	-	2.8%
2042(3)	231	0.50%	-	-
2042(4)	292	-	-	-

(1) US Census Bureau (In-Town Population)

(2) Out-of-Town usage population

(3) Population of Town at Design Year (2042) estimated from 2020 Census at 0.5% Annual Growth

(4) Design Population of Water System Service Area (In Town plus Out-of-Town)

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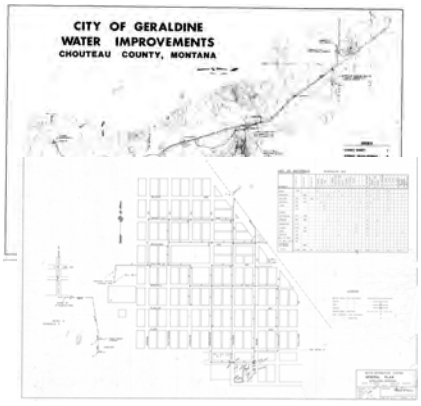
EVALUATION OF EXISTING WATER SYSTEM

- **Evaluation Methods**
  - Site Visits/Investigations
  - Historical Information, As Builts
  - First-Hand Accounts
- **History**
  - Original Water System, Early 1900s
  - AC Mains/Distribution 1950s
  - Springs Developed, Transmission 1980s
  - Concrete Tank Constructed 2004
  - No Major Capital Project Upgrades Done on Distribution System in Recent History
  - Repairs are Done as Needed
  - Corrective Actions for Disinfection



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EVALUATION OF EXISTING WATER SYSTEM – SOURCE (SPRINGS)

WATER RIGHTS AND AGREEMENTS

STATE OF MONTANA
DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

Permit to Appropriate Water

THIS PROVISIONAL PERMIT TO APPROPRIATE WATER IS HEREBY ISSUED TO:

GERALDINE, CITY OF

SOURCE: GROUNDWATER

DIVERSION MEANS: DEVELOPED SPRING

[illegible]

RECEIVED 12
OCT 11 1985
MONTANA D.N.R.C.
HAVRE FIELD OFFICE

File

E A S E M E N T

The GRANTORS, MEISSNER RANCH, INC, a Montana Corporation for and in consideration of the sum of One and No/100ths Dollars acknowledged, do by these presents grant, bargain, sell and convey and confirm unto THE TOWN OF GERALDINE, A Municipal Corporation, with an address of Geraldine, Montana 59446, hereafter referred to as "GRANTEE", and its successors and assigns, a perpetual assignable easement and right-of-way for the purposes and uses hereinafter mentioned in, on, beneath, over and across the following described land situated in the County of Chouteau, State of Montana, to-wit:

TOWNSHIP 20 NORTH, RANGE 17 EAST

Section 27: NW¼SW¼SW¼, S½SW¼SW¼

The perpetual and assignable easement and right-of-way is hereby granted on, beneath, over and across the above described lands for the location, construction, operation, repair, maintenance and patrol of underground water line, and appurtenances thereto, wells and springs and water infiltration gallery, together with the right of ingress and egress thereto for such purposes. GRANTORS hereby grant a perpetual and assignable easement and right-of-way in springs, pumps, infiltration galley, pumping plant and building, pipelines, electrical lines and necessary equipment and fences on the above described lands, together with the right of ingress and egress to maintain, repair and replace said springs and wells and maintain, repair and replace said equipment. GRANTEE may perpetually and permanently withdraw all water needed for its purposes from said land, provided however, the total water withdrawn from said land for use by GRANTEE shall not exceed 250 gallons per minute from all sources including the water to be withdrawn under the Easement between the same parties which was recorded on January 22, 1985 in Book FS-85 Miscellaneous on pages 2 & 3 as Document No. 410057 in the office of the Clerk and Recorder of Chouteau County, Montana.

GRANTEE agrees to install and maintain a fence around said infiltration gallery and spring development.

GRANTORS, shall be entitled to use all water from said lands in excess of 250 gallons per minute and GRANTEE, it's successors and assigns shall have a first priority to use up to but not in excess of 250 gallons per minute from said lands.

GRANTORS also hereby sell, transfer and convey unto GRANTEE and its assigns a perpetual and assignable easement on, beneath, across and over the following described lands for the construction, repair, operation, maintenance and patrol of an underground water line and appurtenances thereto, together with the right of ingress and egress for such purposes. This water line easement on the hereinafter described lands shall be limited to 50 feet in width in, on and under the following described lands located in Chouteau County, Montana, to-wit:

TOWNSHIP 20 NORTH, RANGE 17 EAST

Section 3: E½SW¼
Section 10: SE¼, NE¼, E½NW¼
Section 11: SW¼
Section 15: E½
Section 22: S½, E½NE¼
Section 27: N½NW¼

- 1985-1986
- 250 gpm
- 400 acre-feet/year

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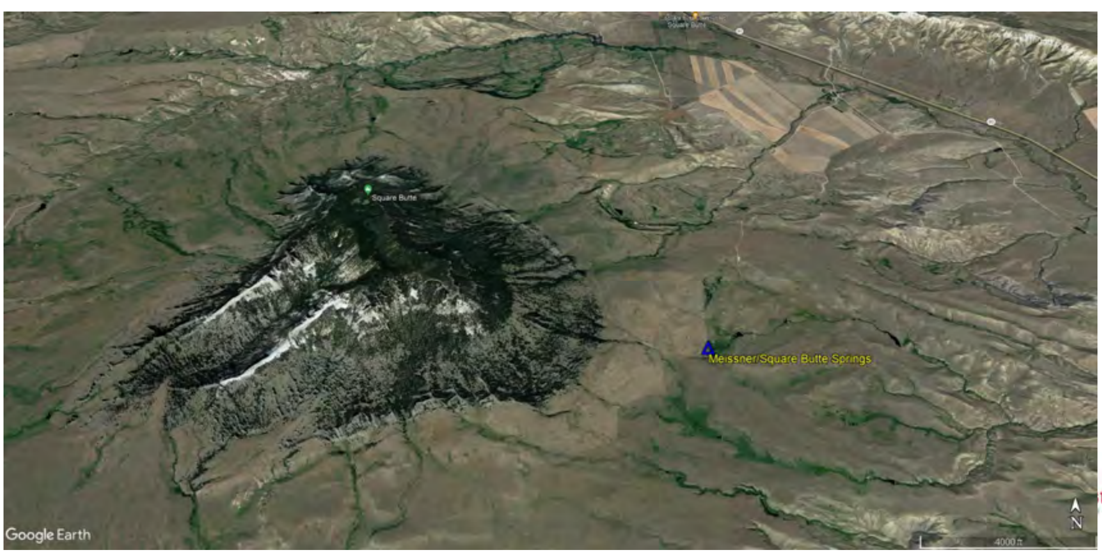
EVALUATION OF EXISTING WATER SYSTEM – SOURCE (SPRINGS)



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EVALUATION OF EXISTING WATER SYSTEM – SOURCE (SPRINGS)

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EVALUATION OF EXISTING WATER SYSTEM – SOURCE (SPRINGS)

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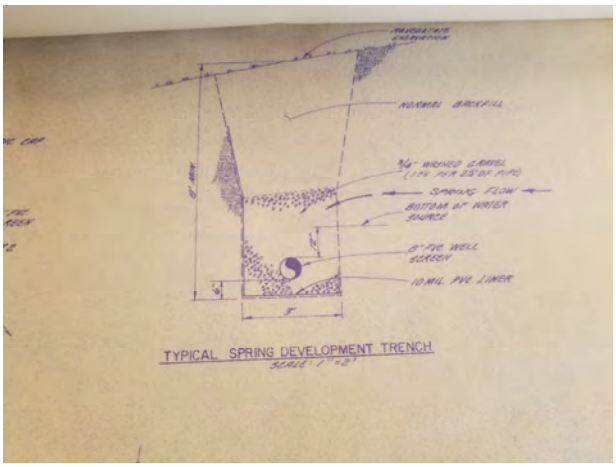
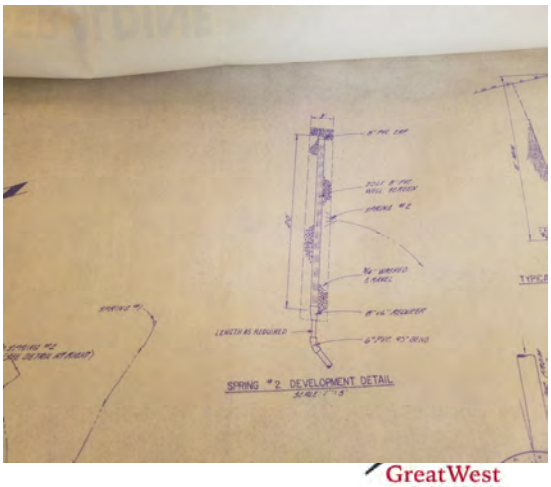
EVALUATION OF EXISTING WATER SYSTEM – SOURCE (SPRINGS)





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EVALUATION OF EXISTING WATER SYSTEM – SOURCE (SPRINGS)

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EVALUATION OF EXISTING WATER SYSTEM – SOURCE (SPRINGS)

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EVALUATION OF EXISTING WATER SYSTEM – SOURCE (SPRINGS)

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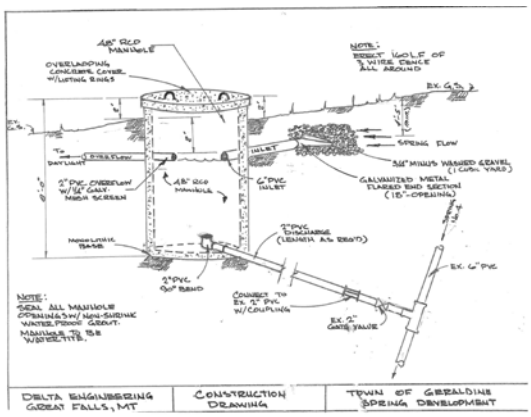
EVALUATION OF EXISTING WATER SYSTEM – SOURCE (SPRINGS)



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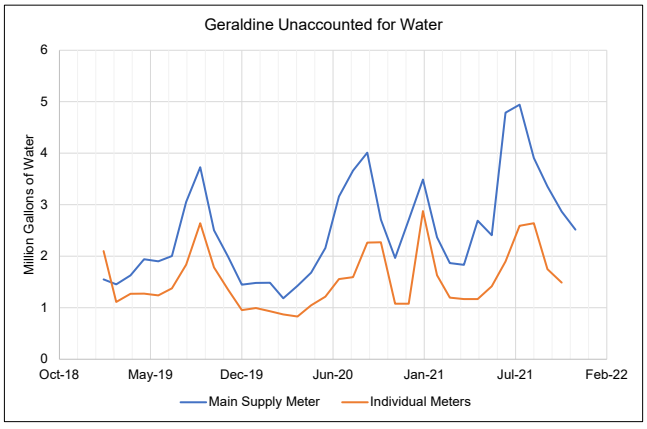
EVALUATION OF EXISTING WATER SUPPLY – DEMANDS/USAGE



- Average Annual Usage: 82,000 gpd
- 20-60% water loss (38% Avg.)
- Hawarden, Square Butte and Geraldine North can use up to 20-40% of Water Demands

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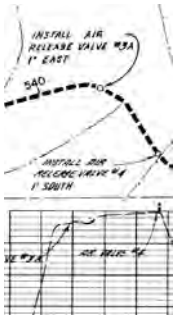
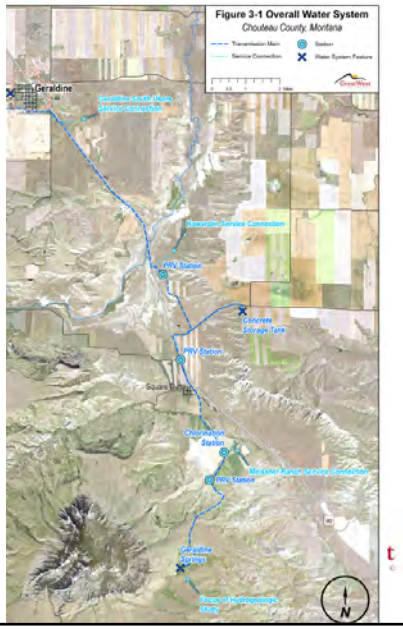
EVALUATION OF EXISTING WATER SYSTEM – TRANSMISSION

- Over 12 miles of 6” PVC Transmission Mains
- 3 PRV Stations
- Several ARVs
- Connections for Rural Connections (metered)





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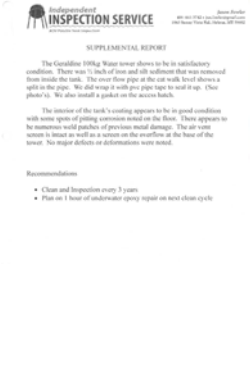
EVALUATION OF EXISTING WATER SYSTEM – STORAGE

Elevated Steel Tank (100k Gal.)


Independent INSPECTION SERVICE

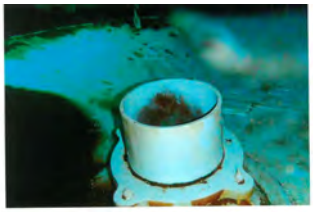
SUPPLEMENTAL REPORT

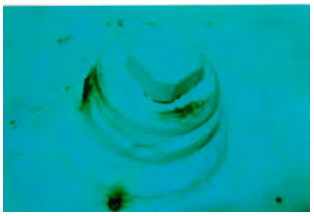
The Geraldine 100kg Water tower shows to be in satisfactory condition. There was ½ inch of iron and silt sediment that was removed from inside the tank. The over flow pipe at the cat walk level shows a split in the pipe. We did wrap it with pvc pipe tape to seal it up. (See photo's). We also install a gasket on the access hatch.

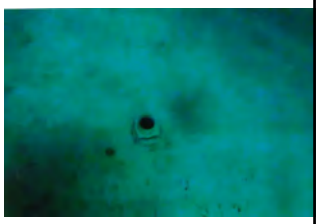
The interior of the tank's coating appears to be in good condition with some spots of pitting corrosion noted on the floor. There appears to be numerous weld patches of previous metal damage. The air vent screen is intact as well as a screen on the overflow at the base of the tower. No major defects or deformations were noted.

Recommendations

- Clean and Inspection every 3 years
- Plan on 1 hour of underwater epoxy repair on next clean cycle







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EVALUATION OF EXISTING WATER SYSTEM – STORAGE

On Grade Concrete Tank (200k Gal.)

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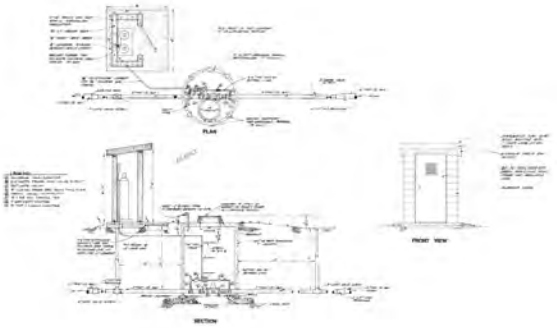
EVALUATION OF EXISTING WATER SYSTEM – TREATMENT



- 2 Vaults (Confined Space)
- Degrading/Corroded Shed Space

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EVALUATION OF EXISTING WATER SYSTEM – DISTRIBUTION

Summary of the Existing Water Mains in Geraldine	
Pipe Size and Material	Approximate Existing Length (ft.)
2” Plastic	1,430
3” AC	790
4” AC	11,590
6” AC	5,350
8” AC	1,000
6” PVC	2,000
8” PVC	1,710
Total	23,870

- 78% AC mains
- 52% 4” and smaller AC

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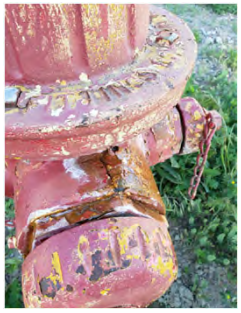
EVALUATION OF EXISTING WATER SYSTEM – DISTRIBUTION



- AC Mains – leaking/cracking mains, undersized
- Lack of functioning valves
- Corroding Fittings
- Diminished Fire Flow
- Low Pressures

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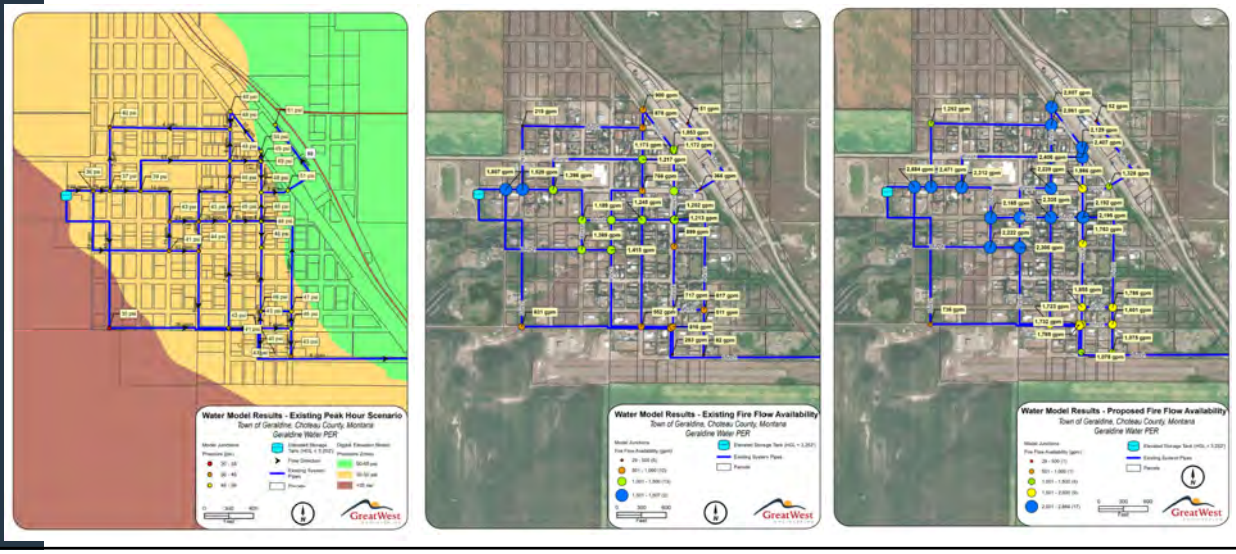
EVALUATION OF EXISTING WATER SYSTEM – DISTRIBUTION

Hydraulic Water Model



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ALTERNATIVES EVALUATION - SPRINGS

PHASE 1

- **MONITOR** and measure individual spring flows monthly (no cost)
- **PROTECT** spring area by fencing out livestock ($10-15,000)
  - Can be done by Town

PHASE 2

- **RESTORE** Spring 5 collection system ($110-$125k)
- Include Budget in Grant Application (to be available in 2 years)
  - S-2: Phase 2 Springs Assessment, and Spring 5 Restoration

PHASE 3

- **PRESERVE** spring collectors ($125-175k – To Be Determined)
  - Remove topsoil and vegetation
  - Install protective liner to prevent surface water infiltration
  - Cap with surface seal (clay and gravel)

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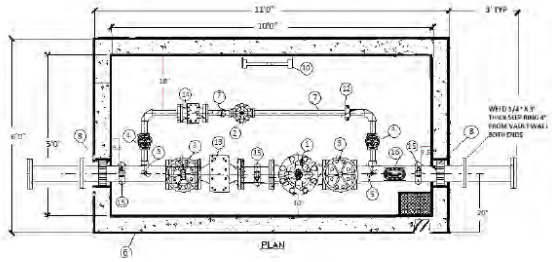
ALTERNATIVES EVALUATION - TRANSMISSION

Total Project Estimates

» **R-1: No Action**

» **R-2: Replace PRVs and ARVs - $408k**

» 3 PRV Stations, 14 ARVs



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ALTERNATIVES EVALUATION - STORAGE

Total Project Estimates

» **R-1: No Action**

» **R-2: Repair Water Tanks - $186k**

» Line conc. tank to full depth, erosion mat/fill at tank, epoxy patch elev. tank

» **R-3: New 210,000 gal On-Grade Concrete Storage Tank - $2.9 mil.**

» Considerations: Location, Transmission pipe, Land, Concrete Vs Steel

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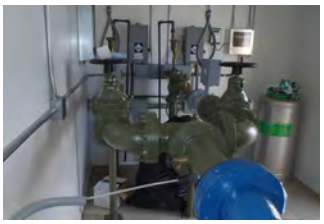
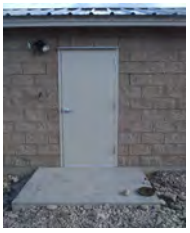
ALTERNATIVES EVALUATION - TREATMENT

Total Project Estimates

» T-1: No Action

» T-2: New Chlorination Station - $378k





OPINION OF PROBABLE COST
The Town of Geraldine
T-2: New Chlorination Station

#	BID ITEM	QTY	UNITS	UNIT PRICE [1]	TOTAL
1	New Equipment Building	140	SF	$ 425.00	$ 59,500
2	Sitework & Grading	1	LS	$ 10,000.00	$ 10,000
3	4" DI Pipe	30	LF	$ 40.00	$ 1,200
4	6" 90° elbows	4	EA	$ 1,000.00	$ 4,000
5	6" x 18" Spool	1	EA	$ 1,000.00	$ 1,000
6	6" x 12" Spool	2	EA	$ 1,000.00	$ 2,000
7	6" to 3" Reducer	2	EA	$ 1,000.00	$ 2,000
8	6" Check Valve	1	EA	$ 1,500.00	$ 1,500
9	6" Gate Valve	2	EA	$ 2,000.00	$ 4,000
10	1 1/2" Pressure Relief Valve	1	EA	$ 1,500.00	$ 1,500
11	1" Air Vacuum Valve	1	EA	$ 1,500.00	$ 1,500
12	Sample Tap	1	EA	$ 500.00	$ 500
13	4" Flow Meter	1	EA	$ 5,000.00	$ 5,000
14	Backup Generator & Transfer Switch	1	EA	$ 40,000.00	$ 40,000
15	Furnish and Install Chlorination System & Safety Equipment	1	LS	$ 25,000.00	$ 25,000
16	HVAC	1	LS	$ 5,000.00	$ 5,000
17	Electrical	1	LS	$ 20,000.00	$ 20,000
18	System	1	LS	$ 15,000.00	$ 15,000
	Direct Construction Subtotal				**$ 199,000**
	Mobilization		10%		$ 20,000
	Construction Subtotal				**$ 219,000**
	2024 Construction Cost [2]		8.0%		$ 255,000
	Contingency		20%		$ 51,000
	Boundary Survey, Easement Services				$ 8,000
	Basic Engineering Services - Preliminary Design, Final Design, Bidding, Construction, Post Construction		20%		$ 51,000
	Legal & Administrative		5%		$ 13,000
	TOTAL				**$ 378,000**

[1] Estimated unit costs are based upon estimates from suppliers and bid tabs for similar projects throughout

[2] The ENR 20 year average Construction Cost Index is +2.95% (as of December 2018), so capital costs are projected to an anticipated construction date in 2024 using a 6% inflation rate.

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ALTERNATIVES EVALUATION - DISTRIBUTION

Locations & Phasing

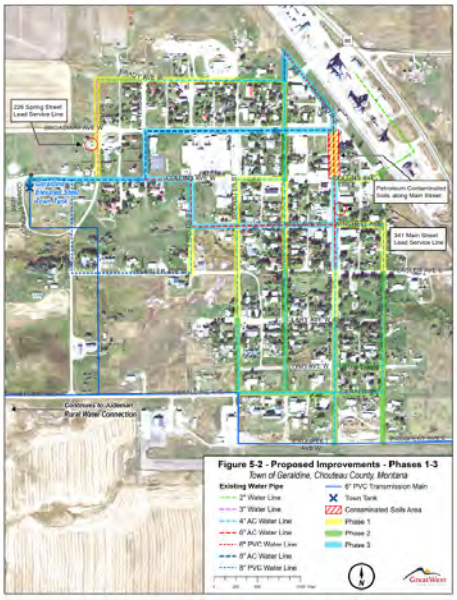
Total Project Estimates

» D-1: No Action

» D-2: Phase 1 – $2.66 mil.

» D-3: Phase 2 - $2.5 mil.

» D-4: Phase 3 - $2.65 mil



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ALTERNATIVES – PRIORITY RANKINGS – PREFERRED ALTERNATIVE

Project Priority List			
Priority	**Alternative**	**Total Project Cost**	**Funding/Const. Date**
1	D-2: Phase 1 – Replacement of Problematic 4" AC and 6" AC in contaminated soils	$2,660,000	ARPA/2023
2	D-3: Phase 2 – Replacement of Remaining 4" AC	$2,503,000	2022 Grant Apps/2024
3	S-2 Phase 2 Springs Assessment, Spring 5 Rehab	$121,000	
4	R-3: New 210,000 Concrete On Grade Storage Tank	$2,879,000	Pending Application Dates
5	T-2: Construction of a New Chlorination Station	$378,000	
6	D-5: Replacement of Pressure Reducing Valves and Air Release Valves	$408,000	
7	R-2: Repairing the Existing Concrete and Steel Tanks	$186,000	
8	D-4: Phase 3 – Replacement of Remaining Pipe in Town	$2,656,000	
9	D-6: Replacing System Control and Data Acquisition (SCADA) System	$30,000	

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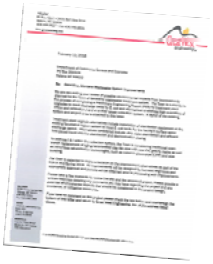
ENVIRONMENTAL ASSESSMENT

What is an Environmental Assessment (EA)?

» Public document analyzing environmental issues

Draft EA has been completed

» State and federal agencies have been contacted
» Many responses have been received
» Public comments solicited



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ENVIRONMENTAL ASSESSMENT

No Substantive Comments or Assessments

- Some Mitigated Impacts
  - Leaking Underground Tank Areas and Mitigation
  - Storm Water
  - Temporary Traffic, Noise, Dust

Decision:

- Environmental Assessment is Acceptable
- Environmental Impact Statement (EIS) is not necessary

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PROJECT FUNDING STRATEGY

Funding Sources Being Considered

- MCEP – Montana Coal Endowment Program
- DNRC – Department of Natural Resources and Conservation
- CDBG – Community Development Block Grant
- SRF – State Revolving Fund
- RD – U.S. Department of Agriculture Rural Development
- ARPA – American Rescue Plan Act

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PROJECT FUNDING STRATEGY

Target Rate Analysis for Grant Eligibility

» Using 2015-2019 American Communities Survey (Department of Commerce)

Medium Household Income (MHI)	**=$39,583**
Department of Commerce Target Rate Threshold:	
(Target Rate is 2.3% for combined water/wastewater)	
SS & Water Target Rate	**=$75.87/MO**
Current Combined Base Rate ($33 Sewer, $36.04 Water)	**=$69.04/MO base + Usage**
Percent Poverty	**=9.5%**
Low & Moderate Income (LMI)	**=77%**

- **Town is eligible for RD,CDBG Grants, SRF Loan w/ Forgiveness**
- **MCEP – combined rate to be at least Target Rate by end of Project**
- **(Note – need to determine average water usage fee to include)**

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PROJECT FUNDING STRATEGY – FINANCIAL POSITION

Town of Geraldine's Water Loans						
Loan	Date Issued	Interest Rate	Term of Years	Loan Amount	Annual Payment	Outstanding
Water Loan #1	7/1/2003	4.250%	40	$140,200.00	$7,380.00	$100,472.64
Water Loan #2	6/15/2005	4.250%	20	$103,500.00	$7,704.00	$17,954.08
Water Loan #3	4/5/2006	4.375%	40	$95,000.00	$5,040.00	$32,989.82
Totals				$338,700.00	$20,124.00	$151,416.54

Existing Water System Revenues and Expenses			
Line Item	2018	2019	2020
Revenues ($)			
Metered Sales	87,898.00	88,355.00	92,347.00
Bulk Water Sales	2,340.00	2,386.00	2,418.00
Installation Charges		120.00	110.00
Miscellaneous Revenue	6,923.00	1,754.00	1,737.00
Total Revenues	97,161.00	92,615.00	96,612.00
Expenses ($)			
Materials and Services	36,147.00	26,414.19	30,699.62
Employee Wages	29,406.14	27,856.57	23,399.70
Debt Payment	20,124.00	20,124.00	20,124.00
Total Expenses	85,677.14	74,394.76	74,223.32
Net Reserve	11,483.86	18,220.24	22,388.68

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PROJECT FUNDING STRATEGY

PROJECT FUNDING SCENARIOS ($2.58 Mil Project)

Note – Very Preliminary, Subject to change. Assumes existing rates, debt, O&M, grants

- **Scenario #1**
  - $500,000 MCEP Grant
  - $125,000 DNRC Grant
  - $600,000 CDBG Grant
  - $677,000 SRF Loan (2.5% 20 years) with 50% SRF forgiveness ($678k)
  - $8-10 per month rate increase
- **Scenario #2**
  - $500,000 MCEP Grant
  - $125,000 DNRC Grant
  - $600,000 CDBG Grant
  - $610,000 RD Grant (Assume 45%)
  - $754,000 RD Loan (1.5%, 40 years)
  - $5-7 per month rate increase

Note – RD has on past projects kept loan fixed and added grant for additional phases. (i.e. Sewer Project)

- **Scenario #3**
  - $500,000 MCEP Grant
  - $125,000 DNRC Grant
  - $570,000 RD Grant (Assume 45%)
  - $1,079,000 RD Loan (1.5%, 40 years)
  - $9-11 per month rate increase
  - (Example without a CDBG Grant)

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IMPLEMENTATION SCHEDULE

Action	Date
Public Hearing on Draft PER & EA, Adopt by Resolution	4/19/22
Apply for DNRC Grants	May 15, 2022
Apply for TSEP Grants	May 19, 2022
Apply for CDBG Grants	Fall, 2022
Apply for RD Grants o	Fall, 2022
MCEP Award and Contracting	June/July, 2023
Finalize Grant Financing and Budget	June/July, 2023
Contracting for Engineering Begin Design	June/July, 2023
Begin Design	July/August ,2023
Submit Design Plans and Specifications to MDEQ	November, 2023
MDEQ Review & Approval	January, 2024
Bidding Process	February/March, 2024
Finalize RD Loan Financing	April, 2024
Start Construction	May/June 2024
Complete Collection and Treatment System Construction	By November 2024

Note – The Phase 1 (ARPA Funded) Pipe Project is on a different schedule track and could start design in Fall of 2022 for 2023 Construction

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WEBSITE

www.geraldineinfrastructure.com

We Can obtain web visit metrics for app.

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WHERE TO GO FROM HERE

- Public Opinion
  - Is there support for the project?
  - Make a comment
- MCEP and DNRC Applications – May 2022
- CDBG and RD Applications – Fall 2022 (One per County per time)
- Phase 1 Project – ARPA award, startup, start design

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QUESTIONS OR COMMENTS?

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3/29/22

GERALDINE WATER WORK SESSION

NAME	#
MATT MUDD	
GREAT WBT	490-3909
Buck Goldhahn	
Homeowner S of Battle Water	739-4293
Rodger Black	737-4428
North Geraldine Water	
Brad Felger	868-1257
Monica	737-4368
Stephanie Baker	406-929-8702
Kathy Boyce	406-737-4361 work.
John Hilberg	406-737-4242
Bruce Lauerman	461-7072
Paul J Dostal	406 737-4486
Vim Woodborn	406-737-4223
Penny Joyce	406-737-4561
Shaya Clark	737 4296

Meeting Summary

Total Number of Participants	3	Virtual Attendance				
Meeting Title	Town of Geraldine Water Work Session					
Meeting Start Time	3/29/2022, 3:22:15 PM					
Meeting End Time	3/29/2022, 4:53:41 PM					
Meeting Id	5d769284-6bb6-4c68-af47-9c4bc045a36c					

Full Name	Join Time	Leave Tim	Duration	Email	Role	Participant ID (UPN)
Matthew Mudd	3/29/2022,	3/29/2022,	1h 31m	mmudd@g	Organizer	mmudd@greatwesteng.com
Julea Robbins	3/29/2022,	3/29/2022,	1h 20m	JRobbins@	Presenter	JRobbins@bearpaw.org
Susan Brurud	3/29/2022,	3/29/2022,	1h 12m	sbrurud@b	Presenter	sbrurud@bearpaw.org

Geraldine Water Project – Work Session

Great West Engineering

Date: 3/29/22

- General background/status of the water project
    - Phase 1 Project Identified: 6,300 feet of AC main replacement (and related valves, hydrants, etc)
    - Project Cost/Budget ($2.64 mil.)
        - 100% grant project
        - $2 million is the competitive grant, remaining is County and Town ARPA
    - Rankings – ETA, April
    - Award of Grant – ETA June/July

- What is a PER, why is it needed? How is it paid for?

- Problem summary (See attached)
    - Town needs to determine highest priorities

- Springs Assessment/Recommendations (Bruce)

- Project alternatives and budgetary costs (total project), funding options and potential user rate impacts

    - Distribution:
        - D-1 No Action
        - D-2 Phase 1 Distribution – replace the worst 4" (and smaller) and 6" AC pipe in North Main St. ($2.63 mil) – (ARPA project application)
        - D-3 Phase 2 Distribution – replace remainder of 4" AC ($2.5+/- mil)
        - D-4 Phase 3 Distribution –replace remainder of all AC pipe ($2.38+/- mil)
        - D-5 Replace All PRV/ARV stations – ($400k+/-)

    - Reservoirs/Tanks:
        - R-1 No Action
        - R-2 Rehabilitate (Epoxy/Seal) Concrete and Elevated Tanks ($187k+/-)

    - Treatment
        - T-1 No Action
        - T-2 Construct New Chlorination Station Building ($378k+/-)

    - Springs/Source:
        - S-1 No Action
        - Cost$

- Preliminary Project Funding Scenarios – Depends on priority and improvements selected
  - *Very Preliminary, Rate Impact analysis factors in current rate, # of service connections, current loans and expenses, potential project grants/loan*

  - D-2: Phase 1 (if ARPA not awarded) - $2.63 mil.
    - $1.84 mil grants (500k MCEP, 125k DNRC, 600k CDBG, RD 45%/55% grant/loan)
    - $4-6 rate increase
  - D-3: Phase 2 (if ARPA awards Phase 1) - $2.5 mil.
    - $1.80 mil grants (500k MCEP, 125k DNRC, 600k CDBG, RD 45%/55% grant/loan)
    - $4-6 rate increase
  - D-3 (Phase 2 Pipe)+T-2(Chl. Bldg) - $2.88 mil.
    - $1.97 mil grants (500k MCEP, 125k DNRC, 600k CDBG, RD 45%/55% grant/loan)
    - $7-9 rate increase
  - D-3 (Phase 2 Pipe)+T-2(Chl. Bldg) + R-2(Tanks upgrades)- $3.07 mil.
    - $2.05 mil grants (500k MCEP, 125k DNRC, 600k CDBG, RD 45%/55% grant/loan)
    - $8-10 rate increase
  - D-3 (Phase 2 Pipe)+T-2(Chl. Bldg) + R-2(Tanks upgrades) +D-5- $3.47 mil.
    - $2.33 mil grants (500k MCEP, 125k DNRC, 600k CDBG, RD 45%/55% grant/loan)
    - $12-14 rate increase

- Need Now:
  - The date/time/location of the public hearing (this must be advertised 2x before hearing)
  - What "project" to apply for in the grant applications and what to show to the public

- Schedule/Next Steps:
  - April 2022 – draft PER done, **complete a public hearing (Required)**
  - May 2022 – PER complete, submit (MCEP/DNRC state grant applications)
  - Fall 2022 – Submit RD and CDBG (federal) grant applications

- Website, Facebook, Project Support
  - www.geraldineinfrastructure.com
  - Need letters of support and comments to help public participation ranking

Problem Definition

A summary of the problems and deficiencies that were identified with the water system are listed in this section.

- Unsafe Chlorination Station – The water system receives disinfection through a chlorination station using liquid sodium hypochlorite at an injection point north of the springs. The vaults that contain the flow meter and injection equipment are in a confined space, and the Town's workers are unable to easily and safely operate and maintain the equipment. Additionally, the building that houses the chlorination equipment has begun to deteriorate to a state which allows rodents and other vermin access to the chlorination equipment.

- Leaking or Corroding Storage Tanks – Geraldine has two water storage tanks that provide operational, emergency and fire flow water storage. One is a partially buried concrete tank that is located south of Town, and the other is an elevated steel tank on the west edge of Town. The concrete tank has a reduced capacity because of a perimeter longitudinal leak in the upper zone. After a recent routine inspection of the elevated steel tank's interior, pitting in several areas has been discovered. The corrosion in the steel tank is a risk for potential leaking the future.

- Corroded Pressure Reducing Valves (PRVs) – There are three PRVs that regulate the pressure in the 6-inch PVC transmission line that runs between the springs and the Town. These valves have deteriorated severely and no longer operate effectively. Additionally, the vaults that house the valves have notable issues with soil and water intrusion.

- Outdated Air Release Valves – The air release valves along the transmission line have reached the end of their service life. The age of the valves has led to the Town occasionally experiencing air locks in the transmission line between the springs and the chlorination station. Air locks can cuase diminished flow capacity in a pipe and require operator attention to address.

- Leaking and Problematic AC Water Distribution Mains and Fittings – The Town's distribution system is comprised mostly of AC pipe that is 4 inches or smaller. These pipes

and fittings were installed in the 1950s, and the system is operating beyond its useful service life and experience significant leaks as well as water main breaks. The suspected causes for the leaking are the age of the pipes and weak points due to connections of AC and PVC pipe. Leaky water main piping presents a significant health hazard due to the potential for contamination from backflow events. There are areas in Town with petroleum spills which provides a ready contaminant for the leaky distribution system in the event of a backflow event. The potential for backflow is significant due to water breaks which commonly occur on the AC piping.

The material of the AC pipe can be extremely hazardous if exposed and broken because of the release of asbestos fibers. Not only is the pipe inadequate, but also the pipe itself presents a hazard to the community.

- Undersized Mains – Not only is the water distribution system old, but most of the pipe in Town is undersized. In several places, the 4-inch AC pipe connects to fire hydrants. According to DEQ, the minimum size for pipe to connect to a fire hydrant is 6-inches in diameter.

- Corroded and Inoperable Water Valves – Another source of leaking in the water system are the old water valves that have corroded severely. In addition to leaking, many of the gate valves in the system no longer function. The lack of useful valves has prevented the Town from being able to isolate small sections of the distribution system for maintenance and repair. Instead, large portions of the system need to be shutdown during leak repairs and often times with little or notice to the residents due to emergency repairs. The inability to isolate specific portions of a system is out of compliance with DEQ standards and poses a higher risk for potential pathways for contaminants to enter the water system when larger sections of mains are depressurized.

- Corroded and Inoperable Fire Hydrants – Most of the fire hydrants in Geraldine are over 60 years old and have experienced significant corrosion damage. Like the valves, the fire hydrants are leaking and lack functionality. Since the fire hydrants are in poor condition and they are fed by undersized lines, the Town is unable to provide adequate fire flow through the hydrants, leaving the public at risk to fire.

- Lead Services – There are two known lead services in Town. The services each serve a residence at 226 Spring St. and 342 Main St. Lead services are a potential health hazard to the users who receive water through the service.

- Outdated System Control and Data Acquisition (SCADA) System – The Town uses an outdated SCADA program to monitor and operate their water system. The hardware and software are both no longer supported. The SCADA system that the Town utilizes is vulnerable to failing and leaving Geraldine without any control of their system.

- Springs Contaminant Threats – The current fencing around the spring area is undersized and provides inadequate protection from livestock/wildlife fecal contamination. In addition, the spring collection galleries were not constructed with an upper liners/impermeable materials to effectively inhibit surface water intrusion. The significant vegetative growth atop the collection galleries provides habitat for rodents and other small animals and poses a risk of roots clogging the buried spring collectors. The associated organic-rich soil horizon that has developed over time is a risk to spring water quality.

- Incomplete Spring Water Collection As-Builts – The records reviewed to date do not provide a clear understanding of the configuration of the spring water collection system. Spring 5 is reported to be tied to the municipal system, but the design and connection of Spring 5 is not well documented.

- Limited Documentation of Spring Flows – The Town monitors production of spring water through a totalizing flow meter at the chlorination station, but does not have a record of actual spring flows which include overflows at the springs site. There are no historic records of spring discharges from the individual spring collectors which limits the Towns ability to manage and maintain the spring collection system.

Geraldine Council Meeting

October 12, 2021

Project Update - Great West Engineering

1. **<u>Wastewater Project</u>**
    a. **Substantial Completion.** Achieved on all in-town sewer work now that paving is done.
        i. A punch list was given to Central and all in-town items completed.
        ii. Central is in the 1-year warranty period for work after substantial completion.
    b. **UV/Chem/Control Building.** official startup/training date is still pending. The UV bulbs are still caught up in Customs. Central wants this completed as much as anybody else to be able to finish out the project.
        i. We are withholding final payments and release of retainage until this UV work is done.
    c. **Patch Paving Done.**
        i. Additional Paving on Flagler at the Park is done and looks quality.
        ii. Central has invoice the Town Directly for the additional grading and paving work. This is paid directly by the Town to Central.
    d. Next Steps:
        i. Great Wests contract includes preparing as-built drawings and preparing an O&M manual for the UV building. We will be working on these in the coming months.
        ii. We will be up for the final startup/training and final acceptance site visits.
    e. Post Office Storm Drain Work.
        i. Per RD, there are sufficient funds to complete the PO Storm Work. (RD stated there is over $57,000 in contingency).
        ii. The cost of the remaining work is about $36,000
        iii. Central is willing to come back to do the work
        iv. Great West will need to re-design the alignment (to get it on the final plan as the pipe line will have to be re-directed around any future building on the Town lot)
        v. Because the design/plan needs to be updated and we have to do a return trip to inspect, an Amendment is needed to cover additional design and inspection.
        vi. Also - Permission to enter the Post Office Property is coming together. I have been in touch with the lot owner for permission. Her name is Annette Smith with Morell Creek Holdings out of Colorado. Before they give permission – they had questions about if the Town will do maintenance on the storm line, and if the Town will be claiming right of way on the Post office Property. I do not believe the Town will need to claim right of way on the PO lot (as its an extension of the PO Storm pipe, not Town's) and I don't believe the post office does much/if any maintenance on the SD line now. Maybe cleaning out sediment yearly would be the extent of what is needed.

vii. I suggest setting up a call with Geraldine and Property Owner to hash out their concerns.

viii. **Action by the Town is needed to proceed. An amendment for $4,500 to cover these items is provided to the Town. Please sign the task order and return to Great West to proceed with the work.**

2. **Water Project**

   a. **ARPA Application.**

      i. The ARPA application for competitive a competitive grant was submitted in July and the Town ranked 96 out of 241 applications. Up to project 75 got funded.

      ii. Bear Paw and Great West believes it is in the best interest of the Town to re-apply for the second round of ARPA competitive grants due by January 14. (with 75 less projects)

      iii. We believe the application should also include the springs hydrogeologic study to add more points make it more competitive.

      iv. It isn't much more effort on Great West and Bear Paw

   b. **Water Preliminary Engineering Report (PER)**

      i. PER Contract has been sent to the Town (Large Document)

      ii. Fee is $50,000 which is for a comprehensive PER on the entire water system (source, treatment, transmission, piping, storage, distribution, usage, etc.)

      iii. A PER is a first step and needed to apply for all grants for long-term improvements

      iv. The PER is fully funded through grants (To Date Town has received $30,000 RD SEARCH grant, $15,000 MCEP grant and has up to $500,000 set aside by Chouteau County for a Water Project.

      v. **Action by the Town is needed. Please Sign and Return the Task Order Page and the Contract Page**

      vi. I have included a list of items needed by the Town for the PER. I will be in touch soon to follow up on these items.

Town of Geraldine Council Meeting - Great West Project Updates

July 13th 2021

Wastewater Project

- Project status:
    - Presently Central is 60% complete based on cost ($1.47 million of total $2.47 million contract)
    - Substantial completion is at August 17th plus added delay/rain days to be added.
        - (Note that we have been tracking rain days from earlier this year to be added on and CO-9 adds some days)
        - The contractor will still have 30-60 days beyond substantial to get to final completion and address the final punch list items, but major underground work will be done.
    - Central is Currently doing open cut on Main St this week as you can see moving north.
    - Work at the lagoon site is moving along. Cell 2 has been lined and rip rapped. Cell 1 has been lined and should be done soon.
    - UV building status is _____
- Post office storm drain work
    - Will leave this part of the work off.
        - We looked at revising the storm drain alignment, but this requires access/permission in the PO property.
    - Since authorization/permission has not been received, the project can leave off the contract and allow the approximately $36,000 in budget for contingency.
- Additional Alley Sewer and Contingency Funds
    - We recommend that we see where the project costs are by August to see if there is enough contingency to do another alley of sewer design and construction.

Water Project

- We are supporting Bearpaw for the ARPA application
- We have completed a tech memo to support the application
    - Scope, which we will call Phase 1 project, includes replacing old undersized 4" AC mains and hydrants. There is over 9,300' of this in Town.
    - Piping has been encountered in many crossings on the sewer project in Town
    - We have done research on water system. Also performed some hydrant testing.
    - This information will inform the upcoming PER
- Great West and Bear Paw approached and attend the Chouteau County commissioner meeting, with Perry and Sue, and County has set aside $500,000 for the water project with ARPA funds.
- Still plan to do a larger Water PER study to look at all the system once it is funded with RD SEARCH and TSEP/DNRC planning grants

Other:

- Hybrid steel provided information to GWE and Bearpaw. This water project may be eligible for an EDA grant.

TOWN OF GERALDINE
Town Council-Senior Citizen Hall
Regular Meeting 7:00 pm July 13, 2021

Mayor Perry Joyce called the meeting to order. The pledge of allegiance to the flag was said Present were the mayor, council people, Monica Rice, Tammey Ludeman, and Marty Clark. Also present were Jon Helberg, director of public works and Rosemary Scott,clerk. Karen Fairbanks was absent. The guests included Dylan Pannabecker-Great West Engineering, Trish Stevenson-Bearpaw Development, Kathy Bond, Carole Locquiao, Brooks Anderson, Will Muir, Will Hucke, Levi/Ashley Clark, Butch Hankins, Rich Owens,

Minutes from previous meeting were read and approved as read, motion made by Tammey, seconded Marty, motion carried.
Treasurer's report and claims Monica questioned the fact that the report showed the garbage fund was running in the red. Discussion followed, Motion to approve by Marty, second by Monica. Motion carried.

Public Comment –Perry thanked Carole for bringing treats again and Marty for bringing the coffee
Continuing business :
Sewer project-Great West Engineering, Dylan Pannabecker subbed for Matt Mudd who was on vacation, he read a statement by Matt:sewer project is about 60% finished, still looking at end of August as the completion date. The uv building is 89% complete, only a few more things to be done. Construction meeting to be held on Wed. this coming week because of Matt being on vacation. The county has set aside 500,000 for the water project.
Water project funding Trish Stevenson with Bearpaw Dev.- Trish presented the draws/corresponding invoices with corrections for the mayor to sign. Motion made by Monica, second by Tammey. Motion carried.Trish said that the grant for the water project is done but cannot submitted without the commitment letter signed by the mayor for 143,000. Discussion involved the Arpa pot a money which half was just received, possibly getting a loan instead of using the pot a money. The clerk said that according to the other clerks the town needs a resolution in the year the money is spent. Trish said "no, they did not need a resolution" Perry said we could do the resolution later.Monica moved to approve the mayor signing the commitment letter, second by Tammey. Motion carried.
Discussion of arpa pot a funds already received- included in previous discussion
Ordinance on building permits- tabled until next meeting

Jon Helberg's report –doing a dig by Corey and Shaya Clark's, been very busy, vacation scheduled for Sep.4 for a week
New Business:
Resolution 305- mail-in ballots for elections- Monica moved to approve the resolution because of the savings of having the mail in election, second by Tammey, motion carried with Marty abstaining because she did not know how much the savings would be.
Levi and Ashley Clark-availability of water- handed out a sheet of info about their business Hybrid Steel and how it has expanded which results in their need for more water. They are requesting to be hooked into the town water system, they would pay all expenses. After discussion it was decided that the mayor would take the next step of consulting with the town attorney in regards to liability issues, also the amount of water available.
Airport Water system-Rich Owens from the airport board and Butch Hankins presented information on the airport project. One of the glitches was that Chuck/Karen Davis and Lance/Trish Juedeman were without water because of a broken water line that had been broken. There is a question if the water line should run where it currently runs even tho Butch repaired the line and the water customers got their

water access back. Monica said that the Davis' should not be billed and Perry said that Juedeman's should also have their bill refunded for the month. Rich said they anticipate finishing the airport in late Oct. and there will be a celebration at that time. The public will be invited.

Resolution 306 to put past due water account on property taxes. Marty moved to approve the resolution putting the past due amount on the property owner's taxes. Second by Monica, motion carried. Question was asked why one of the 3 overdue accounts was going to be put on taxes, the clerk replied that the resident said they did not have the money and if they shut the water off there would be nothing she could do about it. Perry said that then it was her choice.

Davis/Juedeman water line discussion included in previous discussion

Water meter-hookups that don't have meters After a short discussion Marty moved that residents who have city water but are not metered need to be billed the flat rate, second by Monica, Motion carried. Park availability was discussed and when the sewer project would have the park dug up, there are some functions scheduled to be held there..

Past Due Utilities:the clerk said the two were sent shut off notices, the third was the resident whose bill will be put on the taxes. Marty asked if Rick Clark had been sent a notice, the clerk thought it was a person who lives here and that he must have been on the list and said yes. She should have said that if he was on the list he was sent a notice. Rick Clark is an owner of a property that was getting shut off notices. Owners are notified if the past due amount is being put on the taxes but not if it is to shut off the services.

Council Reports Meeting adjourned 8:40 pm.

MAYOR CLERK

TOWN OF GERALDINE
Town Council -Senior Citizen Hall
Regular Meeting 6:00 PM
October 12, 2021

Mayor Joyce called the meeting to order with the pledge of allegiance to the flag. Present were council members Monica Rice, Karen Fairbanks,and Marty Clark. Tammey Ludeman was absent. Also present was Jon Helberg, public works director, Rosemary Scott, clerk, guests:Kathy Bond, Carole Loquiao, Karen Trenner, Brad Felger

Minutes of the previous meetings were read- Special Meeting on 8/31/2021- Monica noted a typo error , Marty moved to approve as read, second by Karen. Minutes were approved. Regular meeting 9/14/21- Monica said she would like it stated how much the 2 bids were on the sidewalk. Perry said that info would be put in, Butch Hankins was 3300.00 and the other bid was for 3350.00. Karen questioned the part about Perry giving Karen the info she requested. She did not remember asking for any info. The clerk said it was regarding water shutoffs and when the letters were sent out. Monica moved the minutes be approved as corrected, second by Karen. Motion carried.

Treas. Report and claims. Karen questioned the check to DEQ for connection fee and that Gary Slaback was paid for using his bobcat, Jon answered. She also questioned why we charged items at the True Value and did not use the debit cards. Perry answered that we had had an account there for years. Marty moved to approve the claims and treas. Report, second by Monica. Motion carried.

Public Comment –Brad Felger introduced himself, he said he and his wife Sue have recently moved here and that the community has given them a warm welcome.

Continuing business: Perry would like to have recommendations on what to do about the barking dogs, he said bark collars work well. Discussion followed. Tabled until there is more information.Karen stated that we also have a skunk problem.Monica stated that anything tabled has to be brought up at the next meeting.

Sewer project Matt Mudd the engineer for Great West Eng.had sent several items over for the meeting since he was not able to attend. One item was an amendment regarding re-doing the drain at the post office parking lot. Monica moved to approve signing the amendment, second by Marty. Motion carried. Bearpaw Dev. had prepared draws with corresponding invoices for Sep meeting and for the Oct. meeting and had been sent to the council by email,Mmonica moved to approve both sets of draws and invoices, second by Marty. Motion carried.

Sale of Fire Truck Perry said we received an email from MMIA saying that if we had an agreement with another fire department the town did not have to have its own truck. Perry was working with Aaron Jones the fire chief, and that we would have to advertise before selling. It is presently stored up at CHS.

Water Project Marty moved that we sign the per contract with Great West, second by Monica. Motion carried.

Garbage Dump/fees/hours Marty reported that new hours were posted, 10-12 m.w.f. and 2-4 on Sunday, Karen said that would not work if they were making multiple trips, Perry said that people could get a hold of him or Jon to be able to access the dump at other times. Monica again said that she thinks the residents rates should be raised to make up for the revenue deficit. Marty disagreed. Monica said we should have a new ordinance regarding dump fees and that Marty and Tammey should prepare the ordinance because they are on the garbage committee, she stated that Andy Rice had taken 12 loads to the dump of burnables and 1 of nonburnables, and that he should not be charged construction fees. Perry said that garbage coming from out of town needs to pay for non burnables. More discussion.

Jon Helberg Report:Jon reported that they had winterized the park bathrooms, working on filling holes in the street, working on cleaning up the dump
New Business: Perry said that Steel Etc. would bring out a dumpster for metal at no charge to the town, at this time Jon was notified of a fire alarm going off at the bank and he left the meeting and returned later.
Gravel left over from sewer project Perry reported that Central is wanting to sell the leftover gravel to the town for 34,225.66. After a short discussion the council rejected the offer.

Past Due Water: past due accounts were reported and the clerk said that shut off notices had been sent
Council report: Marty reported the sign at the rv dump needed to be put back up as well as the stop sign on Main and Flagler. Short discussion on charging people for using the rv dump.
There being no more business the meeting was adjourned at 7:08.

MAYOR

CLERK

TOWN OF GERALDINE
Town Council Regular Meeting-Senior Citizens Hall
Minutes
12/14/2021 6PM

Mayor Joyce called the meeting to order at 6:00 with the Pledge of Allegiance.Council members Monica Rice, Tammey Ludeman, and Marty Clark were present. Karen Fairbanks was absent. Also present was Jon Helberg, Director of Public works, and Rosemary Scott, clerk, guests: Matt Mudd from Great West Engineering , Brooks Anderson, Len Duvall,Shaya Clark with baby Chesney, and Carole Locquiao, and Kathy Bond, mayor elect.

Minutes of the previous meeting were read, Tammey added that she had given the clerk contact into for Rick Clark, The mayor also added that the firetruck is now being housed in the town shop and that it has been decided that the town will not be selling the truck since it was used during the last fire in Denton. The town had not advertised for bids and so there are no bids to open.

Motion to approve as corrected by Tammey and seconded by Monica , motion carried. The treasurer's report was reviewed along with claims, Monica moved to approve the treasurers report along with the claims. Second by Marty, Motion carried. Monica questioned the dog treats on the grocery bill, Jon said it was to give to dogs so he could go in and read the meters

Public Comment –Brooks Anderson stated that he thought the town needed to do something about his wife, Tammey Ludeman being treated disrespectfully by the clerk. He then asked his wife to explain. The clerk asked the mayor 4 times to stop the verbal statements Tammey was making which the clerk denied as false but he would not stop it. He said they had their 3 minutes and then the clerk could have her say. Monica stated that the clerk had tried to get Karen fired from the bank and the clerk vehemently stated that was a lie and they could verify by talking to Jeanie, Karen's supervisor. She also said she had not tried to get Tammey fired when she called the school superintendent to find out if Tammey and the co worker she brought down that day were on the time clock for the school, that the clerk was only making a complaint about it. She ended by making a public apology for getting drawn into the web of evil and said that she was open to anyone who had a complaint and that they should sit down one on one and resolve the issue.

Continuing business SEWER Project:Matt discussed the draw requests were presented for approval: requests and the corresponding invoices that the funds will pay , motion to approve by Marty, seconded by Monica. Motion carried with the letters of completion being on hold until it was determined how much was left in the grants. Matt said that to reimburse the town for the additional lab bills that were required for the sewer project they needed copies of the invoices, the clerk stated that she wanted to be assured that if she spent hours digging the invoices out that they would be paid. Previously she had presented a list of items that had been stated would be reimbursed to be told that they could not be reimbursed for various reasons. Matt said he could not put it in writing that they would or would not be approved. The clerk said she would contact Craig Carlson from RD. Matt said he needed an invoice for the audit before it could be approved, the clerk stated that we have not even accepted a bid yet so do not have an invoice. And that there will be two years of audits. Matt discussed the sewer project and that water pipe issues that resulted from the sewer work would not be covered under the one year warranty. Monica moved that the reconciliation bid change for sewer project #12 be approved, second by Tammey , motion carried. Matt reported on the status of the water grant, the grants will be awarded Jan.14, he explained the different needs that the town had, lead water pipes were discussed. Matt said that the grant would not include any water pipes in the house, at present there are 2 residents that cannot have meters on them because of lead pipes. He asked if the town wanted to focus on the springs or on existing old wells. It was said that the wells should be flushed from time to time and be available in case of firefighting needs. The water has Sulphur in it which makes it undesirable for drinking.

Leftover Gravel. Perry said that Central will take 17,000 for the gravel, since that was half the original price motion was made by Monica and seconded by Tammey to accept the deal, Monica said as long as the gravel got moved from where it is. Motion carried.

Sale of Firetruck The council unanimously agreed to keep the firetruck.
Levi and Ashley Clark access to water system the Clarks will attend the January meeting as they were not able to attend this meeting
Audit bid the bid from JCCS of 20,000 was presented to the council for approval, Monica said we need more than one bid, the mayor said we would ask other firms for a bid. Wipfli has rescinded their previous bid of 17,000 due to being shorthanded.
Jon Helberg Report: Jon said that they were putting up the xmas lites, working on streets and hauling gravel. Perry stated that the lites look great
New Business:
Holiday bonuses for employees: Monica stated that the sewer project had caused a lot of extra work for Jon and Rosemary, Marty said that the other employees should also receive more of a bonus. After discussion Monica moved that Jon and Rosemary receive 500.00, Philip receive 150.00, and Gary and Mirjam Thomas receive 75.00 each. Second by Tammey. Motion carried.
Resolution 313,314-amending 2021 budget-gas tax and garbage fund respectively The mayor and the clerk read a statement from Magda Nelson who advised that since the two funds for year ending June 30, 2021, were not as budgeted that the amendments needed to be on file for the auditors. Monica said the public had to be asked for comment, the guests at the meeting agreed to the resolutions being approved. Marty moved we approve the resolutions, second by Monica, motion carried.
Dan Clark school for incoming elected officials –Jan.25- the mayor announced it would be 4-7pm at the senior citizens hall
Past Due Utility bills-none
Council Reports/Mayor Report Marty reported that she and Tammey had met and that Tammey had come up with more names of people receiving garbage pickups but not being charged. Marty has given that info to the clerk for correction. Monica asked the mayor if there would be a lowering of the sewer fees now that the project was done, Perry said that it was too early yet to say. The mayor read the clerk's letter of resignation, her last day will be 12/31/21 and thanked her for her years of work, he also thanked the council for their hard work. Marty replied by thanking Perry for all his years of work as mayor.
Meeting adjourned at 7:50pm

MAYOR CLERK

Town of Geraldine

Mayor Kathy Bond

Council Members: Brad Felger Monica Rice Shaya Clark Perry Joyce

P.O. Box 211 Geraldine, MT 59446 (406) 737-4361 gertown@itstriangle.com

Town of Geraldine
Town Council Meeting Minutes – Town Hall
7:00P.M. –February 8th, 2022

Mayor Bond called the meeting to order at 7:00p.m. with the pledge of allegiance to the flag. Present were council members: Shaya Clark, Perry Joyce and Monica Rice. Guests present were: Bruce Lauerman, Michael Baker, Stephanie Baker, Levi Clark, Ashley Clark, Virginia Johnston, Calvin Clousing, Carol Locquiao, Jon Helberg and Brad Felger,

Minutes: Minutes for the regular meeting on 1/11/22 were approved with corrections. Treasurer report and claims approved as read.

Public Comment: Levi Clark commented on the ongoing progress of getting approval for city water.

Continuing Business:

1. Bruce Lauerman introduced himself and gave a short summery on his what his plans are with the ongoing assessment of the springs. He has 25 years' experience in working as a hydrogeologist.
2. Three candidates were introduced for the new council member position. Each candidate gave a short speech on why they wanted to be on the council. The candidates were: Brad Felger, Virginia Johnston, and Calvin Clousing. A vote was taken with Brad announced as the winner. Brad was sworn in by Perry Joyce.
3. Committees were appointed and Shaya was elected council president.
    a. Streets: Monica and Shaya
    b. Parks: Shaya and Perry
    c. Water: Monica, Perry and Brad
    d. Sewer: Monica and Brad
    e. Finance: Shaya
    f. Street Lighting & Garbage: Brad and Perry
    g. Marketing & Tourism: Perry and Shaya
    h. Airport: Monica and Perry
4. A motion was made to hire Stephanie as the town clerk. Perry moved to hire and the motion was seconded by Shaya. Approved by general consensus.
5. New signers on the Bank Accounts are Kathy Bond, Stephanie Baker and Shaya Clark. Approved by general consensus.
6. A motion was moved that council members would be payed per meeting. Moved by Monica and seconded by Shaya. Approved by general consensus.

Jon Helberg – Report: Stop sign was reinstalled on Flager and Main. Water main break repaired on Hilger and Long st. Multiple water meters have been repaired. New street signs need to be ordered.

Past Due Utility Bills: Mayor stated that the first 10 day notices have gone out and the second 10 day notices will go out asap. Monica stated that precedence has been set to accept partial payments.

Meeting adjourned at 8:03pm.

_____ _____

Mayor Kathy Bond Town Clerk Stephanie Baker

Town of Geraldine

Mayor Kathy Bond

Council Members: Brad Felger Monica Rice Shaya Clark Perry Joyce

P.O. Box 211 Geraldine, MT 59446 (406) 737-4361 gertown@itstriangle.com

Town of Geraldine
Town Council Meeting Minutes – Town Hall
7:00P.M. –March 8th, 2022

Mayor Bond called the meeting to order at 7:00p.m. with the pledge of allegiance to the flag. Present were council members: Monica Rice, Shaya Clark, Brad Felger and Clerk, Stephanie Baker. Guests present included: Michael Baker, Levi Clark, Ashley Clark, Carol Locquiao, Jon Helberg and Tammy Ludeman.

Minutes: Minutes for the previous meeting on 02/08/22 were approved with corrections. Treasurer report and claims approved as read.

Public Comment: None.

Continuing Business:

1. **Annexation**: The Clark's requested a meeting to discuss the annexation after they get more information.

New Business:

2. **City man raise**: More information was requested by Shaya before voting on a raise. Discussion tabled until next month.
3. **Office hours**: Motion was made by Monica to approve office hours for the new clerk as Monday through Thursday 9am to 3pm with lunch from 12pm to 1pm. Motion seconded by Brad, motion carried.
4. **New Administration Policy**: Reviewed by council, additions were requested by Brad. Motion to approve tabled until the April meeting
5. **Business Email Addresses**: Individual email addresses for each council member to be passed on to the next member was motioned by Shaya, Seconded by Monica. Emails shall be
    a. gertowncouncil1@gmail.com for Perry Joyce
    b. gertowncouncil2@gmail.com for Monica Rice
    c. gertowncouncil3@gmail.com for Shaya Clark
    d. gertowncouncil4@gmail.com for Brad Felger
6. **Sewer Account**: Sewer account will be used for the water project going forward.
7. **Draw #10**: Motion to approve Draw #10 (for GEW and BP invoices) made by Monica, approved by Shaya, motion carried.
8. **Special Water Project Meeting**: March 29th at 3:30pm was agreed for the Water Project Meeting with Matt Mudd and Bruce Lauerman.

Jon Helberg – Report: Worked with Bruce at the springs, flow testing and checking for repairs, worked with Central on fixing manholes, cleaned steel at the dump, controlled burn at dump and football field. Met with Dave at meat processing plant to discuss what is needed to have a USDA meat store.

Past Due Utility Bills: Mayor stated that the first 10 day notices have gone out.

Meeting adjourned at 8:15pm.

_____ _____

Mayor Kathy Bond Town Clerk Stephanie Baker

Geraldine Infrastructure (http://geraldineinfrastructure.com/)

Welcome (http://geraldineinfrastructure.com/)

Welcome to www.geraldineinfrastructure.com (http://www.geraldineinfrastructure.com). The purpose of this website is to keep you informed about Geraldine's latest effort to upgrade its water system. Over the next several months we will provide you with information about the Preliminary Engineering Report (PER) update that the Town is developing with assistance from Great West Engineering of Helena and Bear Paw Development Corporation.

We will also give you regular project updates, and in return, we hope you will ask questions about and comment on the project. Check out the latest meeting minutes and information available to download. Your input and support are vital to the success of Geraldine's mission to provide a reliable, safe, and compliant water system that meets the Town's needs. So please, look around and come back often to see what's happening at www.geraldineinfrastructure.com (http://www.geraldineinfrastructure.com).

Public Meeting Schedule

There are no upcoming events at this time.

Pages

About the Project (http://geraldineinfrastructure.com/about-the-project/)
Comment on Project (http://geraldineinfrastructure.com/comment-on-project/)
Download Project Documents (http://geraldineinfrastructure.com/download-project-documents/)
Project Funding (http://geraldineinfrastructure.com/project-funding/)
Project Schedule (http://geraldineinfrastructure.com/project-schedule/)
Welcome (http://geraldineinfrastructure.com/)
What's a PER? (http://geraldineinfrastructure.com/whats-a-per/)

Search …

Thanks for Visiting

This website has been developed to keep you informed on whats going on with Geraldine's infrastructure.

Geraldine Infrastructure (http://geraldineinfrastructure.com/)

About the Project

The Town owns and manages the community's water system which includes over 23,000 feet of water mains ranging in sizes from 2-inch to 8-inch and being made of asphalt cement (AC) and polyvinyl chloride (PVC). The majority of the water piping is town is AC piping that has caused recurring pipeline ruptures. There is also over 14 miles of PVC transmission line that transports water from the springs 3 miles south of the Town of Square Butte to Geraldine. Recent improvements to the water system include the development of the springs in the 1980s, the upgrade of the treatment equipment in 2002, and the construction of a concrete storage tank in 2005.

The Town needs to address the following overall water system issues:

- Geraldine has over 12,000 feet of undersized AC water mains (<6-inch) that have known issues of leaking and tendencies of rupturing.
- Many of the valves and hydrants in Town do not function properly and leave the community susceptible to fire.
- The elevated steel tank in Town and the concrete storage tank south of Town require maintenance work to repair the interior.
- The pressure reducing valves along the transmission line have reached the end of their useful design life and experience soil intrusion into the vaults.
- The chlorination treatment building and equipment have reached the end of their useful design life and require replacement. The treatment facility requires confined space access.
- The springs, which are the primary drinking water source to Geraldine, are under review by professional hydrogeologists. The springs collector system may require upgrades.

A PER is needed to evaluate alternatives to identify deficiencies in the distribution system, treatment process, and storage facilities in order to bring the entire water system into compliance with DEQ standards. The PER will also analyze the deficiencies to determine the priority for improvements to be made to the water system.

Public Meeting Schedule

There are no upcoming events at this time.

Pages

Welcome (http://geraldineinfrastructure.com/)
What's a PER? (http://geraldineinfrastructure.com/whats-a-per/)

Search …

Thanks for Visiting

This website has been developed to keep you informed on whats going on with Geraldine's infrastructure.

Geraldine Infrastructure (http://geraldineinfrastructure.com/)

Project Schedule

The project schedule will be updated as the PER is developed.

- **Town of Geraldine**
- **Project Implementation Schedule**

Action	Date
Public Hearing on Draft PER & EA	March 2022
Draft PER Complete	March 2022
Town Resolutions, PER adoption	April 2022
Prepare Final PER	May 2022
Apply for DNRC and MCEP Grants	May 2022
Apply for CDBG and RD Grant Funding	Fall 2022
DNRC and MCEP Awards	May 2023
Finalize Grant Financing and Startup	July 2023
Begin Design	August 2023
Design Basis Report/Cost Estimates to the Town of Geraldine	September 2023
Submit Design Plans and Specifications to MDEQ	September 2023
MDEQ Review & Approval	November 2023
Advertise for Bids	December 2023
Start Construction	March 2024
Complete Construction	October 2024

Public Meeting Schedule

There are no upcoming events at this time.

Pages

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Comment on Project

Your feedback counts! Please use the form below to let us know what you think.

Your Name (required)

Your Email (required)

Subject

Your Message

Send

Public Meeting Schedule

There are no upcoming events at this time.

Pages

Search …

Thanks for Visiting

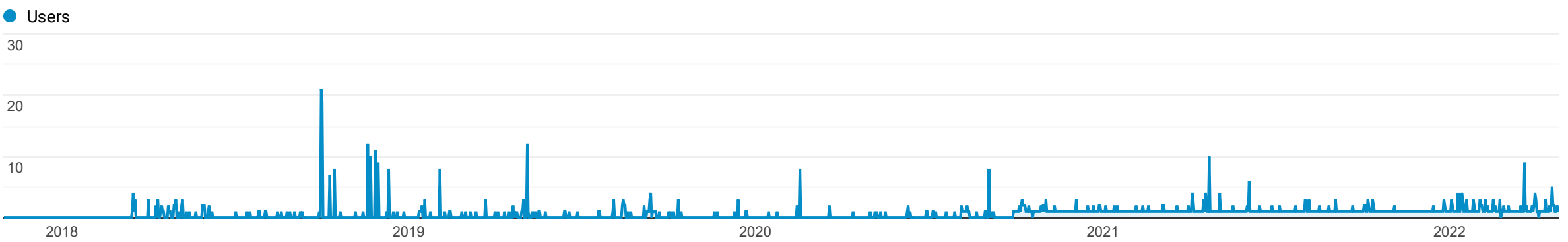
This website has been developed to keep you informed on whats going on with Geraldine's infrastructure.

Audience Overview

All Users
100.00% Users

Nov 1, 2017 - Apr 26, 2022

Overview



Users	997
New Users	999
Sessions	1,090
Number of Sessions per User	1.09
Pageviews	1,637
Pages / Session	1.50
Avg. Session Duration	00:00:42
Bounce Rate	87.52%

	Language	Users	% Users
1.	en-us	932	93.48%
2.	fr-fr	40	4.01%
3.	zh-cn	17	1.71%
4.	"en-us"	3	0.30%
5.	c	2	0.20%
6.	(not set)	1	0.10%
7.	en	1	0.10%
8.	pt-br	1	0.10%

Public Notice

NOTICE OF PUBLIC HEARING

The Town of Geraldine will hold a public hearing on Tuesday, April 19, 2022. The public hearing will begin at 6:30 p.m. at the Senior Citizens Center, 420 Main Street, in Geraldine Montana. The District has scheduled the hearing to obtain public comments regarding the proposed improvements to Town's water system. With assistance from Great West Engineering and Bear Paw Development, the Town is preparing a water preliminary engineering report (PER) and is preparing applications for funding from the Montana Department of Commerce's Montana Coal Endowment Program (MCEP), the Community Development Block Grant Program (CDBG), and also the Montana Department of Natural Resources and Conservation (DNRC) and USDA Rural Development (RD) programs.

At the public hearing, representatives of the Town, Great West Engineering and Bear Paw will explain the purpose of the project, the project area, the scope of work, budget, possible sources of funding, and any costs that may result for local citizens because of the project. An assessment of the project's potential impact on the environment will also be presented. Copies of the draft environmental assessment are available upon request and at the hearing. During the public hearing; residents may ask questions and express their opinions regarding the project and its impact on the District.

Residents can submit written comments and questions about the project by contacting Great West Engineering's Project Manager Matt Mudd, PE, at (406) 495-6196 or mmudd@greatwesteng.com or logging on to www.geraldineinfrastructure.com.

Publish The River Press April 6 & 13, 2022

MNAXLP

AFFIDAVIT OF PUBLICATION

STATE OF MONTANA
COUNTY OF CHOUTEAU ss.

I, Bethany DeBorde, publisher of The River Press, a weekly newspaper at Fort Benton, Montana, do solemnly swear that a copy of the notice as per clipping attached, was published weekly in the regular and entire issue of said newspaper, and not in any supplement thereof, for

2 .....consecutive week(s), commencing with the issue

dated April 6 ,2022
and ending with the issue

dated April 13 ,2022

.....

State of Montana
County of CHOUTEAU

Subscribed and sworn to before me this

15th day of April, 2022

.....

.....

CINDY S FARWICK
NOTARY PUBLIC for the
State of Montana
Residing at Fort Benton Montana
My Commission Expires
August 2, 2023

APPENDIX J

Water Supply Springs Easement and Usage Agreement

MISCELLANEOUS

PROVISIONAL PERMIT

*41R *

58095

00

Current File Location: HAVRE REGIONAL OFFICE

Box Bar Code _____

File Bar Code _____

Date/Initials _____

STATE OF MONTANA
DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
1424 9TH AVENUE P.O.BOX 201601 HELENA, MONTANA 59620-1601

58095-00

GENERAL ABSTRACT

NA

Water Right Number: 41R 58095-00 PROVISIONAL PERMIT
Version: 1 -- ORIGINAL RIGHT
Version Status: ACTIVE

Owners: GERALDINE, TOWN OF
PO BOX 211
GERALDINE, MT 59446

Priority Date: NOVEMBER 20, 1984 at 10:00 A.M.
Enforceable Priority Date: NOVEMBER 20, 1984 at 10:00 A.M.

Purpose (use): MUNICIPAL

Maximum Flow Rate: 250.00 GPM

Maximum Volume: 400.00 AC-FT

Source Name: GROUNDWATER
Source Type: GROUNDWATER

Point of Diversion and Means of Diversion:

ID	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1		NWNWNW	27	20N	12E	CHOUTEAU

Period of Diversion: JANUARY 1 TO DECEMBER 31
Diversion Means: DEVELOPED SPRING

Purpose (Use): MUNICIPAL
Volume: 400.00 AC-FT
Period of Use: JANUARY 1 to DECEMBER 31

Place of Use:

ID	Acres	Govt Lot	Qtr Sec	Sec	Twp	Rge	County
1			N2SW	11	20N	12E	CHOUTEAU
2			S2	1	21N	11E	CHOUTEAU
3			S2N2	1	21N	11E	CHOUTEAU
4			N2N2NE	12	21N	11E	CHOUTEAU

Geocodes/Valid: -- NO VALID GEOCODES --

NA 58095-00

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

HAVRE FIELD OFFICE

TED SCHWINDEN, GOVERNOR

P. O. BOX 1828
1708 WEST 2ND STREET

STATE OF MONTANA

(406) 265-5516

HAVRE, MONTANA 59501

October 17, 1985

M E M O R A N D U M

TO: Waive Notice Committee

FROM: Marvin Cross, Engineering Analyst
Havre Field Office

SUBJECT: Waiver of Public Notice on Application No. 58095-g41R
by the City of Geraldine

The following is a synopsis of the above referenced application:

Source: Groundwater spring, a tributary of Butte Creek.

Point of Diversion (POD): NW NW NW Sec. 27, T20N, R12E
Chouteau County

Water Quantity: 250 gpm - 400 AF/yr. for municipal use

Diversion Means: Horizontal well with 6" PVC class 160 pipeline.

Place of Use: City of Geraldine, Meissner Ranch, and various other ranches.

I recommend that public notice of this application be waived for the following three reasons:

1. The City of Geraldine is in bad need of a new water supply as soon as possible. The City currently pumps water from a series of wells. Both the quantity and quality of the well water has drastically deteriorated in the last few years. City sprinkling was curtailed as early as May 20th of this year.

2. The Meissner Ranch, Inc. owns the land at the proposed POD. The Meissners have granted the City permission to use water from the Meissner springs. A copy of this written agreement is included in File No. 58095-g41R.

461965

RECEIVED

MAR 2 2 2010

MONTANA D.N.R.C.
LEWISTOWN REGIONAL OFFICE

RETURN TO:
CLIVE ROONEY
DNRC
PO BOX 1021
LEWISTOWN, MT 59457-1021

461965 MISC Pages: 14
STATE OF MONTANA CHOUTEAU COUNTY
RECORDED: 01/25/2010 11:10 KOI: MISC
JOANN L. JOHNSON CLERK AND RECORDER
FEE: $118.00 BY: Dana K. Claussen
TO: CLIVE ROONEY DNRC, PO BOX 1021, LEWISTOWN, MT 59457-1021

58095-00

SQUARE BUTTE
BOUNDARY AGREEMENT

WHEREAS, the **State of Montana, State Board of Land Commissioners**, whose address is P.O. Box 201601, Helena, MT 59620-1601 is the owner of N½ of Section 33, and Section 34, all in Township 21 North, Range 12 East and the E½ of Section 3, Township 20 North, Range 12 East, MPM, Chouteau County, Montana; and,

WHEREAS, **Dostal Farm, LLP**, a Montana Limited Liability Partnership, whose address is 883 Photography Way, Geraldine, MT 59446-9043 is the owner of the SE¼ and the W½ of Section 25, Section 26 (less a 12 acre parcel in the SW¼NE¼ of the Section), and Section 27, all in Township 21 North, Range 12 East, MPM, Chouteau County, Montana; and,

WHEREAS: **Eleanor J. Whalen as Trustee of the 2004 Eleanor J. Whalen Trust** whose address is 2322 Calle Almirante, San Clemente California, 92673 owns a 1/3 undivided interest; **Jack Musgrove and Mary Estelle Musgrove** whose address is 33206 Falcon Drive, Fremont, CA 94555-1126- as joint tenants - own a undivided 1/6 interest; **Barbara W. Trent** whose address is P.O. Box 10716, Newport California, 92658 owns an undivided 1/12 interest; **Mary W. Brooks** whose address is 2320 Calle Almirante, San Clemente California 92673 owns an undivided 1/12 interest; **Daniel Branch**, whose address is 119 7th Street, Juneau Alaska, 99801, owns an undivided 3/12 interest; and **Margaret W. Mellor**, whose address is 28521 Via Reggio, Laguna Niguel California, owns an undivided 1/12 interest; all in the N½ of Section 35, Township 21 North, Range 12 East, MPM, Chouteau County, Montana; and,

WHEREAS, **Roland Durocher**, 78 Sun River Road, Great Falls, MT 59404-6319 is the owner of Lots 3 and 4 within Section 2, Township 20 North, Range 12 East, and SW¼ of Section 35, Township 21 North, Range 12 East, MPM, Chouteau County, Montana; and,

WHEREAS, **Meissner Ranches, Inc.**, a Montana Corporation, whose address is P.O. Box 490, Chester, MT 59522-0490 is the owner of the SE¼ of Section 35, and SW¼ of Section 36, all in Township 21 North, Range 12 East, MPM, Chouteau County, Montana; and,

WHEREAS, **Buckskin Butte Ranch, Inc.**, a Montana Corporation, whose address is 69 Brookside, Missoula, MT 59802-3278, is the owner of:

Township 20 North, Range 12 East, MPM, Chouteau County, Montana
Section 3: Lots 3, 4, that part of the S½NW¼, not in the Square Butte township

Township 21 North, Range 12 East, MPM, Chouteau County, Montana

MR28095-00

Section 33: S½, excepting therefrom that land conveyed by that Right of Way Deed filed November 29, 1912, in Book 7 of Deeds, page 86, to Chicago, Milwaukee and Puget Sound Railway Company, and that Highway Right of Way Easement filed January 15, 1948 as Document No. 275706, in Book 60 of Deeds, 187, Records of Chouteau County, Montana.

WHEREAS, these adjacent properties share common boundary lines, and

WHEREAS, due to a lack of original monumentation or physical evidence on the ground for the above-described parcel of real property it is impossible to determine in all certainty the true location of the boundary line common to these parcels of real property, and,

WHEREAS, the above-described adjacent real property owners hereby desire to firmly establish, now and forever, the common boundaries between their properties, and

NOW, THEREFORE, the above-described parties hereby agree that, effective from this 12th day of June, 2009 forward, the true boundary lines between the above-described parcels of real property shall be as depicted in the Certificate of Survey attached hereto, and incorporated herein by reference, as Exhibit "A".

STATE OF MONTANA

_____ DATE:_____

IN TESTIMONY WHEREOF, the State of Montana has caused these presents to be executed by the Governor, and to be attested by the Secretary of State, and countersigned by the Director of the Department of Natural Resources and Conservation, and the Great Seal of the State, and the Seal of the State Board of Land Commissioners to be hereunto affixed this 23 Day of November, A.D. 2009

Governor of the State of Montana

ATTEST:

Secretary of State

Counter-signed by:

Director, Department of Natural Resources & Conservation

NA 58095-00

DOSTAL FARM, LLP, a Montana Limited Liability Partnership

Patricia A Eklund DATE: 8-7-09
Patricia A. Eklund

RECEIVED
AUG 11 2009
DNRC NELO

ACKNOWLEDGMENT

STATE OF MONTANA)
:ss
COUNTY OF Cascade)

This instrument was acknowledged before me on the 7th day of August, 2009 by Patricia A. Eklund, as Partner of Dostal Farm, LLP, a Montana Limited Liability Partnership, on behalf of whom this instrument was executed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

LISA HILL NOTARIAL SEAL STATE OF MONTANA

Lisa Hill
PRINTED NAME Lisa Hill
Notary Public in and for the State of Montana
Residing at Black Eagle, MT
My Commission Expires Aug. 03, 2010

ELEANOR J. WHALEN, AS TRUSTEE OF THE 2004 ELEANOR J. WHALEN TRUST

Eleanor J. Whalen DATE: 8-4-09

ACKNOWLEDGMENT

STATE OF ~~MONTANA~~ California)
:ss
COUNTY OF Orange)

On this the 4 day of Aug, 2009, before me, the undersigned authority, a Notary Public in and for the State of Montana, personally appeared Eleanor J. Whalen, Trustee of the 2004 Eleanor J. Whalen Trust, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that she executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

OFFICIAL SEAL
ALEX D. MARTIN
NOTARY PUBLIC - CALIFORNIA
COMMISSION # 1725175
ORANGE COUNTY
My Comm. Exp. Feb. 12, 2011

Alex D Martin

PRINTED NAME Alex D Martin
Notary Public in and for the
State of ~~Montana~~ California
Residing at Laguna Niguel
My Commission Expires Feb 12 2011

NR 58095-00

JACK MUSGROVE

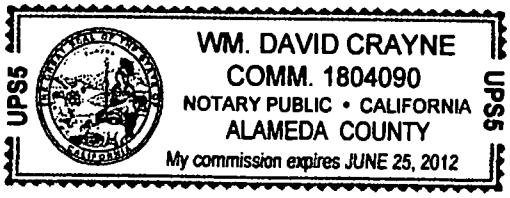
Jack Musgrove DATE: 7/18/2009

ACKNOWLEDGMENT

STATE OF ~~MONTANA~~ CALIFORNIA)
:ss
COUNTY OF ALAMEDA)

On this the 18TH day of JULY, 2009, before me, the undersigned authority, a Notary Public in and for the State of ~~Montana~~ CALIFORNIA, personally appeared Jack Musgrove, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.



PRINTED
NAME WM. DAVID CRAYNE
Notary Public in and for the
State of ~~Montana~~ CALIFORNIA
Residing at UNION CITY, CA
My Commission Expires JUNE 25, 2012

MARY ESTELLE MUSGROVE

DATE: 7/18/09

ACKNOWLEDGMENT

STATE OF ~~MONTANA~~ CALIFORNIA)
:ss
COUNTY OF ~~ALAMEDA~~)

On this the 18TH day of JULY, 2009, before me, the undersigned authority, a Notary Public in and for the State of ~~Montana~~ CALIFORNIA, personally appeared Mary Estelle Musgrove, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

WM. DAVID CRAYNE
COMM. 1804090
NOTARY PUBLIC • CALIFORNIA
ALAMEDA COUNTY
My commission expires JUNE 25, 2012

PRINTED NAME WM. DAVID CRAYNE
Notary Public in and for the
State of ~~Montana~~ CALIFORNIA
Residing at UNION CITY, CA
My Commission Expires JUNE 25, 2012

NR 58095-00

BARBARA W. TRENT

Barbara W. Trent DATE: 8-4-09

RECEIVED
AUG 10 2009
DNRC NELO

ACKNOWLEDGMENT

STATE OF ~~MONTANA~~ California)
:ss
COUNTY OF Orange)

On this the 4 day of Aug, 2009, before me, the undersigned authority, a Notary Public in and for the State of Montana, personally appeared Barbara W. Trent, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that she executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

OFFICIAL SEAL
ALEX D. MARTIN
NOTARY PUBLIC - CALIFORNIA
COMMISSION # 1725175
ORANGE COUNTY
My Comm. Exp. Feb. 12, 2011

PRINTED NAME Alex D Martin
Notary Public in and for the
State of ~~Montana~~ California
Residing at Laguna Niguel
My Commission Expires Feb-12-2011

MARY W. BROOKS

Mary Whalen Brooks DATE: 08-10-09

ACKNOWLEDGMENT

STATE OF ~~MONTANA~~ California)
:ss
COUNTY OF Orange)

On this the 10th day of August, 2009, before me, the undersigned authority, a Notary Public in and for the State of ~~Montana~~ California, personally appeared Mary W. Brooks, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that she executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

JAMES PAK
Commission # 1843747
Notary Public - California
Orange County
My Comm. Expires May 6, 2013

PRINTED NAME James Pak
Notary Public in and for the
State of ~~Montana~~ California
Residing at Tustin, California
My Commission Expires May 6, 2013

NR 58095-00

RECEIVED
SEP 11 2009
DNRC NELO

DANIEL BRANCH

Daniel Branch DATE: 8/31/09

ACKNOWLEDGEMENT

STATE OF ALASKA)
:ss.
FIRST JUDICIAL DISTRICT)

On this the 31st day of August, 2009, before me, the undersigned authority, a Notary Public in and for the State of Alaska, personally appeared Daniel Branch, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

SUBSCRIBED AND SWORN TO before me this 31st day of August, 2009.

Alberta M. Everson
Notary Public, State of Alaska
My commission expires: With Office

ALBERTA M. EVERSON NOTARY PUBLIC STATE OF ALASKA

MARGARET W. MELLOR

Margaret W. Mellor DATE: 8/19/09

ACKNOWLEDGMENT

STATE OF ~~MONTANA~~CALIFORNIA)
:ss
COUNTY OF ORANGE)

On this the 19th day of AUGUST, 2009, before me, the undersigned authority, a Notary Public in and for the State of ~~Montana~~ CALIFORNIA, personally appeared Margaret W. Mellor, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that she executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

SUNG O. PYON
COMM...1701876
NOTARY PUBLIC-CALIFORNIA
ORANGE COUNTY
My Term Exp. October 30, 2010

PRINTED
NAME Sung O. Pyon
Notary Public in and for the
State of ~~Montana~~ CALIFORNIA
Residing at LAGUNA NIGUEL, CA
My Commission Expires 10/30/2010

RECEIVED
AUG 24 2009
DNRC NELO

NR 58095-00

RECEIVED
SEP 23 2009
DNRC MILLO

ROLAND DUROCHER

DATE: 9-22-09

ACKNOWLEDGMENT

STATE OF MONTANA)
:ss
COUNTY OF Cascade)

On this the 22nd day of September, 2009, before me, the undersigned authority, a Notary Public in and for the State of Montana, personally appeared Roland Durocher, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

SARAH SANBORN NOTARIAL SEAL STATE OF MONTANA

PRINTED NAME Sarah Sanborn
Notary Public in and for the
State of Montana
Residing at Great Falls, MT
My Commission Expires 3/13/2011

MEISNER RANCHES, INC.

Paul Meissner DATE: 9 18 09
Paul Meissner

ACKNOWLEDGMENT

STATE OF MONTANA)
:ss
COUNTY OF Liberty)

This instrument was acknowledged before me on the 16th day of Sept., 2009 by Paul Meissner, as the President of Meissner Ranches, Inc., a Montana Corporation on behalf of whom this instrument was executed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

Karen Graham
PRINTED NAME Karen Graham
Notary Public in and for the
State of Montana
Residing at Chester
My Commission Expires 6-10-2010

NA 58095-00

RECEIVED
OCT 0 8 2009
DNRC NELO

BUCKSKIN BUTTE RANCH, INC.

Stephen K. Vielleux DATE: 10/6/09

ACKNOWLEDGMENT

STATE OF MONTANA)
:ss
COUNTY OF CHOUTEAU)

This instrument was acknowledged before me on the 6th day of OCTOBER, 2009 by – Stephen K. Vielleux, as the President of the Buckskin Butte Ranch, Inc., a Montana Corporation on behalf of whom this instrument was executed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

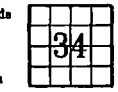
SHARALEE SMITH NOTARIAL SEAL STATE OF MONTANA

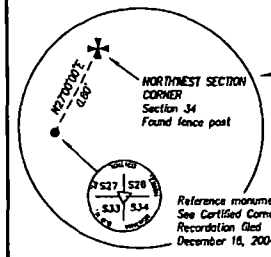
Sharalee Smith
PRINTED
NAME SHARALEE SMITH
Notary Public in and for the
State of Montana
Residing at FORT BENTON
My Commission Expires 11-16-2009

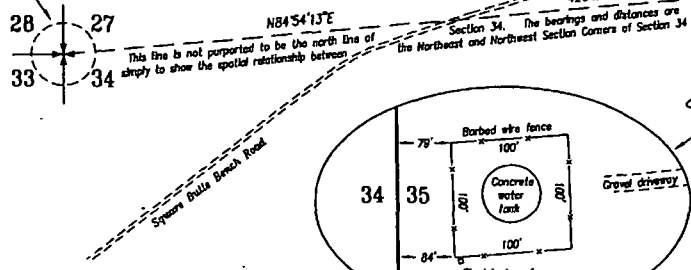
Certificate of Survey

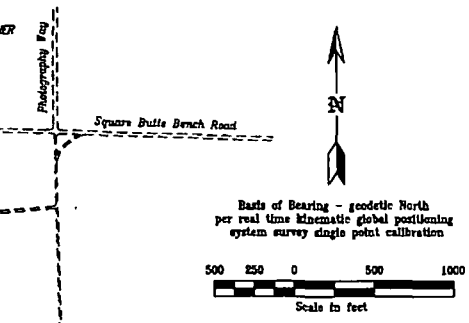
Section 34, Township 21 North, Range 12 East
Principal Meridian, Chouteau County, Montana

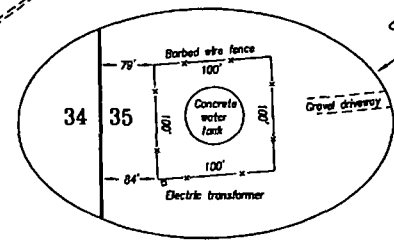
Owner: State of Montana School Trust Lands
Date of survey: August 2007 - June 2008
Purpose: Partial Retracement of Section 34
Commissioned by: State of Montana Department of Natural Resources and Conservation











LEGEND

- Section corner. Found 3½" diameter aluminum cap marked as shown, unless otherwise noted. See Certified Corner Recordation filed in conjunction with this survey.
- Quarter Section corner. Found 3½" diameter aluminum cap marked as shown. See Certified Corner Recordation filed in conjunction with this survey.
- Closing Section corner. Found original General Land Office stone. See Certified Corner Recordation filed in conjunction with this survey.
- Standard Quarter Section corner. Found original General Land Office stone. Set 3½" diameter aluminum cap marked as shown. See Certified Corner Recordation filed in conjunction with this survey.
- Standard Section corner or Closing Section corner as noted. Found original General Land Office stone. Set 3½" diameter aluminum cap marked as shown. See Certified Corner Recordation filed in conjunction with this survey.
- Found 2" diameter aluminum cap marked as shown. Note: Caps are shown as originally found. References to Montana Department of Highways was removed sometime during the time frame of this survey.

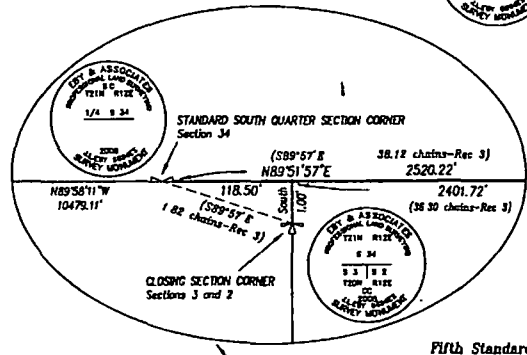
Rec 1 Record measurement per 1883 General Land Office field notes by Harry M. Crocken, Book 1757, Page 11.

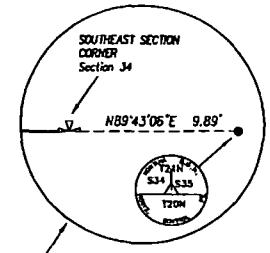
Rec 2 Record measurement per 1883 General Land Office field notes by Harry M. Crocken and George H. Robinson, Book 1759, Page 12.

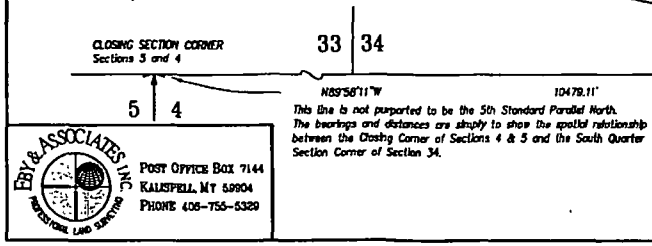
Rec 3 Record measurement per 1911 General Land Office field notes by by Ranney Y. Lyman and Lewellyn D. Lyman, Book 6332, Page 75.

chains 1 chain = 66 feet

==== Traveled way of road







EBY & ASSOCIATES INC
POST OFFICE BOX 7144
KALISPELL, MT 59904
PHONE 406-755-5329

CERTIFICATE OF PROFESSSIONAL LAND SURVEYOR

I hereby certify that I am a Licensed Professional Land Surveyor in the State of Montana, that the survey shown on this Certificate of Survey has been prepared in accordance with Montana Code Annotated Title 76 Chapter 3 and the Montana Department of Labor and Industry Administrative Rules for the Montana Subdivision and Platting Act, Uniform Standards for Survey Monumentation, Certificates of Survey and Final Subdivision Plats.

Dated this ____ day of _____, 2008.

Jane L. Eby
Montana License No. 8694RS

Approved: _____ 2008

Examining Land Surveyor
Reg. No. _____

State of Montana } SS
County of Chouteau }

Filed on the 15 day of Sept, 2008 A.D. at 11 o'clock A m.

County Clerk and Recorder By _____ Deputy

Instrument Rec. No. 459453

Certificate of Survey No. 45B

E A S E M E N T

The GRANTORS, MEISSNER RANCHES,INC, a Montana Corporation for and in consideration of the sum of One and No/100ths Dollars acknowledged, do by these presents grant, bargain, sell and convey and confirm unto THE TOWN OF GERALDINE, A Municipal Corporation, with an address of Geraldine, Montana 59446, hereafter referred to as "GRANTEE", and its successors and assigns, a perpetual assignable easement and right-of-way for the purposes and uses hereinafter mentioned in, on, beneath, over and across the following described land situated in the County of Chouteau, State of Montana, to-wit:

TOWNSHIP 20 NORTH, RANGE 12 EAST

Section 27: NW¼NW¼NW¼, S½NW¼NW¼

The perpetual and assignable easement and right-of-way is hereby granted on, beneath, over and across the above described lands for the location, construction, operation, repair, maintenance and patrol of underground water line, and appurtenances thereto, wells and springs and water infiltration gallery, together with the right of ingress and egress thereto for such purposes. GRANTORS hereby grant a perpetual and assignable easement and right-of-way in springs, pumps, infiltration galley, pumping plant and building, pipelines, electrical lines and necessary equipment and fences on the above described lands, together with the right of ingress and egress to maintain, repair and replace said springs and wells and maintain, repair and replace said equipment. GRANTEE may perpetually and permanently withdraw all water needed for its purposes from said land, provided however, the total water withdrawn from said land for use by GRANTEE shall not exceed 250 gallons per minute from all sources including the water to be withdrawn under the Easement between the same parties which was recorded on January 22, 1985 in Book FS-85 Miscellaneous on pages 2 & 3 as Document No. 410057 in the office of the Clerk and Recorder of Chouteau County, Montana.

GRANTEE agrees to install and maintain a fence around said infiltration gallery and spring development.

GRANTORS, shall be entitled to use all water from said lands in excess of 250 gallons per minute and GRANTEE, it's successors and assigns shall have a first priority to use up to but not in excess of 250 gallons per minute from said lands.

GRANTORS also hereby sell, transfer and convey unto GRANTEE and its assigns a perpetual and assignable easement on, beneath, across and over the following described lands for the construction, repair, operation, maintenance and patrol of an underground water line and appurtenances thereto, together with the right of ingress and egress for such purposes. This water line easement on the hereinafter described lands shall be limited to 50 feet in width in, on and under the following described lands located in Chouteau County, Montana, to-wit:

TOWNSHIP 20 NORTH, RANGE 12 EAST

Section 3: E½SW¼
Section 10: SE¼, NE¼, E½NW¼
Section 11: SW¼
Section 15: E½
Section 22: S½, E½NE¼
Section 27: N½NW¼

IN WITNESS WHEREOF, This instrument is executed the 24th day of APRIL, 1985.

"GRANTORS"

MEISSNER RANCHES INC.

By Joe Meissner Pres

ATTEST

Lawrence Meissner
Secretary

STATE OF MONTANA
COUNTY OF Liberty

On this 24th day of April, 1985, before the undersigned Notary Public for the State of Montana, personally appeared Joe Meissner, and Lawrence Meissner known to me to be the President and Secretary of MEISSNER RANCHES INC., the corporation that executed the within instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

R. V. Kallbleier
Notary Public for the State of Montana
Residing at: Shelby, Mont.
My commission expires: Oct 1, 1987

411054

STATE OF MONTANA, }
COUNTY OF CHOUTEAU, } ss.

Filed for record the 30th day of April A. D. 1985 at 11:00 o'clock A. M. and recorded in book F-23-65 of Misc. on page 12-13 records Chouteau County, Montana.

Janice B. Peres
County Recorder

By Deanna L. Johnson Deputy

Fees _____ Paid

FILE

PROVISIONAL PERMIT

*41R *

58095

00

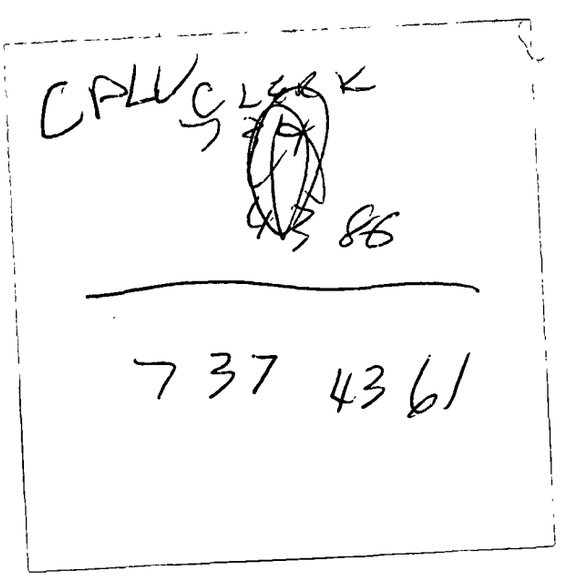
A

Verification:

All materials

- Verifab
- Calculation worksheet
- Maps
- Photos
- Correspondence—

reverse chronological order



Verification

TO: Havre Regional Office

FROM: Nancy Hughes

DATE: January 2, 2001

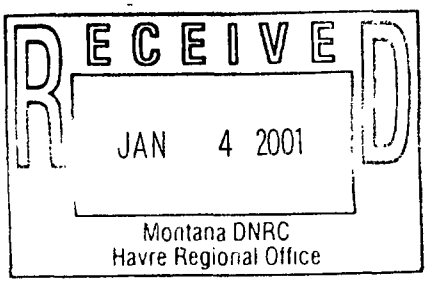
RE: Verified Files

Attached please find 1 files verified through the Verification Project.

Please review the Report of Findings and any other documentation in the files necessary to determine whether you agree with the Report of Findings, agree with modifications, or disagree. If you agree or agree with the modifications, please have Regional Office Manager sign the Verifab. If you disagree with the recommendation on the Report of Findings, please take the necessary steps to complete the verification.

Please return the files to me when you are done.

Thanks for your time and assistance.



Report of Findings

Water Right #: 41R-P058095-00 (Basin-ID-Number) Water Right Owner: Geraldine, Town of 41R

Analyst: Rob Rung (Water Consulting, Inc) Date: December 15, 2000

Recommendation:

- ☐ Approve as Permitted or Authorized
- ■ Approve with Modifications
- ☐ On-site Inspection Recommended to Complete Verification
- ☐ Revoke Permit

Report of Findings:

Background

This permit was issued on January 15, 1986 to City of Geraldine with a priority date of November 20, 1984. The appropriation is for 400.00 acre-feet, diverted at a point in the NWNWNW of Section 27, T20N, R12E, Choteau County, Montana. The source is groundwater. The flow rate is 250.00 GPM. The period of appropriation is 01/01-12/31. The beneficial use is municipal and the place of use is the N2SW of Section 11, T20N, R12E, the S2 of Section 1, T21N, R11E, the S2N2 of Section 1, T21N, R11E and the N2N2NE of Section 12, T21N, R11E, all in Choteau County, Montana. The diversion means is a developed spring. This permit application received one objection and was apparently resolved through the permitting process. This permit was issued with the standard prior rights and adjudication conditions.

Analysis

On December 15, 2000, WCI contacted Bridget Clark, Clerk for the Town of Geraldine to clarify the flow rate stated on the Department of Natural Resources and Conservation (DNRC) Questionnaires. According to the questionnaire, the flow rate is 120 GPM, which is an estimate according to the City Maintenance Supervisor. Ms. Clark said that through her inquiries, she is sure the development is operational and as permitted. When I advised Ms. Clark that if flow rate was only 120 GPM that they were not coming close to the appropriated volume she said that did not surprise her. Ms. Clark said that there

have been some concerns that the spring is not producing the water at the rate it use to produce and has been lowering. Ms. Clark also stated that the Town is now exploring ways to improve the system and possibly secure more water from either the same source or another source. Using a USGS 7.5' Topographical Map, Geraldine; MT – 1978, WCI was able to identify and confirm the places of use. Using a USGS 7.5' Topographical Map, Powmal; MT – 1979, WCI was able to identify the source and point of diversion and an intermittent place of use which is in compliance with the agreement made between the City and the Meisner Ranch. Ms. Clark did confirm that the spring at one time was producing more than enough water for the gravity flow pipeline to carry. The Town is now trying to determine if the reduced flow is due to the source or the system. Ms. Clark did confirm the new mailing address, priority date, source, point of diversion and places of use.

Recommendation

Under Name, correct address to read: "PO Box 211"
The Town of Geraldine is examining the productivity of this water system. The source is not producing at the same rate but the Permittee is unsure of the reason. For this reason, the Regional Office Manager and / or the New Appropriations Manager should review this file and determine if a site visit is warranted to determine if the source is adequate. It is possible that this Permit may need to have a reduction in Flow Rate or Volume. It appears the permit was perfected at one time, but with the current calculations and estimates of a flow rate, it does not currently meet the specifications. However, the permit should be approved as permitted. After the State determines if a reduction in flow and / or volume is necessary, then the Permittee should be allowed to review any changes (if any are necessary) and sign this document.

Actual hours spent on this project: 3.50

PERMIT NUMBER: 41R P058095-00

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
WATER RIGHTS BUREAU
PERMIT VERIFICATION ABSTRACT

DATE....12/07/00
PAGE.....1

PERMITTED DATA	FINDINGS
NAME: GERALDINE, TOWN OF	OK
~~PO BOX 227~~ PO Box 211	Correct to "PO Box 211"
GERALDINE MT 59446	OK
PRIORITY DATE: NOVEMBER 20, 1984 AT 10:00 A.M.	OK
SOURCE: GROUNDWATER	OK
TOTAL FLOW RATE: 250.00 GPM	OK
TOTAL VOLUME: 400.00 ACRE FEET PER YEAR	OK
DIVERSION POINT: NWNWNW SEC. 27 TWP. 20N RGE. 12E CH CO.	OK
	—
PERIOD OF APPROP: 01/01-12/31	OK
USE: 250.00 GPM UP TO 400.00 AF (01/01-12/31)	OK
FOR MUNICIPAL	OK
PLACE OF USE: N2SW SEC. 11 TWP. 20N RGE. 12E CH CO.	OK
FOR MUNICIPAL	OK
S2 SEC. 01 TWP. 21N RGE. 11E CH CO.	OK
FOR MUNICIPAL	OK
S2N2 SEC. 01 TWP. 21N RGE. 11E CH CO.	OK
FOR MUNICIPAL	OK
N2N2NE SEC. 12 TWP. 21N RGE. 11E CH CO.	OK
FOR MUNICIPAL	OK
	—
	—
	—
DIVERSION MEANS: DEVELOPED SPRING	OK
	—
	—

PERMITTED DATA	FINDINGS
	~
	5
	2

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
WATER RIGHTS BUREAU
PERMIT VERIFICATION ABSTRACT

TO BE COMPLETED BY VERIFIER:

ADDITIONAL COMPUTER DATA: WELL: DEPTH-____ STATIC LEVEL-____ WELL YIELD-_____ CASING SIZE-_____ PUMP SIZE-_____

RESERVOIR: DAM HEIGHT-___ SURFACE ACRES-_____ STOCK: ANML UNITS-_____ DOMESTIC: HOUSES-__ IRRIGATION: TYPE-_

SUPPLEMENTAL RIGHTS: IF THIS PERMIT IS SUPPLEMENTAL TO ANY OTHER RIGHTS, MEANING THEY HAVE OVERLAPPING PLACES OF USE, LIST THE WATER RIGHT NUMBERS. 41R P058121

MICROFILM CHECK: ALL PERMITS WILL BE REFILMED IN THEIR ENTIRETY. DOES THE FILE RECORD CONTAIN ANY LARGE MAPS THAT HAVE ALREADY BEEN FILMED? ___YES ___NO

VERIFICATION ATTACHMENTS: (SPECIFY ADDENDUMS, REPORTS, MAPS, PHOTOS, ETC.) DNRC Questionnaires on Water Use & Various Uses, Topographical Maps of Heraldine & Fairfield, MT

VERIFIER'S SIGNATURE: _____ DATE: 12-15-00

TO BE COMPLETED BY PERMITTEE:

PERMITTEE (CHECK ONE): |__| I AGREE WITH ALL OF THE ABOVE FINDINGS OF THE VERIFIER.
|__| I DO NOT AGREE WITH ALL OF THE ABOVE FINDINGS OF THE VERIFIER, AND HEREBY SPECIFY THOSE ITEMS OF DISAGREEMENT

_____

_____

_____

PERMITTEE (CHECK ONE): I |__| DO NOT |__| DO REQUEST A HEARING ON THE SPECIFIC ITEM(S) OF DISAGREEMENT LISTED ABOVE.

PERMITTEE'S SIGNATURE: _____ DATE: _____
(ONLY ONE PERMITTEE NEED SIGN)

TO BE COMPLETED REGIONAL OFFICE MANAGER:

CHECK THE PROPER BOX OR SPECIFY THE PROCESSING ACTION NEEDED ON THE PERMIT:

|__| ISSUE CERTIFICATE OF WATER RIGHT AS PERMITTED (NO CHANGES NEEDED).
|__| ISSUE CERTIFICATE OF WATER RIGHT WITH VERIFIED CHANGES (SEE PERMITTED DATA SECTION).
|__| PERMIT MODIFICATION HEARING NECESSARY.
|__| DO NOT ISSUE A CERTIFICATE. PERMIT IS ABANDONED OR NOT COMPLETE (REVOKE PERMIT).
|__| OTHER (SPECIFY)

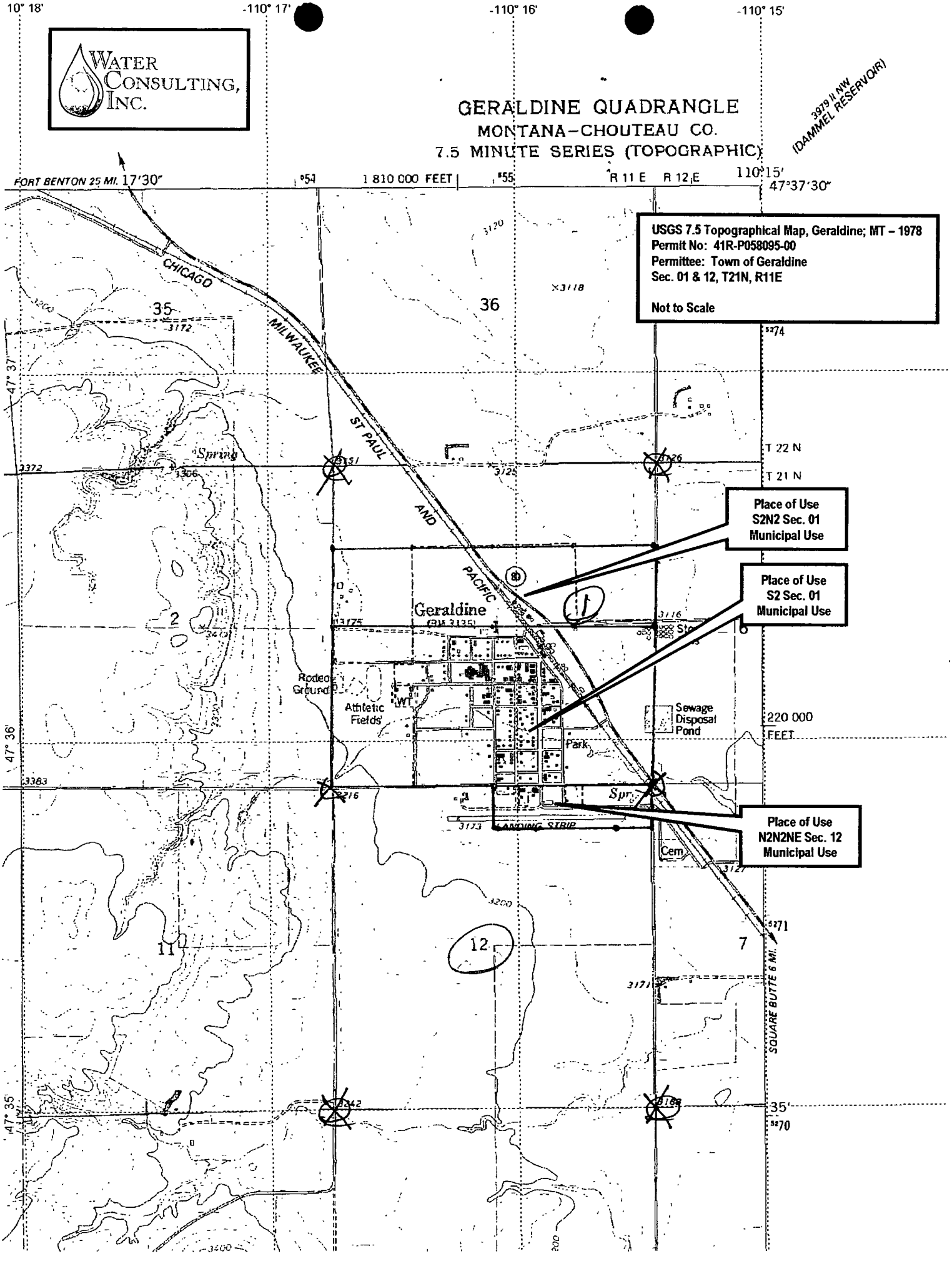
_____

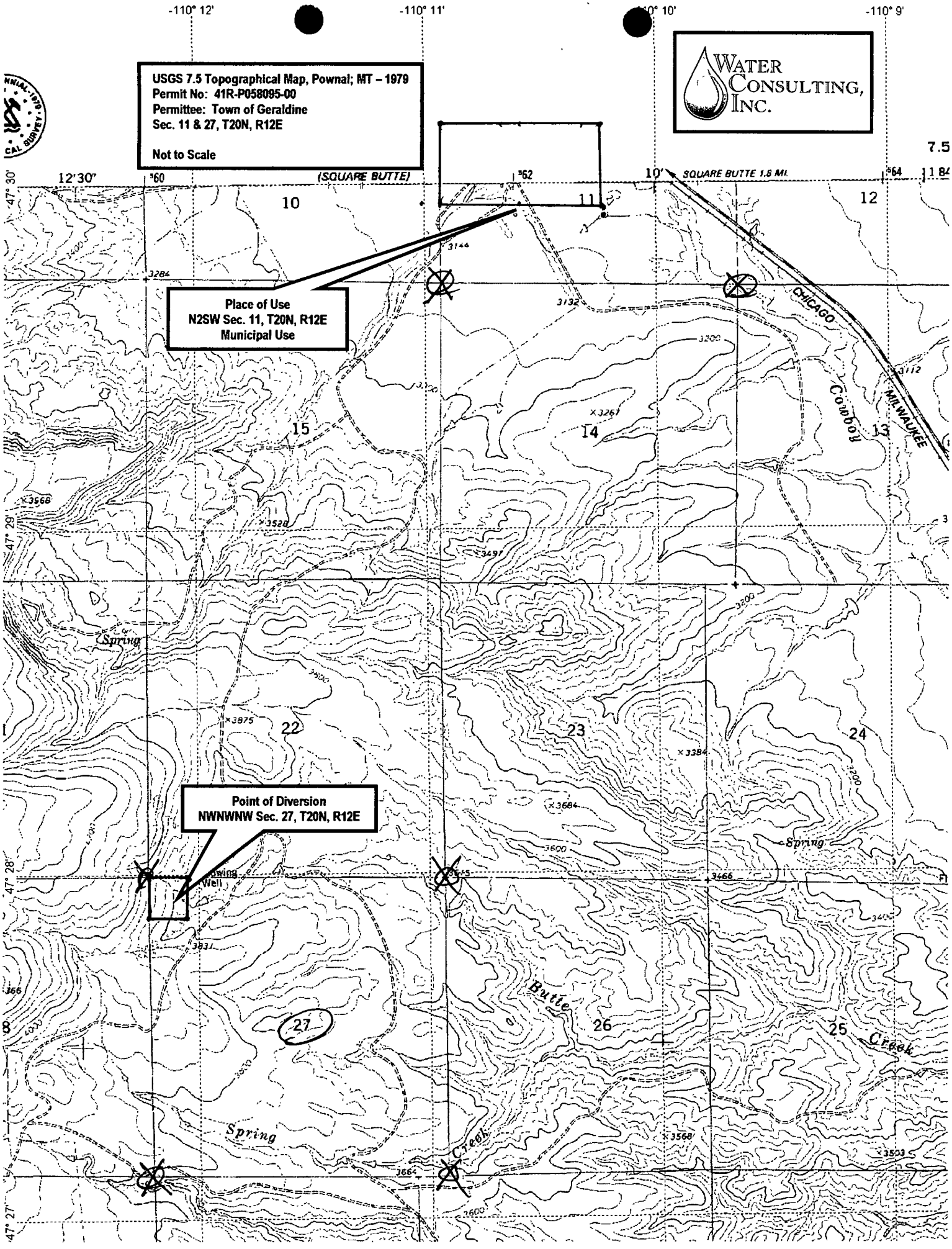
_____

REGIONAL OFFICE MANAGER'S SIGNATURE: _____ DATE: _____

ADDITIONAL VERIFIED DATA	FINDINGS

COMMENTS


WATER CONSULTING, INC.
GERALDINE QUADRANGLE
MONTANA–CHOUTEAU CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
3979 II NW
(DAMMEL RESERVOIR)
USGS 7.5 Topographical Map, Geraldine; MT – 1978
Permit No: 41R-P058095-00
Permittee: Town of Geraldine
Sec. 01 & 12, T21N, R11E
Not to Scale
Place of Use
S2N2 Sec. 01
Municipal Use
Place of Use
S2 Sec. 01
Municipal Use
Place of Use
N2N2NE Sec. 12
Municipal Use
Geraldine
Rodeo Ground
Athletic Fields
Sewage Disposal Pond
Park
Cem.
LANDING STRIP
CHICAGO MILWAUKEE ST PAUL AND PACIFIC
SQUARE BUTTE 6 MI.
FORT BENTON 25 MI.
1 810 000 FEET
R 11 E
R 12 E
T 22 N
T 21 N
220 000 FEET
10° 18'
-110° 17'
-110° 16'
-110° 15'
47° 37' 30"
47° 37'
47° 36'
47° 35'
110° 15'


USGS 7.5 Topographical Map, Pownal; MT – 1979
Permit No: 41R-P058095-00
Permittee: Town of Geraldine
Sec. 11 & 27, T20N, R12E
Not to Scale
WATER CONSULTING, INC.
Place of Use
N2SW Sec. 11, T20N, R12E
Municipal Use
Point of Diversion
NWNWNW Sec. 27, T20N, R12E
-110° 12'
-110° 11'
-110° 10'
-110° 9'
47° 30'
47° 29'
47° 28'
47° 27'
12'30"
(SQUARE BUTTE)
SQUARE BUTTE 1.8 MI
CHICAGO
MILWAUKEE
Cowboy
Spring
Butte
Creek
10
11
12
13
14
15
22
23
24
25
26
27

RECEIVED
NOV 0 9 1999
D.N.R.

Form VerVU 6/99

WATER RIGHT NO 41RP058950

VARIOUS USES

COMPLETE A SEPARATE *VARIOUS USE FORM* FOR EACH USE

1. **HOW DO YOU USE THE WATER?** (Check only one)

☐ FISHERY	☐ FISH & WILDLIFE	☐ COMMERCIAL
☐ INDUSTRIAL	☒ MUNICIPAL	☐ GEOTHERMAL
☐ FIRE PROTECTION	☐ MINING	☐ RECREATION
☐ INSTITUTIONAL	☐ OTHER (EXPLAIN) _____	

If you checked commercial, industrial & institutional use above, explain the use further.

_____

_____

(For example, office bldg. / concrete batch plant / church)

2. **WHAT IS THE LAND DESCRIPTION OF WHERE YOU DIVERT THE WATER?**

NW 1/4 NW 1/4 NW 1/4 Section 27, Twp 20N N/S Rge 12E E/W County CHOUTEAU

Lot _____ Block _____ Tract No. _____ Subdivision Name _____

3. **WHERE DO YOU USE THE WATER?**

____1/4____1/4____1/4 Section _____, Twp _____N/S Rge _____E/W County _____

____1/4____1/4____1/4 Section _____, Twp _____N/S Rge _____E/W County _____

____1/4____1/4____1/4 Section _____, Twp _____N/S Rge _____E/W County _____

____1/4____1/4____1/4 Section _____, Twp _____N/S Rge _____E/W County _____

4. **WHEN DO YOU USE THE WATER?**

☒ From January 1 to December 31

☐ From _____/_____ through _____/_____

Month Day Month Day

5. **HOW MUCH WATER DO YOU USE?** (Please provide both days and hours)

System is Operated 365 Days Each Year (Average number of days)

System is Operated 24 Hours Each Day (Average number of hours)

6. **WHAT FLOW RATE DO YOU USE?**

I use 120 GPM / CFS

How did you determine the flow rate? ESTIMATE

7. **MAP** Please provide a plat map which is available from your county clerk and recorder If a plat map is not available, please provide a USGS quad map Place an X on the map to show where your diversion is located and also the points where you use the water

☞ If at all possible, please attach a **PHOTOGRAPH** of your diversion site and place of use.

THE ABOVE INFORMATION IS A TRUE STATEMENT OF THE EXTENT THE PROJECT WAS DEVELOPED

✖ **SIGNATURE** Brigitte A. Clark, Clerk **DATE** 9/27/99

RECEIVED
NOV 09 1999
D.N.R.C.

Form VerPQ 6/99

WATER USE PERMIT QUESTIONNAIRE

1. **WATER RIGHT NO.** 41N P058095OO

2. **WATER RIGHT OWNER** TOWN OF GERALDINE
   Mailing Address PO BOX 211
   City/State/Zip GERALDINE, MT 59446
   Home Phone _____ Day Phone 406-737-4361

3. **WHO PREPARED THIS INFORMATION?** ☐ Water Right Owner ☒ Other (complete information below)
   Preparer Name BRIGETTE A. CLARK, CLERK
   Mailing Address _____
   City/State/Zip _____
   Home Phone 737-4386 Day Phone 737-4371

4. **IS THE DEVELOPMENT OPERATIONAL?** ☒ Yes ☐ No
   If not, explain why and give date of last use. _____

5. **WHAT IS YOUR SOURCE OF WATER?**
   - ☐ Well
   - ☒ Developed Spring
   - ☐ Lake/Reservoir Name _____
   - ☐ Stream Name _____
   - ☐ Unnamed Source - Tributary to: _____

6. **HOW DO YOU DIVERT THE WATER?**
   - ☐ Pump — GPM Capacity _____ HP Rating _____ Vertical Lift (in feet) _____
     Brand Name _____ Model Number _____
   - ☐ Pipeline — Inside Diameter Size _____ Length _____
   - ☐ Headgate
   - ☐ Dam
   - ☐ Pit
   - ☒ Other GRAVITY FLOW

THE ABOVE INFORMATION IS A TRUE STATEMENT OF THE EXTENT THE PROJECT WAS DEVELOPED.

✖ SIGNATURE Brigette A. Clark, Clerk DATE 9/27/99

Permit/Authorization:

- Permit
- Authorization,

with final order

if applicable

Permit/ Authorization

FORM NO. 601 R6/83

STATE OF MONTANA
DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
32 SOUTH EWING HELENA, MONTANA 59620

Permit to Appropriate Water

THIS PROVISIONAL PERMIT TO APPROPRIATE WATER IS HEREBY ISSUED TO:

GERALDINE, CITY OF
PO BOX 227
GERALDINE MT 59446

UPON FINDING THAT THE REQUIREMENTS OF SECTION 85-2-311 MCA HAVE BEEN MET.

PERMIT NUMBER: 58095-G41R

PRIORITY DATE: NOVEMBER 20, 1984 AT 10:00 A.M.

SOURCE: GROUNDWATER

TOTAL AMOUNT: 250.00 GPM UP TO 400.00 AC-FT PER ANNUM

DIVERSION POINT: NWNWNW SEC. 27 TWP. 20N RGE. 12E CHOUTEAU CO

PERIOD OF APPROPRIATION: JAN 01 - DEC 31

USE: 250.00 GPM UP TO 400.00 AC-FT (JAN 01 - DEC 31)
FOR MUNICIPAL

PLACE OF USE: N2SW SEC. 11 TWP. 20N RGE. 12E CHOUTEAU CO
FOR MUNICIPAL

S2 SEC. 01 TWP. 21N RGE. 11E CHOUTEAU CO
FOR MUNICIPAL

S2N2 SEC. 01 TWP. 21N RGE. 11E CHOUTEAU CO
FOR MUNICIPAL

N2N2NE SEC. 12 TWP. 21N RGE. 11E CHOUTEAU CO
FOR MUNICIPAL

DIVERSION MEANS: DEVELOPED SPRING

** REQUIREMENTS FOR PERMIT HOLDER:
THE DEADLINE FOR COMPLETION OF THIS PERMIT, AND FILING OF THE NOTICE OF COMPLETION OF PERMITTED WATER DEVELOPMENT (FORM 617) SHALL BE NOVEMBER 30, 1987, VERIFYING THAT THE APPROPRIATION OF WATER HAS BEEN COMPLETED AS PERMITTED.

** PRIOR RIGHTS:
THIS PERMIT IS SUBJECT TO ALL PRIOR EXISTING WATER RIGHTS IN THE SOURCE OF SUPPLY. FURTHER; THIS PERMIT IS SUBJECT TO ANY FINAL DETERMINATION OF EXISTING WATER RIGHTS, AS PROVIDED BY MONTANA LAW.

FAILURE TO COMPLY WITH ANY TERMS AND CONDITIONS HEREIN MAY RESULT IN THE LOSS OF THE WATER RIGHT GRANTED BY THIS PERMIT.

** TRANSFER OF OWNERSHIP:
UPON A CHANGE IN OWNERSHIP OF ALL OR ANY PORTION OF THIS PERMIT, THE PARTIES TO THE TRANSFER SHALL FILE WITH THE DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION A WATER RIGHT TRANSFER CERTIFICATE, FORM 608, PURSUANT TO SECTION 85-2-424, MCA.

Carol K. Wiles
WITNESS

Ronald J. Guse
ADMINISTRATIVE ASST: RONALD J GUSE

DATE: JANUARY 15,1986 WATER RIGHTS BUREAU, WATER RESOURCES DIVISION

Application materials:

- Application
- Work copy
- Final letter
- Supplement
- Independent evidence
- Well log

Application Materials

Form No. 600
Revised 11/73

APPLICATION NO. 58095-g41R
(For Dept. Use Only)

RECEIVED
NOV 20 1984
10:00 am
MONTANA D.N.R.C.
HAVRE FIELD OFFICE

STATE OF MONTANA

DEPARTMENT OF NATURAL RESOURCES & CONSERVATION

APPLICATION FOR BENEFICIAL WATER USE PERMIT

Note: Use one application for each source of supply or separate development. Check all appropriate boxes and fill in each blank line. If the question is not applicable in your case, enter NA (not applicable). If more space is necessary, attach additional sheets.

(Please type or print in ink)

1. Name of Applicant City of Geraldine
   Mailing Address P.O. Box 227
   City or Town Geraldine State MT Zip 59446
   Home Phone 737-4361 Other Phone 453-2209 – DELTA ENGINEERING

2. Source of water supply Spring (Groundwater),
   a tributary of Butte Creek.
   (stream name; if well, so indicate)

3. (a) Point of diversion:
   ~~NE~~ NW ¼ NW ¼ NW ¼ Section 27, Township 20 (N) S, Range 12 (E) W, Chouteau County

   TWP AS PER PHONE CALL FROM GARY KNUTSON 4/15/85

   Additional points of diversion, if any:
   ____ ¼ ____ ¼ ____ ¼ Section ____, Township ____ N S, Range ____ E W, ____ County
   ____ ¼ ____ ¼ ____ ¼ Section ____, Township ____ N S, Range ____ E W, ____ County

   (b) If water is not consumed, it will be discharged back into the same source:
   Yes ☒ ; No ☐ . If **no**, explain and give the complete land description at the point of discharge. ____
   ____ ¼ ____ ¼ ____ ¼ Section ____, Township ____ N S, Range ____ E W, ____ County

4. Description of water development:
   (a) Diverting works. Enclose all pertinent engineering data available. If not available, describe the horsepower rating of the pump and capacity in gallons per minute, size of ditches, flumes, dikes or other. Horizontal Well - Groundwater Interceptor

   (b) Reservoir (if applicable).
   1. Project will be an enlargement of an existing reservoir.
      Yes ☐ ; No ☐ . (If **yes**, complete both 3 and 4 below.)
   2. Project will be a new reservoir.
      Yes ☐ ; No ☐ . (If **yes**, enter NA in 3 below, and complete 4.)
   3. Capacity of existing (old) reservoir when constructed: ____ acre-feet.
   4. Capacity of new (proposed) reservoir: ____ acre-feet.

   (c) Well Depth: ____ feet (if applicable).
   (d) Project will be a developed spring: Yes ☒ ; No ☐.

5. Proposed Construction:

(a) Desired starting date June 1985; anticipated completion date Dec. 1985

(b) Estimated construction cost $ 200,000.

6. Amount of water, use to which it will be applied, and period of use:

Amount			Acre-feet	Use	From (month-day)	To (month-day)	
Example: 7.5	cfs / gpm	up to	535	for IRRIGATION	from April 15	to October 15	inclusive.
250	gpm	up to	400	for ~~Domestic~~ Municipal	from Jan. 1	to Dec. 31	inclusive.
	cfs / gpm	up to		for	from	to	inclusive.
	cfs / gpm	up to		for	from	to	inclusive.

Total amount requested: 250 gpm up to 400 acre-feet per year.

MC AS PER PHONE CALL 3/7/85 & 3/15/85

7. Description of proposed beneficial water uses:

(a) Irrigation (if applicable).

1. Method of irrigation: Flood ☐ ; Sprinkler ☐ . If Flood, explain: _____

2. Project will involve new irrigated land: Yes ☐ ; No ☐ .

3. Project will involve supplemental water to existing irrigation: Yes ☐ ; No ☐ .

4. Project will involve both new irrigated land and supplemental water to existing irrigation: Yes ☐ ; No ☐ . If **yes**, the acreage must be entered on separate lines in the Table below, and identified on the map in Item 9, page 3.

5. Acreage by land description: (Enter the number of acres to be irrigated in the appropriate quarter-section.)

Example:

Sec.	Twp.	Rge.	NE¼	NW¼	SW¼	SE¼	Totals	Check Appropriate Block: New	Supplemental
7	18N.	20E	35		140	118	293	✓	

Sec.	Twp.	Rge.	NE¼	NW¼	SW¼	SE¼	Totals	Check Appropriate Block: New	Supplemental

Total number of acres to be irrigated → ☐

(b) Non-irrigation use: (if applicable)

1. Place of use of the water will be the same as location given in Item 3(a), page 1.

MC Yes ☐ ; No ☒ . If no, give the location. ¼ S½ ¼ S½ N½ ¼ Section 1,

Township 21 (N) S Range 11 (E) W Chouteau N½ N½ NE Sec. 12 County.

Meissner - N½ SW¼ Sec. 11, T 20 N, R. 12E

2. Estimate the maximum number and type of livestock to be watered: _____

Are there other locations where the same livestock are watered? Yes ☐ ; No ☐ .

3. Name of municipality to be served: City of Geraldine

4. Number of families to be supplied: 150

5. If water will be used for other purposes, describe: Rural Water System & Commercial Units - other city uses

MC AS PER PHONE CALL 3/7/85

8. Ownership:

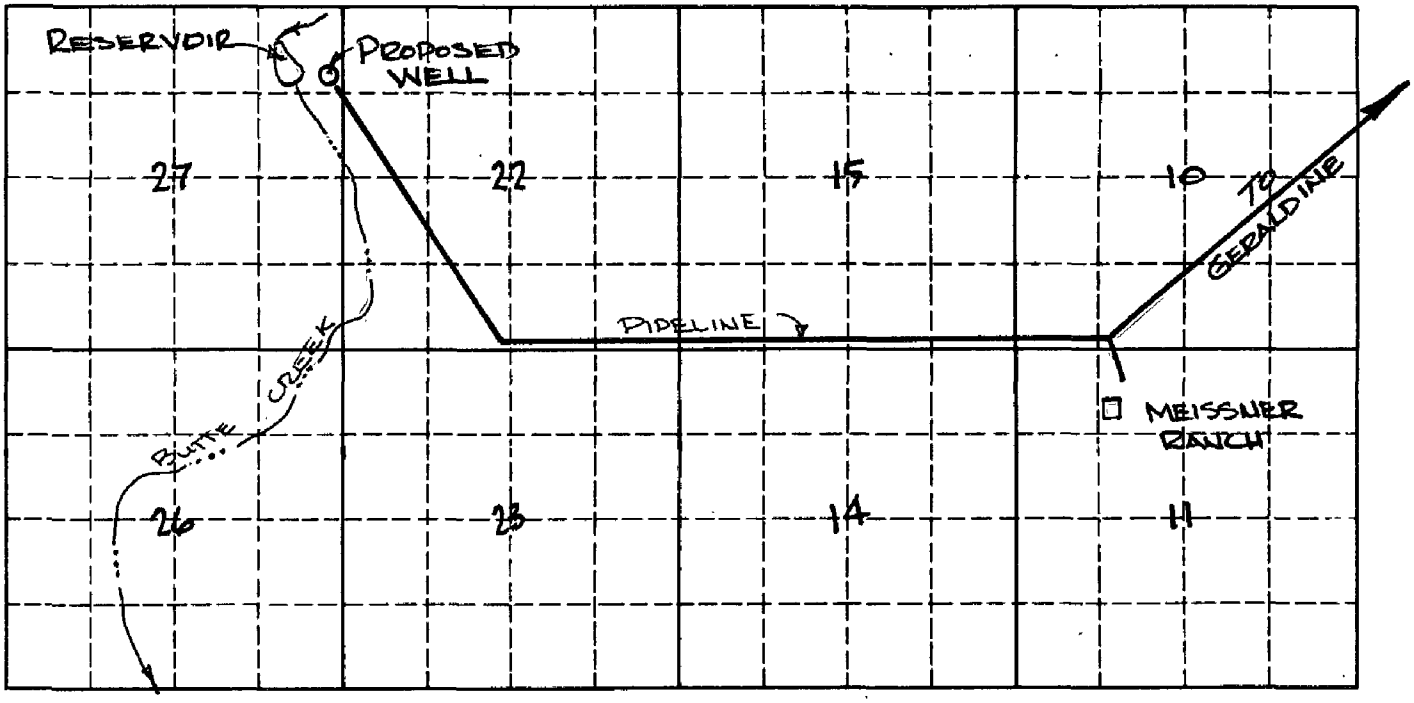
(a) Property owner at the point of diversion: Meissner Ranch, Inc.

(b) Property owner at the place of use: City of Geraldine

(c) If either (a) or (b) above are other than the applicant, describe the arrangement enabling the applicant to make this filing: City of Geraldine has CONTRACT AGREEMENT with Meissner Ranch, Inc. to withdraw up to 250 gpm from spring; additionally the City has an easement with Meissner Ranch, Inc. to develop spring and to construct a waterline across the Ranch.

9. Map of proposed water development: Indicate clearly the point of diversion, place of use, and section, township, and range numbers. Show pertinent information concerning the development, such as dams, canals, ditches, pipelines, wells,etc. Use the largest, most convenient scale possible. If the map shown below is not adequate to describe your development, attach additional sheets.

T20N., R12E.
CHOUTEAU COUNTY



10. Remarks: Water will be used for stock watering and domestic use for Meissner Ranch, Inc., balance of water will be used by the City of Geraldine as a municipal water supply.

Verification
Addl. place of use will be added to this system at a later date. Add those places of use at time of verification.
Check to see if My 11gm MAPS have been provided with water from this permit
Check all POU's for Meissner Ranches

11. THE APPLICANT CERTIFIES THAT THE STATEMENTS APPEARING HEREIN ARE TO THE BEST OF HIS KNOWLEDGE TRUE AND CORRECT.

(Signature) (mayor)	1/23/85 (Date)
(Signature)	1-23-85 (Date)
(Signature)	1/23/85 (Date)

Signature of applicant(s) must be exactly as in Item 1, page 1. If more than one applicant is shown, all must sign.

DEPARTMENT ENDORSEMENT

(This section is not to be filled in by Applicant)

Check When Completed | **ACTION TAKEN**

1. _____ Received (by mail) *over counter* in Department's office by Dixie Shiflett
2. _____ Date Received (priority) : Day 20; Month November; Year 1984; Time 10:00 AM
3. _____ Recorded in; Book _____; Page _____; By _____
4. _____ Preliminary check by _____; Amt. of fee received $ 150.00
   Transmittal No. 04-027-01-01; Remarks _____
5. _____ Application indexed by _____; Platted by _____
6. _____ Application examined by _____; Type of Permit _____
7. _____ Application returned for completion on _____; or corrected by office on _____
   Date to be returned by Applicant _____
8. _____ Corrected Application resubmitted to Department's office on _____
9. _____ Priority of Application *(see No. 2 above)* brought down to _____
   Reason: _____
10. _____ Application approved for advertisement by _____
11. _____ Notice of Publication prepared by _____; Proofed by _____
    Date _____
12. _____ Publication Proof Sheet proofed by _____; Date _____
13. _____ Publication dates: From _____ To _____.
14. _____ Notice published in _____
15. _____ Notice to water users prepared by _____; Proofed by _____
    Date _____
16. _____ Date Notice mailed to water users _____; Public agency with reserved waters _____
    Others *(specify)* _____
17. _____ Protests filed by _____
18. _____ Date notice of hearing sent to Applicant _____; Objector(s) _____
19. _____ Hearing held by _____; Place _____
    _____ Date _____
20. _____ Date *Statement of Opinion* and notice of possible hearing sent _____
    Sent by _____
21. _____ Application field checked by _____; Date _____
22. _____ Application recommended for (*approval or denial*) by _____
23. _____ Application microfilmed by _____; Date _____
    Roll No. _____ *(Microfilm after Item 22 only)*

REMARKS

(For Department Use Only)

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
HAVRE FIELD OFFICE

TED SCHWINDEN, GOVERNOR

P. O. BOX 1828
1708 WEST 2ND STREET

STATE OF MONTANA

(406) 265-5516

HAVRE, MONTANA 59501

October 17, 1985

M E M O R A N D U M

TO: Waive Notice Committee

FROM: Marvin Cross, Engineering Analyst
Havre Field Office

SUBJECT: Waiver of Public Notice on Application No. 58095-g41R
by the City of Geraldine

The following is a synopsis of the above referenced application:

Source: Groundwater spring, a tributary of Butte Creek.

Point of Diversion (POD): NW NW NW Sec. 27, T20N, R12E
Chouteau County

Water Quantity: 250 gpm - 400 AF/yr. for municipal use

Diversion Means: Horizontal well with 6" PVC class 160 pipeline.

Place of Use: City of Geraldine, Meissner Ranch, and various other ranches.

I recommend that public notice of this application be waived for the following three reasons:

1. The City of Geraldine is in bad need of a new water supply as soon as possible. The City currently pumps water from a series of wells. Both the quantity and quality of the well water has drastically deteriorated in the last few years. City sprinkling was curtailed as early as May 20th of this year.

2. The Meissner Ranch, Inc. owns the land at the proposed POD. The Meissners have granted the City permission to use water from the Meissner springs. A copy of this written agreement is included in File No. 58095-g41R.

3. Besides water rights owned by Meissner Ranch, Inc., there are only two other water rights on record with the Department of Natural Resources and Conservation (DNRC) within the area possibly adversely affected by this new use.

   The closest water rights owners, Siama and Ted Myllymaki, have entered into an agreement with the City to protect their existing stockwater rights. (A copy of that agreement is also in File No. 58095-g41R.)

   The other water right on record is a stockwater spring that lies on the second major drainage southwest of the proposed POD. Because there are two substantial ridges between these two spring sites, there should be no connection between the sources.

MC:tp

File

LAW OFFICES OF
NELSON & KALBFLEISCH
206 MAIN STREET
POST OFFICE BOX 518
SHELBY, MONTANA 59474-0518

JAMES A. NELSON
RAE V. KALBFLEISCH

TELEPHONE 434-5231
AREA CODE 406

9 October, 1985

DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION
Havre Field Office
P.O. Box 1828
Havre, Montana 59501

Re: Town of Geraldine water development

ATTEN: BOB L. LARSON

Dear Mr. Larson:

We transmit herewith Agreement entered into October 8, 1985 between Ted and Saima Myllymaki and the Town of Geraldine regarding the appropriation of 250 gallons of water per minute from the NW¼NW¼NW¼ and S½ NW¼NW¼ of Section 27, Township 20 North, Range 12 East, MPM, Chouteau County, Montana.

We are also enclosing copy of Easement and right to withdraw up to 250 gallons of water per minute and 400 acre feet of water annually from the above sources. This Easement is dated April 24, 1985 and is executed by Meissner Ranches, Inc. to the Town of Geraldine. The Easement was recorded on April 30, 1985 in Book F23-85, Miscellaneous, pages 12 and 13 in the office of the Clerk & Recorder of Chouteau County, Montana.

The Town of Geraldine is proceeding with construction of its water development. Please issue the Beneficial Use Permit to the Town of Geraldine. This

should conclude all obstacles to the issuance of the Beneficial Use Permit to the Town of Geraldine.

In the event you should have any questions, please advise.

Respectfully yours,

Rae V. Kalbfleisch

RVK: mk
Encl.
cc. Delta Engineering
cc. Town of Geraldine

MEMORANDUM OF AGREEMENT

THIS AGREEMENT MADE AND ENTERED Into this 8 day of Oct., 1985, by and between the TOWN OF GERALDINE, a municipal corporation, hereinafter referred to as "TOWN", and TED MYLLYMAKI and SAIMA MYLLYMAKI of Stanford, Montana 59479, hereinafter referred to as "MYLLYMAKIS";

W I T N E S S E T H :

WHEREAS, TOWN is developing new water sources from springs, wells and infiltration galleries in the SE¼NE¼NE¼ of Section 21, and in the NW¼NW¼ of Section 27, Township 20 North, Range 12 East, MPM, Chouteau County, Montana on lands owned by Meissner Ranches, Inc. for the purpose of supplying water to TOWN for domestic, municipal and other purposes; and

WHEREAS, TOWN has filed for Interim Water Rights Permits and Application for Beneficial Water Use Permits with the Department of Natural Resources and Conservation in order to establish new water rights and to transfer and use existing water rights now held by Meissner Ranches, Inc.; which said water uses shall include up to 250 gallons of water per minute to be transported by a pipe line to the Town of Geraldine; and

WHEREAS, MYLLYMAKIS, who presently use water under Water Right No. 18549641N with a priority date of May 5, 1978 for up to 1.05 acre feet per year from August 20th to January 1st of each year and under a Use Water Right which said Water Rights provide water for a maximum of 225 cow/calf pairs during the months of June, July, August, September, October, November and December of each year; and

WHEREAS, MYLLYMAKIS water said cow/calf pairs from the following water developments located on their land, to-wit:

(1) Spring, well, holding tank, and pumping system which pumps water to five stock water tanks located above said springs, and one gravity flow spring which flows into a stock tank located below said spring, which are located in the NE¼NE¼ of Section 28, Township 20 North, Range 12 East, MPM, Chouteau County, Montana;

WHEREAS, MYLLYMAKIS have determined they need a minimum of five (5) gallons of water per minute during the months of June, July, August, September, and October, and ten (10) gallons of water per minute from the above sources to water their livestock during the months of November and December to prevent said water systems from freezing; and

WHEREAS, TOWN claims water rights prior to time to water rights claimed by MYLLYMAKIS, and TOWN and MYLLYMAKIS have reached an understanding and desire to reduce their understanding concerning said water rights to writing and avoid any misunderstanding concerning said water developments to be completed by TOWN and the effect of such developments upon MYLLYMAKIS water uses.

NOW, THEREFORE, IN CONSIDERATION OF THE MUTUAL COVENANTS CONTAINED HEREIN, AND OTHER VALUABLE CONSIDERATION, THE RECEIPT OF WHICH IS HEREBY ACKNOWLEDGED, THE PARTIES HERETO COVENANT AND AGREE AS FOLLOWS:

FIRST: TOWN has filed water right applications for said water developments in said Sections 21 and 27, Township 20 North, Range 12 East, MPM, Chouteau County, Montana for up to but not exceeding 250 gallons of water per minute or up to 400 acre feet annually for domestic, municipal and other purposes in said Section 27.

SECOND: MYLLYMAKIS presently water up to a maximum of 225 cow/calf pairs from its water sources in the NE¼ of Section 28, Township 20 North, Range 12 East, MPM, Chouteau County, Montana

during the months of June, July, August, September, October, November, and December of each year.

THIRD: In the event the water developments and subsequent water use by TOWN in Section 27, Township 20 North, Range 12 East, MPM and located adjacent to springs or wells owned by MYLLYMAKIS should dry up Spring No. 1 referred to above used by MYLLYMAKIS thereby reducing their water supply at said Spring No. 1 to less than (5) gallons of water per minute of water during the months of June, July August, September, and October and ten (10) gallons of water per minute during the months of November and December of each year, then and only upon the happening of such events MYLLYMAKIS shall have the first and prior right to connect their pumps to a water sump to be supplied by TOWN at the TOWN infiltration gallery or to water their cattle from a one (1) inch gravity flow pipe extending southwesterly from said sump a distance of between three hundred (300) to four hundred (400) feet from TOWN'S infiltration gallery in the NW¼NW¼ of Section 27, Township 20 North, Range 12 East, MPM, and MYLLYMAKIS shall be entitled to withdraw and pump water from said water sump or to water cattle from said gravity pipe line to be supplied by TOWN up to but not exceeding five (5) gallons of water per minute from any or all of TOWN'S water sources in said NW¼NW¼ of Section 27 during the months of June, July, August, September, and October and ten (10) gallons of water per minute during the months of November and December of each year. MYLLYMAKIS agree to use only said five (5) gallons of water per minute and ten (10) gallons of water per minute limitations agreed upon herein. MYLLYMAKIS shall provide the pumps and pump any water to be used by them upon the happening of the events provided for herein and nothing contained in this Agreement shall be construed or interpreted as requiring TOWN to pump water for MYLLYMAKIS cattle or to MYLLYMAKIS' tanks supplying their cattle with water. In the event it shall be established that TOWN has dried up MYLLYMAKIS' water sources, as aforesaid, TOWN shall provide MYLLYMAKIS with

approximately one hundred ten (110) feet of one and one-fourth (1¼) inch line and install said line from TOWN'S sump to MYLLYMAKIS' spring so that MYLLYMAKIS can pump its water, not to exceed five (5) gallons of water per minute during the months of June, July, August, September and October and ten (10) gallons of water per minute during the months of November and December, from TOWN'S sump to MYLLYMAKIS' spring and holding tank. In the event MYLLYMAKIS' gravity flow Spring No. 1 as referred above should dry up because of use of water by TOWN, then upon the happening of such ever, TOWN will provide MYLLYMAKIS with a one (1) inch gravity pipe and install the same from TOWN'S sump to a point approximately three hundred (300) to four hundred (400) feet Southwesterly from TOWN'S sump in the SW¼NW¼NW¼ of Section 27, Township 20 North, Range 12 East, MPM, Chouteau County, Montana so MYLLYMAKIS may provide a tank and water to their cattle from the one (1) inch gravity flow line and said tank; such tank is presently in existence and MYLLYMAKIS' cattle now consume water from such tank, ~~and Meissner Ranches, Inc. also water cattle from a tank located west of MYLLYMAKIS' tank.~~ B.M. M.E.B. Said gravity flow pipe shall be supplied by TOWN only if it is established that TOWN, through the use of water, has dried up MYLLYMAKIS' above mentioned water source. In lieu of TOWN providing gravity flow line or approximately 110 feet of 1¼ inch pipe, as aforesaid, TOWN at its sole option shall be entitled to develop other water sources on MYLLYMAKIS' land to supply the five (5) gallon per minute and ten (10) gallon per minute deficiency as provided for in this Agreement. The water used by MYLLYMAKIS under this Agreement shall not exceed five (5) gallons of water per minute during the months of June, July, August, September and October and ten (10) gallons of water per minute during the months of November and December from all sources whether pumped by MYLLYMAKIS from the TOWN'S sump or by MYLLYMAKIS' cattle drinking water from said one (1) inch gravity flow pipeline and tank located Southwesterly approximately three hundred (300) to four hundred (400) feet of TOWN'S infiltration gallery.

FOURTH: TOWN does not guarantee MYLLYMAKIS a water supply or a minimum of five (5) gallons of water per minute during the months of June, July, August, September, and October or ten (10) gallons of water per minute during the months of November and December of each year in the event it is established that the water development now used by MYLLYMAKIS should dry up due to TOWN'S use, as aforesaid, but, upon the happening of such event, TOWN does grant to MYLLYMAKIS a priority and preference, subject, however, to Meissner Ranches, Inc.'s first priority to forty-six gallons of water per minute, to withdraw from TOWN'S source in said Section 27 and pump or water cattle up to but not exceeding five (5) gallons of water per minute during the months of June, July, August, September, and October and ten (10) gallons of water per minute during the months of November and December of each year if any water is available from said TOWN water source, which use shall be prior to the right of the 250 gallons per minute water right authorized to be withdrawn by TOWN and if MYLLYMAKIS water source should dry up because of TOWNS use of water, then upon the happening of such event, the TOWN shall reduce its usage to allow said five (5) gallons of water per minute to be withdrawn, as aforesaid, from TOWN'S water source during the months of June, July, August, September, and October and ten (10) gallons of water per minute during the months of November and December of each year.

FIFTH: MYLLYMAKIS covenant and agree that in consideration of their priority right to withdraw up to five (5) gallons of water per minute and ten (10) gallons of water per minute, as aforesaid, they will not object and they hereby consent to the granting of the 250 gallons of water per minute water right application or the granting of a water right permit and certificate to the TOWN for up to 250 gallons of water per minute from the Meissner Ranches, Inc. lands, as aforesaid, to be withdrawn annually up to 400 acre feet per year, and MYLLYMAKIS will recognize the TOWN'S prior water rights and prior uses as set

forth in this Agreement.

IN WITNESS WHEREOF, The Parties hereto have set their hands and seals the day and year first above written.

TOWN OF GERALDINE

By _____
Mayor

ATTEST:

_____
Town Clerk

_____
TED MYLLYMAKI

_____
SAIMA MYLLYMAKI

STATE OF MONTANA

COUNTY OF Judith Basin

On this 8th day of October 1985, before the undersigned Notary Public for the State of Montana, personally appeared TED MYLLYMAKI and SAIMA MYLLYMAKI, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Notarial Seal the day and year first hereinabove written.

Notary Public for the State of Montana
Residing at: Stanford
My commission expires: 2-3-86

STATE OF MONTANA

COUNTY OF Judith Basin

On this 8th day of October, 1985 before me the undersigned Notary Public for the State of Montana, personally appeared Michael E Burt and Dorothy Coates, known to me to be the Mayor and Town Clerk of TOWN OF GERALDINE, a municipal corporation, the corporation that executed the within instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Notary Public for the State of Montana
Residing at: Stanford
My commission expires: 2-3-86

File

RECEIVED 12

OCT 11 1985

MONTANA D.N.R.C.
HAVRE FIELD OFFICE

EASEMENT

The GRANTORS, MEISSNER RANCHES,INC, a Montana Corporation for and in consideration of the sum of One and No/100ths Dollars acknowledged, do by these presents grant, bargain, sell and convey and confirm unto THE TOWN OF GERALDINE, A Municipal Corporation, with an address of Geraldine, Montana 59446, hereafter referred to as "GRANTEE", and its successors and assigns, a perpetual assignable easement and right-of-way for the purposes and uses hereinafter mentioned in, on, beneath, over and across the following described land situated in the County of Chouteau, State of Montana, to-wit:

TOWNSHIP 20 NORTH, RANGE 12 EAST

Section 27: NW¼NW¼NW¼, S½NW¼NW¼

The perpetual and assignable easement and right-of-way is hereby granted on, beneath, over and across the above described lands for the location, construction, operation, repair, maintenance and patrol of underground water line, and appurtenances thereto, wells and springs and water infiltration gallery, together with the right of ingress and egress thereto for such purposes. GRANTORS hereby grant a perpetual and assignable easement and right-of-way in springs, pumps, infiltration galley, pumping plant and building, pipelines, electrical lines and necessary equipment and fences on the above described lands, together with the right of ingress and egress to maintain, repair and replace said springs and wells and maintain, repair and replace said equipment. GRANTEE may perpetually and permanently withdraw all water needed for its purposes from said land, provided however, the total water withdrawn from said land for use by GRANTEE shall not exceed 250 gallons per minute from all sources including the water to be withdrawn under the Easement between the same parties which was recorded on January 22, 1985 in Book FS-85 Miscellaneous on pages 2 & 3 as Document No. 410057 in the office of the Clerk and Recorder of Chouteau County, Montana.

GRANTEE agrees to install and maintain a fence around said infiltration gallery and spring development.

GRANTORS, shall be entitled to use all water from said lands in excess of 250 gallons per minute and GRANTEE, it's successors and assigns shall have a first priority to use up to but not in excess of 250 gallons per minute from said lands.

GRANTORS also hereby sell, transfer and convey unto GRANTEE and its assigns a perpetual and assignable easement on, beneath, across and over the following described lands for the construction, repair, operation, maintenance and patrol of an underground water line and appurtenances thereto, together with the right of ingress and egress for such purposes. This water line easement on the hereinafter described lands shall be limited to 50 feet in width in, on and under the following described lands located in Chouteau County, Montana, to-wit:

TOWNSHIP 20 NORTH, RANGE 12 EAST

Section 3: E½SW¼
Section 10: SE¼, NE¼, E½NW¼
Section 11: SW¼
Section 15: E½
Section 22: S½, E½NE¼
Section 27: N½NW¼

IN WITNESS WHEREOF, This instrument is executed the 24th day of APRIL, 1985.

"GRANTORS"

MEISSNER RANCHES INC.

By Joe Meissner Pres

ATTEST

Lawrence Meissner
Secretary

STATE OF MONTANA
COUNTY OF Liberty

On this 24th day of April, 1985, before the undersigned Notary Public for the State of Montana, personally appeared Joe Meissner, and Lawrence Meissner known to me to be the President and Secretary of MEISSNER RANCHES INC., the corporation that executed the within instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

R. V. Kalbfleisch
Notary Public for the State of Montana
Residing at: Shelby, Mont
My commission expires: Oct 1, 1987

411054

STATE OF MONTANA, }
COUNTY OF CHOUTEAU, } ss.

Filed for record the 30th day of April A. D. 1985 at 11:00 o'clock A. M. and recorded in book F23-85 Misc. on page 12-13 records Chouteau County, Montana.

Joanne B. Peres
County Recorder

By LaAnn L. Johnson Deputy

Fee $ ____ Paid

Ret. Nelson & Kalbfleisch
P.O. Box 518
Shelby, MT 59474-0518

File

MEMORANDUM OF AGREEMENT

THIS MEMORANDUM OF AGREEMENT Made and Entered Into This 21st day of DECEMBER, 1984, by and between THE TOWN OF GERALDINE, a Municipal Corporation, hereinafter referred to as "PARTY OF THE FIRST PART", and MEISSNER RANCH, INC., a Montana Corporation, hereinafter referred to as "PARTIES OF THE SECOND PART":

W I T N E S S E T H :

WHEREAS, Parties of the Second Part have executed an Easement granting Party of the First Part the right to construct and develop a spring and underground water well and infiltration gallery on land owned by Parties of the Second Part located in Section 27, Township 20 North, Range 12 East, Chouteau County, Montana; and

WHEREAS, Party of the First Part, if adequate financing is available and certain other conditions are met intends to construct and develop said spring and groundwater source and to construct a transmission line to the Town of Geraldine, Montana; and

WHEREAS, The Parties hereto have entered into an agreement concerning use of said water and other details concerning said water system.

NOW THEREFORE, In Consideration of the sum of One and No/100ths Dollars ($1.00), other mutual consideration and other valuable consideration, the Parties hereto covenant and agree as follows:

FIRST: Party of the First Part shall be entitled to withdraw and use Two Hundred Fifty (250) gallons of water per minute from a spring and/or underground infiltration gallery located on land owned by Parties of the Second Part which is located in the NE¼NW¼NW¼ of Section 27, Township 20 North, Range 12 East, Chouteau County, Montana. The total water withdrawn by Party of the First Part from said water source shall not exceed Two Hundred Fifty (250) gallons per minute and Parties of the Second Part shall be entitled to use all water form said source in excess of Two Hundred Fifty (250) gallons per minute to be used by Party of the First Part.

SECOND: Party of the First Part at its sole cost shall furnish the pipeline and hydrants to supply Parties of the Second Part with Four (4) Five (5) gallons per minute pasture taps at the ranch of Parties of the Second Part located in Sections 15 and 22, Township 20 North, Range 12 East and Two (2) Eight (8) gallons per minute hydrant uses at the houses of Parties of the Second Part located in the SW¼ of Section 11, Township 20 North, Range 12 East. The Thirty-six (36) gallons per minute water uses by Parties of the Second Part shall be deemed a part of the Two Hundred Fifty (250) gallons per minute of the water to be withdrawn by Party of the First Part and all water withdrawn by Parties of the Second Part in excess of Thirty-six (36) gallons per minute shall be deemed a part of the excess water to be withdrawn by Party of the First Part; provided, however, Party of the First Part shall have first priority to the use of the Two Hundred Fifty (250) gallons per minute and thereafter Parties of the Second Part shall be entitled to any excess water over and above the Two Hundred Fifty (250) gallons per minute permitted to be withdrawn by Parties of the First Part. It is understood and agreed Party of the First Part will deliver the water to within, but not closer than, Two Hundred (200) feet of each of said homes.

THIRD: Parties of the Second Part agree to permit installation and maintenance by Party of the First Part of flow controls limiting each of the Four (4) pasture uses to Five (5) gallons per minute and the Two (2) Eight home uses to (8) gallon per minute. Parties of the Second Part may reduce said Two (2) Eight (8) gallons per minute flow at each home and transfer said excess water to other hydrants at their sole expense provided such transfer does not adversly affect the water service by Party of the First Part to its users.

FOURTH: Party of the First Part will pay for and install Four (4) - Five (5) gallon per minute hydrants and water line to said hydrants at the locations shown on the attached map, which is attached hereto as Exhibit "A", and by this reference made a part hereof.

FIFTH: Party of the First Part shall, in so far as possible, maintain fifty (50) pounds per square inch water pressure at the ranch home.

SIXTH: In the event Party of the First Part has not commenced construction of its infiltration gallery and water transmission line within Four (4) years from the date of this Agreement, unless this Agreement is extended in writing, then this Agreement shall terminate and the Easement dated December 21, 1984 granted by Parties of the Second Part to Party of the First Part shall revert to Parties of the Second Part and be deemed cancelled unless the infiltration system and water system is delayed by litigation or by other causes beyond the control of Party of the First Part.

M2B. SEVENTH Party of the FIRST PART shall hold harmless Party of the SECOND PART from any damages, liability, or legal suits resulting from construction of the Water System improvements.

IT IS UNDERSTOOD By the Parties hereto that Party of the First Part shall not charge Parties of the Second Part any monthly charge for the water or for maintenance of the water

system to be furnished under this Agreement and Parties of the Second Part shall not charge Party of the First Part for any water withdrawn under the terms of this Agreement or for any water line easements or damages therefrom or for the necessary land to install said infiltration gallery.

M.E.B. J.M. Construction ditches shall be restored and disturbed areas regraded and reseeded.

Time is of the essence of this Agreement and this Agreement shall be binding upon and inure to the benefit of the Parties hereto and their successors and assigns.

The Town of Geraldine as Party of the First Part is not obligated to construct said pasture taps or water hydrants for Parties of the Second Part or to furnish them water until the finances are available to construct the infiltration gallery and water transmission line and said system is constructed and water is available therefrom.

IN WITNESS WHEREOF, The Parties hereto have set their hands and seals this 21ST day of DECEMBER, 1984.

"PARTY OF THE FIRST PART"

TOWN OF GERALDINE

By _____
Mayor

ATTEST:

By _____
Town Clerk

"PARTIES OF THE SECOND PART"

MEISSNER RANCH, INC.

By _____
President

ATTEST:

_____
Secretary

M.E.B. M. EIGHTH Party of the SECOND PART shall retain rights to the electric power produced from hydroelectric generation developed as a result of the water line systems; if such power generation is determined to be feasible.

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
HAVRE FIELD OFFICE

TED SCHWINDEN, GOVERNOR

P. O BOX 1828
1708 WEST 2ND STREET

STATE OF MONTANA

(406) 265-5516

HAVRE, MONTANA 59501

April 19, 1985

Saima & Ted Myllymaki
Stanford, MT 59479

RE: Problems with Certificate of Water Right
No. 18549-g41R

Dear Saima & Ted:

Further research of our records since I sent out my Memorandum dated April 15, 1985, has unveiled additional problems:

1. Please look at the enclosed copy of the "Notice of Completion" we received from you for Certificate No. 18549-g41R. Specifically, please examine Section 6, entitled Remarks.

   You indicated that "years ago a plastic pipeline was laid to fill tanks below by gravity flow. Same arrangement now in use."

   Since your remark says that the system you were filing on was a gravity flow system, I have to conclude that the Notice of Completion was actually filed on your developed spring that feeds the two adjacent stock tanks just downstream, rather than your pump system.

   If my conclusion is correct, I can find no filed right on record for your pump system from August 20 to January 1.

   Please examine this Notice of Completion closely and let me know your opinion.

2. The same Certificate of Water Right No. 18549-g41R is limited to 20 gallons per minute (gpm) up to 1.05 acre-feet (AF) per year.

   If you were to divert continuously at a rate of 20 gpm, in less than twelve days you would use the entire volume of 1.05 AF.

Apparently, the volume of 1.05 AF was assigned to your Certificate by our Department based on the information you provided in response to a letter from Thomas E. Zuelke. (I've also enclosed a copy of that letter.) The 1.05 AF is the approximate volume that 150 head of cattle would drink from August 20 to January 1. Unless additional information is supplied with the Notice of Completion indicating that more water is required, the volumes are limited to the amount of water the stock will drink.

What do these problems mean to you?

1. Unless you can produce additional evidence that the enclosed copy of your "Notice of Completion" was intended to apply to your pump system, your Certificate No. 18549-g41R will apply to your other developed spring. The other spring is the one that sits west of your pumpsite and provides water to the two adjacent stock tanks downhill.

2. Unless you have further evidence, you apparently have no water right filed on your stockwater pump system from August 20 to January 1.

   You may wish to change your most recently filed Notice of Completion on this system to year around use, rather than from January 2 to August 19. Your priority date for this system would then be March 25, 1985.

3. As your Certificate No. 18549-g41R now reads, whichever spring it applies to, you are limited to 1.05 AF per season under that water right.

4. You still have the pre-1962 exempt existing water right. It is your responsibility to provide (a) the earliest date that water was used, (b) the flow rate diverted and, (c) the volume of water used under that right.

I apologize for <u>not</u> discovering these problems prior to writing my April 15, 1985 Memorandum!

If you have further questions regarding this matter, please feel free to call me.

Sincerely,

Marvin Cross

Marvin Cross
Engineering Analyst
Water Rights Field Office

MC:tp
Enclosures
cc: City of Geraldine
Gary Knutson, Delta Engineering
Lloyd Bjerum, Geraldine Water Users
Meissner Ranch
Ann Mulroney, Water Development Bureau
Sam Rodriquez, Lewistown Field Office
Rae Kalbfleich, Attorney for City of Geraldine

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
HAVRE FIELD OFFICE

TED SCHWINDEN, GOVERNOR

P. O. BOX 1828
1708 WEST 2ND STREET

STATE OF MONTANA

(406) 265-5516

HAVRE, MONTANA 59501

April 15, 1985

M E M O R A N D U M

TO: File No. 58095-g41R by the City of Geraldine

FROM: Marvin Cross, Engineering Analyst
Havre Field Office

SUBJECT: Field Investigation Report

DATE OF INVESTIGATION: April 4, 1985

Interested Parties attending field investigation

Siama Myllymaki, existing water rights user in area of diversion
Hugo Tureck, operator of Myllymaki Ranch

D.N.R.C. Personnel

Sam Rodriquez, Field Manager, Lewistown Water Rights Bureau
Bob L. Larson, Field Manager, Havre Water Rights Bureau
Marvin Cross, Engineering Analyst, Havre Water Rights Bureau

PURPOSE: To answer the following questions:

1. Do Ted and Siama Myllymaki have water rights on which to base an objection to this application?

2. If so, could the City of Geraldine's proposed spring development damage the Myllymaki water supply?

3. What flow rate is necessary to sustain the existing Myllymaki stockwatering system?

FINDINGS: We found physical evidence of three existing Myllymaki stockwater rights within 200 yards of the springs that the City of Geraldine wants to develop.

1. Certificate of Water Right No. 18549-g41R uses a gasoline powered pump. The pump rests immediately west of the existing boundary fence between the Meissner and Myllymaki Ranches. This pump supplies water to four stockwater sites, which are dispersed in Sections 21 and 28 of Township 20N, Range 12E.

The attached map shows the approximate locations of the pumpsite and stockwater tanks.

Tureck explained that the gas powered piston pump is started whenever the cattle are turned into the pasture and is kept running continuously until the cattle are removed. Including a Bureau of Land Management Lease, the field covers approximately 1240 acres. Normally, this pasture is used from sometime in August until the snow gets too deep for the cattle - December or January.

The pump, which supplies approximately 20 gallons per minute (gpm), must run continuously during cold weather as the supply lines are buried less than 3 feet deep.

Hand controlled valves at each tank regulate the inflow. Excess water simply spills out of the tanks. Tureck says that these valves must be checked regularly to guarantee a sufficient supply without causing erosion problems.

The pumpsite for this water supply is located less than 100 feet from the closest spring that the City of Geraldine wishes to tap.

2. Another developed spring taps the source approximiately 150 feet southwest of the City of Geraldine's springs.

Siama Myllymaki explained that this development consists of a draintile through a swampy area that empties into a stock tank. Overflow from this tank is piped downhill to a stock tank on the Meissner Ranch.

Myllymaki explained that this project was installed prior to 1961. Since pre-1962 spring developments did <u>not</u> have to be filed under Senate Bill 76, this spring has a valid water right. The right is valid even though it is <u>not</u> on record with the Water Rights Bureau.

3. A third spring development lies midway between the previous two points of diversion.

   This project consists of a culvert set vertically in the ground to a depth of about 10 feet. Water was within 2 feet of the surface on the date of the field investigation. A pipeline taps into the side of the culvert and flows water downhill to two adjacent stock tanks, which rest approximately 100 yards southwest of the vertical culvert.

   Twenty (20) gpm was also claimed for this stockwater system.

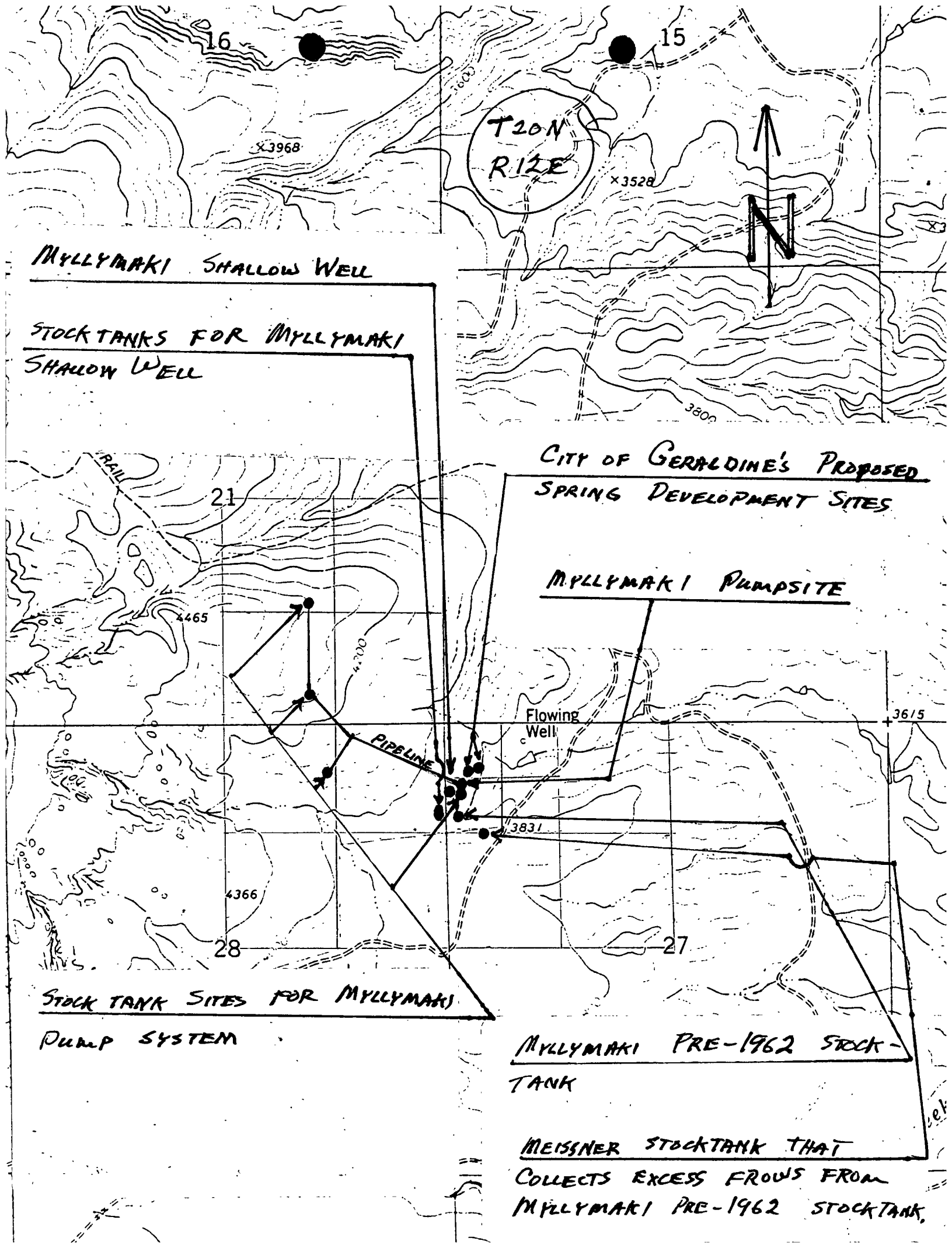
   Although this system was installed in about 1977, it was not filed on until March 25, 1985. Since the City of Geraldine filed its application on February 22, 1985, the City has an older water right than Myllymakis have on this well.

CONCLUSIONS: Do Myllymakis have valid water rights on which to base an objection? Yes, they have two stockwater rights with priority dates earlier than the City of Geraldine's application.

Is it possible that the City of Geraldine's proposed project could jeopardize Myllymakis' stockwater? Again, the answer is yes. All three Myllymaki spring developments lie within 200 yards of the proposed new City water supply. According to Tureck, there are no other water sources on the entire 1240 acre pasture used by Myllymakis.

A flow rate of at least 20 gpm is necessary to maintain the existing system used by Myllymakis. Any lower flow rate would require a reduction in the existing pump size.

MC:tp
cc: City of Geraldine
Gary Knutson, Delta Engineering
Lloyd Bjerum, Geraldine Water Users
Siama & Ted Myllymaki
Meissner Ranch
Ann Mulroney, Water Development Bureau



MYLLYMAKI SHALLOW WELL

STOCK TANKS FOR MYLLYMAKI SHALLOW WELL

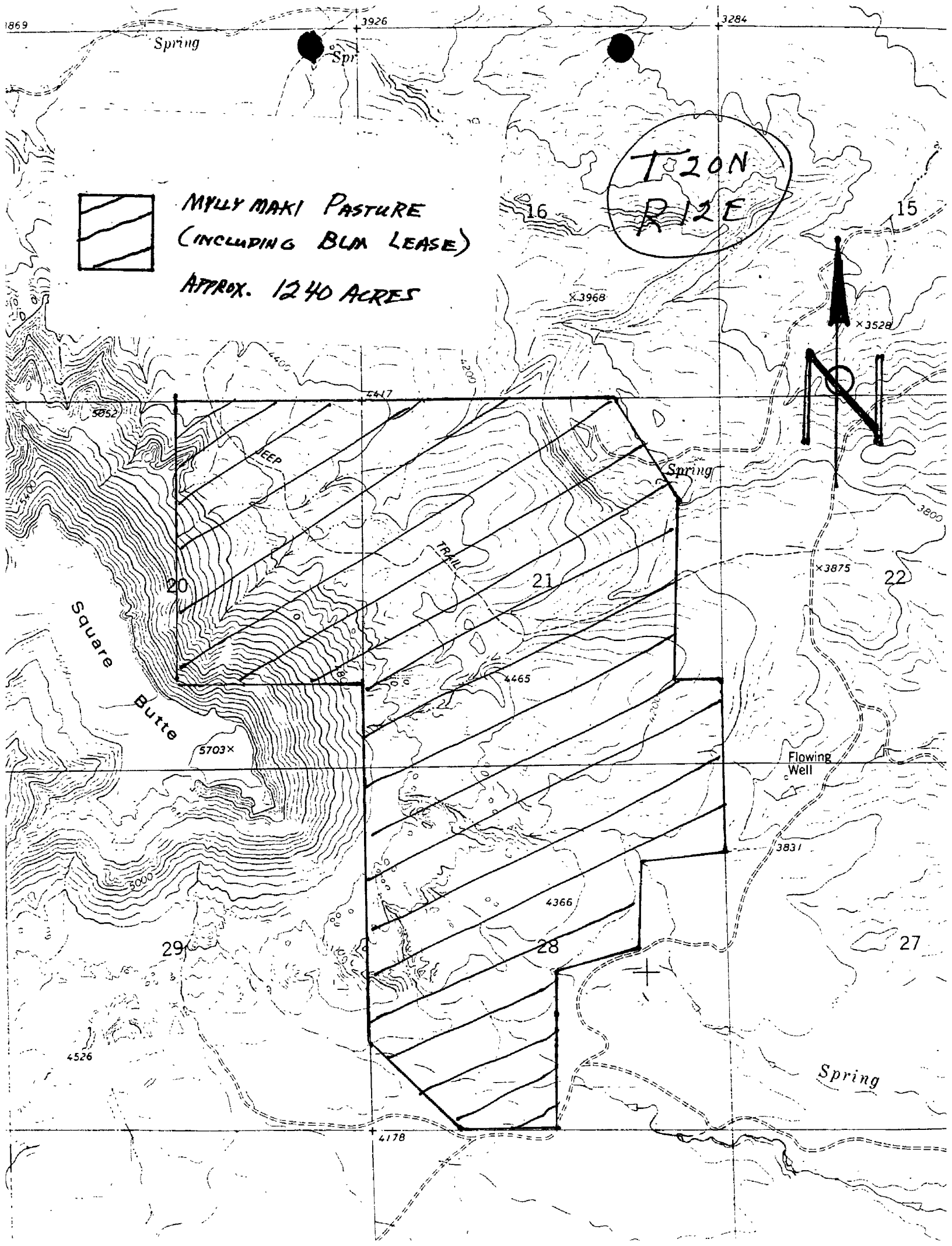
CITY OF GERALDINE'S PROPOSED SPRING DEVELOPMENT SITES

MYLLYMAKI PUMPSITE

STOCK TANK SITES FOR MYLLYMAKI PUMP SYSTEM

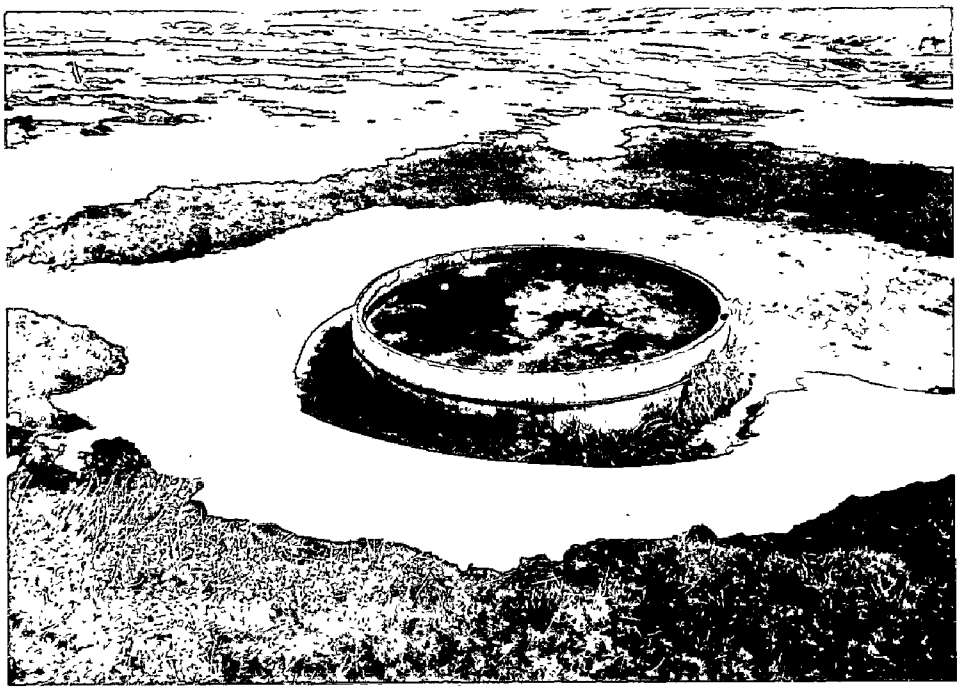
MYLLYMAKI PRE-1962 STOCK-TANK

MEISSNER STOCKTANK THAT COLLECTS EXCESS FROWS FROM MYLLYMAKI PRE-1962 STOCKTANK.

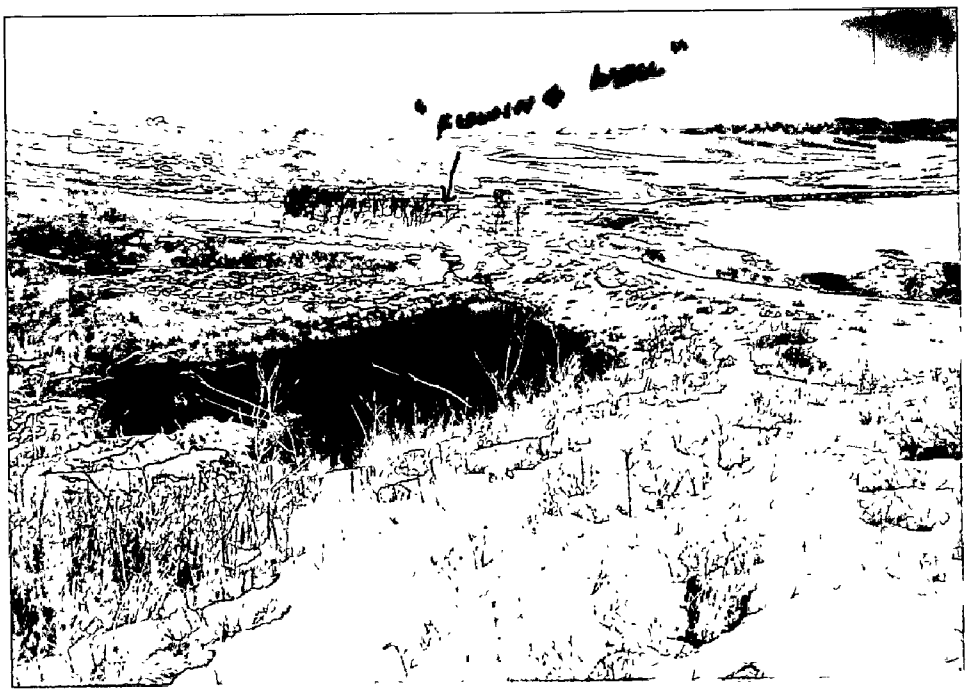

MYLY MAKI PASTURE
(INCLUDING BLM LEASE)
APPROX. 1240 ACRES
T 20 N
R 12 E
16
15
20
21
22
29
28
27
Square Butte
JEEP TRAIL
Spring
Flowing Well
Spring
3926
3284
3968
3528
3875
3800
4417
4400
4200
5052
5400
5703
4465
4366
3831
4526
4178
3000

LOG OF PICTURES
CITY OF GERALDINE
58095- g41R
March 12, 1985

1. Blank

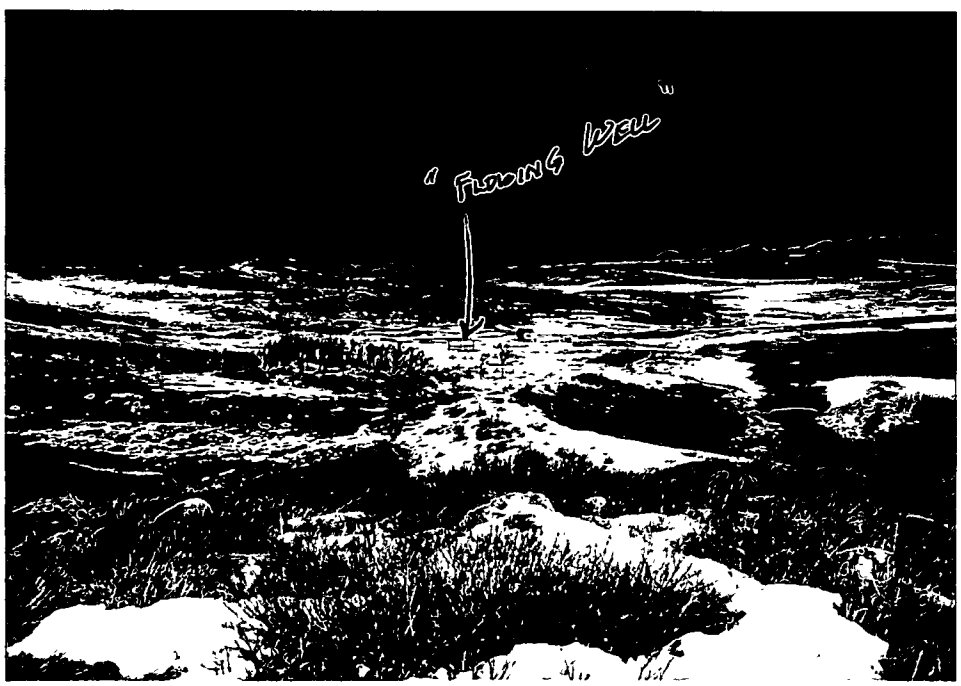


2. "Flowing well" listed on U.S.G.S. Topog map in NE NW NW Section 27, T.20N, R.12E - actually a developed spring.

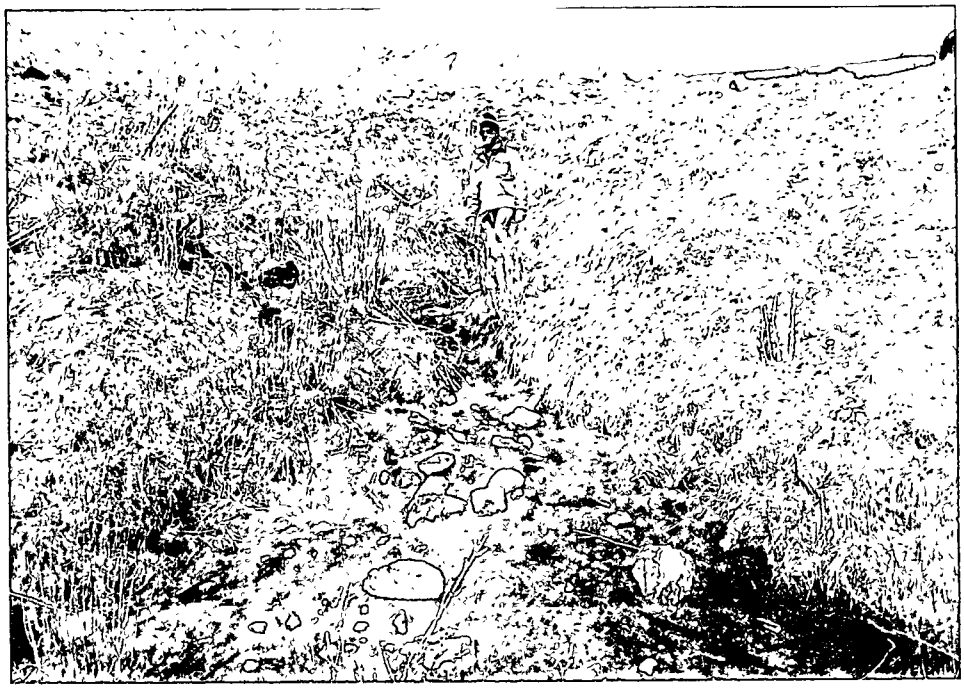


3. Small reservoir just upstream from flowing well location - has culvert that flows into larger downstream collection reservoir - note open water.

4. Larger collection reservoir showing open water on upstream end - facing east.



5. Facing east showing small reservoir and larger collection reservoir with spring development in background ("flowing well").



6. Facing north - easterly spring to be tapped by City of Geraldine - Paul Lemire.

7. Bob Larson - taken facing north - most westerly spring to be tapped.

B. Facing south looking downstream from easterly spring showing open water.

9. Two parallel stock tanks fed from spring development and drain tile system located in the extreme NW¼ NW¼ Section 27, T. 20N, R. 12E. Myllymaki livestock water tanks.

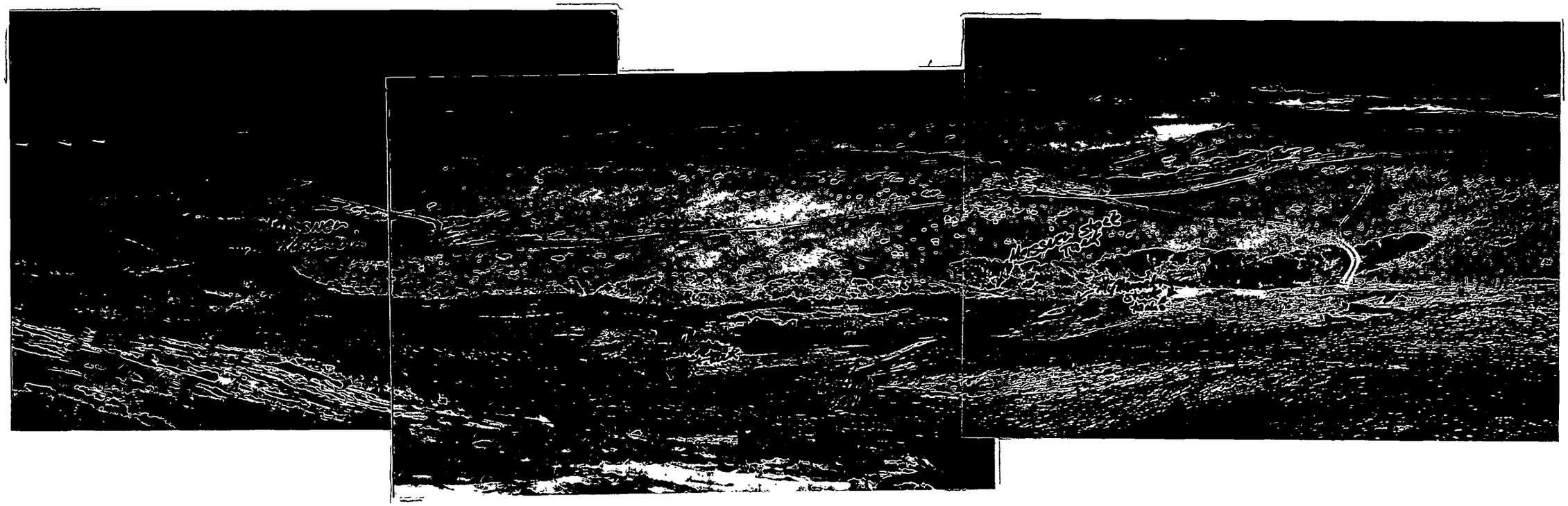
10. Pump and shallow well spring development for Myllamaki livestock watering system. Pump located in NW¼ NW¼ Section 27, T. 20N, R. 12E furnishing water supply to stock tanks (4) - located in:
    1. NE¼ NW¼ NE¼ Section 28, T. 20N, R. 12E
    2. SW¼ SE¼ Section 21, T. 20N, R. 12E
    3. SE¼ Section 21, T. 20N, R. 12E

11. Stock tank (1 of 4) located approximately 400 feet higher than spring source on head water to Butte Creek (tank is fed by pipeline and located in SW¼ SE¼ Section 21, T. 20N, R. 12E.
Myllymaki livestock range.

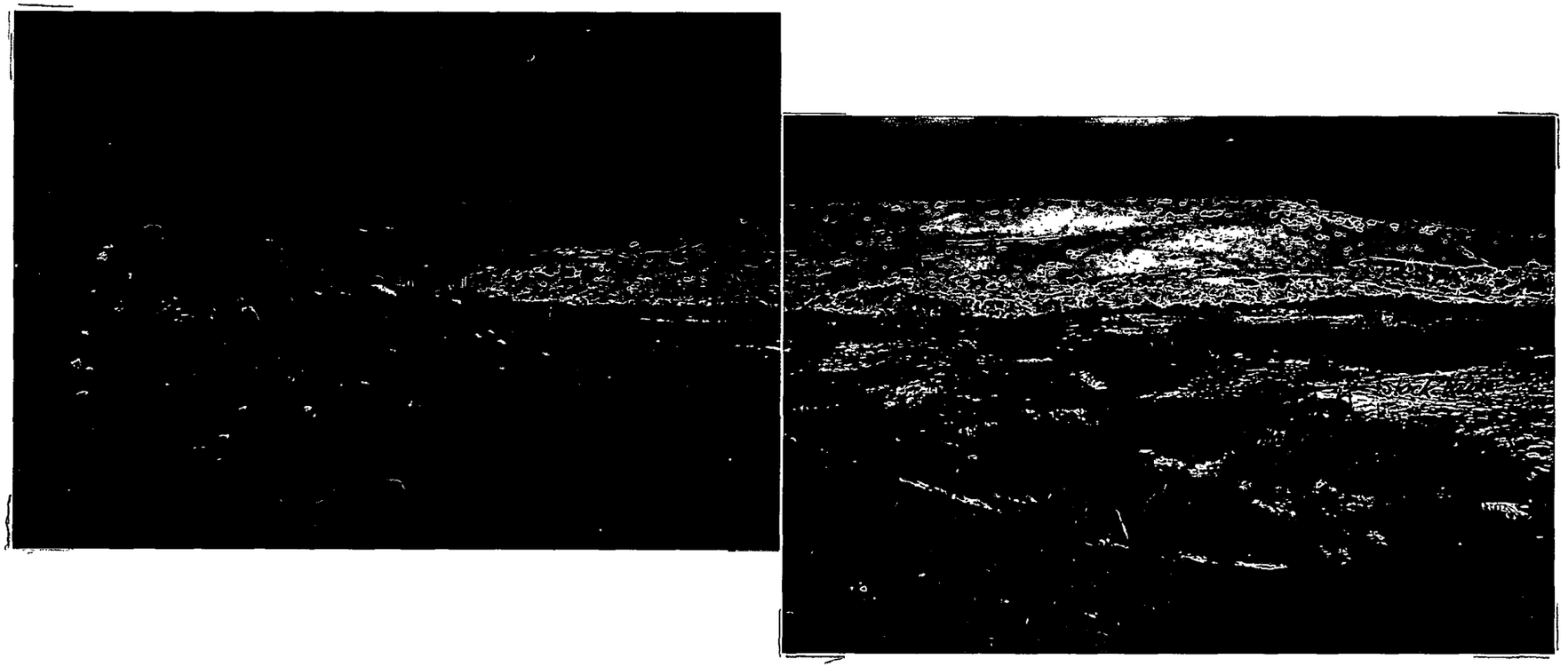
12. Stock tank and spring development for Myllamaki livestock located in NW¼ NW¼ Section 27, T. 20N, R. 12E.

13. Shallow well on Myllymaki range land located in NW¼ NW¼ Section 27, T. 20N, R. 12E.

14. Water control valve to Myllymaki livestock tank located approximately in the NE¼ NW¼ NE¼ of Section 28, T. 20N, R. 12E and fed by pipeline and spring source located in NW¼ NW¼ of Section 27, T. 20N, R. 12E.



15.) Panoramic view of Meissner reservoir and Butte Creek drainage on left photo looking southeast, Myllamaki pump site and shallow well in center photo, and stock tanks on the right photo looking south.
April 4, 1985



16.) Panoramic view of Myllamaki pump site, one stock tank, and spring source area looking southeast.
April 4, 1985 - Marvin Cross, Sam Rodriquez, and Hugo Tureck on left photo overlooking area.

DELTA ENGINEERING

CIVIL MINING GEOLOGY

510 - 1st AVENUE NORTH • SUITE 203 • P. O. BOX 1481 • GREAT FALLS, MONTANA 59403 • PHONE (406) 453-2209

March 5, 1985

DNRC
Water Rights Bureau
P.O. Box 1828
Havre, MT 59501

Attn: Marv Cross

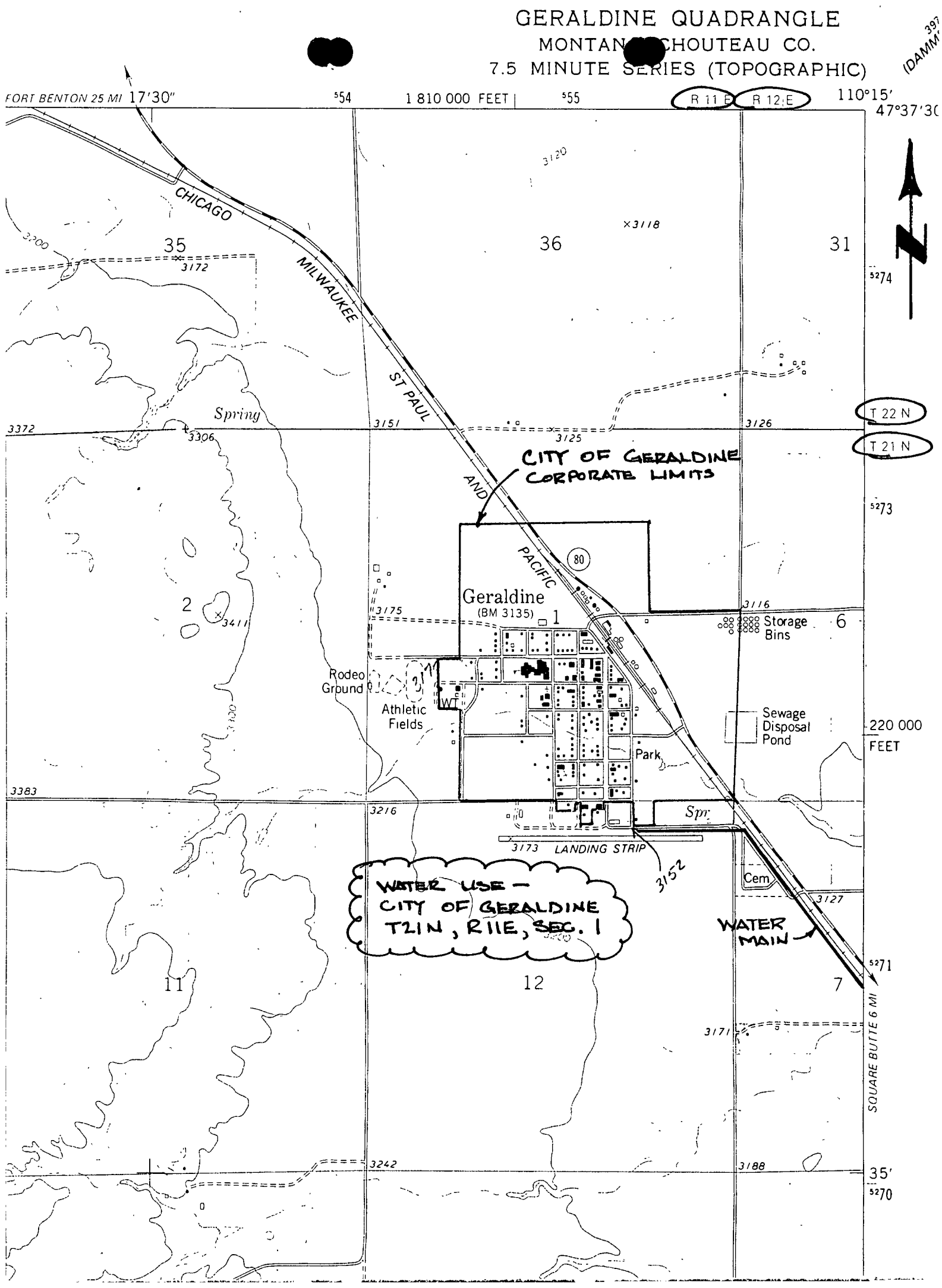
Re: City of Geraldine - Water Rights Application Maps

Dear Marv:

Enclosed are maps showing the City of Geraldine corporate limits and a map of the planned waterline route showing the location of the Meissner Ranch (water use) and probable other rural water user locations. I hope these maps are suitable for your review of the Water Rights Application. If you have any question, please give me a call.

Yours very truly,

Gary L. Knudson, P.E.


GERALDINE QUADRANGLE
MONTANA—CHOUTEAU CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
FORT BENTON 25 MI
17'30"
554
1 810 000 FEET
555
R 11 E
R 12 E
110°15'
47°37'30
CHICAGO
MILWAUKEE
ST PAUL
AND
PACIFIC
Spring
CITY OF GERALDINE
CORPORATE LIMITS
Geraldine
(BM 3135)
Rodeo
Ground
Athletic
Fields
Storage
Bins
Sewage
Disposal
Pond
Park
Spr
3173 LANDING STRIP
3152
Cem
WATER USE —
CITY OF GERALDINE
T21N, R11E, SEC. 1
WATER
MAIN
SQUARE BUTTE 6 MI
T 22 N
T 21 N
220 000
FEET
35'
5270
5271
5273
5274
35
36
31
11
12
7
2
1
6
3372
3306
3151
3125
3126
3175
3116
3411
3383
3216
3242
3188
3171
3127
3118
3120
3200
3172

WATER USE
CITY OF GERALDINE
T21N, R11E, SEC 1

A.R. VALVE

A.R. VALVE

6" PVC. CLASS 160

A.R. VALVE

MEISSNER RANCH
WATER USE
T20N, R12E, SEC 11

A.R. VALVE

MEISSNER SPRING
WATER INTAKE
ELEV. 3780
DIVERSION

A.R. VALVE

PROPOSED WATERLINE ROUTE

MEISSNER SPRING
NENWNW, SEC 27, T20N, R12E

ID #: 058121-41R-CH

BASIN: 41R

NAME: Town of Geraldine

FORM #: 600

PURPOSE: MC

POD: SE NE NE 21 T20N R12E

F.I. DATE: _____

IN CONJ. WITH: _____

STATUS: _____

STATUS 1: _____

STATUS 2: _____

DATE: _____

DATE 1: _____

DATE 2: _____

COMMENTS: _____

X1: _____

Give the file to Terri when you complete the field investigation and the work up to one of the applicable status's. She will route the file as needed.

APPLICABLE STATUS'S

REFIELD
AWAITING INFORMATION
BOB'S REVIEW
PERMITTEE'S SIGNATURE
VERIFICATION COMPLETE
SENT TO HELENA
AWAITING 605 FROM PERMITTEE
AWAITING 605 FROM HELENA
AWAITING TRANSFER
EXTENSION GRANTED (date)

APPLICANT'S NAME	DATE	TIME	CAL
C/T	6/5/85	9:50AM	

There is a large map attached to this Water Right. Please look under Map information.

OWNERSHIP

APPLICATION NO. 58121-g41R COUNTY CHOUTEAU

APPLICANTS NAME(S) CITY of GERALDINE

DECREE YES ☐ NO ☒

INDIAN RESERVATION YES ☐ NO ☒

IRRIGATION DISTRICT YES ☐ NO ☒

FORMATION OR SOURCE DEVELOPED SPRING, A TRIB. of COWBOY CREEK

LAND DESCRIPTION OF P.O.D.S SE NE NE SEC. 21, T20N, R12E
NW NW NE SEC. 21, T20N, R12E

Map ATTached to This Document
See map in Map Information

ANALYST Marion Cross DATED May 23, 1985

LAND OWNER	Name & Address	Sec.	TWSP.	Rge.	SHORT LEGAL
APPLICATION No.					41R - 58121 - 00
NONE					

REMARKS

REFERENCE DNRC RECORDS

OWNERSHIP OBTAINED BY: Marie Cross

DATE 5/23/85

FORM 600 CHECK LIST

58121-~~G 41R~~	9	41R	MAY 10, 1985
Application No.	S/G	Basin	Received Date

FEE CHECK:

Fee Required $100.00 Fee Received $100.00 Transmittal No. 04-030-01-02

Refund Made ☐ Yes, Amount _____ Date _____

FORM CHECK LIST:

	OK	NOK	REMARKS
1.	✓		
2.	✓		
3.	✓		
4.	✓		
5.	✓		
6.	✓		
7.	✓		PLACES OF USE FOR RURAL WATER SUPPLY?
8.	✓		CAN'T SUPPLY - WON'T KNOW WHO FOR
9.	✓		SOME TIME YET
10.	✓		
11.	✓		
12.	✓		
13.	✓		
14.	✓		

DEFICIENT/RETURNED:

Certified No. _____ 30 Day Deadline (up to 6 mo.) _____

Application Corrected _____ (date) Priority Date Changed ☐ Yes, _____ (date)

PROCESSING CHECK:

YES	NO		
	✓	1.	Supplemental map (Quad, Aerial or GLO).
	✓	2.	Field investigation needed: _____ (date).
✓	✓	3.	Irrigation Requirements Worksheet.
✓		4.	Copy of Supplemental Water Right(s) enclosed.
✓		5.	Environmental Assessment enclosed.
	✓	6.	PER/EIS needed, 90 day deadline _____.
✓		7.	Affected Ownership map and list _____.
	✓	8.	Affidavit of Certification and Publication.
	✓	9.	Affidavit of Service enclosed.
✓		10.	Waive Notice checklist.
	✓	11.	612 in file.
	✓	12.	612 due from applicant by: _____ (date).
✓		13.	Code sheet enclosed.

ACTION NEEDED -- HELENA:

	1.	Process refund (claim payment enclosed).
	2.	Review for PER/EIS _____ (Bur. Chief, Prog. Mgr., etc.).
	3.	Review by Water Sciences Bureau _____.
	4.	Run Affidavit of Service per ownership list.
	5.	Prepare Groundwater Ownership.
	6.	Publish per enclosed affidavit.
	7.	Set objection period; ☐ two weeks, other _____.
✓	8.	Issue Permit (notice waived).
	9.	Use completion due date _____.

REMARKS/TERMS OR CONDITIONS RECOMMENDED: _____

ANALYST'S SIGNATURE Marian Crow DATE: May 23, 1985

File Number 58121-9 41R

FORM 600 ENVIRONMENTAL ASSESSMENT CHECKLIST

1. Will the diversion be for more than 15 cfs or 10,000 acre feet?
   Yes _____ No ✓

2. If the permit is granted will future diversions from the water source likely be precluded?
   Yes _____ No ✓

3. Is there evidence of controversy regarding the proposed diversion (other than that involving rights of prior appropriator)?
   Yes _____ No ✓

4. Is the point of diversion, conveyance or place of use near a special use area (e.g., wild, scenic or recreational river, wilderness area, wildlife management area, recreational site)?
   Yes _____ No ✓

5. Is the diversion of water from a blue ribbon stream or water source with a similarly important fishery resource?
   Yes _____ No ✓

6. Will the diversion, conveyance of place of use be on or near an important area for terrestrial wildlife (e.g., nesting site, winter range)?
   Yes _____ No ✓

7. Is saline seep a present or projected problem in the vicinity of the place of use?
   Yes ✓ No _____

8. Will the proposed diversion require a substantial expenditure of funds in order to put it to beneficial use?
   Yes _____ No ✓

9. Are there any known sites of historic or prehistoric importance near the proposed diversion, conveyance or place of use?
   Yes _____ No ✓

10. Are there any present land uses that would be limited on precluded if the proposed diversion is put to beneficial use?
    Yes _____ No ✓

In consideration of the above responses, particularly those in the affirmative, note any environmental, social or economic impacts which may be attributed to issuance of the permit.

THIS SPRING DEVELOPMENT WOULD NOT ADD TO EXISTING SALINE SEEP PROBLEMS. IN THE AREA. IN FACT, IT WOULD BE USED TO SUPPLEMENT ANOTHER SPRING DEVELOPMENT WHICH IS INTENDED TO REPLACE EXISTING WELLS FOR THE CITY OF GERALDINE. THE WELLS WATER IS POOR QUALITY, PARTLY DUE TO SALINE POLLUTION.

Recommendation concerning the preparation of a PER or EIS.
Yes _____ (PER) No ✓
Yes _____ (EIS)
Uncertain, request further review by _____

Reviewer Marie Cross Date May 23, 1985

-1

B

Notice of Completion

RECEIVED

58121-41R

APR 7 1986

MONTANA D.N.R.C.
HAVRE FIELD OFFICE

Form No. 617 R1/82

Permit No. 58121-G41R

NOTICE OF COMPLETION OF WATER DEVELOPMENT

This form must be filed by the permitholder on all completed water developments.

The diversion and distribution works for this appropriation must have been completed and water applied to beneficial use on or before November 30 19 87, as specified in the permit or within any authorized extension of time. This Notice of Completion of Water Development, Form 617, shall be filed on or before April 1 1986.

(Please type or print in ink)

(I) (We) City of Geraldine
Permitholder

Address P.O. Box 227

City Geraldine State Montana Zip 59446

Home Phone No. _____ Other Phone No. 737-4361

attest that the water development has been completed and water put to beneficial use. If the development was not fully developed as specified within the terms, conditions, orders, and limitations of Permit No. _____, give details of the appropriation as actually developed.

Signature: x [signature] Permittee Date: 3-28-86

Signature: x Dorothy Coates Permittee Date: 3-28-86

Signature: _____ Permittee Date: _____

Subscribed and sworn before me, this 28th day of March 19 86

[signature]
Notary Public for the State of Montana

Residing at Geraldine

My Commission expires November 13, 1988

Send completed form to:
MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION
32 SOUTH EWING HELENA, MONTANA 59620 449-3962

DNRC

NO FILING FEE REQUIRED

Public Notice
Objections
Hearings Information

Delta Engineering
P.O. Box 1481
Great Falls, MT 59403

PLACE OF USE

Geraldine
(BM 3135)

Rodeo Ground

Athletic Fields

Pacific and

Storage Bins

Sewage Disposal Pond

Park

3773 LANDING STRIP

Cem.

Sch.

A.R. VALVE

Springs

Storage Bin

A.R. VALVE

N

Creek

Creek Road

Spring

Flat

6" PVC. CLASS 160

Square Butte

Cowboy

Buckboard Butte

Creek

T20N R12E

DIVERSIONS

PLANNED WATERLINE FUTURE

TO MEISSNER RANCH

P.R.

A.R. VALVE

MEISSNER SPRING
WATER INTAKE
ELEV. 3780

A.R. VALVE

PROPOSED WATERLINE ROUTE

MEISSNER SPRING
NENWNW, SEC 22, T20N, R12E

Form No. 600 R4/82

INTERIM PERMIT

APPLICATION FOR BENEFICIAL WATER USE PERMIT

(for groundwater of 100 gpm or more, and all surface water)

INSTRUCTIONS

Use one application for each source of supply or each development. Check all appropriate boxes and fill in each blank. If in your case any question is not applicable, enter NA (not applicable). If more space is needed, attach additional sheets.

A map must accompany this application as instructed under Item 12.

Complete the application and submit it with the appropriate filing fee to the Water Rights Bureau field office nearest you. Their locations are listed on the last page. The form will be returned if any of the pertinent information is incomplete.

TERMINATED

RECEIVED

NOV 20 1984

MONTANA D.N.R.C.
HAVRE FIELD OFFICE

FOR DEPARTMENT USE ONLY

Application No. 54798-g41R
Date Rec'd. _____, 19____
Time 10:00 (am)/pm
Rec'd. By Terri L. Peterson
Fee Rec'd. $10.00
Check No. 681
Transmittal No. 04-018-01-02
Refund _____

See Application COPY

(Please type or print in ink)

1. **NAME OF APPLICANT** City of Geraldine

Mailing Address P.O. Box 227

City or Town Geraldine State Montana Zip 59446

Home Phone _____ Other Phone _____

2. **Source of Water Supply:** Check and/or complete one source below.

☐ Well

☐ Lake Name _____ Tributary to _____

☐ Stream Name _____ ☐ Unnamed Source
Tributary to _____

☒ Spring Name, if any Unnamed
Tributary to Butte Creek

☐ Closed Basin (A closed basin results when water drains into a depression, lake, etc. from which water escapes only by evaporation.)

TERMINATED 58095-41R

3. **Point of Diversion** (Describe the location down to the nearest 10 acres):

NE ¼ NW ¼ NW ¼ Section 27, Township 20 N/S, Range 12 E/W, Chouteau County.
(and when applicable)
Government Lot _____, or Lot _____, Block _____, Subdivision Name _____

NO TERMINATED

Additional Point of Diversion: (Also use Item 13, Remarks, for additional points of diversion):

_____ ¼ _____ ¼ _____ ¼ Section _____, Township _____ N/S, Range _____ E/W, _____ County
(and when applicable)
Government Lot _____, or Lot _____, Block _____, Subdivision Name _____

artcraft printers

The water will be dis[illegible]ed to same source, if not consumed.

☒ Yes ☐ No If no, explain and give the complete land description at the point of discharge.

_____

_____

_____¼_____¼_____¼ Section_____, Township_____N/S, Range_____E/W, _____County,
(and when applicable)
Government Lot_____, or Lot_____, Block_____, Subdivision Name _____

4. Means of Diversion

☐ Pump

_____Rated Capacity (gpm, ghp, cfs)

_____Horsepower

_____Lift (in feet)

☐ Well:_____Depth (in feet)

☒ Developed Spring

☐ Dikes

☐ Headgate/Ditch or Pipeline

If other, describe: _____

5. Reservoir (impoundment by dam or pit). See formulas below for computing volume.

a. Capacity of existing (old) reservoir _____acre-feet.
b. Capacity of proposed (new) reservoir or enlarged reservoir _____acre-feet.
c. Would a permanent drainage device be installed? _____Yes _____No
d. Reservoir will be located off-stream (away from source) _____Yes _____No
If yes, give location: _____¼_____¼_____¼ Section_____, Township_____N/S,
Range_____E/W, _____County

Total volume of pit_____ Compute as follows:

Surface area _____ × maximum depth _____ × 0.5 = _____ acre-feet.
acres feet volume

Total volume of reservoir_____ Compute as follows:

Surface area _____ × 0.4 × maximum depth in feet at dam _____ = _____ acre feet.
acres volume

6. Period of Appropriation: Nov. 84 to Dec. 85 inclusive each year.
(month/day) (month/day)

(The period during the year when the water will be diverted, impounded or withdrawn from the source of supply.)

7. Description of Proposed Beneficial Uses:

Stock: Estimated maximum number and type of livestock _____

Domestic: Number of families to be supplied _____

Other (Describe) TESTING AND EVALUATION

Irrigation

a. Method of Irrigation

☐ Sprinkler ☐ Spreader Dike ☐ Border Dike

☐ Contour Ditch Other (Describe)_____

b. Type of crops to be gr... : ______________________

c. Number of irrigations per season: ______________________

d. If the purpose of this appropriation is to provide additional water to lands which are already irrigated, then the acreage that receives the additional water is considered **supplemental**. If this application involves supplemental irrigation indicate the basis of the **existing water** right that is being supplemented.
Claim No. __________ Permit No. __________ Certificate No. __________
Other ______________________

TERMINATED

8. Place of Use

Irrigation: List the acreages to be irrigated and their location by legal land desription. Also indicate in the extreme right hand column the number of acres to be receiving additional water with an "S" for supplemental, and the acres to be irrigated for the first time with an "N" for new.

County __________ Subdivision Name __________ New (N) or Supplemental (S)

Acres	Lot	Block	¼	¼	¼	Section	T	N/S, R	E/W	N or S
____	____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____	____

TERMINATED

Nonirrigation: If the place of use of the water will be the same as point of diversion (item 3), check ☐. If not, give the location of use:

____ ¼ ____ ¼ ____ ¼ Section ____, Township ____ N/S, Range ____ E/W, __________ County,
(and when applicable)
Government Lot ____, or Lot ____, Block ____, Subdivision Name __________

9. Amount of water, use to which it will be applied (irrigation, stock, domestic, other) **and period of use:**

cfs / gpm	up to (acre-feet)	for (use)	from (mo./day)	to (mo./day)
250 gpm	400	Testing	Nov.84	Dec. 85
____	____	____	____	____
____	____	____	____	____

COPY

Total amount requested 250 cfs/gpm (gpm circled) up to 400 acre-feet per year.

10. Proposed Construction:

What is the amount of time needed to complete the development after permit is received? (Note: Construction should not begin until permit is received.)
Twelve Months

TERMINATED

11. Ownership:

a. Property owner at the point of diversion Meissner Ranch

b. Property owner at the place of use Meissner Ranch

c. If you are not the owner at (a) or (b) above, it is your responsibility to obtain the necessary easements and right-of-way. If state or federal lands are involved, contact the appropriate agency since the water right may need to be applied for by them.

12. Location Map:

A map showing the following items **must** accompany this application. Failure to supply an accurate map constitutes an incomplete application and the appliction will be returned for completion. An ASCS aerial photo or USGS topographic map may be used.

Items to be shown on the map:

a. Township and range numbers
b. Section comers and number.
c. Point of diversion
d. Location of conveyance ditch, pipeline etc.
e. Place of use (irrigated acres: new and supplemental, location of stock tanks)
f. Applicant's signature or name of person preparing map

13. Remarks: Provide any additional information that would help in explaining the proposed appropriation.

The spring will be developed at its emergence and tested and evaluated for quality and quantity for potential use as a municipal and rural water system for the City of Geraldine and neighboring farms.

14. The applicant certifies that the statements appearing here are to the best of his/her knowledge true and correct.

× Mike E. Funk, Mayor — Signature — 11-15-87 — Date

Judy L. Knudson, Delta Engineering — Signature — 11-13-87 — Date

SUBMIT THE COMPLETED APPLICATION AND PROPER FILING FEE TO THE APPROPRIATE FIELD OFFICE NEAREST YOU. FIELD OFFICES ARE LOCATED IN: HELENA, MISSOULA, KALISPELL, HAVRE, GLASGOW, MILES CITY, BILLINGS, LEWISTOWN AND BOZEMAN. (Check your local telephone directory for addresses and telephone numbers.)

FEE SCHEDULE

A) Fee charge based on the following rate schedule: For consumptive uses:

0 - less than 25 acre-feet per year	$ 50
25 - less than 100 acre-feet per year	$100
100 - less than 500 acre-feet per year	$150
500 - less than 1,000 acre-feet per year	$200
1,000 - or more acre-feet per year	$250

B) For Applications for non-consumptive uses: Fee charge based on following rate schedule:

0 - less than 1,000 acre-feet per year	$ 50
1,000 - less than 10,000 acre-feet per year	$100
10,000 - or more acre-feet per year	$200

For any Application with a combination of consumptive and non-consumptive uses the rate schedule shown in (A) above shall apply.

C) For any request for an Interim Permit to drill and test only; there shall be a fee of $10.00 in addition to the rate schedules shown in (A) or (B) above.

Form No. 601R10/75 Permit No. 54798-41R

THURBER S

STATE OF MONTANA
DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

PERMIT TO APPROPRIATE WATER

THIS IS TO CERTIFY, that a INTERIM Permit to appropriate water is hereby granted to City of Geraldine -- P.O. Box 227 of Geraldine, State of Montana 59446, pursuant to Application No. 54798-41R, with a priority date from November 20, 1984 @ 10:00 a.m., upon finding that the criteria of Section 89-885, R.C.M. 1947, have been met.

The source and point of diversion of this appropriation shall be groundwater by means of a developed spring at a point in the NE¼ NW¼ NW¼ of Section 27, Township 20 North, Range 12 East, M.P.M., Chouteau County, Montana.

TERMINATED

The water appropriated pursuant to this Permit shall be used for testing and observation purposes only.

COPY

The diversion and distribution works for this appropriation shall be completed, and water shall be applied to beneficial use as specified above, on or before N/A, or within any authorized extension of time. The Notice of Completion of Water Development, Form No. , shall be filed on or before N/A.

TERMINATED

This Permit is SUBJECT TO ALL PRIOR WATER RIGHTS, and the following limitations, terms, conditions, and restrictions:

SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF.

NOTICE: Failure to comply with all terms and conditions herein may result in the loss of the right to appropriate water granted by this Permit.

Dated December 13, 1984

Witness

Ronald J. Luse
WATER RESOURCES DIVISION
Administrative Officer

Recorded in State Record of Water Rights Permits, Volume , Page .

(For County Use Only)

TERMINATED

STATE OF MONTANA)
ss.
County of _____)

Filed for record this _____ day of _____, 19___, at _____, and Recorded in _____ of the Records of _____ County, state of Montana.

By _____ Deputy

_____ Clerk and Recorder

R6/84

EXHIBIT "A"

The attached Interim Permit relative to Application No. 54798-41R, is hereby granted for drilling and testing purposes only by the Department of Natural Resources and Conservation, subject to the following conditions:

1. Each test hole shall not exceed 6 inches in diameter unless a variance for a larger diameter test hole is requested by the Permittee and granted by the Department.

2. No water shall be removed from the aquifer except that needed for drilling purposes and for testing the hydrologic properties of the aquifer.

   If an aquifer test is performed, data gathered during the pump test should be recorded as in the attached Example. This test should be performed at a constant discharge after the driller has fully developed the test well. Recovery water level data should be recorded at similar intervals after the pump is shut off for at least as long as the pump was running. This data must be submitted to the Department for evaluation along with any items requested under Item 3.

3. There shall be no further processing of your Application for Provisional Permit until the Department receives a Well Log Report, Form 603, for each test hole drilled under this Interim Permit, the pump test data noted above, and is notified in writing of the following:

   - ☐ The specific land (acres and land description) to be irrigated;
   - ☐ The rate in gallons per minute that groundwater will be withdrawn from the well and applied to a beneficial use;
   - ☐ The volume to be beneficially used in acre-feet per annum;
   - ☐ The location(s) (land description) of the actual point(s) of diversion;
   - ☐

4. This Interim Permit will expire on December 31, 1985. If the Permittee fails to complete the aquifer test by the stated expiration date, a new application and fee for an Interim Permit would be required to do further testing. Test data and any other information requested above must be submitted by no later than 30 days after the expiration date of this Interim Permit.

5. The issuance of this Interim Permit does not entitle the Applicant to a Provisional Permit and approval of the Application for a Provisional Permit is subject to the procedures and criteria set forth in the Montana Water Use Act.

If, after reviewing the above conditions or for other reasons, you decide not to do any test drilling under the terms of the Interim Permit, please notify the Department in writing as soon as possible.

Refer to "Interim Permit No. 54798-41R" in any correspondence concerning this Interim Permit, including that correspondence necessary to fulfill the conditions listed above.

EXAMPLE

Table XV-Drawdown Measurements
in Observation Well

Time since pump started, in minutes	Drawdown, s, in ft
1.	0.16
1.5	0.27
2.0	0.38
2.5	0.46
3.0	0.53
4.0	0.67
5.0	0.77
6	0.87
8	0.99
10	1.12
12	1.21
14	1.30
18	1.43
24	1.58
30	1.70
40	1.88
50	2.00
60	2.11
80	2.24
100	2.38
120	2.49
150	2.62
180	2.72
210	2.81
240	2.88

ID #: 058095-41R-CH

BASIN: 41R

NAME: Town of Geraldine

FORM #: 600

PURPOSE: MC

POD: NW NW NW 27 T20N R12E

F.I. DATE: _____

IN CONJ. WITH: _____

STATUS: _____

STATUS 1: _____

STATUS 2: _____

DATE: _____

DATE 1: _____

DATE 2: _____

COMMENTS: _____

X1: _____

Give the file to Terri when you complete the field investigation and the work up to one of the applicable status's. She will route the file as needed.

APPLICABLE STATUS'S

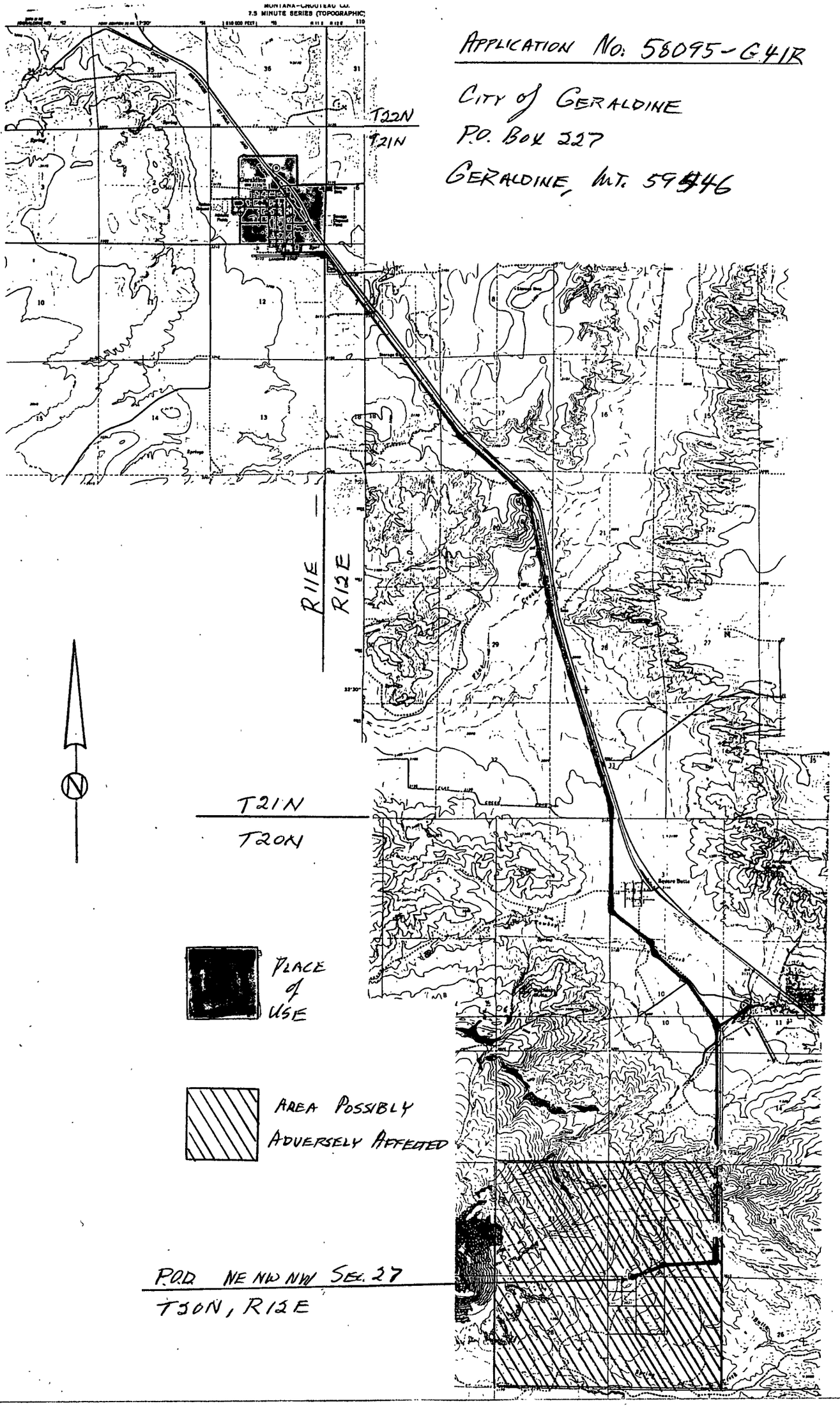
REFIELD
AWAITING INFORMATION
BOB'S REVIEW
PERMITTEE'S SIGNATURE
VERIFICATION COMPLETE
SENT TO HELENA
AWAITING 605 FROM PERMITTEE
AWAITING 605 FROM HELENA
AWAITING TRANSFER
EXTENSION GRANTED (date)

TELEPHONE CALL DOCUMENTATION

Applicant's Name CITY of GERALDINE

Application Number 58095-G41R

DATE	TIME	CALLER	NUMBER CALLED	PARTY CALLED	PURPOSE OF CALL	RESPONSE
3/5/85	2:35	MZ	453-2209	GARY KNUTSON	MAP of POU ?	WILL WORK ONE UP & SEND IT.
3/6/85	9:15	MZ	"	"	HAVE SOME MAPS THAT MAY HELP	NOT IN — WILL CALL BACK.
3/7/85	8:10	MZ	"	"	QUESTIONS ON V LIST	
3/7/85	3:00	MZ	"	"	STOCK WATER FLOW & VOLUME	16gpm Dom., 209 gpm STOCK of 150gpm in UP TO 58 AF ADDITIONAL FOR STOCK
3/15/85	8:05 AM	MZ	"	"	CAN'T WAIVE — MYLLYMAKI OBJECTION	WILL TALK TO RAE KALBFLIESCH & CALL BACK
3/15/85	11:00 AM	GARY KNUTSON	265-5516	MZ	WANTS COPY of MYLLYMAKI CERTIFICATE	WILL SEND IT OUT TODAY
3/15/85	7:30 AM	MZ	566-3498	SAIMA MYLLYMAKI	WILL ADVERSELY AFFECT THEIR WATER SUPPLY	YES, IT COULD — THEIR TANK IS JUST ACCROSS THE FENCE
4/15/85	10:45 AM	GARY KNUTSON	265-5516	MZ	CORRECT LEGAL TO NW NW NW	WILL DO!
6/21/85	9:35	MZ	453-2209	GARY KNUTSON	STATUS ?	MYLLYMAKI'S SUPPOSED TO SIGN AGREEMENT YESTERDAY



APPLICATION NO. 58095-G41R

CITY OF GERALDINE
P.O. BOX 227
GERALDINE, MT. 59446

OWNERSHIP

APPLICATION NO. 58095 - G41R COUNTY CHOUTEAU

APPLICANTS NAME(S) CITY of GERALDINE

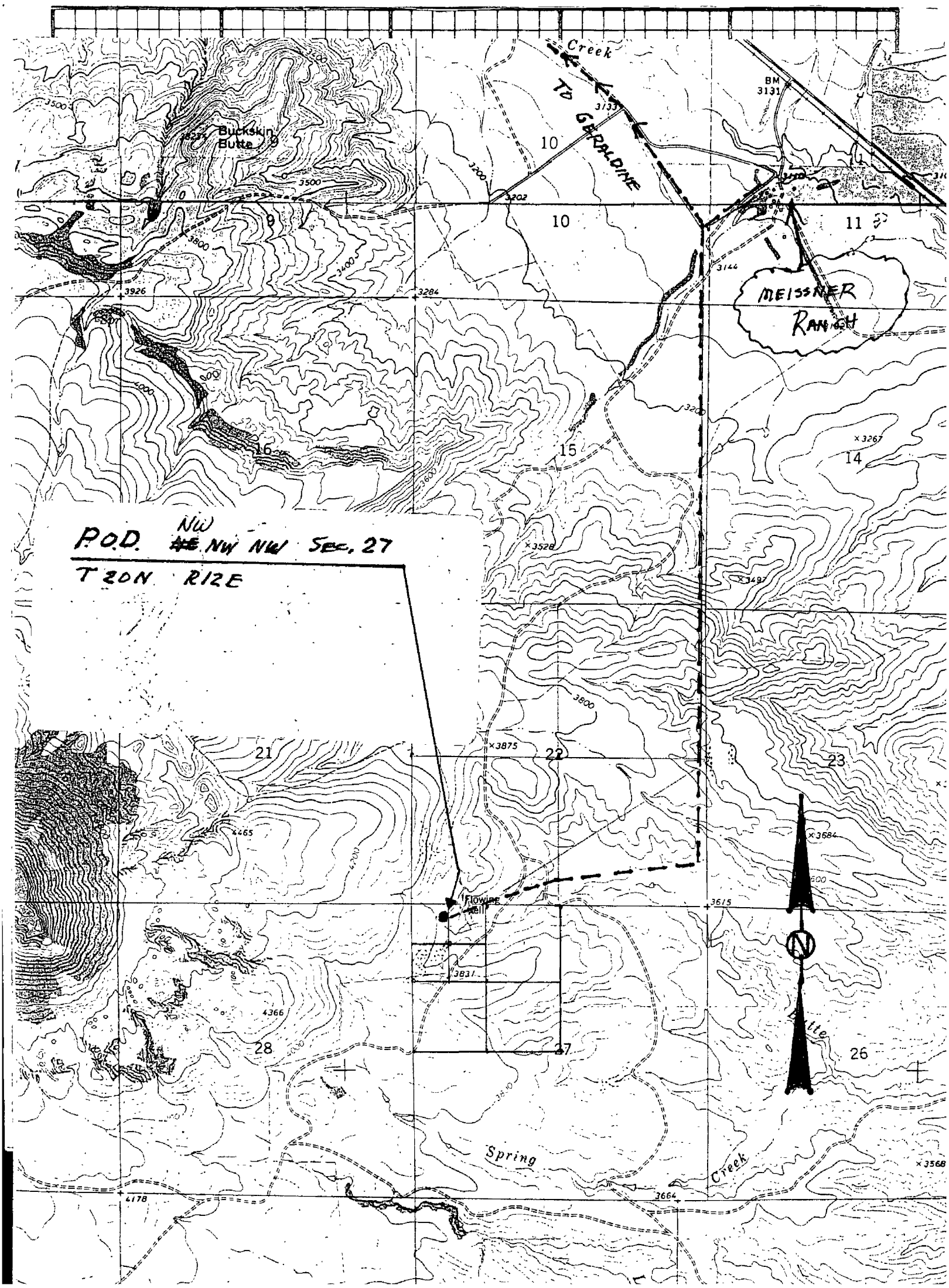
DECREE YES ☐ NO ☒

INDIAN RESERVATION YES ☐ NO ☒

IRRIGATION DISTRICT YES ☐ NO ☒

FORMATION OR SOURCE GROUNDWATER DEVELOPED SPRING

LAND DESCRIPTION OF P.O.D. ~~NE~~ NW NW NW SEC. 27, T20N, R12E



LAND OWNER	Name & Address	Sec.	TWSP.	Rge.	SHORT LEGAL
APPLICATION NO.					58093-G41R
MILLYMAKI	TED NE 28				G41R C018548-00
MILLYMAKI	SAIMA				
STRAND	DEAN SE 28				G41R W037382-00

REMARKS THE USGS TOPOG MAP SHOWS A FLOWING WELL @ THE POD - IF THE AREA HAS ARTESIAN WELLS FROM THE SAME SOURCE AS THIS PROPOSED SPRING, THE AREA POSSIBLY ADVERSELY AFFECTED COULD BE LARGER. THAT IS WHY A RADIUS OF 1 MILE WAS USED RATHER THAN ½ MILE.

REFERENCE DNRC RECORDS OWNERSHIP OBTAINED BY: MARV CROSS

DATE 3/7/85

FORM 600 CHECK LIST

58095 | G | 41R | FEB, 22, 1985

Application No. | S/G | Basin | Received Date

FEE CHECK:

Fee Required $150.00 Fee Received $150.00 Transmittal No. _____

Refund Made ☐ Yes, Amount _____ Date _____

FORM CHECK LIST:

	OK	NOK	REMARKS
1.	✓		
2.	✓		SPRING OR WELL?
3.	✓		
4.	✓		DEPTH OF HORIZONTAL WELL? 15' @ 20' @ DEEPEST
5.	✓		
6.	✓		400 AC-FT = 2.67 AF/FAMILY (150 FAMILIES) OK?
7.	✓		NEED A MAP.
8.	✓		3/7/85
9.	✓		MAP NOT COMPLETE - MUST ~~KNOW~~ SHOW PLACES OF USE
10.	✓		SHOULD A SEPARATE VOLUME BE LISTED
11.	✓		FOR STOCKWATER? NO - see agreement rec'd 6-10-85
12.			
13.			
14.			

DEFICIENT/RETURNED:

Certified No. _____, 30 Day Deadline (up to 6 mo.) _____

Application Corrected _____ (date) Priority Date Changed ☐ Yes, _____ (date)

PROCESSING CHECK:

YES	NO		
✓		1.	Supplemental map (Quad, Aerial or GLO).
✓		2.	Field investigation needed: MARCH 12, 1985 (date).
	✓	3.	Irrigation Requirements Worksheet.
	✓	4.	Copy of Supplemental Water Right(s) enclosed.
✓		5.	Environmental Assessment enclosed.
	✓	6.	PER/EIS needed, 90 day deadline _____.
✓		7.	Affected Ownership map and list _____.
		8.	Affidavit of Certification and Publication.
		9.	Affidavit of Service enclosed.
		10.	Waive Notice checklist.
		11.	612 in file.
		12.	612 due from applicant by: _____ (date).
		13.	Code sheet enclosed.

ACTION NEEDED -- HELENA:

1. Process refund (claim payment enclosed).
2. Review for PER/EIS _____ (Bur. Chief, Prog. Mgr., etc.).
3. Review by Water Sciences Bureau _____.
4. Run Affidavit of Service per ownership list.
5. Prepare Groundwater Ownership.
6. Publish per enclosed affidavit.
7. Set objection period; ☐ two weeks, other _____.
8. Issue Permit (notice waived).
9. Use completion due date _____.

REMARKS/TERMS OR CONDITIONS RECOMMENDED: _____

ANALYST'S SIGNATURE _____ DATE: 3/7/85

B

Notice of Completion

RECEIVED

58095-41R

APR 7 1986

Form No 617 R1/82

Permit No. 58095-G41R

MONTANA D.N.R.C.
HAVRE FIELD OFFICE

NOTICE OF COMPLETION OF WATER DEVELOPMENT

This form must be filed by the permitholder on all completed water developments.

The diversion and distribution works for this appropriation must have been completed and water applied to beneficial use on or before November 30, 19 19 87, as specified in the permit or within any authorized extension of time. This Notice of Completion of Water Development, Form 617, shall be filed on or before April 1 1986.

(Please type or print in ink)

(I) (We) City of Geraldine
Permitholder

Address P.O. Box 227

City Geraldine State Montana Zip 59446

Home Phone No. _____ Other Phone No. 737-4361

attest that the water development has been completed and water put to beneficial use. If the development was not fully developed as specified within the terms, conditions, orders, and limitations of Permit No. 58095-G41R, give details of the appropriation as actually developed.

FILMED
MAY 15 1986

BY _____

Signature: × _____ Permittee Date: 3-28-86

Signature: × Dorothy Coates Permittee Date: 3-28-86

Signature: _____ Permittee Date: _____

Subscribed and sworn before me, this 28th day of March 19 86

_____
Notary Public for the State of Montana

Residing at Geraldine

My Commission expires November 13, 1988

Send completed form to:
MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION DNRC
32 SOUTH EWING HELENA, MONTANA 59620 449-3962

NO FILING FEE REQUIRED

Public Notice
Objections
Hearings Information

Form No. W-2/81

WAIVE NOTICE FACT SHEET

Application No. 58095-G41R

1.) Name of person who prepared this fact sheet and is recommending this application for waiver before the Waive Notice Committee:

Marie Cross
(Signature)

2.) Document all water users or landowners contacted: (abbreviate the contacts made by indicating, T=telephone, L=letter, P=personal)

	Time, Date, and How Contacted	Name	Response
a.			
b.			
c.			
d.			
e.			
f.			

3.) Was a field investigation made and report written? D Yes _____ No

If No, explain: _____

4.) Current applications or existing water rights in the possible affected area:

	Name	Application No. or Ref. No.	Status or Amt. & Source
a.	STRAND, DEAN	W037382-G41R	10 GPM up to 11.8 AF/YR - STOCK
b.	MYLLYMAKI, TED & SAIMA	18548-G41R	20 GPM up to 1.05 AF FOR STOCK
c.	MEISSNER RANCH	158848-S41R (BUTTE CREEK)	2 CFS up to 965 AF/YR FOR IRRIGATION
d.			
e.			
f.			

5.) List below all stream flow records, soil surveys, geology reports, specially prepared reports, etc., used in making a determination to waive public notice. (Also indicate if the report or record is in the file. If not, state where it is located.)

6.) Waive Notice Committee recommends the application be: D waived _____ not waived

a. Date action taken Oct. 22, 1985

b. Signature of Committee members agreeing to waive:

1.) Ron Jones
2.) Marie Cross
3.) Tom Overcast
4.) Dixie Shiflett
5.) Bob A. Johnson
6.) _____

Form No. W-1/81

WAIVE NOTICE CHECKLIST

Application No. 58095-G41R

Analyst Marvin Cross

General Instructions: This checklist must be completed and the responses to the following questions should, unless supportive evidence and circumstances prove otherwise, all be in the WAIVE NOTICE column before proceeding to the Waive Notice fact sheet on the reverse side. If one response is in the DO NOT WAIVE column, then caution should be exercised in the Waive Notice process and possibly the application should be advertised. (Circle Yes or No)

		Waive Notice	Do Not Waive
1.)	Is the application in a controlled groundwater area?	(No)	Yes
2.)	Is the application for waters that flow into, through, adjacent to, or under an Indian Reservation?	(No)	Yes
3.)	Is there potential significant environmental impact?	(No)	Yes
4.)	Have all the criteria for issuance of a permit been met?	Yes	No
5.)	The proposed application for change will not adversely affect the rights of other persons?	(No)	Yes
6.)	The application is on a decreed stream and no field investigation and field report have been made.	(No)	Yes
7.)	The application is for a reservoir on the source stream where facts about the construction and safety of the dam are unknown.	(No)	Yes
8.)	The proposed well is in a populated area or subdivision.	(No)	Yes
9.)	The groundwater source is an artesian aquifer where rapid affect to water well pressure of prior users may be evident.	No	Yes
10.)	The application is in an area of known water conflicts.	(No)	Yes
11.)	The application is in an area of known environmental concern.	(No)	Yes
12.)	The application is in a known water short area.	(No)	Yes
13.)	The application is in the Big Flat groundwater study area.	(No)	Yes

Remarks: _____

Transfers:

Transfers and attachments

Transfers

RELEASE to Town of Geraldine

for

providing non-chlorinated water

KNOW ALL MEN BY THESE PRESENTS that the undersigned for and in consideration of the providing of water from the Town of Geraldine municipal water system prior to any chlorine being added to the water to the Meissner Ranch, Square Butte, Montana, does hereby forever release all persons working in connection with the Town of Geraldine, its agents, and employees, from any and all liabilities and claims for damages of any kind arising out of such provision of non-chlorinated water, including any liability which might arise by reason of any type of sickness, disease or other malady that might be connected with the use of non-chlorinated water. The undersigned further covenants and agrees to indemnify and save harmless the Town of Geraldine, Chouteau County, Montana, and its agents and employees from all such liabilities, charges, expenses and costs, including reasonable attorneys fees and court costs, incurred as a result of the provision of non-chlorinated water.

DATED this 12th day of February, 2002.

Meissner Ranches Inc.
By Paul Meissner

Address:
Box 490
Chester MT 59522

STATE OF MONTANA)
)ss.
County of Liberty)

This instrument was acknowledged before me on 12 Feb. 2002, by Paul Meissner, Pres. Meissner Ranches, Inc.

(NOTARIAL SEAL)

Hugh B. Brown
Printed Name: Hugh B. Brown
NOTARY PUBLIC FOR STATE OF MONTANA
Residing at Chester
My Commission expires 1/10/2004

APPENDIX K

Geraldine Source Water Delineation and DEQ Sanitary Survey

GERALDINE, MONTANA

Public Water System

PWSID # MT0000225

SOURCE WATER PROTECTION PLAN

Report Date: June 4, 2001

Contact Person:

Mayor, Monica Rice

Certified Operator

Jay Eklund

PO Box 211

Geraldine, MT 59446

phone: (406) 737-4361

TABLE OF CONTENTS

Appendices

Note: Well logs available upon request from the Department of Environmental Quality or the Public Water Supply.

INTRODUCTION

This Report was completed by Bill O'Connell, Groundwater Technician with Montana Rural Water Systems inc. (MRWS), Monica Rice the Mayor of Geraldine, Jay Eklund, the licensed operator and Fred Pyatt the operator in training for Geraldine's Public Water System (PWS). Carolyn DeMartino, Water Quality Specialist with the Montana Department of Environmental Quality, reviewed and provided comment on the document and constructed the maps.

Purpose

This report is intended to meet the technical requirements for the completion of the Source Water Protection Plan for Geraldine as required by the Montana Source Water Protection Program (DEQ, 1999) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996.

The Montana Source Water Protection Program is intended to be a practical and cost-effective approach to protect public drinking water supplies from contamination. A major component of the Montana Source Water Protection Program is "delineation and assessment." Delineation is a process of mapping source water protection areas that contribute water used for drinking. Assessment involves identifying locations or regions in source water protection areas where contaminants may be generated, stored, or transported, and then determining the relative potential for contamination of drinking water by these sources. The primary purpose of this source water protection plan to protect its drinking water source.

Limitations

This report was prepared to assess threats to Geraldine's public water supply, and is based on published information and information obtained from local residents familiar with the community. The terms "drinking water supply" or "drinking water source" refer specifically to the source of the community's public water supply and not any other public or private water supply. Also, not all potential or existing sources of groundwater or surface water contamination in the Geraldine area are identified. Only potential sources of contamination in areas that contribute water to its drinking water source are considered.

The term "contaminant" are used in this report to refer to constituents for which maximum concentration levels (MCLs) have been specified under the national primary drinking water standards and certain constituents that do not have MCLs but are considered to be significant health threats.

CHAPTER 1

BACKGROUND

The Community

Geraldine is located in central Montana, about 25 miles east of Fort Benton. The town has 300 residents and provides services for the agricultural community in the surrounding area. Two grain elevators along the BN railroad right-of-way through town provide storage and rail loading facilities. Highway 80 connects Geraldine to US 87 at Fort Benton and also at Stanford. The public water system has 190 hook-ups; this includes North Geraldine and Haywarden, two rural water systems. See Appendix I, figure 1, the Vicinity Map.

Geographic setting

Geraldine is located in the Glaciated Missouri Plateau of the Great Plains Physiographic Province. The Highwood Mountains and Square and Round Butte are the most visible geographic features in the area. Another geographic feature is the Shonkin Sag a large river carved valley that outlines the base of the northern and eastern edge of the Highwood Mountains and marks the southern extent of the Bull Lake Glacier. See figure 2.

The town sits on Cretaceous age sedimentary deposits. The Highwood Mountains rise east of town and Square Butte and Round Butte are south of Geraldine. The Montana Plains surround Geraldine and extend out to the north, south and east. The average annual temperature in the region is 44.2^{o} F and the average precipitation is 14 to 18 inches (National Water and Climate Center).

General Description of the Source Water

Geraldine uses groundwater supplied by two wells (figure 3) and several spring collectors (figure 3A) to meet it's drinking water requirements. In 1959, several wells were drilled to depths of around 2000 ft below the surface. Initially the wells had closed in pressures of 120 to 140 psi and flowed at 35 to 60 gpm. Over the years that production has fallen to about 5 gpm. Two years ago a pump was placed in one well. In June 2001, the pump was lowered 100 feet to a depth of 961 ft and production was reduced from 67 gpm to 55 gpm. The wells are recharged in the Little Belt Mountains where the formations are exposed.

In the late 1980's, a spring system was developed on the southeast slope of Square Butte and a 14 mile pipeline constructed to carry the water to Geraldine. Square Butte is a large laccolith that was formed by the same magma that formed the Highwood Mountains. The

Butte is separated from the Highwood Mountains by several miles and the surrounding sediments have been eroded away, leaving the Butte rising high above the surrounding land. The springs are located near the contact between the uplifted sedimentary formations and the igneous rock of the Butte (Appendix II, Figure 2). The springs are on the southern flank of the Butte and are recharged by precipitation infiltrating through fractures in the Butte.

Table 1. List of geologic or hydrogeologic maps available for the Geraldine, Montana area.

Title or Description	scale	Area Covered	Reference
Topographic, geologic	1:24,000	Pownal Creek	NRIS, map finder
Geologic	various	Montana	Taylor and Ashley

The Public Water Supply

The football field well (well #2) is located on the southeast edge of town near the water tower and athletic field (Appendix III, Figure 3). Well #3, (Knedler well) is located on the east side of town, this well is not pumped, but is connected to the distribution system (Appendix III, Figure 3). The springs are located on the south flank of Square Butte, 10 miles south of town (Appendix III, Figure 3a). A 14-mile transmission pipe brings the water to town. The spring water goes directly into the distribution system and the pumped well flows directly to the tank (personal communication with Mayor Rice, 4-01). The water distribution system is composed of asbestos cement pipe.

The PWS originally had four wells. Two of the wells are mentioned above and the firehouse well (Appendix III, Figure 3) was not used or connected to the distribution system due to poor water quality (high sulfate). The fourth well is located north of town in a field across the highway. The town did not have title to the land and after the original owners death his children took over the well. The well is not connected to the distribution system (personal communication with Mayor Rice, 6-01). Also, Winchell Springs located west of town have been used to supply water to Geraldine. The springs are not connected to the distribution system.

Water Quality

Geraldine is routinely monitored for compliance with drinking water standards. Bacteriological monitoring occurs monthly. Compliance with other drinking water standards is based on additional sampling on a variety of schedules. The well water is hard and has a high iron and other mineral content.

Influencing Factors

The source water protection plan was started by Mayor Rice a part of a program to ensure an adequate water supply for the town. The PWS has received testing waivers for the springs. The analysis was completed by the DEQ. The wells were not used at that time.

Source Water Protection Management

Mayor Monica Rice will oversee implementation of the SWPP.

CHAPTER 2

DELINEATION

The portions of the aquifer that contributes water to Geraldine's wells and springs are identified in this chapter. Three management regions (the control zone, inventory region, and recharge region) are mapped for each source. The goal of management in the control zone is to protect against direct introduction of contaminants into the well or the immediate surrounding area.

Management in the inventory region should focus on pollution prevention activities where water is likely to flow to the wells within a relatively short time period. The goal of management in the recharge region is to maintain and improve the quality of groundwater that could reach the wells over longer times or with increasing water usage.

Geologic Conditions and Aquifer Characteristics

Geraldine uses groundwater supplied by two wells and several spring collectors to meet it's drinking water requirements. In 1959, four wells were drilled to the Kootenai Formation at depths of around 2000 ft below the surface. Initially the wells had closed in pressures of 120 to 140 psi and flowed at 35 to 60 gpm. Over the years that production has fallen to about 5 gpm and a pump was placed in one well. The pump is at a depth of 961 ft and produces 55 gpm. The wells are recharged in the Little Belt Mountains where the Kootenai formations are exposed.

In the late 1980's, a spring system was developed on the southeast slope of Square Butte and a 14 mile pipeline was constructed to carry the water to Geraldine. Square Butte is a large laccolith that was formed by the same magma that formed the Highwood Mountains. The Butte is separated from the Highwood Mountains by several miles and the surrounding sediments have been eroded away, leaving the Butte rising high above the surrounding land. The springs are located near the contact between the uplifted sedimentary formations and the igneous rock of the Butte.

See the section on Conceptual Model and Assumptions for additional information.

Wells and Springs

Geraldine's pumped well (#2) is 1905 feet deep and the casing is slotted from 1858 feet to 1908 feet below the ground surface. The well has a 30 hp pump that is at a depth of 861 feet. The original drillers log (O.C. Thatcher, 4/10/59) recorded a shut in pressure of 120 psi and flowed at 60 gpm.

Well #3 (Knedler) was drilled to a depth of 2217 feet where sulfur water was encountered, the well was back filled with 20 sacks of cement to a depth of 1965 feet. The well had a shut in pressure of 140 psi and flowed 65 to 70 gpm of water, when drilled (O.C. Thatcher, 1/1 1960). The well is still connected to the distribution system but a pump is not in this well. The well has a coin operated bulk water connection next to it. See the well logs in Appendix IV.

The springs are 10 miles south of and several hundred feet above Geraldine. There are two collectors several hundred feet apart. The water is gravity fed to town. The springs are on the south flank of Square Butte, where a series of contact springs flow off the Butte. Laterals extend from two collectors which are tied together. The collected water then flows from the main collector to town.

Table 2. Source well and springs information for Geraldine.

Data Parameters	Football Field well #2 (003)	Knedler Well #3 (004)	Springs (005)
MBMG #	2547	2556	
Water Right #	N/A	N/A	N/A
Latitude / Longitude	47.6022/-110.2738	47.5986/-110.2675	44.1978/-116.7066
Date Completed	April 10, 1959	January 1, 1960	N/A
Depth	1908	1965	N/A
Perforated Interval	1858 to 1908 ft	1746 to 1872 ft	N/A
SWL Depth	flowing 7.5 gpm	flowing	N/A
PWL Depth	961 ft	not pumped	N/A
Drawdown	+861 ft	N/A	N/A
Test Pumping Rate	67 gpm	N/A	N/A
Specific Capacity	.0078 gpm/ft	N/A	N/A
Pumping Rate	55 gpm	N/A	N/A
Source Type	bedrock confined	N/A	N/A

N/A-Not available

Conceptual Model and Assumptions

Wells

The wells are 2000 feet deep which is very deep for a drinking water well. The depth allows deeper sedimentary formations of the Kootenai to be reached. These formations have recharge areas that are located far from the wells in the Little Belt Mountains, 40 miles west of Geraldine. The nearby Highwood Mountains could provide some recharge but the main recharge to the deep aquifers is from the Little Belt Mountain's.

The Kootenai formations are exposed in the Little Belt Mountains, at elevations several hundred feet above the land surface at the wells. Over the last several thousand years, infiltration has filled the voids in the sandstone units with water. The water level in the Kootenai formation is at an elevation sufficient to pressurize the formation beneath Geraldine.

The actual water infiltrating in the Little Belt Mountains takes hundreds to thousands of years to travel beneath Geraldine. These long travel times allow the water to dissolve minerals out of the formations. These minerals show up as the high Total Dissolved Solids (TDS) in the water quality analysis.

Springs

The springs are located just below the contact between the igneous core of Square Butte and the uplifted sediments that surround the Butte. Precipitation falling on the Butte infiltrates through the many cracks and fractures in the igneous rock. The sedimentary formations act as a dam when compared to ease with which water moves through the highly permeable fractures. The water rises to a level where sufficient head (pressure) and a thinning sediment layer allows the groundwater to surface as springs.

When the wells where put in the aquifer had sufficient pressure to flow at 60 gpm per well. Over the last 40 years a combination of allowing the wells flowing freely to waste and a prolonged drought have dropped the pressure in the wells to the point where they must be pumped.

Similarly, when the springs were developed in the 1980's, they produced over 100 gpm all year. The regional drought of the last several years have reduced recharge to Square Butte to the point that base flow from the springs is around 45 gpm. In addition the spring collectors are now susceptible to local surface water infiltration from snow melt or rain events.

Methods and Criteria

DEQ's Source Water Protection Program specifies methods and criteria used to delineate subregions of the source water protection areas for Geraldine. Based on these methods and their associated criteria, the protection areas delineated for Geraldine include 100-foot fixed radius control zones for each source, and 1000-foot fixed radius inventory regions for each source (Appendix III, Figure 4 and Appendix III, Figure 5). The 100-foot

radius control zone surrounding the wells/springs is the most critical area within which direct introduction of contaminants into the wells/ springs or immediate area could occur. The 1000-foot inventory region encompasses the area within which water or contaminants can flow to the wells/springs over a period of months to years. In other words, this boundary delineates the distance in the aquifer that water or nitrates and chlorides could travel in three years. Finally, topographic divides were used to approximate hydrologic boundaries in order to delineate the recharge region for the springs (Appendix III, Figure 8).

Delineation Results

Due to well depths (open below 320 ft) and the overlying geology (shale and clay), time-of-travel calculations were not used for the delineation of the inventory regions. Instead 1000-foot fixed radius inventory regions were delineated around each source. The recharge region for the springs was delineated using hydrogeologic mapping.

Limitations

The reader needs to remember that this delineation is based on estimated groundwater flow and pumping conditions. Conclusions based on this interpretation are uncertain because the extent and properties of the aquifer, and the direction and rate of groundwater flow are not known precisely.

CHAPTER 3

INVENTORY

Potential sources of contamination were inventoried to assess the susceptibility of Geraldine's drinking water sources to contamination. Potential sources of all contaminants with primary drinking water standards and cryptosporidium were identified but a detailed inventory was conducted only for potential sources of contaminants that are the greatest threat to health. The contaminants of greatest concern to Geraldine are nitrate and pathogenic organisms.

The inventory for Geraldine focuses on all activities in the control zone, major facilities in the inventory region, and general land uses in the recharge region.

Inventory Method

Databases were searched to identify businesses and land uses that are potential sources of regulated contaminants in the inventory region. The following steps were followed:

Step 1.: Major road and rail transportation routes were identified throughout the inventory region.

Step 2.: All land uses and facilities that generate, store, or use large quantities of hazardous materials were identified within the recharge region and identified on the base map.

Potential contaminant sources are designated as significant if they fall into one of the following categories:

1. Large quantity hazardous waste generators

2. Landfills

3. Hazardous waste contaminated sites

4. Underground storage tanks

5. Major roads or rail transportation routes

6. Cultivated cropland

7. Animal feeding operations

8. Wastewater treatment or spray irrigation

9. Septic systems, Sewered residential areas

10. Storm sewer outflows

Inventory Results/Control Zone

The control zone is a 100-foot radius around each well. Within the control zone for the existing wells (football, Nedeler), the main potential contaminant is from vehicle traffic near the well head.

Inventory Results/Inventory Region

The Inventory Region for Geraldine's wells includes 1 septic system, town roads and a municipal sewer system. See Appendix III, Figure 4 and Appendix III, Figure 6.

The Inventory Region for the springs includes pasture land as shown in Appendix III, Figure 7.

Table 4. Results for Geraldine's inventory regions

	Contaminant Source	Description
1	septic system	located at the athletic field, nitrates and pathogens
2	roads	chemical spills or leaks
3	municipal sewer	leaks, nitrates and pathogens
4	pasture	animal waste, nitrates and pathogens

Inventory Results/Recharge Region

The Recharge Region for the wells outside the inventory region is located 40 miles west in the Little Belt Mountains.

The recharge region for the springs is located on Square Butte. The area is partially forested and inaccessible except by foot. See Appendix III, Figure 8.

Inventory Update

The certified operator should update the inventory for his records every year. Changes in land uses or potential contaminant sources should be noted and additions made as needed. A complete inventory should be submitted to DEQ every five years.

Inventory Limitations

The potential sources of contaminants for Geraldine are determined from readily available data and reports. Unregulated activities or unreported contaminant releases may have been missed. The use of multiple sources of data, however, should ensure the major threats to the source water for Geraldine.

CHAPTER 4

SUSCEPTIBILITY ASSESSMENT

The susceptibility of Geraldine's wells and springs to significant potential contaminant sources is assessed in this chapter to rank threats to the drinking water source. The degree of susceptibiltiy is determined by the hazard associated with a source and the existence of barriers to contamination (Table 5). The proximity of point contaminant sources to the town's wells or the density of non-point sources in the inventory region determines hazard (Table 6). Barriers can be anything that decreases the likelihood that contaminated water will flow to the town's wells. Barriers can be engineered structures, management actions, or natural conditions. Examples of engineered barriers are spill catchment structures for industrial facilities and leak detection for underground storage tanks. Emergency planning and best management practices can be considered management barriers. Thick clayey soils, a deep water table, or a thick saturated zone above the well intake can be natural barriers.

Susceptibility ratings are presented individually for each significant potential contaminant source in the inventory region. Geraldine is not considered susceptible to individual point sources in the recharge region because dispersion and dilution of contaminants should reduce concentrations of contaminants below levels associated with adverse health affects.

Table 5. Susceptibility to specific contaminant sources as determined by hazard and the presence of barriers.

	High Hazard	**Moderate Hazard**	**Low Hazard**
No Barriers	Very High Susceptibility	High Susceptibility	Moderate Susceptibility
One Barrier	High Susceptibility	Moderate Susceptibility	Low Susceptibility
Multiple Barriers	Moderate Susceptibility	Low Susceptibility	Very Low Susceptibility

Table 6. Hazard of potential contaminant sources for Geraldine.

	High Hazard	**Moderate Hazard**	**Low Hazard**
Point Source Contaminants	Within one-year TOT	one to three years TOT	Over three years TOT
Septic Systems	More than 300 per sq. mi.	50 – 300 per sq. mi.	Less than 50 per sq. mi.
Municipal Sanitary Sewer (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region
Cropped Agricultural Land (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region

The results of the susceptibility assessment for Geraldine are summarized in Table 7. The following are brief descriptions of the susceptibility assessments for each significant potential contaminant source.

Table 7. Susceptibility assessment for the Geraldine Inventory region.

Source	Contaminant	Hazard	Rating	Barriers	Susceptibility	Management
Municipal sewers	pathogens and nitrates	Leaks	High	:well intake below 1900 feet :well grouted to bedrock :distance from well :flowing well	very low	routine monitoring
Pasture land Springs	pathogens, nitrates	Infiltra-tion	High	:fenced area around springs :cattle in area during transit	high	fence maintenance and routine monitoring
town roads	VOCs SOCs other chemicals	spills	High	:distance from well well intake below 1900 feet :confined aquifer	very low	routine monitoring
septic system	nitrates and pathogens	Infiltra-tion	High	confined aquifer distance to well depth to groundwater	very low	routine monitoring

CHAPTER 5

MANAGEMENT

The goal of the Source Water Protection Program is to prevent Geraldine's drinking water source from being contaminated. All land uses have been inventoried and the potential for these activities to contaminate the drinking water have been ranked. Management activities can be considered as another barrier developed to reduce the susceptibility of a specific contaminant from entering Geraldine's water.

Control Zone Management

No chemicals will be used, stored or transported within the 100-foot radius of the well or spring. Due to the remote location of the springs, this requirement is already in effect.

Inventory Region Management

Management of this region for Geraldine is based on the well's depth and location away from most land use activities. The Town limits include all the land in this region and will control the land use near the wells.

The area around the springs is controlled by 2 land owners, Hugo Tureck and Paul Meisser. The town has easement agreements with both land owners.

Recharge Region Management

The recharge region for Geraldine is in the Little Belt Mountains forty miles west of the town. The land between the Town and the Mountains is agricultural. The recharge travel time makes land use travel times unnecessary.

The PWS operator will monitor any land use changes in the springs' area to ensure they won't impact the water quality or quantity.

Management Implementation

The management strategies have been in use since the springs began serving the PWS.

CHAPTER 6

EMERGENCY PLAN

Procedures for responding to emergencies are described and an emergency coordinator is designated in this chapter. The equipment and materials needed to respond to an emergency and the source of a temporary water supply are also described.

Possible Disruption Threats

The main threat to the PWS has been identified as casing failure or line breaks. A failure of the casing could allow contaminated surface water to enter the well. A break in the line or laterals from the springs could allow contaminants to enter the distribution system or prevent groundwater from entering the spring box.

Emergency Coordinator

The emergency coordinator for Geraldine is Mayor Monica Rice with backup provided by Jay Eklund and Fred Pyatt.

Equipment and Material Resources

A catastrophic loss of water will require the services of an engineer and a well driller. Minor disruptions to the public water system will be handled by public works.

Procedures to Shut Down the Well

The wells can be isolated from the water distribution system by using the valves at the well sites. The wells can be turned off at the respective pump house but requires a key for access. Flow from the springs can be turned off at several places. The keys are located in the town shop.

CHAPTER 7

ALTERNATE WATER SOURCES

Geraldine is actively looking for additional water source(s). The community replaced their wells with the spring collection system in the 1980's. The springs produced sufficient water to supply the Geraldine and 2 small rural water systems. The springs are on the south side of Square Butte and the water flows by gravity the 10 miles to town.

Two years ago the PWS began using one of the wells again when the yield from the springs dropped off. The well is high in iron and other minerals but the water is not treated. When the wells were first drilled in 1959, they had a closed in pressure of 120 psi and flowed at 60 gpm. Through a combination of drought and a practice (regional) of letting the well water drain to waste when not in use, have greatly reduced the flow rate to 5 gpm.

Recommendations

The town is working with Delta Engineering on the spring area to increase the water production. Cleaning the laterals may allow for additional production but the area was dry when we visited the site in early May. The area was reported to be a marsh into late summer until the last few years. The area is showing the effects of several years of drought reducing the recharge to Square Butte. The springs were producing 46 gpm on May 9th, down from over 100 gpm when the springs were first constructed.

Recent work completed in June/July 2001, has expanded the laterals capturing the groundwater. The work has captured an additional 30 to 35 gpm

Geraldine still has 3 of the 4 deep wells drilled in the late 50's. Well #2 (Source ID 003) has been refurbished and produces 67 gpm of water from 861 feet using a 30 hp pump. The pumping costs have gone way up recently (Mayor Rice, personal communication). We don’t know if the higher cost is due to lifting the water 861 feet or due to cavitation caused by an oversized pump dropping the water level down to the inlet. The important thing to remember is that the well produces 67 gpm.

The pump was lowered 100 ft in June 2001. The lower setting has eliminated the air entrainment problem, but has lowered the yield from 65 gpm down to 55 gpm.

The town also has a second well hooked into the distribution system (Knedler well). This well does not have a pump but is allowed to flow freely. The pumphouse is the site of a bulk water outlet. This well should be evaluated to determine what it can produce. Also the cost of sequestering the iron with a polyphosphate should be determined. The well should produce at least 60 gpm. This is what it originally flowed. The regional potentiometric surface has dropped but the tranmissivity of the aquifer should be the same.

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1. Alt, David, A., and Hyndman, Donald, W., 1992, Roadside Geology of Montana

2. Feltis, R,D., 1973, Geology and Water Resources of the of Judith Basin, Montana

3. Levens, Russell, L.,1999, Source Water Protection Plan, Sage Creek Hutterite Colony

4. Nelson, John A., 1993, Structural Geology of the Cat Creek Anticline and Related Features. Central Montana

5. Ross, Clyde P., Andrews, David, A., and Witkind, Irving, J., 1955, Geologic Map of Montana, Montana Bureau of Mines and Geology

6. Taylor, Robert, L., and Ashley, Joseph, M., Geological Map of Montana and Yellowstone National Park, Department of Earth Sciences, Montana State University

GLOSSARY*

Acute Health Effect. An adverse health effect in which symptoms develop rapidly.

Alkalinity. The capacity of water to neutralize acids.

Aquifer. A water-bearing layer of rock or sediment that will yield water in usable quantity to a well or spring.

Best Management Practices (BMPs). Methods that have been determined to be the most effective, practical means of preventing or reducing pollution from nonpoint sources.

Coliform Bacteria. Bacteria found in the intestinal tracts of animals. Their presence in water is an indicator of pollution and possible contamination by pathogens.

Confined Aquifer. A fully saturated aquifer overlain by a confining unit such as a clay layer. The static water level in a well in a confined aquifer is at an elevation that is equal to or higher than the base of the overlying confining unit.

Confining Unit. A geologic formation that inhibits the flow of water.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Enacted in 1980. CERCLA provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through the Act, EPA was given power to seek out those parties responsible for any release and assure their cooperation in the cleanup.

Delineation. A process of mapping source water management areas.

Hardness. Characteristic of water caused by presence of various salts. Hard water may interfere with some industrial processes and prevent soap from lathering.

Hazard. A measure of the potential of a contaminant leaked from a facility to reach a public water supply source. Proximity or density of significant potential contaminant sources determines hazard.

Hydraulic Conductivity. A coefficient of proportionality describing the rate at which water can move through an aquifer.

Inventory Region. A source water management area that encompasses the area expected to contribute water to a public water supply within a fixed distance or a specified groundwater travel time.

Maximum Contaminant Level (MCL). Maximum concentration of a substance in water that is permitted to be delivered to the users of a public water supply. Set by EPA under authority of the Safe Drinking Water Act.

Nitrate. An important plant nutrient and type of inorganic fertilizer. In water the major sources of nitrates are septic tanks, feed lots and fertilizers.

Nonpoint-Source Pollution. Pollution sources that are diffuse and do not have a single point of origin or are not introduced into a receiving stream from a specific outlet.

Pathogens. A bacterial organism typically found in the intestinal tracts of mammals, capable of producing disease.

Point-Source. A stationary location or fixed facility from which pollutants are discharged.

Public Water System. A system that provides piped water for human consumption to at least 15 service connections or regularly serves 25 individuals.

Pumping Water Level. Water level elevation in a well when the pump is operating.

Recharge Region. A source water management region that is generally the entire area that could contribute water to an aquifer used by a public water supply. Includes areas that could contribute water over long time periods or under different water usage patterns.

Resource Conservation and Recovery Act (RCRA). Enacted by Congress in 1976. RCRA's primary goals are to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner.

Section Seven Tracking System (SSTS). SSTS is an automated system EPA uses to track pesticide producing establishments and the amount of pesticides they produce.

Source Water Protection Area. For surface water sources, the land and surface drainage network that contributes water to a stream or reservoir used by a public water supply.

Static Water Level (SWL). Water level elevation in a well when the pump is not operating.

Susceptibility (of a PWS). The potential for a PWS to draw water contaminated at concentrations that would pose concern. Susceptibility is evaluated at the point immediately preceding treatment or, if no treatment is provided, at the entry point to the distribution system.

Synthetic Organic Compounds (SOC). Man made organic chemical compounds (e.g. herbicides and pesticides).

Total Dissolved Solids (TDS). The dissolved solids collected after a sample of a known volume of water is passed through a very fine mesh filter.

Transmissivity. The ability of an aquifer to transmit water.

Unconfined Aquifer. An aquifer containing water that is not under pressure. The water table is the top surface of an unconfined aquifer.

Underground Storage Tanks (UST). A tank located at least partially underground and designed to hold gasoline or other petroleum products or chemicals.

Volatile Organic Compounds (VOC). Any organic compound which evaporates readily to the atmosphere.

* Definitions taken from EPA's Glossary of Selected Terms and Abbreviations (http://www.epa.gov/ceisweb1/ceishome/ceisdocs/glossary/glossary.html)

APPENDICES

Appendix I: Figure 1. Vicinity Map

Appendix II: Figure 2. Geologic Map

Appendix III: Site Maps & Area Delineations

Figure 3. Geraldine PWS Wells

Figure 3a. Geraldine Spring Vicinity Map

Figure 4. Geraldine PWS Inventory Regions

Figure 5. Geraldine Spring Inventory Regions

Figure 6. Landcover in Geraldine PWS Well Inventory Regions

Figure 7. Landcover in the Geraldine Spring Inventory Zone

Figure 8. Landcover in the Geraldine Spring Recharge Region

Appendix IV: Well Logs

Note: Well Logs available upon request from the Department of Environmental Quality or the Public Water Supply.

DEQ
Montana Department
of Environmental Quality

October 11, 2016

Town of Geraldine
Attn: Phillip Thomas
PO Box 211
Geraldine, MT 59446

Re: Sanitary Survey Inspection of Town of Geraldine (PWSID: MT0000225).

Dear Phillip,

I would like to thank Russell Schaeffer for assisting me during the sanitary survey inspection of the Town of Geraldine public water supply system. As a community public water supply, your facility is required to have a sanitary survey inspection every three years. These routine inspections offer us an opportunity to look for sanitary deficiencies that have the potential to cause contamination in the water system, as well as pointing out operation and maintenance concerns. Below are a few comments relating to the sanitary survey conducted on 9/20/2016.

Geraldine is located in central Montana, 28 miles east of Fort Benton. The town supports the agricultural community in the surrounding area. Highway 80 connects Geraldine to US 87 at Fort Benton and also at Stanford. The public water supply system serves Geraldine plus North Geraldine (MT0003521) and Hawarden Square Butte (MT0003522), two rural water systems, and is classified as a community water system.

SOURCE(s):
Lower Spring (SP002) on Square Butte-consists of reportedly up to seven spring water captures in 4 distinct zones that are fenced for protection. The upper area has a box and overflow and the lower area has a box and overflow. The main collection then overflows into a reservoir while the collected water is piped the distance to the treatment facility (TP001) then on to town. The system serves Geraldine and two other rural water systems (N. Geraldine MT0003521 & Hawarden Square Butte Water MT0003522) prior to town after treatment (TP001). The spring source was inaccessible during the inspection due to adverse conditions.

- It is recommended that you inspect the spring collection area and ensure the overflow pipe has a fine mesh screen placed on the outlet line and that the spring collection boxes have gaskets in place to ensure a tight seal between the access hatch and spring box cover.

Well 2 (WL003) GWIC 2547 is a historic source retained for emergency purposes only. Well 2 is an artesian well that is located in town at the end of Flagler Street. The well log was located for the well and a copy is made a part of this report. Historically this well has had water quality issues.

- In the case of an emergency, Well 2 would have to be flushed extensively and have water quality testing completed prior to being approved for use by the water system for potable use.

SOURCE WATER:
In the late 1980's, a spring system was developed on the southeast slope of Square Butte and a 14 mile pipeline constructed to carry the water to Geraldine. Square Butte is a large laccolith that was formed

by the same magma that formed the Highwood Mountains. The Butte is separated from the Highwood Mountains by several miles and the surrounding sediments have been eroded away, leaving the Butte rising high above the surrounding land. The springs are located near the contact between the uplifted sedimentary formations and the igneous rock of the Butte. The springs are on the southern flank of the Butte and are recharged by precipitation infiltrating through fractures in the Butte. *(Excerpt from source water delineation report 2001)*

TREATMENT:

Treatment (TP001) consists of full time disinfection using liquid sodium hypochlorite fed by injection with a positive displacement pump that is flow paced with a meter. The chlorine solution is drawn from a batch tank filled by the supplier or the operator depending on access. NSF approved 12.5% liquid sodium hypochlorite is used and a spare pump is provided. The chlorine equipment is protected inside a small building and the injection point is in a manhole on the line flowing to town.

DISTRIBUTION:

The distribution system is comprised mostly of PVC piping. A 6 inch PVC main carries water via gravity flow from the spring collection to the treatment facility. From the treatment facility a 4 inch PVC main carries treated water north to serve connections to N. Geraldine (MT0003521) and Hawarden (MT0003522) as well as to the Town of Geraldine. In town water fills the elevated storage tank via a solenoid controlled valve that allows the tank to fill as needed. Water is then gravity fed to the rest of the distribution system in town. Fire hydrants are provided in town and are flushed annually.

- Several pits and meters were inspected during this visit. A number of pits had hose bibs off the main line for flushing and sampling if needed or to exit entrained air. Since the pits are subject to flooding periodically the hose bibs should be fitted with caps while not being used to assist with sealing the system from potential contamination through on of the fittings.

STORAGE:

Storage Facility (ST001) is an elevated steel tank with capacity of 100,000 gallons. The elevated tank is located on the west side of town. All water for the distribution system of Geraldine is first introduced into this tank via the piping arrangement and solenoid valve added during a system upgrade. Water then feed the town distribution via gravity flow from the tank. The tank overflow extends down a leg of the tower and is screened and protected. The tank receives routine inspection with the last inspection completed in the summer of 2016.

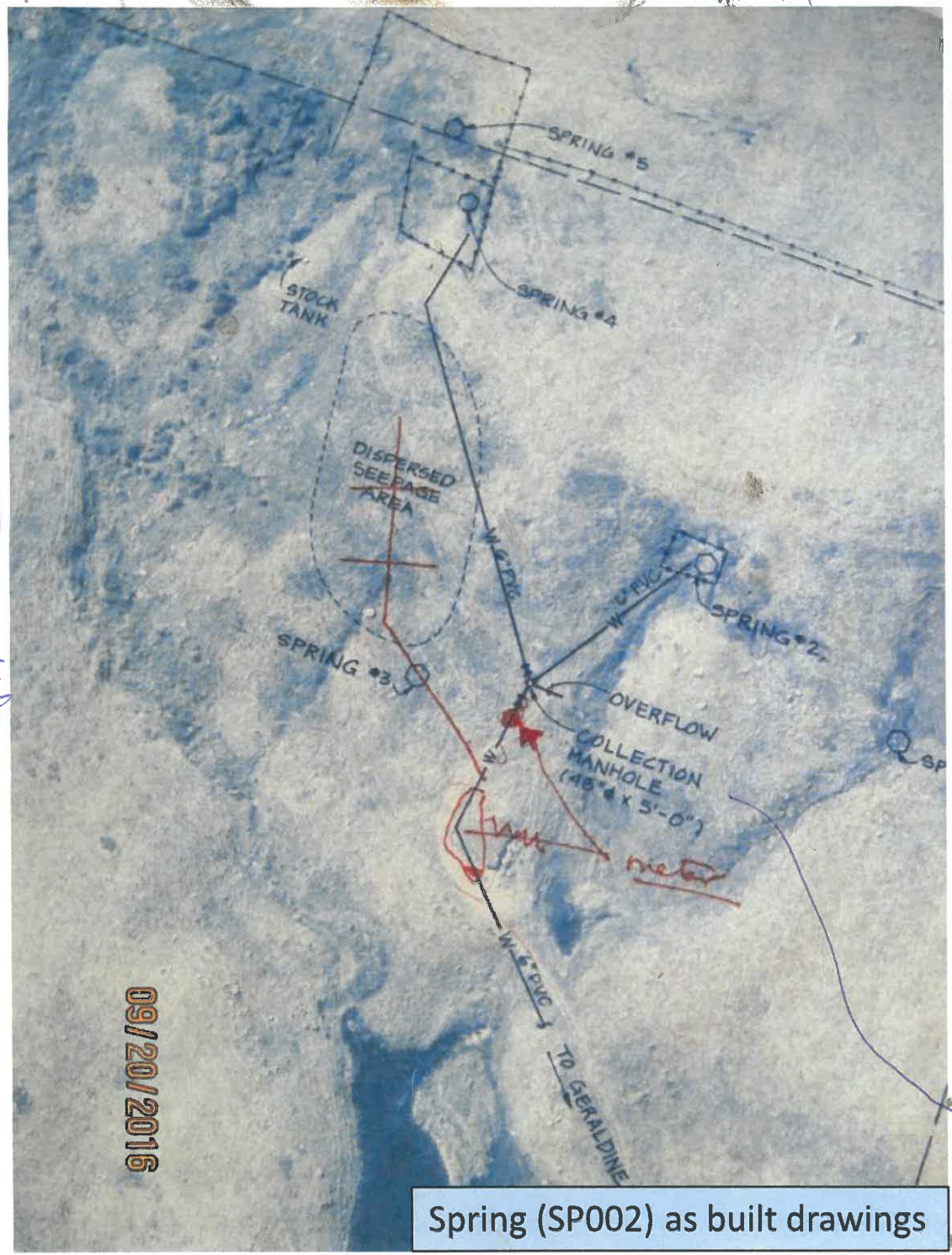
- It is recommended that you ensure that tank vent has a fine mesh screen installed on it to prevent contamination to the storage tank.

PUMPS, PUMP FACILITIES and CONTROLS:

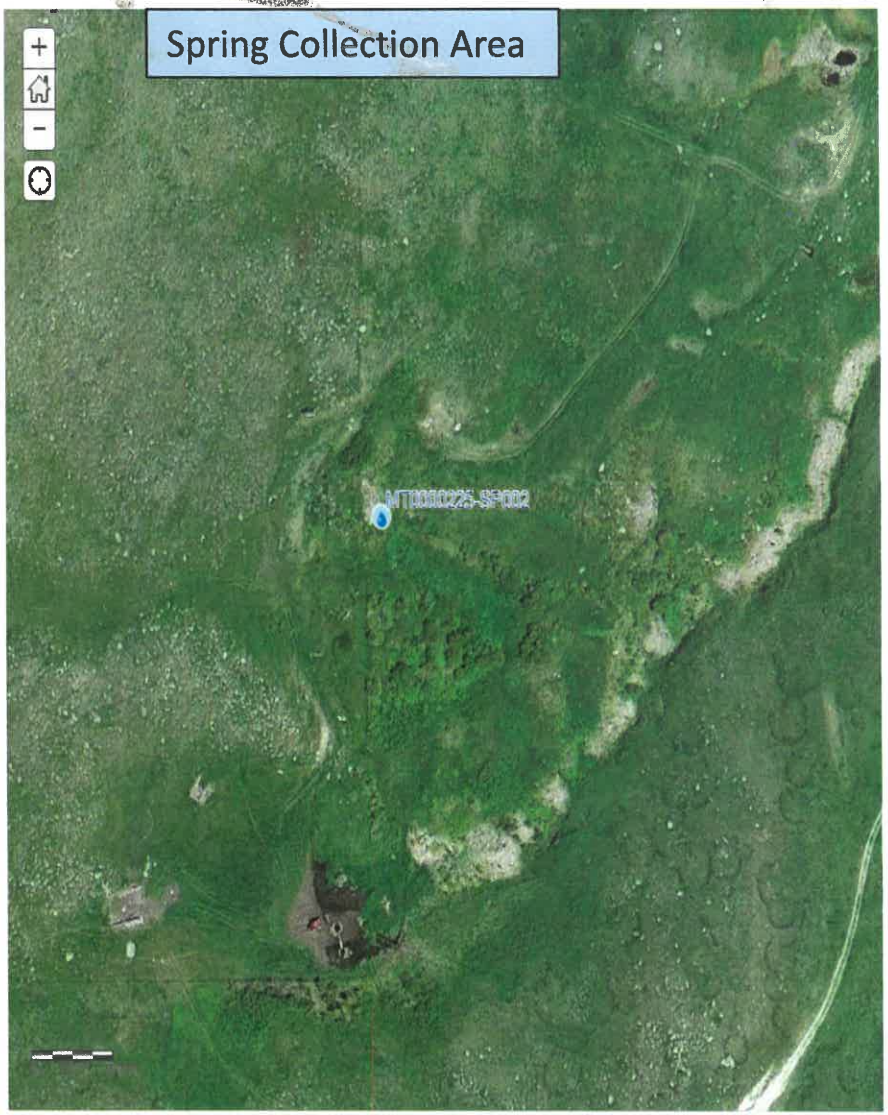
There are no pumps or pumping facilities associated with this system. The town telemetry controls a solenoid valve operated by the tank levels that allows for the tank to call for water from the system as needed.

MONITORING, REPORTING and DATA VERIFICATION:

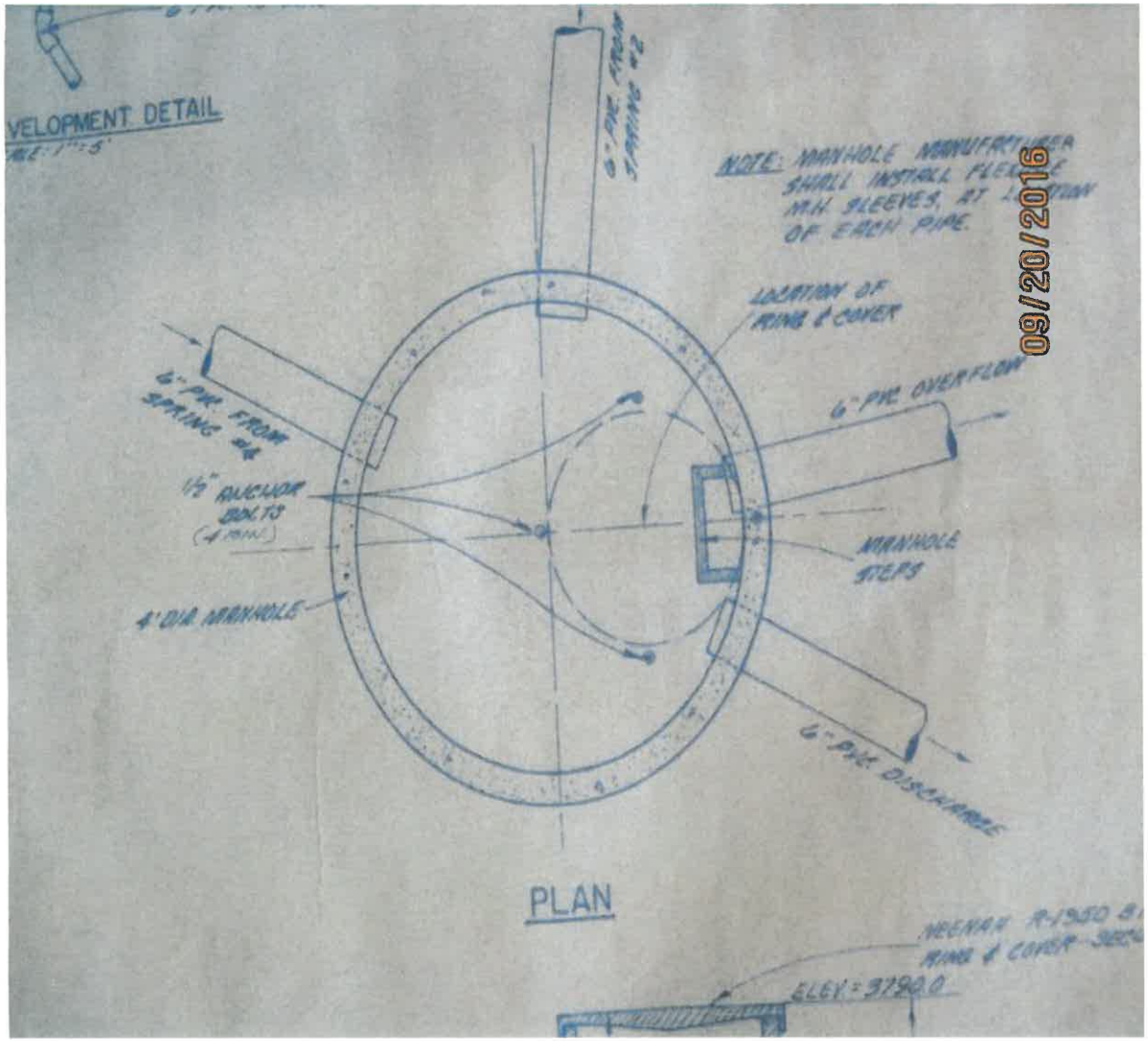
Monitoring and reporting appeared adequate and a two year violations review showed a violation in February of 2014 for failure to submit chlorine residuals and a violation in April of 2016 for failure to submit a coliform bacteria sample. These violations have been brought back into compliance and there are currently no open violations.

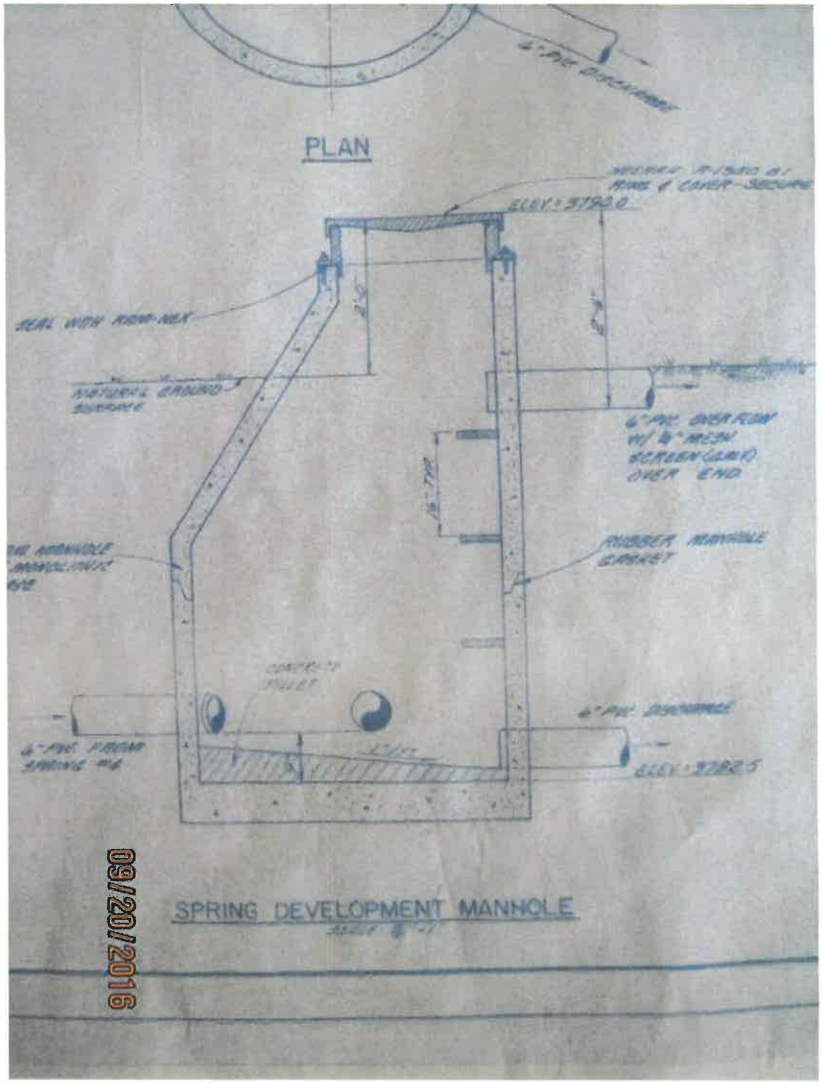


Spring (SP002) as built drawings

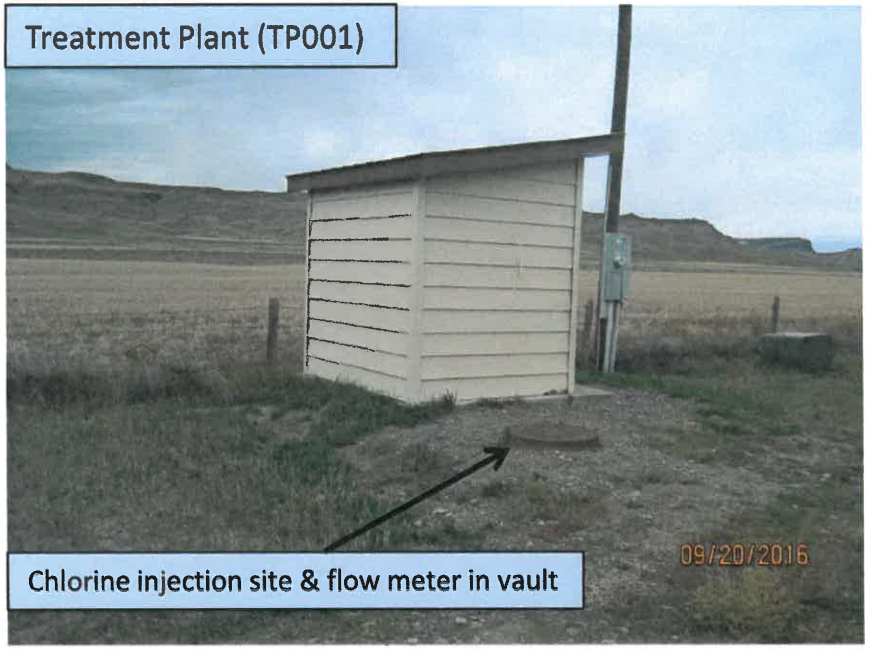


- PERRY IS COORDINATING
- STAKE IP
- SLOPE STABILITY / GEOTECH
- DAN CRAMER
- FILTER AWAY FROM MOUNTAIN
- SATURATED GROUND
- COLLEGE OF MINES & DEQ
- HOW MUCH MOVED
- HOW MUCH MOVED

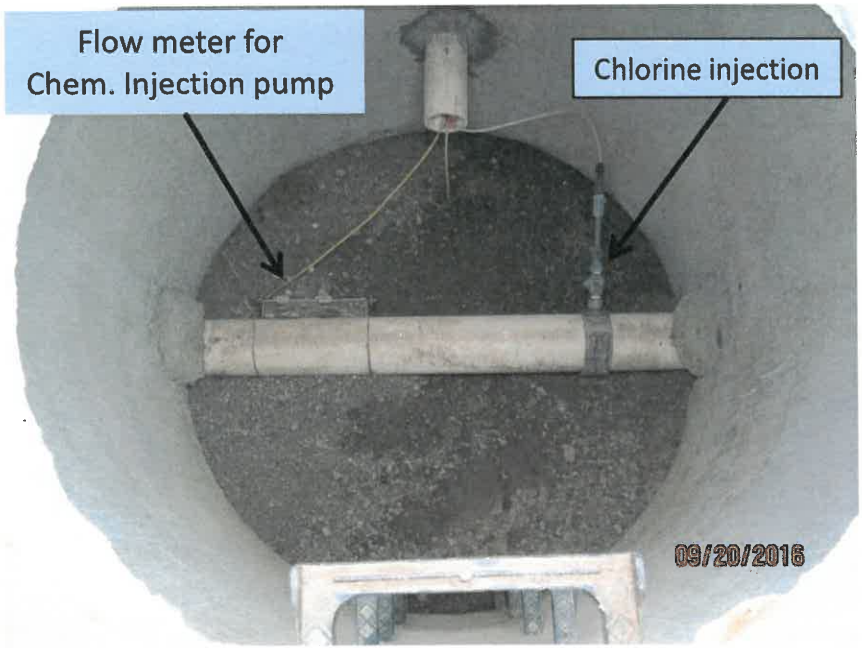




Spring Collection box as-built drawings

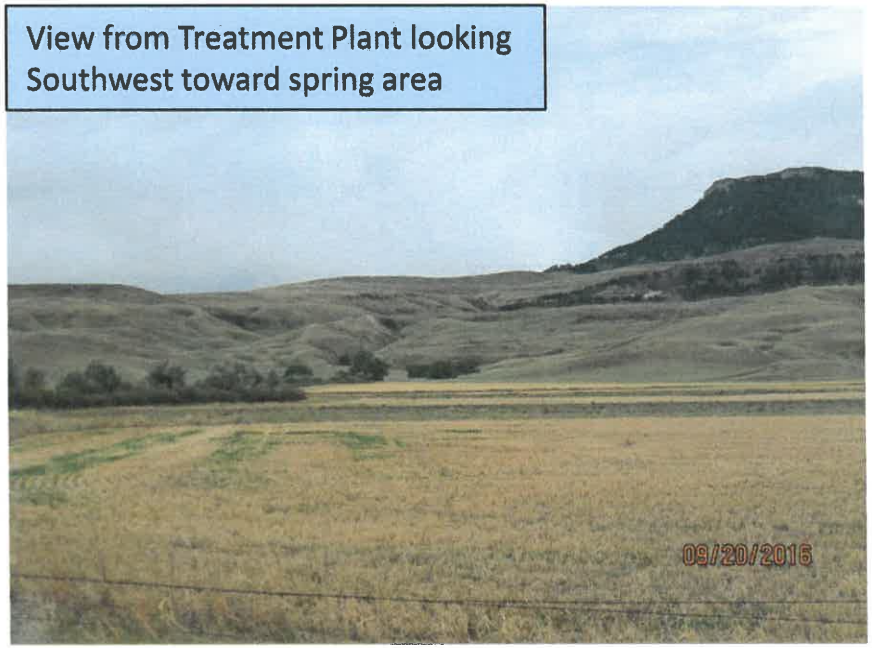


Treatment consists of full time disinfection by injecting sodium hypochlorite into the line flowing from the spring source. Sodium hypochlorite is injected via an LMI metering pump that is flow paced using a flow meter in a vault next to the treatment plant building. There were no issues noted with the treatment plant.


Flow meter for
Chem. Injection pump
Chlorine injection
09/20/2016

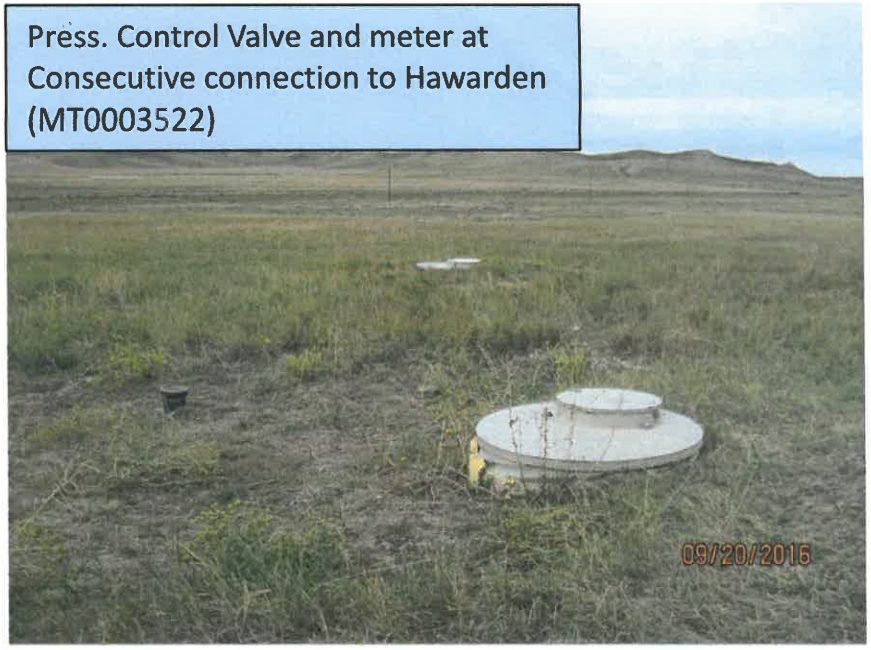

Pressure reducing valve at the treatment plant
09/20/2016


Flow Rate
BAT. VOLTAGE
RTU TEMP
1
2
3
4
5
6
09/20/2016


View from Treatment Plant looking
Southwest toward spring area
09/20/2016

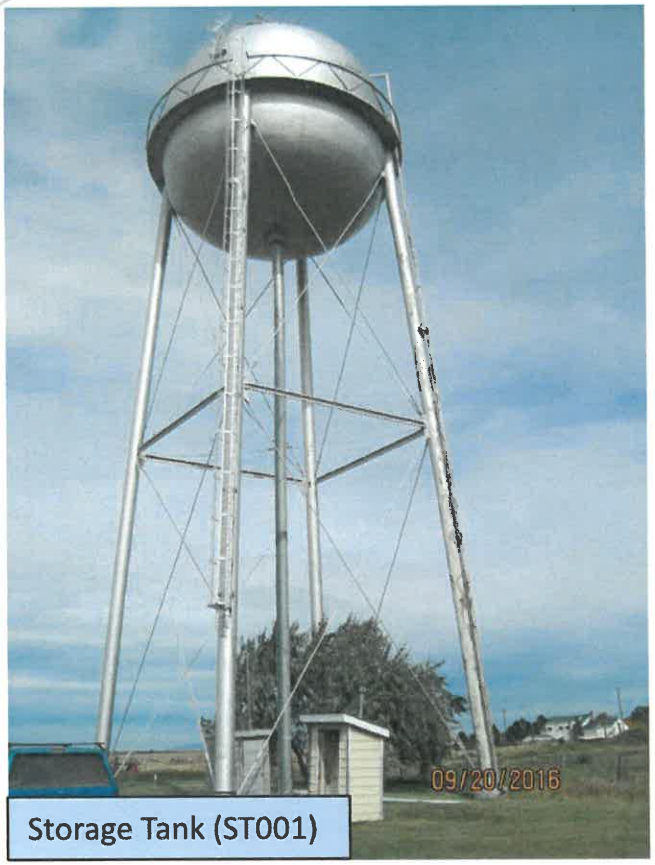
Pressure Reducing/Sustaining valve
at the connection to Hawarden (MT0003522)

Press. Control Valve and meter at
Consecutive connection to Hawarden
(MT0003522)



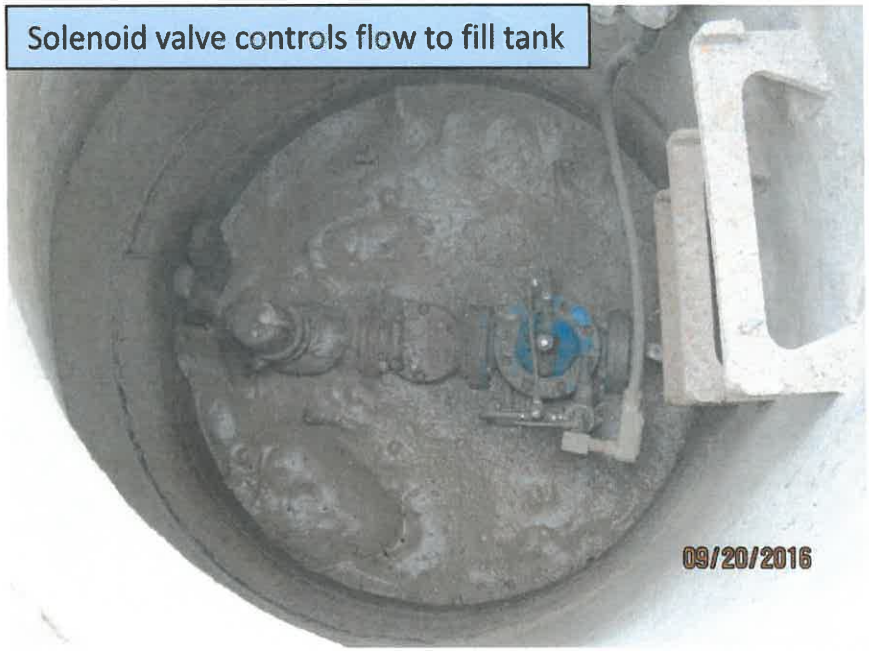
Connection to N. Geraldine (MT0003521)

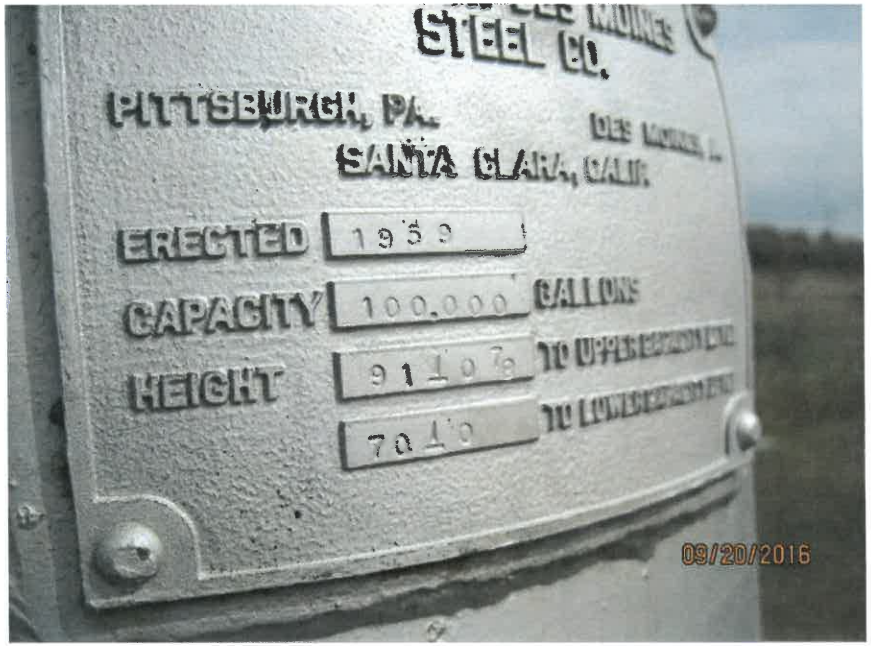
Meter at Consecutive Connection (CC001)
to North Geraldine (MT0003521)



Storage Tank (ST001)

Solenoid valve controls flow to fill tank





Screened overflow line

Well 2 (WL003) –Emergency Source

Well 2 is an artesian well used as Backup/emergency source

Tank level control activates solenoid valve to fill tank

Well 2 has not been used in quite some time. The well is retained as an emergency source. The well would need flushing and water quality testing along with DEQ approval prior to use as potable source. It currently is valve off from the system but still connected.

Drinking water limits are based on U.S. Environmental Protection Agency primary and secondary standards for public water supplies (**view their standards**). Stock water and irrigation water recommendations are from U.S. Department of Agriculture Natural Resources Conservation Service water-quality guidelines. The guidelines are general and may vary depending on specific applications. Irrigation guidelines are based on continuous irrigation.

Sample Id	GWIC Id	Sample Date	Site Name	Location	Site Type
1983Q0352	2547	5/24/1983 1:55:00 PM	CITY OF GERALDINE * WELL #2	21N 11E 01 CBDD	WELL

Constituent	This Sample	Drinking Water	Stock Water	Irrigation Water
Calcium (Ca)	76.000 mg/L	---	---	---
Magnesium (Mg)	28.700 mg/L	---	2,000 mg/L	---
Sodium (Na)	95.800 mg/L	---	2,000 mg/L	see SAR
Potassium (K)	21.400 mg/L	---	---	---
Iron (Fe)	0.540 mg/L	0.3 mg/L [smcl]	---	---
Manganese (Mn)	0.013 mg/L	0.05 mg/L [smcl]	---	2.0 mg/L
Silica (SiO2)	10.000 mg/L	---	---	---
Bicarbonate (HCO3)	313.000 mg/L	---	---	---
Carbonate (CO3)	0.000 mg/L	---	---	---
Chloride (Cl)	15.000 mg/L	250 mg/L [smcl]	1,500 mg/L	---
Sulfate (SO4)	250.000 mg/L	250 mg/L [smcl]	1,500 mg/L	[b]
Nitrate (NO3 as N)	0.020 mg/L	10 mg/L [mcl]	100 mg/L	---
Fluoride (F)	3.800 mg/L	4 mg/L [mcl]	2 mg/L	---
Ortho-Phosphate (as P)	NR mg/L	---	---	---
Aluminum (Al)	<30. ug/L	50-200 ug/L [smcl]	---	1,000 ug/L
Antimony (Sb)	NR ug/L	6 ug/L [mcl]	---	---
Arsenic (As)	0.200 ug/L	10 ug/L [mcl]	50 ug/L	100 ug/L
Barium (Ba)	NR ug/L	2,000 ug/L [mcl]	---	---
Boron (B)	230.000 ug/L	---	---	---
Cadmium (Cd)	<2. ug/L	5 ug/L [mcl]	10 ug/L	5 ug/L
Chromium (Cr)	<2. ug/L	100 ug/L [mcl]	1,000 ug/L	100 ug/L
Cobalt (Co)	NR ug/L	---	1,000 ug/L	50 ug/L
Copper (Cu)	6.000 ug/L	1,300 ug/L [mcl]	500 ug/L	200 ug/L
Lead (Pb)	<40. ug/L	15 ug/L [mcl]	50 ug/L	5,000 ug/L
Lithium (Li)	310.000 ug/L	---	---	2,500 ug/L
Molybdenum (Mo)	<20. ug/L	---	---	5 ug/L
Nickel (Ni)	<10. ug/L	---	---	200 ug/L
Phosphate (P)	NR ug/L	---	---	---
Selenium (Se)	<.1 ug/L	50 ug/L [mcl]	50 ug/L	20 ug/L
Silver (Ag)	<2. ug/L	100 ug/L [smcl]	---	---
Strontium (Sr)	1,220.000 ug/L	---	---	---
Thallium (Tl)	NR ug/L	2.0 ug/L	---	---
Titanium (Ti)	9.000 ug/L	---	---	---
Uranium (U)	NR ug/L	30 ug/L	---	---
Vanadium (V)	2.000 ug/L	---	---	---
Zinc (Zn)	<3. ug/L	5,000 ug/L [smcl]	24,000 ug/L	2,000 ug/L
Zirconium (Zr)	<4. ug/L	---	---	---

Key: **NR** = No reading in GWIC; **mg/L** = milligrams per Liter; **ug/L** = micrograms per Liter; **---** = Currently no standard for this constituent; **[b]** = High concentrations of sulfate may restrict calcium uptake by crops; **[c]** = Varies with crop, generally dissolved solids should be less than 2,000 mg/L (equivalent to specific conductance of about 2,000 to 3,000 micromhos/cm); **[d]** = Dependent upon other variables such as type of clay in soil and salt content of water. (See SAR); **[mcl]** = U.S. Environmental Protection Agency maximum contaminant level or action level: revised October 13, 1999; **[smcl]** = U.S. Environmental Protection Agency maximum contaminant level or action level: revised October 13, 1999. This standard is based on aesthetic quality of water (i.e. odor, color, etc.) and is not a health standard.

APPENDIX L

Elevated Tank Inspection

Independent INSPECTION SERVICE

R.O.V. Potable Water Tank Inspection

406-465-3742 • www.independentispectionservice.net

Independent INSPECTION SERVICE

ROV Potable Tank Inspection

Jason Fowler
406-465-3742
jsn.fowler@gmail.com
www.independentinspectionservice.net
1063 Sunny Vista Rd.
Helena, MT 59602

MONTANA DEPARTMENT OF LABOR & INDUSTRY

INDEPENDENT CONTRACTOR

INDEPENDENT CONTRACTOR PROGRAM

Montana Department of LABOR & INDUSTRY

06/05/2020-06/04/2022 Water Tank Inspection
END OF OCCUPATION LIST

INDEPENDENT CONTRACTOR EXEMPTION CERTIFICATE

IC#: 315343IC

Certificate Holder:

JASON E FOWLER
1063 SUNNY VISTA RD
HELENA, MT 59602

The certificate holder has sworn to the Department of Labor and Industry that this person is:

*engaged in an independently established trade, occupation, profession, or business; and
*free from control and direction by hiring agents over the performance of the person's services, both under contract and in fact, when working as an independent contractor

The named certificate holder has waived all rights and benefits under the Workers' Compensation Act of Montana and is not required to be personally covered by workers' compensation insurance while working as an independent contractor in the occupation(s) listed above.

See back for important information

1/1

1. The certificate has important information on the back. If making copies to provide to hiring agents, please copy both the front and back of the certificate and provide both sides to the hiring agent. You may make copies as needed. The status can be verified by visiting our website at www.mtcontractor.com or by calling our office at 406-444-7734.

2. Please notify our office of changes to your information, including changes to your address, phone number, business name and structure, and any occupations you may wish to add or remove. Failure to keep your information current may result in the revocation of your ICEC.

3. The wallet card below is provided as a way for you to conveniently identify yourself as an ICEC holder to Department of Labor representatives. It should not be given to hiring agents as proof of independent contractor status because the full occupation descriptions are not displayed. North American Industry Classification System (NAICS) codes have been assigned based on the occupation descriptions you submitted and are for Department reference only. The NAICS codes alone do not represent the occupation(s) you are approved for as an Independent Contractor. Full occupation descriptions are displayed on the certificate and can be verified by visiting our website at www.mtcontractor.com.

INSTRUCTIONS: Fold at perforations then tear card out. Fold card in half at score

INDEPENDENT CONTRACTOR EXEMPTION CARD

JASON E FOWLER
1063 SUNNY VISTA RD
HELENA, MT 59602
IC#: 315343IC

This wallet card is provided as a way for you to identify yourself as an ICEC holder to Montana Department of Labor representatives. Assigned NAICS codes are for department reference only. For full occupation descriptions refer to the certificate.

Exempt Occupations Valid Until: 06/04/2022

221310 Water Tank Inspection

Independent
INSPECTION SERVICE
ROV Potable Tank Inspection

Jason Fowler
406-465-3742 • jsn.fowler@gmail.com
1063 Sunny Vista Rd., Helena, MT 59602

SUPPLEMENTAL REPORT

The Geraldine 100kg Water tower shows to be in satisfactory condition. There was ½ inch of iron and silt sediment that was removed from inside the tank. The over flow pipe at the cat walk level shows a split in the pipe. We did wrap it with pvc pipe tape to seal it up. (See photo's). We also install a gasket on the access hatch.

The interior of the tank's coating appears to be in good condition with some spots of pitting corrosion noted on the floor. There appears to be numerous weld patches of previous metal damage. The air vent screen is intact as well as a screen on the overflow at the base of the tower. No major defects or deformations were noted.

Recommendations

- Clean and Inspection every 3 years
- Plan on 1 hour of underwater epoxy repair on next clean cycle

Independent INSPECTION SERVICE
ROV Potable Tank Inspection

Jason Fowler
406-465-3742 • jsn.fowler@gmail.com
1063 Sunny Vista Rd., Helena, MT 59602

Geraldine Tower Sanitation Survey
August 14, 2020

Components	Number	Good/Fair/Poor	Sealed or Screen	Comments
Air Vents/Screen	**1**	**Good**	**Screen**	**None**
Painter Plugs	**4**	**Good**	**Sealed**	**None**
Over Flow/Screen	**1**	**Good**	**Screen**	**Pipe split at catwalk**
Hatch & lid lip	**1**	**Good**	**Gasket Installed**	**None**
Telemetry Penetrations	**0**	**N/A**	**None**	**None**
Man Ways	**1**	**Good**	**None**	**None**
Miscellaneous Penetrations	**0**	**N/A**	**None**	**None**
Waters hue	**Clear Blue**			

Safety and Security

Components	Condition	Secure	Size / Dimension	Compliant
Internal Ladder	**None**	**N/A**	**None**	**None**
External Ladder	**Good**	**Yes**	**Standard**	**Yes**
Hatches	**Good**	**Padlock**	**24 Diameter**	**Yes**
Man Ways	**Oval**	**Sealed**	**18**	**Yes**
Balcony / Railing	**Good**	**Yes**	**Standard**	**Yes**
Vandal Guard	**Good**	**Locked Ladder cage**	**N/A**	**Yes**
Perimeter Fence	**None**	**N/A**	**None**	**None**
Antennas	**Good**	**Yes**	**Repeater**	**Yes**
Light fixtures	**None**	**N/A**	**None**	**None**
Safety Climb system	**Ladder Cage**	**Yes**	**Standard**	**Yes**
Toe Rail	**Good**	**Yes**	**4 inch**	**Yes**
Signs of Trespass	**None**			

Independent INSPECTION SERVICE
POV Potable Tank Inspection

Jason Fowler
406-465-3742 • jsn.fowler@gmail.com
1063 Sunny Vista Rd., Helena, MT 59602

General Inspection Form

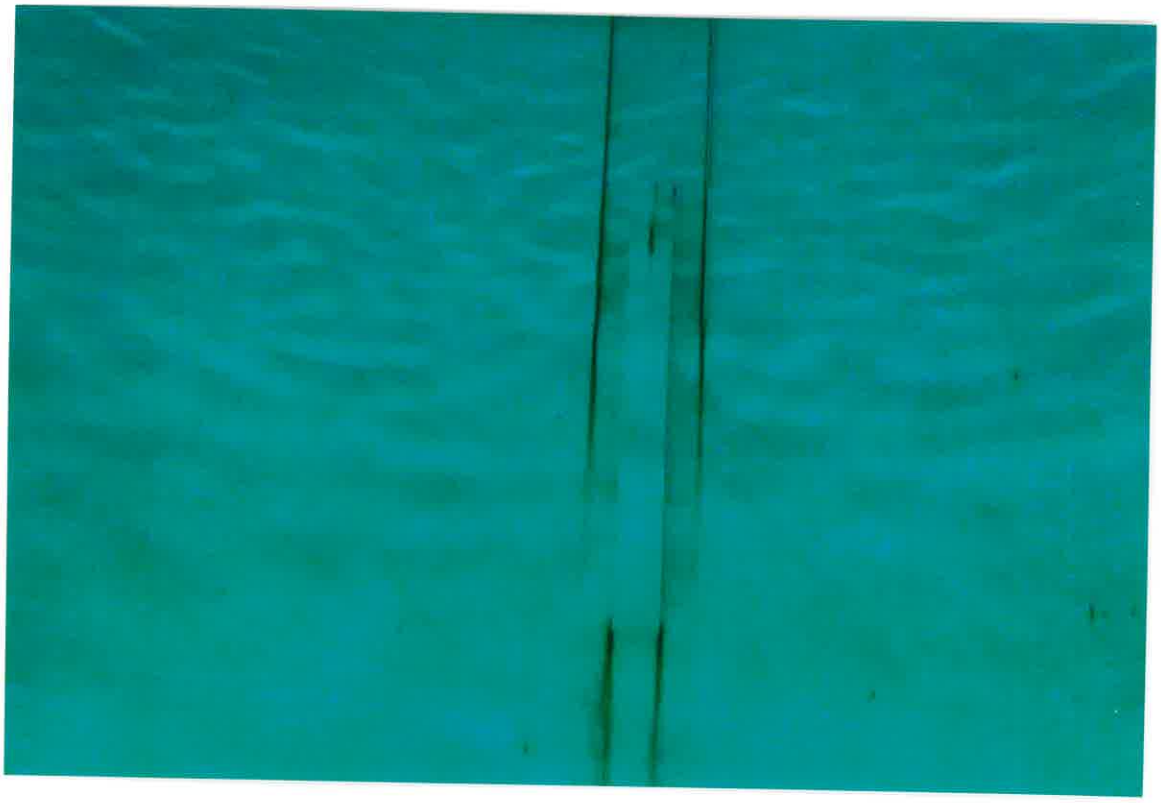
Date: August 14, 2020 Tank Name: Tower Gallons: 100kg

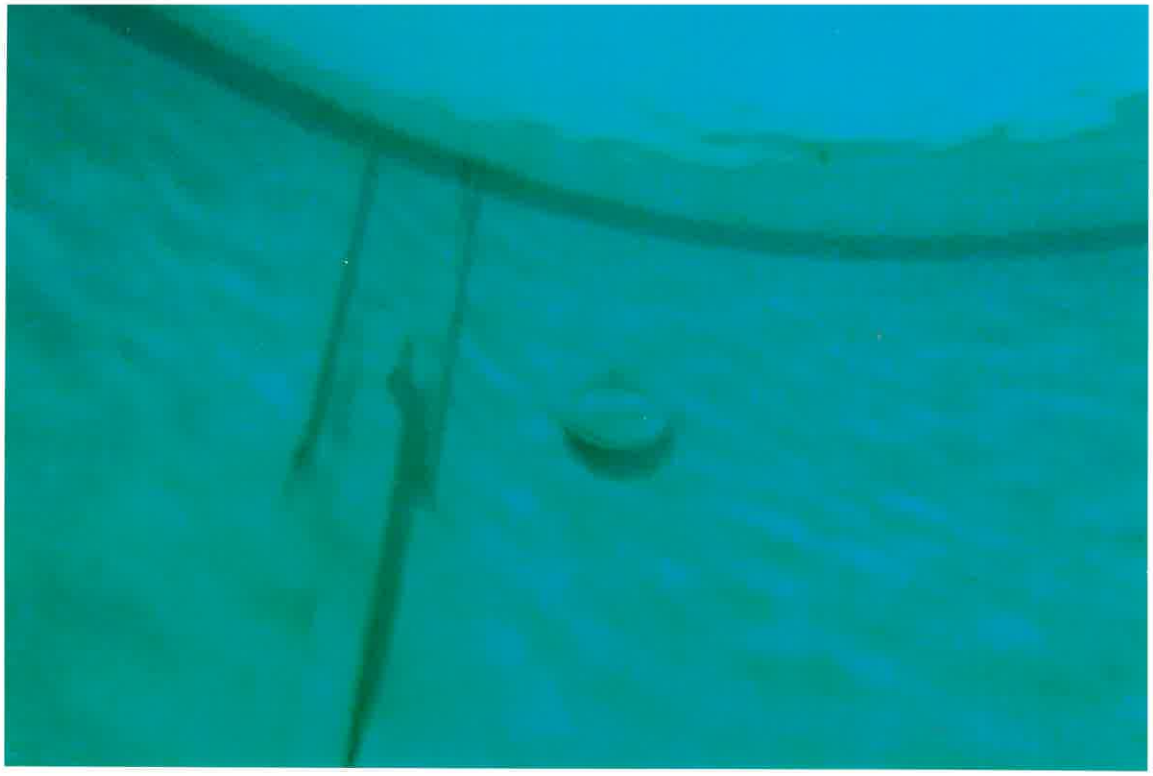
Utility: Geraldine Water City: Geraldine State: MT

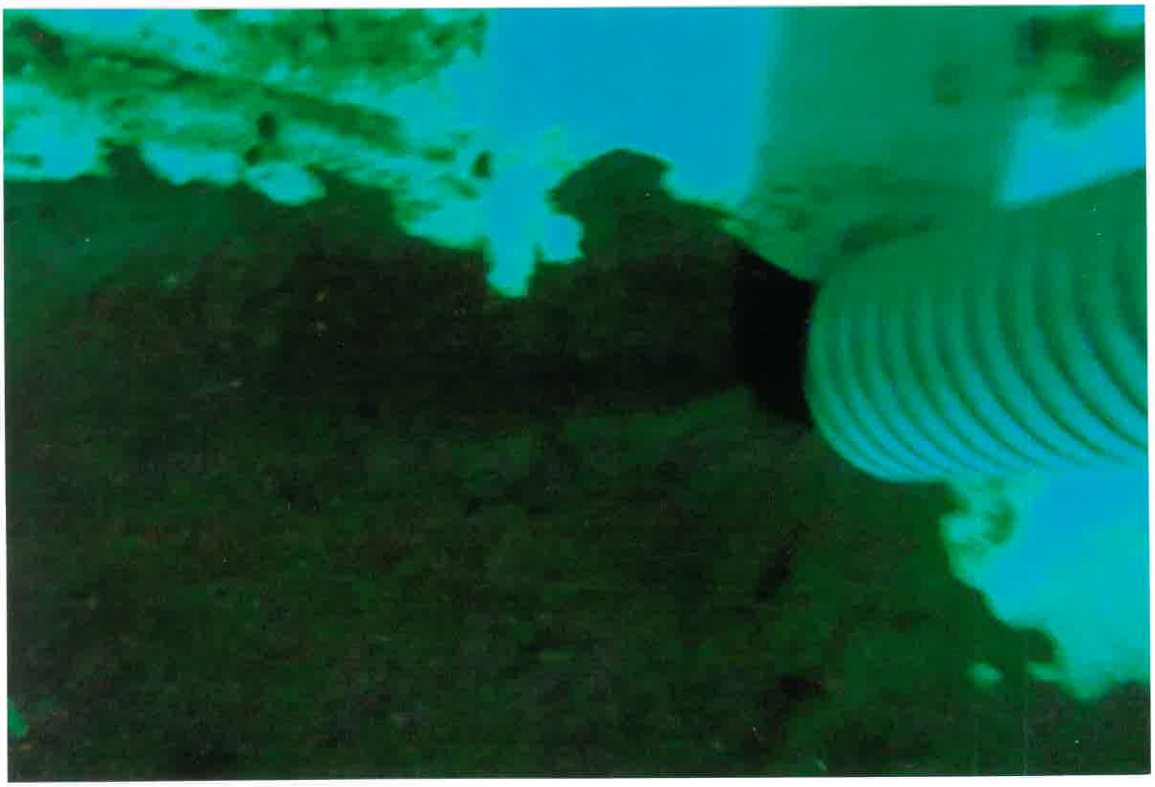
Components	Number	Good/Fair/Poor	Discrepancies	Recommendation
Access Hatches	**1**	**Good**	**None**	**None**
Ladder(s) Safety climb system	**1**	**Ladder Cage Good**	**None**	**None**
Man ways / cleanouts hatches	**1**	**Good**	**None**	**None**
Interior walls	**1**	**Good/Fair**	**Areas of Surface corrosion**	**Monitor**
Interior columns	**0**	**N/A**	**None**	**None**
Interior roof	**1**	**Good**	**Minor Pitting**	**Monitor**
Air vent	**1**	**Good**	**None**	**None**
Overflow	**1**	**Fair**	**Split at catwalk**	**None**
Inlet/Outlet	**1**	**Good**	**None**	**None**
Exterior roof	**1**	**Good**	**None**	**None**
Exterior walls	**1**	**Good**	**None**	**None**
Antennas	**1**	**Good**	**None**	**None**
Aviation lights	**0**	**None**	**None**	**None**
Balconies/ Rail	**1**	**Good**	**None**	**None**
Estimated amount of sediment and type	**½ inch**	**Iron**	**None**	**None**
Interior floor if visible	**1**	**Good**	**None**	**None**
Cathodic protection system if present	**None**	**N/A**	**None**	**None**
Wet riser were applicable	**Frost Casing Good**			
Floor Drain	**1**	**Good**	**None**	**None**

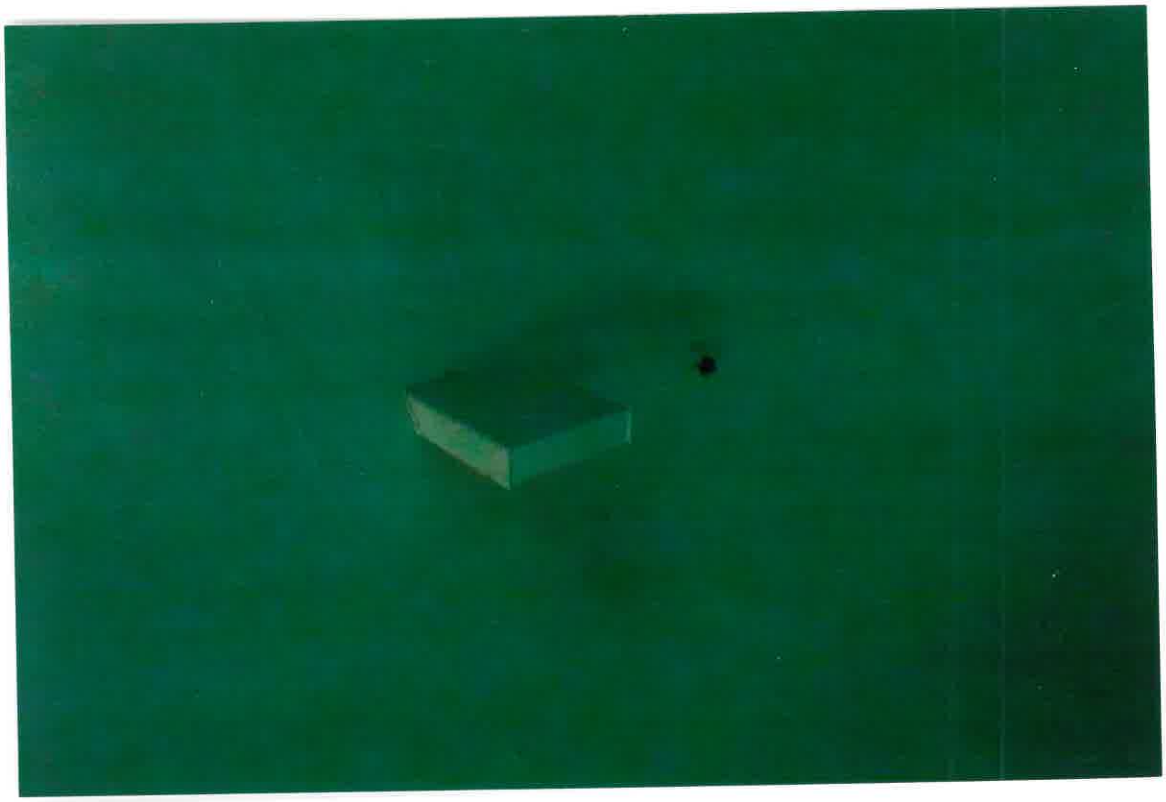
* Any areas marked as poor have a corresponding picture to that component to help monitor the rate of deterioration.

Notes: Overflow pipe froze and split. PVC tape wrapped to prevent insects










PVC PIPE WRAPPING TAPE

FLOATINGISLANDINTERNATIONAL®

PO Box 252, Shepherd, MT 59079

Jon Helberg
Department of Public Works
Geraldine, Montana

August 2020

Dear Mr Helberg,

WaterRR is a subsidiary of Floating Island International, the world leader in launches of floating treatment islands with some 9,000 BioHaven Floating Islands in the water today. WaterRR's mission is to help you both reduce nutrient load and gain value from your wastewater. Our name stands for Water Resource Recovery, which can take many forms, but BioHaven Floating Solar is a low hanging fruit and we'd like to show you how it can save money or generate revenue for your community, while improving water quality as a byproduct.

We have developed a BioHaven Solar Platform that merges three breakthrough technologies: solar panels, biofilm reactive surface area and the exciting new nano-bubbler, which fills the water column with microscopic bubbles. It can be configured to run your entire system, replacing aging mixers that are expensive to operate. The system is turnkey. We launch it, and your wastewater facility can step off the grid. The power associated with your wastewater lagoon operation can be provided by the sun.

There is a lower cost option too. The NanoHaven is a 285-square feet BioHaven that supports solar panels and nano-bubble production. The system is self-powered and contributes significant new aeration and nutrient cycling to your system. So if your community has grown of late and meeting standards is becoming more challenging, we can help!

We can model installations for you, and let you decide which of these two options makes the most sense for your community.

If you are interested in learning more, please reach out to me and a local Island Master will be in touch!

Best,

Bruce Kania
WaterRR.co
FloatingIslandInternational.com
406-373-5200

APPENDIX M

Contaminated Soils and LUST Sites

SOIL REMOVAL AND SAMPLING REPORT
Geraldine Sewer Project
Geraldine, Montana

October 14, 2021

Submitted to:

Montana Department of Environmental Quality
Petroleum Tank Cleanup Section

Submitted by:

Resource Technologies, Inc.
1050 E Main St. Suite 4
Bozeman, MT 59715
(406) 585-8005

1.0 EXECUTIVE SUMMARY

During a sewer upgrade project in the Town of Geraldine, soil exhibiting petroleum hydrocarbon odors and staining was encountered along the Main Street leg of the project adjacent to the former Bob's Exxon leaking underground storage tank (LUST) site. The excavation contractor stockpiled impacted soil, and further excavation along Main Street was halted until a plan for disposing stockpiled soil; and managing any other impacted soil could be implemented.

DEQ retained Resource Technologies, Inc. (RTI), under Contract 421027 Task Order 8, to coordinate and oversee disposal of stockpiled soil; conduct screening, segregating, and disposal of any additional impacted soil encountered; and perform soil sampling to assess the extent and magnitude of soil impacts.

On August 19 and 20, 2021, 340 yards of impacted soil weighing 412 tons were loaded and hauled to the Republic Services High Plains Landfill in Great Falls.

Soil impacts were encountered in two areas of the sewer installation trench along Main Street adjacent to the Bob's Exxon site. The southern impacted area extended for approximately 35 feet and the northern impacted area beginning approximately 25 to 30 feet north of the southern impacted area extended northward for approximately 50 feet.

RTI collected soil samples to assess the extent and magnitude of soil impacts. Worst-case impacts were encountered at depths of 6 to 8 feet; however, impacts attenuated to non-detectable concentrations within a short vertical distance below 8 feet. The profile of contamination in soil samples indicated that impacts are composed of substantially weathered gasoline. Soil analytical results indicated that, in worst-case samples, only concentrations of C9-C10 aromatics exceeded applicable Montana Tier 1 Risk Based Screening Levels.

A flowable-fill cap was emplaced along the length of the north impacted area to protect the new sewer line from exposure to hydrocarbon compounds.

Once the extent of the northern impacted zone was reached, no further soil impacts were encountered for 200 feet and soil screening was discontinued.

2.0 TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

3.0 BACKGROUND

During a sewer upgrade project in the Town of Geraldine, completed by Great West Engineering (Great West), soil exhibiting petroleum hydrocarbon odors and staining was encountered along the Main Street leg of the project adjacent to the former Bob's Exxon leaking underground storage tank (LUST) site (Facility ID #08-03014, Release #3659) as shown in Figures 1 and 2. The impacted soil was encountered during the week of July 12, 2021. Great West and their excavation contractor, Central Plumbing, Heating, and Excavation (Central) stockpiled impacted soil, and further excavation along Main Street was halted until a plan for disposing stockpiled soil and managing any other impacted soil that might be encountered once excavation resumed could be implemented.

DEQ retained Resource Technologies, Inc. (RTI), under Contract 421027 Task Order 8, to coordinate and oversee disposal of stockpiled soil; conduct screening, segregating, and disposal of any additional impacted soil encountered; perform soil sampling to assess the extent and magnitude of soil impacts; and to protect the new sewer line.

4.0 PRELIMINARY ACTIVITIES

4.1 Waste Characterization Sampling

After conferring with DEQ, Great West collected two samples from the impacted soil stockpile for waste characterization purposes. The samples were submitted to Energy Laboratories in Helena, Montana, for Volatile Petroleum Hydrocarbons (VPH), Extractable Petroleum Hydrocarbons (EPH), low-level polynuclear aromatic hydrocarbons (PAH, EPA Method 8270), total Resource Conservation and Recovery Act (RCRA) metals and zinc, Toxicity Characteristic Leaching Procedure (TCLP) metals and zinc, volatile organic compounds (VOCs, EPA Method 8260 B), 1,2 dichloroethane (DCA) and ethylene dibromide (EDB) analyses. Waste characterization sample analytical reports are included in Appendix A.

4.2 Soil Disposal Coordination

RTI submitted waste profiling paperwork, including waste-characterization sampling results, to Republic Services in advance of disposing the impacted soil at the High Plains Landfill in Great Falls. Republic Services approved disposal and provided RTI with waste manifests.

4.3 Subcontracting

RTI subcontracted with Central to load, haul, and dispose of the stockpiled soil and any additional impacted soil that might be encountered. Central was chosen as the excavation contractor since they were the excavation contractor for the sewer project and had the equipment on-site to complete the necessary tasks. The subcontract provided for loading and hauling up to 120 cubic yards of soil.

5.0 SOIL SCREENING, LOADING, AND DISPOSAL

Impacted-soil loading and hauling commenced on August 19, 2021. Excavation along the sewer line recommenced concurrently.

5.1 Soil Screening

Almost immediately after excavation along the sewer line resumed on August 19, additional impacted soil was encountered. RTI instructed Central to stockpile impacted soil for removal from the site. RTI screened excavated soil for VOCs with a Mini Rae Lite photoionization detector and heated headspace methods. Prior to use, the PID was calibrated with 100 part-per-million isobutylene standard span gas.

Soil impacts encountered on August 19 persisted for approximately 50 linear feet and extended to depths of approximately 8 feet. PID readings decreased substantially at depths greater than 8 feet. The distribution of soil impacts identified along the sewer line trench in July and August are shown in Figure 2. Soil screening data are included in Table 1.

RTI continued screening soils until excavation had proceeded approximately 200 feet northward beyond the northernmost extent of impacted soil. No staining, odors, or elevated PID readings were noted along this interval. RTI discontinued soil screening on August 24, 2021, since the potential of encountering additional soil impacts associated with the Bob's Exxon UST site appeared to be remote and no additional sources for petroleum contamination were identified.

5.2 Soil Sampling

Soil samples were collected at four locations along the trench as shown in Figure 2. At location SW-1, situated at the approximate center of the northern contaminant area, samples were collected from 0-2 feet below ground surface (bgs), 4-6 feet bgs, 7-8 feet bgs, and 8-10 feet bgs. Soil impacts did not appear to extend to the west wall of the trench so RTI collected sample SW1A-7-8 on the opposite side of the trench from sample SW1 7-8.

At sample location SW2 situated approximately 20 feet south of worst case impacts at location SW1, samples were collected from 0-2 feet bgs, 4-7 feet bgs, and 6-8 feet bgs. At sample location SW3 situated approximately 25 feet north of location SW1, samples were collected from 0-2 feet bgs and 6-8 feet bgs.

Sample location SW4 was situated in the approximate center of the southern impacted area identified in July. Field screening in this area indicated that worst case impacts were concentrated at the 4-6 foot depth and PID readings decreased below that depth. Soil samples were collected from 0-2 feet bgs and 5-6 feet bgs. Based on visual and olfactory observations and field screening results, impacts in the southern area extended from the north edge of the former Bob's Exxon building for a distance of approximately 35 feet north.

A five sub-sample composite of soil hauled off site was collected for waste characterization purposes. Two subsamples were collected from the soil stockpiled in July and the remaining three subsamples were collected from soil excavated and stockpiled on August 19.

Soil samples were placed in a cooler on ice and were submitted, with chain-of-custody documentation, to Energy Laboratories in Billings for VPH and lead-scavengers analyses. Laboratory analytical results are summarized in Table 1 and laboratory analytical reports are included in Appendix B.

5.3 Soil Loading, Hauling, and Disposal

On August 19 and 20, 2021, 340 yards of impacted soil were loaded and hauled to the Republic Services High Plains Landfill in Great Falls. A total of 17 side-dump truck loads were hauled from the site. Waste manifests that accompanied each load are included in Appendix C.

5.4 Flowable Fill Cap

The RTI geologist supervising soil screening noted that the most substantial impacts identified in the north impacted area extended within two vertical feet of the top of the new sewer line. RTI communicated this information to the DEQ Case Manager on August 19, 2021 and DEQ determined that a flowable-fill cap should be emplaced above the sewer line along the length of the contaminated interval.

On August 20, 2021, Central installed a two- to three-foot thick flowable fill cap immediately above the sewer line along the 50 foot length of the northern impacted area (between sample locations SW2 and SW3.

5.5 Backfilling

RTI instructed Central that excavated soil could be used for backfill beginning approximately 25 feet north of sample location SW-3.

5.6 Photographic Log and Field Notes

A photographic log of activities described in this report is included in Appendix D. Field notes are included in Appendix E.

6.0 RESULTS

6.1 Data Validation

Soil analytical data were validated using the DEQ Data Validation Summary Form. All data were deemed useable. Data Validation Summary Forms are included in Appendix F.

Noted data quality issues included:

- The laboratory reporting limit for all methyl tertiary butyl ether (MTBE) and EDB results as well as benzene results for samples SW1 7-8 (and duplicate) and SW4 5-6 were higher than the applicable soil Risk Based Screening Level (RBSL).

- VPH aliphatic surrogate recoveries for samples SW1 7-8 (and duplicate) and SW4 5-6 were out of range high indicating potential high bias. Data were assigned a "J+" qualifier.
- VPH aromatic surrogate recoveries for samples SW5 7-8 (duplicate of SW1 7-8) and SW4 5-6 were out of range high indicating potential high bias. Data were assigned a "J+" qualifier.
- Relative percent difference (RPD) for total purgeable hydrocarbon (TPH) in Laboratory Control Sample Laboratory Control Duplicate Sample out of range. All positive results are estimated and assigned "J" qualifiers.

RPDs for detected compounds in sample SW1 7-8 and duplicate sample SW5 7-8 were 27% for toluene, 30% for ethylbenzene, 32% for TPH, 21% for C5-C8 aliphatics, 39% for C9-C12 aliphatics, and 37% for C9-C10 aromatics.

6.2 Soil Analytical Results

Excepting sample SW4 0-2, no hydrocarbon compounds were detected in any 0 to 2 foot soil samples. Only total purgeable hydrocarbon (TPH) was detected in sample SW4 0-2 at a trace concentration of 1.7 milligrams per kilogram (mg/kg).

Worst-case impacts in the southern impacted area are represented by sample SW4 5-6. Detected compounds in this sample included toluene (0.87 mg/kg), ethylbenzene (12 mg/kg), TPH (694 mg/kg), C5-C8 aliphatics (119 mg/kg), C9-C12 aliphatics (334 mg/kg), and C9-C10 aromatics (299 mg/kg). Only the C9-C10 aromatics concentration exceeded the applicable soil RBSL (subsurface soil less than 10 feet to groundwater).

Worst-case impacts in the northern impacted area are represented by sample SW1 7-8 and duplicate sample SW5 7-8. Of the two samples, duplicate sample SW5 7-8 exhibited the higher concentrations. Detected compounds in this sample included toluene (1 mg/kg), ethylbenzene (19 mg/kg), TPH (594 mg/kg), C5-C8 aliphatics (180 mg/kg), C9-C12 aliphatics (242 mg/kg), and C9-C10 aromatics (200 mg/kg). Only the C9-C10 aromatics concentration exceeded the applicable soil RBSL (subsurface soil less than 10 feet to groundwater).

No target analytes were detected in samples SW1 8-10 collected two feet below worst case sample SW1 7-8 and duplicate, SW1A 7-8 collected from the opposite wall of the trench from sample SW1 7-8, and sample SW2 6-8 collected at the southern limit of the northern impacted area.

Minor concentrations of TPH and VPH aliphatics and aromatics were reported in samples SW2 4-7 and SW3 6-8. Sample SW3 6-8 was collected from the most impacted depth at the northern end of the north impacted area. All reported concentrations were well below the applicable RBSLs.

Benzene was not detected in any samples; however, the laboratory reporting limit in worst-case samples SW1 7-8 and duplicate, and SW4 5-6 was higher than the applicable RBSL. MTBE and 1,2 dibromoethane were not detected in any samples; however, in all samples, the laboratory

reporting limit was higher than the applicable RBSLs. 1,2 DCA was not detected in any samples.

Groundwater was not encountered during trenching.

7.0 CONCLUSIONS

Soil impacted with gasoline range hydrocarbons was encountered in two areas of the sewer installation trench along Main Street adjacent to the former Bob's Exxon (Figure 2). The southern impacted area began at a point in line with the north edge of the former Bob's Exxon building and extended approximately 35 feet to the north. Worst case conditions in this area were in the approximate center of the interval at a depth of 5 to 6 feet in a lense of slightly coarser material (silt) than the surrounding clay.

The northern impacted area began approximately 25 to 30 feet north of the southern impacted area and extended northward for approximately 50 feet. Worst-case impacts were encountered at depths of 6 to 8 feet; however, impacts attenuated to non-detectable concentrations within a short vertical distance below 8 feet. Also, impacts did not extend to the opposite (west) trench wall. Beyond the northern impacted area, no soil staining or hydrocarbon odors were encountered for approximately 200 feet when soil screening was discontinued.

The profile of contamination in soil samples indicates that impacts are composed of substantially weathered gasoline. Although soil impacts extend vertically to within one to two feet of the new sewer line, impacts are relatively minor and emplacement of the flowable-fill cap along the length of the north impacted area should protect the sewer line from exposure to hydrocarbon compounds.

A total of 340 loose yards of soil weighing 412 tons were transported off-site and disposed at the Republic Services High Plains Landfill in Great Falls.

8.0 RECOMMENDATIONS

RTI recommends assessment of soil conditions in the impacted areas east of the sewer trench to determine if more substantial soil impacts exceeding applicable RBSLs exist.

Respectfully Submitted,
Resource Technologies, Inc.

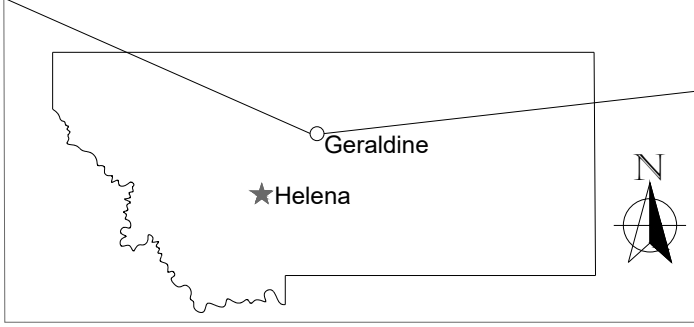
Joe Laudon
Hydrogeologist

Figures

Mercator Projection
WGS84
USNG Zone 12TWT
CALTOPO

0.1 0.2 0.3 0.4 0.5 km
0.1 0.2 0.3 mi
Scale **1:5449** 1 inch = 454 feet

N MN 11°

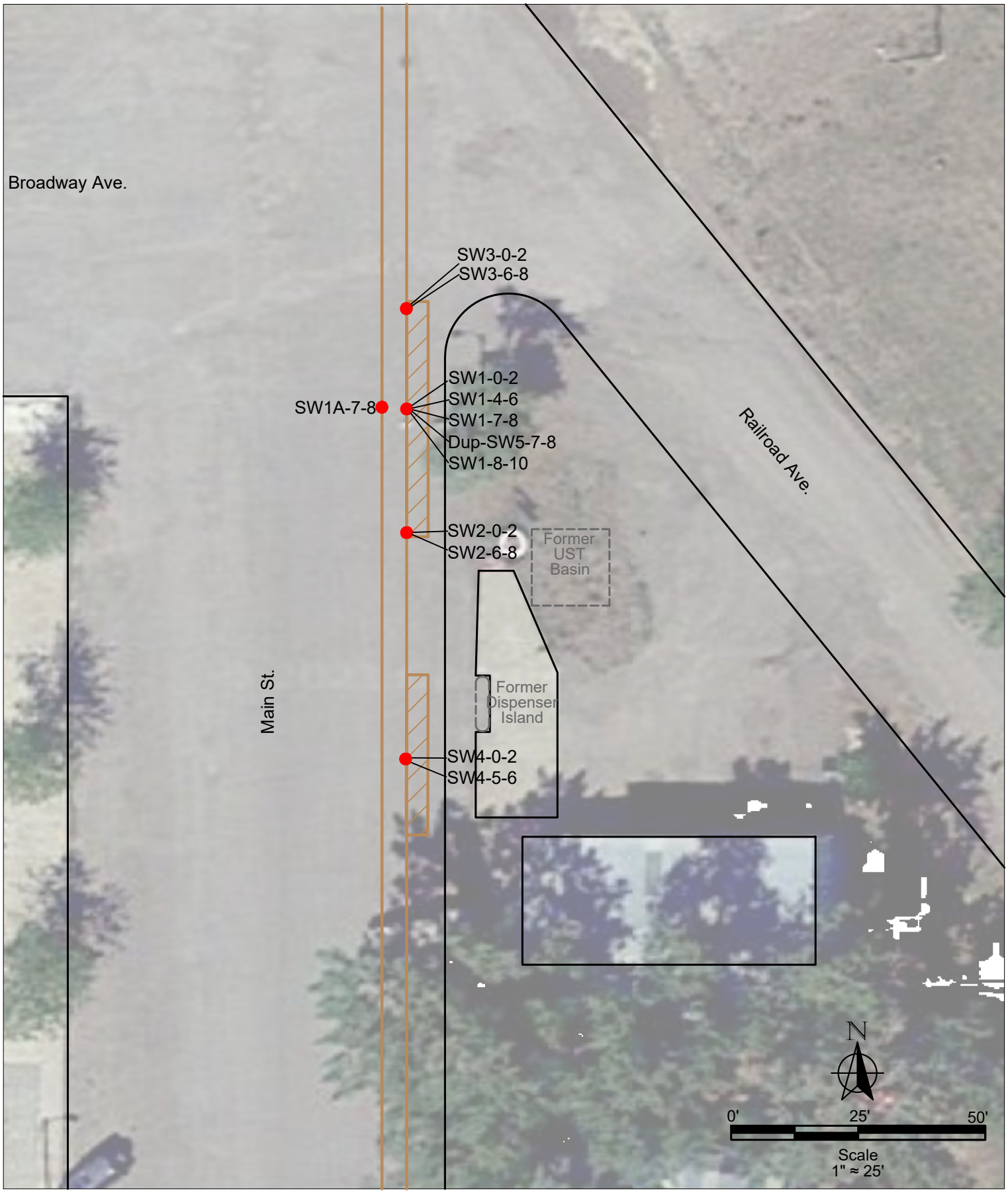


N

Figure 1

Site Location
August 2021
124 Broadway Ave
Geraldine, Montana 59446

RESOURCE TECHNOLOGIES, INC.
1050 EAST MAIN STREET, SUITE 4
BOZEMAN, MT 59715
(406) 585-8005 FAX: (406) 585-0069



Legend

- Sidewall soil sample location
- Trench interval exhibiting staining and petoleum odor.

Figure 2

Sample Map
August 2021
124 Broadway Ave
Geraldine, Montana 59446

RESOURCE TECHNOLOGIES, INC.
1050 EAST MAIN STREET, SUITE 4
BOZEMAN, MT 59715
(406) 585-8005 FAX: (406) 585-0069

Tables

Table 1. Soil Analytical Results; Geraldine Sewer Line Project; Main St. and Broadway Ave, Geraldine, MT

				VPH																Lead Scavengers			
Volatile Petroleum Hydrocarbons				MTBE		BENZENE		TOLUENE		ETHYL-BENZENE		TOTAL XYLENES		NAPH-THALENE		C9-C10 AROMATICS		C5-C8 ALIPHATICS		C9-C12 ALIPHATICS		TPH		1,2 DCA		1,2 Dibromoethane	
	Unit			mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
MDEQ - Tier 1 Surface (0-2') Commercial Direct Contact Soil RBSLs				**230**		**5.7**		**5,500**		**28**		**310**		**19**		**1,000**		**290**		**360**				**2.3**		**0.18**	
MDEQ - Tier 1 Subsurface (>2') Direct Contact Construction Soil RBSLs				**8,900**		**240**		**5,500**		**1,300**		**610**		**140**		**1,000**		**410**		**640**				**110**		**7.8**	
MDEQ -Tier 1 Subsurface <10 feet to groundwater Soil RBSLs				**0.078**		**0.07**		**21**		**26**		**320**		**12**		**130**		**220**		**640**				**0.019**		**0.000086**	
Sample ID	Sample Depth	Date	PID	Results	Q	Results	Q	Results	Q	Results	Q	Results	Q	Results	Q	Results	Q	Results	Q	Results	Q	Results	Q	Results	Q	Results	Q
SW1	0-2	8/19/2021	<10	<0.12	*	<0.062		<0.062		<0.062		<0.062		<0.12		<2.5		<2.5		<2.5		<2.5		-		-	
SW1	4-6	8/19/2021	170	<0.13	*	<0.064		0.077		0.81		<0.064		<0.13		37		15		47		99	J	<0.0064		<0.00025	*
SW1	7-8	8/19/2021	>2000	<0.65	*	<0.32	*	0.76		14		<0.32		<0.75		**138**		146	J+	163	J+	432	J	<0.0065		<0.00026	*
Duplicate (SW5)	7-8	8/19/2021		<0.64	*	<0.32	*	1.0		19		<0.32		<1.1		**200**	J+	180	J+	242	J+	594	J	<0.019		<0.00025	*
SW1A	7-8	8/19/2021	<10	<0.13	*	<0.063		<0.063		<0.063		<0.063		<0.13		<2.5		<2.5		<2.5		<2.5		<0.0063		<0.00025	*
SW1	8-10	8/19/2021	40	<0.12	*	<0.062		<0.062		<0.062		<0.062		<0.12		<2.5		<2.5		<2.5		<2.5		-		-	
SW2	0-2	8/19/2021	<10	<0.12	*	<0.059		<0.059		<0.059		<0.059		<0.12		<2.4		<2.4		<2.4		<2.4		-		-	
SW2	4-7	8/19/2021	23	<0.12	*	<0.062		0.079		<0.080		<0.062		<0.12		14		8.4		22		43	J	-		-	
SW2	6-8	8/19/2021	<10	<0.12	*	<0.060		<0.060		<0.060		<0.060		<0.12		<2.4		<2.4		<2.4		<2.4		-		-	
SW3	0-2	8/20/2021	<10	<0.13	*	<0.066		<0.066		<0.066		<0.066		<0.13		<2.6		<2.6		<2.6		<2.6		-		-	
SW3	6-8	8/20/2021	18	<0.13	*	<0.065		0.080		<0.25		<0.075		<0.13		7.2		9.6		14		30	J	-		-	
SW4	0-2	8/20/2021	<10	<0.10	*	<0.051		<0.051		0.1		<0.051		<0.10		<2.0		<2.0		<2.0		1.7	J	-		-	
SW4	5-6	8/20/2021	72	<0.64	*	<0.32	*	0.87		12		<0.85		<2.0		**299**	J+	119	J+	334	J+	694	J	<0.019		<0.00025	*
Waste	-	8/19/2021		<0.12		<0.061		0.26		3.1		<0.061		<0.50		56		55		80		186	J	-		-	

Qualifiers - Q

* - Laboratory reporting limit exceeds RBSL.

J - Estimated value. The analyte was present but less than the reporting limit .

J- -Surrogate recovery lower than QC advisory limits due to sample matrix interference. Potential low bias.

J+ -Surrogate recovery higher than QC advisory limits due to sample matrix interference. Potential high bias.

Report Definitions:

– Compound not analyzed

Concnetrations exceeding RBSL highlighted in grey bold text.

mg/kg - milligrams per kilogram

MDEQ RBSLs - Montana Tier 1 Risk Based Screening levels for subsurface soil less than 10 feet to groundwater (May 2018).

Appendix A

Laboratory Analytical Reports
Waste Characterization

Appendix D

Photographic Log

Stained soil, northern impacted area.

Northern impacted area looking south. Samples SW1 4-7 and SW1 7-8 collected at lower Center of photo.

Emplacing flowable fill cap along north impacted area.

Loading Stockpiled Soil.

Trench wall – southern impacted area.

Stockpiled soil from north impacted area.

Loading soil from north impacted area.

Trench looking north from end of impacted areas.

Appendix E

Field Notes

"Outdoor writing products for outdoor writing people."

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To Geraldine

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Project Geraldine Sewer Project

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www.RiteintheRain.com

8/19/21 J. Lawler
Mostly Cloudy, - Temp - 50's

7:30 Arrive on site
On site Central Crew
Team with Great West
2 side dumps for hauling.

7:50 Begin Loading

8:10 - Both trucks empty,
Collected 4 subsamples from
pile. No discernible odor.

9:15 Excavating next to tree
at N end of Bob's house
Soil Stain + odor
PID - 190 ppm

Worst Case 720 ppm
9:45
Collect sample SW1 8-10 PID 45
in worst case area at sewer
pipe level.
10:00 ~15' past worst case
130 ppm

10:30 - 2nd round of trucks (2) away

10845 - Collect SW-1 4-6 PID - 176

11:10 Collect SW1 7-8 PID > 2000 strong odor. Duplicate SW5-7-8

11:45 Apex install has slowed due to working around water line.

7-8 foot layer 25' north + 20' south of hot zone appear clean

13:00 - Call Shenson Corp - Place blowable fish cap after cont interval

13:20 5th Truck Departs

13:45 - 6th + 7th Trucks departed

13:55 Collected Samples
SW-1 0-2 - PID < 10
SW2 0-2 - PID < 10
SW2 7-8 and SW1A-7-8
< PID < p

SW1A-7-8 collected from opposite (west) wall of trench across from SW1-7-8.

15:30 - Done excavating for the day

2 total side dumps hauled.

15:45 Depart

MZ

8/20/21 J Lawton

Overcast Temp = 50's

7:05 Arrive - 1st Truck loading

7:20 2nd Truck away

7:30
Collect Samples SW3 0-2 and SW3 6-8 ~25' north of SW1 at apparent north limit of contamination.
Flowable fill trucks arrive.
SW3-0-2 PID <10 SW3-6-8 PID 18
7:50 - Flowable fill cap 1-2' thick placed over 50' length of trench.

9:20 - 3rd Truck away

10:40 4th + 5th Trucks away

Sidewall Screening

1 & 1A	5 & 7 ft	5' north of building
2 & 2A	5 & 7 ft	15' north of building
3 & 3A	5 & 7 ft	25' north of building
4	5'	35 north of building

	PID
1	77
2	77
3	34
4	<10

	PID
1A	10
2A	10
3A	<10

11:05 Collect Samples

SW4-5-6	72
SW4-0-2	PID <10

15 feet north of building

Contamination concentrated in grey Stripe at 5-6' depth
appears clean @ 7-8'

Intermittent runs from N Edge of building for about 30 ft.

12:00 6th truck away

13:10 7th & 8th Trucks away

15:00 9th truck away
~5 yards left.

15:05 Central calls for one additional side dump.

Leave manifest for the last bit of soil.

15:20 Depart

8/23/21

16:00 Arrive on site. Crew is installing sewer manhole.

No indications of soil impacts along trench.

16:45 Depart

10.

8/24/21 Sunny - Temp 60's

7:40 - Arrive on site. Crew continuing work on sewer manhole.

9:30 - Begin extending trench north of sewer manhole

11:30 - Trench extends ~ 200 feet north of last contaminated soil. No evidence of impacts along this length.

12:00 Crew nearing point where they will turn west up alley.

Potential of encountering impacts associated with Bob's Exxon are remote. Determine no further need for soil screening.

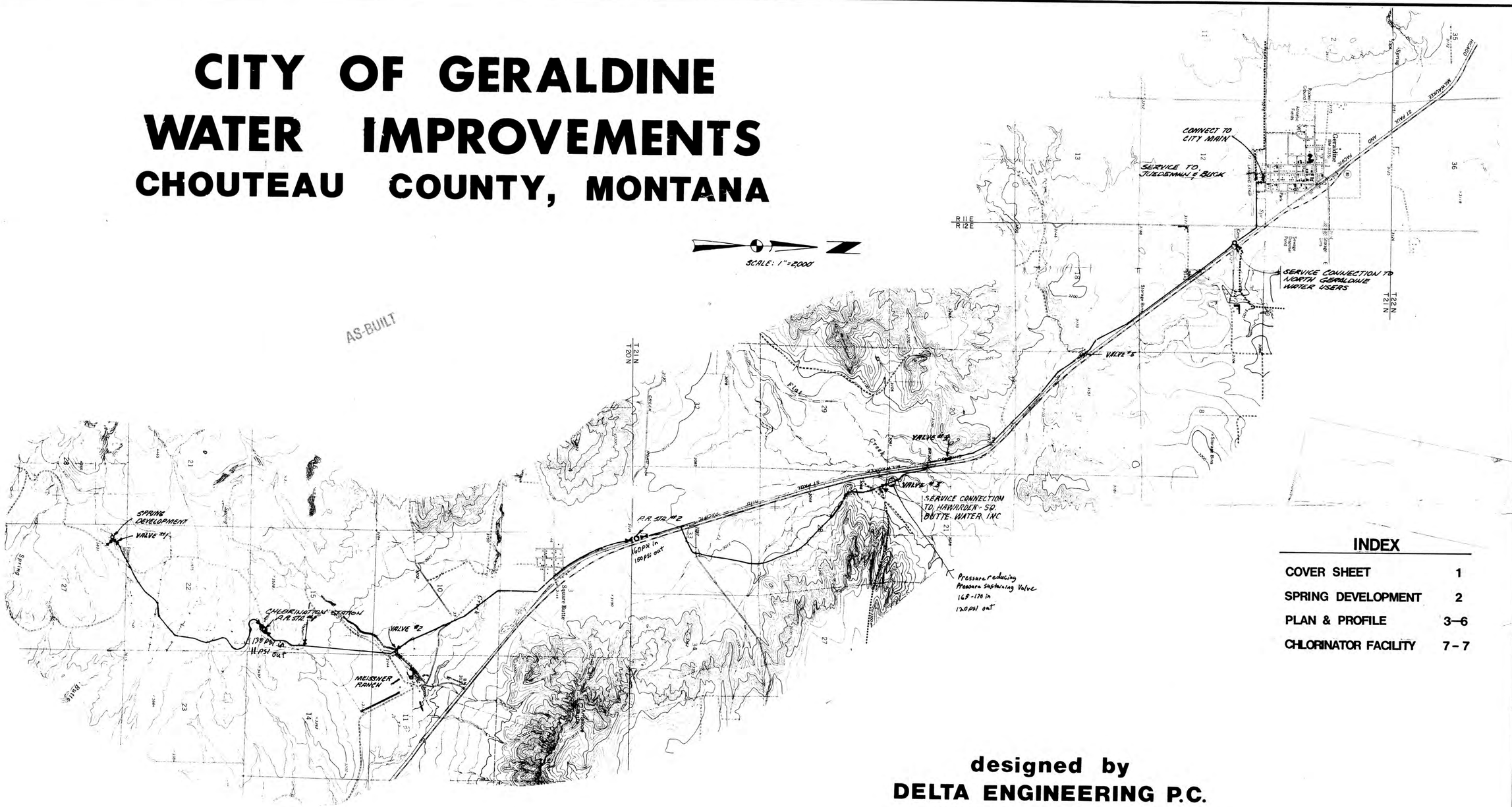
12:10 Depart for Bozeman

Release Code	Facility Site Name	Facility Code	Legacy FID	Address	City	County	Release Regulation	Confirmed Date	Resolved Date	Eligibility	Status
3493	JOYCE FUEL and FEEDS GERALDINE	19310	08-09375	MT Hwy 80	Geraldine	Chouteau	Unknown	8/13/1998	6/13/2013	Eligible	Resolved
4098	CHOUTEAU COUNTY SHOP #4098	17163	804011	Address Unavailable (DEQ_GEO_LOC_INFO : 27970)	Geraldine	Chouteau	Unknown	4/25/2002	10/15/2009	Eligible	Resolved
1581	MEISSNER RANCHES INC GERALDINE	19122	08-02008	Address Unavailable (DEQ_GEO_LOC_INFO : 33667)	Geraldine	Chouteau	Unknown	3/9/1993	1/18/1994		Resolved
3659	BOBS EXXON	19147	08-03014	101 N Main St	Geraldine	Chouteau	Federal	1/14/1999		Eligible	Confirmed

APPENDIX N

Water System Record Drawing and Photos

CITY OF GERALDINE
WATER IMPROVEMENTS
CHOUTEAU COUNTY, MONTANA



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DELTA ENGINEERING P.C.
GREAT FALLS, MONTANA
PH. 453–2209

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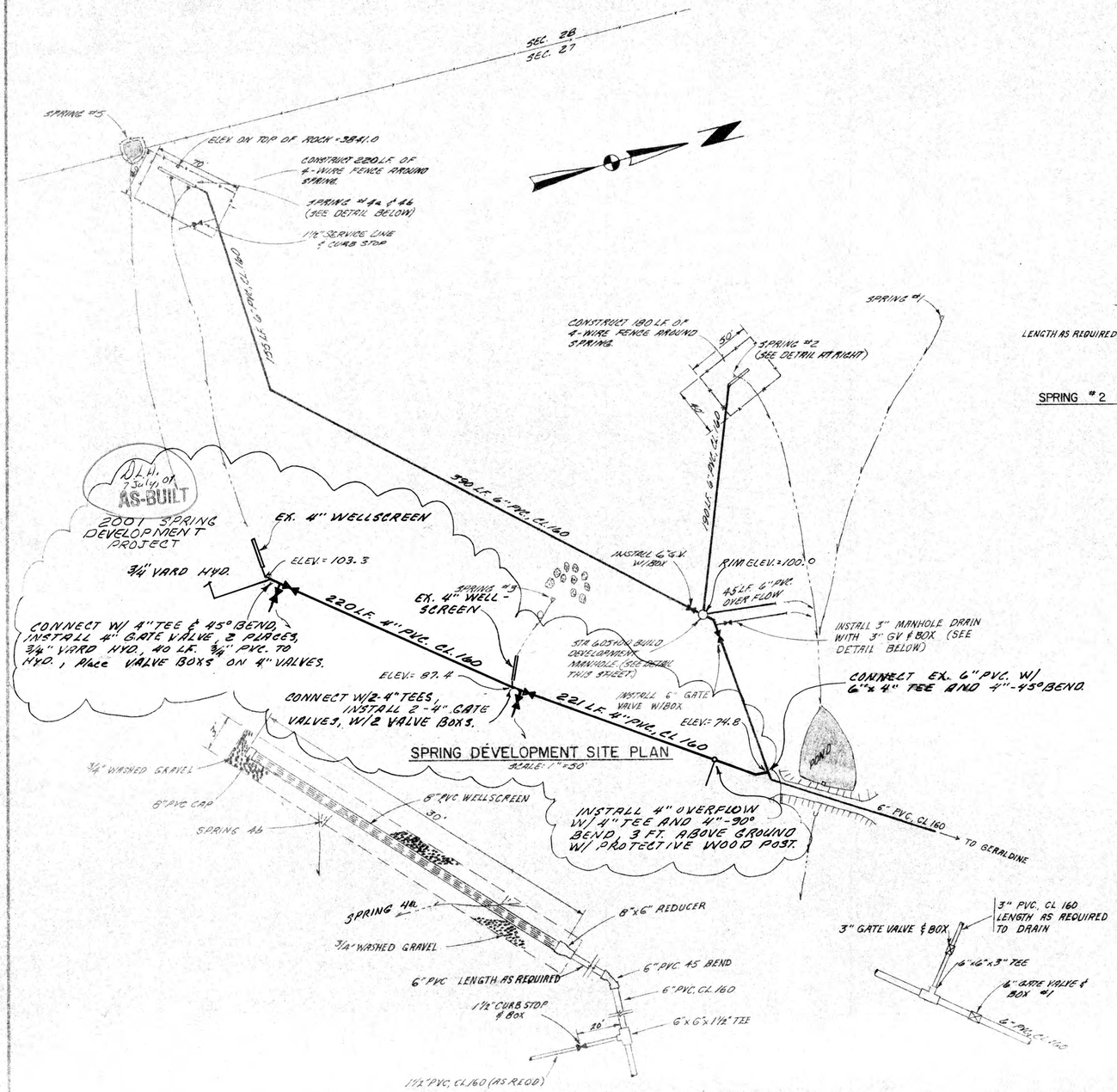
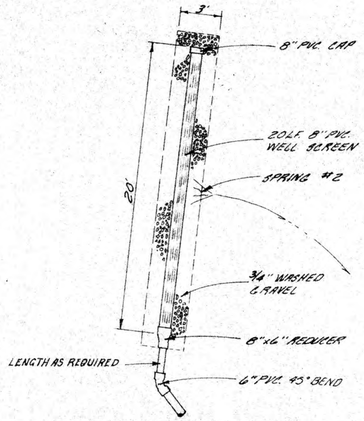
Job No. 2-85	File No.	Sheet 1 of 7



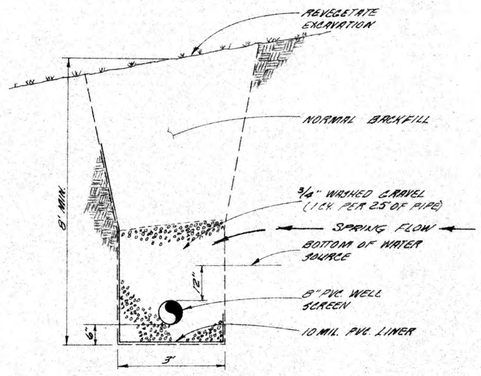
SPRING DEVELOPMENT SITE PLAN
SCALE: 1" = 50'

SPRING #4 DEVELOPMENT DETAIL
SCALE: 1" = 5'

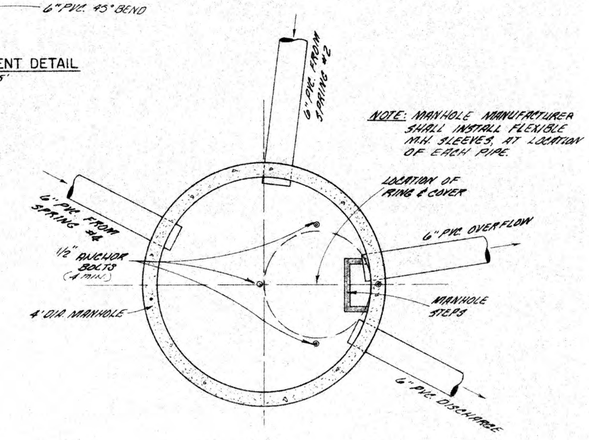
MANHOLE DRAIN DETAIL
SCALE: 1" = 5'



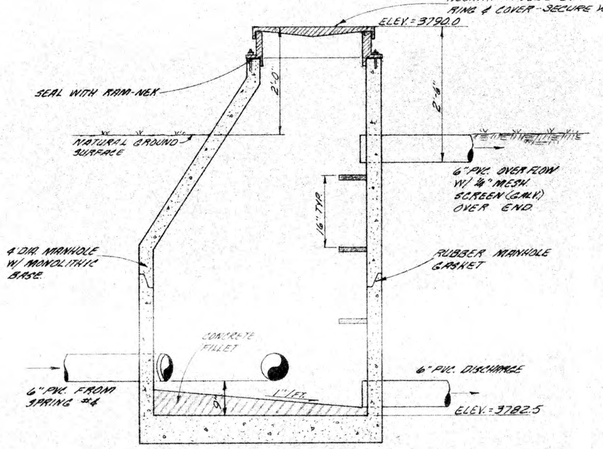
SPRING #2 DEVELOPMENT DETAIL
SCALE: 1" = 5'



TYPICAL SPRING DEVELOPMENT TRENCH
SCALE: 1" = 2'



PLAN



SPRING DEVELOPMENT MANHOLE
SCALE: 3/4" = 1'

Add Two Spring Developments 7/2001

REVISION DATE INITIAL

GERALDINE WATER IMPROVEMENTS AND SPRING DEVELOPMENT

SECTION 27, R12E, T20N

CHOUTEAU COUNTY, MONTANA

DESIGNED	D.L.H. & C.L.N.
DRAWN	D.L.H.
CHECKED	G.L.K.
SCALE	AS SHOWN
DATE	July, 2001
JOB NO.	
FILE NO.	
SHEET	2 OF 7

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STA. 346+00 MATCH LINE-THIS SHEET

INSTALL AIR RELEASE VALVE #3A 1' EAST

INSTALL AIR RELEASE VALVE #4 1' SOUTH

GATE

PASTURE OUTLET #2 100' FROM 6" LINE

ROAD TO SPRINGS

STA. 310+00 BUILD PRESSURE REDUCTION STATION #1 ELEV. = 3460.0 CONSTRUCT CHLORINATION FACILITY - SEE SHEET 7 of 7

ROAD TO MEISSNER'S

PASTURE OUTLET #3

1500'

1½" VALVE 12" FROM 6" LINE

6"

6" PVC, CL. 160

GATE

W2"

PRIVATE WATER LINE

195'

SEC. 15
SEC. 22

SEC. 22
SEC. 15

SEC. 23
SEC. 14

SEC. 14
SEC. 11

STA. 406+00 MATCH TO SHEET 4

525
510
495
480
465
540

3720
3700
3680
3660
3640
3620
3600
3560
3540
3480
3460
3380
3360
3280
3240
3220
3200
3180
3160
3140

AIR VALVE #3A

AIR VALVE #4

P.R. STA. #1 ELEV. = 3460.0

STA. 346+00 MATCH LINE

STA. 406+00 MATCH TO SHEET 4

AS-BUILT

SEC. 28
SEC. 27

SEC. 22

ROAD TO MEISSNER'S

FLOWING WELL

600

585

570

555

6" PVC, CL. 160

PASTURE OUTLET #1 1' EAST

GATE

INSTALL AN AUTOM. AIR RELEASE VALVE #1 (SEE DRW. W-22)

INSTALL AIR RELEASE VALVE #3 WITH PROTECTION (SEE DRW. W-18) 1' EAST

INSTALL AIR RELEASE VALVE #2 (SEE DRW. W-19) 1' WEST

SEC. 22
SEC. 23

STA. 346+00 MATCH LINE-THIS SHEET

NOTE: SEE SHEET 2 FOR SPRING DEVELOPMENT PLAN.

3840
3820
3800
3760
3740
3720
3700
3680
3660
3640

SPRING DEVELOPMENT MANHOLE

A.R. VALVE #1

A.R. VALVE #2

A.R. VALVE #3

STA. 346+00 MATCH LINE-THIS SHEET

4.4%

20'

300'

AS-BUILT

HIGHWAY FEDERAL AID SHEET
PLATE 2-DOUBLE PLAN AND PROFILE-FULL LINE
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DRAWN: O.L.A.
CHECKED: G.A.R.
DATE: MARCH, 1965

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STA 363+00 MATCH LINE - THIS SHEET
MANUAL AIR RELEASE - 8' WEST #5
℄ RAIL ROAD
6" PVC, CL 160
PRESSURE REDUCTION STATION #2
SEC 4
SEC 9
T20N
T21N
ROAD
SEC 33
STA 327+00 AH = STA 330+00 BK
BORING OF RAIL ROAD AND HIGHWAY. INSTALL 50' OF 12" STEEL CASING UNDER EACH.
PASTURE OUTLET ON FENCE # 6 (PETERS) ⊄ 50
℄ RAIL ROAD
HIGHWAY
STA 312+00 AH = STA 315+00 BK
PASTURE OUTLET #7 (70' FROM 6" LINE
INSTALL AIR RELEASE VALVE WITH PROTECTION #6, 1' WEST
6" PVC, CL 160
SEC 28
SEC 29
STA 297+00 MATCH LINE - THIS SHEET

STA 363+00 MATCH LINE THIS SHEET
A.R. VALVE #3
PRESS. REDUCTION STA #2
STA 330+00 BK
STA. EQUATION 1 FOOT
STA 327+00 AH
6" TEE
COUNTY ROAD
A.R. VALVE #6
STA 297+00 MATCH LINE - THIS SHEET
3160
3140
3120
3100
3120
3100
3080
3060
360
345
330
315
300
285

STA 456+00 MATCH TO SHEET 3
STA 449+80 INSTALL 2" TAP TO MEISSNER RANCH AND 6" GATE VALVE & BOX #2
GATE
INSTALL PASTURE OUTLET ON FENCE #4 9' WEST
GATES
TO MEISSNER'S
SEC 10
SEC 11
6" PVC, CL 160
STA 417 MATCH
GATE
AS-BUILT
STA 417 MATCH
PASTURE OUTLET #5, 1' EAST
COWBOY CREEK
SEC 10
SEC 3
405
390
6" PVC, CL 160
℄ RAIL ROAD
BROADWAY AVE
SQUARE BUTTE WATER & TELE. CROSSING
375
STA 396+00 MATCH LINE - THIS SHEET

STA 456+00 MATCH TO SHEET 3
6" GATE VALVE #2
PASTURE OUTLET ON FENCE LINE
SCALE
20'
300'
SQUARE BUTTE BROADWAY AVE
STA 396+00 MATCH LINE - THIS SHEET
AS-BUILT
450
435
420
405
390
375

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CHECKED G.L.S.
DATE NOV 21, 1975

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STA. 184+00 MARCH LINE

STA. 184+50 INSTALL 6"GATE VALVE & BOX. #9

INSTALL AIR RELEASE VALVE #8 WITH PROTECTION (SEE DRW. W-18)

SEC. 20 / SEC. 17

¾" TAP W/ ¾" VALVE & BOX MEEKS 10' SO.

AIR RELEASE VALVE #8A WITH PROTECTION 1' WEST

6" PVC, CL 160

℄ RAIL ROAD

6" GATE VALVE & BOX #4

SEC. 18 / SEC. 17

INSTALL AIR RELEASE VALVE #9 WITH PROTECTION. 1' WEST

INSTALL AUTO AIR RELEASE VALVE #10 (SEE DRAWING W-22)

STA. 96+00 MATCH LINE - THIS SHEET

180 165 150 135 120 105

3080 3060

STA. 184+00 MATCH LINE - THIS SHEET

6" GATE V. #9

A.R. VALVE #8

MEEKS TAP

A.R. VALVE #8A

EXISTING GROUND

6" GATE V. #4

A.R. VALVE #9

A.R. VALVE #10

STA. 96+00 MATCH LINE - THIS SHEET

3140 3120 3100 3080

180 165 150 135 120 105

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SEC. 33 / SEC. 28

STA. 279+00 MATCH TO SHEET 4

AS-BUILT

PASTURE OUTLET #8 30' WEST OF LINE ON FENCE

INSTALL MANUAL AIR RELEASE VALVE WITH PROTECTION #7

240

INSTALL AIR RELEASE VALVE WITH PROTECTION #7A 1' EAST

SEC. 29 / SEC. 20

℄ RAIL ROAD

℄ HIGHWAY

FLAT CREEK

INSTALL 3" SERVICE CONNECTION W/ 3" GATE VALVE & BOX. INSTALL 6" GATE VALVE WITH BOX ON MAIN LINE (HAWARDEN-SQUARE BUTTE SERVICE)

SEC. 28 / SEC. 21

INSTALL 6" LINE UNDER NORTH END OF RAIL ROAD & HIGHWAY BRIDGES PIPE IS TO HAVE 2" INSULATION AND BURIED 3' BELOW EXISTING GROUND LEVEL UNDER BRIDGES

SEC. 20 / SEC. 21

STA. 184+00 MATCH LINE - THIS SHEET

270 255 240 225 210 195

STA. 279+00 MATCH TO SHEET 4

A.R. VALVE #7

A.R. VALVE #7A

EXISTING GROUND

6" GATE VALVE & SERVICE CONNECTION FOR HAWARDEN-SO. BUTTE WATER SYSTEM

CROSSING UNDER BRIDGES

300'

AS-BUILT

3100 3080 3060 3040

270 255 240 225 210 195

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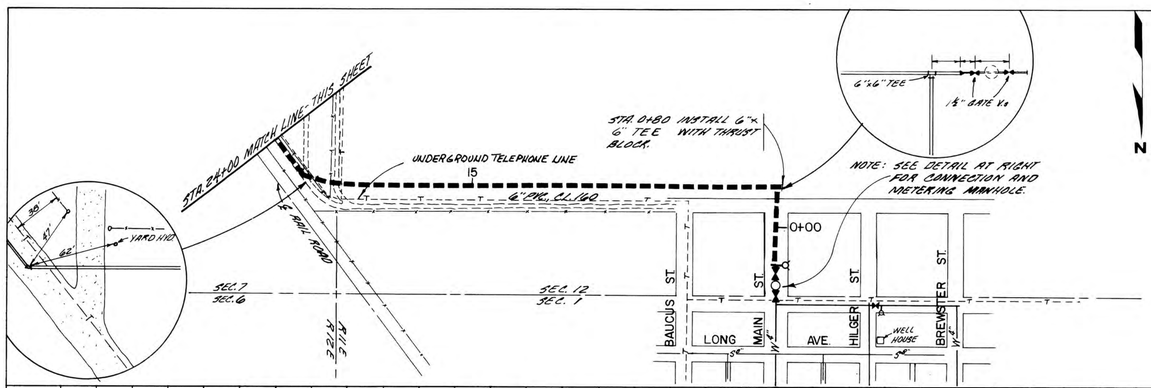
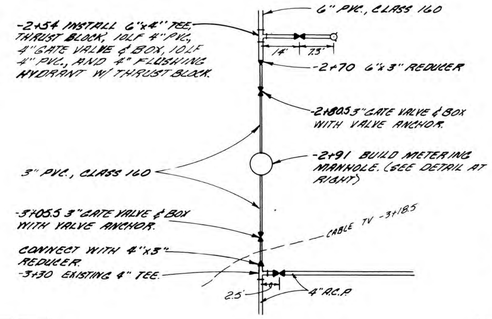
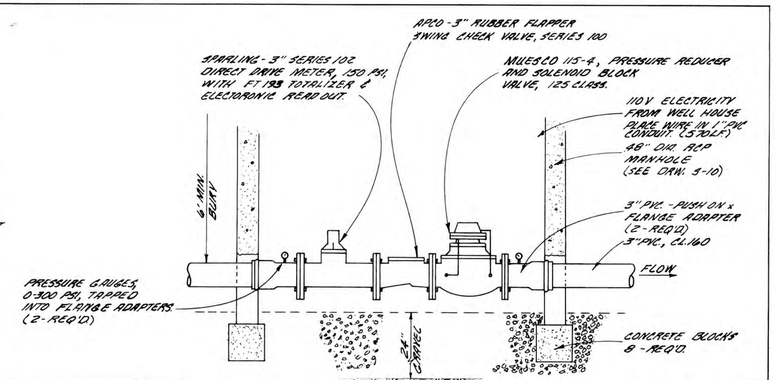
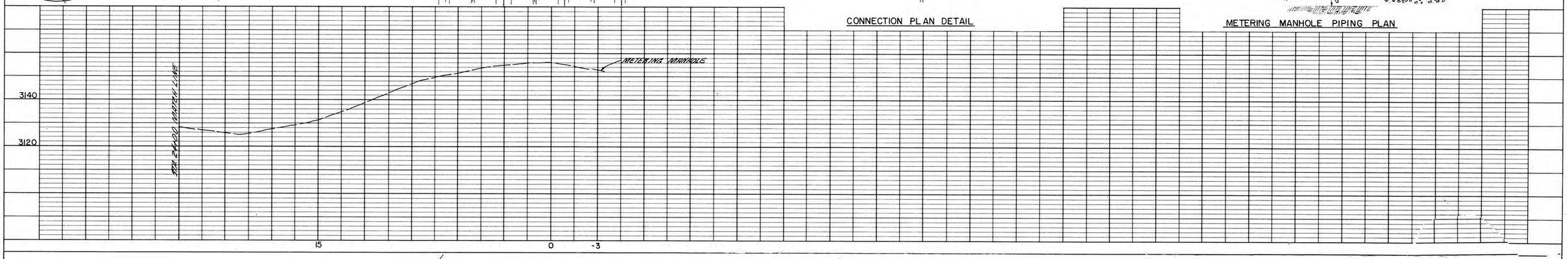




CONNECTION PLAN DETAIL



METERING MANHOLE PIPING PLAN



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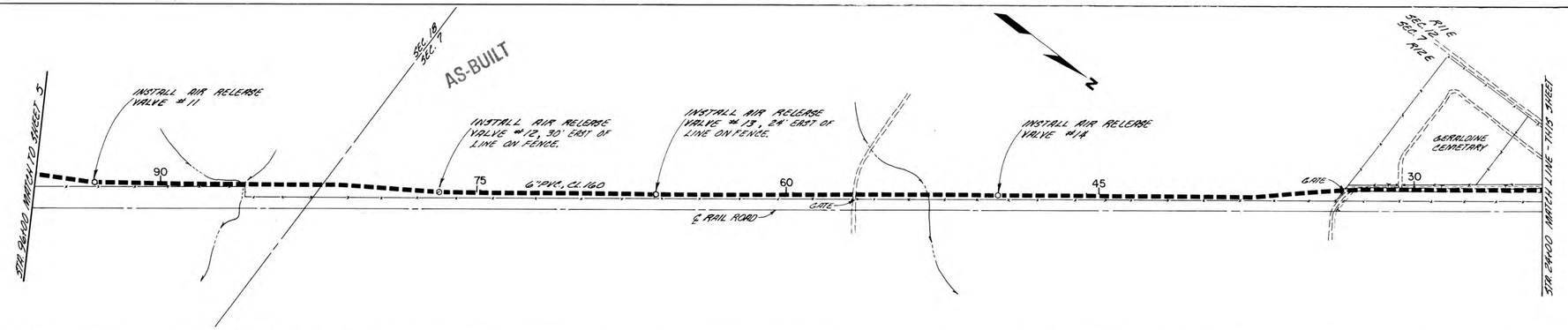

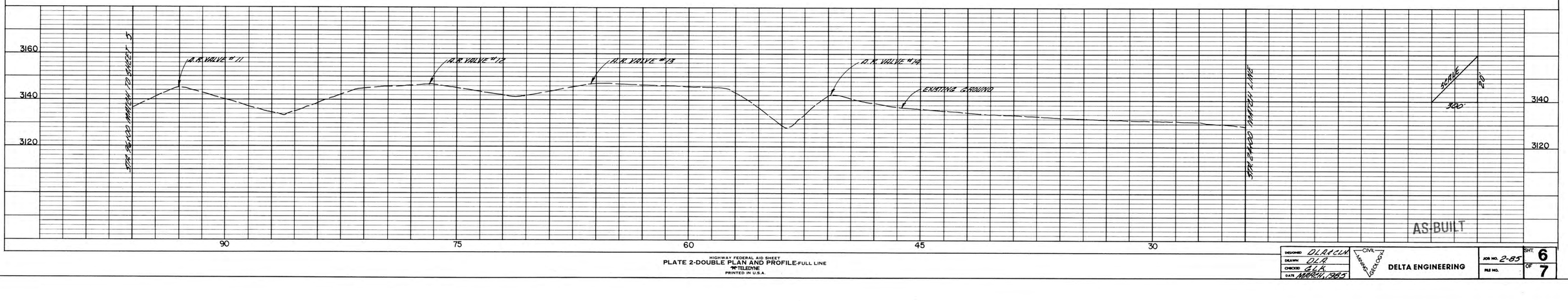

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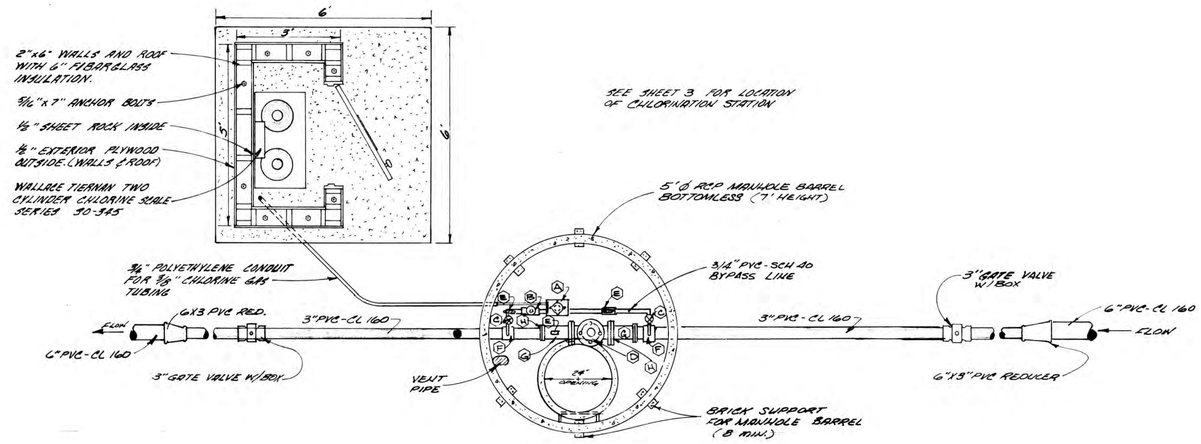
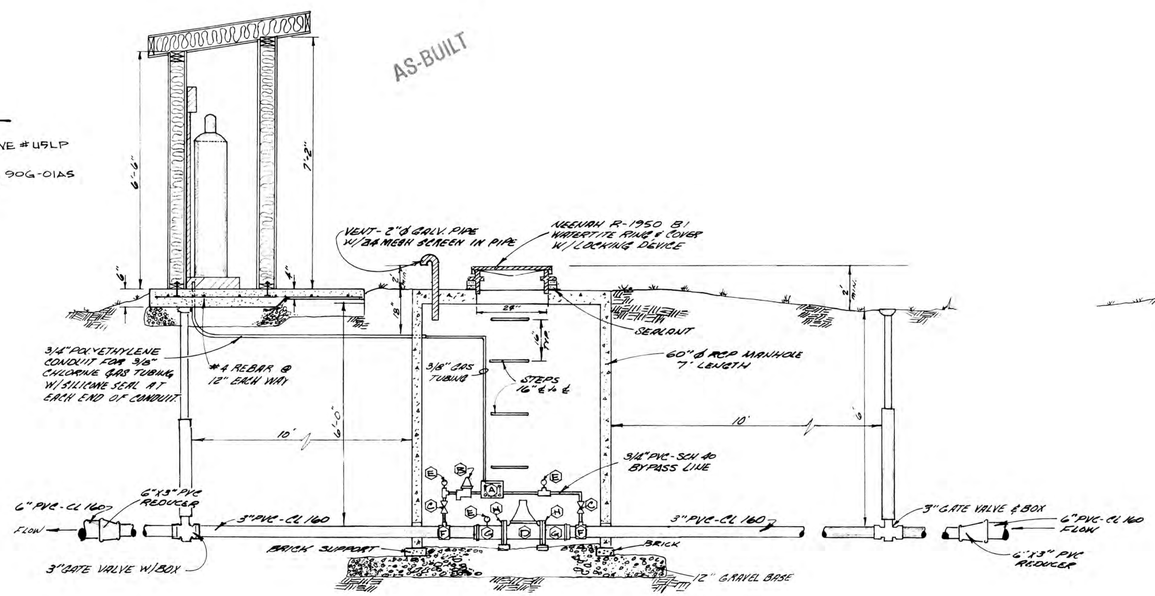


PLAN

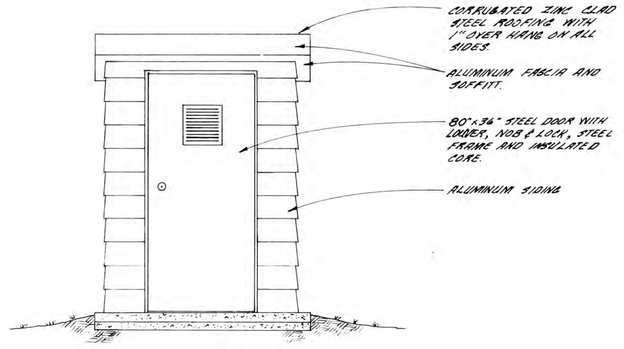
LEGEND

- (A) CHLORINE GAS EJECTOR
- (B) 3/4" WATTS PRESS. RED. VALVE #U5LP
- (C) 3/4" GATE VALVE
- (D) 3" CLA-VAL PRESS. RED. VALVE 90G-01AS
- (E) PRESS. GAUGE W/PETCOCK
- (F) 2" X 3/4" PVC SADDLE TEE
- (G) 3" GASK. X MIPT ADAPTER
- (H) 3" FIPT X FLANGE ADAPTER

AS-BUILT



SECTION



FRONT VIEW

AS-BUILT

REVISION	DATE	INITIAL

CITY OF GERALDINE

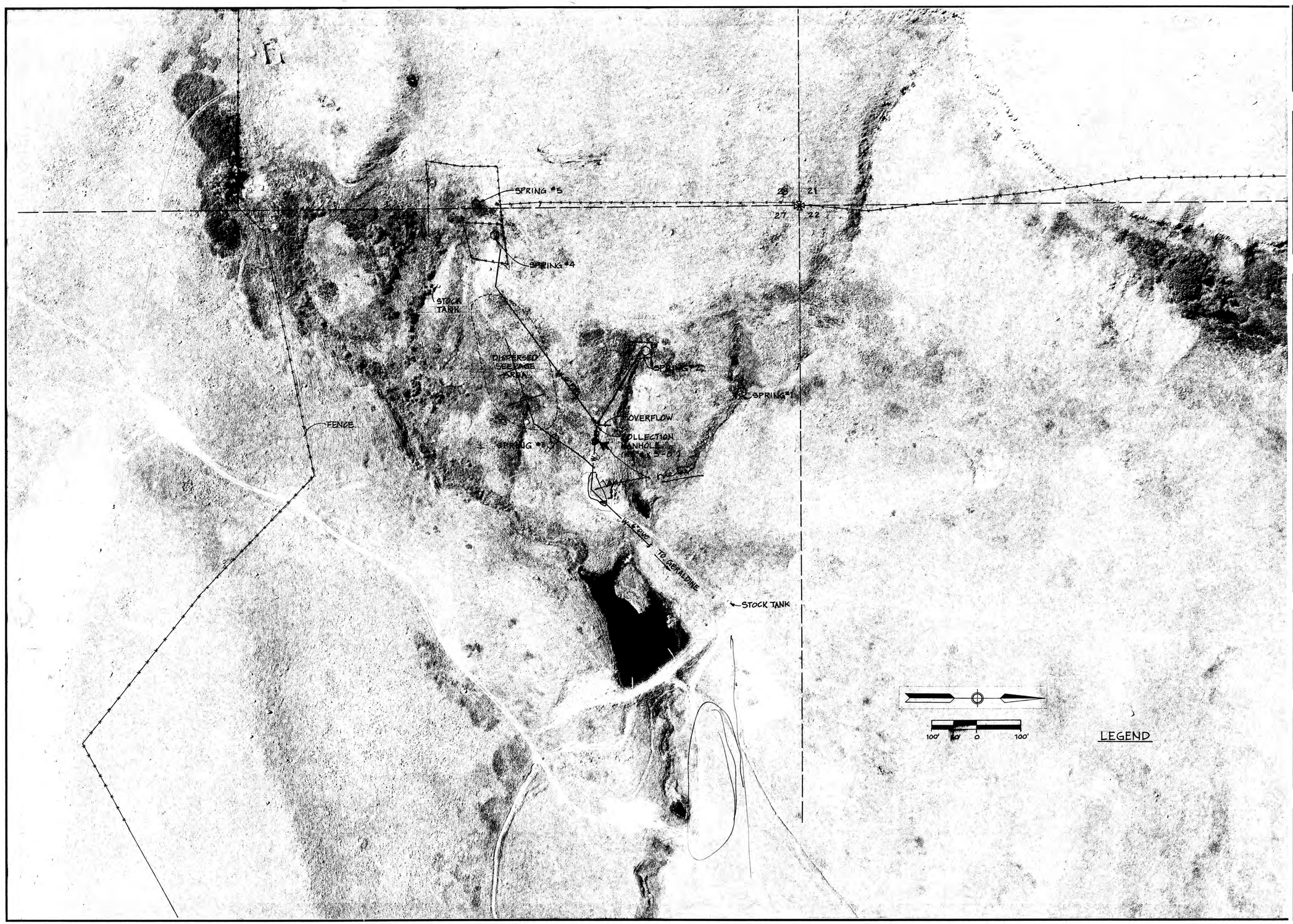
WATER DEVELOPMENT

CHLORINATOR

DESIGNED	GLK
DRAWN	DLA
CHECKED	GLK
SCALE	1"=2'
DATE	AUGUST, 1984

DELTA ENGINEERING
"Water Resource Specialists"
GREAT FALLS, MONTANA 59403

JOB NO. 13-84 | FILE NO. | SHEET 7 OF 7



Revisions	By	Date

File No.	Job No.
102.16	9718 9718-03
Date	Scale
11-11-97	AS SHOWN
Drawn	Approved
POINTER	NEIL
Designed	Checked
MEEKS	MCGILLIVRAY

Professional Seal

ENGINEERS
PLANNERS
DESIGNERS

NEIL CONSULTANTS, INC.
4509 North Star Boulevard
P.O. Box 6350
Great Falls, MT 59406
Phone 406-453-5478
Fax 406-453-2009
Email: jneil@mcn.net

Owner
TOWN OF GERALDINE

Location
CHOTEAU COUNTY, MONTANA

Project Title
WATER AND WASTEWATER IMPROVEMENTS

Sheet Title
SPRING DEVELOPMENT SITE PLAN

Sheet	Of
3	

File # 102.16

7.5 MINUTE SERIES (TOPOGRAPHIC)

GEOLOGICAL SURVEY

HAWARDEN WUA TAP

MEISSNER RANCH TAP

EXISTING CHLORINATION STATION

SPRING SOURCE

---------- EXISTING WATER TRANSMISSION LINE

Revisions	By	Date

File No.	Job No.
102.16	9718 9718_USGS
Date	**Scale**
9-22-99	AS SHOWN
Drawn	**Approved**
POINTER	NEIL
Designed	**Checked**
MEEKS	MCGILLIVRAY

Professional Seal

ENGINEERS

PLANNERS

DESIGNERS

NEIL CONSULTANTS, INC.

4509 North Star Boulevard
P.O. Box 6350
Great Falls, MT 59406
Phone 406-453-5478
Fax 406-453-2009
Email: jneil@mcn.net

Owner
TOWN OF GERALDINE

Location
CHOUTEAU COUNTY, MONTANA

Project Title
WATER SYSTEM MASTER PLAN

SPRING ST.

PATTERSON ST.

FRIELDS ST.

BREWSTER

WILSON AVE.

BRADY AVE.

BROADWAY

COLLINS AVE.

WINCHELL AVE.

MAIN ST.

BAUDUS ST.

TO STORAGE TANK SEE SHEETS 165

TO REMAIN IN SERVICE

3" Gate Valve

8" Gate Valve

Post office sprinkler system not metered

Water Main lowered in this area for Sewer

DETAIL "B"

DETAIL "C"

ELEVATOR

EXISTING

THIS CONTRACT

NEW 6" WATER MAIN

INDICATES SEWER CROSSING. NEW SEWER LINE WITH 10' C.A.R. EACH S

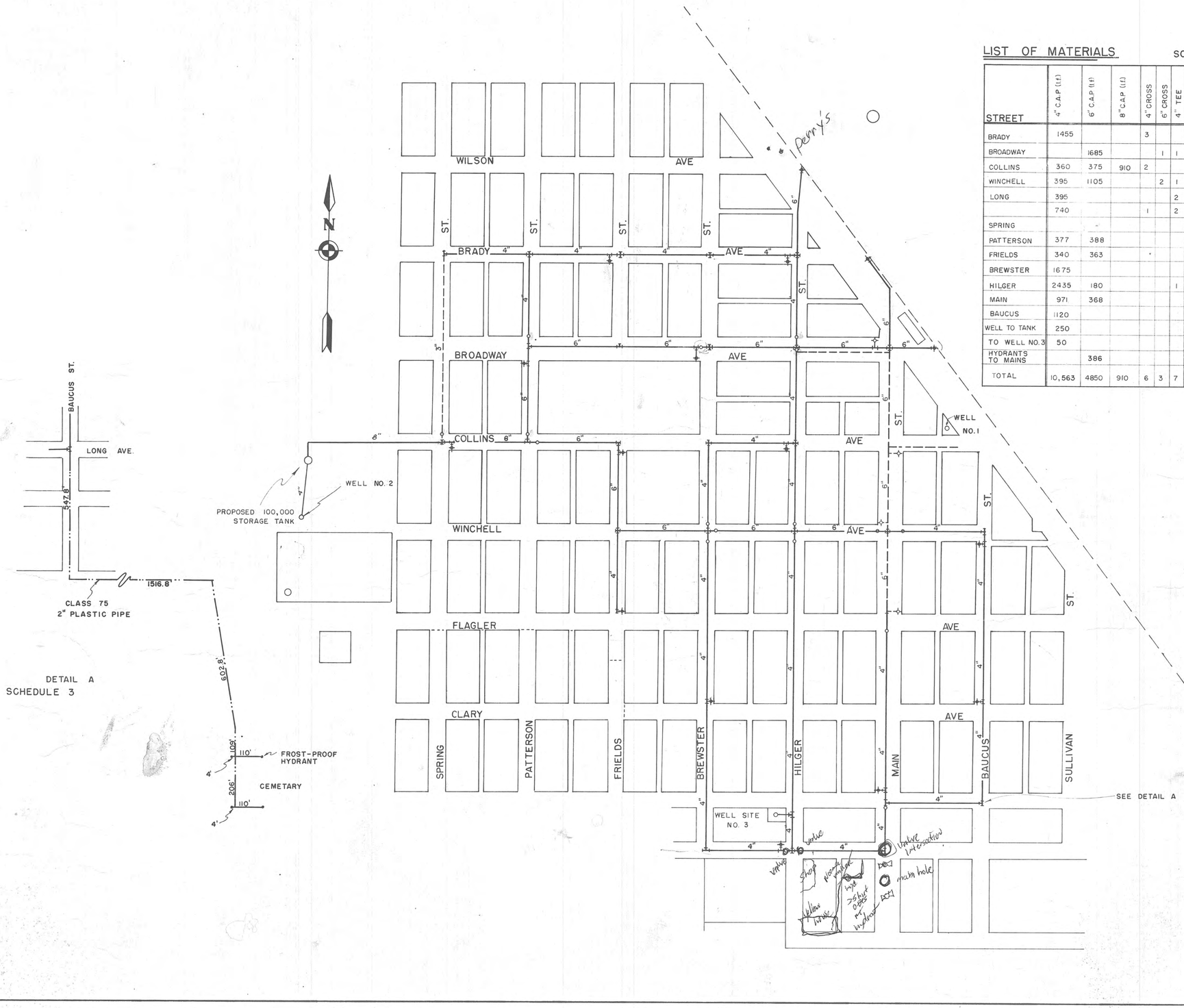
DETAIL PLAN

WINCHELL AVE.
FLAGLER AVE.
CLARY AVE.
LONG AVE.
SPRING
PATTERSON ST.
FRIELDS ST.
BREWSTER
HILGER ST.
MAIN ST.
BACKUS ST.
LEGEND
THIS CONTRACT
EXISTING
WATER MAIN
WOOD
CAP
MISC
SEWER
TEE
CROSS
VALVE
HYDRANT
CONCRETE WALK
CONCRETE CURB
NOTE: INDICATES SEWER CROSSING. REPLACE SEWER LINE WITH CAP 10' EACH SIDE of WATER MAIN.
1105 INDICATES LOCATION OF 3/4" CORPORATION COCKS ON NEW MAIN.
EXISTING 6" TRANSITE
CONNECTION
DETAIL "D"
WELL SITE NO. 3
8" Main C-900 (2003)
fire hyd
curbstop
1¼ poly
1¼ curb stop
Shuts off other hangers
2" poly
No measurement but Corp. Cock in line
12' From Curb
WATER DISTRIBUT
DETAIL P

LIST OF MATERIALS

SCHEDULES 1 & 2

STREET	4" C.A.P (l.f)	6" C.A.P (l.f)	8" C.A.P (l.f)	4" CROSS	6" CROSS	4" TEE	6" "	8" CROSS	3"x3"x4" TEE	4"x4"x6" TEE	6"x6"x4" "	8" ELBOW	6"x4" REDUC	3" VALVE	4" "	6" "	8" "	3/4 CORP COCK	6"x6"x4" CROSS	8"x8"x6" TEE	HYDRANT	8"x6" REDUCER	3" PLUG	4" PLUG	6" PLUG	8" PLUG	CROSSWALK 8" CI PIPE	SEWER CROSSING 8" CI	CONNECTION
BRADY	1455			3					-	2			1					6	1		2		-	6					
BROADWAY		1685			1	1	3				2		1		1	1		15	2		2			3				2	
COLLINS	360	375	910	2			-	1		1				-		1		1		2	2	-		2	1			1	1
WINCHELL	395	1105			2	1						2		1	2			2	2					1	1	1		1	
LONG	395					2												4						1					
	740			1		2				1					1			6			1			3					
SPRING																													
PATTERSON	377	388					1								1	1		7			1								
FRIELDS	340	363					1			1								4			2			1					
BREWSTER	1675									1					2			18			1							1	
HILGER	2435	180				1									3			30			1			1				1	
MAIN	971	368								1			1		2			9			1							3	
BAUCUS	1120									2								6			2								
WELL TO TANK	250																												
TO WELL NO. 3	50																												
HYDRANTS TO MAINS		386																											
TOTAL	10,563	4850	910	6	3	7	6	1	1	9	2	1	5	1	11	5	1	108	5	2	15	1	1	18	2	1	270	9	1



LEGEND

- WATER MAIN, THIS CONTRACT
- VALVE, " "
- TEE, " "
- CROSS, " "
- WATER MAIN, EXISTING
- FIRE HYDRANT, THIS CONTRACT
- " " EXISTING

WATER DISTRIBUTION SYSTEM

GENERAL PLAN

GERALDINE, MONTANA

WENZEL & COMPANY - CONSULTING ENGINEERS
GREAT FALLS, MONTANA

DESIGNED: A.T.J.	APPROVED: WENZEL & COMPANY
DRAWN: GLS RPB	
CHECKED:	
SCALE: 1" = 200'	
DATE: JULY 8, 1959	DWG. NO. 58-57 SHEET OF

SPRING ST.
PATTERSON ST.
FRIELDS ST.
BREWSTER ST.
HILGER ST.
MAIN ST.
BAUCUS ST.
WILSON AVE.
BRADY AVE.
BROADWAY
COLLINS AVE.
WINCHELL AVE.
BULK PLANT
BULK PLANT
BULK PLANT
ELEVATOR
ELEVATOR
ELEVATOR
ELEVATOR
DEPOT
ST. P. & P. R. R.
PLUG 3" LINE
TO REMAIN IN SERVICE
4" TO REMAIN IN SERVICE
6" TO REMAIN IN SERVICE
DETAIL "B"
DETAIL "C"
EXISTING TRANSITE
THIS CONTRACT
NEW 4" THIS CONTRACT
NEW 6" THIS CONTRACT
6" T THIS CONTR
DETAIL B
DETAIL C
LEGEND
THIS CONTRACT
EXISTING
WATER MAIN
WOOD
C.A.P.
MISC.
SEWER
TEE
CROSS
VALVE
HYDRANT
CONCRETE WALK
CONCRETE CURB
NOTE: —S— INDICATES SEWER CROSSING. REPLACE SEWER LINE WITH 10' C.A.P. EACH SIDE.

WATER DISTRIBUTION SYSTEM

DETAIL PLAN I

GERALDINE, MONTANA

WENZEL & COMPANY - CONSULTING ENGINEE[RS]
GREAT FALLS, MONTANA

DESIGNED: A.T.J R.B.
DRAWN: GLS RPB
CHECKED: R.J.
SCALE: 1" = 100'
DATE: JULY 8, 1959

APPROVED: WENZEL & CO

DWG. NO. 58 – 57 | SHEET

N

WINCHELL AVE.

SPRING

FLAGLER AVE.

DETAIL "D"

CLARY AVE.

PATTERSON ST.

FRIELDS ST.

LONG AVE.

WELL SITE NO. 3

BREWSTER

HILGER ST.

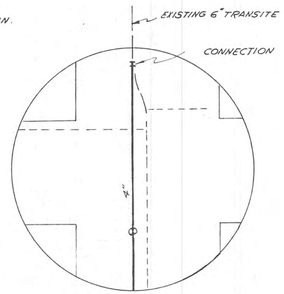
MAIN ST.

BAUCUS ST.

LEGEND

THIS CONTRACT		EXISTING
	WATER MAIN	
	WOOD	
	CAP	
	MISC.	
	SEWER	S
	TEE	
	CROSS	
	VALVE	
	HYDRANT	
	CONCRETE WALK	
	CONCRETE CURB	

NOTE: —S— INDICATES SEWER CROSSING. REPLACE SEWER LINE WITH C.A.P. 10' EACH SIDE of WATER MAIN.



DETAIL "D"

WATER DISTRIBUTION SYSTEM

DETAIL PLAN 2

GERALDINE, MONTANA

WENZEL & COMPANY — CONSULTING ENGINEERS
GREAT FALLS, MONTANA

DESIGNED: A.T.J
DRAWN: GLS RPB
CHECKED: A.T.J.
SCALE: 1" = 100'
DATE: JULY 8, 1959

APPROVED:
WENZEL & COMPANY

DWG. NO. 58—57

SHEET 3 OF 5

WINCHELL AVE.

SPRING

FLAGLER AVE.

CLARY AVE.

PATTERSON ST.

FRIELDS ST.

LONG AVE.

BREWSTER

HILGER ST.

MAIN ST.

BAUCUS ST.

WELL SITE NO. 3

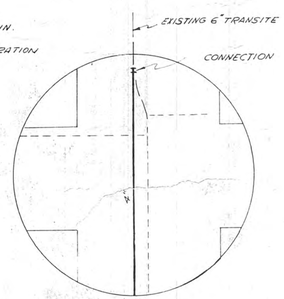
DETAIL "D".

LEGEND

THIS CONTRACT	EXISTING
WATER MAIN	
WOOD	
CAP	
MISC.	
SEWER	S
TEE	
GROSS	
VALVE	
HYDRANT	
CONCRETE WALK	
CONCRETE CURB	

NOTE: —S— INDICATES SEWER CROSSING. REPLACE SEWER LINE WITH CAP 10' EACH SIDE of WATER MAIN.

1115 ····1105 INDICATES LOCATION OF ¾" CORPORATION COCKS ON NEW MAIN.



DETAIL "D"

"AS BUILT"

WATER DISTRIBUTION SYSTEM
DETAIL PLAN 2
GERALDINE, MONTANA

WENZEL & COMPANY - CONSULTING ENGINEERS
GREAT FALLS, MONTANA

DESIGNED: A.T.J. E.B.	APPROVED:
DRAWN: SLS RPB	
CHECKED: [illegible]	
SCALE: 1" = 100'	
DATE: JULY 8, 1969	DAG

SPRING ST.

PATTERSON ST.

FRIELDS ST.

BREWSTER ST.

WILSON AVE.

BRADY AVE.

BROADWAY

COLLINS AVE.

WINCHELL AVE.

HILGER ST.

MAIN ST.

BAUCUS ST.

TAHKUCH

BULK PLANT

BULK PLANT

BULK PLANT

ELEVATOR

ELEVATOR

ELEVATOR

DEPOT

GARAGE

DETAIL B

DETAIL "B"

DETAIL "C"

TO STORAGE TANK
2 SEE SHEETS 1 & 5

TO REMAIN IN SERVICE

THIS CONTRACT

EXISTING

NEW 4" THIS CONTR

LEGEND

WATER MAIN
WOOD
CI
MISC
SEWER
TEES
CROSS
VALVE
HYDRANT
LOCATION MARK
CONCRETE CURB

INDICATES SEWER L

INDICATES LOCATIC COCKS ON MAIN M

APPROX. MAIN

OF ¾" CORPORATION

DIRECTION & STATIONING

AS BUILT

WATER DISTRIBUTION SYSTEM

DETAIL PLAN I

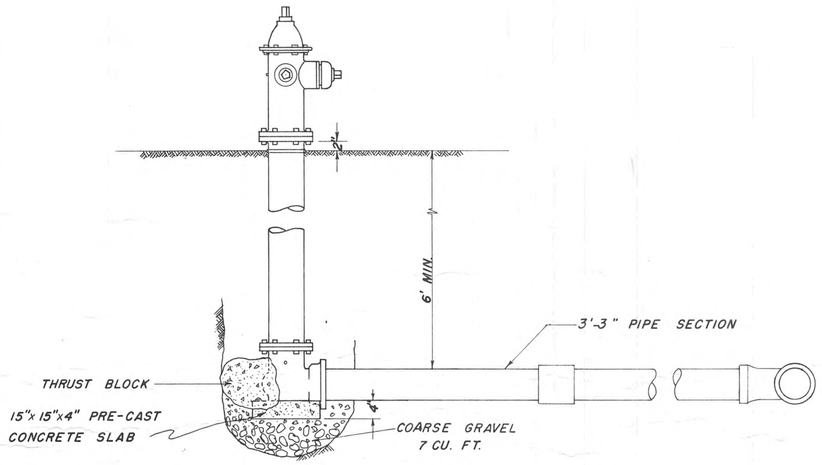
GERALDINE, MONTANA

WENZEL & COMPANY - CONSULTING ENGINEERS
GREAT FALLS, MONTANA

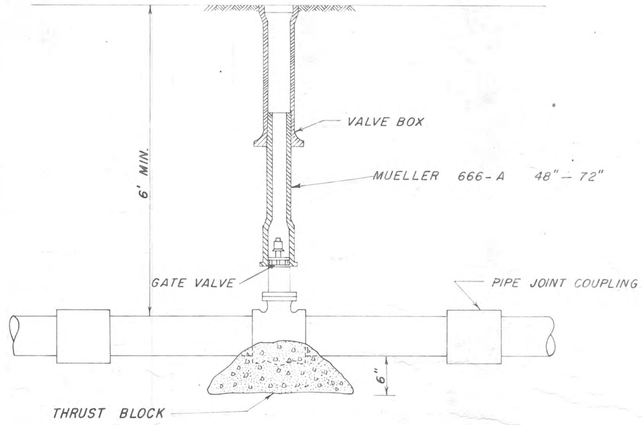
APPROVED:
WENZEL & COM

DWG NO 58-57

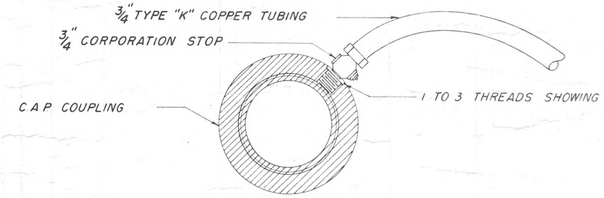
SHEET 3



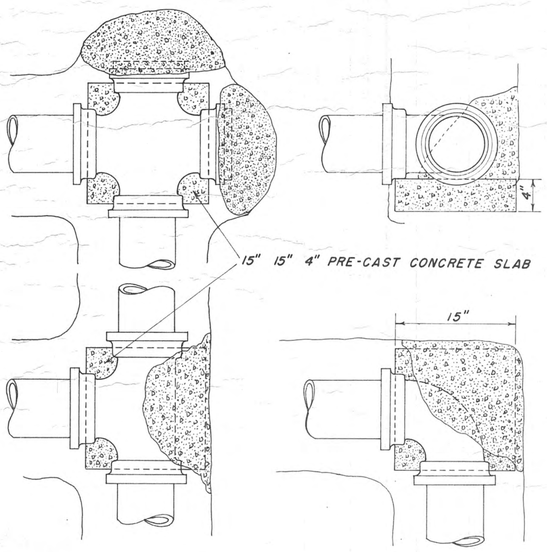
FIRE HYDRANT INSTALLATION DETAIL



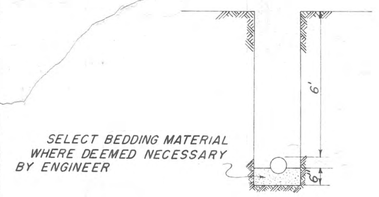
GATE VALVE SETTING DETAIL



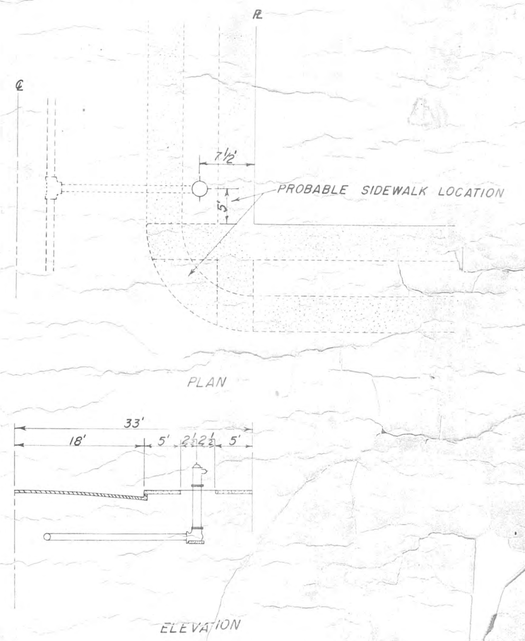
CEMENT ASBESTOS PIPE HEAVY TAPPED COUPLING



THRUST BLOCKS



TYPICAL TRENCH



TYPICAL FIRE HYDRANT LOCATION

AS BUILT

WATER DISTRIBUTION SYSTEM

CONSTRUCTION DETAILS

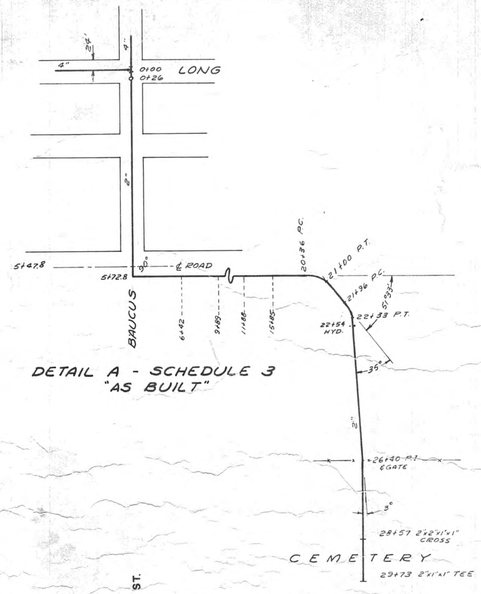
GERALDINE, MONTANA

WENZEL & COMPANY – CONSULTING ENGINEERS

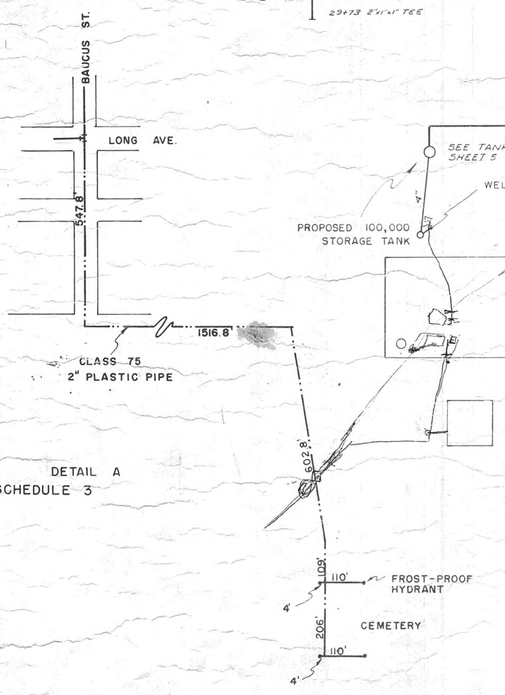
GREAT FALLS, MONTANA

APPROVED

BUTTE MONTANA



DETAIL A - SCHEDULE 3
"AS BUILT"



DETAIL A
SCHEDULE 3

LIST OF MATERIALS

SCHEDULES 1 & 2

STREET	4" CAP (Lf)	6" CAP (Lf)	8" CAP (Lf)	4" CROSS	6" CROSS	4" TEE	6" TEE	8" CROSS	3"x3"x4" TEE	4"x4"x6" TEE	6"x6"x4" REDUC	8" ELBOW	6"x4" REDUC	3" VALVE	4" "	6" "	8" "	3/4" CURB QUICK	6"x6"x4" CROSS	8"x8"x6" TEE	HYDRANT	8"x6" REDUCER	3" PLUG	4" PLUG	6" PLUG	8" PLUG	6" SEWER CROSSING	8"x8"x4" CONNECTION
BRADY	1455			3					2									6	1		2		1	6				
BROADWAY		1685			1	1	3			2					1	1		15	2		2			3				
COLLINS	360	375	910	2		3								1		1		1		2	2	1		2	1		2	
WINCHELL	395	1105			2	1							2		1	2		2	2					1				1
LONG	395					2												4						1				
	740				1	2									1			6			1			3				
SPRING																												
PATTERSON	377	388													1	1		7			1							
FRIELDS	340	363				1												4			2			1				
BREWSTER	1675														2			18			1							
HILGER	2435	180				1								3				30			1			1				
MAIN	971	368							1				1	2				9			1							
BAUCUS	120									2								6			2							
WELL TO TANK	250																											
TO WELL NO. 3	50																											
HYDRANTS TO MAINS		386																										
TOTAL	10,563	4850	910	6	3	7	6	1	1	3	2	1	5	1	11	5	1	108	5	2	15	1	1	18	1	2	1	1

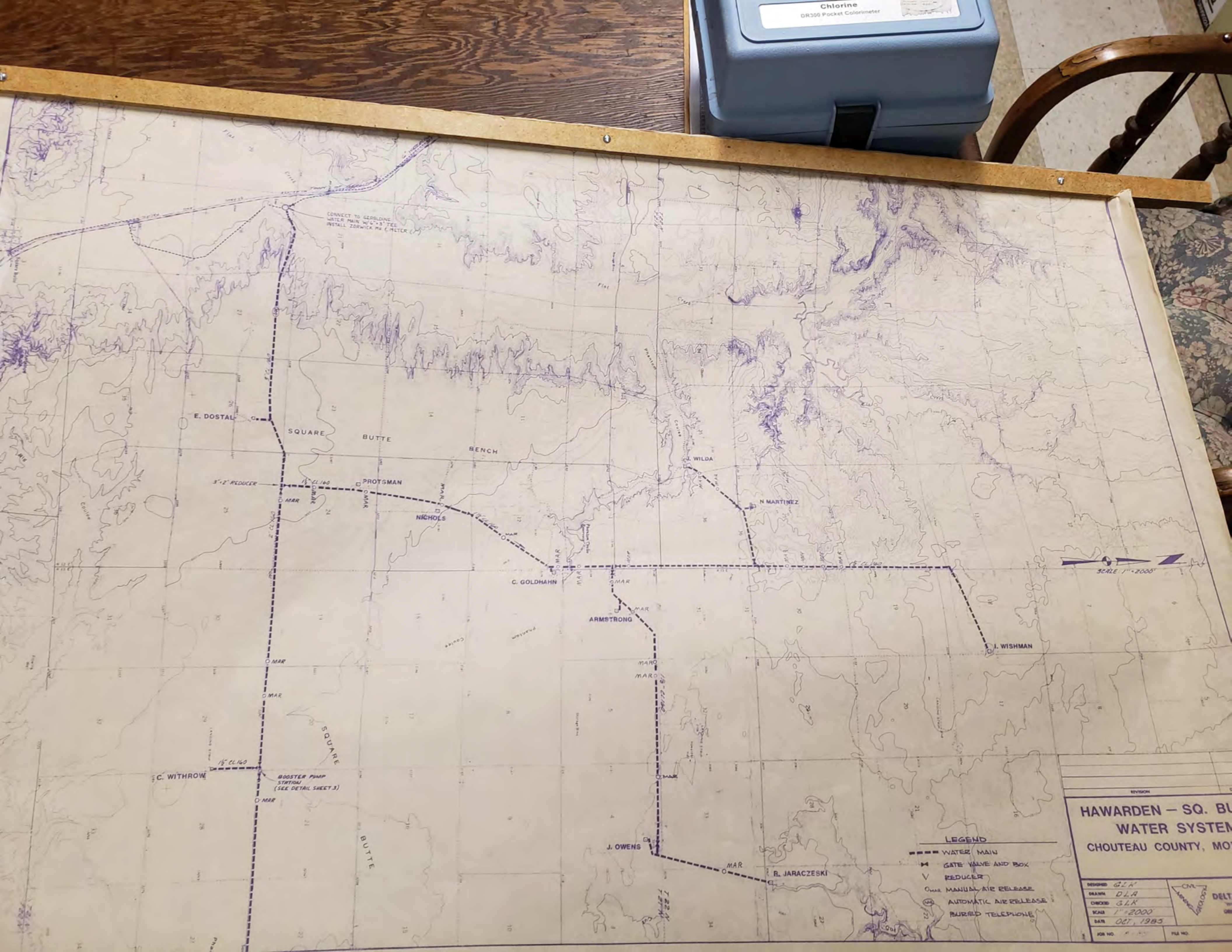
LEGEND

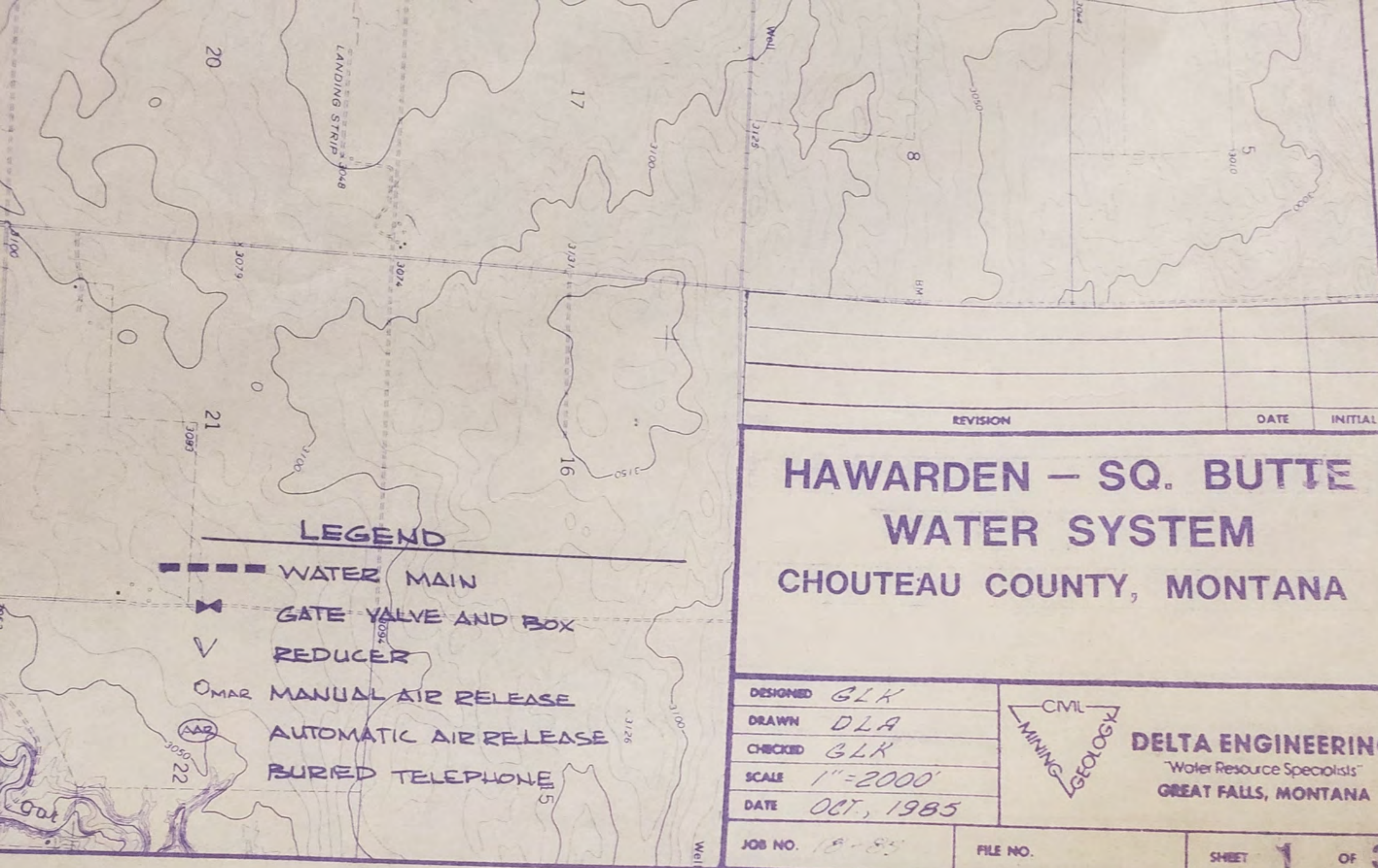
WATER MAIN, THIS CONTRACT
VALVE, " "
TEE, " "
CROSS, " "
WATER MAIN, EXISTING
FIRE HYDRANT, THIS CONTRACT
" EXISTING

AS BUILT

WATER DISTRIBUTION
GENERAL
GERALDINE,
WENZEL & COMPANY
GREAT FA

DESIGNED A.T.J. CB AP
DRAWN G.L. RPB
CHECKED AP
SCALE
DATE


Chlorine
DR300 Pocket Colorimeter
CONNECT TO GERALDINE WATER MAIN W/6"×3" TEE
INSTALL ZORWICK M& E METER
E. DOSTAL
SQUARE
BUTTE
BENCH
3"×2" REDUCER
PROTSMAN
NICHOLS
J. WILDA
N MARTINEZ
C. GOLDHAHN
ARMSTRONG
J. WISHMAN
SCALE: 1" = 2000'
C. WITHROW
BOOSTER PUMP STATION (SEE DETAIL SHEET 3)
SQUARE
BUTTE
J. OWENS
R. JARACZESKI
MAR
LEGEND
WATER MAIN
GATE VALVE AND BOX
REDUCER
MANUAL AIR RELEASE
AUTOMATIC AIR RELEASE
BURIED TELEPHONE
REVISION
HAWARDEN – SQ. BU
WATER SYSTEM
CHOUTEAU COUNTY, MO
DESIGNED GLK
DRAWN DLA
CHECKED GLK
SCALE 1" = 2000'
DATE OCT, 1985
JOB NO.
FILE NO.



REVISION	DATE	INITIAL

HAWARDEN – SQ. BUTTE WATER SYSTEM

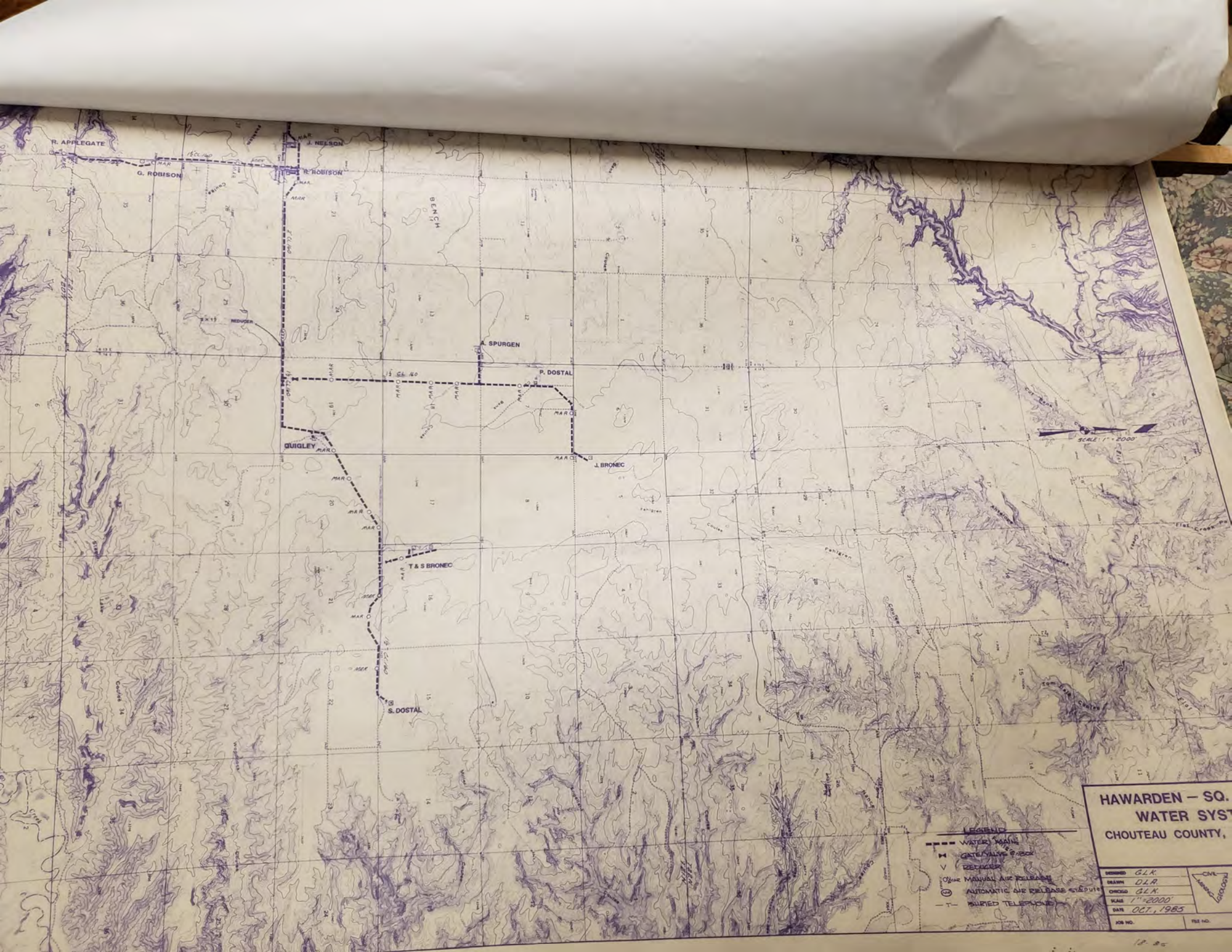
CHOUTEAU COUNTY, MONTANA

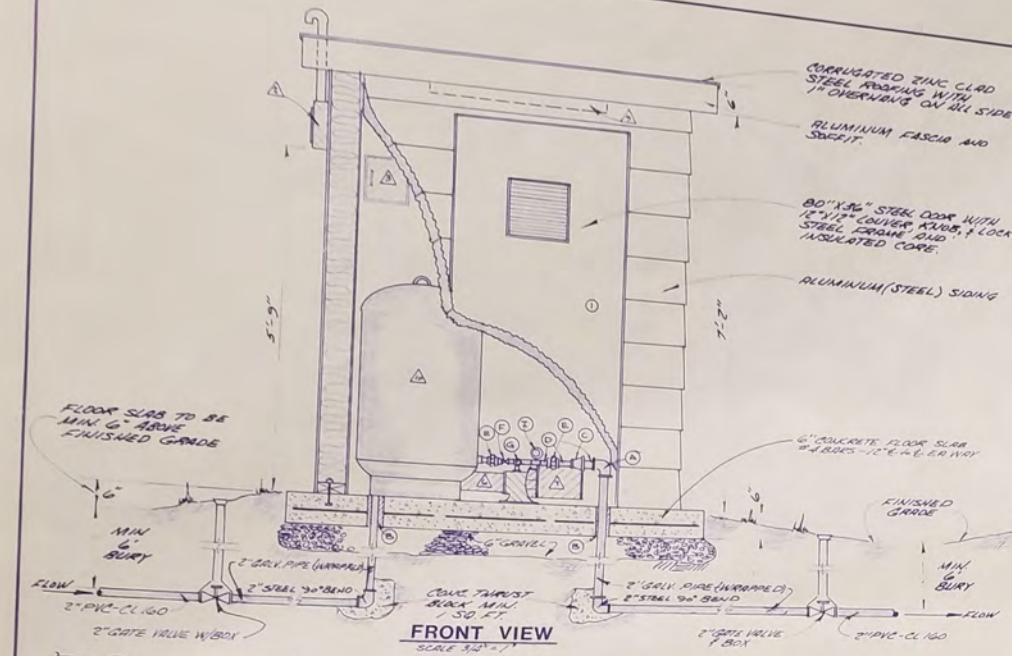
DESIGNED	GLK
DRAWN	DLA
CHECKED	GLK
SCALE	1" = 2000'
DATE	OCT. 1985

CIVIL – MINING – GEOLOGY

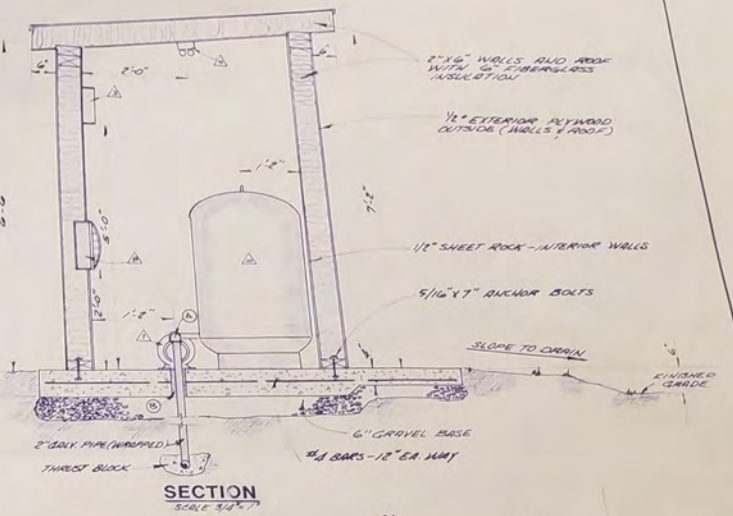
DELTA ENGINEERING
"Water Resource Specialists"
GREAT FALLS, MONTANA

JOB NO. 18-85 | FILE NO. | SHEET 1 OF 3

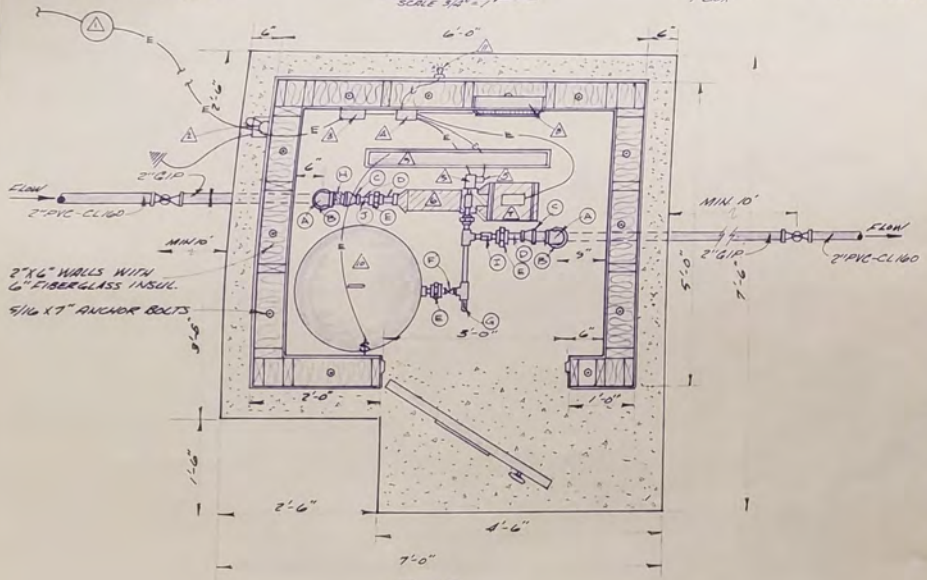

R. APPLEGATE
G. ROBISON
J. NELSON
R. ROBISON
BENCH
A. SPURGEN
P. DOSTAL
QUIGLEY
J. BRONEC
T & S BRONEC
S. DOSTAL
REDUCER
SCALE 1" = 2000'
LEGEND
WATER MAIN
GATE VALVE & BOX
REDUCER
MANUAL AIR RELEASE
AUTOMATIC AIR RELEASE STATION
BURIED TELEPHONE
HAWARDEN – SQ.
WATER SYST
CHOUTEAU COUNTY,
DESIGNED G.L.K.
DRAWN D.L.R.
CHECKED G.L.K.
SCALE 1"=2000'
DATE OCT., 1985
JOB NO.
FILE NO.



FRONT VIEW
SCALE 3/4" = 1'



SECTION
SCALE 3/4" = 1'

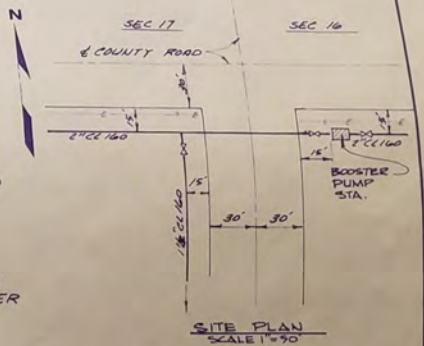


PLAN
SCALE 3/4" = 1'

ELECTRICAL SCHEDULE

- (A) POWER & TRANSFORMER - BY POWER COMPANY
- (B) LEAD, WEATHERHEAD, METER SOCKET, GROUND
- (C) BREAKER PANEL (120V/240V)
- (D) MAGNETIC STARTER
- (E) PRESSURE SWITCH - ON AT 120 PSI; OFF AT 140 PSI
- (F) JACUZZI PUMP SERIES H4 - MOD. NO. 1H4B1B-S (1 HP)
- (G) PUMP MOTOR 115-230 VOLT, SINGLE PHASE, 60 CYCLE
- (H) 1.75 KW 240V FORCED AIR WALL HEATER
- (I) 48" FLUORESCENT LIGHT - 2-40 WATT LAMPS
- (J) WELL X-TROL WX 404 PRESSURE TANK (120-140 PSI)
- (K) LOW PSI. RED WARNING LIGHT W/ PROTECTIVE COVER

PLEASE NOTE:
1. ALL ELECTRICAL TO BE U.L. APPROVED
2. UNDERGROUND CONDUIT FROM SERVICE POLE MAY BE USED IN LIEU OF WEATHERHEAD



SITE PLAN
SCALE 1" = 30'

MECHANICAL SCHEDULE

- (A) 2" GALV. 90° BEND
- (B) 3" GALV. FLOOR SLEEVE
- (C) 2"X1 1/4" GALV. REDUCER
- (D) NIPPLES - AS REQ'D
- (E) UNIONS - AS REQ'D
- (F) 1" GATE VALVE
- (G) 1"-160 PSI PRESS. RELEASE VALVE
- (H) COMPOUND GAGE (0-200 PSI)
- (I) PRESSURE GAGE (0-200 PSI)
- (J) 1 1/4" CHECK VALVE (INST. BEFORE PUMP)

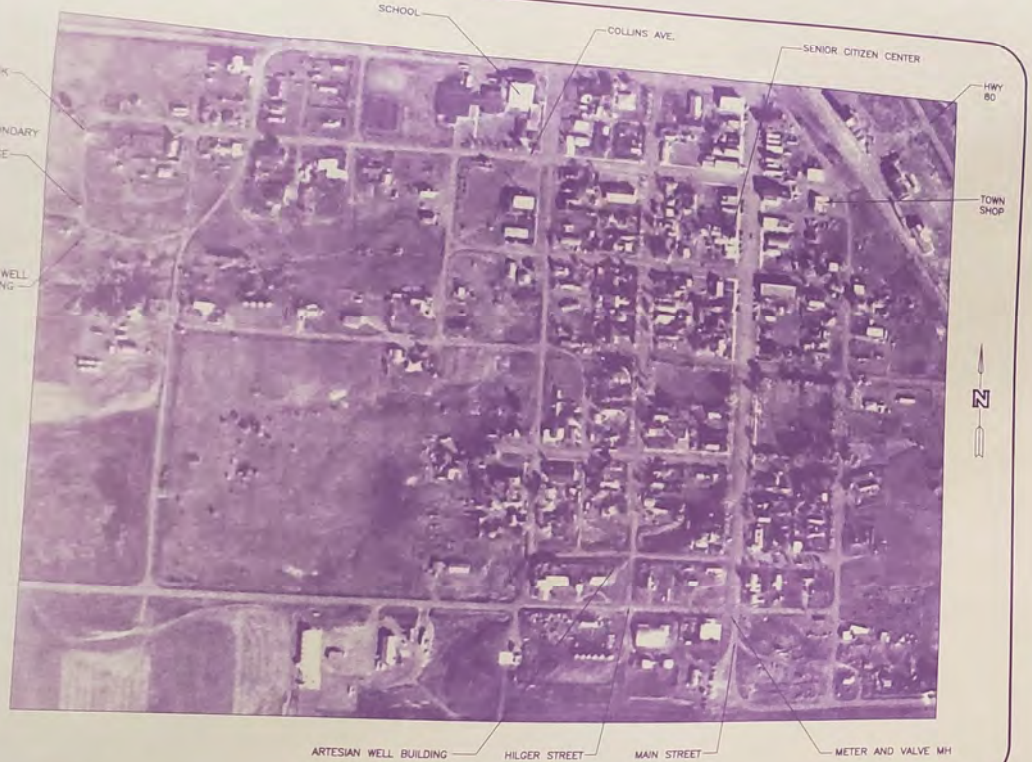
HAWARDEN SQ. BUTTE WATER INC.
CHOUTEAU COUNTY, MT

BOOSTER PUMP STATION

DESIGNED	G.L.K.	DELTA ENGINEERING	JOB NO.
DRAWN	G.L.K.		INV. NO.
CHECKED			SHT 3
DATE	10-85		OF 3


NORTH GERALDINE
WATER SYSTEM
CHOUTEAU COUNTY, MONTA
LEGEND
WATER MAIN
GATE VALVE & BOX
REDUCER
MANUAL AIR RELEASE
BURIED TELEPHONE
SCALE 1"=2000'
FAIRBANKS
REED
W. WOODBURN
K. ENGELLANT
M. BUCK
E. ANDERSON
B. ANDERSON
C. APPLE
H. GOLDMANN
C. STOOS
L. KNEDLER
R. VANVOAST
L. GOLDMANN
H. GOLDMANN & J.F. ENGELLANT SERVICE TAP
L. KNEDLER'S SERVICE TAP
DESIGNED C.L.K.
DRAWN D.L.R.
CHECKED C.L.K.
SCALE AS SHOWN
DELTA ENGIN

GERALDINE WATER SYSTEM IMPROVEMENTS



CONSTRUCTION NOTES:

1. METER PIT INSTALLATIONS SHALL PROCEED AS FOLLOWS: THE SERVICE SHALL BE LOCATED AND STAKED BY TOWN PERSONNEL. THE CONTRACTOR SHALL EXCAVATE AT THE STAKED LOCATION TO A DEPTH OF 8 FEET, AT THE CONTRACTORS EXPENSE, TO VERIFY THE SERVICE SIZE AND MATERIALS AND COMPLETE THE INSTALLATION. IF THE SERVICE IS NOT UNCOVERED, TOWN PERSONNEL SHALL BE CONTACTED TO RELOCATE THE SERVICE. THE SECOND EXCAVATION WILL BE PAID FOR AS EXPLORATORY EXCAVATION. THE OWNER OR OWNER'S REPRESENTATIVE WILL SECURE PERMISSION FROM THE HOMEOWNER PRIOR TO CONTRACTOR'S PERFORMING ANY WORK ON PRIVATE PROPERTY. METER PIT SURFACE RESTORATION, EXCEPT SOD AND CONCRETE REPLACEMENT, IS INCIDENTAL TO THE ITEM (INCLUDING GRAVEL REPLACEMENT IN DRIVEWAYS, IF NECESSARY).

2. CURB STOP AND BOX INSTALLATIONS OR REPLACEMENTS SHALL PROCEED AS FOLLOWS: THE CONTRACTOR SHALL EXCAVATE THE EXISTING SERVICE LINE/CURB STOP. SERVICE WITHOUT AN EXISTING CURB STOP AND BOX SHALL HAVE ONE INSTALLED PRIOR TO THE PIT OR MOUNTING ASSEMBLY INSTALLATION AS DIRECTED BY THE ENGINEER. NONFUNCTIONAL CURB STOPS ON SERVICE LINES SHALL BE REPLACED AS DIRECTED BY THE ENGINEER.

3. THE CONTRACTOR SHALL RETURN ALL CONSTRUCTION AREAS TO PRECONSTRUCTION CONDITIONS OR BETTER.

4. ALL EXCAVATIONS LEFT OPEN OVERNIGHT SHALL BE PROTECTED BY CONTINUOUS FENCING AND FLASHING BARRICADES. ACCESS TO LOCAL RESIDENCES SHALL BE MAINTAINED AT ALL TIMES.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING PRIVATE PROPANE AND HEATING OIL LINES. THE TOWN OF GERALDINE IS NOT SERVED BY NATURAL GAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO PROPANE, LP GAS, OR OIL LINES CAUSED BY THE CONTRACTOR ACTIVITIES.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL EXCESS MATERIALS GENERATED ON THE PROJECT. ALL EXCESS MATERIALS SHALL BE DISPOSED OF IN A LEGAL MANNER.

7. SITE STAKING FOR METER INSTALLATIONS AND CURB STOP REPLACEMENTS ARE AS FOLLOW:

A. EXISTING OPERATIONAL CURB STOP	– PURPLE
B. METER PIT INSTALLATION	– WHITE
C. REPLACEMENT CURB STOP INSTALLATION	– ORANGE
D. NEW CURB STOP INSTALLATION	– RED

8. THE AS-BUILT INSTALLATION QUANTITIES ARE AS FOLLOW:
- TOTAL METER PITS = 58
- TOTAL WATER METERS W/ MOUNTS = 106
- TOTAL CURBSTOPS AND/OR BOXES = 65

AS-BUILT

GENERAL NOTES:

1. ALL SITE WORK SHALL MEET OR EXCEED THE MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS. ALL OTHER WORK SHALL BE IN CONFORMANCE WITH STATE AND LOCAL CODES AS REFERENCED.

2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY PERTINENT UTILITY LOCATIONS AND ELEVATIONS, ESPECIALLY AT CONNECTION POINTS, AND AT POTENTIAL UTILITY CONFLICTS. CALL MISS ONE-CALL CENTER AT 1-800-424-5555 FOR LOCATES.

3. THE CONTRACTOR SHALL COORDINATE AND COOPERATE WITH ALL UTILITY COMPANIES INVOLVED AND THE TOWN OF GERALDINE WITH REGARD TO RELOCATIONS OR ADJUSTMENTS OF EXISTING UTILITIES DURING CONSTRUCTION TO ASSURE THAT THE WORK IS ACCOMPLISHED IN A TIMELY FASHION AND WITH A MINIMUM DISRUPTION OF SERVICE.

4. THE CONTRACTOR SHALL NOTIFY THE MAYOR OF GERALDINE, DELTA ENGINEERING AND THE UTILITY COMPANIES FORTY-EIGHT (48) HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION. THE CONTRACTOR SHALL ALSO MAKE THE FOLLOWING NOTIFICATIONS:

A. NOTIFY ALL EMERGENCY SERVICES, THE TOWN OF GERALDINE AND THE MDT (IF APPLICABLE) OF STREET CLOSURES A MINIMUM OF 24 HRS IN ADVANCE OF CLOSURE. UPDATE STREET CLOSURE NOTIFICATIONS DAILY.

B. NOTIFY AFFECTED USERS (BY DOOR HANGER), THE TOWN OF GERALDINE AND EMERGENCY SERVICES OF SERVICE OUTAGES IN WRITING A MINIMUM OF 24 HOURS IN ADVANCE OF PLANNED OUTAGE. PROVIDE DETAILS SUCH AS PHONE NUMBER OF SUPERINTENDENT, DATE AND TIMES FOR OUTAGE.

5. THE CONTRACTOR SHALL OBTAIN ALL PERMITS FOR STREET CUTS, UTILITY INTERFERENCES AND TRAFFIC CONTROL. THE MAINLINE VALVES WILL BE OPERATED ONLY BY CITY PERSONNEL.

6. IF, DURING THE CONSTRUCTION PROCESS, CONDITIONS ARE ENCOUNTERED WHICH COULD INDICATE AN UNIDENTIFIED SITUATION IS PRESENT, THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY.

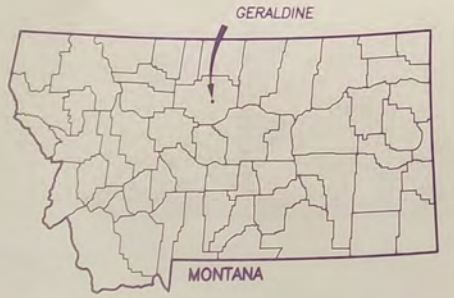
7. THE CONTRACTOR SHALL NOTIFY THE ENGINEER ONE WEEK PRIOR TO PERFORMING WORK ON PRIVATE PROPERTY. THE OWNER'S REPRESENTATIVE WILL THEN SECURE PERMISSION FROM THE PRIVATE PROPERTY OWNER.

8. THE MAXIMUM WATER SERVICE OUTAGE PERIOD SHALL NOT EXCEED 4 HOURS. TEMPORARY WATER SERVICE SHALL BE PROVIDED IF OUTAGE PERIOD WILL EXCEED 4 HOURS.

9. SEE BID SCHEDULE AND MEASUREMENT AND PAYMENT SECTIONS IN THE SPECIFICATIONS FOR THE DIVISION OF WORK RESPONSIBILITIES BETWEEN BID SCHEDULES.

SET Town of Geraldine
AS-BUILT

VICINITY MAP



NOTIFICATION TELEPHONE NUMBERS

EMERGENCY	**911**
DELTA ENGINEERING P.C. (OFFICE – PROJECT ENGINEER)	(406) 727-3687
TOWN OF GERALDINE (TOWN OFFICE)	(406) 737-4361
MAYOR (MONICA RICE)	(406) 737-4368
SHERIFF (NON EMERGENCY NUMBER)	(406) 622-5451
MONT. POWER CO.	(406) 567-2203
TELEPHONE COMPANY	(406) 622-3301
CABLE TV	(406) 737-4251

SHEET INDEX

prepared for:
TOWN OF GERALDINE, MT

AS-BUILT
DECEMBER 2002

prepared by:
DELTA ENGINEER
CONSULTING EN
GREAT FALLS, M
PHONE: 727-3

MINING GEOLOGY CIVIL

911	
(406) 727-3687	
(406) 737-4361	
(406) 737-4368	
(406) 622-5451	
(406) 567-2203	
(406) 622-3301	
(406) 737-4251	

SHEET INDEX

SHEET	DESCRIPTION
1	COVER SHEET
2	CHLORINATION FACILITY
3	MISCELLANEOUS DETAILS
4	SOLENOID VALVE AND SCADA DETAILS

AS-BUILT

AS-BUILT

DECEMBER 2002

MONTANA SHAWN ARTHUR NO. 17007 PE REGISTERED PROFESSIONAL ENGINEER

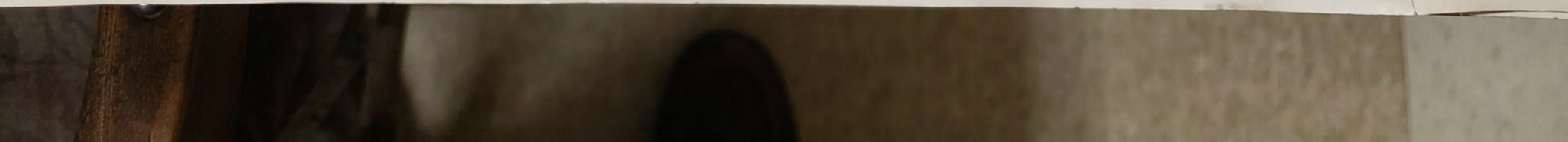
prepared for:

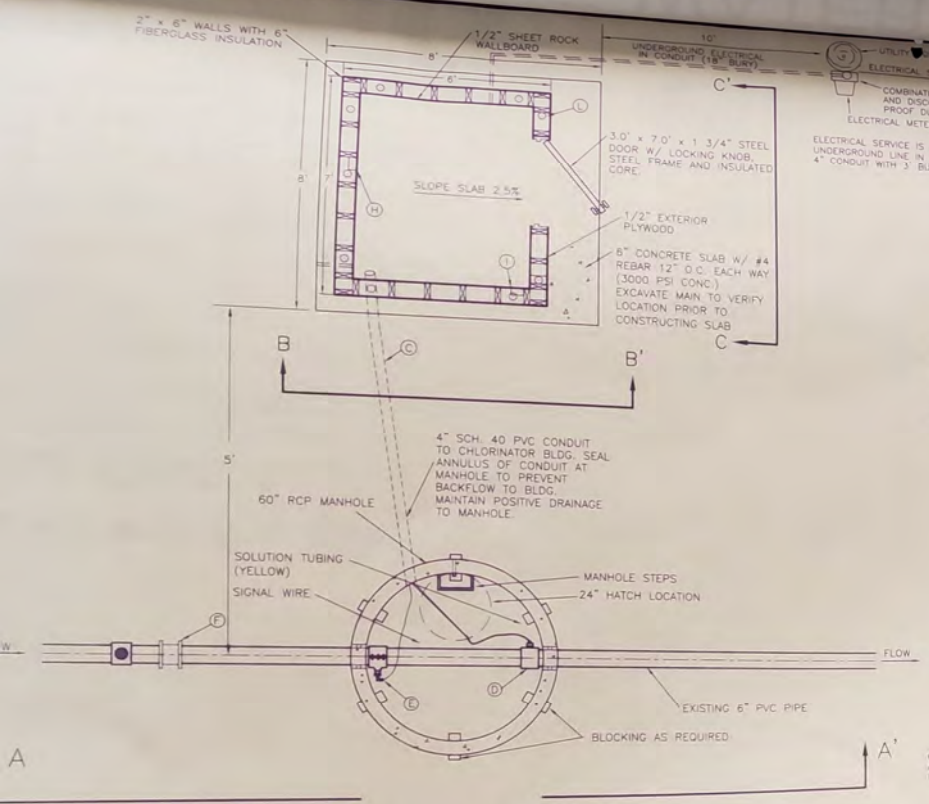
TOWN OF GERALDINE, MT

MINING GEOLOGY CIVIL

prepared by:

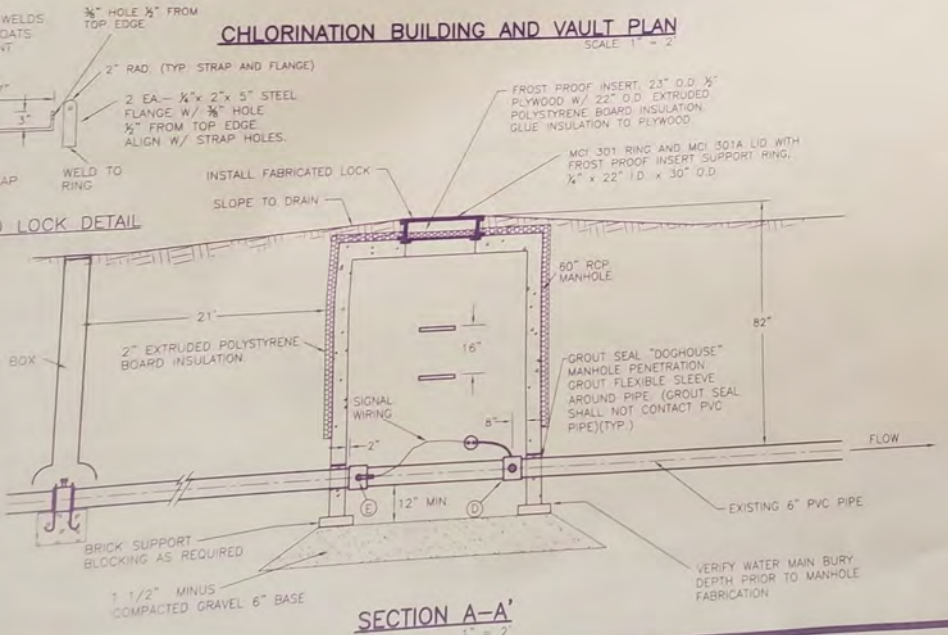
DELTA ENGINEERING P.C.
CONSULTING ENGINEERS
GREAT FALLS, MONTANA
PHONE: 727-3687





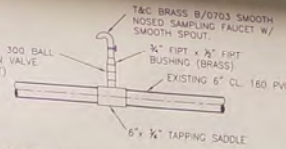
CHLORINATION BUILDING AND VAULT PLAN

SCALE: 1" = 2'



SECTION A-A'

1" = 2'



SMOOTH NOSED SAMPLING TAP

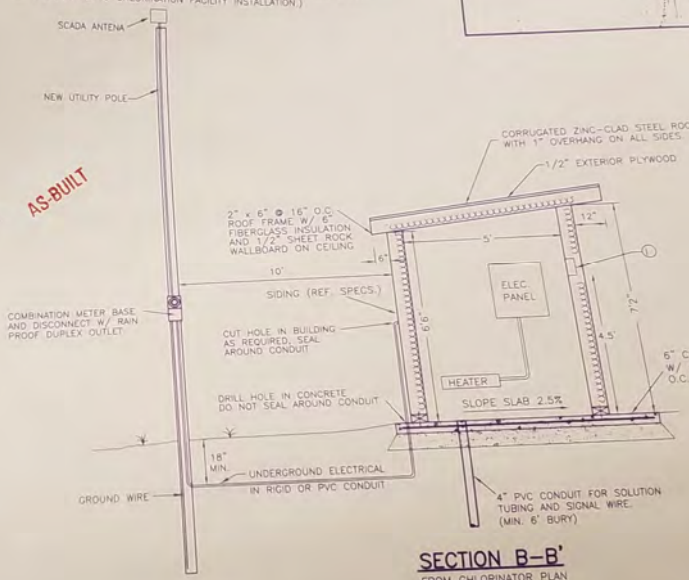
NO SCALE

CHLORINATOR NOTES:

1. INSTALL 3/4" SERVICE SADDLE AND SMOOTH NOSED SAMPLING TAP IN METER MANHOLE LOCATED 100' DOWNSTREAM OF CHLORINATION PIT. (INCIDENTAL TO CHLORINATION FACILITY INSTALLATION.)
2. INSTALL SMOOTH NOSED SAMPLING TAP IN PRESSURE REDUCER MANHOLE LOCATED AT ABANDONED CHLORINATOR FACILITY. SEE SHEET
3. (INCIDENTAL TO CHLORINATION FACILITY INSTALLATION.)

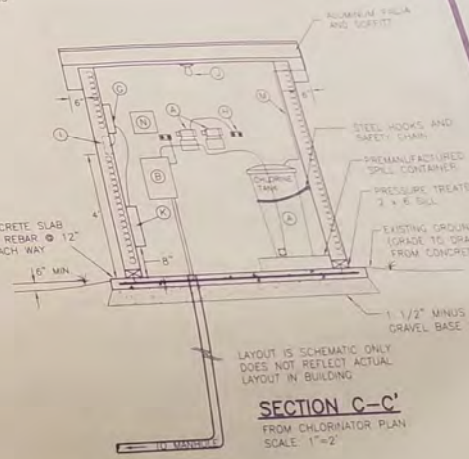
VICINITY MAP

AS-BUILT



SECTION B-B'

FROM CHLORINATOR PLAN
SCALE: 1"=2'



SECTION C-C'

FROM CHLORINATOR PLAN
SCALE: 1"=2'

PARTS LEGEND

- (A) LMI CHEMICAL FEED SYSTEM (2 REQ'D) WITH 50 GAL. TANK, WALL MOUNT BRACKETS (2 REQ'D), AND SUCTION LINE.
- (B) WALL MOUNTED ULTRASONIC FLOW METER – EASTECH–BADGER COMPU–SONIC 4500. INSTALL AND CALIBRATE PER MANUFACTURERS' INSTRUCTIONS.
- (C) 4" SCH. 40 PVC FOR SOLUTION TUBING AND SIGNAL CABLE.
- (D) 6"x 3/4" TAPPING SADDLE W/ MAIN CONNECTOR ASSEMBLY INCLUDING INJECTOR FITTING, BALL VALVE AND MAIN PROBE. (2 REQ'D; 1 INSTALLED, 1 RESERVE IN BUILDING)
- (E) EXTERNALLY MOUNTED FLOW SENSOR: EAST TECH–BADGER COMPU–SONIC 4500
- (G) ELECTRICAL PANEL BOARD (REF. SPECS.)
- (H) DUPLEX OUTLETS (2 REQ'D, REF. SPECS.)
- (I) LIGHT SWITCH – SINGLE POLE
- (J) LIGHT (SEE SPECIFICATIONS)
- (K) HEATER – CADET MODEL 3F790–1W W/ DOUBLE POLE BASE BOARD. MOUNT CADET MODEL BTF 2W–R THERMOSTAT.
- (L) 7/16" x 7" ANCHOR BOLTS (MIN. 9 REQ'D)
- (M) CHLORINE TANK VENT
- (N) SCADA EQUIPMENT MOUNT (SCHEDULE II WORK)

AS–B

NOVEMBE

AS-BUILT

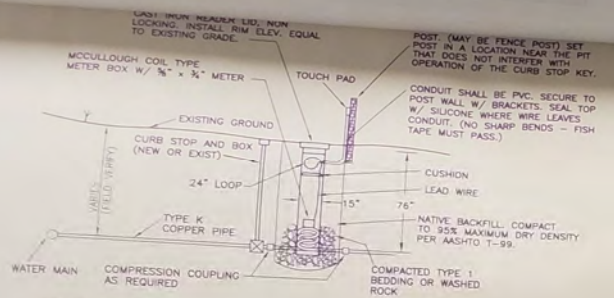
DESIGNED :	SRA
DRAWN :	SRA
CHECKED :	GLK
SCALE :	AS SHOWN
DATE :	FEBRUARY 2002

DELTA ENGINEERING P.C.
CONSULTING ENGINEERS
P.O. BOX 1481
GREAT FALLS, MT 59403

JOB NO.

FILE NO. GWS–SHT2

GERALDINE WATER SYSTEM IMP
CHLORINATION FACILI

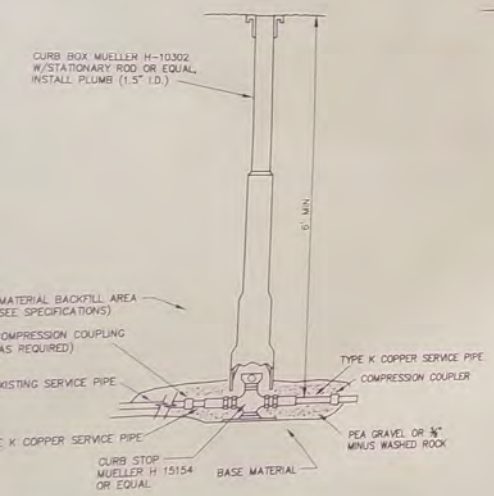


WATER METER NOTES:

1. WATER SERVICE AND MATERIAL MAY VARY.
2. METER BOX SHALL BE MUELLER/McCULLOUGH THERMAL-COIL W/ ANGLE METER STOP AND DUAL CHECK VALVE (OR APPROVED EQUAL) WITH INSULATION CUSHION.
3. METER BOX SHALL BE LOCATED TO THE HOUSE SIDE OF THE CURB STOP AND OUTSIDE THE PROPERTY LINE WHEN POSSIBLE.
4. METER INSTALLATION SHALL INCLUDE YOKE AND DUAL CHECK VALVE.
5. NOTIFY RESIDENT A MINIMUM OF 48 HOURS IN ADVANCE OF METER INSTALLATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER ONE WEEK IN ADVANCE OF CONSTRUCTION.

3/4" WATER METER W/ PIT DETAIL

NO SCALE

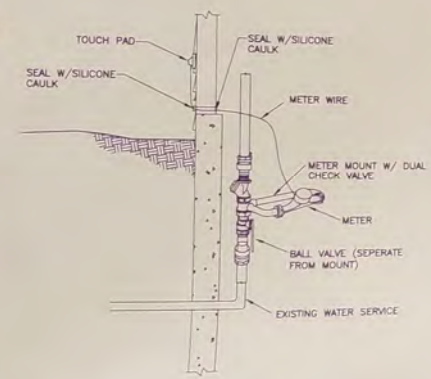


CURB STOP NOTES:

1. CURB STOPS SHALL HAVE A MINIMUM COVER OF SIX (6) FEET MEASURED FROM THE EXISTING GROUND SURFACE, EXCEPT THAT COVER SHALL BE MEASURED FROM ℄ OF STREET GRADE WHEN SERVICE LINES ARE LAID TO A STREET SIDE WHICH HAS AN UPHILL SLOPE.
2. WATER SERVICE LINE SIZE AND MATERIAL MAY VARY. COPPER SERVICES SHALL BE DIRECTLY CONNECTED TO THE CURB STOP. OTHER SERVICE LINE MATERIALS SHALL BE CONNECTED WITH APPROPRIATE COMPRESSION COUPLERS OR ASTM D 2609 NSF CERTIFIED PVC INSERT FITTINGS FOR PE PIPE. PE FITTINGS SHALL HAVE DOUBLE STAINLESS STEEL CLAMPS.
3. BEDDING SHALL BE 1" ø MAXIMUM WITHIN 6" OF SERVICE PIPE.
4. SALVAGE ALL REMOVED CURB STOPS TO THE TOWN OF GERALDINE SHOP.

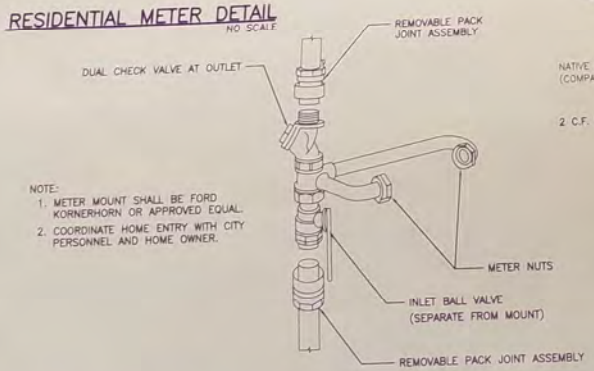
CURB STOP DETAIL

NO SCALE



RESIDENTIAL METER DETAIL

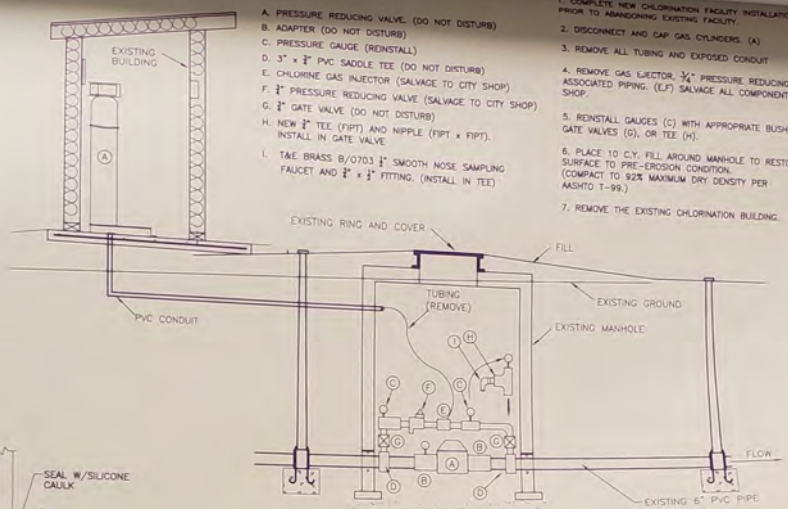
NO SCALE



NOTE:
1. METER MOUNT SHALL BE FORD KORNERHORN OR APPROVED EQUAL.
2. COORDINATE HOME ENTRY WITH CITY PERSONNEL AND HOME OWNER.

FORD KORNERHORN HORIZONTAL METER MOUNT ASSEMBLY

NO SCALE



A. PRESSURE REDUCING VALVE. (DO NOT DISTURB)
B. ADAPTER (DO NOT DISTURB)
C. PRESSURE GAUGE (REINSTALL)
D. 3" × 3" PVC SADDLE TEE (DO NOT DISTURB)
E. CHLORINE GAS INJECTOR (SALVAGE TO CITY SHOP)
F. 3" PRESSURE REDUCING VALVE (SALVAGE TO CITY SHOP)
G. 3" GATE VALVE (DO NOT DISTURB)
H. NEW 3" TEE (FIPT) AND NIPPLE (FIPT x FIPT). INSTALL IN GATE VALVE
I. T&E BRASS B/0703 ½" SMOOTH NOSE SAMPLING FAUCET AND 3" × ½" FITTING. (INSTALL IN TEE)

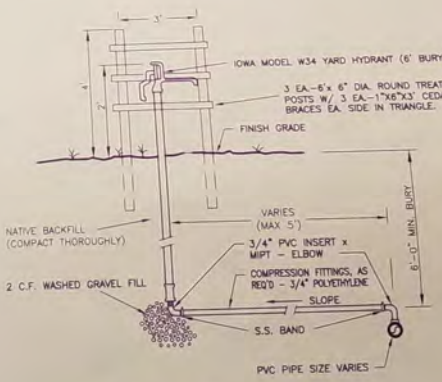
1. COMPLETE NEW CHLORINATION FACILITY INSTALLATION PRIOR TO ABANDONING EXISTING FACILITY.
2. DISCONNECT AND CAP GAS CYLINDERS. (A)
3. REMOVE ALL TUBING AND EXPOSED CONDUIT
4. REMOVE GAS EJECTOR, ¾" PRESSURE REDUCING VALVE AND ASSOCIATED PIPING. (E,F) SALVAGE ALL COMPONENTS TO CITY SHOP.
5. REINSTALL GAUGES (C) WITH APPROPRIATE BUSHING IN ¾" GATE VALVES (G), OR TEE (H).
6. PLACE 10 C.Y. FILL AROUND MANHOLE TO RESTORE GROUND SURFACE TO PRE-EROSION CONDITION. (COMPACT TO 92% MAXIMUM DRY DENSITY PER AASHTO T-99.)
7. REMOVE THE EXISTING CHLORINATION BUILDING.

AS-BUILT

ABANDON EXISTING CHLORINATION FACILITY

NO SCALE

AS-BUILT

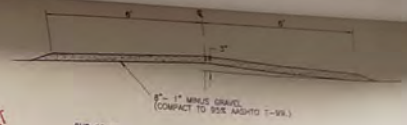


AIR RELIEF VALVE NOTES:

1. REMOVE EXISTING HYDRANT, FITTINGS AND POLYETHYLENE PIPE. DO NOT REMOVE EXISTING TAPPING SLEEVE AND TAP.
2. INSTALL NEW HYDRANT, FITTINGS, POLYETHYLENE PIPE AND PROTECTIVE POSTS.
3. COORDINATE PIPELINE SHUTDOWN WITH TOWN PERSONNEL.

MANUAL AIR RELIEF VALVE – PROFILE VIEW

NO SCALE

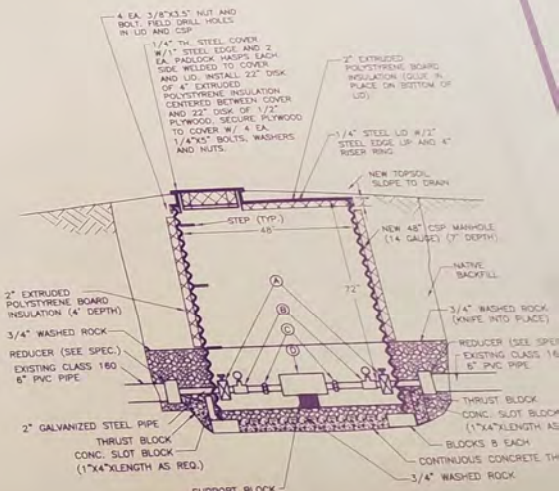


SUB GRADE
EXISTING DIRT ROADWAY (SCARIFY TO DEPTH OF SIX (6) INCHES. SHAPE TO PROVIDE 3 INCH CROWN AND COMPACT VIA SIX (6) PASSES W/ SELF PROPELLED VIBRATORY ROLLER.) (LENGTH APPROX. 100 LINEAR FEET)

SURFACING QUANTITIES
30 C.Y. -1" MINUS CRUSHED BASE COURSE (PER TABLE 02235.1 MPWSS)

GRAVEL SURFACING TO CHLORINATION BUILDING

NO SCALE



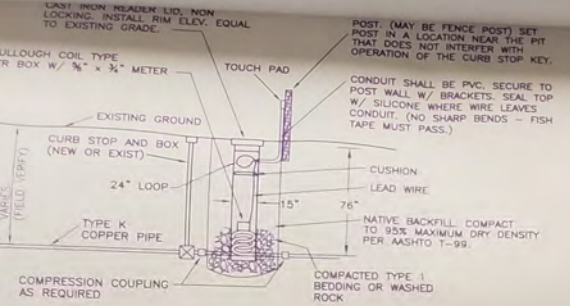
1. COORDINATE MAIN LINE SHUTDOWN WITH INSPECTOR AND TOWN PERSONNEL. THE CONTRACTOR SHALL EXERCISE CARE IN ASSEMBLY OF THE SYSTEM COMPONENTS TO ENSURE THAT THE FINAL ASSEMBLY FITS WITHIN THE MANHOLE SPACE AVAILABLE.
2. CSP MANHOLE SHALL BE SLOT CUT TO PROVIDE FOR 3/4" MIN. CLEARANCE AROUND THE 2" PIPE AND REMOVAL OF THE MANHOLE WITH OUT DISTURBING THE PIPELINE. THE SLOTS SHALL BE LOCATED 90° FROM THE STEP LOCATION.
3. WRAP ALL EXPOSED METAL FITTINGS LOCATED OUTSIDE THE MANHOLE PRIOR TO BURY. WRAP WITH POLYKAN 932-35 TAPE OR APPROVED EQUAL.
4. PARTS DESCRIPTION:
A : COMBRACO #64-108-01 2" BALL VALVE.
B : TEE W/ BUSHING AND ASHCROFT 25-1009SWL-02L PRESSURE GAUGE (0-200 PSIG). THE GAUGE SHALL HAVE A 2.5" FACE AND BE GLYCERIN FILLED.
C : UNION FITTING.
D : PRESSURE SUSTAINING VALVE
5. THRUST BLOCK REDUCERS WITH CONTINUOUS THURST BLOCK. USE BLOCKOUT MATERIAL TO PREVENT CONCRETE FROM CONTACTING 2" PIPE. DO NOT COVER REDUCER BOLTS WITH CONCRETE.
6. LID AND COVER SHALL BE ZINC PAINTED. (ALL SURFACES)

PRESSURE SUSTAINING VALVE MANH

AS-BU

NOVEMBER 20

DESIGNED : SRA	DELTA ENGINEERING P.C.	JOB NO:	GERALDINE WATER SYSTEM
DRAWN : SRA	CONSULTING ENGINEERS		MISCELLANEOUS
CHECKED : GLK	P.O. BOX 1481	FILE NO.	
SCALE : AS SHOWN	GREAT FALLS, MT 59403	GWSR-SHT3	
DATE : FEBRUARY 2002	MINING GEOLOGY CIVIL		



METER NOTES:

R SERVICE AND MATERIAL MAY VARY.

R BOX SHALL BE MUELLER/McCULLOUGH THERMAL-COIL LE METER STOP AND DUAL CHECK VALVE (OR APPROVED WITH INSULATION CUSHION.

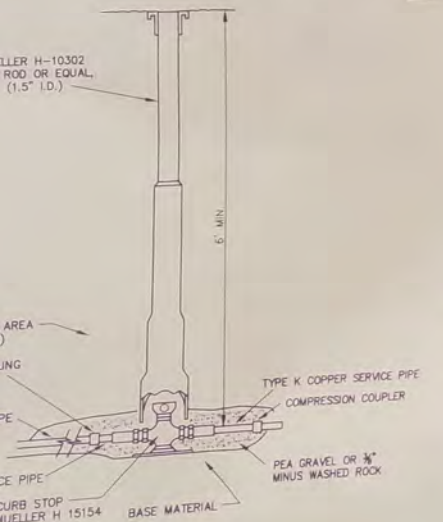
R BOX SHALL BE LOCATED TO THE HOUSE SIDE OF THE TOP AND OUTSIDE THE PROPERTY LINE WHEN POSSIBLE.

R INSTALLATION SHALL INCLUDE YOKE AND DUAL CHECK

CY RESIDENT A MINIMUM OF 48 HOURS IN ADVANCE OF NSTALLATION. THE CONTRACTOR SHALL NOTIFY THE R ONE WEEK IN ADVANCE OF CONSTRUCTION.

" WATER METER W/ PIT DETAIL

NO SCALE



TOP NOTES:

OPS SHALL HAVE A MINIMUM COVER OF SIX (6) FEET MEASURED XISTING GROUND SURFACE, EXCEPT THAT COVER SHALL BE ROM ℄ OF STREET GRADE WHEN SERVICE LINES ARE LAID TO A WHICH HAS AN UPHILL SLOPE.

RVICE LINE SIZE AND MATERIAL MAY VARY. COPPER ALL BE DIRECTLY CONNECTED TO THE CURB STOP. OTHER MATERIALS SHALL BE CONNECTED WITH APPROPRIATE COUPLERS OR ASTM D 2609 NSF CERTIFIED PVC INSERT PE PIPE. PE FITTINGS SHALL HAVE DOUBLE STAINLESS STEEL

HALL BE 1" ø MAXIMUM WITHIN 6" OF SERVICE PIPE.

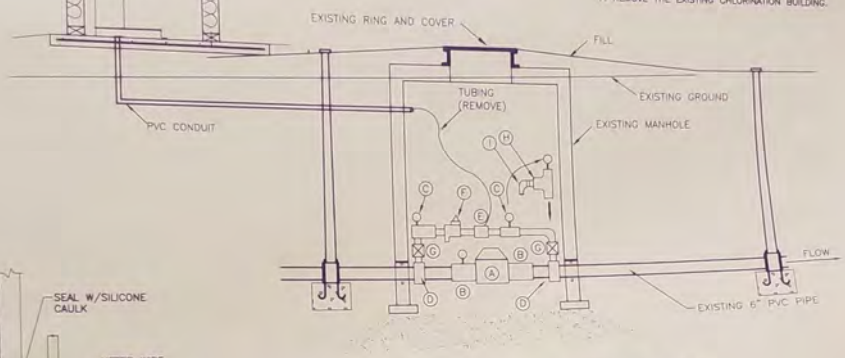
L REMOVED CURB STOPS TO THE TOWN OF GERALDINE SHOP.

CURB STOP DETAIL

A. PRESSURE REDUCING VALVE. (DO NOT DISTURB)
B. ADAPTER (DO NOT DISTURB)
C. PRESSURE GAUGE (REINSTALL)
D. 3" x ¾" PVC SADDLE TEE (DO NOT DISTURB)
E. CHLORINE GAS INJECTOR (SALVAGE TO CITY SHOP)
F. ¾" PRESSURE REDUCING VALVE (SALVAGE TO CITY SHOP)
G. ¾" GATE VALVE (DO NOT DISTURB)
H. NEW ¾" TEE (FIPT) AND NIPPLE (FIPT x FIPT). INSTALL IN GATE VALVE
I. T&E BRASS B/0703 ¼" SMOOTH NOSE SAMPLING FAUCET AND ¾" x ¼" FITTING. (INSTALL IN TEE)

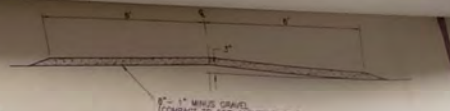
1. COMPLETE NEW CHLORINATION FACILITY INSTALLATION PRIOR TO ABANDONING EXISTING FACILITY.
2. DISCONNECT AND CAP GAS CYLINDERS. (A)
3. REMOVE ALL TUBING AND EXPOSED CONDUIT
4. REMOVE GAS EJECTOR, ¾" PRESSURE REDUCING VALVE AND ASSOCIATED PIPING. (E,F) SALVAGE ALL COMPONENTS TO CITY SHOP.
5. REINSTALL GAUGES (C) WITH APPROPRIATE BUSHING IN ¾" GATE VALVES (G), OR TEE (H).
6. PLACE 10 C.Y. FILL AROUND MANHOLE TO RESTORE GROUND SURFACE TO PRE-EROSION CONDITION. (COMPACT TO 92% MAXIMUM DRY DENSITY PER AASHTO T-99.)
7. REMOVE THE EXISTING CHLORINATION BUILDING.

AS-BUILT



ABANDON EXISTING CHLORINATION FACILITY

NO SCALE



SUB GRADE

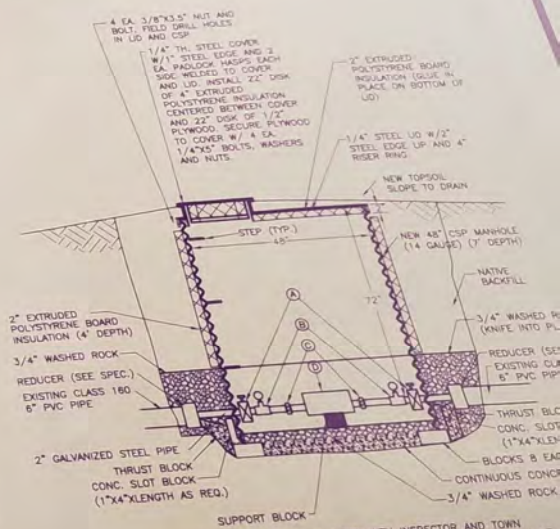
EXISTING DIRT ROADWAY (SCARIFY TO DEPTH OF SIX (6) INCHES, SHAPE TO PROVIDE 3 INCH CROWN AND COMPACT W/ SIX (6) PASSES W/ SELF PROPELLED VIBRATORY ROLLER.) (LENGTH APPROX. 100 LINEAR FEET)

SURFACING QUANTITIES

30 C.Y. 1" MINUS CRUSHED BASE COURSE. (PER TABLE 02235.1 MPWSS)

GRAVEL SURFACING TO CHLORINATION BUILDING

NO SCALE



1. COORDINATE MAIN LINE SHUTDOWN WITH INSPECTOR AND TOWN PERSONNEL. THE CONTRACTOR SHALL EXERCISE CARE IN ASSEMBLY OF THE SYSTEM COMPONENTS TO ENSURE THAT THE FINAL ASSEMBLY FITS WITHIN THE MANHOLE SPACE AVAILABLE.

2. CSP MANHOLE SHALL BE SLOT CUT TO PROVIDE FOR 3/4" MIN. CLEARANCE AROUND THE 2" PIPE AND REMOVAL OF THE MANHOLE WITH OUT DISTURBING THE PIPELINE. THE SLOTS SHALL BE LOCATED 90° FROM THE STEP LOCATION.

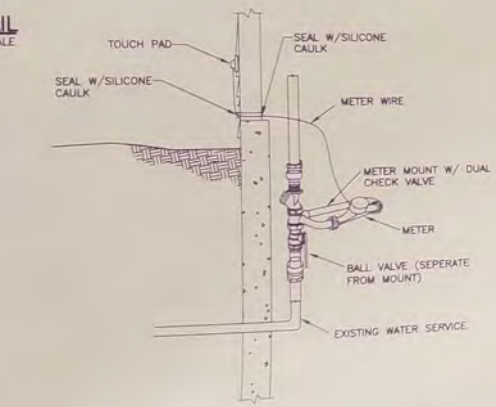
3. WRAP ALL EXPOSED METAL FITTINGS LOCATED OUTSIDE THE MANHOLE PRIOR TO BURY. WRAP WITH POLYKAN 932-35 TAPE OR APPROVED EQUAL.

4. PARTS DESCRIPTION:
A : COMBRACO #64-108-01 2" BALL VALVE.
B : TEE W/ BUSHING AND ASHCROFT 25-1009SWL-02L PRESSU GAUGE (0-200 PSIG). THE GAUGE SHALL HAVE A 2.5" FACE AN GLYCERIN FILLED.
C : UNION FITTING.
D : PRESSURE SUSTAINING VALVE

5. THRUST BLOCK REDUCERS WITH CONTINUOUS THURST BLO BLOCKOUT MATERIAL TO PREVENT CONCRETE FROM CONTACTI PIPE. DO NOT COVER REDUCER BOLTS WITH CONCRETE.

6. LID AND COVER SHALL BE ZINC PAINTED. (ALL SURFACI

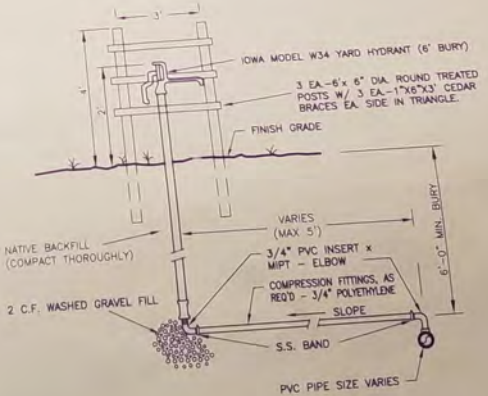
PRESSURE SUSTAINING VALVE



RESIDENTIAL METER DETAIL

NO SCALE

AS-BUILT



AIR RELIEF VALVE NOTES:

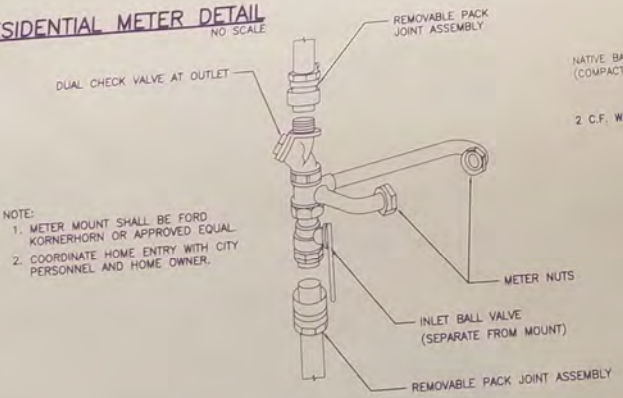
1. REMOVE EXISTING HYDRANT, FITTINGS AND POLYETHYLENE PIPE. DO NOT REMOVE EXISTING TAPPING SLEEVE AND TAP.

2. INSTALL NEW HYDRANT, FITTINGS, POLYETHYLENE PIPE AND PROTECTIVE POSTS.

3. COORDINATE PIPELINE SHUTDOWN WITH TOWN PERSONNEL.

MANUAL AIR RELIEF VALVE – PROFILE VIEW

NO SCALE



NOTE:
1. METER MOUNT SHALL BE FORD KORNERHORN OR APPROVED EQUAL.
2. COORDINATE HOME ENTRY WITH CITY PERSONNEL AND HOME OWNER.

FORD KORNERHORN HORIZONTAL METER MOUNT ASSEMBLY

NO SCALE

AS-B

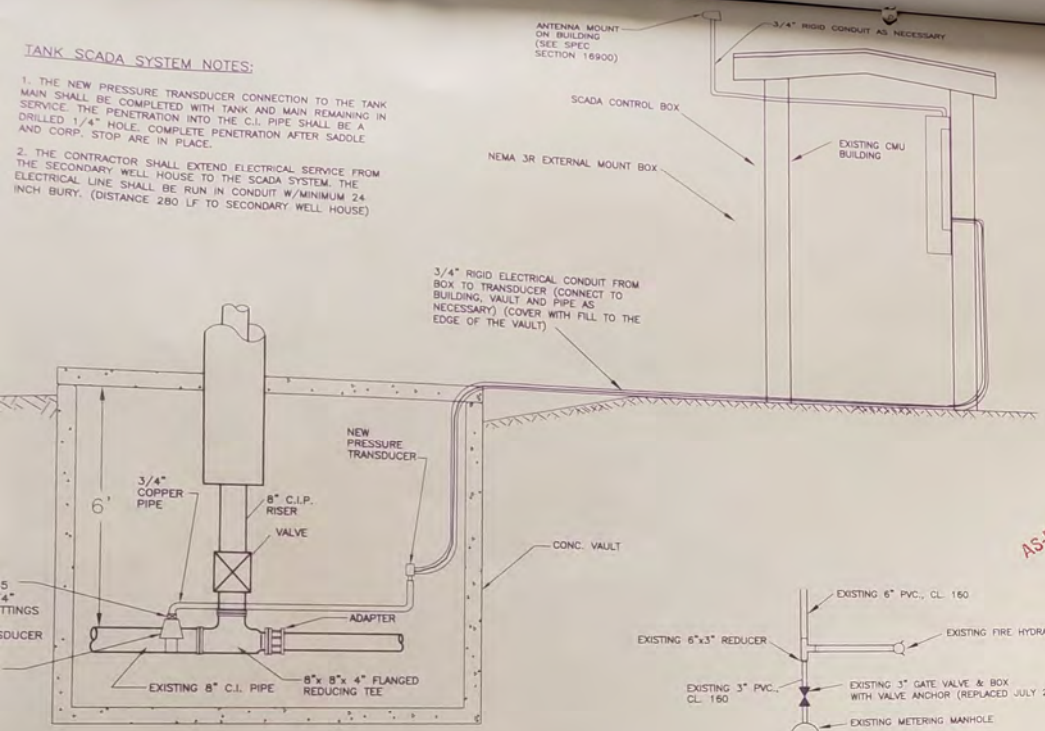
NOVEMBE

DESIGNED : SRA	DELTA ENGINEERING P.C. CONSULTING ENGINEERS P.O. BOX 1481 GREAT FALLS, MT 59403	JOB NO.	GERALDINE WATER
DRAWN : SRA			MISCELL
CHECKED : GLK		FILE NO. GWSR-SHT3	
SCALE : AS SHOWN			
DATE : FEBRUARY 2002			

TANK SCADA SYSTEM NOTES:

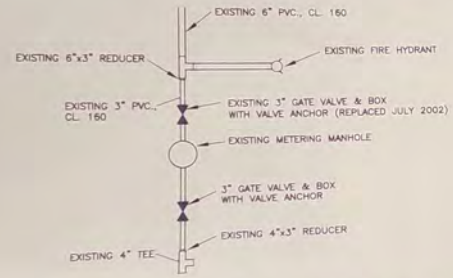
1. THE NEW PRESSURE TRANSDUCER CONNECTION TO THE TANK MAIN SHALL BE COMPLETED WITH TANK AND MAIN REMAINING IN SERVICE. THE PENETRATION INTO THE C.I. PIPE SHALL BE A DRILLED 1/4" HOLE. COMPLETE PENETRATION AFTER SADDLE AND CORP. STOP ARE IN PLACE.

2. THE CONTRACTOR SHALL EXTEND ELECTRICAL SERVICE FROM THE SECONDARY WELL HOUSE TO THE SCADA SYSTEM. THE ELECTRICAL LINE SHALL BE RUN IN CONDUIT W/MINIMUM 24 INCH BURY. (DISTANCE 280 LF TO SECONDARY WELL HOUSE)



TANK VAULT DETAIL
NO SCALE

AS-BUILT



METERING / VALVE MANHOLE PLAN
NO SCALE
INFORMATIONAL PURPOSES

SCADA INSTALLATION NOTES:

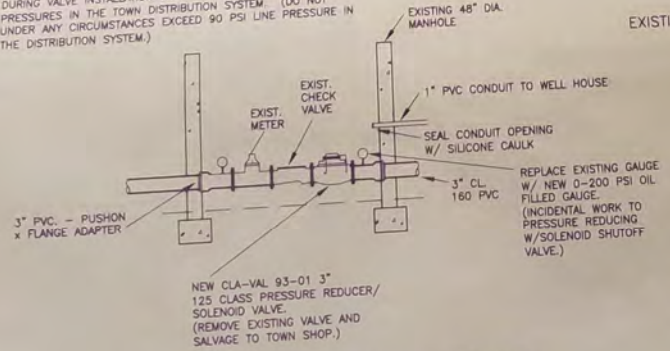
1. INSTALL THE SCADA VALVE AND METER STATION IN THE WELL HOUSE.

2. A BURIED CONDUIT IS IN PLACE FROM THE BUILDING TO THE MANHOLE. THE EXISTING CONDUIT IS ABANDONED. SEVERAL UNDERGROUND BURIED LINES EXIST IN THE AREA.

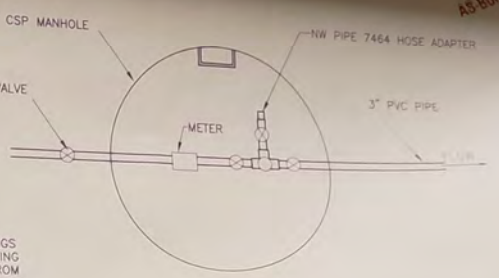
G MANHOLE VICINITY MAP
NO SCALE

VALVE INSTALLATION NOTES:

1. THE CONTRACTOR SHALL TAKE APPROPRIATE MEASURES DURING VALVE INSTALLATION AND CALIBRATION TO PREVENT HIGH PRESSURES IN THE TOWN DISTRIBUTION SYSTEM. (DO NOT UNDER ANY CIRCUMSTANCES EXCEED 90 PSI LINE PRESSURE IN THE DISTRIBUTION SYSTEM.)



METERING MANHOLE PIPING PROFILE
NO SCALE



AS-BUILT

PLAN VIEW

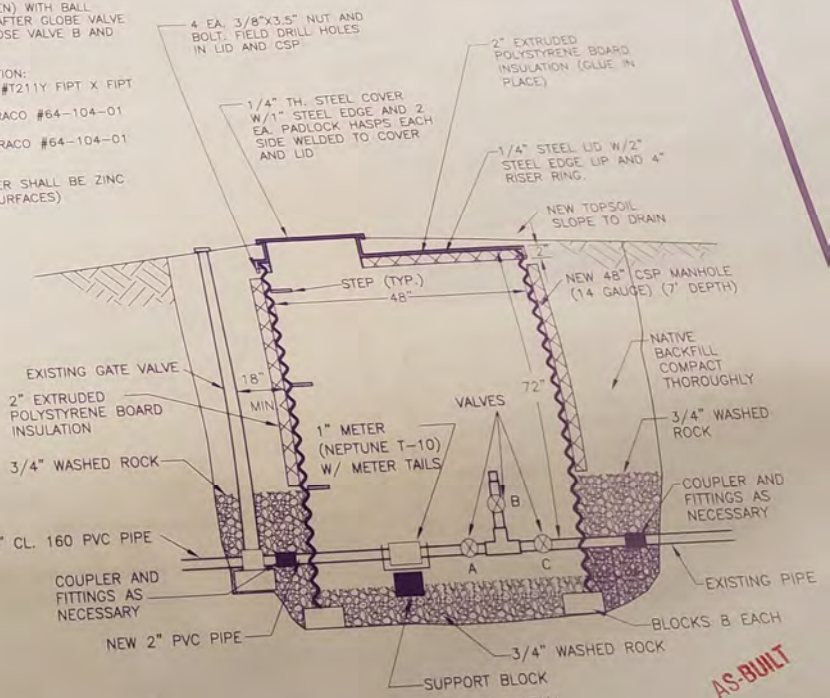
FLOW CONTROL MANHOLE NOTES:

1. EXCAVATE AND CONFIRM PIPE MATERIALS AND CONNECTION FITTINGS NECESSARY TO CONNECT TO EXISTING MAIN PRIOR TO REMOVING LINE FROM SERVICE. (INCIDENTAL WORK) PROVIDE FITTINGS TO CONNECT TO EXISTING MAIN. THE MAIN SIZE IS 3". EXISTING PIPE MATERIAL IS CL. 160 PVC.

2. ADJUST GLOBE VALVE A TO PROVIDE 6.0 GPM FLOW OUT OF VALVE B (FULL OPEN) WITH BALL VALVE C CLOSED. AFTER GLOBE VALVE A IS ADJUSTED CLOSE VALVE B AND OPEN VALVE C.

3. VALVE DESCRIPTION:
VALVE-A : NIBCO #T211Y FIPT X FIPT GLOBE VALVE.
VALVE-B : COMBRACO #64-104-01 3/4" BALL VALVE.
VALVE-C : COMBRACO #64-104-01 2" BALL VALVE.

4. LID AND COVER SHALL BE ZINC PAINTED. (ALL SURFACES)



AS-BUILT

PROFILE VIEW

FLOW CONTROL MANHOLE
NO SCALE

AS-BUILT

NOVEMBER 2002

DESIGNED : SRA	DELTA ENGINEERING P.C.	JOB NO.	GERALDINE WATER SYSTEM IMPR
DRAWN : SRA	CONSULTING ENGINEERS		SOLENOID VALVE AND SCADA
CHECKED : GLK	P.O. BOX 1481	FILE NO.	
SCALE : AS SHOWN	GREAT FALLS, MT 59403	GWS-SHT4	
DATE : FEBRUARY 2002	MINING GEOLOGY CIVIL		

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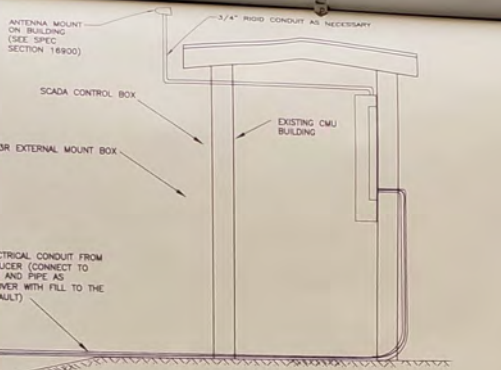
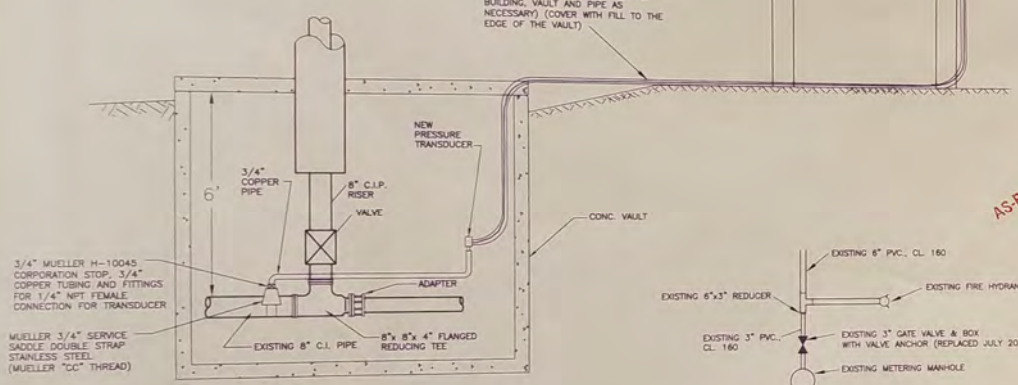
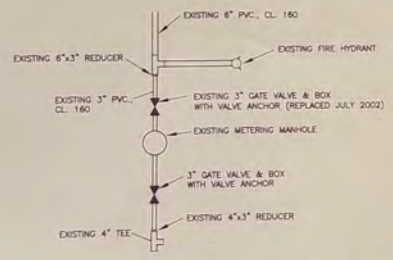




AS-BUILT

TANK VAULT DETAIL
NO SCALE



METERING / VALVE MANHOLE PLAN
NO SCALE
INFORMATIONAL PURPOSES

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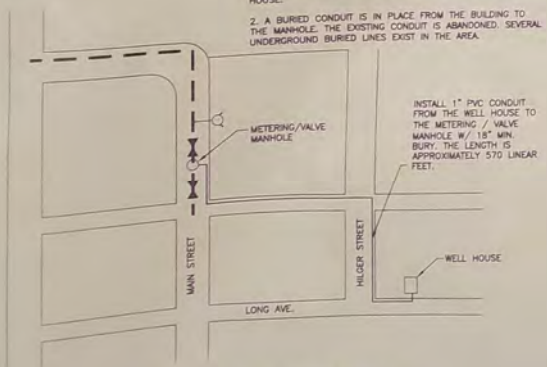

METERING MANHOLE VICINITY MAP
NO SCALE

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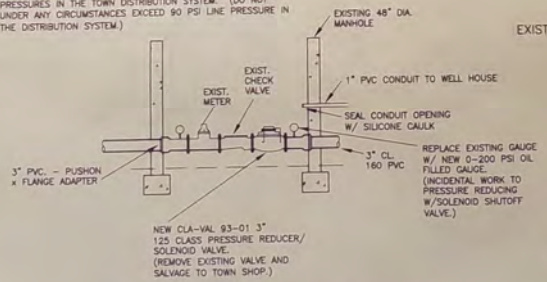
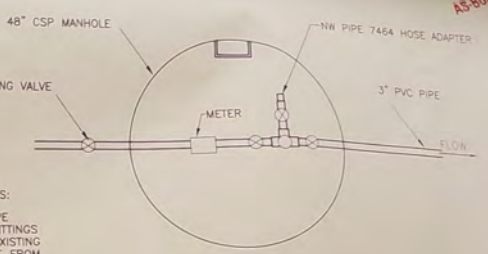


METERING MANHOLE PIPING PROFILE
NO SCALE

AS-BUILT



PLAN VIEW

FLOW CONTROL MANHOLE NOTES:

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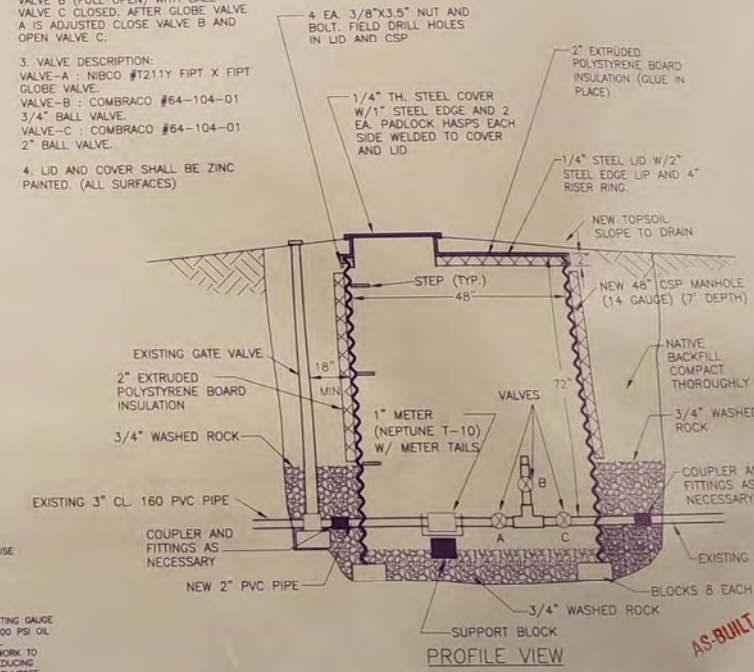


AS-BUILT

PROFILE VIEW

FLOW CONTROL MANHOLE
NO SCALE

AS-BUILT
NOVEMBER 2002

DESIGNED : SRA	DELTA ENGINEERING P.C. CONSULTING ENGINEERS P.O. BOX 1481 GREAT FALLS, MT 59403	JOB NO.	GERALDINE WATER SYSTEM IMPROVEMENTS
DRAWN : SRA			SOLENOID VALVE AND SCADA DETAILS
CHECKED : GLK	MINING GEOLOGY CIVIL	FILE NO. GWS-SHT4	
SCALE : AS SHOWN			
DATE : FEBRUARY 2002			

GERALDINE WATER SYSTEM IMPROVEMENTS PHASE 2

GENERAL NOTES:

1. ALL SITE WORK SHALL MEET OR EXCEED THE MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS (MARCH 2003). ALL OTHER WORK SHALL BE IN CONFORMANCE WITH STATE AND LOCAL CODES AS REFERENCED.

2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY PERTINENT UTILITY LOCATIONS AND ELEVATIONS, ESPECIALLY AT CONNECTION POINTS AND AT POTENTIAL UTILITY CONFLICTS. CALL UULC ONE-CALL CENTER AT 1-800-424-5555 FOR LOCATES.

3. THE CONTRACTOR SHALL COORDINATE AND COOPERATE WITH ALL UTILITY COMPANIES INVOLVED AND THE TOWN OF GERALDINE WITH REGARD TO RELOCATIONS OR ADJUSTMENTS OF EXISTING UTILITIES DURING CONSTRUCTION TO ASSURE THAT THE WORK IS ACCOMPLISHED IN A TIMELY FASHION AND WITH A MINIMUM DISRUPTION OF SERVICE.

4. THE CONTRACTOR SHALL NOTIFY THE MAYOR OF GERALDINE, DELTA ENGINEERING AND THE UTILITY COMPANIES FORTY-EIGHT (48) HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION. THE CONTRACTOR SHALL ALSO MAKE THE FOLLOWING NOTIFICATIONS:

A. NOTIFY ALL EMERGENCY SERVICES, THE TOWN OF GERALDINE AND THE MDT (IF APPLICABLE) OF STREET CLOSURES A MINIMUM OF 24 HRS IN ADVANCE OF CLOSURE. UPDATE STREET CLOSURE NOTIFICATIONS DAILY.

B. NOTIFY AFFECTED USERS (BY DOOR HANGER), THE TOWN OF GERALDINE AND EMERGENCY SERVICES OF SERVICE OUTAGES IN WRITING A MINIMUM OF 24 HOURS IN ADVANCE OF PLANNED OUTAGE. PROVIDE DETAILS SUCH AS PHONE NUMBER OF SUPERINTENDENT, DATE AND TIMES FOR OUTAGE.

5. THE CONTRACTOR SHALL OBTAIN ALL PERMITS FOR STREET CUTS, UTILITY INTERFERENCE'S AND TRAFFIC CONTROL. THE MAINLINE VALVES WILL BE OPERATED ONLY BY CITY PERSONNEL.

6. IF, DURING THE CONSTRUCTION PROCESS, CONDITIONS ARE ENCOUNTERED WHICH COULD INDICATE AN UNIDENTIFIED SITUATION IS PRESENT, THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY.

7. THE CONTRACTOR SHALL NOTIFY THE ENGINEER ONE WEEK PRIOR TO PERFORMING WORK ON PRIVATE PROPERTY. THE OWNER'S REPRESENTATIVE WILL THEN SECURE PERMISSION FROM THE PRIVATE PROPERTY OWNER.

8. THE MAXIMUM WATER SERVICE OUTAGE PERIOD SHALL NOT EXCEED 4 HOURS. TEMPORARY WATER SERVICE SHALL BE PROVIDED IF OUTAGE PERIOD WILL EXCEED 4 HOURS. AN 8 HOUR MAX. OUTAGE SHALL BE ALLOWED ON FLAGLER AVENUE.

CONSTRUCTION NOTES:

1. WATER SERVICE MAINS (8-INCH) SHALL BE CLASS 150 C-900 PVC. W
TRANSMISSION MAINS (6-INCH) SHALL BE CLASS 150 C-900 PVC. WATER
FITTINGS SHALL BE C153 OR C110.

2. THE CONTRACTOR SHALL VERIFY THE DEPTH, MATERIAL, AND CLASS O
PIPE OR FITTINGS AT CONNECTION LOCATIONS (SEE SPECIAL PROVISIONS

3. THE CONTRACTOR SHALL RETURN ALL CONSTRUCTION AREAS TO PR
CONDITIONS OR BETTER. THE GRAVEL SURFACING REPLACEMENT AREA S
THE EXISTING LOCATION TO A MAXIMUM 5' WIDTH ON EACH SIDE OF T

4. ALL EXCAVATIONS LEFT OPEN OVERNIGHT SHALL BE PROTECTED BY
FENCING AND FLASHING BARRICADES. ACCESS TO LOCAL RESIDENCES
MAINTAINED AT ALL TIMES.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING PRIVATE
HEATING OIL LINES. THE TOWN OF GERALDINE IS NOT SERVED BY N
CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO PROPANE, L
LINES CAUSED BY THE CONTRACTOR ACTIVITIES.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF A
GENERATED ON THE PROJECT. ALL EXCESS MATERIALS SHALL BE
LEGAL MANNER. THE TOWN OF GERALDINE WILL PROVIDE A DISPO
THE TOWN LAGOON. UTILIZE CLEAN NON-SATURATED EXCESS MAT
FILLS. EXCESS SALVAGED GRAVEL MATERIALS SHALL BE PLACED
STOCKPILE AREA.

7. OPEN ENDS OF ABANDONED WATER MAINS SHALL BE PLUGG
NON-SHRINK GROUT (RE-CRETE 20) AND A BONDING AGENT.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL A
WATER ENCOUNTERED DURING CONSTRUCTION. IF GROUND WA
DEWATER THE TRENCH TO PREVENT FLOTATION OR CONTAMINA
MPWSS.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION
(SEE MPDES PERMITTING IN THE SPECIAL PROVISIONS).

10. REFERENCE ELEVATIONS FOR THE WORK DESCRIBED H
EACH PLAN SHEET.

11. THE TRANSMISSION MAIN SHALL MAINTAIN A 7' BURY
ON THE DRAWINGS. THE WATER MAINS SHALL MAINTAIN
OTHERWISE ON THE DRAWINGS.

12. SEE TOWN PHOTO ON THIS SHEET FOR DEDUCTIVE
INCLUDED ON THE PLAN DRAWINGS.

13. CONTACT TOWN OPERATOR TO ARRANGE ACCESS
RECONSTRUCTION SITE.

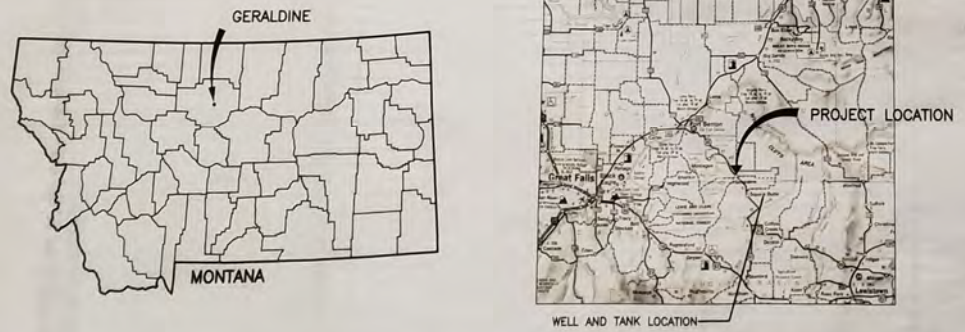
14. ALL EXCAVATION AND MATERIALS REMOVAL ON T
THE EXCAVATION, REMOVAL, AND DISPOSAL ARE INC
ITEMS AND WILL NOT BE PAID SEPARATELY. THE CO
FOR EXCAVATION OF ANY OF THE VARIOUS TYPES
ENCOUNTERED REGARDLESS OF TYPE.

SHEET INDEX

LEGEND

	EXISTING
MANHOLE	○
WATER LINE	EXISTING 8" AC
WATER SERVICE	WS
SANITARY SEWER	SS 8"
U.G. ELECTRIC	UG ELEC
U.G. TELEPHONE	UG TELE
GATE VALVE	
FIRE HYDRANT	
UTILITY POLE	○ POLE
IRON MONUMENT	○
PROPERTY LINE	
FENCE	
TREE	
CULVERT	
COUNTY ROAD R/W (SHEET 10 AND 11)	

VICINITY MAP



NOTIFICATION TELEPHONE NUMBERS

EMERGENCY	**911**
DELTA ENGINEERING P.C. (OFFICE - PROJECT ENGINEER)	(406) 727-3687
TOWN OF GERALDINE (TOWN OFFICE)	(406) 737-4361
MAYOR (MONICA RICE)	(406) 737-4368
SHERIFF (NON EMERGENCY NUMBER)	(406) 622-5451
NORTHWESTERN ENERGY	(406) 567-2203
TELEPHONE COMPANY	(406) 622-3301
CABLE TV	(406) 737-4251
TERASEN PIPELINES (PETROLEUM MAIN)	(888) 449-7539

AS-BUILT
NOVEMBER 2005
prepared for:
TOWN OF GERALDINE, MT

U.G. ELECTRIC	UG ELEC
U.G. TELEPHONE	UG TELE
GATE VALVE	
FIRE HYDRANT	
UTILITY POLE	POLE
IRON MONUMENT	
PROPERTY LINE	PL
FENCE	
TREE	
CULVERT	
COUNTY ROAD R/W (SHEET 10 AND 11)	

AS-BUILT

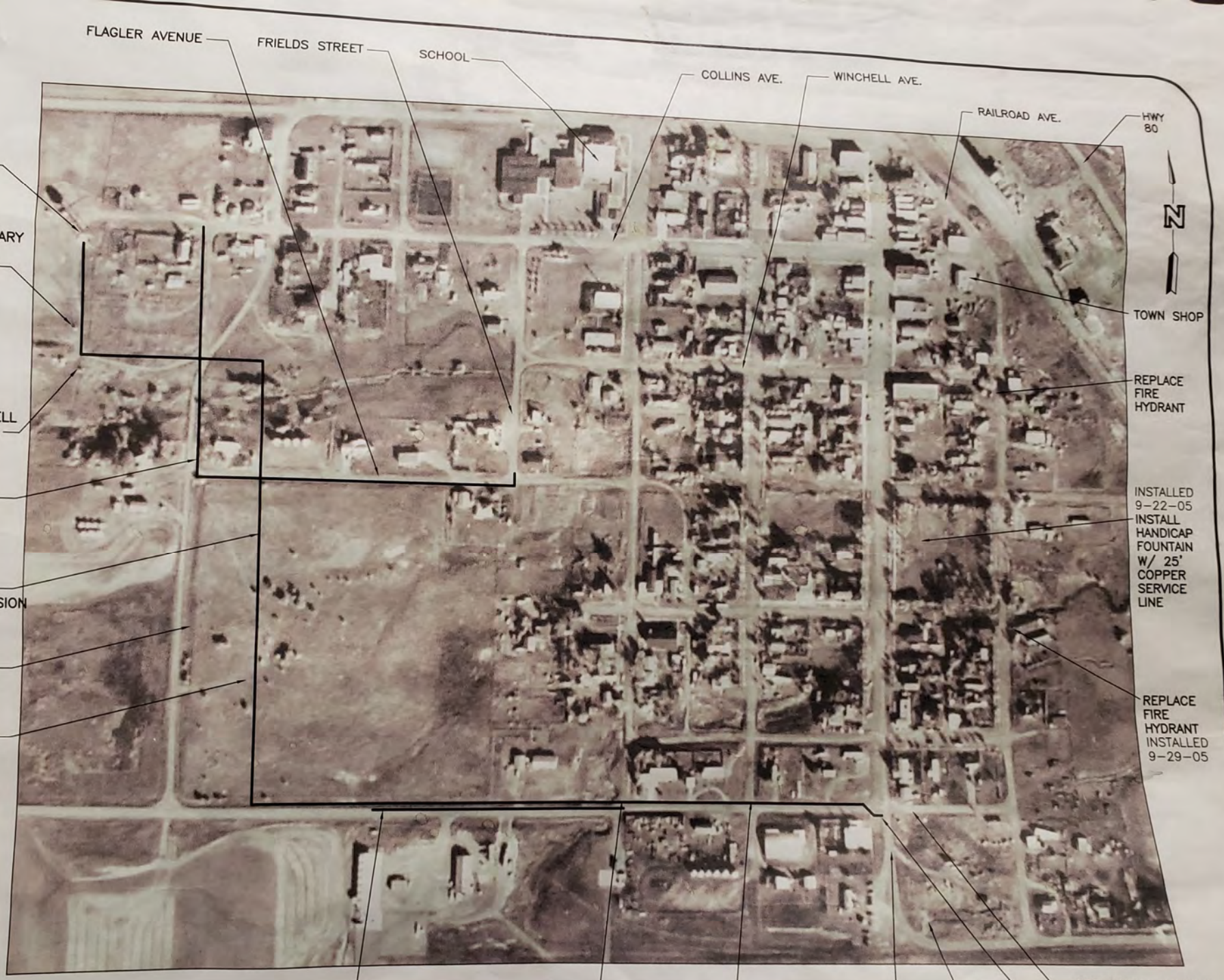
MONTANA
SHAWN ARTHUR
NO. 11007
REGISTERED PROFESSIONAL

EPHONE NUMBERS

	911
	(406) 727-3687
	(406) 737-4361
	(406) 737-4368
MBER)	(406) 622-5451
	(406) 567-2203
	(406) 622-3301
	(406) 737-4251
M MAIN)	(888) 449-7539

AS-BUILT
NOVEMBER 2005
prepared for:
TOWN OF GERALDINE, MT

DELTA ENGINEERING P
CONSULTING ENG
P. O. BOX 14
GREAT FALLS, MT
(406) 727-36


FLAGLER AVENUE
FRIELDS STREET
SCHOOL
COLLINS AVE.
WINCHELL AVE.
RAILROAD AVE.
HWY 80
TANK
SECONDARY WELL HOUSE
DEEP WELL BUILDING
NEW 8" WATER MAIN ROUTE
NEW 6" TRANSMISSION MAIN ROUTE
ALLEY WEST OF SPRING STREET
SPRING STREET
N
TOWN SHOP
REPLACE FIRE HYDRANT
INSTALLED 9-22-05
INSTALL HANDICAP FOUNTAIN W/ 25' COPPER SERVICE LINE
REPLACE FIRE HYDRANT INSTALLED 9-29-05
8" WATER MAIN SHEET 8
BREWSTER STREET
HILGER STREET
MAIN STREET
GERALDINE AVENUE
METER AND VALVE MH
GRAVEL STOCKPILE

NOTE:

1. BACKFILL UNDER ROADWAYS AND DRIVEWAYS SHALL BE TYPE A. ALL OTHER BACKFILL ON THIS SHEET SHALL BE TYPE B.

STA. 11+30 EXISTING 30" CSP CULVERT REPLACED BY COOPERATIVE EFFORT BY TOWN AND COUNTY DURING PROJECT (7-26-05)

NOTES:

1. PROTECT EDGE OF EXISTING ASPHALT FROM DAMAGE.

2. CUT AND REMOVE ASPHALT AT 3.5' FROM CENTER LINE OF PIPE IN AREAS OF ASPHALT ENCROACHMENT ON EXCAVATION (EXCLUDES STREET CROSSINGS). (INCIDENTAL WORK)

3. PLACE CLEAN FILL DIRT TO EDGE OF ASPHALT (INCIDENTAL WORK TO MAIN INSTALLATION)

From Hilger to Main ST. 6" C-900 and 8" PVC Valves 6/1/08

IRON MONUMENT (NOT CONFIRMED)

BREWSTER ST. (ASPHALT PAVED) EXISTING 4" AC

GERALDINE AVE. / AIRPORT RD.

GRAVEL ROADWAY

UG TELE

UG CABLE TV

STONE CURB

GRAVEL DRIVEWAY

CONC. DRIVEWAY

POLE

SS

WS

10+00 11+00 12+00 13+00 14+00 15+00

HILGER ST. (ASPHALT PAVED)

TOWN BURIED POWER (IN CONDUIT)

EXISTING 4" AC

CLEANOUT

16+00 17+00 18+00 19+00

IRON MONUMENT (LOCATED)

STA. 17+98 CROSS 1 EA. SANITARY SEWER SERVICE

ABANDONED SAN. SEWER

8" SAN. SEWER

SAN. SEWER 4"

4" ORANGEBERG

MAIN STREET

IRON MONUMENT (NOT CONFIRMED)

4" DRESSER

4" TEE

6" VALVE

4" & 3" REDUCER

3" DRESSER

EXISTING 6" PVC

SAN. SEWER

STA. 20+23.5 30' LT. INSTALL 6" TEE (PUSH X PUSH X FLANGE), 6" VALVE, VALVE BOX, 42 L.F. 6" PVC PIPE, FIRE HYDRANT (SEE DETAIL), THRUST BLOCK AND CONNECT TO EXISTING MAIN W/ 1 EA. 6" COUPLER AND 2 L.F. PVC PIPE. (PAID AS 1 EA. CONNECT TO EXISTING MAIN)

VALVE MH

PRESSURE REDUCING / SOLENOID BLOCK VALVE REPLACED JUNE 30, 2005.

GRAVEL ROADWAY

STA. 10+75 TO 12+10 CONSTRUCT 100 C.Y. EARTH FILL (SEE FILL SECTION) (INCIDENTAL WORK TO TRANSMISSION MAIN)

STA. 10+43 TO 12+24 MAINTAIN TOP OF PIPE ELEVATION = 2785'

PRESSURE TEST 8-23-05 90 PSI FOR 10 HRS END TO VALVE AT WELL HOUSE

STA. 10+50 TO 19+78.6 INSTALL 970 L.F. 6" TRANSMISSION MAIN — INSTALLED JULY 2005

STA. 12+20 TO 19+80 REMOVE AND REPLACE 20 S.Y. 8" TH. GRAVEL SURFACING (MAX. GRAVEL PAY WIDTH 5' FROM CENTER OF PIPE ON EACH SIDE) (INCLUDES DRIVEWAY) — INSTALLED OCTOBER 2005

BASIS OF STATIONING: IRON MONUMENT STA. 16+00

STA. 12+20 TO 20+02 REMOVE AND REPLACE 113 S.Y. ASPHALT SURFACING (MAX. ASPHALT PAY WIDTH 3.5' FROM CENTER OF PIPE ON EACH SIDE)

STA. 19+07 INSTALL 6" 45° BEND AND THRUST BLOCK (PUSH X PUSH)

STA. 19+38 31.2' RT. INSTALL 6" 45° BEND AND THRUST BLOCK (PUSH X PUSH)

STA. 19+73.6 31.2' RT. INSTALL 6" GATE VALVE AND VALVE BOX

STA. 19+78.6 31.2' RT. INSTALL CONNECTION TO EXISTING MAIN (SEE DETAIL) PAID AS 1 EA. CONNECT TO EXISTING MAIN (INCLUDES 1 EA. 6" COUPLING INCIDENTAL TO CONNECTION)

STA. 19+78.6 31.2' RT. INSTALL 6" TEE (PUSH X PUSH X PUSH) AND THRUST BLOCK

STA. 19+78.6 28.2' RT. INSTALL 6"X4" REDUCER (PUSH X PUSH) AND THRUST BLOCK

STA. 19+82.5 25.2' RT. INSTALL 4" GATE VALVE AND VALVE BOX (THE CONNECTION TO THE EXISTING MAIN SHALL BE INCIDENTAL TO THE 4" VALVE)

AS-BUILT

EXISTING 6" PVC

EXISTING 4" AC

4" VALVE

4" TEE

SCALE: 1"=50'

TRANSITION LOCATION UNKNOWN

EXISTING 3" PVC

4"X3" REDUCING COUPLER

NEW 4" GATE VALVE NORMAL CLOSED

4" CLASS 200 C-900 PVC (INCIDENTAL TO 4" GATE VALVE)

6"X4" PUSH X PUSH REDUCER

6" CLASS 150 C-900 PVC

ALIGN EAST-WEST 6" GATE VALVE

6" TEE

8" CLASS 150 C-900 PVC

INSTALLED SEPTEMBER 2005

8.25'

6"X4" REDUCING COUPLING 4" LONG 4" C200 PVC 4"X3" PVC BUSHING (GLUE X GLUE) NO THRUST BLOCK

#4 REBAR

CONC.

REDUCER THRUST BLOCK

THRUST BLOCK NOTES: SEE SHEET 8

NEW CONNECTION EXISTING L

CONNECTION DETAIL

NO SCALE.

ELEV.

2800 2795 2790 2785 2780 2775 2770

FILLED GROUND SURFACE ELEV.= 2791.25

ASPHALT

CONCRETE DRIVEWAY

EXISTING GROUND SURFACE

GRAVEL DRIVEWAY

NEW WATER TO HYD. (SHEET 8)

WATER

WATER SERV. CABLE

WATER SERV.

WATER POWER CONDUIT

SANITARY SEWER

7' MIN.

18" MIN.

6" CLASS 150 C-900 PVC

+43 MAINTAIN TOP OF PIPE ELEV.= 2785.90 TO EAST

+50 MATCH LINE SHEET 3

+24 MAINTAIN TOP OF PIPE ELEV.= 2785.00 TO WEST

+07 45° BEND

+38 45° BEND

+73.6 6" GATE VALVE

+78.6 TEE

+82.5 ℄ MAIN STREET

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00

SCALE: 5' 50'

MAINTAIN FILL ELEV.= 2791.25 OVER TOP OF PIPE

3:1 MIN. FILL

ELEV.= 2785.

TRANSMISSION MAIN

0+10 LT

FILL SECTION STA. 11+25

DESIGNED : SRA	
DRAWN : SRA	
CHECKED : GLK	
SCALE : 1"= 50'	
DATE : AUGUST 2004	

DELTA ENGINEERING P.C.
CONSULTING ENGINEERS
P. O. BOX 1481
GREAT FALLS, MT 59403
(406) 727-3687

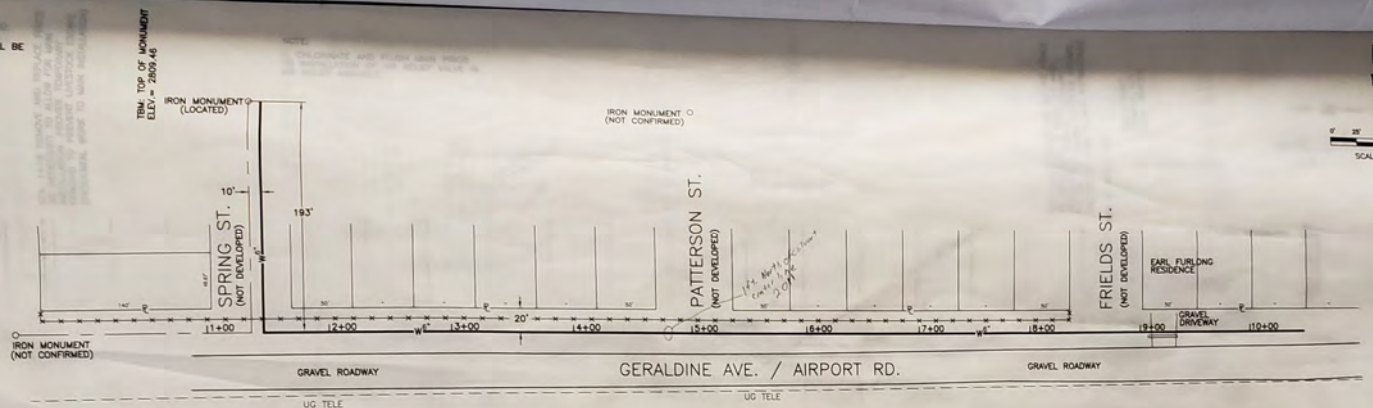
FILE NO. SHEET2 AS BUILT

GERALDINE WATER SYSTEM

TRANSMISSION MAIN- GERALDINE

NOTE:

1. BACKFILL UNDER DRIVEWAYS SHALL BE TYPE A. ALL OTHER BACKFILL ON THIS SHEET SHALL BE TYPE C.



AS-BUILT

BASIS OF STATIONING: SEE SHEET 2

STA. 1+46.2 INSTALL 6" 90° BEND AND THRUST BLOCK. (PUSH X PUSH) INSTALLED JULY 2005

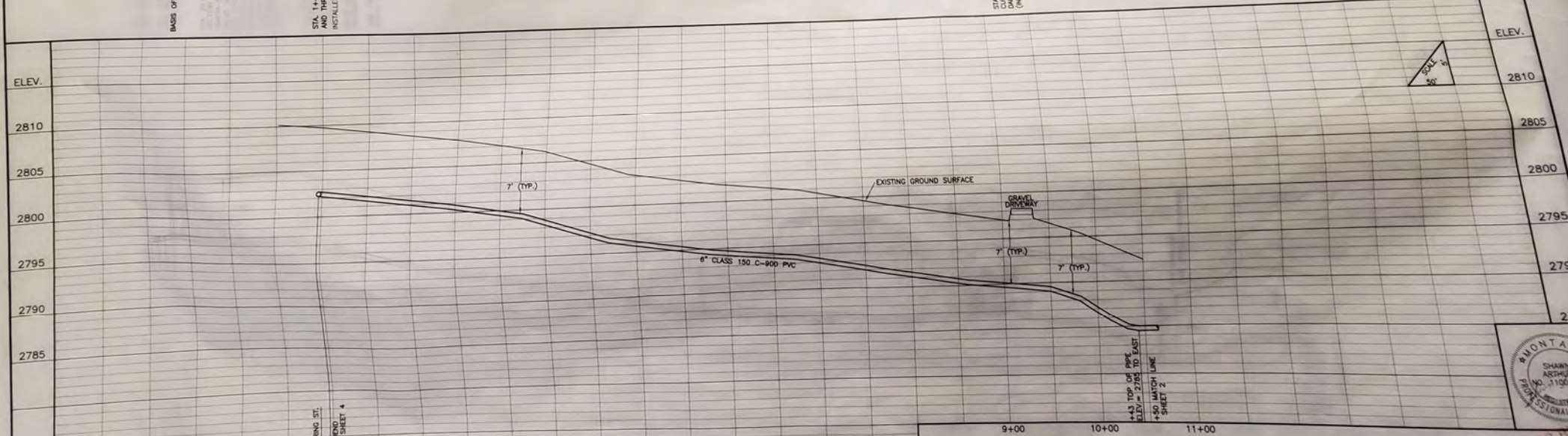
PRESSURE TEST 8-23-05 90 PSI FOR 10 HRS END TO VALVE AT WELL HOUSE

STA. 1+46.2 TO 10+50 INSTALL 925 L.F. 6" TRANSMISSION MAIN — INSTALLED JULY 2005

STA. 9+10 TO 9+33 REMOVE AND REPLACE 25 S.Y. 8" TH. GRAVEL SURFACING (MAX. GRAVEL PAY WIDTH 5' FROM CENTER OF PIPE ON EACH SIDE) — INSTALLED OCTOBER 2005

STA. 9+07 TO 9+34 PROTECT EXISTING CULVERT FROM DISTURBANCE OR DAMAGE DURING PIPE INSTALLATION (INCIDENTAL WORK)

NOVEMBER 2005
AS-BUILT



DESIGNED : SRA DRAWN : SRA CHECKED : GLK SCALE : 1" = 50' DATE : AUGUST 2004	DELTA ENGINEERING P.C. CONSULTING ENGINEERS P. O. BOX 1481 GREAT FALLS, MT. 59403 (406) 727-3687	FILE NO. SHEET3 AS BUILT	GERALDINE WATER SYSTEM IMPROVEMENTS – PHASE TRANSMISSION MAIN– GERALDINE AVE. FROM BREWSTER ST. TO SPRING

MONTANA
SHAWN ARTHUR
NO. 11007
REGISTERED PROFESSIONAL

AS-BUILT

NOTE:

1. BACKFILL UNDER STREETS AND DRIVEWAYS SHALL BE TYPE A. ALL OTHER BACKFILL ON THIS SHEET SHALL BE TYPE C.

NOTE:

1. CHLORINATE AND FLUSH MAIN PRIOR TO INSTALLATION OF AIR RELIEF VALVE IN AIR RELIEF MANHOLE.

STA. 1+18 REMOVE AND REPLACE FENCE AS NECESSARY TO ALLOW FOR MAIN INSTALLATION, PROVIDE TEMPORARY FENCING TO PREVENT LIVESTOCK ESCAPE. (INCIDENTAL WORK TO MAIN INSTALLATION)

STA. 9+98 REMOVE AND REPLACE FENCE AS NECESSARY TO ALLOW FOR MAIN INSTALLATION, PROVIDE TEMPORARY FENCING TO PREVENT LIVESTOCK ESCAPE. (INCIDENTAL WORK TO MAIN INSTALLATION)

GERALDINE AVE. / AIRPORT ROAD

SPRING STREET (NOT DEVELOPED)

LONG AVE. (NOT DEVELOPED)

FLAGLER AVE.

WINCHELL AVE. (NOT DEVELOPED)

SPRING STREET (NOT DEVELOPED)

IRON MONUMENT (LOCATED)

IRON MONUMENT (UNCONFIRMED)

IRON MONUMENT (LOCATED)

TBM: HYDRANT ELEV.= 2804.83

TBM: TOP OF MONUMENT ELEV.= 2798.64

FLUSHING HYDRANT

NEW 6" WATER MAIN

EXISTING 2" PE WATER MAIN

EXISTING SANITARY SEWER (CROSSING IS INCIDENTAL WORK)

GRAVEL ROADWAY

GRAVEL DRIVEWAY

ABANDONED WOOD WATER MAIN

BRIAN DUVAL RESIDENCE

BILL & MARY SILVIUS RESIDENCE

POLE

UG TELE

UG CABLE TV

W.S.

BIN

SCALE: 1"=50'

STA. 1+07 10' RT, CONTINUE MAIN FROM 90° BEND

STA. 1+15 10' RT, INSTALL 6" GATE VALVE AND VALVE BOX INSTALLED JULY 2005

STA. 2+10 10' RT, INSTALL 2" SINGLE SECTION TAPERSEAL CLAMP (SMITH BLAIR 372), CORPORATION VALVE (MUELLER B-25046), 5 LF. 2" PVC PIPE W/ GLUE X MIP FITTINGS (INCIDENTAL TO HYDRANT INSTALLATION), POST TYPE 2" FLUSHING HYDRANT (KUPFERLE #77 MANGING HYDRANT) AND 1 C.Y. DRAIN GRAVEL INSTALLED AUGUST 2005

STA. 2+25 10' RT, INSTALL AUTOMATIC AIR RELEASE STATION (SEE DETAIL) INSTALLED AUGUST 2005

BASIS OF STATIONING: IRON MONUMENT STA. 3+00

TBM: TOP OF MONUMENT ELEV.= 2809.46

PRESSURE TEST 8-23-05 90 PSI FOR 10 HRS END TO VALVE AT WELL HOUSE

STA. 1+07 TO 13+73.2 10' RT, INSTALL 1270 LF 6" TRANSMISSION MAIN — INSTALLED JULY 2005

STA. 10+23 TO 11+16 10' RT, REMOVE AND REPLACE 115 S.Y. 8" TH. GRAVEL SURFACING (MAX. GRAVEL PAY WIDTH 5' FROM CENTER OF PIPE ON EACH SIDE) — INSTALLED OCTOBER 2005

STA. 13+73.2 10' RT, INSTALL 6"x90° BEND AND THRUST BLOCK (MJ X PVC) INSTALLED JULY 2005

NOVEMBER 2005
AS-BUILT

ELEV.
2815
2810
2805
2800
2795
2790
2785

SCALE 5' 50'

FENCE
6.5'
7' (TYP.)
EXISTING GROUND SURFACE
WATER SERV.
TELE
6" MIN.
NEW WATER
SANITARY SEWER
18" MIN.
7' (TYP.)
GRAVEL
DRY DRAINAGE (SEE SPECIAL PROVISIONS)
6" CLASS 150 C-900 PVC
ABANDONED WATER
7' (TYP.)
CABLE TV

MATCH LINE SHEET 3
+07 90° BEND
+15 6" GATE VALVE
+23 FLUSHING HYDRANT
+33 AUTOMATIC AIR RELEASE STATION

+73.2 90° BEND
MATCH LINE SHEET 5
+97.3 WINCHELL AVE.

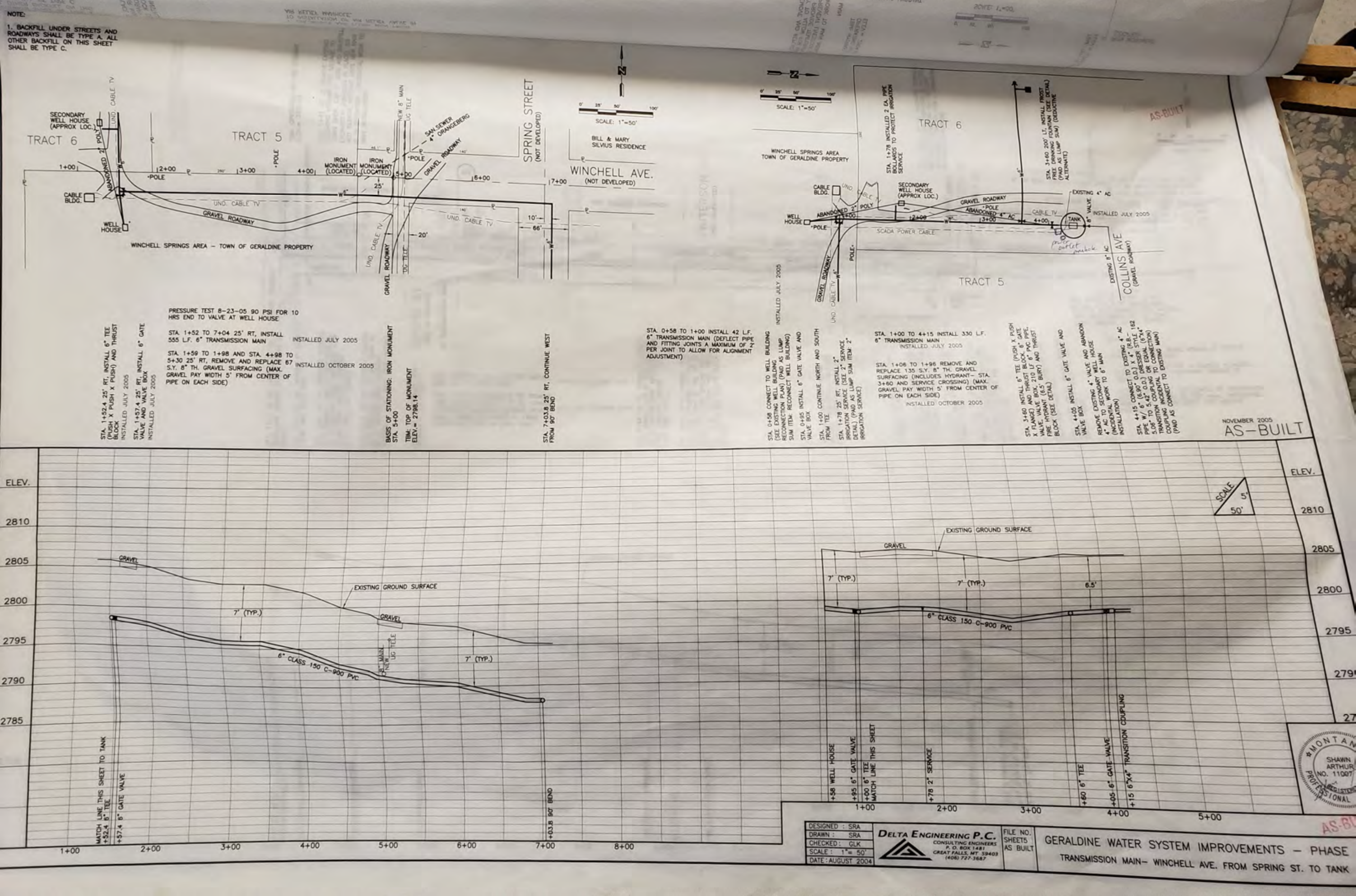
1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00

DESIGNED : SRA	DELTA ENGINEERING P.C.
DRAWN : SRA	CONSULTING ENGINEERS
CHECKED : GLK	P. O. BOX 1481
SCALE : 1" = 50'	GREAT FALLS, MT. 59403
DATE : AUGUST 2004	(406) 727-3587

FILE NO.
SHEET4
AS BUILT

GERALDINE WATER SYSTEM IMPROVEMENTS – P

TRANSMISSION MAIN– SPRING ST. FROM GERALDINE AVE. TO WI


NOTE:
1. BACKFILL UNDER STREETS AND ROADWAYS SHALL BE TYPE A. ALL OTHER BACKFILL ON THIS SHEET SHALL BE TYPE C.
TRACT 6
TRACT 5
SECONDARY WELL HOUSE (APPROX LOC.)
CABLE BLDG.
WELL HOUSE
UND. CABLE TV
GRAVEL ROADWAY
WINCHELL SPRINGS AREA – TOWN OF GERALDINE PROPERTY
IRON MONUMENT (LOCATED)
SAN SEWER 4" ORANGEBERG
SPRING STREET (NOT DEVELOPED)
SCALE: 1"=50'
BILL & MARY SILVIUS RESIDENCE
WINCHELL AVE. (NOT DEVELOPED)
PRESSURE TEST 8-23-05 90 PSI FOR 10 HRS END TO VALVE AT WELL HOUSE
STA. 1+52 TO 7+04 25' RT, INSTALL 555 L.F. 6" TRANSMISSION MAIN INSTALLED JULY 2005
STA. 1+59 TO 1+98 AND STA. 4+98 TO 5+30 25' RT, REMOVE AND REPLACE 67 S.Y. 8" TH. GRAVEL SURFACING (MAX. GRAVEL PAY WIDTH 5' FROM CENTER OF PIPE ON EACH SIDE) INSTALLED OCTOBER 2005
STA. 1+52.4 25' RT, INSTALL 6" TEE (PUSH X PUSH X PUSH) AND THRUST BLOCK INSTALLED JULY 2005
STA. 1+57.4 25' RT, INSTALL 6" GATE VALVE AND VALVE BOX INSTALLED JULY 2005
BASIS OF STATIONING: IRON MONUMENT STA. 5+00
TBM: TOP OF MONUMENT ELEV.= 2798.14
STA. 7+03.8 25' RT, CONTINUE WEST FROM 90° BEND
WINCHELL SPRINGS AREA TOWN OF GERALDINE PROPERTY
SCADA POWER CABLE
EXISTING 4" AC
INSTALLED JULY 2005
TANK
COLLINS AVE (GRAVEL ROADWAY)
STA. 0+58 TO 1+00 INSTALL 42 L.F. 6" TRANSMISSION MAIN (DEFLECT PIPE AND FITTING JOINTS A MAXIMUM OF 2° PER JOINT TO ALLOW FOR ALIGNMENT ADJUSTMENT)
STA. 1+00 TO 4+15 INSTALL 330 L.F. 6" TRANSMISSION MAIN INSTALLED JULY 2005
STA. 1+06 TO 1+96 REMOVE AND REPLACE 135 S.Y. 8" TH. GRAVEL SURFACING (INCLUDES HYDRANT– STA. 3+60 AND SERVICE CROSSING) (MAX. GRAVEL PAY WIDTH 5' FROM CENTER OF PIPE ON EACH SIDE) INSTALLED OCTOBER 2005
AS-BUILT
NOVEMBER 2005
AS–BUILT
ELEV.
2810
2805
2800
2795
2790
2785
EXISTING GROUND SURFACE
GRAVEL
7' (TYP.)
6" CLASS 150 C-900 PVC
6.5'
MATCH LINE THIS SHEET TO TANK
+52.4 6" TEE
+57.4 6" GATE VALVE
+03.8 90° BEND
+58 WELL HOUSE
+95 6" GATE VALVE
+00 6" TEE MATCH LINE THIS SHEET
+78 2" SERVICE
+60 6" TEE
+05 6" GATE VALVE
+15 6"X4" TRANSITION COUPLING
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
DESIGNED : SRA
DRAWN : SRA
CHECKED : GLK
SCALE : 1"= 50'
DATE : AUGUST 2004
DELTA ENGINEERING P.C.
CONSULTING ENGINEERS
P.O. BOX 1481
GREAT FALLS, MT 59403
(406) 727-3687
FILE NO.
SHEETS
AS BUILT
GERALDINE WATER SYSTEM IMPROVEMENTS – PHASE
TRANSMISSION MAIN– WINCHELL AVE. FROM SPRING ST. TO TANK

TE:
ALL BACKFILL ON THIS SHEET
LL BE TYPE A.

TBM: OPERATING NUT ON HYDRANT
ELEV. = 2804.93

STA. 1+41 18' LT, REMOVE EXISTING FLUSHING HYDRANT AND SALVAGE TO TOWN SHOP. CAP 2" MAIN AND BACKFILL EXCAVATION (ABANDON IN PLACE). DO NOT REMOVE HYDRANT UNTIL NEW MAIN IS IN OPERATION. (INCIDENTAL WORK TO MAIN INSTALLATION)

REMOVED FLUSHING HYDRANT

BRIAN DUVAL RESIDENCE

GRAVEL DRIVEWAY

BIN

CURB STOP METER PIT

SANITARY SEWER CLEANOUT

POLE

SANITARY SEWER

GRAVEL DRIVEWAY

BOB SPEVACEK RESIDENCE

PATTERSON ST.
(NOT DEVELOPED)

UG CABLE TV

UG TELE

1+00

2+00

IRON MONUMENT

3+00 GRAVEL ROADWAY

4+00

EXISTING 4" PVC

5+00

METER PIT

6+00

IRON MONUMENT

7+00

GRAVEL ROADWAY

ABANDONED 2" MAIN

8+00

9+00

10+00

11+00

GRAVEL ROADWAY

SPRING ST.
(NOT DEVELOPED)

6" TRANSMISSION MAIN

POLE

STA. 10+37 47' LT, EXCAVATE SERVICE LINE, CONNECTION, ABANDON IN PLACE, REINSTALL CURB STOP, REPAIR ASPHALT SURFACING (PAID AS ITEM – ABANDON SERVICE CONNECTION)

8" SANITARY SEWER

FRIELDS ST.

EXISTING 4" AC

ABANDONED WOOD PIPE

LEONARD THORESON RESIDENCE

WS

EXISTING VALVE (REMOVED)

ABANDONED WOOD PIPE

FLAGLER AVE.

MAIN CONTINUED TO EAST AS ADDITIONAL WORK (SEE EXTENSION DRAWING)

BOB CARTWRIGHT RESIDENCE

ABANDONED WOOD PIPE

STA. 10+37 45' LT TO 10' RT, INSTALL 44 L.F. 8" WATER MAIN. SALVAGE ALL FITTINGS, TAPS, VALVES, AND VALVE BOXES TO THE TOWN SHOP (SALVAGE WORK, INCIDENTAL)

AS BUILT

SCALE: 1"=50'

EXISTING 4" AC

4" COUPLER (AC TO PVC)
4" 90° BEND (PUSH X PUSH)
8.5 L.F. 4" CLASS 200 C-900 PVC
4" 90° BEND (PUSH X PUSH)
8"X4" REDUCER (PUSH X PUSH)
8" TEE (PUSH X 3)
EXISTING 6" HYDRANT VALVE (NOT DISTURBED)
6" CLASS 150 C-900 PVC
8" CLASS 150 C-900 PVC
8" GATE VALVE

NOTES:

1. EXISTING MAINS SHALL REMAIN IN SERVICE DURING CONSTRUCTION.
2. SERVICE OUTAGE NOT TO EXCEED 8 HOURS MAXIMUM. PROVIDE TEMPORARY SERVICE IF NECESSARY.
3. THE EXISTING 4" MAIN SHALL BE ABANDONED AFTER INSTALLATION OF NEW MAIN. (INCIDENTAL WORK TO 8" WATER MAIN.) (SEE SPECIAL PROVISIONS.)

NOVEMBER 2005
AS-BUILT

STA. 1+12 10' RT, INSTALL 8" 90° BEND AND THRUST BLOCK (PUSH X PUSH)

STA. 1+17 10' RT, INSTALL 8" GATE VALVE AND VALVE BOX

STA. 1+41 10' RT, CONNECT EXISTING 3/4" SERVICE LINE TO NEW MAIN W/ 12 LF COPPER PIPE, INSTALLED NEW CURB STOP. EXISTING SERVICE – 3/4" POLY. (SEE DETAIL)

STA. 2+15 10' RT, CONNECT EXISTING 3/4" SERVICE LINE TO NEW MAIN W/ 10 LF COPPER PIPE, INSTALLED NEW SERVICE – 3/4" POLY. (SEE DETAIL)

BASIS OF STATIONING: IRON MONUMENT STA. 3+00

STA. 1+12 TO 10+39 10' RT, INSTALL 935 L.F. 8" WATER MAIN — INSTALLED AUGUST 2005

STA. 1+12 TO 10+42 16' RT, REMOVE AND REPLACE 500 S.Y. 8" TH. GRAVEL SURFACING (INCLUDES SERVICE RUNS) (MAX. GRAVEL PAY WIDTH 5' FROM CENTER OF PIPE ON EACH SIDE) — INSTALLED OCTOBER 2005

STA. 5+64 10' RT, CONNECT EXISTING 3/4" SERVICE LINE TO NEW MAIN W/ 15 LF COPPER PIPE, INSTALLED NEW CURB STOP. EXISTING SERVICE – 3/4" POLY. (SEE DETAIL)

STA. 6+23 10' RT, INSTALL 8"X6" TEE (ALL X ALL FLANGE), 6" VALVE, VALVE BOX AND STEM (TOP BOLT BURIED 1' BELOW GROUND SURFACE), 16 L.F. 6" PVC PIPE, FIRE HYDRANT (6.5' BURY) AND THRUST BLOCK (SEE DETAIL)

STA. 8+20 PAD (PROTECT EXISTING CULVERT FROM DAMAGE (DO NOT DISTURB)) (INCIDENTAL WORK)

STA. 9+84 10' RT, CROSS 1 EA. SANITARY SEWER SERVICE

STA. 9+93 10' RT, CONNECT EXISTING 3/4" SERVICE LINE TO NEW MAIN W/ 5' LF COPPER PIPE. INSTALL NEW – UNKNOWN MATERIALS. (SEE DETAIL)

STA. 10+37 36' LT, INSTALL 8"X8"X6" (PUSH X PUSH) TEE AND THRUST BLOCK

STA. 10+37 TO 10+53 36' LT, CONNECT EXISTING 6" CLASS 150 C-900 INSTALL 16 LF 6" CLASS 150 C-900 PIPE, (CONNECTION TO MAIN INCIDENTAL) AND MJ COUPLING IS INCIDENTAL AND NOT PAID AS SEPARATE ITEM

STA. 10+37 5' RT, INSTALL 8" GATE VALVE AND VALVE BOX

STA. 10+37 10' RT, INSTALL 8"X8"X6" (PUSH X PUSH X PUSH) TEE AND THRUST BLOCK

SCALE 5' 50'

ELEV.
2805
2800
2795
2790
2785

GRAVEL

EXISTING GROUND SURFACE

6.5' (TYP.)

8" CLASS 150 C-900 PVC

NEW 6" WATER

6.5' (TYP.)

CULVERT

TELE

SAN. SEWER SERVICE

18" MIN.

+12 90° BEND
+17 8" GATE VALVE
+45 SERVICE CONNECTION
+15 SERVICE CONNECTION
+00 ℄ SPRING STREET
+88 SERVICE CONNECTION
+23 8"x6" TEE
+66 ℄ PATTERSON STREET
+83 SERVICE CONNECTION
+32 ℄ FRIELDS STREET
+17 8"x8"x8" TEE
+39 8" END CAP

1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00

DESIGNED : SRA	
DRAWN : SRA	
CHECKED : GLK	
SCALE : 1"= 50'	
DATE : AUGUST 2004	

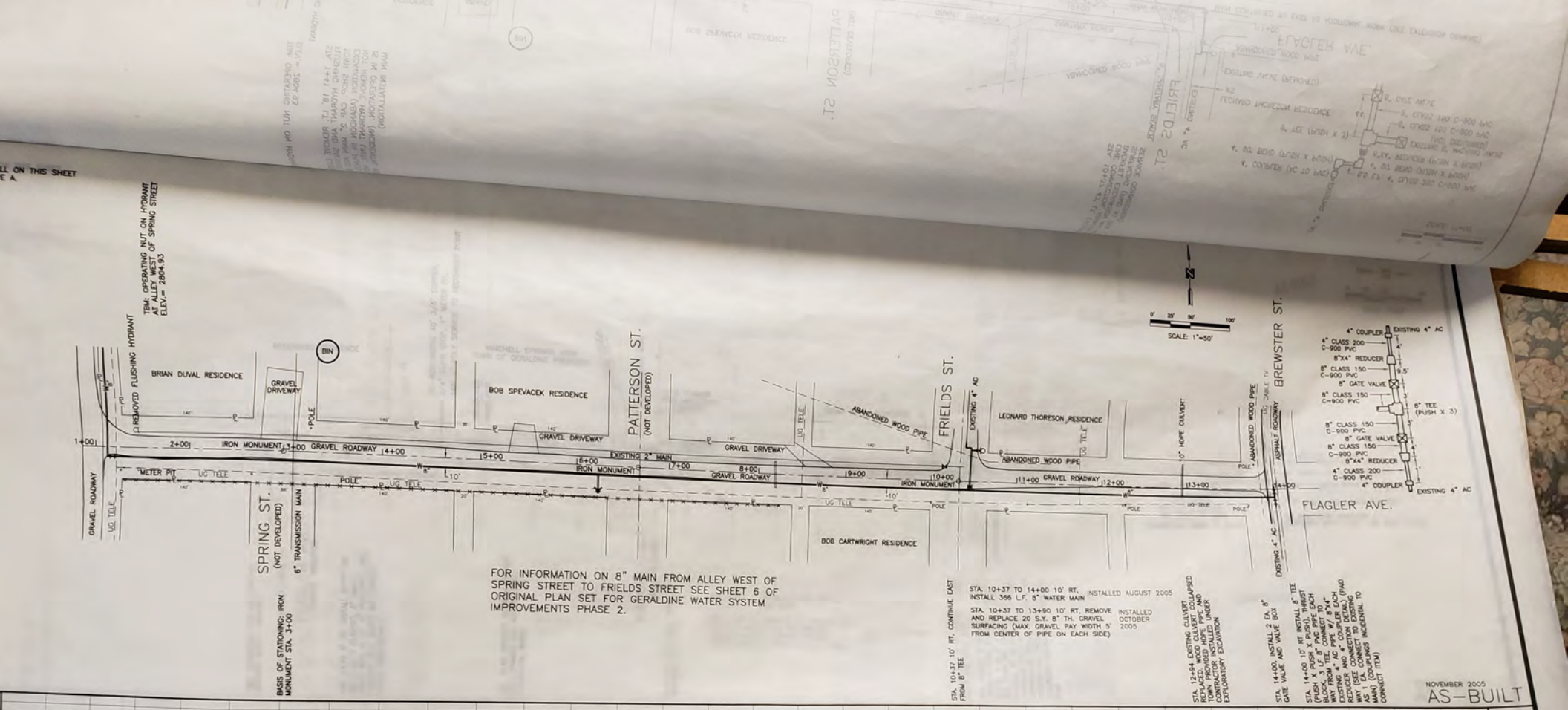
DELTA ENGINEERING P.C.
CONSULTING ENGINEERS
P. O. BOX 1481
GREAT FALLS, MT 59403
(406) 727-1687

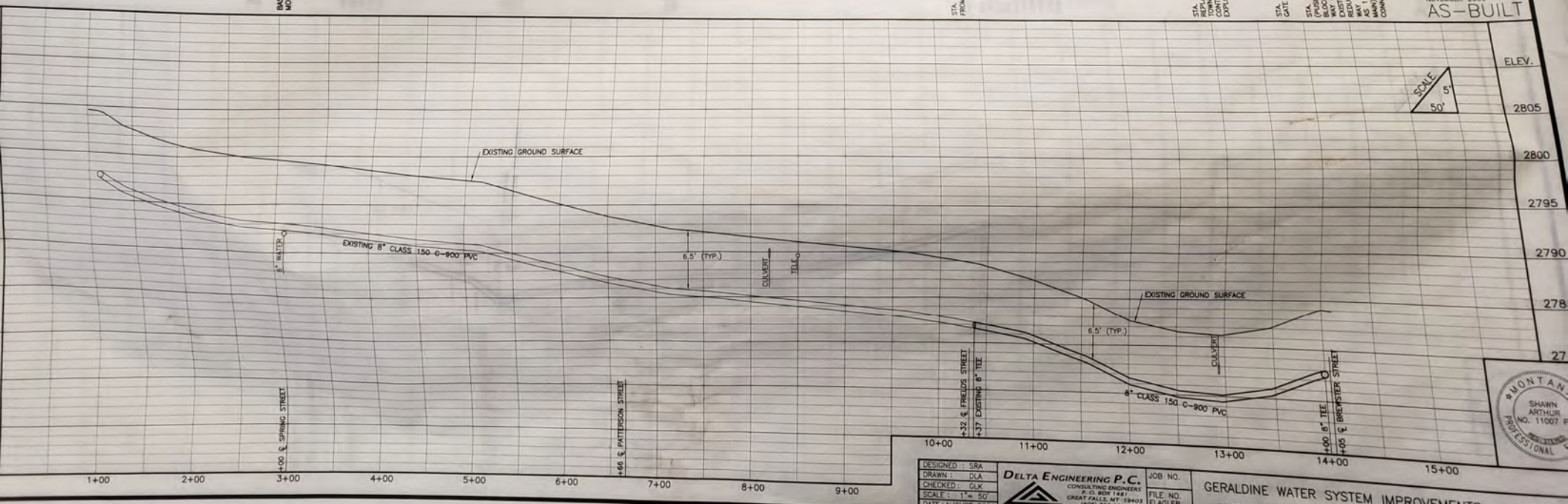
FILE NO.
SHEET 6
AS BUILT

GERALDINE WATER SYSTEM IMPROVEMENTS – PHASE II
WATER MAIN– FLAGLER AVE. FROM FRIELDS ST. TO ALLEY W. OF SPRING

MONTANA
SHAWN ARTHUR
NO. 11007
PROFESSIONAL ENGINEER
REGISTERED

AS-BUILT





DESIGNED : SRA	
DRAWN : DLA	
CHECKED : GLK	
SCALE : 1"= 50'	
DATE : AUGUST 2005	

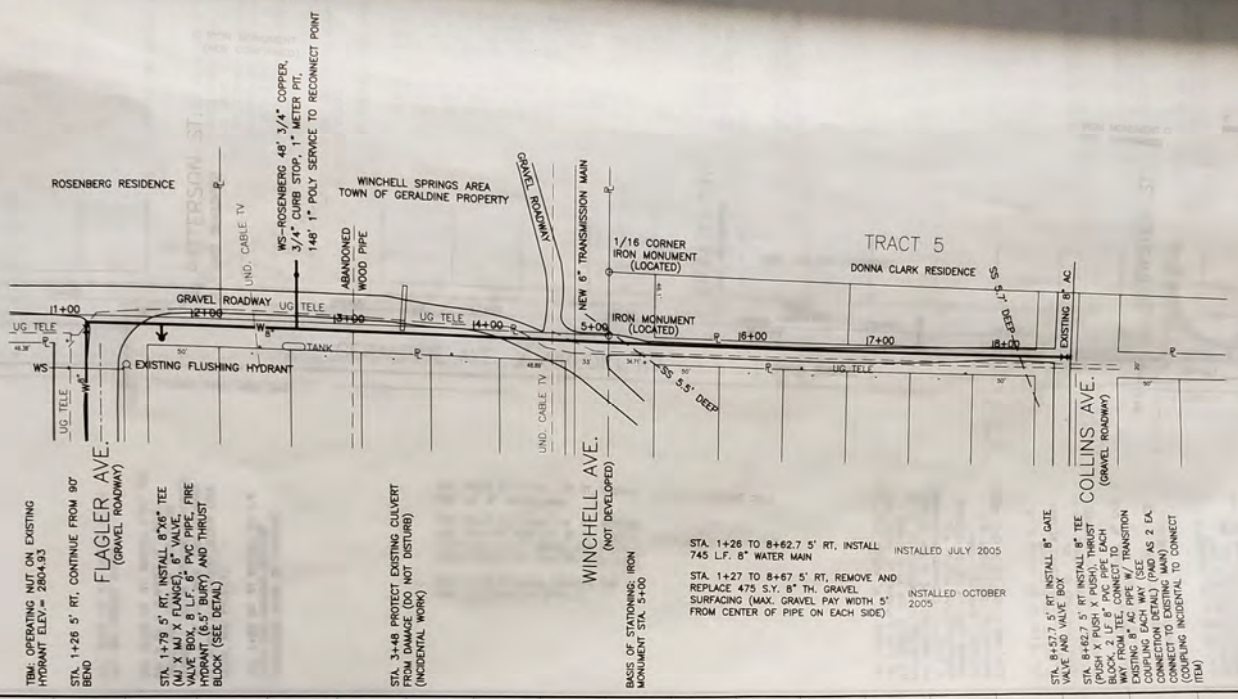
DELTA ENGINEERING P.C.
CONSULTING ENGINEERS
P. O. BOX 1481
GREAT FALLS, MT 59403
(406) 727-3687

JOB NO.
FILE NO. FLAGLER EXTENSION

GERALDINE WATER SYSTEM IMPROVEMENTS – PHASE

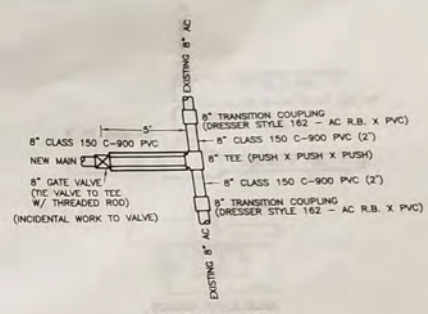
WATER MAIN– FLAGLER AVE. FROM FRIELDS ST.

MONTANA
SHAWN ARTHUR
NO. 11007
PROFESSIONAL
REGISTERED



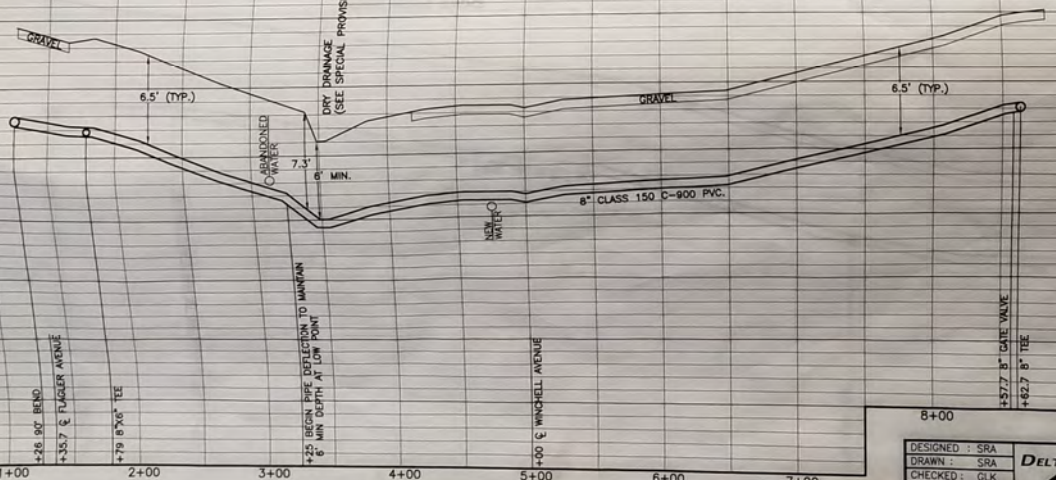
AS-BUILT

SCALE: 1"=50'



CONNECTION DETAIL
NO SCALE

NOVEMBER 2005
AS-BU



DESIGNED : SRA	
DRAWN : SRA	
CHECKED : GLK	
SCALE : 1"= 50'	
DATE :AUGUST 2004	

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GREAT FALLS, MT 59403
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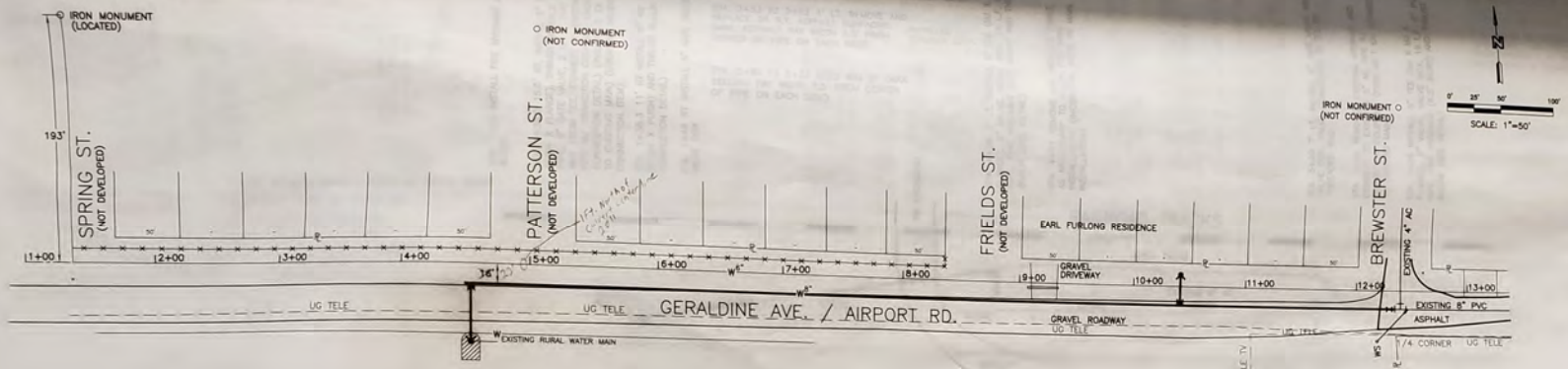
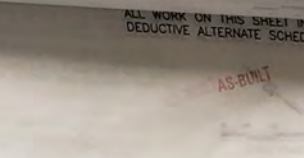
FILE NO.
SHEET7
AS BUILT

GERALDINE WATER SYSTEM IMPROVEMENTS –
WATER MAIN– ALLEY W. OF SPRING ST. FROM FLAGLER AVE.

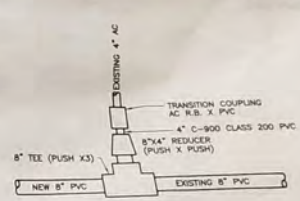
L BACKFILL ON THIS SHEET
BE TYPE A.





ALL WORK ON THIS SHEET IN DEDUCTIVE ALTERNATE SCHEDULE

AS-BUILT



REDUCER THRUST BLOCK

NOTE:
1. INSTALL THRUST BLOCK ON TEE PER MPWSS. (CONC. SHALL NOT OBSTRUCT BOLT REPLACEMENT)
2. INSTALL 2'X2'X1.5' THRUST BLOCK BELOW REDUCER AND SECURE REDUCER TO BLOCK W/ 1 EA. #4 REBAR EMBEDDED INTO BLOCK AS SHOWN. (EMBED MIN. 8")
3. FIELD BEND REBAR TO FIT TIGHTLY AROUND REDUCER.
4. PAINT REBAR W/ 3 COATS OIL-BASED PAINT PRIOR TO PLACEMENT.

CONNECTION DETAIL
NO SCALE

NOVEMBER 2005
AS-BUILT

TBM: TOP OF MONUMENT
ELEV.= 2859.46

BASIS OF STATIONING: (SEE SHEET 2)

STA. 4+50 16' RT, INSTALL 8" MJ CAP AND THRUST BLOCK

STA. 4+55 16' RT, INSTALL 8"X6" TEE (MJ X MJ X FLANGE), 6" VALVE, VALVE BOX (TOP OF BOX TO BE BURIED 1' BELOW GROUND SURFACE), 50 L.F. 6" PVC PIPE, FIRE HYDRANT (6' BURY) AND THRUST BLOCK (SEE DETAIL AND PROFILE)

STA. 4+55 50' RT, INSTALL 16 C.Y. EARTH FILL AROUND HYDRANT (INCIDENTAL WORK TO HYDRANT)

STA. 4+50 TO 12+40 16' RT, INSTALL 790 L.F. 8" WATER MAIN — INSTALLED AUGUST 2005

STA. 4+45 TO 12+20 16' RT, REMOVE AND REPLACE 630 S.Y. 8" TH. GRAVEL SURFACING (MAX. GRAVEL PAY WIDTH 5' FROM CENTER OF PIPE ON EACH SIDE) — INSTALLED OCTOBER 2005

STA. 4+50 TO 5+45 MAINTAIN TOP OF PIPE ELEVATION OF 2798.30'

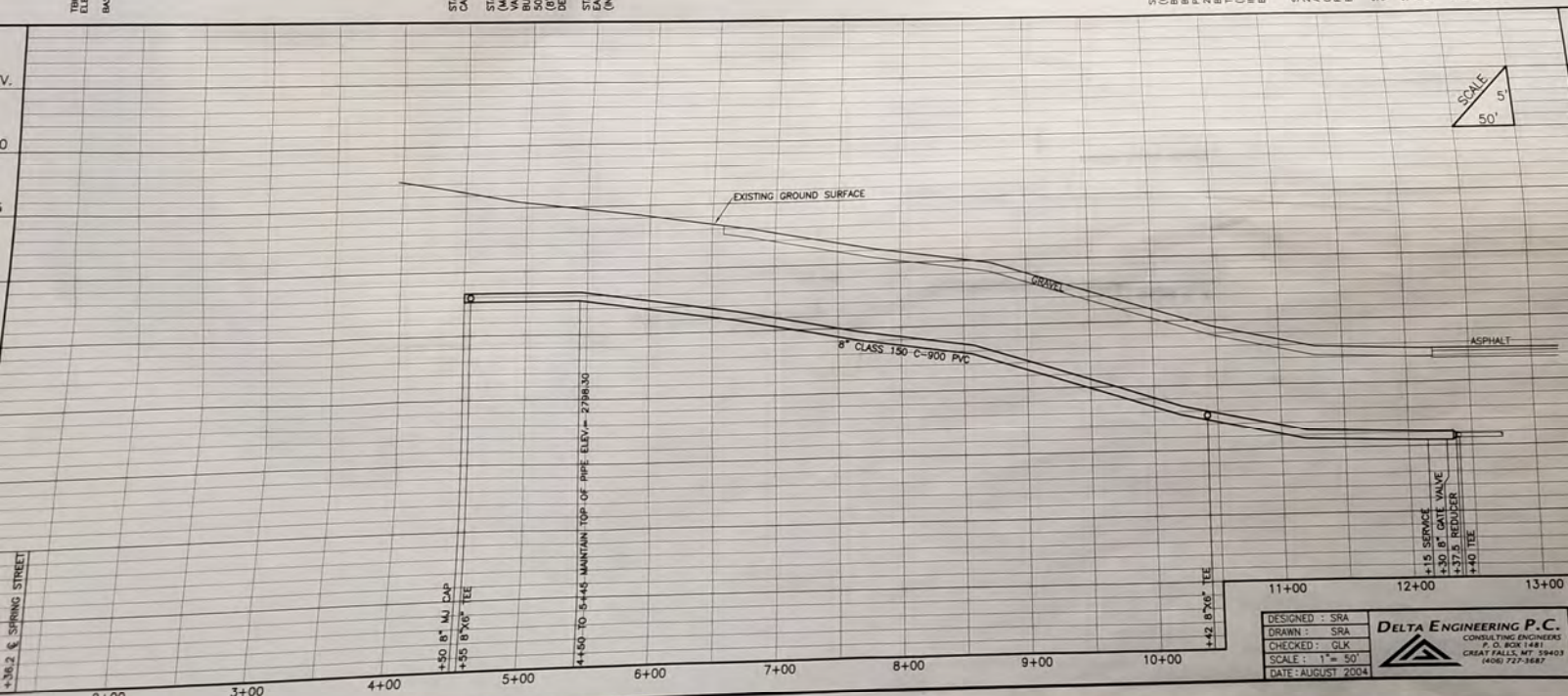
STA. 10+42 16' RT, INSTALL 8"X6" TEE (MJ X MJ X FLANGE), 6" VALVE, VALVE BOX (TOP OF BOX TO BE BURIED 1' BELOW GROUND SURFACE), 20 L.F. 6" PVC PIPE, (BED AND BACKFILL W/ 2" EXTRUDED POLYSTYRENE R5 HIGH INSULATION (INSTALL FULL TRENCH WIDTH ON TOP OF BEDDING) AND THRUST BLOCK, HYDRANT (INCIDENTAL WORK TO HYDRANT INSTALLATION, 6.5' BURY) AND THRUST BLOCK (SEE DETAIL)

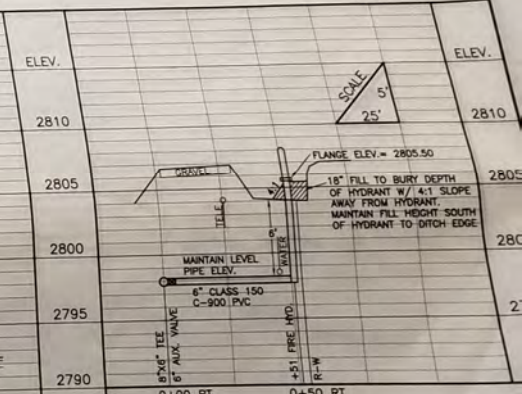
STA. 12+15 16' RT, INSTALL 5 L.F. 2" SERVICE AND CURB STOP, SADDLE EXISTING SERVICE AT MAIN AND CONNECTION (PAD AS 2 EA. RECONNECT EXISTING SERVICE AND 1 EA. ABANDON SERVICE CONNECTION)

STA. 12+30 16' RT, INSTALL 8" GATE VALVE AND VALVE BOX

STA. 12+38 16' RT, INSTALL 8" TEE AND THRUST BLOCK (SEE DETAIL) (PUSH X 3)

STA. 12+38 16' RT, CONNECT TO EXISTING 4" MAIN WITH 8"X4" REDUCER, 18" LONG DETAIL, PAD AS 2 EA. COUPLER, TO EXISTING CONNECT BY SPEC.





STA. 4+55 RT – FIRE HYDRANT LATERAL PROFILE

ALL WORK ON THIS SHEET IN DEDUCTIVE ALTERNATE SCHEDULE

DESIGNED : SRA	
DRAWN : SRA	
CHECKED : GLK	
SCALE : 1"= 50'	
DATE : AUGUST 2004	

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FILE NO.
SHEET8
AS BUILT

GERALDINE WATER SYSTEM IMPROVEMENTS – PH

WATER MAIN– GERALDINE AVE. FROM BREWSTER ST. TO PATTER

ACKFILL UNDER ROADWAYS
L BE TYPE A. ALL OTHER
KFILL ON THIS SHEET SHALL BE
E C.

STA. 1+00 INSTALL FIRE HYDRANT AND THRUST BLOCK

STA. 1+36.2 15.5' RT, INSTALL 6" TEE (PUSH X PUSH X FLANGE), THRUST BLOCK,2 LF, 6" PVC PIPE, 6" GATE VALVE, 2 LF 6" PVC PIPE EACH WAY FROM TEE, CONNECT TO EXISTING 6" AC PIPE WITH TRANSITION COUPLING (PAID AS 1 EA. CONNECT TO EXISTING MAIN) (COUPLING INCIDENTAL TO CONNECTION ITEM)

STA. 1+36.3 11' RT INSTALL 6" 45° BEND (PUSH X PUSH) AND THRUST BLOCK (SEE CONNECTION DETAIL)

STA. 1+48 RT INSTALL 6" GATE VALVE AND VALVE BOX

STA. 1+36.2 TO 7+43 INSTALL 852 LF 6" TRANSMISSION MAIN — INSTALLED AUGUST 2005

STA. 3+53 TO 3+82 4' LT, REMOVE AND REPLACE 25 S.Y. ASPHALT SURFACING (MAX. ASPHALT PAY WIDTH 3.5' FROM CENTER OF PIPE ON EACH SIDE) — INSTALLED OCTOBER 2005

STA. 3+80 TO 5+33 SEED 400 SY (MAX. SEEDING PAY WIDTH 7.5' FROM CENTER OF PIPE ON EACH SIDE)

STA. 4+28 6' LT, INSTALL 6" TEE (MJ X MJ X FLANGE), 6" VALVE, VALVE BOX, 19 LF, 6" PVC PIPE, FIRE HYDRANT (6.5' BURY) AND THRUST BLOCK (SEE DETAIL)

STA. 4+61 REMOVE AND REPLACE FENCE AS NECESSARY TO ALLOW FOR MAIN INSTALLATION. (INCIDENTAL WORK TO MAIN INSTALLATION)

STA. 5+20 7' LT, INSTALL 6" GATE VALVE AND VALVE BOX CONNECTED TO TEE BY THREADED ROD

STA. 7+28 REMOVED EXISTING HYDRANT AND CONNECT TO EXISTING 6" AC PIPE W/ TRANSITION COUPLING (PAID AS 1 EA. CONNECT TO EXISTING MAIN)

STA. 7+26 INSTALL 6" TEE (MJ X MJ X FLANGE), 6" VALVE, VALVE BOX, 19 LF, 6" PVC PIPE, FIRE HYDRANT (6.5' BURY) AND THRUST BLOCK (SEE DETAIL)

ALL WORK ON THIS SHEET IN DEDUCTIVE ALTERNATE SCHEDULE

AS-BUILT

0' 25' 50' 100'
SCALE: 1"=50'

6" GATE VALVE (PUSH X PUSH) TIED TO TEE W/ THREADED ROD
6" 45° BEND (PUSH X PUSH) W/ THRUST BLOCK
6" CLASS 150 C-900 PVC
6" CLASS 150 C-900 PVC
6" VALVE (PUSH X FLANGE)
6" TEE (PUSH X PUSH X FLANGE)
6" CLASS 150 C-900 PVC (2')
6" TRANSITION COUPLING (DRESSER STYLE 162 – AC R.B. X PVC)
EXISTING 6" AC
6" TRANSITION COUPLING (DRESSER STYLE 162 – AC R.B. X PVC)
EXISTING 6" AC
6" CLASS 150 C-900 PVC (2')

CONNECTION DETAIL
NO SCALE

RR CROSSING
RAILROAD TRACKS
WOOD FENCE
EXISTING 6" AC
MILWAUKEE DEPOT
ASPHALT
RAILROAD AVE.
(ASPHALT PAVED)
BRADY AVE.
(DEVELOPED)
1+00 WS
2+00
3+00
4+00
5+00
6+00
7+00

BASIS OF STATIONING: FIRE HYDRANT STA. 1+00

TBM: OPERATING NUT ON HYDRANT ELEV.= 201.64

TBM: OPERATING NUT ON HYDRANT ELEV.= 202.46

NOVEMBER 2005
AS-BUILT

ELEV.
205
200
195
190
185
180

SCALE 5' 50'

FENCE
EXISTING GROUND SURFACE
ASPHALT
6.5' MIN.
EXISTING 6" AC
6" CLASS 150 C-900 PVC

+00 EXISTING FIRE HYDRANT
+36.2 TEE
+48 6" GATE VALVE
+06 FIRE HYDRANT
+20 GATE VALVE
+28 COUPLING
+44 EXISTING FIRE HYDRANT

1+00 2+00 3+00 4+00 5+00 6+00 7+00

ALL WORK ON THIS SHEET IN DEDUCTIVE ALTERNATE SCHEDULE

DESIGNED : SRA	
DRAWN : SRA	
CHECKED : GLK	
SCALE : 1" = 50'	
DATE : AUGUST 2004	

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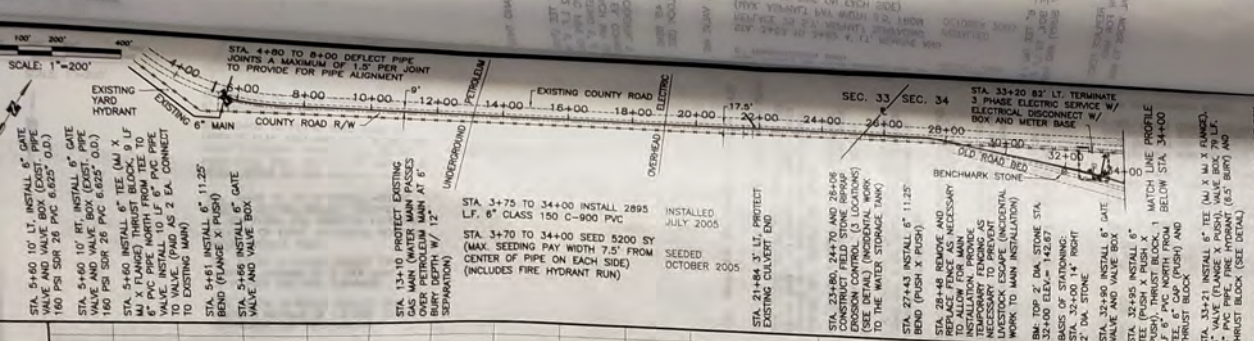
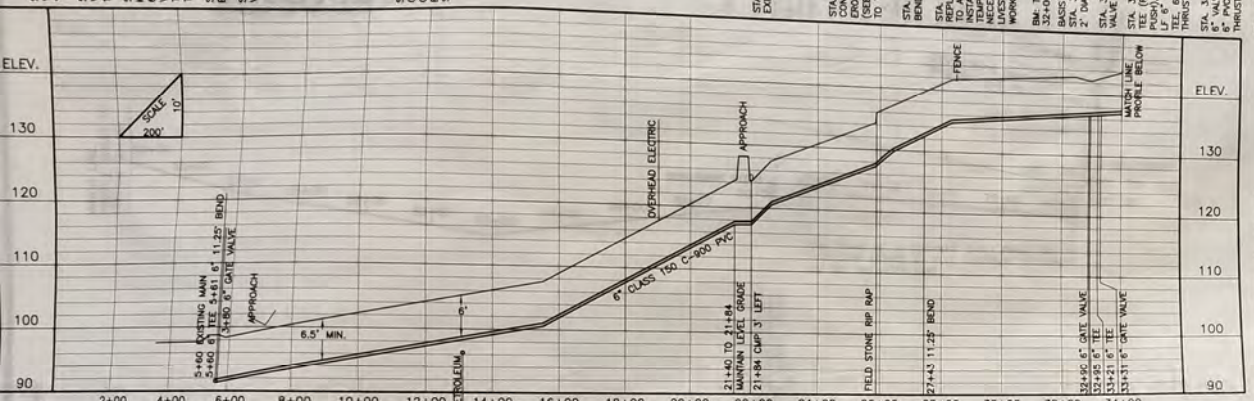
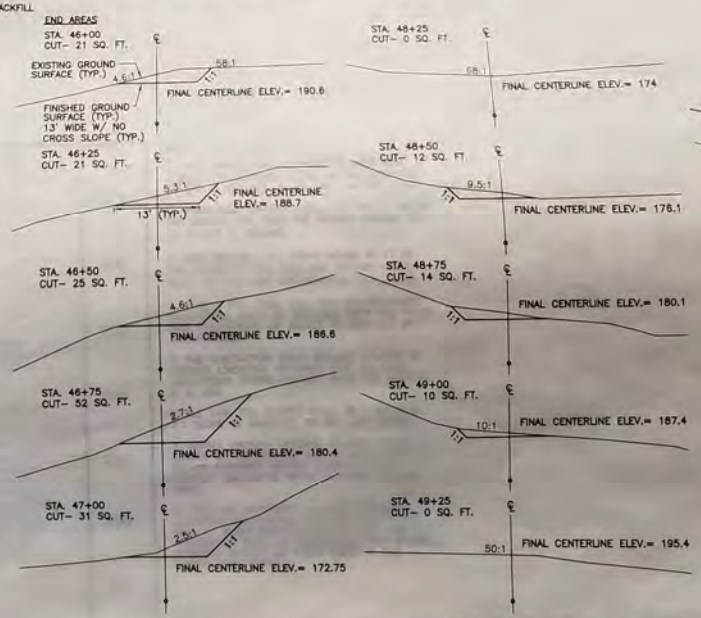
(406) 727-3687

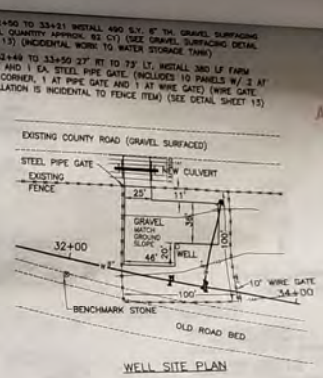
FILE NO.
SHEET9
AS BUILT

GERALDINE WATER SYSTEM IMPROVEMENTS – PHASE
TRANSMISSION MAIN– RAILROAD AVE. FROM DEPOT TO NORTH









WELL SITE PLAN

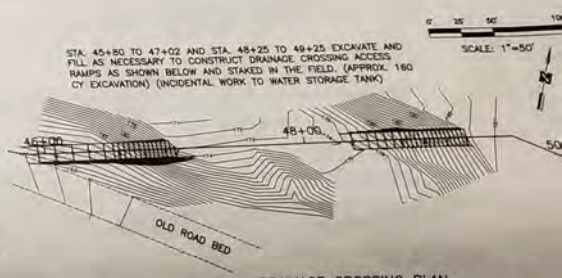
NOTE:

1. NATIVE SOILS THAT ARE FREE OF ROCK AND CLUMPS LARGER THAN 1" DIA. WILL BE ACCEPTED AS TYPE 1 BEDDING ON ALL PIPE ON THIS SHEET.

2. BACKFILL SHALL BE TYPE C EXCEPT WHERE THE TRENCH CROSSES APPROACHES, IN RIPRAP AREAS AND AT DRAINAGE ACCESS RAMPS. MOUND THE EXCESS SOIL OVER THE TRENCH (MOUND NOT TO EXCEED 8" HEIGHT).

3. TRENCH BACKFILL AT APPROACH CROSSINGS, IN RIPRAP AREAS AND AT DRAINAGE ACCESS RAMPS SHALL BE TYPE A. (DO NOT MOUND SOIL AT THE APPROACH CROSSINGS).

4. THE CONTRACTOR SHALL PROVIDE FENCING TO PREVENT LIVESTOCK ENTRANCE INTO ALL OPEN EXCAVATIONS DURING PERIODS WHEN THE PASTURE IS IN USE. (INCIDENTAL WORK)



DRAINAGE CROSSING PLAN

NOTES:

1. THE RAMP WIDTH SHALL BE 13'. THE CROSS SECTIONS PROVIDED ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ALL INVESTIGATIONS AND DETERMINATIONS OF THE EARTH EXCAVATION AND FILL NECESSARY FOR CONSTRUCTION OF THE DRAINAGE CROSSING RAMPS. THE OWNER AND ENGINEER MAKE NO REPRESENTATIONS AS TO THE ACCURACY OF THE CROSS SECTIONS PROVIDED.

2. ALL SLOPE FILL SHALL BE COMPACTED TO 92% AASHTO T-99.

3. PIPE BACKFILL SHALL BE COMPACTED TO 95% AASHTO T-99.

4. THE CUT SLOPES SHALL BE 1:1 MAXIMUM PERPENDICULAR AND AWAY FROM THE EDGE OF THE RAMP. ALL EXCAVATION IS UNCLASSIFIED AND INCIDENTAL TO THE WATER STORAGE TANK ITEM.

5. THE CONTRACTOR SHALL CONSTRUCT COMPACTED FILL TO A MINIMUM 1:1 FILL SLOPE PERPENDICULAR AND AWAY FORM THE RAMP EDGE. ALL FILL CONSTRUCTION IS INCIDENTAL TO THE WATER STORAGE TANK ITEM. ADDITIONAL FILL MAY BE PLACED AT THE CONTRACTORS REQUEST (AT NO COST TO THE OWNER) ON THE FILL SLOPES TO ALLOW FOR DISPOSAL OF EXCESS EXCAVATED MATERIAL. ALL FILL MATERIAL SHALL MEET THE FILL COMPACTION REQUIREMENTS.

6. SEED ALL DISTURBED SURFACES. SEEDING QUANTITIES INCLUDE ALL INDICATED CUT AND FILL SLOPES, AND 14' WIDTH CENTERED ON THE PIPE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEEDING REQUIRED OUTSIDE OF THE DESCRIBED AREAS AT NO COST TO THE OWNER.

EXCAVATION CROSS SECTIONS
SCALE: 1"=10'
NO VERTICAL EXAGGERATION

DESIGNED :	SRA
DRAWN :	SRA
CHECKED :	GLK
SCALE :	1" = 200'
DATE :	DEC. 2004

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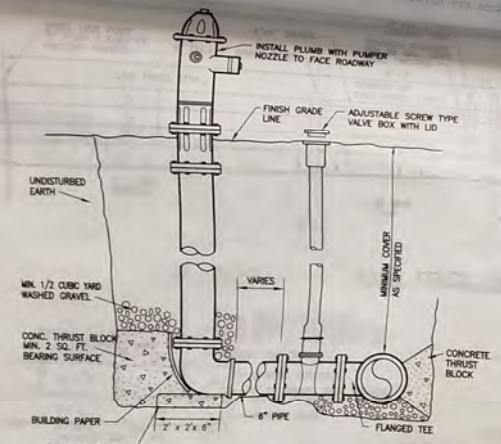
FILE NO.
SHEET 10
AS BUILT

GERALDINE WATER SYSTEM IMPROVEMENTS
TRANSMISSION MAIN- COUNTY ROAD FROM SPRING M

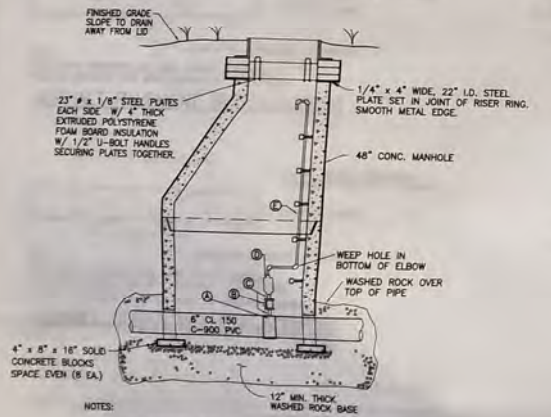


NOTES:

1. FIRE HYDRANT– MUELLER SUPER CENTURION A-423.
2. THRUST BLOCKING SHALL BE IN CONFORMANCE WITH STANDARD DRAWING 02660-1 (MPWSS).
3. FOR BOLTED FITTINGS, BLOCKING SHALL NOT OBSTRUCT BOLTS.
4. THRUST BLOCK OR POLYETHYLENE WRAP SHALL NOT OBSTRUCT HYDRANT DRAIN HOLES.

FIRE HYDRANT AND AUX. VALVE

NO SCALE



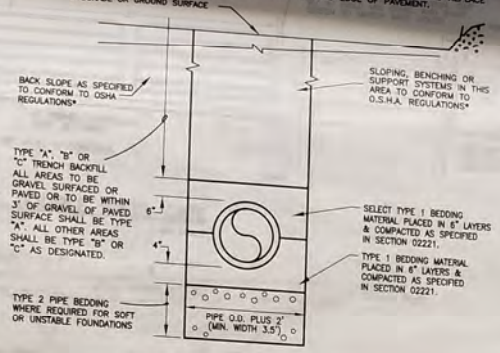
NOTES:

1. MANHOLE SHALL BE ASTM C-478 PER MPWSS STD. DWG. NO. 02720-5.
2. MANHOLE PIPE OPENINGS SHALL BE DOG-HOUSE TYPE TO PROVIDE FOR 3/4" MIN. CLEARANCE AROUND THE 6" PIPE AND REMOVAL OF THE MANHOLE WITHOUT DISTURBING THE PIPELINE. THE SLOTS SHALL BE LOCATED 90° FROM THE STEP LOCATION.
3. PARTS DESCRIPTION:
   A : 3/4" STAINLESS STEEL SERVICE SADDLE W/ F.I.P. THREAD. (SEE SPECS)
   B : MUELLER 3/4" 300 BALL CURB VALVE (B-20283) W/ F.I.P. THREAD INLET AND F.I.P. THREAD OUTLET.
   C : 2" – 3/4" M.I.P. X 3/4" M.I.P. BRASS NIPPLE.
   D : APCO MODEL 65 AIR RELEASE VALVE. (CONTACT TOWN OPERATOR FOR ORDERING INFORMATION)
   E : 3/8" PVC VENT PIPE – M.I.P X GLUE FITTING W/ GLUE 90° BENDS
4. FROST INSERT SHALL BE PAINTED W/ 2 COATS OF GRAY SPRAY PAINT ON ALL SURFACES AFTER FABRICATION. SAND BLAST OR SOLVENT CLEAN ALL METAL SURFACES AFTER FABRICATION AND PRIOR TO PAINTING.
5. DEPTH OF COVER AT AIR RELEASE VALVE MANHOLE SHALL BE 6.5'.

AUTOMATIC AIR RELEASE STATION (NEW CONSTRUCTION)

NO SCALE

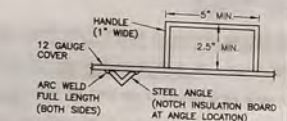
A NEAT VERTICAL LINE A MIN. OF 12" FROM THE EDGE OF THE TRENCH OR WHERE NEAT LINE IS LESS THAN 3' FROM THE EDGE OF EXISTING PAVEMENT, REMOVE AND REPLACE THE ENTIRE PAVEMENT SECTION BETWEEN THE TRENCH AND EDGE OF PAVEMENT.



* SEE O.S.H.A. CONSTRUCTION STANDARDS FOR EXCAVATIONS. CONSTRUCTION, SECTION 1926.652.

TYPICAL UTILITY TRENCH DETAIL

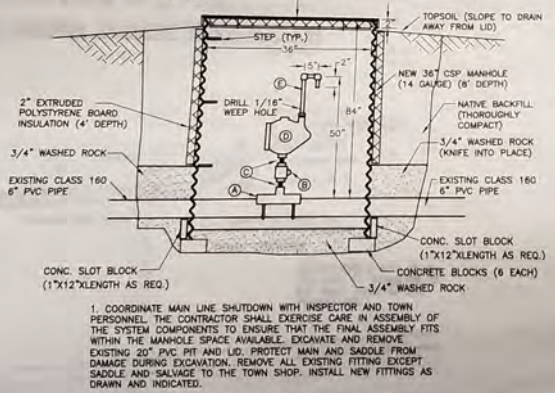
NO SCALE



ANGLE WELD AND HANDLE DETAIL

NO SCALE

12 GAUGE STEEL COVER (38" DIA.) W/2" STEEL EDGE AND 1"x1"X1/4" ANGLE STIFFENER (34" LONG) (SEE DETAIL) CONTINUOUSLY WELDED AND CENTERED ON BOTTOM OF LID. INSTALL 32" DISK OF 2" EXTRUDED POLYSTYRENE BOARD INSULATION CENTERED BETWEEN COVER AND 32" DISK OF 1/4" PLYWOOD. (PAINT PLYWOOD ON ALL SURFACES W/ SPRAY PAINT PRIOR TO ASSEMBLY AND REPAINT WITH COVER). SECURE PLYWOOD TO COVER W/ 6 EA. 1/4"X3" BOLTS, WASHERS AND NUTS (SPACE EVENLY 1' FROM CENTER). INSTALL 4 EA. LIFT HANDLES AT EVEN SPACING (12 GAUGE STEEL MATERIAL OR PREFABRICATED HANDLE).



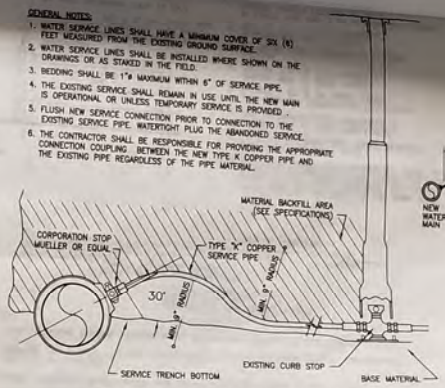
1. COORDINATE MAIN LINE SHUTDOWN WITH INSPECTOR AND TOWN PERSONNEL. THE CONTRACTOR SHALL EXERCISE CARE IN ASSEMBLY OF THE SYSTEM COMPONENTS TO ENSURE THAT THE FINAL ASSEMBLY FITS WITHIN THE MANHOLE SPACE AVAILABLE. EXCAVATE AND REMOVE EXISTING 20" PVC PIT AND LID. PROTECT MAIN AND SADDLE FROM DAMAGE DURING EXCAVATION. REMOVE ALL EXISTING FITTING EXCEPT SADDLE AND SALVAGE TO THE TOWN SHOP. INSTALL NEW FITTINGS AS DRAWN AND INDICATED.
2. CSP MANHOLE SHALL BE SLOT CUT TO PROVIDE FOR 3/4" MIN. CLEARANCE AROUND THE 6" PIPE AND REMOVAL OF THE MANHOLE WITH OUT DISTURBING THE PIPELINE. THE SLOTS SHALL BE LOCATED 90° FROM THE STEP LOCATION.
3. PARTS DESCRIPTION:
   A : EXISTING 3/4" TAPPING SADDLE W/ F.I.P. THREAD. (LEAVE IN PLACE)
   B : MUELLER 3/4" 300 BALL CURB VALVE (B-20283) W/ F.I.P. THREAD INLET AND F.I.P. THREAD OUTLET OR APPROVED EQUAL.
   C : 2" – 3/4" M.I.P. X 3/4" M.I.P. BRASS NIPPLE.
   D : APCO MODEL 65 AIR RELEASE VALVE. (CONTACT TOWN OPERATOR FOR ORDERING INFORMATION)
   E : 3/8" PVC VENT PIPE – M.I.P X GLUE FITTING W/ GLUE 90° BENDS
4. COVER SHALL BE PAINTED W/ 2 COATS OF GRAY SPRAY PAINT ON INTERIOR AND EXTERIOR SURFACE AFTER FABRICATION. SAND BLAST OR SOLVENT CLEAN ALL METAL SURFACES AFTER FABRICATION AND PRIOR TO PAINTING.
5. LOCATION OF AIR RELEASE STATION IS 12 MILES FROM THE TOWN OF GERALDINE. CONTACT TOWN OPERATOR FOR ACCESS TO THE SITE.

AUTOMATIC AIR RELEASE STATION RECONSTRUCTION

NO SCALE

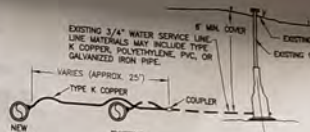
GENERAL NOTES:

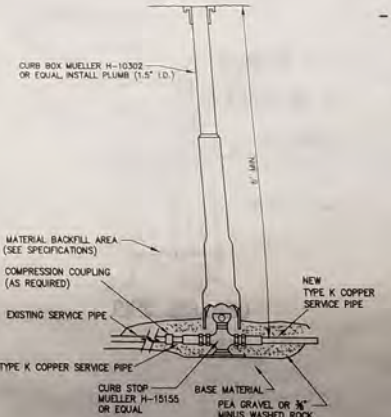
1. WATER SERVICE LINES SHALL HAVE A MINIMUM COVER OF SIX (6) FEET MEASURED FROM THE EXISTING GROUND SURFACE.
2. WATER SERVICE LINES SHALL BE INSTALLED WHERE SHOWN ON THE DRAWINGS OR AS STAKED IN THE FIELD.
3. BEDDING SHALL BE 1"ø MAXIMUM WITHIN 6" OF SERVICE PIPE.
4. THE EXISTING SERVICE SHALL REMAIN IN USE UNTIL THE NEW MAIN IS OPERATIONAL OR UNLESS TEMPORARY SERVICE IS PROVIDED.
5. FLUSH NEW SERVICE CONNECTION PRIOR TO CONNECTION TO THE EXISTING SERVICE PIPE. WATERTIGHT PLUG THE ABANDONED SERVICE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE APPROPRIATE CONNECTION COUPLING BETWEEN THE NEW TYPE K COPPER PIPE AND THE EXISTING PIPE REGARDLESS OF THE PIPE MATERIAL.



SERVICE RECONNECTION (LONG)

NO SCALE





CURB STOP NOTES:

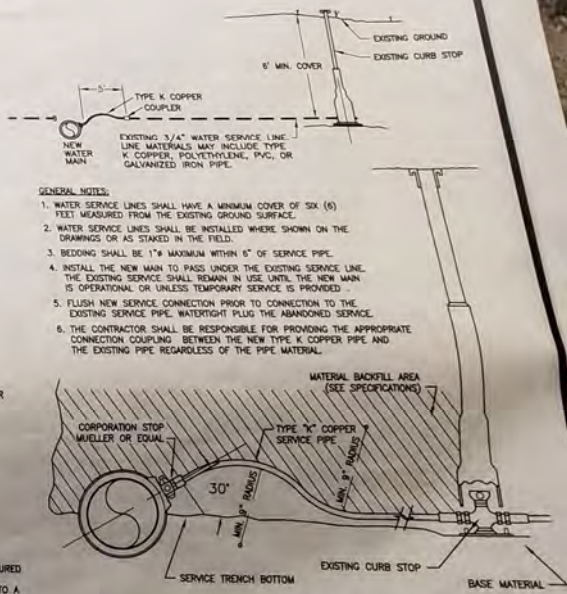
1. CURB STOPS SHALL HAVE A MINIMUM COVER OF SIX (6) FEET MEASURED FROM THE EXISTING GROUND SURFACE, EXCEPT THAT COVER SHALL BE MEASURED FROM 6 OF STREET GRADE WHEN SERVICE LINES ARE LAID TO A STREET SIDE WHICH HAS AN UPHILL SLOPE.
2. WATER SERVICE LINE SIZE AND MATERIAL MAY VARY. COPPER SERVICES SHALL BE DIRECTLY CONNECTED TO THE CURB STOP. OTHER SERVICE LINE MATERIALS SHALL BE CONNECTED WITH APPROPRIATE COMPRESSION COUPLERS OR ASTM D 2609 NSF CERTIFIED PVC INSERT FITTINGS FOR PE PIPE. PE FITTINGS SHALL HAVE DOUBLE STAINLESS STEEL CLAMPS.
3. BEDDING SHALL BE 1" ø MAXIMUM WITHIN 6" OF SERVICE PIPE.
4. SALVAGE ALL REMOVED CURB STOPS TO THE TOWN OF GERALDINE SHOP.

CURB STOP DETAIL

NO SCALE

GENERAL NOTES:

1. WATER SERVICE LINES SHALL HAVE A MINIMUM COVER OF SIX (6) FEET MEASURED FROM THE EXISTING GROUND SURFACE.
2. WATER SERVICE LINES SHALL BE INSTALLED WHERE SHOWN ON THE DRAWINGS OR AS STAKED IN THE FIELD.
3. BEDDING SHALL BE 1"ø MAXIMUM WITHIN 6" OF SERVICE PIPE.
4. INSTALL THE NEW MAIN TO PASS UNDER THE EXISTING SERVICE LINE. THE EXISTING SERVICE SHALL REMAIN IN USE UNTIL THE NEW MAIN IS OPERATIONAL OR UNLESS TEMPORARY SERVICE IS PROVIDED.
5. FLUSH NEW SERVICE CONNECTION PRIOR TO CONNECTION TO THE EXISTING SERVICE PIPE. WATERTIGHT PLUG THE ABANDONED SERVICE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE APPROPRIATE CONNECTION COUPLING BETWEEN THE NEW TYPE K COPPER PIPE AND THE EXISTING PIPE REGARDLESS OF THE PIPE MATERIAL.



SERVICE RECONNECTION (SHORT)

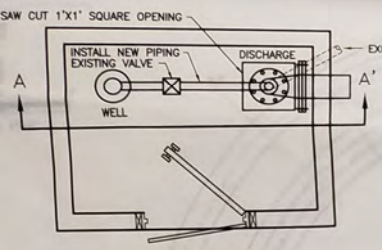
NO SCALE

MONTANA
SHAWN ARTHUR
NO. 11007 PE
PROFESSIONAL ENGINEER

NOVEMBER 20
AS-B

DESIGNED : SRA DRAWN : JCM CHECKED : GLK SCALE : AS SHOWN DATE : AUGUST 2004	DELTA ENGINEERING P.C. CONSULTING ENGINEERS P.O. BOX 1481 GREAT FALLS, MT 59403 (406) 727-3687	FILE NO. SHEET 12 AS BUILT	GERALDINE WATER SYSTEM IMPROVEMENTS – PHASE MISCELLANEOUS DETAILS

AS-BUILT

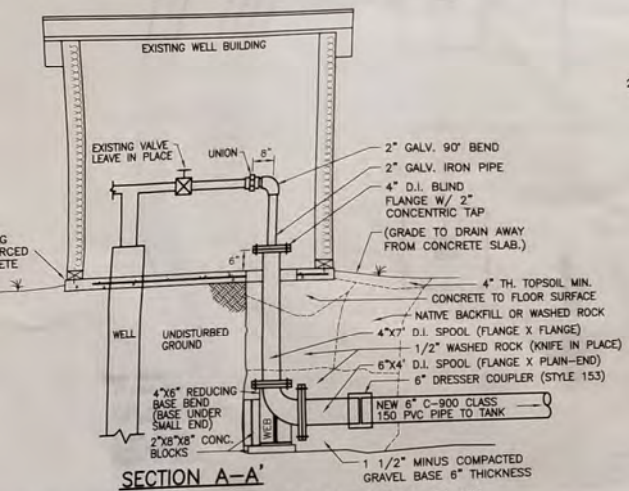


PLAN VIEW

RECONNECTION NOTES:

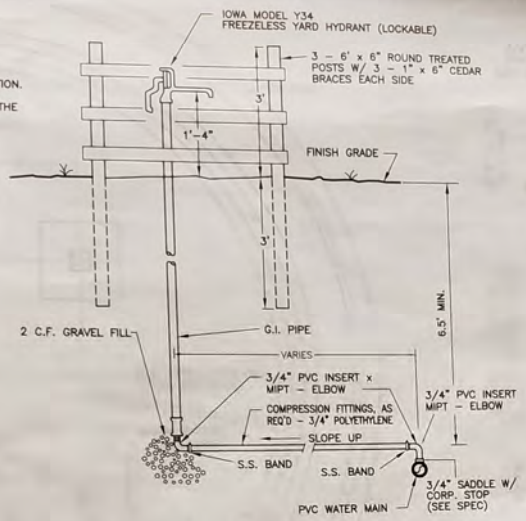
1. INSTALL 4" RISER SPOOL ON CENTERLINE OF THE EXISTING 2" PIPING TO ALLOW FOR RECONNECTION.

2. FINISH NEW CONC. TO MATCH THE SURROUNDING SLAB SURFACE.

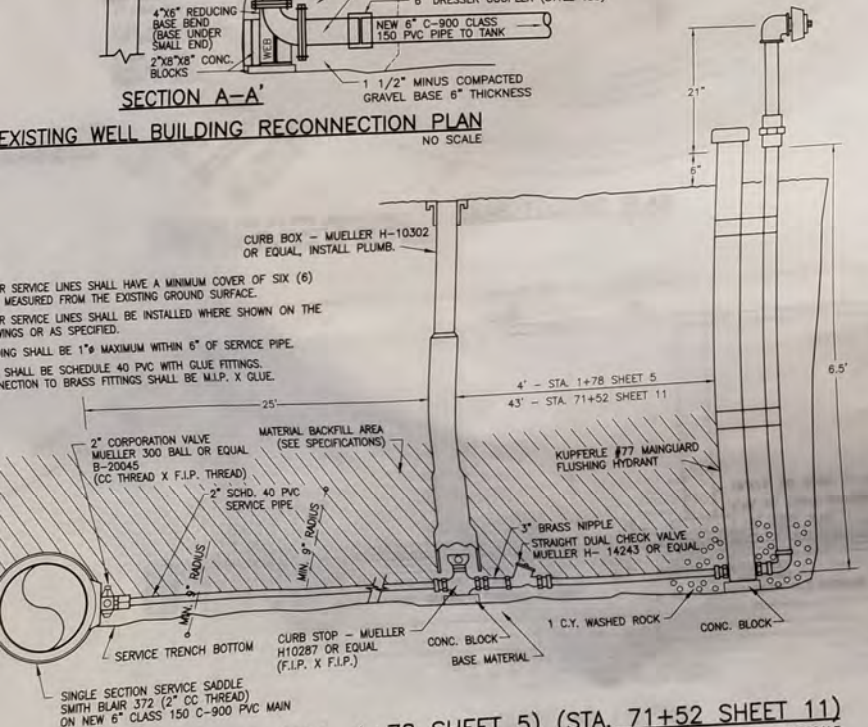


SECTION A-A'

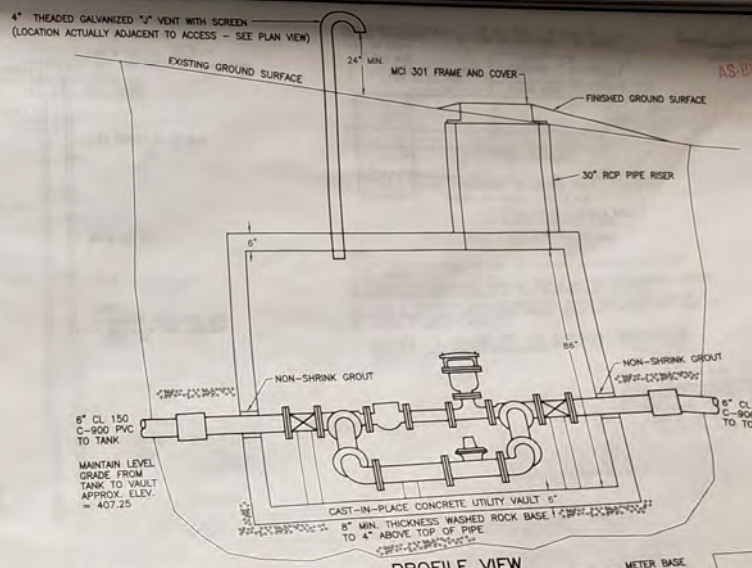
EXISTING WELL BUILDING RECONNECTION PLAN
NO SCALE



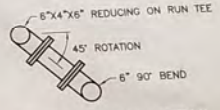
MANUAL AIR RELEASE STATION
NO SCALE



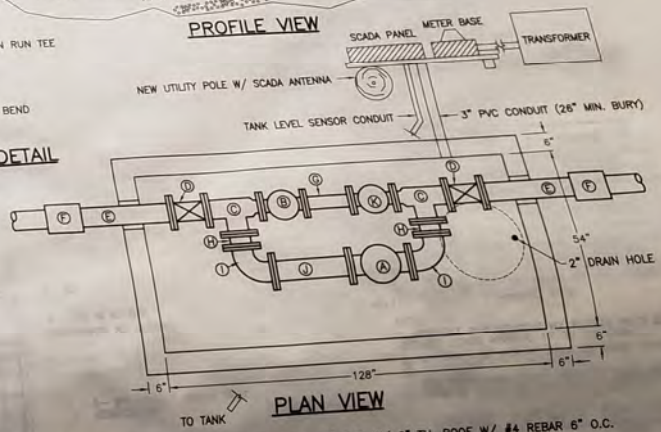
," IRRIGATION SERVICE (STA. 1+78 SHEET 5) (STA. 71+52 SHEET 11)
NO SCALE



PROFILE VIEW



TEE ROTATION DETAIL



PLAN VIEW

NOTES:

1. VAULT FLLOR AND WALLS CAST-IN-PLACE W/ #4 REBAR 6" O.C. W/ 6" TH. ROOF W/ #4 REBAR 6" O.C.

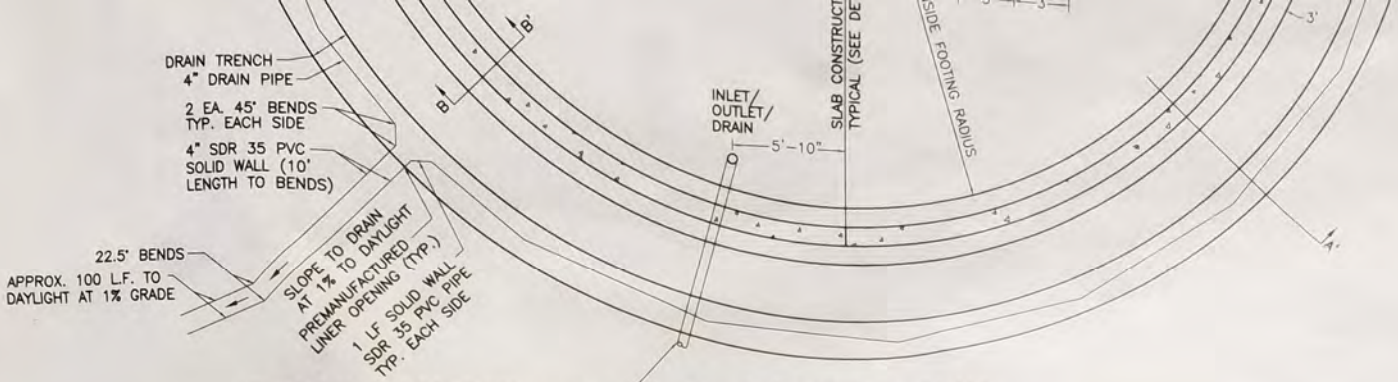
2. PARTS DESCRIPTION:
A : 6" SOLENOID CONTROL VALVE CLA-VAL MODEL 636-EG-03YBCS (SEE SPECS)
B : 4" SWING CHECK VALVE (FLANGED), MUELLER A-2600-6-02 (CLOSE SPRING REMOVED).
C : 6"X4"X6" D.I. REDUCING ON RUN TEE (FLANGED)
D : 6" GATE VALVE W/ HAND WHEEL- MUELLER A-2360-6.
E : 6" D.I. SPOOL - 38" LENGTH - (FLANGE X PLAIN END)
F : 6"X6" COUPLER (INCIDENTAL TO VAULT CONSTRUCTION)
G : 4" D.I. SPOOL - NECESSARY LENGTH VARIABLE (CONTRACTOR RESPONSIBLE FOR LENGTH DETERMINATION) - (FLANGE X
H : 6" D.I. SPOOL - 12" LENGTH - (FLANGE X FLANGE)
I : 6" 90° BEND (FLANGE X FLANGE)
J : 6" D.I. SPOOL - NECESSARY LENGTH VARIABLE (CONTRACTOR RESPONSIBLE FOR LENGTH DETERMINATION) - (FLANGE X
K : 4"X4"X4" D.I. TEE (FLANGED) AND 4" AIR AND VACUUM VALVE (FLANGED), APCO MODEL 152.

3. DOUBLE WRAP ALL D.I. PIPE AND FITTINGS LOCATED OUTSIDE VAULT W/ POLY SHEETING.

4. STEEL SUPPORTS INSTALLED AT CENTERS OF VALVES AND AT CENTERS OF THE 4 SPOOL SECTIONS. (6 EA.)

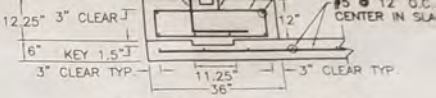
FLOW CONTROL VAULT
NO SCALE

DESIGNED : SRA	DELTA ENGINEERING P.C. CONSULTING ENGINEERS P. O. BOX 1481 GREAT FALLS, MT 59403 (406) 727-3687	FILE NO. SHEET14 AS BUILT	GERALDINE WATER SYSTEM IMPROVEM
DRAWN : SRA			DETAILS
CHECKED : GLK			
SCALE : AS SHOWN			
DATE : JAN. 2005			



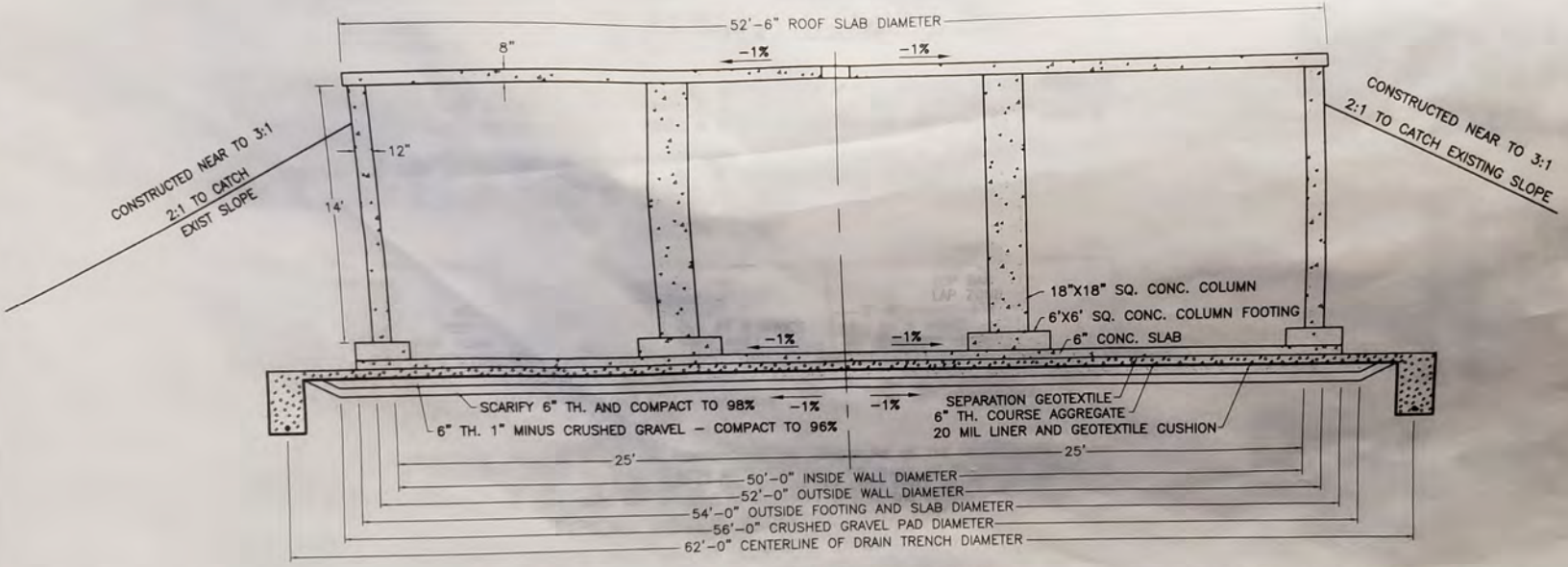
SLAB/FOOTING PLAN

SCALE 1"=5'



TANK WALL SECTION

SECTION B-B' SCALE 1"=2'



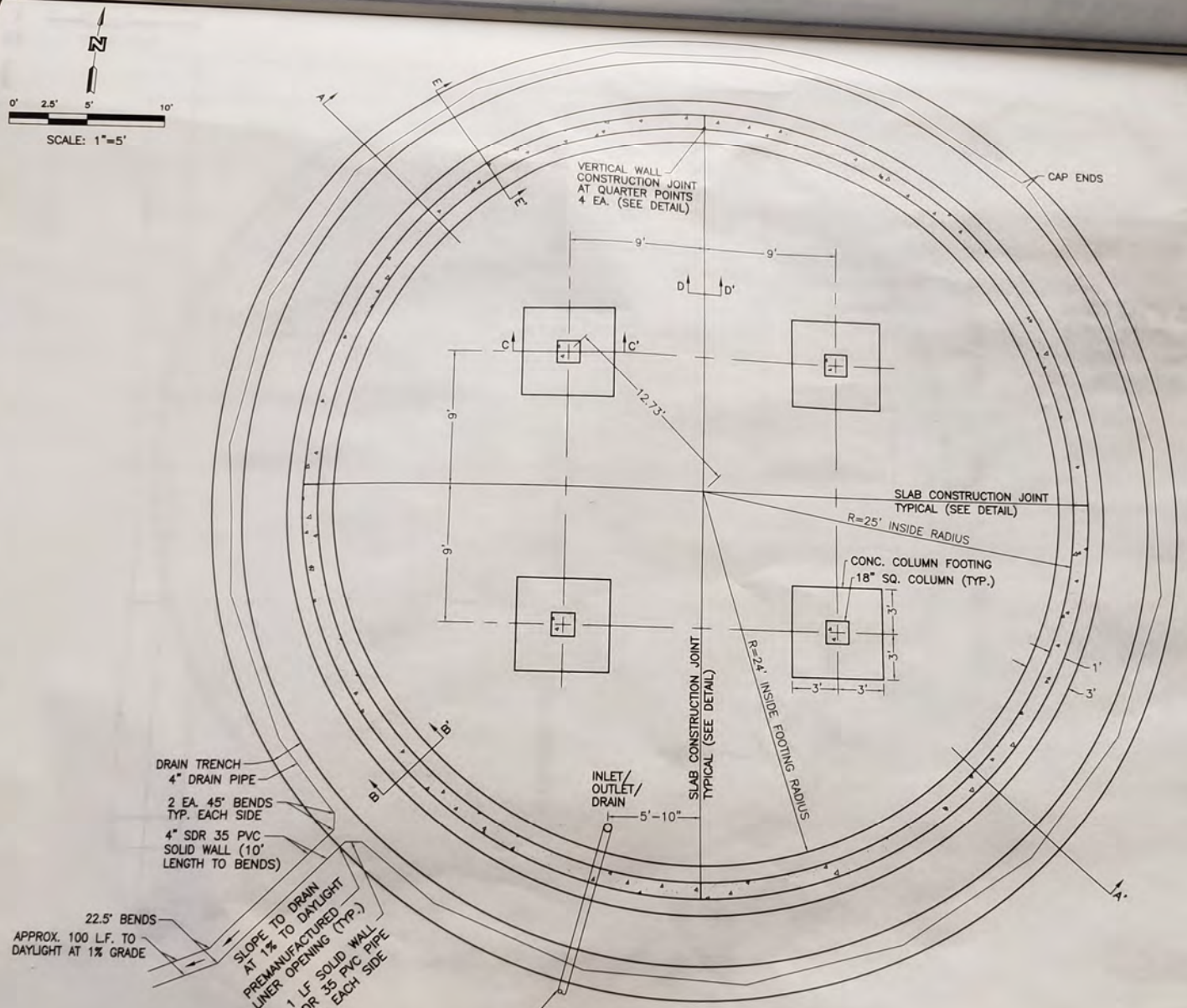
CENTERLINE PROFILE

SECTION A-A' SCALE 1"=5'

COLUMN & FOO

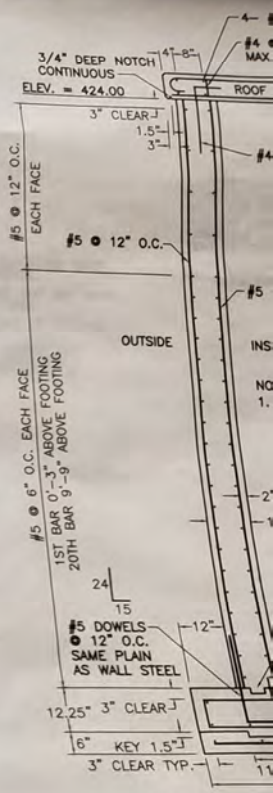
SECTION C-C'

DESIGNED :	
DRAWN :	
CHECKED :	
SCALE : AS	
DATE : JAN.	



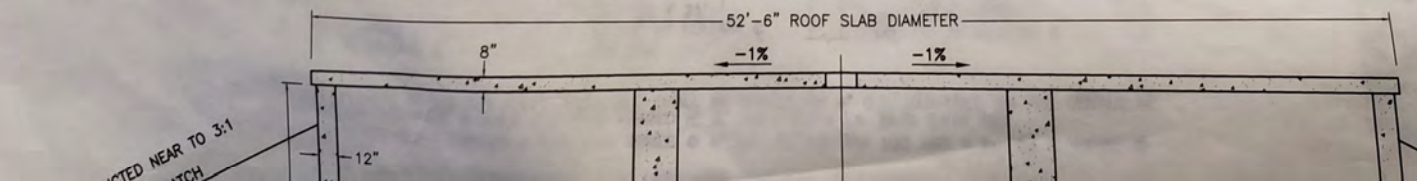
SLAB/FOOTING PLAN

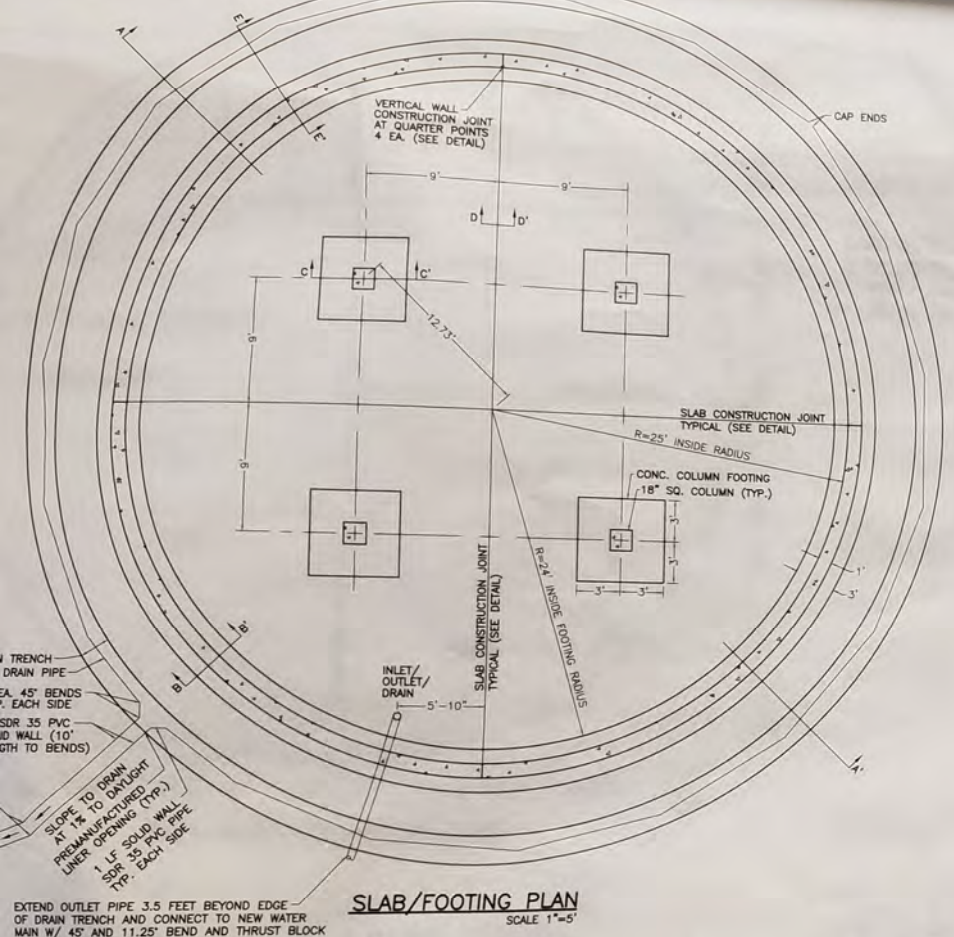
SCALE 1"=5'



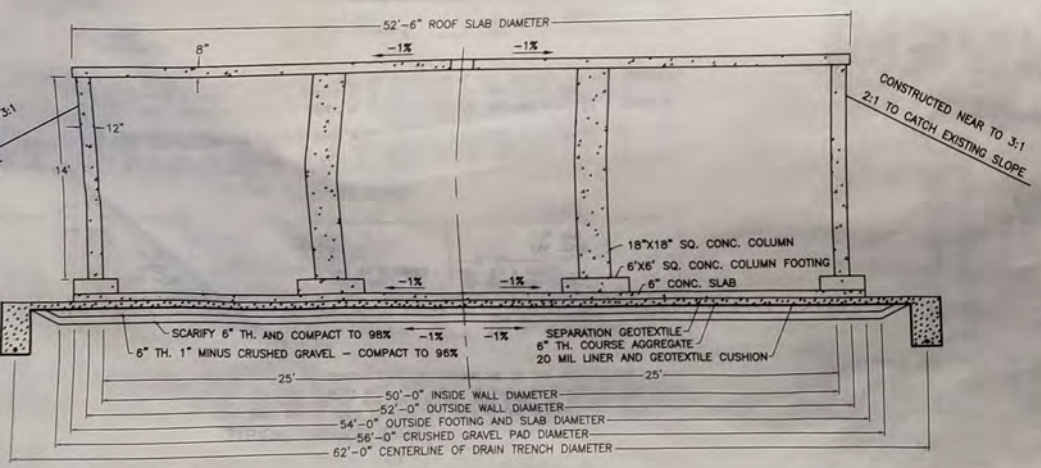
TANK WA

SECTION B-B'

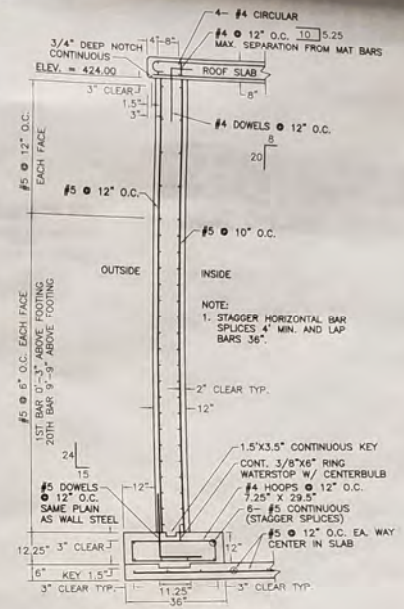




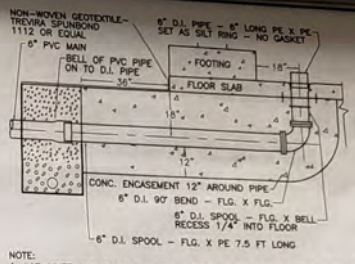
SLAB/FOOTING PLAN
SCALE 1"=5'



CENTERLINE PROFILE

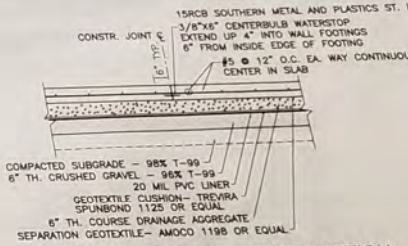


TANK WALL SECTION
SECTION B–B' SCALE 1"=2'

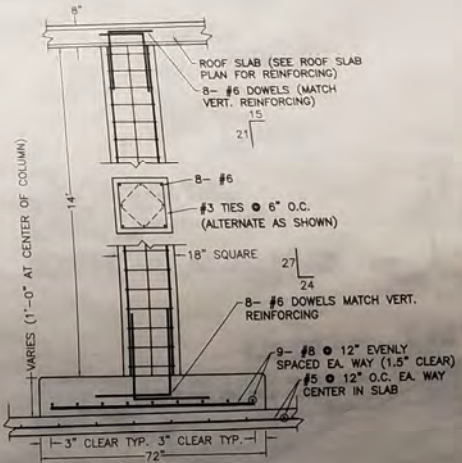


NOTE:
1. LAP LINER AND FABRIC UP SIDE OF CONCRETE ENCASEMENT 4 IN. MIN. FROM NORMAL LINER ELEVATION.
2. ENCASE PIPE PROJECTING THROUGH TRENCH IN POLY ENCASEMENT. INSTALL MANUFACTURED LINER OPENINGS AT PIPE PENETRATION LOCATION.
3. PLACE 4" WATERSTOP RING BETWEEN PIPE BLOCK AND FLOOR SLAB AT 3" DISTANCE FROM DRAIN PENETRATION. PLACE HEAVY DUTY WATER STOP RING ON D.I. SPOOL 8" ABOVE FLANGE.

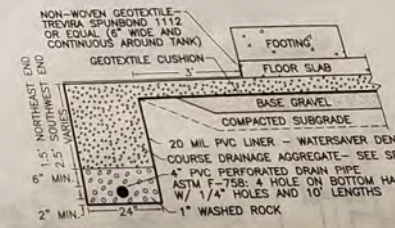
INLET / OUTLET / DRAIN SECTION
SECTION E–E' SCALE 1"=2'



FLOOR AND CONST. JOINT SECTION
SECTION D–D' SCALE 1"=2'

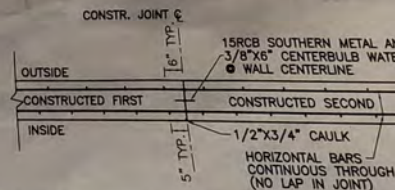


COLUMN & FOOTING SECTION
SECTION C–C' SCALE 1"=2'



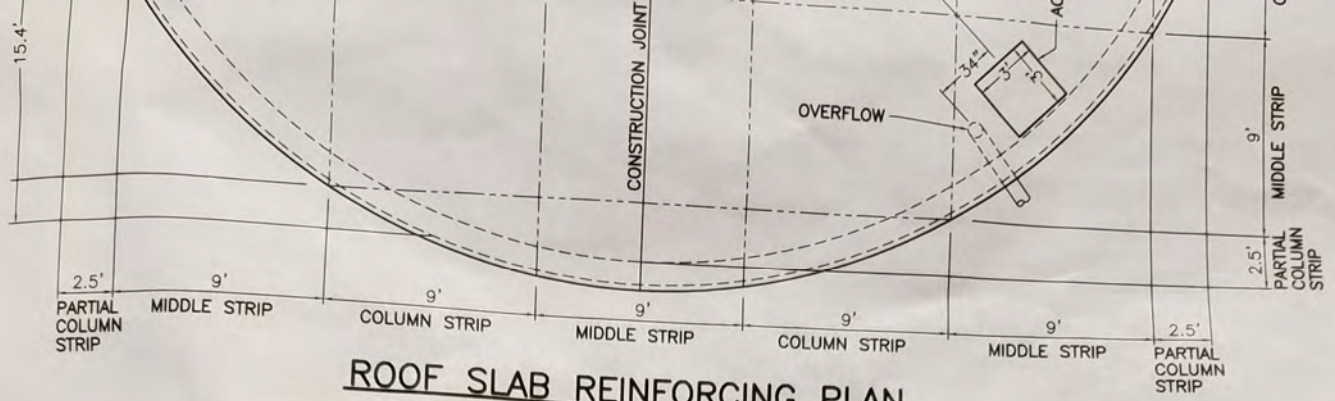
NOTE:
1. CONNECT PIPE LENGTHS W/ RUBBER BOOT COUPLES. DEFLECT JOINTS APPROX. 17' TO 20' EACH.
2. MAINTAIN 1/8" PER FT DROP TO DRAIN. SLOPE NORTH TO SOUTHWEST.
3. END SEPARATION FABRIC BETWEEN CONC. AND FLOOR AT EDGE OF SLAB. END CUSHION AT EDGE OF TRENCH.

DRAIN TRENCH SECTION
SECTION E–E' SCALE 1"=2'



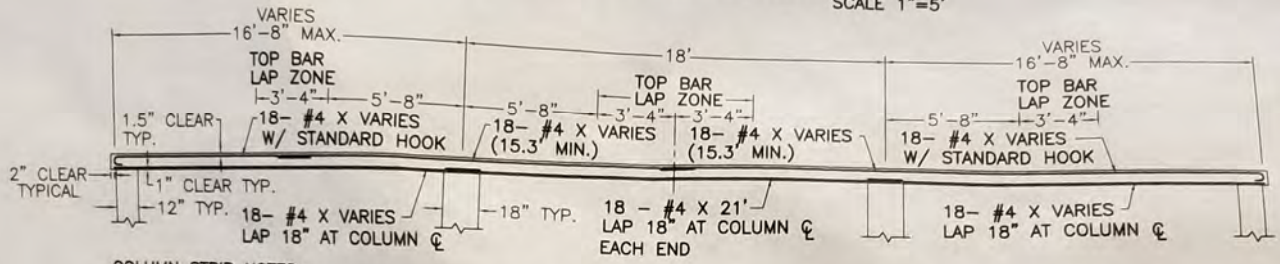
VERTICAL WALL CONST. JOINT SECT
SCALE

DESIGNED : SRA	DELTA ENGINEERING P.C.	FILE NO.	
DRAWN : SRA			



ROOF SLAB REINFORCING PLAN

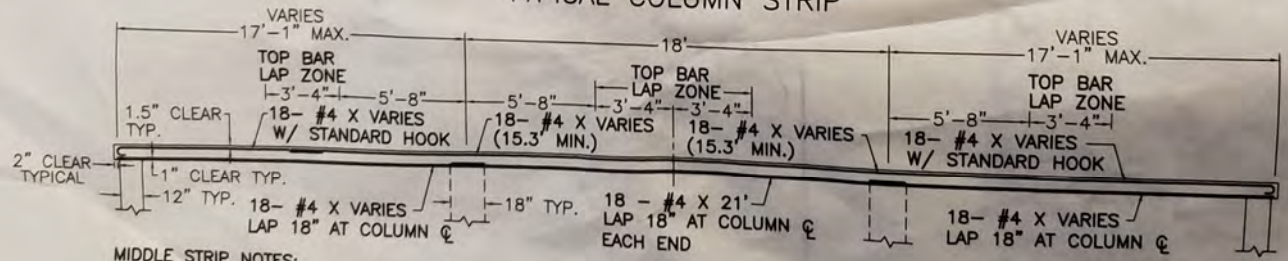
SCALE 1"=5'



COLUMN STRIP NOTES:

1. 10 EA. OF THE 18 EA. BARS IN THE TOP AND BOTTOM MAT SHALL BE SPACED AT 4" O.C. CENTERED ON THE CENTERLINE OF THE COLUMN STRIP. THE REMAINING 8 BARS SHALL BE SPACED AT 8" O.C. W/ 4 EA. BARS EACH SIDE.
2. THE PARTIAL COLUMN STRIP SHALL CONTAIN 6 EA. #4 X VARIES @ 6" O.C. IN THE TOP MAT AND 6 EA. #4 X VARIES @ 6" O.C. IN THE BOTTOM MAT.
3. REINFORCING SHALL BE CONTINUOUS ACROSS THE SLAB IN BOTH MATS. TOP MAT LAPS SHALL BE STAGGERED AND WITHIN THE THE DESIGNATED LAP ZONE. THE TOP MAT LAPS SHALL BE 18" MIN. BOTTOM MAT LAPS SHALL BE 18" MIN. AND CENTERED ON THE COLUMN CENTER LINE. LONG BARS MAY BE USED TO ELIMINATE LAPS AT THE CONTRACTORS DISCRETION. ALL BARS AND LAPS SHALL BE CONTINUOUS THROUGH THE CONSTRUCTION JOINT.

TYPICAL COLUMN STRIP



MIDDLE STRIP NOTES:

1. THE MIDDLE STRIP REINFORCEMENT SHALL BE 6" O.C. AND CENTERED ON THE CENTERLINE OF THE MIDDLE STRIP.
2. REINFORCING SHALL BE CONTINUOUS ACROSS THE SLAB IN BOTH MATS. TOP MAT LAPS SHALL BE STAGGERED AND WITHIN THE THE DESIGNATED LAP ZONE. THE TOP MAT LAPS SHALL BE 18" MIN. BOTTOM MAT LAPS SHALL BE 18" MIN. AND CENTERED ON THE COLUMN CENTER LINE. LONG BARS MAY BE USED TO ELIMINATE LAPS AT THE CONTRACTORS DISCRETION.

TYPICAL MIDDLE STRIP

GENERAL NOTES:

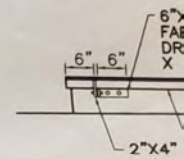
1. CONCRETE SHALL BE M-3000 AND REINFORCING STEEL SHALL BE GRADE 40 IN THE ROOF SLAB.
2. ROOF SLAB JOINTS MAY BE PRECISION SAW CUT TO 3/4" DEPTH AND CAULKED WITH ENGINEERS APPROVAL.

ROOF SLAB SECTIONS

SCALE 1"=5'

THREADS EXPOSED FOR CURB

HATCH S



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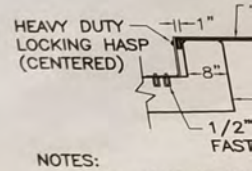


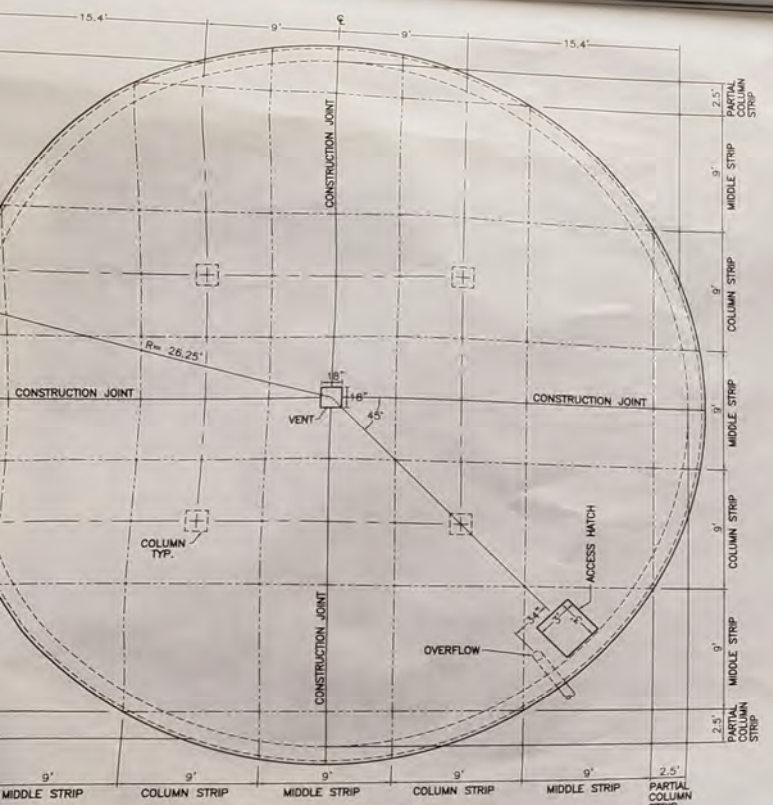
NOTES:

1. CONTINUOUS WELD
2. GRIND 0.25" CHAN LID SWING CLEARANC
3. PLACE PLATE STE AND ROOF AS NECE
4. AFTER FABRICATIO COURSE GRIT SAND THE INTERIOR OF T EPOXY PAINT MEET STANDARD 61. (EP TANKS) THE EXTER THEN PAINTED WIT

NOTES:

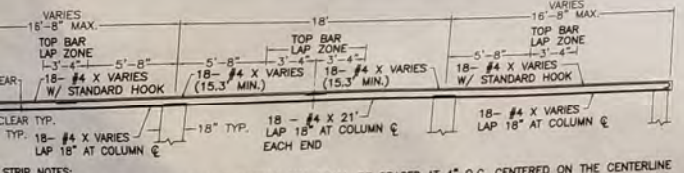
1. ONLY ADDITIONAL BARS BETWEEN MATS. TIE BARS
2. AFTER ADDITIONAL BARS TO PROVIDE 2" CLEAR TO
3. PROVIDE 2" CLEAR FRO

REINFORCI



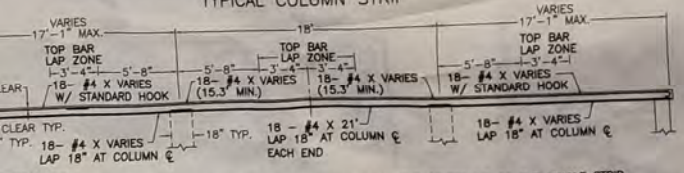
ROOF SLAB REINFORCING PLAN

SCALE 1"=5'



STRIP NOTES:
- OF THE 18 EA. BARS IN THE TOP AND BOTTOM MAT SHALL BE SPACED AT 4" O.C. CENTERED ON THE CENTERLINE COLUMN STRIP. THE REMAINING 8 BARS SHALL BE SPACED AT 8" O.C. W/ 4 EA. BARS EACH SIDE.
- PARTIAL COLUMN STRIP SHALL CONTAIN 6 EA. #4 X VARIES ✪ 6" O.C. IN THE TOP MAT AND 6 EA. #4 X VARIES ✪ IN THE BOTTOM MAT.
- ORCING SHALL BE CONTINUOUS ACROSS THE SLAB IN BOTH MATS. TOP MAT LAPS SHALL BE STAGGERED AND WITHIN DESIGNATED LAP ZONE. THE TOP MAT LAPS SHALL BE 18" MIN. BOTTOM MAT LAPS SHALL BE 18" MIN. AND D ON THE COLUMN CENTER LINE. LONG BARS MAY BE USED TO ELIMINATE LAPS AT THE CONTRACTORS DISCRETION.
- S AND LAPS SHALL BE CONTINUOUS THROUGH THE CONSTRUCTION JOINT.

TYPICAL COLUMN STRIP



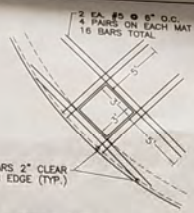
STRIP NOTES:
- MIDDLE STRIP REINFORCEMENT SHALL BE 6" O.C. AND CENTERED ON THE CENTERLINE OF THE MIDDLE STRIP.
- ORCING SHALL BE CONTINUOUS ACROSS THE SLAB IN BOTH MATS. TOP MAT LAPS SHALL BE STAGGERED AND WITHIN DESIGNATED LAP ZONE. THE TOP MAT LAPS SHALL BE 18" MIN. BOTTOM MAT LAPS SHALL BE 18" MIN. AND D ON THE COLUMN CENTER LINE. LONG BARS MAY BE USED TO ELIMINATE LAPS AT THE CONTRACTORS DISCRETION.

TYPICAL MIDDLE STRIP

NOTES:
- RETE SHALL BE M-3000 AND REINFORCING STEEL SHALL BE GRADE 40 IN THE ROOF SLAB.
- SLAB JOINTS MAY BE PRECISION SAW CUT TO 3/4" DEPTH AND CAULKED WITH ENGINEERS APPROVAL.

ROOF SLAB SECTIONS

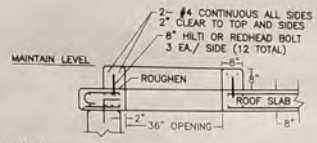
SCALE 1"=5'



NOTES:
1. ONLY ADDITIONAL BARS SHOWN. TIE ADDITIONAL BARS BETWEEN MATS. TIE BARS AT ALL CROSSINGS.
2. AFTER ADDITIONAL BARS ARE IN PLACE CUT MAT BARS TO PROVIDE 2" CLEAR TO EDGE OF OPENING.
3. PROVIDE 2" CLEAR FROM BAR TO EDGE OF OPENING.

REINFORCING AT HATCH

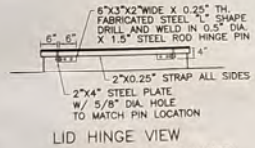
SCALE 1"=5'



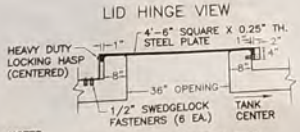
NOTES:
1. CURB CONTINUOUS AROUND OPENING.
2. INSTALL ANCHOR BOLTS AFTER SLAB COMPLETION. DRILL FOR 3" EMBEDMENT AND 5" EXPOSURE. LEAVE THREADS EXPOSED FOR CURB POUR.

HATCH SECTION

SCALE 1"=2'



LID HINGE VIEW



NOTES:
1. CONTINUOUS WELD ALL JOINTS BOTH SIDES.
2. GRIND 0.25" CHAMFER ON "L" SHAPE TO ALLOW LID SWING CLEARANCE.
3. PLACE PLATE STEEL SHIMS BETWEEN LOCKING HASP AND ROOF AS NECESSARY TO ALLOW PROPER FIT.
4. AFTER FABRICATION, ENTIRE LID SURFACE SHALL BE COURSE GRIT SAND BLASTED TO A "NEAR WHITE" FINISH. THE INTERIOR OF THE LID SHALL BE PAINTED WITH EPOXY PAINT MEETING THE REQUIREMENTS OF ANSI/NSF STANDARD 61. (EPOXY COATING REPAIR PAINT FOR STEEL TANKS) THE EXTERIOR SURFACE SHALL BE PRIMED AND THEN PAINTED WITH AN OIL-BASED GLOSS (DARK GRAY).

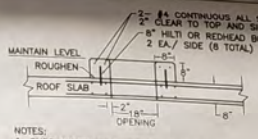
ACCESS LID

SCALE 1"=2'

NOTES:
1. ONLY ADDITIONAL BARS SHOWN. TIE ADDITIONAL BARS BETWEEN MATS. TIE BARS AT ALL CROSSINGS.
2. AFTER ADDITIONAL BARS ARE IN PLACE CUT MAT BARS TO PROVIDE 2" CLEAR TO EDGE OF OPENING.
3. PROVIDE 2" CLEAR FROM BAR TO EDGE OF OPENING.

REINFORCING AT VENT

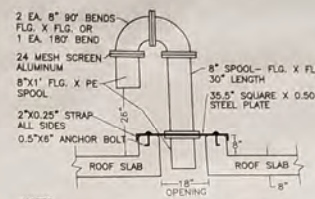
SCALE 1"=5'



NOTES:
1. CURB CONTINUOUS AROUND OPENING.
2. INSTALL ANCHOR BOLTS AFTER SLAB COMPLETION. DRILL FOR 3" EMBEDMENT AND 5" EXPOSURE. LEAVE THREADS EXPOSED FOR CURB POUR. INSTALL 4 EA. EMBEDDED ANCHOR BOLTS AT CENTER OF CURBS. (SEE VENT SECTION DETAIL). USE TEMPLATE FOR BOLT PLACEMENT.

VENT OPENING SECTION

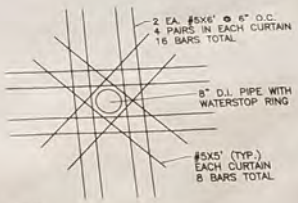
SCALE 1"=2'



NOTES:
1. CONTINUOUS WELD ALL PLATE JOINTS BOTH SIDES.
2. ONLY INSTALL GASKET BETWEEN THE SPOOL AND TOP OF PLATE.
3. AFTER PLATE FABRICATION, ENTIRE PLATE SURFACE SHALL BE COURSE GRIT SAND BLASTED TO A "NEAR WHITE" FINISH. THE INTERIOR OF THE PLATE SHALL BE PAINTED WITH EPOXY PAINT MEETING THE REQUIREMENTS OF ANSI/NSF STANDARD 61. (EPOXY COATING REPAIR PAINT FOR STEEL TANKS) THE EXTERIOR SURFACE SHALL BE PRIMED AND PAINTED WITH AN OIL-BASED GLOSS (BLACK). D.I. IRON PIPE AND BENDS SHALL BE BLACK WITH MANUFACTURERS STANDARD COATINGS. ASSEMBLE VENT AFTER PAINTING AND PRIOR TO INSTALLING ON TANK.

VENT SECTION

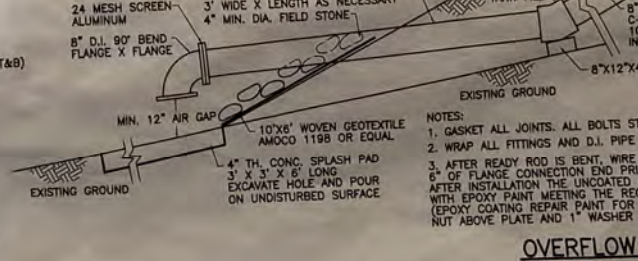
SCALE 1"=2'



NOTES:
1. ONLY ADDITIONAL BARS SHOWN. TIE ADDITIONAL BARS BETWEEN CURTAINS. TIE BARS AT ALL CROSSINGS.
2. PROVIDE 1.5" CLEAR BETWEEN BAR AND EDGE OF PIPE.

REINFORCING AT OVERFLOW

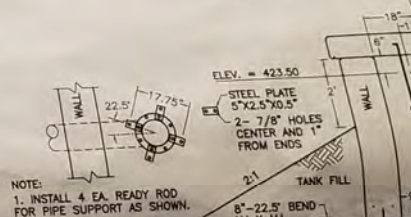
SCALE 1"=5'



NOTES:
1. GASKET ALL JOINTS. ALL BOLTS STAINLESS STEEL.
2. WRAP ALL FITTINGS AND D.I. PIPE INSTALLED OUTSIDE OF TANK.
3. AFTER READY ROD IS BENT, WIRE BRUSH AND EPOXY COAT TO WITHIN 6" OF FLANGE CONNECTION END PRIOR TO EMBEDMENT. EMBED ROD 4". AFTER INSTALLATION THE UNCOATED ROD AND PLATES SHALL BE PAINTED WITH EPOXY PAINT MEETING THE REQUIREMENTS OF ANSI/NSF STANDARD 61. (EPOXY COATING REPAIR PAINT FOR STEEL TANKS). INSTALL 1" WASHER AND NUT ABOVE PLATE AND 1" WASHER AND DOUBLE NUT BELOW PLATE.

OVERFLOW SECTION

SCALE 1"=2'

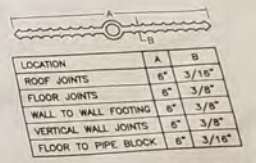


NOTE: ALL CONCRETE IS M-4000 AND ALL STEEL IS GRADE 60 AS-BUILT

STRUCTURAL NOTES:

SCALE: 1"=2'

1. CONCRETE - ROOF SLAB, COLUMNS, COLUMN FOOTINGS, PIPE BLOCKS AND CURBS: M-3000
   - WALLS, WALL FOOTINGS, FLOOR SLAB: M-4000
   CONTRACTOR MAY SUBSTITUTE M-4000 FOR M-3000 AT NO ADDITIONAL COST TO OWNER.
2. REINFORCING STEEL - ASTM A615 GRADE 60 OR GRADE 40 AS BELOW.
   - ROOF SLAB, COLUMNS, COLUMN FOOTINGS, AND CURBS: GRADE 60
   - FLOOR SLAB, WALLS, WALL FOOTINGS: GRADE 60
   CONTRACTOR MAY SUBSTITUTE GRADE 60 FOR GRADE 40 AT NO ADDITIONAL COST TO OWNER.
   - ALL REINFORCING STEEL SHALL BE EPOXY COATED.
3. ALL CONSTRUCTION JOINTS SHALL BE FURNISHED WITH A PVC WATERSTOP AS INDICATED IN THE WATERSTOP SCHEDULE. TIE OFF ALL WATERSTOPS AT 12" O.C. ON BOTH SIDES AND IN BOTH DIRECTIONS.
4. ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4" UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
5. THE CONNECTION AREA BETWEEN FLOOR SLAB AND FOOTINGS, FOOTINGS AND WALLS OR COLUMNS, AND ROOF SLAB AND CURBS SHALL BE ADEQUATELY ROUGHENED BY SAND BLASTING OR OTHER ENGINEER APPROVED METHOD PRIOR TO PLACING FORMS. ALL CONNECTIONS SHALL BE CLEANED OF CURING COMPOUNDS, PROTECT WATERSTOPS FROM CONTACT DURING CLEANING AND ROUGHENING PROCEDURES.
6. POUR A 1/2" THICK LAYER OF 1C:1S MIX AT THE BASE OF THE FALL FOOTING AND AT THE BASE OF THE WALL IMMEDIATELY PRIOR TO BEGINNING THE FOOTING OR WALL POUR.
7. MAINTAIN THE MINIMUM SLAB THICKNESS WHEN SLOPING TO DRAINS.
8. PRESSURE WASH THE TOP 3 FEET OF THE TANK WALL EXTERIOR AND THE EXTERIOR TOP OF THE ROOF SLAB AND APPLY EUCOSEAL MASONRY COATING OR APPROVED EQUAL. APPLY AT A RATE OF 1 E.A. 50 LB BAG PER 165 SQUARE FEET. MIX SHALL INCLUDE 1/2 GALLON FLEX-CON LATEX LIQUID PER BAG. INSTALL PER MANUFACTURERS RECOMMENDATION. COLOR SHALL BE FOUNDATION GRAY.
9. CONSTRUCTION JOINTS IN THE ROOF SLAB SHALL BE 1.25" IN DEPTH. THE JOINTS SHALL BE CAULKED.

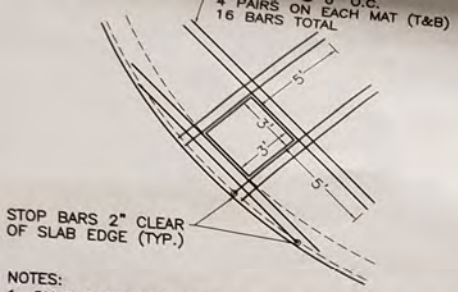


LOCATION	A	B
ROOF JOINTS	6"	3/16"
FLOOR JOINTS	6"	3/8"
WALL TO WALL FOOTING	6"	3/8"
VERTICAL WALL JOINTS	6"	3/8"
FLOOR TO PIPE BLOCK	6"	3/16"

NOTES:
1. ALL WATERSTOPS SHALL HAVE CENTERBULBS.
2. SEE SPECIFICATION FOR MATERIAL REQUIREMENTS.
3. ALL SPLICES SHALL BE ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

WATERSTOP SCHEDULE

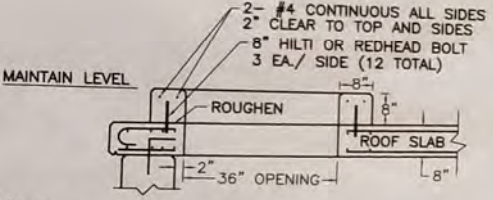
DESIGNED : SRA	DELTA ENGINEERING P.C. CONSULTING ENGINEERS P. O. BOX 1481 GREAT FALLS, MT 59403 (406) 727-3687	FILE NO.	GERALDINE WATER SYSTEM IMPROVEMENTS -
DRAWN : SRA		SHEET16	CONCRETE TANK DETAILS #2
CHECKED: GLK		AS BUILT	
SCALE : AS SHOWN			
DATE : JAN. 2005			



NOTES:
1. ONLY ADDITIONAL BARS SHOWN. TIE ADDITIONAL BARS BETWEEN MATS. TIE BARS AT ALL CROSSINGS.
2. AFTER ADDITIONAL BARS ARE IN PLACE CUT MAT BARS TO PROVIDE 2" CLEAR TO EDGE OF OPENING.
3. PROVIDE 2" CLEAR FROM BAR TO EDGE OF OPENING.

REINFORCING AT HATCH

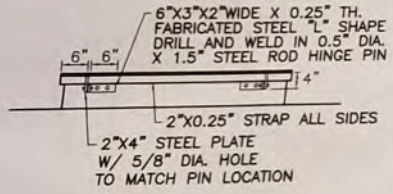
SCALE 1"=5'



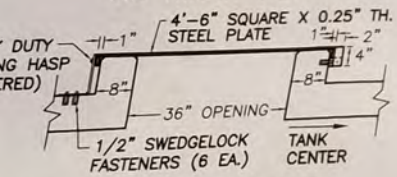
NOTES:
1. CURB CONTINUOUS AROUND OPENING.
2. INSTALL ANCHOR BOLTS AFTER SLAB COMPLETION. DRILL FOR 3" EMBEDMENT AND 5" EXPOSURE. LEAVE THREADS EXPOSED FOR CURB POUR.

HATCH SECTION

SCALE 1"=2'



LID HINGE VIEW



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0.25" CHAMFER ON "L" SHAPE TO ALLOW CLEARANCE.
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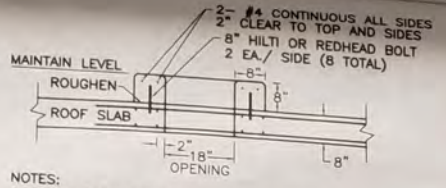

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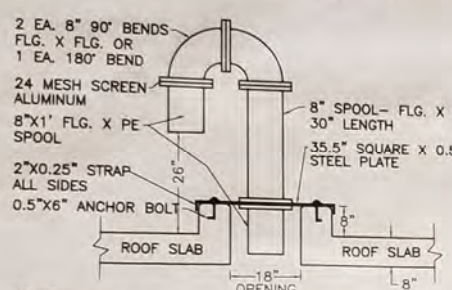

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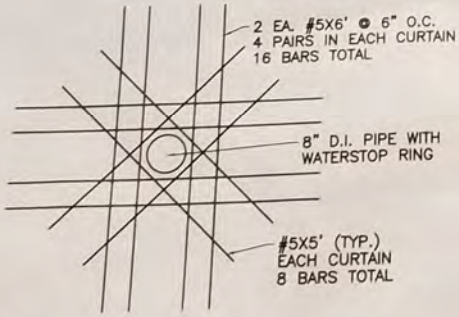

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REINFORCING AT OVERFLOW

SCALE 1"=5'

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   - WALLS, WALL FOOTINGS, FLOOR SLAB: M-4000
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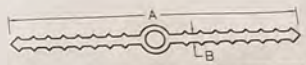

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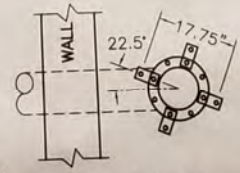
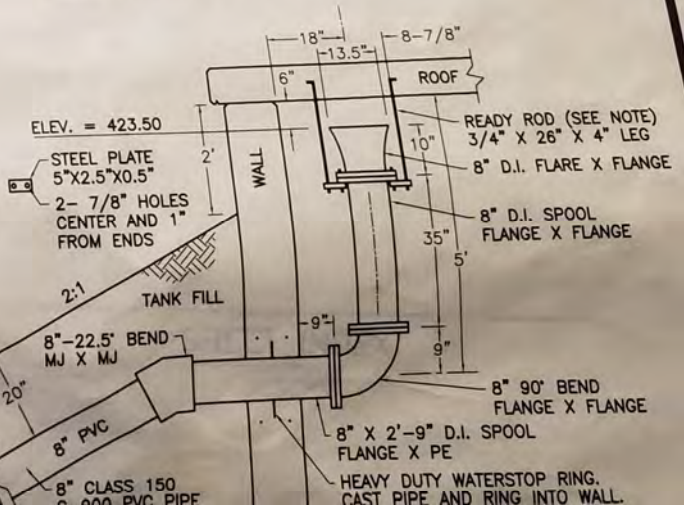
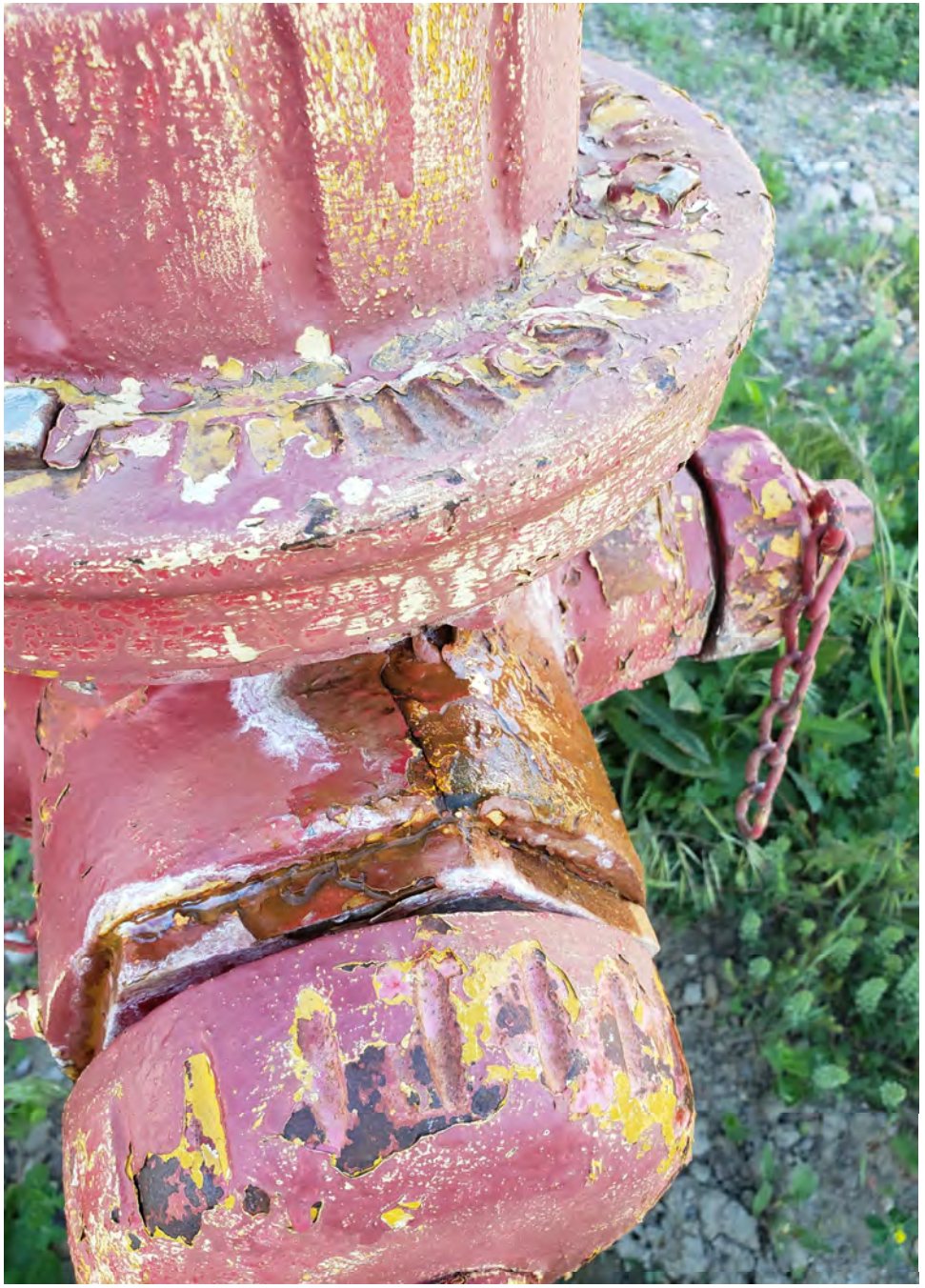
WATERSTOP SCHEDULE

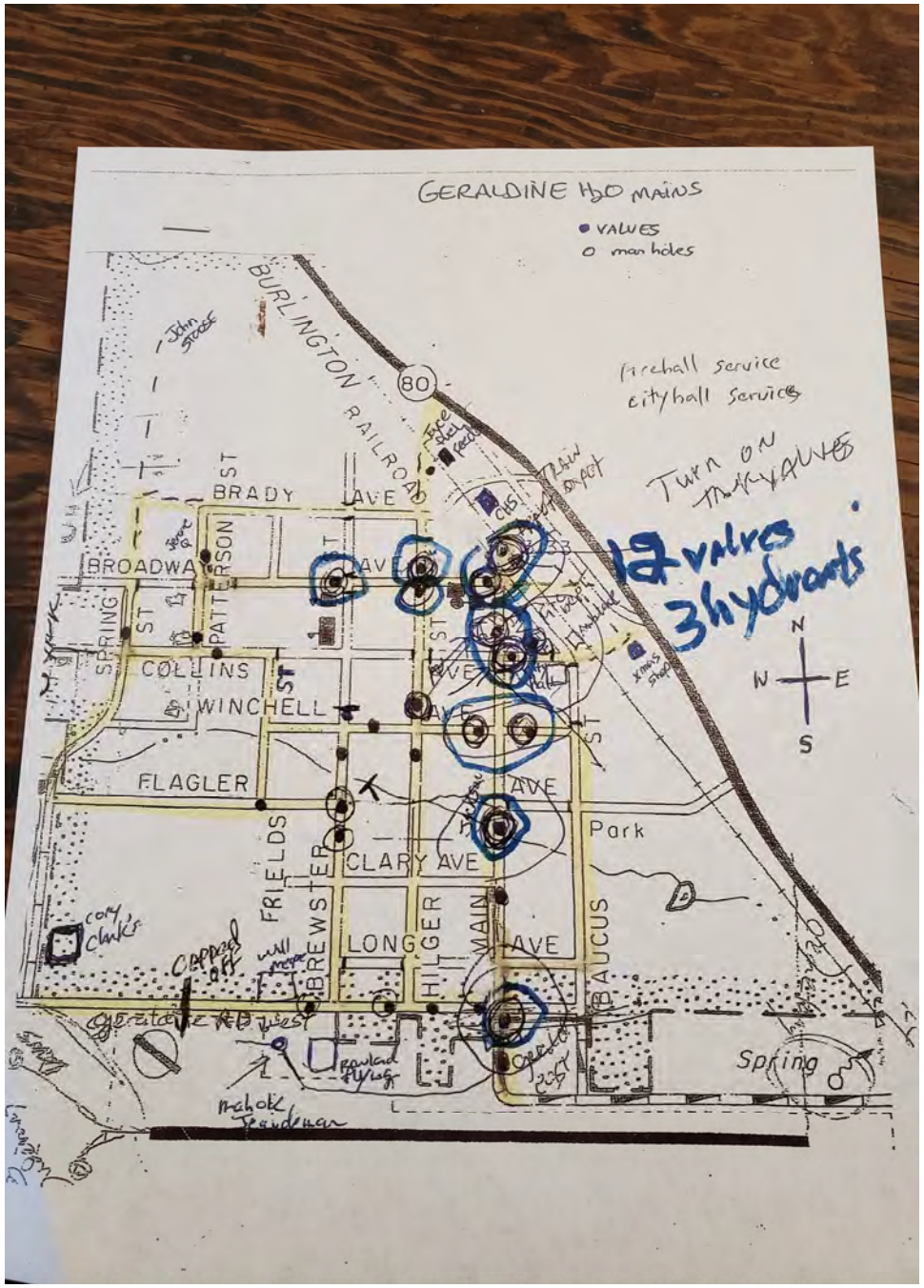


NOTE:
1. INSTALL 4 EA. READY ROD FOR PIPE SUPPORT AS SHOWN.




PITTSBURGH-DES MOINES
STEEL CO.
PITTSBURGH, PA.
DES MOINES, IA.
SANTA CLARA, CALIF.
ERECTED 1959
CAPACITY 100,000 GALLONS
HEIGHT 91 1 0 7/8 TO UPPER CAPACITY LEVEL
70 1 0 TO LOWER CAPACITY LEVEL



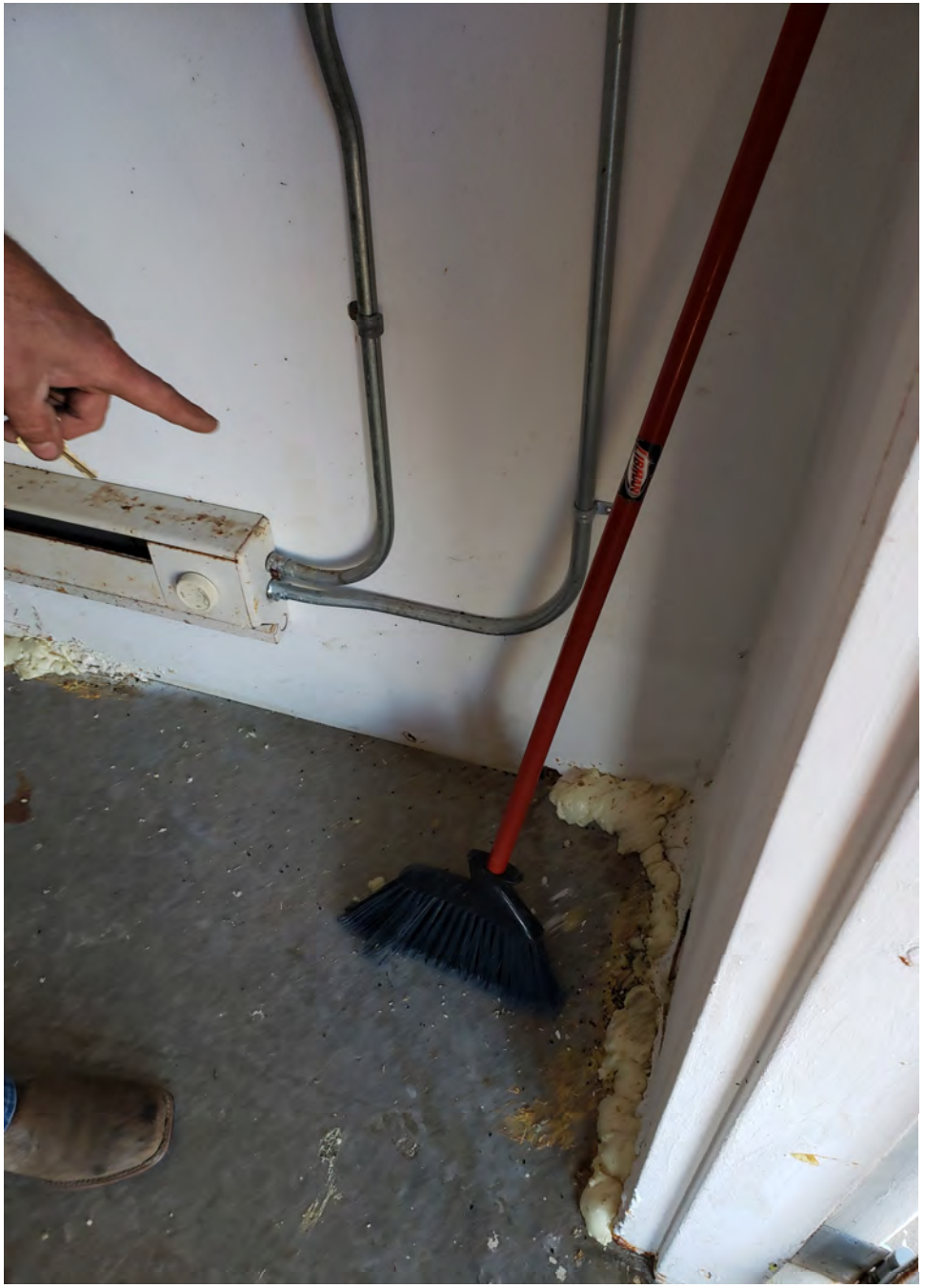

GERALDINE H2O MAINS
• VALVES
o manholes
Firehall service
cityhall service
Turn ON
12 valves
3 hydrants
BURLINGTON RAILROAD
80
BRADY AVE
BROADWAY
PATTERSON ST
SPRING ST
COLLINS
WINCHELL
FLAGLER
FRIELDS
BREWSTER
CLARY AVE
Park
LONG AVE
HILGER
MAIN
BAUCUS
Spring
N
S
E
W


100
50
150
psi
0
200


DANGER
CHLORINE


MICROCOMM
CL2 BUILDING/FLOW METER RTU


Eastech Badger
FLOW .031 GPM x 1 OK
TOTAL 983999 GAL x 100




GREAT FALLS IRON
GREAT FALLS MONT

APPENDIX O

Town Financials

SERVICES: WATER SEWER GARBAGE SERVICE CHG MISC TURN ON / OFF OVERPAYMENT

SECTIONS: ALL

Service / Rate Code	Usage in Actual Units: Monthly Usage	Charges	Number		
GARBAGE					
I - IN TOWN	0	324.00	17	0	0
NO RATE CODE	0	135.00	2	0	0
S - SCHOOLS	0	239.70	1	0	0
Subtotal for Service GARBAGE :		**698.70**	20	0	0
SEWER					
B - BUSINESS	30550	264.00	8	0	0
F-FLAT NON-PROFIT	0	165.00	5	0	0
NO RATE CODE	0	11.00	1	0	0
R - RESIDENTIAL	0	4026.00	122	0	0
S - SCHOOLS	0	200.50	1	0	0
Subtotal for Service SEWER :	**30550**	**4666.50**	137	0	0
TURN ON / OFF					
NO RATE CODE	0	25.00	1	0	0
Subtotal for Service TURN ON / OFF :		**25.00**	1	0	0
WATER					
B - BUSINESS	32050	375.15	10	0	0
F - FLAT NON-PROFIT	0	20.00	5	0	0
H - HAWARDEN	259700	926.32	1	0	0
L - LIVESTOCK INTOWN	0	37.50	3	0	0
M - LIVESTOCK OUT	146900	226.78	2	0	0
N - NORTH	258280	694.59	1	0	0
NO RATE CODE	0	12.01	1	0	0
R - RESIDENTIAL	2576870	7211.41	128	0	0
S - SCHOOLS	1000	144.16	2	0	0
Subtotal for Service WATER :	**3274800**	**9647.92**	153	0	0
Grand Total :	**3305350**	**15038.12**	**311**	**0**	**0**

Matthew Mudd

From: Town of Geraldine <gertown1914@gmail.com>
Sent: Monday, April 25, 2022 3:24 PM
To: Matthew Mudd
Subject: Water Rates
Attachments: Rate Code Usage Summary for April Billing.pdf

Hello Matt,

I went into our utility program to find what you are looking for. I am sending you a report of the different types of billing codes and how many users are on each.

Hawarden: $757.16 and $1.13/gal over 110,000 gallons.
Geraldine North: $481.83 and $1.13/gal over 70,000 gallons.
School: $72.08 and $1.13/gal over 10,000 gallons.
Residential: $36.04 and $1.13/gal over 5,000 gallons.

Let me know if you need any more information.

Thanks,

Stephanie Baker
Clerk/Treasurer
Town of Geraldine
PO Box 211
Geraldine, MT 59446
406-737-4361 (office)

5210 WATER FUND

Account	July	August	September	October	November	December	January	February	March	April	May	June	Total
330000													
330000 INTERGOVERNMENTAL REVENUE	0	0	0	0	0	0	0	0	0	0	0	0	2,132
336020 on behalf contrib. to pension	0	0	0	0	0	0	0	0	0	0	0	0	582
Total for 330000 INTERGOVERNMENTAL REVENUE	0	0	0	0	0	0	0	0	0	0	0	0	2,715
340000													
343021 Metered Water Sales	9,661	6,501	7,867	6,945	7,160	6,930	7,834	6,407	6,992	7,081	7,119	7,397	87,898
343022 Unmetered Water Sales	306	199	143	212	44	123	62	47	64	116	546	474	2,340
343027 Misc Water Revenue	0	0	179	0	140	5,055	148	0	118	860	0	421	6,923
Total for 340000 CHARGES FOR SERVICES	9,967	6,700	8,190	7,157	7,345	12,110	8,045	6,454	7,174	8,058	7,665	8,292	97,162
380000													
381070 Proceeds from Loan	0	0	0	0	0	0	0	0	0	2,132	0	0	0
Total for 380000 OTHER FINANCING SOURCES	0	0	0	0	0	0	0	0	0	2,132	0	0	0
Total for Fund	9,967	6,700	8,190	7,157	7,345	12,110	8,045	6,454	7,174	10,190	7,665	8,292	99,878

Note: Totals may not net due to rounding

5210 WATER FUND

Account	July	August	September	October	November	December	January	February	March	April	May	June	Total
330000													
336020 on behalf contrib. to pension	0	0	0	0	0	0	0	0	0	0	0	0	470
Total for 330000 INTERGOVERNMENTAL REVENUE	0	0	0	0	0	0	0	0	0	0	0	0	470
340000													
343021 Metered Water Sales	7,495	8,709	7,918	6,986	6,993	7,028	6,893	6,934	6,887	7,104	7,457	7,947	88,355
343022 Unmetered Water Sales	363	127	231	163	92	17	69	68	66	179	565	443	2,386
343026 Installation Charges	0	0	0	0	0	0	120	0	0	0	0	0	120
343027 Misc Water Revenue	258	-223	287	118	276	-123	272	326	310	97	105	50	1,754
Total for 340000 CHARGES FOR SERVICES	8,116	8,612	8,437	7,267	7,362	6,922	7,355	7,329	7,263	7,380	8,128	8,440	92,616
Total for Fund	8,116	8,612	8,437	7,267	7,362	6,922	7,355	7,329	7,263	7,380	8,128	8,440	93,087

Note: Totals may not net due to rounding

5210 WATER FUND

Account	July	August	September	October	November	December	January	February	March	April	May	June	Total
330000													
336020 on behalf contrib. to pension	0	0	0	0	0	0	0	0	0	0	0	0	1,315
Total for 330000 INTERGOVERNMENTAL REVENUE	0	0	0	0	0	0	0	0	0	0	0	0	1,315
340000													
340000 CHARGES FOR SERVICES	0	0	0	0	0	0	0	0	0	0	61	0	61
343021 Metered Water Sales	8,009	8,574	8,189	7,381	7,241	7,368	7,832	7,314	7,324	7,186	7,644	8,044	92,347
343022 Unmetered Water Sales	178	125	119	113	144	66	96	53	70	228	424	798	2,418
343024 Water Material Supplies	0	0	0	0	0	0	0	0	0	0	0	49	49
343027 Misc Water Revenue	4	60	557	0	0	103	633	0	43	335	0	0	1,737
Total for 340000 CHARGES FOR SERVICES	8,192	8,759	8,866	7,494	7,386	7,538	8,562	7,368	7,437	7,749	8,131	8,891	96,614
Total for Fund	8,192	8,759	8,866	7,494	7,386	7,538	8,562	7,368	7,437	7,749	8,131	8,891	97,929

Note: Totals may not net due to rounding

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
002-00	00-9999999	74060	12/20/2019	74060	11/20/2019	0	7138172827
JUEDEMANN & CO.		P.O.BOX 224					
010050-00	01-010050	1429700	12/19/2019	1427500	11/19/2019	2200	76381846
ANDERSON, FRANCINE		PO BOX 287					
010100-00	01-010100	207000	12/20/2019	207000	10/21/2019	0	76381812
JOYCE, RILEY		P.O.BOX 66					
010150-00	01-010150	384900	12/19/2019	384800	11/19/2019	100	76381830
BOND KATHY		BOX 294					
010200-00	01-010200	14100	12/20/2019	10330	11/20/2019	3770	38653417
ARMSTRONG, STUART		PO BOX 202			NEW METER 8/22/19/NEW LINE AT NO CH		
010250-00	01-010250	864100	12/19/2019	863600	11/19/2019	500	7073119276
ARMSTRONG, STUART		PO BOX 202					
010300-00	01-010300	247400	12/19/2019	245350	11/19/2019	2050	87562350
BUCK LITA		PO BOX 91					
010350-00	01-010350	814400	12/19/2019	814400	11/19/2019	0	76381765
LOCQUIAO, CAROLE		PO BOX 313					
010360-01	01-010360	0	/ /	0	/ /	0	87052687
DISKINSON, BARBARA		PO BOX 102					
010400-00	01-010400	0	09/29/2016	0	09/29/2016	0	0
MATT BUCK TRUST		P.O.BOX 144					
010450-00	01-010450	107600	12/19/2019	107400	11/19/2019	200	76381888
MATT BUCK TRUST		P.O.BOX 144					
010500-00	01-010500	1026550	12/19/2019	1023550	11/19/2019	3000	76381792
BURTCHETT, CHRIS		PO BOX 143					
010530-00	01-010530	16250	09/29/2016	16250	09/29/2016	0	42834756
BURTCHETT, JIM		PO BOX 353					
010550-00	01-010550	2185950	12/19/2019	2177700	11/19/2019	8250	76381768
NORTON, DEBORAH		PO BOX 192					
010560-00	01-010560	646700	07/18/2018	646700	07/18/2018	0	76381791
CHAMBERLAIN, ALAN		824 WEST EVELYN					
010600-00	01-010600	1790200	12/19/2019	1787850	11/19/2019	2350	76381913
CARWTRIGHT, BEN		PO BOX 215					
010650-00	01-010650	526200	12/19/2019	524300	11/19/2019	1900	76381869
PROTSMAN, RICHARD		PO BOX 325					
010700-00	01-010700	146300	12/19/2019	146300	11/19/2019	0	7195171457
CHS BIG SKY		PO BOX 330					
010750-00	01-010750	209350	12/19/2019	208900	11/19/2019	450	76110141
GOODHART KEITH		P.O. BOX 3					
010800-00	01-010800	730300	12/19/2019	728400	11/19/2019	1900	76381781
CHOUTEAU COUNTY SHOP		PO BOX 459					
010850-00	01-010850	361750	12/19/2019	360150	11/19/2019	1600	76381857
CLARK, RICHARD		PO BOX 22					
010900-00	01-010900	1249700	12/19/2019	1245800	11/19/2019	3900	76381784
LUDEMAN, TAMMEY		PO BOX 233					
010950-00	01-010950	410850	09/29/2016	410850	09/29/2016	0	76381856
TANNER, WV		100 34TH AVE. NE					
010960-00	01-010960	1513600	12/19/2019	1506100	11/19/2019	7500	87052588
HOOPER, DARCI		PO BOX 86					
011000-00	01-011000	713100	12/19/2019	711800	11/19/2019	1300	76381875
CLARK, MARTY		PO BOX 76					
011050-00	01-011050	807100	12/19/2019	804450	11/19/2019	2650	76381823
POINDEXTER, JOHN		PO BOX 248					
011100-00	01-011100	817050	12/19/2019	814800	11/19/2019	2250	76381892
CLARK, JOHN E		PO BOX 229					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
011150-00	01-011150	386850	12/19/2019	383250	11/19/2019	3600	39215907
SALOIS, DENA		143 GERALDINE RD EAST					
011250-00	01-011250	1372000	12/19/2019	1368600	11/19/2019	3400	76381760
CLARK, PAUL		PO BOX 191					
011300-01	01-011300.01	8950	09/29/2016	8950	09/29/2016	0	76381900
COMPUTERIZED TAX SER		781 ROUDEBUSH LANE					
011330-01	01-011330.01	126050	09/29/2016	126050	09/29/2016	0	0
CROFT, DANA		106 BROADWAY					
011340-00	01-011340	283550	09/29/2016	283550	09/29/2016	0	76381850
DANBROOK, HELEN		2065 GRACEVILLE RD N					
011350-00	01-011350	1851600	12/19/2019	1847250	11/19/2019	4350	76381911
DAVIS RANCH		PO BOX 336					
011360-00	01-011360	195300	12/19/2019	194650	11/19/2019	650	76381787
SCOTT, ROSEMARY		PO BOX115					
011360-01	01-011360.01	0	/ /	0	/ /	0	0
ROWLAND RON		4290 NORTH LOLA LEE LANE					
011370-01	01-011370.01	2128650	02/20/2019	2128650	02/20/2019	0	76381872
MCOMBER DEREK		P.O.BOX 334					
011400-00	01-011400	1879650	12/19/2019	1874650	11/19/2019	5000	76381896
MCOMBER, JON & ADRIANE		PO BOX 132					
011450-00	01-011450	303850	12/19/2019	300950	11/19/2019	2900	7138173340
JOYCE, CODY		PO BOX 14					
011500-00	01-011500	3114450	12/19/2019	3108700	11/19/2019	5750	76381766
BURTCHETT, TOM		PO BOX 245					
011550-00	01-011550	3108500	12/19/2019	3105050	11/19/2019	3450	76381783
ANTONICH, OWEN, ELAINA		P.O. BOX 106					
011600-00	01-011600	1796050	12/19/2019	1795000	11/19/2019	1050	76381887
DUVALL, LEN		PO BOX 305					
011650-00	01-011650	1317100	12/19/2019	1314600	11/19/2019	2500	76381775
EBELING, ROB		PO BOX 12					
011700-00	01-011700	27600	12/19/2019	25300	11/19/2019	2300	36327951
FAIRBANKS, BEVERLEE		PO BOX 197					
011750-00	01-011750	1310350	12/19/2019	1302800	10/21/2019	7550	76381788
FAIRBANKS, LOIS		700 4TH AVE.NW A6					
011800-00	01-011800	2861300	12/19/2019	2855100	11/19/2019	6200	76381771
FAIRBANKS, ROCQUE		PO BOX 241					
011850-00	01-011850	7372000	12/19/2019	7368500	11/19/2019	3500	76381774
FARMER, ROBERT		PO BOX 85					
011900-00	01-011900	36350	12/19/2019	35450	11/19/2019	900	7073112997
JOYCE, R		P.O.BOX 66					
011950-00	01-011950	89850	12/19/2019	86300	11/19/2019	3550	36409109
HUTLEY, MELANIE		372 GERALDINE AVE					
012000-00	01-012000	746450	12/19/2019	745350	11/19/2019	1100	76381764
RAY, CALIEB		4909 BURKWOOD CT. APT.104					
012050-00	01-012050	0	/ /	0	/ /	0	76381903
BRAY SHAWN R		P.O.BOX303					
012050-01	01-012050.01	43800	12/20/2019	43800	11/19/2018	0	0
FELGER BRAD		P.O.BOX 346					
012150-01	01-012150	13850	09/29/2016	13850	09/29/2016	0	76381910
CENTRAL MONTANA CO-OP		PO BOX 330					
012200-00	01-012200	344650	09/29/2016	344650	09/29/2016	0	76381862
M & M TIRE REPAIR		PO BOX 166					
012250-00	01-012250	667000	12/19/2019	662500	11/19/2019	4500	83817149
RUSTYS BED & BREAKFAST		PO BOX 76					
012300-00	01-012300	101400	12/19/2019	100500	11/19/2019	900	76381899
FRESH START COOPERATIVE		P.O.BOX 30					
012350-00	01-012350	7700	12/19/2019	7300	11/19/2019	400	7344161231
SPENCER, DAVID		PO BOX 171					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
012400-00	01-012400	986050	12/19/2019	986050	10/21/2019	0	52132901
GERALDINE SWIMMING POOL		PO BOX 312					
012450-00	01-012450	22650	09/29/2016	22650	09/29/2016	0	76381794
BAKER MICHAEL		P.O. BOX 292					
012500-00	01-012500	6440	12/19/2019	2610	11/19/2019	3830	38199210
LITTLE, LARRY		P.O.BOX 162					
012550-00	01-012550	540900	12/19/2019	540100	11/19/2019	800	76381819
OAKLEY, LEXIE R		PO BOX 33					
012610-00	01-012610	11900	09/29/2016	11900	09/29/2016	0	76381838
THOMAS, PHILIP		PO BOX 203					
012700-00	01-012700	419400	12/19/2019	411200	11/19/2019	8200	76381795
STOCKMAN BANK		PO BOX 327					
012750-00	01-012750	9750	11/19/2018	9750	11/19/2018	0	201888
STOLK, JOHN		PO BOX 118					
012800-00	01-012800	579850	12/19/2019	576450	11/19/2019	3400	76381870
SCHOOL RENTAL		PO BOX 347					
012850-01	01-012850.01	0	/ /	0	/ /	0	0
FRITZ, TRAVIS		PO BOX 204					
012900-00	01-012900	38880	12/19/2019	39640	11/19/2019	0	76381778
BURTCHETT, ERIC		PO BOX 242					
012950-00	01-012950	318500	12/19/2019	297250	11/19/2019	21250	76381803
JACKSON, GENE		PO BOX 62					
013000-00	01-013000	846000	12/19/2019	842800	11/19/2019	3200	76381835
JACKSON, GENE		PO BOX 62					
013050-01	01-013050.01	73820	09/29/2016	73820	09/29/2016	0	76381832
GOODHART		PO BOX 3					
013250-00	01-013250	2062600	12/19/2019	2059300	11/19/2019	3300	76381825
WEAVER, LEROY		P.O. BOX 130					
013250-01	01-013250.01	0	/ /	0	/ /	0	0
OBERGFELL, DALLAS		491 BREWSTER ST					
013300-00	01-013300	43250	12/19/2019	41800	11/19/2019	1450	7195171897
JOYCE FUEL & FEED		PO BOX 66					
013350-00	01-013350	1013650	12/19/2019	1010500	11/19/2019	3150	76381889
JOYCE, PERRY		PO BOX 66					
013400-00	01-013400	1005300	12/19/2019	931300	11/19/2019	74000	79595099
JOYCE, PERRY		PO BOX 66					
013450-00	01-013450	4252850	12/19/2019	4245600	11/19/2019	7250	76381799
JUEDEMAN, WILEY		PO BOX 276					
013500-00	01-013500	846750	12/19/2019	844000	11/19/2019	2750	76381893
WILLIAMSON, EDWARD		PO BOX 1555					
013510-00	01-013510	1392300	12/19/2019	1389700	11/19/2019	2600	434200966
KLEIN MONTE & ANITA		PO BOX 173					
013550-00	01-013550	1203500	12/19/2019	1201850	11/19/2019	1650	76110135
PELTON, DONNA		P.O.BOX 314					
013600-00	01-013600	420900	12/19/2019	418100	11/19/2019	2800	7099088842
STINE, DANIEL & TAMI		PO BOX 43					
013650-00	01-013650	9110	12/19/2019	7820	11/19/2019	1290	36409093
LEISTIKO, ERIC		PO BOX 103					
013700-00	01-013700	912250	12/19/2019	908100	11/19/2019	4150	76381895
LUNDY, ROY		PO BOX 153					
013750-00	01-013750	1864100	11/19/2019	1861300	11/19/2019	2800	76381770
HOOPER, DANIEL		PO BOX 141					
013800-00	01-013800	96110	09/29/2016	96110	09/29/2016	0	76381885
HOOPER, DANIEL		PO BOX 141					
013840-00	01-013840	87100	12/19/2019	85100	11/19/2019	2000	36409108
IKARD, MIKE		PO BOX 244					
013850-00	01-013850	616700	12/19/2019	612900	11/19/2019	3800	76381865
MARTIN, MELVIN JR		PO BOX 15					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
013900-00	01-013900	914950	12/19/2019	907200	11/19/2019	7750	76381860
TOOLE, SAGE		P.O.BOX 293					
013905-00	01-013905	999900	12/19/2019	998100	11/19/2019	1800	76381881
LUDEMAN, BARBARA		PO BOX 232					
013950-00	01-013950	495100	12/19/2019	493900	11/19/2019	1200	76381871
CLOUSING, CALVIN		P.O. BOX 236					
014000-00	01-014000	142100	12/19/2019	140850	11/19/2019	1250	83817148
JUEDEMAN & CO. 3		P.O. BOX 224			11/18 CHANGED FROM 100'S TO 10'S		
014050-00	01-014050	373700	12/19/2019	368600	11/19/2019	5100	7023088087
DONNER, BETTY		PO BOX 61					
014100-00	01-014100	337600	12/19/2019	337600	11/19/2019	0	76381790
HANSEN, LAULETTE		127 S EASY STREET					
014150-00	01-014150	1393400	12/19/2019	1388800	11/19/2019	4600	80536570
MCGRANN, MAX		PO BOX 6					
014200-00	01-014200	531250	12/19/2019	530700	11/19/2019	550	76381916
PENWELL, NANCY		179 WINCHELL P.O.BOX 183					
014200-01	01-014200.OW	0	/ /	0	/ /	0	0
EBELING, ROBERT		PO BOX 1					
014250-00	01-014250	1156750	12/19/2019	1092600	11/19/2019	64150	35789318
MEEKS, KRAIG		PO BOX 36					
014300-00	01-014300	0	/ /	0	/ /	0	76381845
SARRAZIN, CARLA		P.O.BOX 298					
014300-OW	01-014300.OW	1063750	12/19/2019	1060550	11/19/2019	3200	0
GERALDINE COMMUNITY CHURCH		PO BOX 167					
014305-00	01-014305	261000	12/19/2019	260900	11/19/2019	100	7140170087
OUTRIDERS SADDLE CLUB		PO BOX 175					
014350-00	01-014350	743050	12/19/2019	735600	11/19/2019	7450	76381820
LAZY BELL RANCH		PO BOX 36					
014400-00	01-014400	408800	12/19/2019	408200	11/19/2019	600	76381868
MOLINE, BONNIE		PO BOX 263					
014550-00	01-014550	488250	12/19/2019	488250	11/19/2019	0	76381836
NACK, BLAIR		544 SQUARE BUTTE RD					
014600-00	01-014600	507800	12/19/2019	505000	11/19/2019	2800	88632277
MUIR, WILL		PO BOX 92					
014650-00	01-014650	926550	12/19/2019	926550	11/19/2019	0	76381834
PACINI, JOSEPH		244 COLLINS PO BOX 209					
014750-00	01-014750	105760	12/19/2019	105710	11/19/2019	50	76381912
SMITH EARL		P.O.BOX 206					
014800-00	01-014800	221600	12/19/2019	221100	11/19/2019	500	76381908
U S POSTAL SERVICE		PO BOX 9998			CHANGED FROM 100'S TO TENS 5/30/18		
014850-00	01-014850	288000	12/19/2019	287950	11/19/2019	50	76381851
DANBROOK, HELEN		2065 GRACEVILLE RD N					
014900-00	01-014900	736700	12/19/2019	736200	11/19/2019	500	76381817
BURTCHETT, JAMES		PO BOX 353					
014950-00	01-014950	875800	12/19/2019	874200	11/19/2019	1600	76381907
QUNELL,JERRY		PO BOX 184					
015000-00	01-015000	26500	07/19/2019	26500	07/19/2019	0	76381880
TIMMONS, JOE BLAIR		PO BOX 27					
015050-00	01-015050	1440250	12/19/2019	1438650	11/19/2019	1600	76381841
QUNELL, MICHAEL		PO BOX 351					
015100-00	01-015100	1607350	12/19/2019	1603800	11/19/2019	3550	79595100
RICE, HAL & MONICA		PO BOX 354					
015150-00	01-015150	617900	12/19/2019	616700	11/19/2019	1200	7226091817
ROMANCHUK, PAT		PO BOX 332					
015200-00	01-015200	4485050	12/19/2019	4484400	11/19/2019	650	7049180092
CHS BIG SKY		PO BOX 330			3/26/19 READ 440065/HAD READ WRONG		
015250-00	01-015250	726400	12/19/2019	722500	11/19/2019	3900	76381759
RICE ANDY		P.O. BOX 354					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
015300-00	01-015300	421200	12/19/2019	419150	11/19/2019	2050	76381796
LAMBERT, RONALD		PO BOX 89					
015350-00	01-015350	17700	12/19/2019	15050	11/19/2019	2650	36327943
MCOMBER, KAYLA		PO BOX 93			NEW METER/LINE 8/16/19 NO CH		
015400-00	01-015400	63850	12/20/2019	63850	11/20/2019	0	7009170028
MCOMBER, KAYLA		PO BOX 93					
015500-00	01-015500	0	09/29/2016	0	09/29/2016	0	90986262
ROWLAND RON		4290 NORTH LOLA LEE LANE					
015550-00	01-015550	495200	12/19/2019	491400	11/19/2019	3800	7048075931
CLARK, COREY AND SHAYA		P.O. BOX 84					
015550-01	01-015550.01	362800	01/17/2019	362800	01/17/2019	0	0
ROWLAND RON		4290 NORTH LOLA LEE LANE					
015560-00	01-015560	2302800	12/19/2019	2295130	11/20/2019	7670	76381842
RUSTYS BAR		PO BOX 76					
015600-00	01-015600	391100	12/19/2019	389400	11/19/2019	1700	76381909
SANDE, GARY		3207 7TH AVENUE SOUTH					
015650-00	01-015650	0	/ /	0	/ /	0	76381901
QUNELL, JEROME JR.		P.O.BOX 223					
015650-01	01-015650.01	896250	12/19/2019	894550	11/19/2019	1700	0
CLARK		PO BOX 76					
015680-00	01-015680	161700	12/19/2019	161700	11/19/2019	0	79732759
WILLIAMS ALLEN		PO BOX 74					
015690-00	01-015690	390800	12/19/2019	388100	11/19/2019	2700	90838683
PROPER, KENDRA &JAKE MOLINE		P.O. BOX 252					
015700-00	01-015700	1881000	12/19/2019	1875000	11/19/2019	6000	1421468320
SCHOOL DISTRICT #3 ~2		PO BOX 347			USED METER 8/20/21		
015705-00	01-015705	4592500	12/19/2019	4583000	11/19/2019	9500	1224021096
SCHOOL DISTRICT #3		PO BOX 347					
015750-00	01-015750	2109400	12/19/2019	2107300	11/19/2019	2100	76381773
SCHOOL DISTRICT #3		PO BOX 347					
015760-00	01-015760	1073000	12/19/2019	1073000	11/19/2019	0	61017284
SCHOOL DIST #3 FOOTBALL FIELD		P.O.BOX 347					
015800-00	01-015800	36600	12/19/2019	34300	11/19/2019	2300	36327946
SCOTT, DUANE		PO BOX 164					
015850-00	01-015850	1926200	12/19/2019	1922300	11/19/2019	3900	76110138
SCRIBNER, CAROL		1142 SCRIBNER LANE					
015900-00	01-015900	1300	12/19/2019	1505900	11/19/2019	0	76381839
SCRIBNER, WARD		PO BOX 88					
015950-00	01-015950	378500	12/19/2019	377050	11/19/2019	1450	76381828
SERVICE PLUS		PO BOX 143					
016000-00	01-016000	0	/ /	0	/ /	0	76381906
FELGER BRAD		P.O.BOX 346					
016000-01	01-016000.01	2876950	12/19/2019	2872400	11/19/2019	4550	0
ENGELLANT, RICK		PO BOX 2					
016050-00	01-016050	852400	12/19/2019	851750	11/19/2019	650	76381858
JOHNSTON, VIRGINIA		PO BOX 24					
016100-00	01-016100	1052750	12/19/2019	1051500	11/19/2019	1250	76381815
SMITH, SHIRLEY		PO BOX 174					
016150-00	01-016150	0	/ /	0	/ /	0	76381867
MCCONNELL, DARYL (LEE)		P.O.BOX 81					
016150-01	01-016150.01	1329200	12/19/2019	1325000	11/19/2019	4200	0
SMITH, STAN		PO BOX 322					
016200-00	01-016200	799300	12/19/2019	797350	11/19/2019	1950	76381831
SMOOTZ, WINONA		P.O.BOX 262					
016250-00	01-016250	1411100	12/19/2019	1408600	11/19/2019	2500	76381863
SPENCER, DAVID		PO BOX 171					
016300-00	01-016300	1178350	12/19/2019	1177200	11/19/2019	1150	76381776
SPENCER, DELORES		PO BOX 296					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
016350-00	01-016350	1750	12/19/2019	1720	11/19/2019	30	7023170194
MILLER, NORMA		129 RIVERVIEW C					
016400-00	01-016400	310550	12/19/2019	310550	11/19/2019	0	39383570
BRONEC, SAM		P.O.B OX 222					
016500-00	01-016500	4202950	12/19/2019	4197200	11/19/2019	5750	76381864
MCBEE LAUREL		P.O. BOX 243					
016500-01	01-016500.01	4015250	12/11/2018	4015250	12/11/2018	0	0
BOND KATHY		BOX 294					
016550-00	01-016550	2278500	12/19/2019	2275000	11/19/2019	3500	76381762
MILLS, KEN OR ANKA		PO BOX 2					
016550-01	01-016550.01	1952000	09/29/2016	1952000	09/29/2016	0	0
FORSNESS, DEWEY		PO BOX 252					
016600-00	01-016600	74800	12/19/2019	73200	11/19/2019	1600	90986267
LUDEMAN, RANDY & SANDY		PO BOX 61					
016700-00	01-016700	1453700	12/19/2019	1452150	11/19/2019	1550	1240012182
STOOS, MJ		PO BOX 196					
016750-00	01-016750	391800	02/26/2018	391800	02/26/2018	0	76381874
STOOS, WES		PO BOX 64					
016800-00	01-016800	2784050	12/19/2019	2783850	11/19/2019	200	76381882
TANNER, WV		100 34TH AVE. NE					
016850-00	01-016850	1413400	12/19/2019	1411000	11/19/2019	2400	76381859
TULL DUSTIN & DESTINY MARTINEZ		PO BOX 231					
016900-00	01-016900	88100	12/19/2019	88080	11/19/2019	20	76381878
ROWLAND, DAVID		4091 HAWARDEN RD					
016950-00	01-016950	1018500	12/19/2019	1012100	11/19/2019	6400	79732761
JONES, BRIAN		P.O.BOX 112					
016950-01	01-016950.01	986800	07/19/2019	986800	07/19/2019	0	0
LITTLE, MATTHEW		P.O.BOX 21					
017000-00	01-017000	263300	12/19/2019	261100	11/19/2019	2200	76381805
LEWIS ELIZABETH		P.O.BOX 288					
017000-01	01-017000.01	255300	07/19/2019	255300	07/19/2019	0	0
LITTLE, MATTHEW		P.O.BOX 21					
017050-00	01-017050	1870	12/31/2019	20	11/19/2019	1850	36327952
THOMPSON, LES		PO BOX 35			DEC. BILL SAID USAGE 8K PLUS GAL.		
017100-00	01-017100	2017100	12/19/2019	2014900	11/19/2019	2200	76381800
CORROW-SCOTT, AMBER		701 2ND ST. SOUTH					
017150-00	01-017150	1017650	12/19/2019	1016000	11/19/2019	1650	76381816
DUNN, DARRELL		PO BOX 214					
017200-00	01-017200	0	/ /	0	/ /	0	76381883
JENNIFER ANDERSON		10617 SOUTH LAMOND					
017200-01	01-017200.01	884400	12/19/2019	883900	11/19/2019	500	0
ANDERSON JENNIFER		10617 S. LAMOND					
017250-00	01-017250	1885500	12/19/2019	1882000	11/19/2019	3500	76110140
WILLIAMSON, JUSTIN		PO BOX 207					
017300-00	01-017300	1051550	08/31/2017	1051550	08/31/2017	0	76381876
HELBERG JON		344 FRIELDS ST					
017400-00	01-017400	265100	12/19/2019	264300	11/19/2019	800	76381843
SLABACK, GARY		639 MAIN STREET					
017450-00	01-017450	190400	12/19/2019	189400	11/19/2019	1000	76381769
BURTCHETT, SUE		5137 HAWLEY BLVD					
017550-00	01-017550	1340300	12/19/2019	1339750	11/19/2019	550	76381767
SCHMIDT, DEAN		PO BOX 19					
017600-00	01-017600	1871500	12/19/2019	1867900	11/19/2019	3600	76381810
WIMER, TOM & LINDA		PO BOX 263					
017650-00	01-017650	1395700	12/19/2019	1392700	11/19/2019	3000	76381873
ROWLAND, DAN & MARCI		P.O. BOX 94					
018000-00	01-018000	234250	09/19/2018	234250	09/19/2018	0	76381761
GOODHART, KEITH		PO BOX 3					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
018010-00	01-018010	14370	12/19/2019	14370	11/19/2019	0	79732764
GOODHART SHOP		PO BOX 3					
018100-00	01-018100	137600	12/19/2019	136400	11/19/2019	1200	76381898
THOMAS, PHILIP ~2		P.O. BOX 203					
018150-00	01-018150	1330	09/29/2016	1330	09/29/2016	0	76110134
DIAMOND D BAR PROCESSING		PO BOX 134					
018200-00	01-018200	125300	12/19/2019	125100	11/19/2019	200	76381802
CHO COUNTY LIBRARY		PO BOX 639					
018250-00	01-018250	5400	01/22/2019	5400	01/22/2019	0	76381897
HOLIDAY SHOP		PO BOX 194					
018300-00	01-018300	10090	09/29/2016	10090	09/29/2016	0	76381837
ENGELLANT, DAN		521 PATTERSON STREET					
018350-00	01-018350	312900	12/19/2019	307400	11/19/2019	5500	76381798
JUEDEMAN GRAIN COMPANY		PO BOX 276					
018400-00	01-018400	819400	12/19/2019	811800	11/19/2019	7600	76381757
SCHOOL(OLD AUDITORIUM)		PO BOX 347					
018450-00	01-018450	206300	12/19/2019	205400	11/19/2019	900	76381866
SCHOOL RENTAL HOUSE~2		PO BOX 347					
018500-00	01-018500	1175550	12/19/2019	1169800	11/19/2019	5750	76381758
SCHOOL RENTAL HOUSE		PO BOX 347					
018550-00	01-018550	2105300	07/21/2019	2105300	07/21/2019	0	0
MEEKS, KRAIG		PO BOX 36					
018550-01	01-018550.01	0	07/21/2019	0	07/21/2019	0	0
ROSE, STEVE		PO BOX 205					
018600-00	01-018600	400600	12/19/2019	400000	11/19/2019	600	76381821
CLARK, BRENT J		PO BOX 121					
018750-00	01-018750	178550	12/19/2019	174200	11/19/2019	4350	7324106723
SCRIBNER HANGAR		1142 SCRIBNER LANE					
018800-00	01-018800	7100	01/22/2019	7100	01/22/2019	0	76381884
CLARK ,TOBY		P.O. BOX 229					
018850-00	01-018850	271800	12/19/2019	269700	11/19/2019	2100	88688630
LEISTIKO, MORGAN		P.O. BOX 331					
018900-00	01-018900	316550	12/19/2019	310450	11/19/2019	6100	76381782
LUDEMAN, TAMMEY		PO BOX 233					
018950-00	01-018950	718400	12/19/2019	718400	11/19/2019	0	76381855
WENNERBERG, CARLA							
019100-00	01-019100	2531700	12/19/2019	2249200	11/19/2019	282500	1249053484
HAWARDEN-SQ BUTTE WTR		PO BOX 265					
019150-00	01-019150	525270	12/20/2019	332900	11/19/2019	192370	2901836728
NORTH GERALDINE WATER		PO BOX 324			MAY 2018 CHANGED FROM TENS TO 100'S		
10260-00	01-010260	0	/ /	0	/ /	0	172036778
GERALDINE AIRPORT		P.O. BOX 867					

Total Monthly Usage: 992480

Total Number of Accounts: 193

SERVICES: WATER SEWER GARBAGE SERVICE CHG MISC WATER TURN ON OVERPAYMENT

METER SIZES: ALL

SUBDIVISIONS: ALL

Service / Rate Code	Usage in Actual Units	Usage	Charges	Number
GARBAGE				
I - IN TOWN		0	180.00	10
O - OUT OF TOWN		0	44.00	2
S - SCHOOLS		0	239.70	1
Subtotal for Service GARBAGE :			463.70	13
SEWER				
B - BUSINESS		20530	198.00	6
F-FLAT NON-PROFIT		0	165.00	5
R - RESIDENTIAL		0	4224.00	128
S - SCHOOLS		0	200.50	1
Subtotal for Service SEWER :		20530	4787.50	140
WATER				
B - BUSINESS		23130	259.06	7
F - FLAT NON-PROFIT		0	20.00	5
H - HAWARDEN		527300	1228.71	1
L - LIVESTOCK INTOWN		0	50.00	4
M - LIVESTOCK OUT		87150	164.91	2
N - NORTH		158070	581.35	1
R - RESIDENTIAL		337030	4881.91	134
S - SCHOOLS		1200	144.16	2
Subtotal for Service WATER :		1133880	7330.10	156
Grand Total :		1154410	12581.30	309

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
002-00	00-9999999	74060	11/21/2021	74060	10/19/2021	0	7138172827
JUEDEMANN & CO.		P.O.BOX 224					
010050-00	01-010050	1607100	11/19/2021	1602400	10/19/2021	4700	76381846
ANDERSON, FRANCINE		PO BOX 287					
010100-00	01-010100	210150	10/19/2021	210150	10/19/2021	0	76381812
JOYCE, RILEY		P.O.BOX 66					
010150-00	01-010150	399600	11/19/2021	398400	10/19/2021	1200	76381830
BOND KATHY		BOX 294					
010200-00	01-010200	117780	11/19/2021	115270	10/19/2021	2510	38653417
ARMSTRONG, STUART		PO BOX 202			NEW METER 8/22/19/NEW LINE AT NO CH		
010250-00	01-010250	876500	11/19/2021	875900	10/19/2021	600	7073119276
ARMSTRONG, STUART		PO BOX 202					
010300-00	01-010300	334800	11/19/2021	332000	10/19/2021	2800	87562350
BUCK LITA		PO BOX 91					
010350-00	01-010350	881900	11/19/2021	880100	10/19/2021	1800	76381765
LOCQUIAO, CAROLE		PO BOX 313					
010360-01	01-010360	0	/ /	0	/ /	0	87052687
DISKINSON, BARBARA		PO BOX 102					
010400-00	01-010400	0	06/23/2020	0	06/23/2020	0	0
MATT BUCK TRUST		P.O.BOX 144					
010450-00	01-010450	119950	11/19/2021	117550	10/19/2021	2400	76381888
MATT BUCK TRUST		P.O.BOX 144					
010500-00	01-010500	242100	11/19/2021	1079800	10/19/2021	0	76381792
BURTCHETT, CHRIS		PO BOX 143					
010530-00	01-010530	16250	06/23/2020	16250	06/23/2020	0	42834756
BURTCHETT, JIM		PO BOX 353					
010550-00	01-010550	2417300	11/19/2021	2409600	10/19/2021	7700	76381768
NORTON, DEBORAH		PO BOX 192					
010560-00	01-010560	724000	10/19/2021	724000	10/19/2021	0	76381791
CHAMBERLAIN, ALAN		824 WEST EVELYN					
010600-00	01-010600	1990050	11/19/2021	1987650	10/19/2021	2400	76381913
CARWTRIGHT, BEN		PO BOX 215					
010650-00	01-010650	557200	11/19/2021	556000	10/19/2021	1200	76381869
PROTSMAN, RICHARD		PO BOX 325					
010700-00	01-010700	499200	11/19/2021	477200	10/19/2021	22000	7195171457
CHS BIG SKY		PO BOX 330					
010750-00	01-010750	243450	11/19/2021	243000	10/19/2021	450	76110141
GOODHART KEITH		P.O. BOX 3					
010800-00	01-010800	774300	11/19/2021	772900	10/19/2021	1400	76381781
CHOUTEAU COUNTY SHOP		PO BOX 459					
010850-00	01-010850	391650	11/19/2021	389650	10/19/2021	2000	76381857
CLARK, RICHARD		PO BOX 22					
010900-00	01-010900	1387800	11/19/2021	1385300	10/19/2021	2500	76381784
LUDEMAN, TAMMEY		PO BOX 233					
010950-00	01-010950	410850	06/23/2020	410850	06/23/2020	0	76381856
TANNER, WV		100 34TH AVE. NE					
010960-00	01-010960	1772900	11/19/2021	1767800	10/19/2021	5100	87052588
HOOPER, DARCI		PO BOX 86					
011000-00	01-011000	755100	11/19/2021	754500	10/19/2021	600	76381875
CLARK, MARTY		PO BOX 76					
011050-00	01-011050	884250	11/19/2021	881250	10/19/2021	3000	76381823
POINDEXTER, JOHN		PO BOX 248					
011100-00	01-011100	912750	11/19/2021	910200	10/19/2021	2550	76381892
CLARK, JOHN E		PO BOX 229					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
011150-00	01-011150	2290	11/19/2021	2290	10/19/2021	0	39215907
SALOIS, DENA		143 GERALDINE RD EAST					
011250-00	01-011250	1498800	11/19/2021	1495700	10/19/2021	3100	76381760
CLARK, PAUL		PO BOX 191					
011300-01	01-011300.01	8950	06/23/2020	8950	06/23/2020	0	76381900
COMPUTERIZED TAX SER		781 ROUDEBUSH LANE					
011330-01	01-011330.01	126050	06/23/2020	126050	06/23/2020	0	0
CROFT, DANA		106 BROADWAY					
011340-00	01-011340	283550	06/23/2020	283550	06/23/2020	0	76381850
DANBROOK, HELEN		2065 GRACEVILLE RD N					
011350-00	01-011350	2002600	11/19/2021	1997000	10/19/2021	5600	76381911
DAVIS RANCH		PO BOX 336					
011360-00	01-011360	242100	11/19/2021	241400	10/19/2021	700	76381787
SCOTT, ROSEMARY		PO BOX115					
011360-01	01-011360.01	0	/ /	0	/ /	0	0
ROWLAND RON		4290 NORTH LOLA LEE LANE					
011370-01	01-011370.01	2128650	06/23/2020	2128650	06/23/2020	0	76381872
MCOMBER DEREK		P.O.BOX 334					
011400-00	01-011400	2219900	11/19/2021	2213220	10/19/2021	6680	76381896
MCOMBER, JON & ADRIANE		PO BOX 132					
011450-00	01-011450	657050	11/19/2021	654000	10/19/2021	3050	7138173340
JOYCE, CODY		PO BOX 14					
011500-00	01-011500	3460600	11/19/2021	3456850	10/19/2021	3750	76381766
BURTCHETT, TOM		PO BOX 245					
011550-00	01-011550	3285600	11/19/2021	3281900	10/19/2021	3700	76381783
ANTONICH, OWEN, ELAINA		P.O. BOX 106					
011600-00	01-011600	1979400	11/19/2021	1977150	10/19/2021	2250	76381887
DUVALL, LEN		PO BOX 305					
011650-00	01-011650	1389650	11/19/2021	1387300	10/19/2021	2350	76381775
EBELING, ROB		PO BOX 12					
011700-00	01-011700	112700	11/19/2021	111150	10/19/2021	1550	36327951
FAIRBANKS, BEVERLEE		PO BOX 197					
011750-00	01-011750	1375950	11/19/2021	1375950	10/19/2021	0	76381788
FAIRBANKS, LOIS		700 4TH AVE.NW A6					
011800-00	01-011800	3194000	11/19/2021	3188000	10/19/2021	6000	76381771
FAIRBANKS, ROCQUE		PO BOX 241					
011850-00	01-011850	760100	11/19/2021	760100	10/19/2021	0	76381774
FARMER, ROBERT		PO BOX 85					
011900-00	01-011900	238950	11/19/2021	238950	10/19/2021	0	7073112997
JOYCE, R		P.O.BOX 66					
011950-00	01-011950	196700	11/19/2021	191950	10/19/2021	4750	36409109
HUTLEY, MELANIE		372 GERALDINE AVE					
012000-00	01-012000	765400	11/19/2021	765400	10/19/2021	0	76381764
RAY, CALIEB		4909 BURKWOOD CT. APT.104					
012050-00	01-012050	43800	11/21/2021	43800	10/19/2021	0	76381903
BRAY SHAWN R		P.O.BOX303					
012050-01	01-012050.01	43800	09/18/2021	43800	09/18/2021	0	0
FELGER BRAD		P.O.BOX 346					
012150-01	01-012150	13850	06/23/2020	13850	06/23/2020	0	76381910
CENTRAL MONTANA CO-OP		PO BOX 330					
012200-00	01-012200	383350	11/19/2021	381300	10/19/2021	2050	76381862
M & M TIRE REPAIR		PO BOX 166					
012250-00	01-012250	79100	11/19/2021	78000	10/19/2021	1100	83817149
RUSTYS BED & BREAKFAST		PO BOX 76					
012300-00	01-012300	142650	11/19/2021	141200	10/19/2021	1450	76381899
FRESH START COOPERATIVE		P.O.BOX 30					
012350-00	01-012350	12700	11/19/2021	12400	10/19/2021	300	7344161231
SPENCER, DAVID		PO BOX 171					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
012400-00	01-012400	1234150	10/19/2021	1234150	10/19/2021	0	52132901
GERALDINE SWIMMING POOL		PO BOX 312					
012450-00	01-012450	184200	11/19/2021	152300	10/19/2021	31900	76381794
BAKER MICHAEL		P.O. BOX 292					
012500-00	01-012500	139490	11/19/2021	137410	10/19/2021	2080	38199210
LITTLE, LARRY		P.O.BOX 162					
012550-00	01-012550	557100	11/19/2021	556700	10/19/2021	400	76381819
OAKLEY, LEXIE R		PO BOX 33					
012610-00	01-012610	11900	06/23/2020	11900	06/23/2020	0	76381838
THOMAS, PHILIP		PO BOX 203					
012700-00	01-012700	574450	11/19/2021	567150	10/19/2021	7300	76381795
STOCKMAN BANK		PO BOX 327					
012750-00	01-012750	44650	11/19/2021	42600	10/19/2021	2050	201888
STOLK, JOHN		PO BOX 118					
012800-00	01-012800	641700	11/19/2021	639800	10/19/2021	1900	76381870
SCHOOL RENTAL		PO BOX 347					
012850-01	01-012850.01	0	/ /	0	/ /	0	0
FRITZ, TRAVIS		PO BOX 204					
012900-00	01-012900	444750	11/19/2021	444600	10/19/2021	150	76381778
BURTCHETT, ERIC		PO BOX 242					
012950-00	01-012950	414350	11/19/2021	411300	10/19/2021	3050	76381803
JACKSON, GENE		PO BOX 62					
013000-00	01-013000	979100	11/19/2021	976700	10/19/2021	2400	76381835
JACKSON, GENE		PO BOX 62					
013050-01	01-013050.01	738750	11/19/2021	73840	10/19/2021	664910	76381832
GOODHART		PO BOX 3					
013250-00	01-013250	2157700	11/19/2021	2155050	10/19/2021	2650	76381825
WEAVER, LEROY		P.O. BOX 130					
013250-01	01-013250.01	0	/ /	0	/ /	0	0
OBERGFELL, DALLAS		491 BREWSTER ST					
013300-00	01-013300	115550	11/19/2021	112450	10/19/2021	3100	7195171897
JOYCE FUEL & FEED		PO BOX 66					
013350-00	01-013350	1078450	11/19/2021	1075800	10/19/2021	2650	76381889
JOYCE, PERRY		PO BOX 66					
013400-00	01-013400	1037650	11/19/2021	1036300	10/19/2021	1350	79595099
JOYCE, PERRY		PO BOX 66					
013450-00	01-013450	4509200	11/19/2021	4498500	10/19/2021	10700	76381799
JUEDEMAN, WILEY		PO BOX 276					
013500-00	01-013500	937950	11/19/2021	935100	10/19/2021	2850	76381893
WILLIAMSON, EDWARD		PO BOX 1555					
013510-00	01-013510	1543750	11/19/2021	1539900	10/19/2021	3850	434200966
KLEIN MONTE & ANITA		PO BOX 173					
013550-00	01-013550	1338800	11/19/2021	1338150	10/19/2021	650	76110135
PELTON, DONNA		P.O.BOX 314					
013600-00	01-013600	522600	11/19/2021	520400	10/19/2021	2200	7099088842
STINE, DANIEL & TAMI		PO BOX 43					
013650-00	01-013650	345050	11/19/2021	339350	10/19/2021	5700	36409093
LEISTIKO, ERIC		PO BOX 103					
013700-00	01-013700	1020500	11/19/2021	1016400	10/19/2021	4100	76381895
LUNDY, ROY		PO BOX 153					
013750-00	01-013750	1959300	11/19/2021	1953700	10/19/2021	5600	76381770
HOOPER, DANIEL		PO BOX 141					
013800-00	01-013800	96110	06/23/2020	96110	06/23/2020	0	76381885
HOOPER, DANIEL		PO BOX 141					
013840-00	01-013840	273000	11/19/2021	270550	10/19/2021	2450	36409108
IKARD, MIKE		PO BOX 244					
013850-00	01-013850	680150	11/19/2021	678150	10/19/2021	2000	76381865
MARTIN, MELVIN JR		PO BOX 15					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
013900-00	01-013900	1041850	11/19/2021	1040800	10/19/2021	1050	76381860
TOOLE, SAGE		P.O.BOX 293					
013905-00	01-013905	1077000	11/19/2021	1077000	10/19/2021	0	76381881
LUDEMAN, BARBARA		PO BOX 232					
013950-00	01-013950	544100	11/19/2021	543000	10/19/2021	1100	76381871
CLOUSING, CALVIN		P.O. BOX 236					
014000-00	01-014000	174400	11/19/2021	173050	10/19/2021	1350	83817148
JUEDEMAN & CO. 3		P.O. BOX 224			11/18 CHANGED FROM 100'S TO 10'S		
014050-00	01-014050	406900	11/19/2021	406900	10/19/2021	0	7023088087
DONNER, BETTY		PO BOX 61					
014100-00	01-014100	374100	11/19/2021	374100	10/19/2021	0	76381790
HANSEN, LAULETTE		127 S EASY STREET					
014150-00	01-014150	1599500	11/19/2021	1595000	10/19/2021	4500	80536570
MCGRANN, MAX		PO BOX 6					
014200-00	01-014200	584250	11/19/2021	582900	10/19/2021	1350	76381916
PENWELL, NANCY		179 WINCHELL P.O.BOX 183					
014200-01	01-014200.OW	0	/ /	0	/ /	0	0
EBELING, ROBERT		PO BOX 1					
014250-00	01-014250	2415700	10/19/2021	2415700	10/19/2021	0	35789318
MEEKS, KRAIG		PO BOX 36					
014300-00	01-014300	1185450	11/19/2021	1182050	10/19/2021	3400	76381845
SARRAZIN, CARLA		P.O.BOX 298					
014300-OW	01-014300.OW	1097000	07/20/2020	1097000	07/20/2020	0	0
GERALDINE COMMUNITY CHURCH		PO BOX 167					
014305-00	01-014305	566600	11/19/2021	539450	10/19/2021	27150	7140170087
OUTRIDERS SADDLE CLUB		PO BOX 175					
014350-00	01-014350	846450	11/19/2021	846450	10/19/2021	0	76381820
LAZY BELL RANCH		PO BOX 36					
014400-00	01-014400	421600	11/19/2021	421200	10/19/2021	400	76381868
MOLINE, BONNIE		PO BOX 263					
014550-00	01-014550	524200	08/19/2020	524200	08/19/2020	0	76381836
NACK, BLAIR		544 SQUARE BUTTE RD					
014600-00	01-014600	602900	11/19/2021	600150	10/19/2021	2750	88632277
MUIR, WILL		PO BOX 92					
014650-00	01-014650	926550	06/23/2020	926550	06/23/2020	0	76381834
PACINI, JOSEPH		244 COLLINS PO BOX 209					
014750-00	01-014750	1121450	11/19/2021	1120600	10/19/2021	850	76381912
SMITH EARL		P.O.BOX 206					
014800-00	01-014800	250850	11/19/2021	250200	10/19/2021	650	76381908
U S POSTAL SERVICE		PO BOX 9998			CHANGED FROM 100'S TO TENS 5/30/18		
014850-00	01-014850	289300	11/19/2021	289250	10/19/2021	50	76381851
DANBROOK, HELEN		2065 GRACEVILLE RD N					
014900-00	01-014900	763600	11/19/2021	762200	10/19/2021	1400	76381817
BURTCHETT, JAMES		PO BOX 353					
014950-00	01-014950	951700	11/19/2021	950000	10/19/2021	1700	76381907
QUNELL,JERRY		PO BOX 184					
015000-00	01-015000	26500	06/23/2020	26500	06/23/2020	0	76381880
TIMMONS, JOE BLAIR		PO BOX 27					
015050-00	01-015050	1571900	11/19/2021	1569800	10/19/2021	2100	76381841
QUNELL, MICHAEL		PO BOX 351					
015100-00	01-015100	1806150	11/19/2021	1803000	10/19/2021	3150	79595100
RICE, HAL & MONICA		PO BOX 354					
015150-00	01-015150	737200	11/19/2021	736500	10/19/2021	700	7226091817
ROMANCHUK, PAT		PO BOX 332					
015200-00	01-015200	251600	11/19/2021	245800	10/19/2021	5800	7049180092
CHS BIG SKY		PO BOX 330			3/26/19 READ 440065/HAD READ WRONG		
015250-00	01-015250	884350	11/19/2021	881700	10/19/2021	2650	76381759
RICE ANDY		P.O. BOX 354					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
015300-00	01-015300	471000	11/19/2021	468350	10/19/2021	2650	76381796
LAMBERT, RONALD		PO BOX 89					
015350-00	01-015350	107000	11/19/2021	104150	10/19/2021	2850	36327943
MCOMBER, KAYLA		PO BOX 93			NEW METER/LINE 8/16/19 NO CH		
015400-00	01-015400	173500	11/19/2021	167600	10/19/2021	5900	7009170028
MCOMBER, KAYLA		PO BOX 93					
015500-00	01-015500	0	06/23/2020	0	06/23/2020	0	90986262
ROWLAND RON		4290 NORTH LOLA LEE LANE					
015550-00	01-015550	637350	11/19/2021	627250	10/19/2021	10100	7048075931
CLARK, COREY AND SHAYA		P.O. BOX 84					
015550-01	01-015550.01	362800	06/23/2020	362800	06/23/2020	0	0
ROWLAND RON		4290 NORTH LOLA LEE LANE					
015560-00	01-015560	2450700	11/19/2021	2443850	10/19/2021	6850	76381842
RUSTYS BAR		PO BOX 76					
015600-00	01-015600	455700	11/19/2021	454200	10/19/2021	1500	76381909
SANDE, GARY		3207 7TH AVENUE SOUTH					
015650-00	01-015650	939650	11/19/2021	937450	10/19/2021	2200	76381901
QUNELL, JEROME JR.		P.O.BOX 223					
015650-01	01-015650.01	903500	06/23/2020	903500	06/23/2020	0	0
CLARK		PO BOX 76					
015680-00	01-015680	177600	11/19/2021	176900	10/19/2021	700	79732759
WILLIAMS ALLEN		PO BOX 74					
015690-00	01-015690	452100	11/19/2021	449100	10/19/2021	3000	90838683
PROPER, KENDRA &JAKE MOLINE		P.O. BOX 252					
015700-00	01-015700	0	11/15/2021	1455500	10/19/2021	0	1421468320
SCHOOL DISTRICT #3 ~2		PO BOX 347			USED METER 8/20/21		
015705-00	01-015705	486400	11/19/2021	485500	10/19/2021	900	1224021096
SCHOOL DISTRICT #3		PO BOX 347					
015750-00	01-015750	2203700	11/21/2021	2203700	10/19/2021	0	76381773
SCHOOL DISTRICT #3		PO BOX 347					
015760-00	01-015760	338100	10/19/2021	338100	10/19/2021	0	61017284
SCHOOL DIST #3 FOOTBALL FIELD		P.O.BOX 347					
015800-00	01-015800	184150	11/19/2021	182350	10/19/2021	1800	36327946
SCOTT, DUANE		PO BOX 164					
015850-00	01-015850	2025900	11/19/2021	2024850	10/19/2021	1050	76110138
SCRIBNER, CAROL		1142 SCRIBNER LANE					
015900-00	01-015900	1641600	11/19/2021	1637700	10/19/2021	3900	76381839
SCRIBNER, WARD		PO BOX 88					
015950-00	01-015950	423700	11/19/2021	422000	10/19/2021	1700	76381828
SERVICE PLUS		PO BOX 143					
016000-00	01-016000	2937600	11/19/2021	2935250	10/19/2021	2350	76381906
FELGER BRAD		P.O.BOX 346					
016000-01	01-016000.01	2921050	05/19/2021	2921050	05/19/2021	0	0
ENGELLANT, RICK		PO BOX 2					
016050-00	01-016050	870000	11/19/2021	869200	10/19/2021	800	76381858
JOHNSTON, VIRGINIA		PO BOX 24					
016100-00	01-016100	1117250	11/19/2021	1115700	10/19/2021	1550	76381815
SMITH, SHIRLEY		PO BOX 174					
016150-00	01-016150	1482200	11/19/2021	1481000	10/19/2021	1200	76381867
MCCONNELL, DARYL (LEE)		P.O.BOX 81					
016150-01	01-016150.01	1386900	12/18/2020	1386900	12/18/2020	0	0
SMITH, STAN		PO BOX 322					
016200-00	01-016200	881350	11/19/2021	878450	10/19/2021	2900	76381831
SMOOTZ, WINONA		P.O.BOX 262					
016250-00	01-016250	1528100	11/19/2021	1525650	10/19/2021	2450	76381863
SPENCER, DAVID		PO BOX 171					
016300-00	01-016300	1335750	11/19/2021	1334050	10/19/2021	1700	76381776
SPENCER, DELORES		PO BOX 296					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
016350-00	01-016350	147700	11/19/2021	147250	10/19/2021	450	7023170194
MILLER, NORMA		129 RIVERVIEW C					
016400-00	01-016400	92310	11/19/2021	90760	10/19/2021	1550	39383570
BRONEC, SAM		P.O.B OX 222					
016500-00	01-016500	4477650	11/19/2021	4475150	10/19/2021	2500	76381864
MCBEE LAUREL		P.O. BOX 243					
016500-01	01-016500.01	4015250	06/23/2020	4015250	06/23/2020	0	0
BOND KATHY		BOX 294					
016550-00	01-016550	2371300	11/19/2021	2369250	10/19/2021	2050	76381762
MILLS, KEN OR ANKA		PO BOX 2					
016550-01	01-016550.01	1952000	06/23/2020	1952000	06/23/2020	0	0
FORSNESS, DEWEY		PO BOX 252					
016600-00	01-016600	110400	11/19/2021	109700	10/19/2021	700	90986267
LUDEMAN, RANDY & SANDY		PO BOX 61					
016700-00	01-016700	1514650	11/19/2021	1511950	10/19/2021	2700	1240012182
STOOS, MJ		PO BOX 196					
016750-00	01-016750	391800	06/23/2020	391800	06/23/2020	0	76381874
STOOS, WES		PO BOX 64					
016800-00	01-016800	2957250	11/19/2021	2957150	10/19/2021	100	76381882
TANNER, WV		100 34TH AVE. NE					
016850-00	01-016850	1511800	11/19/2021	1507300	10/19/2021	4500	76381859
TULL DUSTIN & DESTINY MARTINEZ		PO BOX 231					
016900-00	01-016900	895750	11/19/2021	892100	10/19/2021	3650	76381878
ROWLAND, DAVID		4091 HAWARDEN RD					
016950-00	01-016950	100	11/19/2021	1205700	10/19/2021	0	79732761
JONES, BRIAN		P.O.BOX 112					
016950-01	01-016950.01	986800	06/23/2020	986800	06/23/2020	0	0
LITTLE, MATTHEW		P.O.BOX 21					
017000-00	01-017000	277950	11/19/2021	276250	10/19/2021	1700	76381805
LEWIS ELIZABETH		P.O.BOX 288					
017000-01	01-017000.01	255300	06/23/2020	255300	06/23/2020	0	0
LITTLE, MATTHEW		P.O.BOX 21					
017050-00	01-017050	12400	11/19/2021	11100	10/19/2021	1300	36327952
THOMPSON, LES		PO BOX 35			DEC. BILL SAID USAGE 8K PLUS GAL.		
017100-00	01-017100	2107250	11/19/2021	2107250	10/19/2021	0	76381800
CORROW-SCOTT, AMBER		701 2ND ST. SOUTH					
017150-00	01-017150	1056400	11/19/2021	1054900	10/19/2021	1500	76381816
DUNN, DARRELL		PO BOX 214					
017200-00	01-017200	922600	11/21/2021	922600	10/19/2021	0	76381883
JENNIFER ANDERSON		10617 SOUTH LAMOND					
017200-01	01-017200.01	889200	07/20/2020	889200	07/20/2020	0	0
ANDERSON JENNIFER		10617 S. LAMOND					
017250-00	01-017250	2142650	11/19/2021	2138200	10/19/2021	4450	76110140
WILLIAMSON, JUSTIN		PO BOX 207					
017300-00	01-017300	1051550	06/23/2020	1051550	06/23/2020	0	76381876
HELBERG JON		344 FRIELDS ST					
017400-00	01-017400	291700	11/19/2021	290250	10/19/2021	1450	76381843
SLABACK, GARY		639 MAIN STREET					
017450-00	01-017450	214800	11/19/2021	213800	10/19/2021	1000	76381769
BURTCHETT, SUE		5137 HAWLEY BLVD					
017550-00	01-017550	1372250	11/19/2021	1371700	10/19/2021	550	76381767
SCHMIDT, DEAN		PO BOX 19					
017600-00	01-017600	1972300	11/19/2021	1968300	10/19/2021	4000	76381810
WIMER, TOM & LINDA		PO BOX 263					
017650-00	01-017650	1473950	11/19/2021	1473950	10/19/2021	0	76381873
ROWLAND, DAN & MARCI		P.O. BOX 94					
018000-00	01-018000	234250	06/23/2020	234250	06/23/2020	0	76381761
GOODHART, KEITH		PO BOX 3					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
018010-00	01-018010	163550	11/19/2021	162850	10/19/2021	700	79732764
GOODHART SHOP		PO BOX 3					
018100-00	01-018100	157850	11/19/2021	157250	10/19/2021	600	76381898
THOMAS, PHILIP ~2		P.O. BOX 203					
018150-00	01-018150	35300	11/19/2021	32350	10/19/2021	2950	76110134
DIAMOND D BAR PROCESSING		PO BOX 134					
018200-00	01-018200	129600	11/19/2021	129500	10/19/2021	100	76381802
CHO COUNTY LIBRARY		PO BOX 639					
018250-00	01-018250	6000	11/19/2021	5800	12/18/2020	200	76381897
HOLIDAY SHOP		PO BOX 194					
018300-00	01-018300	10090	06/23/2020	10090	06/23/2020	0	76381837
ENGELLANT, DAN		521 PATTERSON STREET					
018350-00	01-018350	410400	11/19/2021	406400	10/19/2021	4000	76381798
JUEDEMAN GRAIN COMPANY		PO BOX 276					
018400-00	01-018400	870750	11/19/2021	870700	10/19/2021	50	76381757
SCHOOL(OLD AUDITORIUM)		PO BOX 347					
018450-00	01-018450	337800	11/19/2021	337800	10/19/2021	0	76381866
SCHOOL RENTAL HOUSE~2		PO BOX 347					
018500-00	01-018500	1301800	11/19/2021	1300600	10/19/2021	1200	76381758
SCHOOL RENTAL HOUSE		PO BOX 347					
018550-00	01-018550	2105300	06/23/2020	2105300	06/23/2020	0	0
MEEKS, KRAIG		PO BOX 36					
018550-01	01-018550.01	0	06/23/2020	0	06/23/2020	0	0
ROSE, STEVE		PO BOX 205					
018600-00	01-018600	418300	11/19/2021	417400	10/19/2021	900	76381821
CLARK, BRENT J		PO BOX 121					
018750-00	01-018750	283150	11/19/2021	277100	10/19/2021	6050	7324106723
SCRIBNER HANGAR		1142 SCRIBNER LANE					
018800-00	01-018800	7100	06/23/2020	7100	06/23/2020	0	76381884
CLARK ,TOBY		P.O. BOX 229					
018850-00	01-018850	324000	11/19/2021	322200	10/19/2021	1800	88688630
LEISTIKO, MORGAN		P.O. BOX 331					
018900-00	01-018900	581750	11/19/2021	581750	10/19/2021	0	76381782
LUDEMAN, TAMMEY		PO BOX 233					
018950-00	01-018950	881800	11/19/2021	718400	06/23/2020	163400	76381855
WENNERBERG, CARLA							
019100-00	01-019100	2657800	11/19/2021	2138000	10/19/2021	519800	1249053484
HAWARDEN-SQ BUTTE WTR		PO BOX 265					
019150-00	01-019150	6163070	11/19/2021	5980740	10/19/2021	182330	2901836728
NORTH GERALDINE WATER		PO BOX 324			MAY 2018 CHANGED FROM TENS TO 100'S		
10260-00	01-010260	170	11/19/2021	160	10/19/2021	10	172036778
GERALDINE AIRPORT		P.O. BOX 867					

Total Monthly Usage: 1919670

Total Number of Accounts: 193

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
002-00	00-9999999	74060	12/18/2020	74060	11/20/2020	0	7138172827
JUEDEMANN & CO.		P.O.BOX 224					
010050-00	01-010050	1512400	12/18/2020	1509600	11/19/2020	2800	76381846
ANDERSON, FRANCINE		PO BOX 287					
010100-00	01-010100	207500	12/18/2020	207500	11/19/2020	0	76381812
JOYCE, RILEY		P.O.BOX 66					
010150-00	01-010150	390300	12/18/2020	389900	11/19/2020	400	76381830
BOND KATHY		BOX 294					
010200-00	01-010200	62860	12/18/2020	59380	11/19/2020	3480	38653417
ARMSTRONG, STUART		PO BOX 202			NEW METER 8/22/19/NEW LINE AT NO CH		
010250-00	01-010250	870800	12/18/2020	870500	11/19/2020	300	7073119276
ARMSTRONG, STUART		PO BOX 202					
010300-00	01-010300	311200	12/18/2020	308200	11/19/2020	3000	87562350
BUCK LITA		PO BOX 91					
010350-00	01-010350	842300	12/18/2020	840300	11/19/2020	2000	76381765
LOCQUIAO, CAROLE		PO BOX 313					
010360-01	01-010360	0	/ /	0	/ /	0	87052687
DISKINSON, BARBARA		PO BOX 102					
010400-00	01-010400	0	06/23/2020	0	06/23/2020	0	0
MATT BUCK TRUST		P.O.BOX 144					
010450-00	01-010450	111550	10/19/2020	111550	10/19/2020	0	76381888
MATT BUCK TRUST		P.O.BOX 144					
010500-00	01-010500	1056900	12/18/2020	1055550	11/19/2020	1350	76381792
BURTCHETT, CHRIS		PO BOX 143					
010530-00	01-010530	16250	06/23/2020	16250	06/23/2020	0	42834756
BURTCHETT, JIM		PO BOX 353					
010550-00	01-010550	2314950	12/18/2020	2308350	11/19/2020	6600	76381768
NORTON, DEBORAH		PO BOX 192					
010560-00	01-010560	646700	06/23/2020	646700	06/23/2020	0	76381791
CHAMBERLAIN, ALAN		824 WEST EVELYN					
010600-00	01-010600	1898100	12/18/2020	1896000	11/19/2020	2100	76381913
CARWTRIGHT, BEN		PO BOX 215					
010650-00	01-010650	537800	12/18/2020	537700	11/19/2020	100	76381869
PROTSMAN, RICHARD		PO BOX 325					
010700-00	01-010700	341700	12/18/2020	330700	11/19/2020	11000	7195171457
CHS BIG SKY		PO BOX 330					
010750-00	01-010750	223000	12/18/2020	222050	11/19/2020	950	76110141
GOODHART KEITH		P.O. BOX 3					
010800-00	01-010800	750900	12/18/2020	749500	11/19/2020	1400	76381781
CHOUTEAU COUNTY SHOP		PO BOX 459					
010850-00	01-010850	376400	12/18/2020	375100	11/19/2020	1300	76381857
CLARK, RICHARD		PO BOX 22					
010900-00	01-010900	1328700	12/18/2020	1324400	11/19/2020	4300	76381784
LUDEMAN, TAMMEY		PO BOX 233					
010950-00	01-010950	410850	06/23/2020	410850	06/23/2020	0	76381856
TANNER, WV		100 34TH AVE. NE					
010960-00	01-010960	1646700	12/18/2020	1641400	11/19/2020	5300	87052588
HOOPER, DARCI		PO BOX 86					
011000-00	01-011000	730000	12/18/2020	729200	11/19/2020	800	76381875
CLARK, MARTY		PO BOX 76					
011050-00	01-011050	842750	12/18/2020	839850	11/19/2020	2900	76381823
POINDEXTER, JOHN		PO BOX 248					
011100-00	01-011100	861600	12/18/2020	857900	11/19/2020	3700	76381892
CLARK, JOHN E		PO BOX 229					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
011150-00	01-011150	402900	12/18/2020	402450	11/19/2020	450	39215907
SALOIS, DENA		143 GERALDINE RD EAST					
011250-00	01-011250	1430200	12/18/2020	1426400	11/19/2020	3800	76381760
CLARK, PAUL		PO BOX 191					
011300-01	01-011300.01	8950	06/23/2020	8950	06/23/2020	0	76381900
COMPUTERIZED TAX SER		781 ROUDEBUSH LANE					
011330-01	01-011330.01	126050	06/23/2020	126050	06/23/2020	0	0
CROFT, DANA		106 BROADWAY					
011340-00	01-011340	283550	06/23/2020	283550	06/23/2020	0	76381850
DANBROOK, HELEN		2065 GRACEVILLE RD N					
011350-00	01-011350	1931900	12/18/2020	1927500	11/19/2020	4400	76381911
DAVIS RANCH		PO BOX 336					
011360-00	01-011360	215700	12/18/2020	215100	11/19/2020	600	76381787
SCOTT, ROSEMARY		PO BOX115					
011360-01	01-011360.01	0	/ /	0	/ /	0	0
ROWLAND RON		4290 NORTH LOLA LEE LANE					
011370-01	01-011370.01	2128650	06/23/2020	2128650	06/23/2020	0	76381872
MCOMBER DEREK		P.O.BOX 334					
011400-00	01-011400	2001750	12/18/2020	1994750	11/19/2020	7000	76381896
MCOMBER, JON & ADRIANE		PO BOX 132					
011450-00	01-011450	484850	12/18/2020	481100	11/19/2020	3750	7138173340
JOYCE, CODY		PO BOX 14					
011500-00	01-011500	3303150	12/18/2020	3294500	11/19/2020	8650	76381766
BURTCHETT, TOM		PO BOX 245					
011550-00	01-011550	3249000	12/18/2020	3246400	11/19/2020	2600	76381783
ANTONICH, OWEN, ELAINA		P.O. BOX 106					
011600-00	01-011600	1872300	12/18/2020	1870700	11/19/2020	1600	76381887
DUVALL, LEN		PO BOX 305					
011650-00	01-011650	1355000	12/18/2020	1352400	11/19/2020	2600	76381775
EBELING, ROB		PO BOX 12					
011700-00	01-011700	74200	12/18/2020	70700	11/19/2020	3500	36327951
FAIRBANKS, BEVERLEE		PO BOX 197					
011750-00	01-011750	1375550	12/18/2020	1375300	11/19/2020	250	76381788
FAIRBANKS, LOIS		700 4TH AVE.NW A6					
011800-00	01-011800	3019500	12/18/2020	3013900	11/19/2020	5600	76381771
FAIRBANKS, ROCQUE		PO BOX 241					
011850-00	01-011850	749900	12/18/2020	749600	11/19/2020	300	76381774
FARMER, ROBERT		PO BOX 85					
011900-00	01-011900	55400	12/18/2020	48700	11/19/2020	6700	7073112997
JOYCE, R		P.O.BOX 66					
011950-00	01-011950	147200	12/18/2020	142600	11/19/2020	4600	36409109
HUTLEY, MELANIE		372 GERALDINE AVE					
012000-00	01-012000	757400	12/18/2020	756200	11/19/2020	1200	76381764
RAY, CALIEB		4909 BURKWOOD CT. APT.104					
012050-00	01-012050	0	/ /	0	/ /	0	76381903
BRAY SHAWN R		P.O.BOX303					
012050-01	01-012050.01	43800	12/18/2020	43800	10/19/2020	0	0
FELGER BRAD		P.O.BOX 346					
012150-01	01-012150	13850	06/23/2020	13850	06/23/2020	0	76381910
CENTRAL MONTANA CO-OP		PO BOX 330					
012200-00	01-012200	344650	06/23/2020	344650	06/23/2020	0	76381862
M & M TIRE REPAIR		PO BOX 166					
012250-00	01-012250	69900	12/18/2020	69400	11/19/2020	500	83817149
RUSTYS BED & BREAKFAST		PO BOX 76					
012300-00	01-012300	125750	12/18/2020	124420	11/19/2020	1330	76381899
FRESH START COOPERATIVE		P.O.BOX 30					
012350-00	01-012350	10200	12/18/2020	10000	11/19/2020	200	7344161231
SPENCER, DAVID		PO BOX 171					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
012400-00	01-012400	1123800	10/19/2020	1123800	10/19/2020	0	52132901
GERALDINE SWIMMING POOL		PO BOX 312					
012450-00	01-012450	30500	12/18/2020	25700	11/19/2020	4800	76381794
BAKER MICHAEL		P.O. BOX 292					
012500-00	01-012500	84180	12/18/2020	80250	11/19/2020	3930	38199210
LITTLE, LARRY		P.O.BOX 162					
012550-00	01-012550	548500	12/18/2020	548100	11/19/2020	400	76381819
OAKLEY, LEXIE R		PO BOX 33					
012610-00	01-012610	11900	06/23/2020	11900	06/23/2020	0	76381838
THOMAS, PHILIP		PO BOX 203					
012700-00	01-012700	522600	12/18/2020	515850	11/19/2020	6750	76381795
STOCKMAN BANK		PO BOX 327					
012750-00	01-012750	24750	12/18/2020	22950	11/19/2020	1800	201888
STOLK, JOHN		PO BOX 118					
012800-00	01-012800	616400	12/18/2020	613850	11/19/2020	2550	76381870
SCHOOL RENTAL		PO BOX 347					
012850-01	01-012850.01	0	/ /	0	/ /	0	0
FRITZ, TRAVIS		PO BOX 204					
012900-00	01-012900	404100	12/18/2020	402700	11/19/2020	1400	76381778
BURTCHETT, ERIC		PO BOX 242					
012950-00	01-012950	380700	12/18/2020	378150	11/19/2020	2550	76381803
JACKSON, GENE		PO BOX 62					
013000-00	01-013000	918000	12/18/2020	912600	11/19/2020	5400	76381835
JACKSON, GENE		PO BOX 62					
013050-01	01-013050.01	73820	06/23/2020	73820	06/23/2020	0	76381832
GOODHART		PO BOX 3					
013250-00	01-013250	2117150	12/18/2020	2113500	11/19/2020	3650	76381825
WEAVER, LEROY		P.O. BOX 130					
013250-01	01-013250.01	0	/ /	0	/ /	0	0
OBERGFELL, DALLAS		491 BREWSTER ST					
013300-00	01-013300	77600	12/18/2020	75000	11/19/2020	2600	7195171897
JOYCE FUEL & FEED		PO BOX 66					
013350-00	01-013350	1046100	12/18/2020	1043300	11/19/2020	2800	76381889
JOYCE, PERRY		PO BOX 66					
013400-00	01-013400	1026750	12/18/2020	248550	11/19/2020	778200	79595099
JOYCE, PERRY		PO BOX 66					
013450-00	01-013450	4383450	12/18/2020	4377000	11/19/2020	6450	76381799
JUEDEMAN, WILEY		PO BOX 276					
013500-00	01-013500	869100	12/18/2020	867000	11/19/2020	2100	76381893
WILLIAMSON, EDWARD		PO BOX 1555					
013510-00	01-013510	1454200	12/18/2020	1450850	11/19/2020	3350	434200966
KLEIN MONTE & ANITA		PO BOX 173					
013550-00	01-013550	1227750	12/18/2020	1225700	11/19/2020	2050	76110135
PELTON, DONNA		P.O.BOX 314					
013600-00	01-013600	477700	12/18/2020	475300	11/19/2020	2400	7099088842
STINE, DANIEL & TAMI		PO BOX 43					
013650-00	01-013650	254900	12/18/2020	248500	11/19/2020	6400	36409093
LEISTIKO, ERIC		PO BOX 103					
013700-00	01-013700	968400	12/18/2020	964600	11/19/2020	3800	76381895
LUNDY, ROY		PO BOX 153					
013750-00	01-013750	1902700	12/18/2020	1898800	11/19/2020	3900	76381770
HOOPER, DANIEL		PO BOX 141					
013800-00	01-013800	96110	06/23/2020	96110	06/23/2020	0	76381885
HOOPER, DANIEL		PO BOX 141					
013840-00	01-013840	169100	12/18/2020	145400	11/19/2020	23700	36409108
IKARD, MIKE		PO BOX 244					
013850-00	01-013850	650500	12/18/2020	647800	11/19/2020	2700	76381865
MARTIN, MELVIN JR		PO BOX 15					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
013900-00	01-013900	980350	12/18/2020	978000	11/19/2020	2350	76381860
TOOLE, SAGE		P.O.BOX 293					
013905-00	01-013905	1067100	12/18/2020	1065400	11/19/2020	1700	76381881
LUDEMAN, BARBARA		PO BOX 232					
013950-00	01-013950	519900	12/18/2020	518800	11/19/2020	1100	76381871
CLOUSING, CALVIN		P.O. BOX 236					
014000-00	01-014000	159050	12/18/2020	158350	11/19/2020	700	83817148
JUEDEMAN & CO. 3		P.O. BOX 224			11/18 CHANGED FROM 100'S TO 10'S		
014050-00	01-014050	400000	12/18/2020	398650	11/19/2020	1350	7023088087
DONNER, BETTY		PO BOX 61					
014100-00	01-014100	372700	10/19/2020	372700	10/19/2020	0	76381790
HANSEN, LAULETTE		127 S EASY STREET					
014150-00	01-014150	1468700	12/18/2020	1464600	11/19/2020	4100	80536570
MCGRANN, MAX		PO BOX 6					
014200-00	01-014200	551000	12/18/2020	547850	11/19/2020	3150	76381916
PENWELL, NANCY		179 WINCHELL P.O.BOX 183					
014200-01	01-014200.OW	0	/ /	0	/ /	0	0
EBELING, ROBERT		PO BOX 1					
014250-00	01-014250	1867950	12/18/2020	1780800	11/19/2020	87150	35789318
MEEKS, KRAIG		PO BOX 36					
014300-00	01-014300	1135500	12/18/2020	1131750	11/19/2020	3750	76381845
SARRAZIN, CARLA		P.O.BOX 298					
014300-OW	01-014300.OW	1097000	07/20/2020	1097000	07/20/2020	0	0
GERALDINE COMMUNITY CHURCH		PO BOX 167					
014305-00	01-014305	348250	12/18/2020	348250	11/19/2020	0	7140170087
OUTRIDERS SADDLE CLUB		PO BOX 175					
014350-00	01-014350	808100	12/18/2020	807700	11/19/2020	400	76381820
LAZY BELL RANCH		PO BOX 36					
014400-00	01-014400	414100	12/18/2020	413700	11/19/2020	400	76381868
MOLINE, BONNIE		PO BOX 263					
014550-00	01-014550	524200	08/19/2020	524200	08/19/2020	0	76381836
NACK, BLAIR		544 SQUARE BUTTE RD					
014600-00	01-014600	553050	12/18/2020	550500	11/19/2020	2550	88632277
MUIR, WILL		PO BOX 92					
014650-00	01-014650	926550	06/23/2020	926550	06/23/2020	0	76381834
PACINI, JOSEPH		244 COLLINS PO BOX 209					
014750-00	01-014750	1080000	12/18/2020	108000	11/19/2020	972000	76381912
SMITH EARL		P.O.BOX 206					
014800-00	01-014800	227400	12/18/2020	226950	11/19/2020	450	76381908
U S POSTAL SERVICE		PO BOX 9998			CHANGED FROM 100'S TO TENS 5/30/18		
014850-00	01-014850	288650	12/18/2020	288600	11/19/2020	50	76381851
DANBROOK, HELEN		2065 GRACEVILLE RD N					
014900-00	01-014900	753100	12/18/2020	752500	11/19/2020	600	76381817
BURTCHETT, JAMES		PO BOX 353					
014950-00	01-014950	925200	12/18/2020	923700	11/19/2020	1500	76381907
QUNELL,JERRY		PO BOX 184					
015000-00	01-015000	26500	06/23/2020	26500	06/23/2020	0	76381880
TIMMONS, JOE BLAIR		PO BOX 27					
015050-00	01-015050	1502500	12/18/2020	1500700	11/19/2020	1800	76381841
QUNELL, MICHAEL		PO BOX 351					
015100-00	01-015100	1706400	12/18/2020	1703500	11/19/2020	2900	79595100
RICE, HAL & MONICA		PO BOX 354					
015150-00	01-015150	674300	12/18/2020	673000	11/19/2020	1300	7226091817
ROMANCHUK, PAT		PO BOX 332					
015200-00	01-015200	4633050	12/18/2020	4633050	11/19/2020	0	7049180092
CHS BIG SKY		PO BOX 330			3/26/19 READ 440065/HAD READ WRONG		
015250-00	01-015250	763650	12/18/2020	762900	11/19/2020	750	76381759
RICE ANDY		P.O. BOX 354					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
015300-00	01-015300	444450	12/18/2020	442350	11/19/2020	2100	76381796
LAMBERT, RONALD		PO BOX 89					
015350-00	01-015350	61850	12/18/2020	58900	11/19/2020	2950	36327943
MCOMBER, KAYLA		PO BOX 93			NEW METER/LINE 8/16/19 NO CH		
015400-00	01-015400	115750	12/18/2020	110750	11/19/2020	5000	7009170028
MCOMBER, KAYLA		PO BOX 93					
015500-00	01-015500	0	06/23/2020	0	06/23/2020	0	90986262
ROWLAND RON		4290 NORTH LOLA LEE LANE					
015550-00	01-015550	530700	12/18/2020	528600	11/19/2020	2100	7048075931
CLARK, COREY AND SHAYA		P.O. BOX 84					
015550-01	01-015550.01	362800	06/23/2020	362800	06/23/2020	0	0
ROWLAND RON		4290 NORTH LOLA LEE LANE					
015560-00	01-015560	2370400	12/18/2020	2365800	11/19/2020	4600	76381842
RUSTYS BAR		PO BOX 76					
015600-00	01-015600	421600	12/18/2020	420100	11/19/2020	1500	76381909
SANDE, GARY		3207 7TH AVENUE SOUTH					
015650-00	01-015650	908400	12/18/2020	907850	11/19/2020	550	76381901
QUNELL, JEROME JR.		P.O.BOX 223					
015650-01	01-015650.01	903500	06/23/2020	903500	06/23/2020	0	0
CLARK		PO BOX 76					
015680-00	01-015680	169000	12/18/2020	168300	11/19/2020	700	79732759
WILLIAMS ALLEN		PO BOX 74					
015690-00	01-015690	413600	12/18/2020	411700	11/19/2020	1900	90838683
PROPER, KENDRA &JAKE MOLINE		P.O. BOX 252					
015700-00	01-015700	196200	12/18/2020	195700	11/19/2020	500	1421468320
SCHOOL DISTRICT #3 ~2		PO BOX 347			USED METER 8/20/21		
015705-00	01-015705	472600	12/18/2020	471900	11/19/2020	700	1224021096
SCHOOL DISTRICT #3		PO BOX 347					
015750-00	01-015750	2161100	12/18/2020	2159200	11/19/2020	1900	76381773
SCHOOL DISTRICT #3		PO BOX 347					
015760-00	01-015760	2324000	09/21/2020	2324000	09/21/2020	0	61017284
SCHOOL DIST #3 FOOTBALL FIELD		P.O.BOX 347					
015800-00	01-015800	121250	12/18/2020	117100	11/19/2020	4150	36327946
SCOTT, DUANE		PO BOX 164					
015850-00	01-015850	1969550	12/18/2020	1968600	11/19/2020	950	76110138
SCRIBNER, CAROL		1142 SCRIBNER LANE					
015900-00	01-015900	1577500	12/18/2020	1576300	11/19/2020	1200	76381839
SCRIBNER, WARD		PO BOX 88					
015950-00	01-015950	398900	12/18/2020	398500	11/19/2020	400	76381828
SERVICE PLUS		PO BOX 143					
016000-00	01-016000	0	/ /	0	/ /	0	76381906
FELGER BRAD		P.O.BOX 346					
016000-01	01-016000.01	2910600	12/18/2020	2908950	11/19/2020	1650	0
ENGELLANT, RICK		PO BOX 2					
016050-00	01-016050	861350	12/18/2020	860700	11/19/2020	650	76381858
JOHNSTON, VIRGINIA		PO BOX 24					
016100-00	01-016100	1088600	12/18/2020	1087350	11/19/2020	1250	76381815
SMITH, SHIRLEY		PO BOX 174					
016150-00	01-016150	1386900	12/18/2020	1386900	12/18/2020	0	76381867
MCCONNELL, DARYL (LEE)		P.O.BOX 81					
016150-01	01-016150.01	1386900	12/18/2020	1385100	11/19/2020	1800	0
SMITH, STAN		PO BOX 322					
016200-00	01-016200	833700	12/18/2020	828950	11/19/2020	4750	76381831
SMOOTZ, WINONA		P.O.BOX 262					
016250-00	01-016250	1466050	12/18/2020	1463500	11/19/2020	2550	76381863
SPENCER, DAVID		PO BOX 171					
016300-00	01-016300	1276250	12/18/2020	1274700	11/19/2020	1550	76381776
SPENCER, DELORES		PO BOX 296					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
016350-00	01-016350	68950	12/18/2020	68500	11/19/2020	450	7023170194
MILLER, NORMA		129 RIVERVIEW C					
016400-00	01-016400	365900	12/18/2020	3659000	11/19/2020	0	39383570
BRONEC, SAM		P.O.B OX 222					
016500-00	01-016500	4382800	12/18/2020	4380650	11/19/2020	2150	76381864
MCBEE LAUREL		P.O. BOX 243					
016500-01	01-016500.01	4015250	06/23/2020	4015250	06/23/2020	0	0
BOND KATHY		BOX 294					
016550-00	01-016550	2340300	12/18/2020	2337150	11/19/2020	3150	76381762
MILLS, KEN OR ANKA		PO BOX 2					
016550-01	01-016550.01	1952000	06/23/2020	1952000	06/23/2020	0	0
FORSNESS, DEWEY		PO BOX 252					
016600-00	01-016600	97000	12/18/2020	95700	11/19/2020	1300	90986267
LUDEMAN, RANDY & SANDY		PO BOX 61					
016700-00	01-016700	1484500	12/18/2020	1482250	11/19/2020	2250	1240012182
STOOS, MJ		PO BOX 196					
016750-00	01-016750	391800	06/23/2020	391800	06/23/2020	0	76381874
STOOS, WES		PO BOX 64					
016800-00	01-016800	2849950	12/18/2020	2849900	11/19/2020	50	76381882
TANNER, WV		100 34TH AVE. NE					
016850-00	01-016850	1456700	12/18/2020	1452800	11/19/2020	3900	76381859
TULL DUSTIN & DESTINY MARTINEZ		PO BOX 231					
016900-00	01-016900	885550	12/18/2020	884600	11/20/2020	950	76381878
ROWLAND, DAVID		4091 HAWARDEN RD					
016950-00	01-016950	1129200	12/18/2020	1120100	11/19/2020	9100	79732761
JONES, BRIAN		P.O.BOX 112					
016950-01	01-016950.01	986800	06/23/2020	986800	06/23/2020	0	0
LITTLE, MATTHEW		P.O.BOX 21					
017000-00	01-017000	271200	07/20/2020	271200	07/20/2020	0	76381805
LEWIS ELIZABETH		P.O.BOX 288					
017000-01	01-017000.01	255300	06/23/2020	255300	06/23/2020	0	0
LITTLE, MATTHEW		P.O.BOX 21					
017050-00	01-017050	0	12/18/2020	730	11/19/2020	0	36327952
THOMPSON, LES		PO BOX 35			DEC. BILL SAID USAGE 8K PLUS GAL.		
017100-00	01-017100	2063700	12/18/2020	2059100	11/19/2020	4600	76381800
CORROW-SCOTT, AMBER		701 2ND ST. SOUTH					
017150-00	01-017150	1038900	12/18/2020	1037550	11/19/2020	1350	76381816
DUNN, DARRELL		PO BOX 214					
017200-00	01-017200	902700	12/18/2020	900500	11/19/2020	2200	76381883
JENNIFER ANDERSON		10617 SOUTH LAMOND					
017200-01	01-017200.01	889200	07/20/2020	889200	07/20/2020	0	0
ANDERSON JENNIFER		10617 S. LAMOND					
017250-00	01-017250	2002050	12/18/2020	1999000	11/19/2020	3050	76110140
WILLIAMSON, JUSTIN		PO BOX 207					
017300-00	01-017300	1051550	06/23/2020	1051550	06/23/2020	0	76381876
HELBERG JON		344 FRIELDS ST					
017400-00	01-017400	276300	12/18/2020	275500	11/19/2020	800	76381843
SLABACK, GARY		639 MAIN STREET					
017450-00	01-017450	203600	12/18/2020	202600	11/19/2020	1000	76381769
BURTCHETT, SUE		5137 HAWLEY BLVD					
017550-00	01-017550	1354400	12/18/2020	1354150	11/19/2020	250	76381767
SCHMIDT, DEAN		PO BOX 19					
017600-00	01-017600	1922500	12/18/2020	1918800	11/19/2020	3700	76381810
WIMER, TOM & LINDA		PO BOX 263					
017650-00	01-017650	1462000	12/18/2020	1459550	11/19/2020	2450	76381873
ROWLAND, DAN & MARCI		P.O. BOX 94					
018000-00	01-018000	234250	06/23/2020	234250	06/23/2020	0	76381761
GOODHART, KEITH		PO BOX 3					

SECTIONS: All

USER TYPES: ALL

BILLING CODES: 1 FULL CHARGES 2 PRORATED OR FULL INITIAL CHARGES 3 PRORATED OR FULL FINAL CHARGES 4 NO NEW CHARGES 5 NO NEW CHARGES AND SUPPRESS BILL

STATUS: ALL

Account	Route - Meter	-----[Current]------ Reading	Date	------[Previous]------ Reading	Date	[USAGE IN ACTUAL GALLONS] Monthly Usage	Meter Id
Customer Name		CUSTOMER ADDRESS			Meter Comment		
018010-00	01-018010	151050	12/18/2020	151000	11/20/2020	50	79732764
GOODHART SHOP		PO BOX 3					
018100-00	01-018100	147150	12/18/2020	146350	11/19/2020	800	76381898
THOMAS, PHILIP ~2		P.O. BOX 203					
018150-00	01-018150	8900	12/18/2020	6150	11/19/2020	2750	76110134
DIAMOND D BAR PROCESSING		PO BOX 134					
018200-00	01-018200	128100	12/18/2020	128000	11/19/2020	100	76381802
CHO COUNTY LIBRARY		PO BOX 639					
018250-00	01-018250	5800	12/18/2020	5550	11/19/2020	250	76381897
HOLIDAY SHOP		PO BOX 194					
018300-00	01-018300	10090	06/23/2020	10090	06/23/2020	0	76381837
ENGELLANT, DAN		521 PATTERSON STREET					
018350-00	01-018350	356600	12/18/2020	356600	11/19/2020	0	76381798
JUEDEMAN GRAIN COMPANY		PO BOX 276					
018400-00	01-018400	850100	12/18/2020	840750	11/19/2020	9350	76381757
SCHOOL(OLD AUDITORIUM)		PO BOX 347					
018450-00	01-018450	284650	12/18/2020	283600	11/19/2020	1050	76381866
SCHOOL RENTAL HOUSE~2		PO BOX 347					
018500-00	01-018500	1251350	12/18/2020	1249200	11/19/2020	2150	76381758
SCHOOL RENTAL HOUSE		PO BOX 347					
018550-00	01-018550	2105300	06/23/2020	2105300	06/23/2020	0	0
MEEKS, KRAIG		PO BOX 36					
018550-01	01-018550.01	0	06/23/2020	0	06/23/2020	0	0
ROSE, STEVE		PO BOX 205					
018600-00	01-018600	410000	12/18/2020	409200	11/19/2020	800	76381821
CLARK, BRENT J		PO BOX 121					
018750-00	01-018750	218200	12/18/2020	217850	11/19/2020	350	7324106723
SCRIBNER HANGAR		1142 SCRIBNER LANE					
018800-00	01-018800	7100	06/23/2020	7100	06/23/2020	0	76381884
CLARK ,TOBY		P.O. BOX 229					
018850-00	01-018850	305500	12/18/2020	303800	11/19/2020	1700	88688630
LEISTIKO, MORGAN		P.O. BOX 331					
018900-00	01-018900	485000	12/18/2020	479100	11/19/2020	5900	76381782
LUDEMAN, TAMMEY		PO BOX 233					
018950-00	01-018950	718400	06/23/2020	718400	06/23/2020	0	76381855
WENNERBERG, CARLA							
019100-00	01-019100	6315300	12/18/2020	5788000	11/19/2020	527300	1249053484
HAWARDEN-SQ BUTTE WTR		PO BOX 265					
019150-00	01-019150	3365450	12/18/2020	3207380	11/19/2020	158070	2901836728
NORTH GERALDINE WATER		PO BOX 324			MAY 2018 CHANGED FROM TENS TO 100'S		
10260-00	01-010260	0	/ /	0	/ /	0	172036778
GERALDINE AIRPORT		P.O. BOX 867					

Total Monthly Usage: 2875860

Total Number of Accounts: 193

Town of Geraldine
Montana

172 E Collins Avenue
Geraldine, Montana 59858

ANNUAL FINANCIAL REPORT

Fiscal Year Ended
June 30, 2019

Entity #020803

ANNUAL FINANCIAL REPORT FILING FEE & AUDIT DETERMINATION

FISCAL YEAR ENDING

June 30, 2019

ENTITY #: _____

Town of Geraldine
PO Box 211
Geraldine
Montana 59446

If the local government entity name or mailing address on the Department's mailing list is inaccurate or has changed recently please note the correction below.

Part I - Determination of Filing Fee

GOVERNMENTAL FUNDS - *(STATEMENT OF REVENUES, EXPENDITURES, AND CHANGES IN FUND BALANCES)*		
Total Revenues	145,664.10	
Other Financing Sources - Proceeds from Sale of Capital Assets	0.00	
Other Financing Sources - other revenues	0.00	
Special and/or Extraordinary Items (Revenues only)	0.00	
ENTERPRISE FUNDS - *(STATEMENT OF REVENUES, EXPENSES AND CHANGES IN FUND NET POSITION)* *Note: Do not include revenues of Internal Service Funds*		
Total Operating Revenues	176,168.57	**Box #1**
Non-Operating Revenues: (Do not include Gain on Sale of Capital Assets)		
Taxes/Assessments	0.00	
Licenses/Permits	0.00	
Intergovernmental Revenues	2,132.25	**Filing Fee Owed** **0**
Interest Revenues	0.00	
Other Non-operating Revenues not included above	0.00	
Capital Contributions	25,000.00	
Special and/or Extraordinary Items (Revenues only)	0.00	
ENTERPRISE FUNDS - *(STATEMENT OF CASH FLOWS)*		
Proceeds from Sale of Capital Assets	0.00	
TRUST FUNDS - *(STATEMENT OF CHANGES IN FIDUCIARY NET POSITION)* *NOTE: Do not include additions to Investment Trust Funds*		
Total Additions to **Pension & Private Purpose** Trust Funds Only	0.00	
Total Revenues for Calculation of Filing Fee:	**$348,964.92**	

If total revenues are equal to or less than $750,000, no filing fee is required to be paid. However, your entity may be subject to audit requirements.

Must Review and complete Part II below to determine if there is an audit requirement. *Must* manually subtract proceeds received to refinance an existing debt to exclude from audit determination.

If total revenues plus adjusted debt proceeds in the fiscal year exceed $750,000 your entity will be subject to audit requirements .

Part II - Determination of Audit Requirement w/ No Filing Fee (Must make applicable adjustments in yellow cells manually)

Add: Proceeds from Debt provided by a Federal agency,a State agency, another local government. [*DOES NOT* include proceeds received from non-governmental entities (e.g. Banks, savings & Loans)]		**Box #2**
Governmental Funds (Statement of Revenues, Expenditures, and Changes in Fund Balances-Proceeds from general long-term debt)	0.00	
Proprietary Funds (Statement of Cash Flows-Major & Non Major Enterprise funds-Proceeds from debt)	23,799.44	
Manually subtract amount of debt proceeds received from non-governmental financial institutions (e.g. banks, savings & loans) included above. (enter as a negative)		**Audit Required?** **NO**
Subtotal - Proceeds received from Debt:	$23,799.44	
Manually subtract amount of debt proceeds received from government agencies used to refinance (pay-off) an existing debt (enter as a negative)		
Adjusted Debt Proceeds	$23,799.44	
Total Revenues + Adjusted Debt Proceeds	**$372,764.36**	

If total revenues plus adjusted debt proceeds are in excess of $750,000, you are required to have an audit for the fiscal year.

Town of Geraldine
Annual Financial Report
Table of Contents
June 30, 2019

INTRODUCTORY SECTION

Town of Geraldine
Elected Officials/Officers

OFFICE	CITY/TOWN OFFICIALS/OFFICERS	DATE TERM EXPIRES
Mayor	Perry Joyce	2022
Councilperson/Commissioner	Marty Clark	2020
Councilperson/Commissioner	Will Muir	2022
Councilperson/Commissioner	Michael Qunell	2022
Councilperson/Commissioner	Anita Klein	2020
Councilperson/Commissioner		
Councilperson/Commissioner		
Councilperson/Commissioner		
Councilperson/Commissioner		
City manager		
Attorney		
Chief of police		
Clerk		
Clerk/Treasurer	Rosemary Scott	
Deputy Clerk/Treasurer		
City Judge		
City Services Supervisor		
Utility billing/collection clerk		

In accordance with State law, I hereby transmit the
Town of Geraldine
Annual Financial Report for the fiscal year ended
June 30, 2019

Respectfully submitted;

Rosemary Scott

Town Clerk-Treasurer

September 24, 2019

Date

FINANCIAL SECTION

BASIC FINANCIAL STATEMENTS AND NOTES TO FINANCIAL STATEMENTS

GOVERNMENT-WIDE FINANCIAL STATEMENTS

Town of Geraldine
Statement of Net Position
June 30, 2019

	Primary Government		
	Governmental Activities	Business-type Activities	Total
ASSETS			
Current assets:			
Cash and investments	$ 197,517.71	$ 29,694.41	$ 227,212.12
Taxes and assessments receivable, net	8,971.55	4,440.00	13,411.55
Accounts receivable	-	12,958.15	12,958.15
Total current assets	206,489.26	47,092.56	253,581.82
Noncurrent assets:			
Restricted cash and investments	-	81,522.70	81,522.70
Capital assets - land	6,700.00	29,212.00	35,912.00
Capital assets - construction in progress	-	48,799.44	48,799.44
Capital assets - net of depreciation	33,299.50	1,867,911.78	1,901,211.28
Total noncurrent assets	39,999.50	2,027,445.92	2,067,445.42
Total Assets	246,488.76	2,074,538.48	2,321,027.24
DEFERRED OUTFLOWS OF RESOURCES			
Pensions	3,593.44	9,159.56	12,753.00
Total deferred outflows of resources	3,593.44	9,159.56	12,753.00
LIABILITIES			
Current liabilities:			
Capital debt	6,856.00	20,786.00	27,642.00
Compensated absences payable	567.90	1,373.74	1,941.64
Total current liabilities	7,423.90	22,159.74	29,583.64
Noncurrent liabilities:			
Capital debt	13,181.72	200,456.44	213,638.16
Compensated absences payable	567.89	1,373.73	1,941.62
Net pension liability	16,082.12	40,992.88	57,075.00
Total noncurrent liabilities	29,831.73	242,823.05	272,654.78
Total Liabilities	37,255.63	264,982.79	302,238.42
DEFERRED INFLOWS OF RESOURCES			
Pensions	2,700.50	6,883.50	9,584.00
Total deferred inflows of resources	2,700.50	6,883.50	9,584.00
NET POSITION			
Net investment in capital assets	19,961.78	1,724,680.78	1,744,642.56
Restricted for:			
Public safety	13,863.00		13,863.00
Public works	41,306.44		41,306.44
Debt service	-	33,351.70	33,351.70
Replacement and depreciation	-	48,171.00	48,171.00
Unrestricted	134,994.85	5,628.27	140,623.12
Total net position	$ 210,126.07	$ 1,811,831.75	$ 2,021,957.82

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Activities
For the Fiscal Year Ended
June 30, 2019

Functions/Programs	Expenses	Program Revenues: Charges for Services	Program Revenues: Operating Grants and Contributions	Program Revenues: Capital Grants and Contributions	Net (Expense) Revenue and Changes in Net Position: Primary Government: Governmental Activities	Primary Government: Business-Type Activities	Primary Government: Total
Primary government:							
Governmental activities:							
General government	$ 56,490.67	$ 50.00	$ 351.17	$ -	$ (56,089.50)		$ (56,089.50)
Public safety	4,362.32	-	359.00	-	(4,003.32)		(4,003.32)
Public works	41,869.13	14,133.60	26,024.20	-	(1,711.33)		(1,711.33)
Public health	1,650.00	-	-	-	(1,650.00)		(1,650.00)
Culture and recreation	1,772.04	-	6.68	-	(1,765.36)		(1,765.36)
Debt service - interest and other charges	872.80	-	-	-	(872.80)		(872.80)
Internal services	10,348.20	-	-	-	(10,348.20)		(10,348.20)
Total governmental activities	117,365.16	14,183.60	26,741.05	-	(76,440.51)		(76,440.51)
Business-type activities:							
Water	115,696.96	90,239.08	2,715.14	-		$ (22,742.74)	(22,742.74)
Sewer	46,874.22	39,000.75	329.26	25,000.00		17,455.79	17,455.79
Garbage	41,462.30	39,092.73	-	-		(2,369.57)	(2,369.57)
Total business-type activities	204,033.48	168,332.56	3,044.40	25,000.00		(7,656.52)	(7,656.52)
Total primary government	$ 321,398.64	$ 182,516.16	$ 29,785.45	$ 25,000.00	(76,440.51)	(7,656.52)	(84,097.03)
General revenues:							
Property taxes for general purposes					58,881.18	-	58,881.18
Local option tax					12,080.48	-	12,080.48
Unrestricted federal/state shared revenues					21,834.12	-	21,834.12
Unrestricted investment earnings					331.04	-	331.04
Miscellaneous					2,320.92	6,923.86	9,244.78
Transfers - net					-	-	-
Total general revenues and transfers					95,447.74	6,923.86	102,371.60
Change in net position					19,007.23	(732.66)	18,274.57
Net position - beginning					191,118.84	1,812,564.41	2,003,683.25
Net position - ending					$ 210,126.07	$ 1,811,831.75	$ 2,021,957.82

The notes to the financial statements are an integral part of this statement

FUND FINANCIAL STATEMENTS

Town of Geraldine
Balance Sheet
Governmental Funds
June 30, 2019

	Major Governmental Funds		
	General Fund	Total Nonmajor Governmental Funds	Total Governmental Funds
ASSETS			
Current assets			
Cash and investments	$ 173,816.66	$ 23,701.05	$ 197,517.71
Taxes and assessments receivable, net	8,971.55	-	8,971.55
Total current assets	182,788.21	23,701.05	206,489.26
Total assets	182,788.21	23,701.05	206,489.26
DEFERRED INFLOWS OF RESOURCES			
Property tax/special assessment revenue	8,971.55	-	8,971.55
Total deferred inflows of resources	8,971.55	-	8,971.55
FUND BALANCES			
Restricted for:			
Public safety	-	13,863.00	13,863.00
Public works	31,468.39	9,838.05	41,306.44
Unassigned	142,348.27	-	142,348.27
Total fund balances	$ 173,816.66	$ 23,701.05	$ 197,517.71
Total liabilities, deferred inflows of resources and fund balance	$ 182,788.21	$ 23,701.05	$ 206,489.26

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Reconciliation of the Governmental Funds Balance Sheet
to the Statement of Net Position
June 30, 2019

Total fund balances - governmental funds		$	197,517.71
Capital assets used in governmental activities are not financial resources and, therefore, are not reported in the funds.			
Land	6,700.00		
Depreciable capital assets (net)	33,299.50		
			39,999.50
Taxes and Assessments receivable that will be collected but are not available soon enough to pay for current-period expenditures are deferred inflows of resources in the funds.			8,971.55
Long-term liabilities (current and non-current portions) are not due and payable in the current period and therefore are not reported as liabilities in the funds.			
Capital debt	(20,037.72)		
Compensated absences payable	(1,135.79)		
Pension liability	(16,082.12)		
			(37,255.63)
Employer contributions to a plan during the reporting period not recognized as of the plan's measurement date and the proportionate share of collective plan expense that is applicable to future periods are reported as deferred outflows of resouces on the Statement of Net Position.			
Pensions			3,593.44
The proportionate share of reductions to collective plan expense that are applicable to future periods is reported as deferred inflows of resouces on the Statement of Net Position.			
Pensions			(2,700.50)
Total net position - governmental activities		$	210,126.07

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Revenues, Expenditures, and Changes in Fund Balances
Governmental Funds
For Fiscal Year Ended
June 30, 2019

	Major Governmental Funds		
	General Fund	Total Nonmajor Governmental Funds	Total Governmental Funds
REVENUES			
Taxes and assessments	$ 94,744.82	$ -	$ 94,744.82
Licenses and permits	50.00	-	50.00
Intergovernmental	33,984.56	14,232.76	48,217.32
Miscellaneous	2,320.92	-	2,320.92
Investment earnings	331.04	-	331.04
Total revenues	131,431.34	14,232.76	145,664.10
EXPENDITURES			
Current:			
General government	57,528.04	-	57,528.04
Public safety	4,362.32	-	4,362.32
Public works	35,474.42	4,394.71	39,869.13
Public health	1,650.00	-	1,650.00
Culture and recreation	520.68	-	520.68
Internal services	10,348.20	-	10,348.20
Debt service - principal	10,986.79	-	10,986.79
Debt service - interest and other charges	872.80	-	872.80
Total expenditures	121,743.25	4,394.71	126,137.96
Excess (deficiency) of revenues over (under) expenditures	9,688.09	9,838.05	19,526.14
Net change in fund balance	9,688.09	9,838.05	19,526.14
Fund balances - beginning	164,128.57	13,863.00	177,991.57
Fund balances - ending	$ 173,816.66	$ 23,701.05	$ 197,517.71

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Reconciliation of the Statement of Revenues, Expenditures, and
Changes in Fund Balances of Governmental Funds
to the Statement of Activities
For the Fiscal Year Ended
June 30, 2019

Net change in fund balances - total governmental funds		$ 19,526.14
Governmental funds report capital outlays as expenditures. However, in the Statement of Activities, the cost of those assets is allocated over their estimated useful lives and reported as depreciation expense.		
Depreciation expense	(4,218.75)	
		(4,218.75)
Revenues reported in the Statement of Activities that do not provide current financial resources are not reported as revenues in governmental funds:		
Tax and assessment revenue		(9,649.56)
The change in compensated absences payable is reported as an increase or decrease to expense on the Statement of Activities, but is not recognized as an increase or decrease to expenditures on the Statement of Revenues, Expenditures and Changes in Fund Balance:		
Change in compensated absence liability		(599.10)
Repayment of debt principal during the reporting period consumes current financial resources and are recognized as expenditures in the governmental funds, but the repayment of long-term debt principle balances reduces the liability in the Statement of Net Position:		
Long-term debt principal payments		10,986.79
Employer contributions made to pension plans during the reporting period consume current financial resources, thus are reported as expenditures in the Statement of Revenues, Expenditures, and Changes in Fund Balances. However, only the amount of pension expense recognized by the plan during the measurement period is reported as expenses in the Statement of Activities.		2,603.86
The difference between on-behalf contributions to fund pension liabilities recognized as revenue during the reporting period in the Statement of Revenues, Expenditures, and Changes in Fund Balances and on-behalf contributions recognized during the measurement period increases (decreases) operating grants and contributions reported on the Statement of Activities.		357.85
Change in net position - Statement of Activities		$ 19,007.23

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Net Position
Proprietary Funds
June 30, 2019

	Business-Type Activities			
	Major Enterprise Funds			
	5210 Water	5310 Sewer	5410 Garbage	Total Enterprise Funds
ASSETS				
Current assets				
Cash and investments	$ 24,601.79	$ -	$ 5,092.62	$ 29,694.41
Taxes and assessments receivable, net	-	-	4,440.00	4,440.00
Accounts receivable	8,263.20	4,210.73	484.22	12,958.15
Total current assets	32,864.99	4,210.73	10,016.84	47,092.56
Noncurrent assets				
Restricted cash and investments	80,571.00	951.70	-	81,522.70
Capital assets - land	5,512.00	23,700.00	-	29,212.00
Capital assets - construction in progress	-	48,799.44	-	48,799.44
Capital assets - net of depreciation	1,322,388.65	545,523.13	-	1,867,911.78
Total noncurrent assets	1,408,471.65	618,974.27	-	2,027,445.92
Total assets	1,441,336.64	623,185.00	10,016.84	2,074,538.48
DEFERRED OUTFLOWS OF RESOURCES				
Pensions	5,853.22	3,306.34	-	9,159.56
Total deferred outflows of resources	5,853.22	3,306.34	-	9,159.56
LIABILITIES				
Current liabilities				
Capital debt	12,786.00	8,000.00	-	20,786.00
Compensated absences payable	798.54	575.20	-	1,373.74
Total current liabilities	13,584.54	8,575.20	-	22,159.74
Noncurrent liabilities				
Capital debt	164,657.00	35,799.44	-	200,456.44
Compensated absences payable	798.54	575.19	-	1,373.73
Net pension liability	26,195.62	14,797.26	-	40,992.88
Total noncurrent liabilities	191,651.16	51,171.89	-	242,823.05
Total liabilities	205,235.70	59,747.09	-	264,982.79
DEFERRED INFLOWS OF RESOURCES				
Pensions	4,398.75	2,484.75	-	6,883.50
Total deferred inflows of resources	4,398.75	2,484.75	-	6,883.50
NET POSITION				
Net investment in capital assets	1,150,457.65	574,223.13	-	1,724,680.78
Debt service	32,400.00	951.70	-	33,351.70
Replacement and depreciation	48,171.00	-	-	48,171.00
Unrestricted	6,526.76	(10,915.33)	10,016.84	5,628.27
Total net position	$ 1,237,555.41	$ 564,259.50	$ 10,016.84	$ 1,811,831.75

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Revenues, Expenses, and Changes in Net Position
Proprietary Funds
For Fiscal Year Ended
June 30, 2019

	Business-Type Activities			
	Major Enterprise Funds			
	5210	5310	5410	
	Water	Sewer	Garbage	Totals
OPERATING REVENUES				
Charges for services	$ 97,162.94	$ 39,000.75	$ 39,092.73	$ 175,256.42
On-behalf - pensions	582.89	329.26	-	912.15
Total operating revenues	97,745.83	39,330.01	39,092.73	176,168.57
OPERATING EXPENSES				
Personal services	34,003.94	20,292.10	-	54,296.04
Supplies	23,298.74	1,669.42	-	24,968.16
Purchased services	10,968.84	7,867.47	41,462.30	60,298.61
Building materials	1,879.42	-	-	1,879.42
Depreciation	37,672.97	15,949.55	-	53,622.52
Total operating expenses	107,823.91	45,778.54	41,462.30	195,064.75
Operating income (loss)	(10,078.08)	(6,448.53)	(2,369.57)	(18,896.18)
NON-OPERATING REVENUES (EXPENSES)				
Intergovernmental revenue	2,132.25	-	-	2,132.25
Debt service interest expense	(7,873.05)	(1,095.68)	-	(8,968.73)
Total non-operating revenues (expenses)	(5,740.80)	(1,095.68)	-	(6,836.48)
Income (loss) before contributions, transfers, special & extraordinary items	(15,818.88)	(7,544.21)	(2,369.57)	(25,732.66)
Capital contributions	-	25,000.00	-	25,000.00
Change in net position	(15,818.88)	17,455.79	(2,369.57)	(732.66)
Net position - beginning	1,253,374.29	546,803.71	12,386.41	1,812,564.41
Net position - ending	$ 1,237,555.41	$ 564,259.50	$ 10,016.84	$ 1,811,831.75

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Cash Flows
Proprietary Fund
For Fiscal Year Ended
June 30, 2019

	Business-type Activities			
	Major Enterprise Funds			
	5210 Water	5310 Sewer	5410 Garbage	Total Enterprise Funds
Cash Flows from Operating Activities:				
Cash received from customers	$ 98,610.55	$ 39,610.36	$ 41,153.91	$ 179,374.82
Cash received from miscellaneous sources	-	-	-	-
Cash paid to suppliers of goods and services	(36,147.00)	(9,536.89)	(41,462.30)	(87,146.19)
Cash paid to employees	(29,406.14)	(16,952.04)	-	(46,358.18)
Net cash provided (used) by operating activities	33,057.41	13,121.43	(308.39)	45,870.45
Cash Flows from Non-Capital and Related Financing Activities:				
Short-term loans from other funds	-	(13,050.81)	-	(13,050.81)
Intergovernmental revenue received	2,132.25	-	-	2,132.25
Net cash provided (used) by non-capital and related financing activities	2,132.25	(13,050.81)	-	(10,918.56)
Cash Flows from Capital and Related Financing Activities:				
Principal paid on capital debt	(12,250.95)	(7,000.00)	-	(19,250.95)
Proceeds from capital debt	-	23,799.44	-	23,799.44
Interest paid on capital debt	(7,873.05)	(1,095.68)	-	(8,968.73)
Acquisition and construction of capital assets	(0.00)	(48,799.44)	-	(48,799.44)
Capital Contributions received	-	25,000.00	-	25,000.00
Net cash provided (used) by non-capital and related financing activities	(20,124.00)	(8,095.68)	-	(28,219.68)
Net increase (decrease) in cash and cash equivalents	15,065.66	(8,025.06)	(308.39)	6,732.21
Cash and cash equivalents as of:				
June 30, 2018	90,107.13	8,976.76	5,401.01	104,484.90
June 30, 2019	$ 105,172.79	$ 951.70	$ 5,092.62	$ 111,217.11
Displayed on Statement of Net Position-Proprietary Funds as:				
Cash and investments	$ 24,601.79	$ -	$ 5,092.62	$ 29,694.41
Restricted cash and investments	80,571.00	951.70	-	81,522.70
Total at end of year	$ 105,172.79	$ 951.70	$ 5,092.62	$ 111,217.11
Reconciliation of operating income to net cash provided by operating activity:				
Operating income (loss)	$ (10,078.08)	$ (6,448.53)	$ (2,369.57)	$ (18,896.18)
Adjustments to reconcile operating income to net cash provided (used) by operating activities:				
Depreciation expense	37,672.97	15,949.55	-	53,622.52
Change in assets, deferred outflows of resources, liabilities, and deferred inflows of resources:				
(Increase) decrease in assessments receivable	-	-	1,752.00	1,752.00
(Increase) decrease in accounts receivable	1,447.61	609.61	309.18	2,366.40
Increase (decrease) in compensated absences payable	873.52	612.31	-	1,485.83
Increase (decrease) in net pension liability	(6,409.06)	(2,678.41)	-	(9,087.47)
(Increase) decrease in deferred outflows-pension	5,417.66	2,734.70	-	8,152.36
Increase (decrease) in deferred inflows-pension	4,132.79	2,342.20	-	6,474.99
Net cash provided (used) by operating activities	$ 33,057.41	$ 13,121.43	$ (308.39)	$ 45,870.45
Schedule of non-cash transactions				
Depreciation	37,672.97	15,949.55	-	53,622.52
On-behalf contributions to pensions from State	582.29	329.26	-	911.55
Pension expense related to on-behalf contributions from State	582.29	329.26	-	911.55

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Fiduciary Net Position
Fiduciary Funds
June 30, 2019

		Agency Funds
ASSETS		
Cash and cash equivalents	$	8,887.60
Receivables:		
Total assets		8,887.60
LIABILITIES		
Warrants payable		8,887.60
Total liabilities		8,887.60

The notes to the financial statements are an integral part of this statement.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The financial statements of the Town have been prepared in conformity with accounting principles generally accepted in the United States of America (US GAAP) as applied to governmental units. The Governmental Accounting Standards Board (GASB) is the accepted standard-setting body for governmental accounting and financial reporting principles.

For the fiscal year ending June 30, 2019, the government adopted the provisions of the following new accounting pronouncements issued by the GASB:

GASB Statement No. 83, *Certain Asset Retirement Obligations* addresses accounting and financial reporting for certain asset retirement obligations (AROs). An ARO is a legally enforceable liability associated with the retirement of a tangible capital asset. The Statement establishes uniform criteria for determining the timing and pattern of recognition of a liability and a corresponding deferred outflow of resources for AROs when laws, regulations, contracts, or court judgments together with the occurrence of an internal obligating event, require governments to take specific actions to retire certain tangible capital assets at the end of the asset's useful life, abandonment of a tangible capital asset before it is placed into operation, or acquiring a capital asset that has an existing ARO..

GASB Statement No. 88, *Certain Disclosures Related to Debt, including Direct Borrowings and Direct Placements.* The Statement defines debt and requires that additional essential information related to debt be disclosed in notes to financial statements, including unused lines of credit; assets pledged as collateral for the debt; and terms specified in debt agreements related to significant events of default with finance-related consequences, significant termination events with finance-related consequences, and significant subjective acceleration clauses.

The Town's significant accounting policies are described below.

A. Reporting Entity

The Town of Geraldine is a political subdivision of the State of Montana governed by a Mayor and Council (Commission) duly elected by the registered voters of the Town. The Town utilizes the Mayor/Council form of government. The accompanying financial statements present the primary government.

GASB Statement No. 14, as amended, sets forth the criteria for reporting component units. The Town has determined there are no outside entity's that meet the criteria set forth by the GASB that would require the Town to include such entities as a blended or discretely presented component unit in the Town's financial statements.

B. Basis of Presentation

Government-Wide Financial Statements

The government-wide financial statements (i.e., the Statement of Net Position and the Statement of Activities) report information of the primary government. They include all funds of the primary government except fiduciary funds. Governmental activities are financed by taxes, intergovernmental revenues, and other non-exchange revenues. Business-type Activities are financed, in whole or in part, by fees charged to external parties for goods or services.

The Statement of Net Position presents the financial condition of the governmental and business-type activities of the Town at year-end. As a general rule, interfund activities, interfund payables and receivables, have been removed from this statement except those representing balances between the governmental activities and the business-type activities, which are presented as internal balances and eliminated in the total primary government column. Exceptions to this general rule are payments-in-lieu of taxes and other charges between the governments' enterprise functions and various other functions of the government. Elimination of these charges would distort the direct costs and program revenues reported for the various functions.

The Statement of Activities demonstrates the degree to which the direct expenses of a given function or program are offset by program revenues. Direct expenses are those that are clearly identifiable with a specific function. Program revenues include: 1) charges to customers who purchase, use, or directly benefit from goods, services, or privileges provided by a given function and 2) grants and contributions that are restricted to meeting the operational or capital requirements of a particular function. Taxes revenues and other items not properly included among program revenues are reported as general revenues. The Town does not allocate indirect expenses to functions or programs.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

B. Basis of Presentation - cont.

Fund Financial Statements

Unlike a private business, which is accounted for as a single entity, a governmental unit is accounted for through several separate funds. A fund is a fiscal and accounting entity with a self-balancing set of accounts. Fund accounting segregates specific activities according to their intended purpose and is used to aid management in demonstrating compliance with finance-related, legal, and contractual provisions. Funds are classified into three categories: governmental, proprietary, and fiduciary. Each fund category presents separate fund financial statements. The fund financial statements presenting a fund category may contain one or more 'fund types'. The governmental and proprietary fund financial statements emphasis is on major funds. Internal service funds are combined and the totals are presented in a single column on the face of the proprietary fund statements. Fiduciary fund financial statements report by fiduciary fund type. Interfund activity is reported on the fund financial statements.

Each major fund is reported in a separate column in the respective fund financial statements. A fund is considered major if it is the primary operating fund of the Town or meets the following criteria:

a. Total assets and deferred outflows of resources, the total liabilities and deferred inflows of resources, revenues, or expenditures/expenses of that individual governmental or enterprise fund are at least 10 percent of the corresponding total for all funds of that category or type; and

b. The same element(s) that met the 10 percent criterion above is at least 5 percent of the corresponding total for all governmental and enterprise funds combined.

Per GAAP, the government's officials are allowed to present any individual fund that does not meet the criteria as a major fund in the respective fund financial statements if they believe the fund is particularly important to financial statement users.

All of the remaining funds are aggregated and reported in the respective governmental and proprietary fund financial statements in a single column as '*nonmajor funds'.*

The Town maintains the minimum number of governmental funds consistent with legal and managerial requirements.

The City reports the following major governmental funds:

General Fund - The general fund is the primary operating fund of the Town. It accounts for all financial resources traditionally associated with the Town's operations except those required to be accounted for in other funds.

The Town reports the following major proprietary funds:

Water Fund - An enterprise fund used to account for the operating and nonoperating revenues and expenses of the public water utility system.

Sewer Fund - An enterprise fund used to account for the operating and nonoperating revenues and expenses of the public sewer utility system.

Garbage Fund - An enterprise fund used to account for the operating and nonoperating revenues and expenses of solid waste disposal.

Additionally, the Town reports the following fund types:

Agency Funds - These funds are custodial in nature and used to account for assets held by the Town in a trustee capacity or as an agent for individuals, private organizations, other governments.

The Governmental Accounting Standards Board (GASB) issued Statement No. 62. The Statement codifies the requirements of all pre-November 30, 1989 FASB and AICPA pronouncements that apply to state and local governments. The government has adopted and applied the provisions of GASB Statement No. 62 to both the government-wide and proprietary fund financial statements. Governments may continue to apply post-November 30, 1989 FASB pronouncements or other accounting literature that do not conflict with or contradict with GASB pronouncements, including Statement No. 62.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

C. Measurement Focus and Basis of Accounting

The government-wide financial statements, and the proprietary and fiduciary fund financial statements are reported using the economic resources measurement focus and the accrual basis of accounting. Revenues are recorded when earned, except for grant revenue and similar voluntary nonexchange revenues received prior to meeting imposed time requirements. Property tax revenue is recognized when levied. Expenses are recorded when a liability is incurred, regardless of the timing of related cash flows.

The Statement of Revenues, Expenses, and Changes in Net Position-Proprietary Funds, distinguishes operating revenues and expenses from nonoperating items. Operating revenues and expenses generally result from providing services and producing and delivering goods in connection with a proprietary fund's principal ongoing operations. Revenues of proprietary funds are defined as operating vs nonoperating based on how individual transactions are categorized on the statement of cash flows for proprietary funds. All cash receipts that do not result from transactions defined as operating activities are considered nonoperating and reported on the statement of cash flows as capital and related financing, noncapital financing, or investing activities.

Governmental fund financial statements are reported using the current financial resources measurement focus and the modified accrual basis of accounting. Under this method, revenues are recognized when measurable and available. “Measurable” means the amount of the transaction can be determined. “Available” means collectible within the current period or soon enough thereafter to be used to pay liabilities of the current period.

The Town considers revenues to be available if they are collected within 60 days of the end of the current fiscal period. Property taxes, license, and interest associated with the current fiscal period are all considered to be susceptible to accrual and so have been recognized as revenues of the current fiscal period. Only the portion of special assessments receivable due within the current fiscal period are considered to be susceptible to accrual as revenue of the current period. Entitlements and shared revenues are recorded at the time of receipt or earlier if the susceptible to accrual criteria is met.
Property tax revenue is considered available upon receipt. Taxes and assessments receivable due within the current period and remaining uncollected at year end are offset by deferred tax/assessment revenue, a deferred inflow of resources account, since they are not considered available to pay liabilities of the current period. All other revenue items, other than grant revenue and similar voluntary nonexchange revenues, are considered to be both measurable and available only when cash is received by the government.

Expenditures are recorded when the related fund liability is incurred, except for principal and interest on general long-term debt, claims and judgments, and compensated absences, which are recognized as expenditures to the extent they have matured. General capital asset acquisitions are reported as expenditures in governmental funds. Issuance of general long-term debt and acquisitions under capital leases are reported as other financing sources.

Both financial statements presented on the accrual basis and modified accrual basis of accounting recognize grant revenue and similar voluntary nonexchange revenues, pending purely routine requirements such as filing reimbursement and/or progress reports where all eligibility requirements other than time requirements imposed by the provider have been met, as revenue of the current period. Grant revenue and similar voluntary nonexchange revenues received prior to meeting imposed time requirements but after all eligibility requirements are met, are offset by deferred grant revenues, a deferred inflows of resources account, until use is required or first permitted.

D. Assets, deferred outlflows of resources, liabilities, deferred inflows of resources, and fund balance/net position

1. Deposits and investments

Allowable deposit and investment of public funds is governed by Title 7, Chapter 6, Part 2 of the Montana Code Annotated (MCA). Deposits and investments may include demand, time, and savings deposits, direct obligations of the United States Government, securities issued by agencies of the United States, investments in the Montana Short-Term Investment Program (STIP), repurchase agreements, and registered warrants.

In the statement of cash flows for proprietary funds, the term cash and cash equivalents is used. Cash equivalents are short-term, highly liquid investments that are both readily convertible to known amounts of cash, and investments with original maturities of three months or less at the time of purchase.

Investments, with limited exceptions, are reported at fair value. Investments in nonparticipating certificates of deposit are reported at cost. Money market investments, including U.S. Treasury and Agency obligations, that mature within one year of acquisition are reported at amortized cost. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is determined annually, and requires the use of valuation techniques, a specific method or combination of methods using one or more of three approaches: market, cost or income approach.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

D. Assets, deferred outlflows of resources, liabilities, deferred inflows of resources, and fund balance/net position - cont.

2. Receivables and payables

Activity between funds that are representative of lending/borrowing arrangements outstanding at fiscal year-end are referred to as either "due to/from other funds" or "advances to/from other funds". The non-current portion of advances between funds are not available for appropriation and are not expendable available financial resources.

Accounts receivables are shown net of allowance for uncollectible amounts. Property tax receivables are offset by deferred inflows of resource accounts since they are not available to pay liabilities of the current period. All property tax levies are set at the time of the adoption of the annual budget. The real estate taxes are payable in two installments, the first due by November 30 and the second by May 31. Personal property taxes are assessed in April or May and are payable within 30 days of the issuance of the notice.

3. Inventories and prepaid items

All inventories are valued at cost. Inventories are recorded as expenditures when purchased (when consumed).

Certain payments reflect costs applicable to future accounting periods and are recorded as prepaid items in both the government-wide and fund financial statements.

3. Restricted assets

Certain assets of the enterprise funds are restricted for specific use as required by the bond indenture agreement covenants established with the issuance and sale of the revenue bonds representing a liability to the enterprise funds. These restricted assets represent cash and cash equivalents restricted for use to establish a reserve for future debt and to establish a replacement and depreciation reserve for the purpose of replacing the system's short lived assets in the future.

4. Capital assets

Capital assets which include property, plant, equipment, and infrastructure are reported in the applicable governmental or business-type activities columns in the government-wide financial statements. Capital assets, other than infrastructure assets, are defined by the Town as assets with an initial cost of more than $5,000 and an estimated useful life of three years or more. Such assets are recorded at historical cost. Donated capital assets are recorded at acquisition value at the date of donation.

Generally accepted accounting principles (GAAP) require the recording of infrastructure assets (i.e. roads, bridges, and similar assets). The Town did not meet the required annual revenue limitation as set forth by the GASB for retroactive reporting of such assets. However, prospectively the Town does capitalize new construction of infrastructure assets in accordance with the standard.

The costs of normal maintenance and repairs that do not add to the value of the asset or materially extend assets lives are not capitalized.

GAAP also requires the Town's management to estimate the useful life of capital assets and record annual depreciation expense using the straight-line depreciation method . These estimates affect the reported amounts of capital assets -net of depreciation. The range of estimated useful lives of property, plant, equipment, and infrastructure assets are as follows :

Buildings	30 years
Improvement other than Buildings	15 - 50 years
Machinery & Equipment	7 - 20 years
Utility Systems (i.e. source of supply, plants, transmission & distribution)	50 years

5. Deferred outflows of resources

Deferred outflow of resources is a financial statement element. A deferred outflow of resources is a consumption of net assets by the government that is applicable to a future reporting period. The government-wide statement of net position, proprietary fund statement of net position, and governmental fund balance sheet report a separate section for deferred outflows of resources.

Deferred outflows of resources are disclosed by type on the face of the financial statements and in the respective notes to the financial statements to augment understanding of the deferral.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

D. Assets, deferred outlflows of resources, liabilities, deferred inflows of resources, and fund balance/net position - cont.

6. Long-term obligations

In the government-wide financial statements and in proprietary fund types in the fund financial statements, long-term debt and other long-term obligations are reported as liabilities in the applicable governmental activity or business-type activity column or proprietary fund financial statement. Principal payments on long-term obligations due within the next fiscal year are reported as current liabilities. Bond premiums and discounts are deferred and amortized over the life of the bond issue using the straight-line method that approximates the effective interest method. Bonds payable are reported net of the applicable bond premium or discount. Bond issuance costs, except for prepaid insurance costs, are expensed in the reporting period in which they are incurred. Prepaid insurance costs are expensed over the life of the debt.

In the governmental fund financial statements, governmental funds recognize bond premiums and discounts, as well as bond issuance costs, during the current period. The face amount of debt issued is reported as other financing sources. Premiums received on debt issuances are reported as other financing sources while discounts on debt issuance are reported as other financing uses. Issuance costs, whether or not withheld from the actual debt proceeds received, are reported as debt service expenditures.

7. Compensated absences

As required by State law, the Town allows employees to accumulate earned vacation and sick leave benefits.

Vacation Leave: Full time employees earn vacation leave at the rate of 15 working days per year for the first 10 years of service. Employees with 10 to 20 years of service earn vacation leave at an increasing rate, to a maximum rate of 24 working days per year after 20 years of service. Employees may accumulate a total not to exceed two times the maximum number of days earned annually as of the end of the first pay period of the next calendar year.

Sick Leave: Full time employees earn sick leave at the rate of 12 working days per year. There is no restriction as to the number of working days that may be accumulated. Upon termination, employees in good standing are entitled to a cash payout of 25% of their sick leave balance.

Such amounts are reported in the Town's government-wide financial statements and in proprietary fund types in the fund financial statements as an expense and a liability for compensated absences as the leave is earned. The portion of that time that is estimated to be used within the next fiscal year is presented as a current liability.

In the governmental fund financial statements, governmental funds report vacation and sick leave as expenditures when used.

8. Deferred inflows of Resources

A deferred inflow of resources is an acquisition of net assets by the government that is applicable to a future reporting period. The government-wide statement of net position, proprietary fund statement of net position, and governmental fund balance sheet report a separate section for deferred inflows of resources.

Deferred inflows of resources are disclosed by type on the face of the financial statements and in the respective notes to the financial statements to augment understanding of the deferral.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

D. Assets, deferred outlflows of resources, liabilities, deferred inflows of resources, and fund balance/net position - cont.

9. Net Position/Fund Balance

Net Position

The government-wide and proprietary fund financial statements report net position. Net position represents the difference between assets plus deferred outflow of resources and liabilities plus deferred inflows of resources. Components of net position are net investment in capital assets, restricted, and unrestricted.

Net investment in capital assets consists of capital assets net of accumulated depreciation plus capital related deferred outflows of resources, less the outstanding balance of any related borrowing used for the acquisition, construction, or improvement of those assets and capital related deferred inflows of resources.

Restricted net position represents constraints on resources that can be spent only for specific purposes which are externally imposed either by: a) providers such as creditors, grantors, contributors, and laws/regulations of other governments; or b) imposed by law through constitutional provisions or enabling legislation.

Unrestricted net position is any portion of net position that does not meet the definition of net investment in capital assets and restricted.

The Town applies restricted resources first for purposes for which both restricted and unrestricted net position are available.

Fund Balances

The governmental fund financial statements report fund balance. Fund balance is composed of five classifications designed to disclose the hierarchy of constraints that control how specific amounts can be spent. See Note 3. F for further information on fund balance classifications and the Town's spending hierarchy.

NOTE 2. COMPLIANCE AND ACCOUNTABILITY

A. Budgetary Information

The Town adopts an annual budget for each of its funds in accordance with Title 7, Chapter 6, Part 40 of the Montana Code Annotated. Statute requires the preparation of a preliminary budget, public hearings on the preliminary budget and adoption of the budget by the later of the first Thursday after the first Tuesday in September or within 30 calendar days of the receipt of the certified taxable valuations from the Department of Revenue. The Town must also submit a copy of the final budget to the Department of Administration by the later of October 1 or 60 days after the receipt of taxable values from the Department of Revenue.

Appropriations are created by fund, function, and activity and may further be detailed by department. State statute limits the incurrence of fund obligations or making of expenditures from the fund to the amount of the fund's total appropriations in the final budget as adopted or as amended. Expenditure limitations imposed by law extend to the department level which is identified as the legal level of budgetary control. Budget transfers may be made by designated individuals between and among the general classifications of operations, provided that total expenditures do not exceed the fund's total budgeted appropriations as adopted or amended.

Budget transfers and amendments are authorized by law, and in some instances, may require further public hearings and a majority vote of the governing board. Budget amendments providing for additional appropriations required to be passed by resolution must identify the resource, such as unanticipated/unbudgeted revenue received or fund reserves, that will be used to finance the appropriation.

The 'original' budgeted amounts reported on the fund's Budget and Actual statement represent the original adopted budget. The 'final' budgeted amounts may differ as the amount includes all transfers and amendments made during the fiscal year subsequent to the adoption of the original budget and represents the final budget for the fiscal year.

Encumbrance accounting is not employed for the governmental funds.

B. Excess of expenditures over appropriations

At fiscal year-end the Town had no funds where expenditures exceeded total appropriations.

C. Deficit fund equity

At fiscal year-end the Town had no funds with deficit fund equity.

NOTE 3. DETAILED NOTES ON ALL FUNDS

A. Deposits and Investments

At year end, the Town's cash, cash equivalents and investments are reported in the basic financial statements as follows:

Governmental Activities		197,517.71
Business-Type Activities		111,217.11
Fiduciary Funds		8,887.60
Total - Primary Government	$	317,622.42
Discretely Presented Component Unit(s)		-
Total cash, cash equivalents and investments	$	317,622.42

The composition of cash and investments held by the Town at fiscal year-end is as follows:

	June 30, 2019
Cash on hand (petty cash)	
Deposits	
Demand and Savings deposits	317,622.42
Total deposits	$ 317,622.42

Custodial Credit Risk-Deposits
The custodial credit risk for deposits is the risk that, in the event of the failure of a depository financial institution, a government will not be able to recover deposits or will not be able to recover pledged (collateral) securities that are in the possession of an outside party.

The Town does not have a formal deposit policy that addresses custodial credit risk.

As of June 30th, $ 0 of the government’s bank balance of $ 317,622.42 was exposed to custodial credit risk. 100% of the Town's deposits were covered by the financial institutions FDIC insurance.

NOTE 3. DETAILED NOTES ON ALL FUNDS - cont.

B. Capital assets

Capital asset activity for the fiscal year ended June 30, 2019.

	Balance as of 6/30/2018	Acquisitions/Additions	Balance as of June 30, 2019
Governmental activities:			
Capital assets not being depreciated			
Land	6,700		6,700
Total capital assets not being depreciated	$ 6,700	$ -	$ 6,700
Capital assets being depreciated			
Buildings	12,000		12,000
Improvements other than buildings	34,550		34,550
Machinery and equipment	173,389		173,389
Total capital assets being depreciated	$ 219,939	$ -	$ 219,939
Less accumulated depreciation for:			
Buildings	(12,000)		(12,000)
Improvements other than buildings	(16,550)	(2,000)	(18,550)
Machinery and equipment	(153,870)	(2,219)	(156,089)
Total accumulated depreciation	$ (182,420)	$ (4,219)	$ (186,639)
Total capital assets being depreciated	$ 37,519	$ (4,219)	$ 33,300
Governmental activities capital assets net	$ 44,219	$ (4,219)	$ 40,000
Business-type activities:			
Capital assets not being depreciated			
Land	29,212		29,212
Construction in progress		48,799	48,799
Total capital assets not being depreciated	$ 29,212	$ 48,799	$ 78,011
Capital assets being depreciated			
Buildings	38,738		38,738
Improvements other than buildings	603,049		603,049
Machinery and equipment	-		-
Source of supply	-		-
Pumping plant	1,209,036		1,209,036
Treatment plant	785,022		785,022
Transmission and distribution	400,620		400,620
Total capital assets being depreciated	$ 3,036,464	$ -	$ 3,036,464
Less accumulated depreciation for:			
Buildings	(20,660)	(1,291)	(21,952)
Improvements other than buildings	(429,715)	(4,436)	(434,152)
Machinery and equipment	-		-
Source of supply	-		-
Pumping plant	(308,863)	(24,181)	(333,043)
Treatment plant	(235,507)	(15,700)	(251,207)
Transmission and distribution	(120,186)	(8,012)	(128,198)
Total accumulated depreciation	$ (1,114,931)	$ (53,621)	$ (1,168,552)
Total capital assets being depreciated	$ 1,921,533	$ (53,621)	$ 1,867,912
Business-Type activities capital assets net	$ 1,950,745	$ (4,822)	$ 1,945,923

NOTE 3. DETAILED NOTES ON ALL FUNDS - cont.

B. Capital assets - cont.

Depreciation expense was charged to functions/programs of the primary government as follows:

Governmental activities:		
General government		919
Public works		2,000
Culture and recreation		1,300
	Total depreciation expense - governmental activities	$ 4,219
Business-type activities:		
Water utilities		37,672
Sewer utilities		15,950
	Total depreciation expense - business-type activities	$ 53,621

C. Long-term debt obligations

Changes in Long-term Debt Obligations - During the year ended June 30, 2019, the following changes occurred in long-term debt liabilities:

Governmental Activities

	Balance as of 6/30/2018	Additions	Deletions	Balance as of June 30, 2019	Due Within One Year
Notes/Loans payable	$ 31,025		(10,987)	20,038	6,856
Compensated absences payable	537	599		1,136	568
Net pension liability	27,399		(6,197)	21,202	
Total	$ 58,960	599	(17,184)	42,376	7,424

Business-type Activities

	Balance as of 6/30/2018	Additions	Deletions	Balance as of June 30, 2019	Due Within One Year
Revenue bonds	$ 216,694		(19,251)	197,443	20,786
Notes/Loans payable	-	23,799		23,799	
Compensated absences payable	1,262	1,486		2,747	1,374
Net pension liability	50,080	3,962		54,042	
Total	$ 268,036	29,247	(19,251)	278,032	22,160

Revenue Bonds

Purpose	Issue Date	Interest Rate	Term of years	Final maturity	Bonds issued	Outstanding June 30, 2019	Annual serial payment
Water RD Loan #1	July-03	4.250%	40	November-41	140,200	106,405	7,380
Water RD Loan #2	June-05	4.250%	20	December-23	103,500	31,196	7,704
Water RD Loan #4	April-04	4.375%	40	March-29	95,000	39,842	5,040
Sewer Bonds	July-02	3.000%	20	January-22	113,000	20,000	varies
Total revenue bonds					$ 311,500	$ 197,443	

Annual requirement to amortize revenue bond debt:

For Fiscal Year Ended	Principal	Interest	Total Payments
2020	20,786	7,878	28,664
2021	21,345	7,079	28,424
2022	17,927	6,257	24,184
2023	14,536	5,588	20,124
2024	10,890	4,998	15,888
2025-2030	45,553	22,500	68,053
2031-2035	25,346	11,554	36,900
2036-2040	31,335	5,565	36,900
2041-2045	9,725	300	10,025
Total	$ 197,443	$ 71,719	$ 269,162

NOTE 3. DETAILED NOTES ON ALL FUNDS - cont.

C. Long-term debt obligations - cont.

Notes/Loans/Contracts

Purpose	Issue Date	Interest Rate	Term of years	Final maturity	Amount issued	Outstanding June 30, 2019	Annual serial payment
Sidewalks	December-12	1.95%-3.37%	10 years	February-23	30,000	12,403	varies
Software	December-15	1.95%-3.37%	6 years	February-21	18,000	7,634	varies
Intercap-sewer project	September-18	3.370%	3 years	August-21	50,000	23,799	varies
Total notes/loans/contracts					$ 98,000	$ 43,837	

Annual requirement to amortize notes/loans/contract debt:

For Fiscal Year Ended	Sidewalks Principal	Software Principal	Sewer project-interim financing Principal	All loans Interest @3.37%	Total Payments
2020	3,055	3,801	-	1420	8,276
2021	3,094	3,834	-	1190	8,117
2022	3,132		23,799	583	27,514
2023	3,121			78	3,199
Total	$ 12,403	$ 7,634	$ 23,799	$ 3,271	$ 47,107

The Town has completed the preliminary engineering requirements for the sewer project. Work began on the project in fiscal year ending 2019. The Town has received TSEP and RRGL grants and a loan commitment from USDA, Rural Development (RD) to fund the project. Proceeds from the RD loan will be used to pay the principal balance of interim financing received from Intercap.

TOWN OF GERALDINE (6542)
PUBLIC EMPLOYEES' RETIREMENT SYSTEM – DEFINED BENEFIT
GASB 68 NOTES TO THE FINANCIAL STATEMENTS
FOR FISCAL YEAR ENDED

JUNE 30, 2018 (measurement date)
JUNE 30, 2019 (reporting date)

In accordance with GASB Statement 68, *Accounting and Financial Reporting for Pensions*, employers and the non-employer contributing entity are required to recognize and report certain amounts associated with participation in the Public Employees' Retirement System Defined Benefit Retirement Plan (the Plan). This includes the proportionate share of the collective Net Pension Liability; Pension Expense; and Deferred Outflows and Deferred Inflows of Resources associated with pensions. Employers are provided guidance in GASB Statement 68, paragraph 74, where pension amounts must be combined as a total or aggregate for reporting, whether provided through cost-sharing, single-employer, or agent plans. This report provides information for employers who are using a June 30, 2018 measurement date for the 2019 reporting. If an employer's fiscal year end is after June 30th, the employer will not use the measurements shown in this report but will need to wait for the measurement date as of June 30, 2019.

Summary of Significant Accounting Policies

MPERA prepared financial statements using the accrual basis of accounting. The same accrual basis was used by MPERA for the purposes of determining the Net Pension Liability (NPL); Deferred Outflows of Resources and Deferred Inflows of Resources related to pensions; Pension Expense; the Fiduciary Net Position; and, Additions to or Deductions from Fiduciary Net Position. Member contributions are recognized in the period in which contributions are due. Employer contributions are recognized when due and the employer has made a formal commitment to provide the contributions. Revenues are recognized in the accounting period they are earned and become measurable. Benefit payments and refunds are recognized in the accounting period in which they are due and payable in accordance with the benefit terms. Expenses are recognized in the period incurred. Investments are reported at fair value. MPERA adhered to all accounting principles generally accepted by the United States of America. MPERA applied all applicable pronouncements of the Governmental Accounting Standards Board (GASB).

General Information about the Pension Plan

Plan Description: The PERS-Defined Benefit Retirement Plan (DBRP), administered by the Montana Public Employee Retirement Administration (MPERA), is a multiple-employer, cost-sharing plan established July 1, 1945, and governed by Title 19, chapters 2 & 3, Montana Code Annotated (MCA). This plan provides retirement benefits to covered employees of the State, and local governments, and certain employees of the Montana University System, and school districts. Benefits are established by state law and can only be amended by the Legislature.

All new members are initially members of the PERS-DBRP and have a 12-month window during which they choose to remain in the PERS-DBRP or join the PERS-DCRP by filing an irrevocable election. Members may not be participants of both the *defined benefit* and *defined contribution* retirement plans. All new members from the universities also have a third option to join the university system's Montana University System Retirement Program (MUS-RP).

Benefits provided: The PERS-DBRP provides retirement, disability, and death benefits to plan members and their beneficiaries. Benefits are based on eligibility, years of service, and highest average compensation (HAC). Member rights are vested after five years of service.

Service retirement:

- Hired prior to July 1, 2011:
  - Age 60, 5 years of membership service
  - Age 65, regardless of membership service
  - Any age, 30 years of membership service
- Hired on or after July 1, 2011
  - Age 65, 5 years of membership service
  - Age 70, regardless of membership service

NOTE 3. DETAILED NOTES ON ALL FUNDS

D. Pension Plans - cont.

Early Retirement:

- Hired prior to July 1, 2011
  - Age 50, 5 years of membership service
  - Any age, 25 years of membership service
- Hired on or after July 1, 2011
  - Age 55, 5 years of membership service

Second Retirement: (requires returning to PERS-covered employer or PERS service)

- Retired before January 1, 2016 and accumulate less than 2 years additional service credit or retired on or after January 1, 2016 and accumulate less than 5 years additional service credit:
  - A refund of member's contributions plus return interest (currently .77% effective July 1, 2017).
  - No service credit for second employment;
  - Start the same benefit amount the month following termination; and
  - Guaranteed Annual Benefit Adjustment (GABA) starts again in the January immediately following the second retirement.
- Retired before January 1, 2016 and accumulate at least 2 years of additional service credit:
  - A recalculated retirement benefit based on provisions in effect after the initial retirement; and
  - GABA starts on the recalculated benefit in the January after receiving the new benefit for 12 months.
- Retired on or after January 1, 2016 and accumulate 5 or more years of service credit:
  - The same retirement as prior to the return to service;
  - A second retirement benefit as prior to the second period of service based on laws in effect upon the rehire date; and
  - GABA starts on both benefits in the January after receiving the original and the new benefit for 12 months.

Member's highest average compensation (HAC)

- Hired prior to July 1, 2011 - highest average compensation during any consecutive 36 months;
- Hired on or after July 1, 2011 – highest average compensation during any consecutive 60 months;

Compensation Cap

- Hired on or after July 1, 2013 – 110% annual cap on compensation considered as a part of a member's highest average compensation.

Monthly benefit formula

- Members hired prior to July 1, 2011
  - Less than 25 years of membership service: 1.785% of HAC per year of service credit;
  - 25 years of membership service or more: 2% of HAC per year of service credit.
- Members hired on or after July 1, 2011
  - Less than 10 years of membership service: 1.5% of HAC per year of service credit;
  - 10 years or more, but less than 30 years of membership service: 1.785% of HAC per year of service credit;
  - 30 years or more of membership service: 2% of HAC per year of service credit.

Guaranteed Annual Benefit Adjustment (GABA)

After the member has completed 12 full months of retirement, the member's benefit increases by the applicable percentage (provided below) each January, **inclusive** of all other adjustments to the member's benefit.

- 3.0% for members hired **prior to** July 1, 2007
- 1.5% for members hired between July 1, 2007 and June 30, 2013
- Members hired on or after July 1, 2013:
  - (a) 1.5% for each year PERS is funded at or above 90%;
  - (b) 1.5% reduced by 0.1% for each 2.0% PERS is funded below 90%; and
  - (c) 0% whenever the amortization period for PERS is 40 years or more.

Contributions: The state Legislature has the authority to establish and amend contribution rates. Member and employer contribution rates are specified by Montana Statute and are a percentage of the member's compensation . Contributions are deducted from each member's salary and remitted by participating employers.

Special Funding: The state of Montana, as the non-employer contributing entity, paid to the Plan, additional contributions that qualify as *special funding*. Those employers who received *special funding* are all participating employers.

Not Special Funding: Per Montana law, state agencies and universities paid their own additional contributions. The employer paid contributions are *not* accounted for as special funding for state agencies and universities but are reported as employer contributions.

NOTE 3. DETAILED NOTES ON ALL FUNDS

D. Pension Plans - cont.

Member and employer contribution rates are shown in the table below.

Fiscal Year	Member		State & Universities	Local Government		School Districts	
	Hired < 07/01/11	Hired > 07/01/11	Employer	Employer	State	Employer	State
2019	7.900%	7.900%	8.670%	8.570%	0.100%	8.30%	0.370%
2018	7.900%	7.900%	8.570%	8.470%	0.100%	8.200%	0.370%
2017	7.900%	7.900%	8.470%	8.370%	0.100%	8.100%	0.370%
2016	7.900%	7.900%	8.370%	8.270%	0.100%	8.000%	0.370%
2015	7.900%	7.900%	8.270%	8.170%	0.100%	7.900%	0.370%
2014	7.900%	7.900%	8.170%	8.070%	0.100%	7.800%	0.370%
2012 – 2013	6.900%	7.900%	7.170%	7.070%	0.100%	6.800%	0.370%
2010 – 2011	6.900%		7.170%	7.070%	0.100%	6.800%	0.370%
2008 – 2009	6.900%		7.035%	6.935%	0.100%	6.800%	0.235%
2000 - 2007	6.900%		6.900%	6.800%	0.100%	6.800%	0.100%

1. Member contributions to the system of 7.9% are temporary and will be decreased to 6.9% on January 1 following actuary valuation results that show the amortization period has dropped below 25 years and would remain below 25 years following the reduction of both the additional employer and additional member contribution rates.

2. Employer contributions to the system:
   a. Effective July 1, 2014, following the 2013 Legislative session, PERS-employer contributions increase an additional 0.1% a year and will continue over 10 years through 2024. The additional employer contributions including the 0.27% added in 2007 and 2009, will terminate on January 1 following actuary valuation results that show the amortization period has dropped below 25 years and would remain below the 25 years following the reduction of both the additional employer and additional member contributions rates.
   b. Effective July 1, 2013, employers are required to make contributions on working retirees' compensation. Member contributions for working retirees are not required.
   c. The portion of employer contributions allocated to the PCR are included in the employers reporting. The PCR was paid off effective March 2016 and the contributions previously directed to the PCR are now directed to member accounts.

3. Non-Employer Contributions:
   a. Special Funding
      i. The state contributed 0.1% of members' compensation on behalf of local government entities.
      ii. The state contributed 0.37% of members' compensation on behalf of school district entities.
      iii. The state contributed a Statutory Appropriation from the General Fund of $33,454,182.

NOTE 3. DETAILED NOTES ON ALL FUNDS

D. Pension Plans - cont.

Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

GASB Statement 68 allows a measurement date of up to 12 months before the employer's fiscal year-end can be utilized to determine the Plan's TPL. The basis for the TPL as of June 30, 2018, was determined by taking the results of the June 30, 2017, actuarial valuation and applying standard roll forward procedures. The roll forward procedure uses a calculation that adds the annual normal cost (also called the service cost), subtracts the actual benefit payments and refunds for the plan year, and then applies the expected investment rate of return for the year. The roll forward procedure will include the effects of any assumption changes and legislative changes. The update procedures are in conformity with Actuarial Standards of Practice issued by the Actuarial Standards Board.

The Total Pension Liability (TPL) minus the Fiduciary Net Position equals the Net Pension Liability (NPL). The proportionate shares of the employer's and the state of Montana's NPL for June 30, 2018, and 2017, are displayed below. The employer's proportionate share equals the ratio of the employer's contributions to the sum of all employer and non-employer contributions during the measurement period. The state's proportionate share for a particular employer equals the ratio of the contributions for the particular employer to the total state contributions paid. The employer recorded a liability of $57,075 and the employer's proportionate share was 0.0027 percent.

As of measurement date	Net Pension Liability as of 6/30/2018	Net Pension Liability as of 6/30/2017	Percent of Collective NPL as of 6/30/2018	Percent of Collective NPL as of 6/30/2017	Change in Percent of Collective NPL
TOWN OF GERALDINE Proportionate Share	$ 57,075	$ 77,479	0.0027%	0.0040%	(0.0012)%
State of Montana Proportionate Share associated with Employer	$ 19,030	$ 927	0.0037%	0.0047%	(0.0011)%
Total	$ 76,105	$ 78,406	0.0064%	0.0087%	(0.0023)%

Changes in actuarial assumptions and methods: There were no changes in assumptions or other inputs that affected the measurement of the TPL.

Changes in benefit terms: There have been no changes in benefit terms since the previous measurement date.

Changes in proportionate share: There were no changes between the measurement date of the collective NPL and the employer's reporting date that are expected to have a significant effect on the employer's proportionate share of the collective NPL.

Pension Expense: At June 30, 2018, the employer recognized $6,137 for its proportionate share of the Plan's pension expense and recognized grant revenue of $1,270 for the state of Montana proportionate share of the pension expense associated with the employer. Additionally, the employer recognized grant revenue of $0 from the State Statutory Appropriation from the General Fund.

As of measurement date	Pension Expense as of 6/30/2018	Pension Expense as of 6/30/2017
Employer's Proportionate Share	$6,137	$12,256
Employer Grant Revenue – State of Montana Proportionate Share for employer	1,270	49
Employer Grant Revenue – State of Montana State Appropriation for employer	0	1,108
Total	$7,407	$13,413

NOTE 3. DETAILED NOTES ON ALL FUNDS

D. Pension Plans - cont.

Recognition of Deferred Inflows and Outflows: At June 30, 2018, the employer reported its proportionate share of the Plan's deferred outflows of resources and deferred inflows of resources from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Expected vs. Actual Experience	$4,340	$0
Projected Investment Earnings vs. Actual Investment Earnings	0	886
Changes in Assumptions	4,853	0
Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	0	8,698
Employer Contributions Subsequent to the Measurement Date	3,560	
Total	$12,753	$9,584

 # the employer's contributions subsequent to the measurement date must be entered by the employer. These are the FY2019 contributions paid to the Plan

Other amounts reported as deferred outflows and inflows of resources related to pensions are recognized in the employer's pension expense as follows:

For the Measurement Year ended June 30:	Recognition of Deferred Outflows and Deferred Inflows in future years as an increase or (decrease) to Pension Expense
2019	$3,138
2020	$2,297
2021	$(5,461)
2022	$(364)
2023	$0
Thereafter	$0

NOTE 3. DETAILED NOTES ON ALL FUNDS

D. Pension Plans - cont.

Actuarial Assumptions: The total pension liability in the June 30, 2018 actuarial valuation was determined using the following actuarial assumptions.

Investment Return (net of admin expense)	7.65%
Admin Expense as % of Payroll	0.26%
General Wage Growth * *includes Inflation at	3.50% 2.75%
Merit Increases	0% to 6.30%
Postretirement Benefit Increases 1. Guaranteed Annual Benefit Adjustment (GABA) each January • After the member has completed 12 full months of retirement, the member's benefit increases by the applicable percentage (provided below) each January, inclusive of all other adjustments to the member's benefit. • Members hired prior to July 1, 2007 • Members hired between July 1, 2007 & June 30, 2013 • Members hired on or after July 1, 2013 • For each year PERS is funded at or above 90% • The 1.5% is reduced by 0.1% for each 2.0% PERS is funded below 90% • 0% whenever the amortization period for PERS is 40 years or more	 3.0% 1.5% 1.5% 0%
Mortality: • Contributing members, , service retired members & beneficiaries • Disabled Members	 RP-2000 Combined Employee and Annuitant Mortality Tables projected to 2020 with scale BB, set back one year for males RP-2000 Combined Mortality Tables, with no projections

The most recent experience study, performed for the period covering fiscal years 2011 through 2016, is outlined in a report dated May 5, 2017 and can be located on the MPERA website. The long-term expected return on pension plan assets is reviewed as part of the regular experience studies prepared for the Plan. Several factors are considered in evaluating the long-term rate of return assumption including historical rates of return, rate of return assumptions adopted by similar public-sector systems, and by using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges were combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the target asset allocation as of June 30, 2018, are summarized in the table on the top of the next page.

Asset Class	Target Asset Allocation	Long-Term Expected Real Rate of Return Arithmetic Basis
Cash Equivalents	2.6%	4.00%
Domestic Equity	36.0%	4.55%
Foreign Equity	18.0%	6.35%
Fixed Income	23.4%	1.00%
Private Equity	12.0%	7.75%
Real Estate	8.0%	4.00%
Total	100.0%	

Discount Rate: The discount rate used to measure the TPL was 7.65%. The projection of cash flows used to determine the discount rate assumed that contributions from participating plan members, employers, and non-employer contributing entities would be made based on the Board's funding policy, which established the contractually required rates under the Montana Code Annotated. The state contributed 0.10% of the salaries paid by local governments and 0.37% paid by school districts. In addition, the state contributed a statutory appropriation from the general fund. Based on those assumptions , the Plan's fiduciary net position was projected to be adequate to make all the projected future benefit payments of current plan members through the year 2121. Therefore,

NOTE 3. DETAILED NOTES ON ALL FUNDS

D. Pension Plans - cont.

the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the TPL. A municipal bond rate was not incorporated in the discount rate.

Sensitivity of the proportionate share of the net pension liability to changes in the discount rate – 78g: The following presents the employer's sensitivity of the NPL to the discount rate in the table below. A small change in the discount rate can create a significant change in the liability. The NPL was calculated using the discount rate of 7.65%, as well as what the NPL would be if it were calculated using a discount rate 1.00% lower or 1.00% higher than the current rate.

As of measurement date	1.0% Decrease (6.65%)	Current Discount Rate	1.0% Increase (8.65%)
TOWN OF GERALDINE's Net Pension Liability	$82,544	$57,075	$36,161

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. Pension Plans within the scope of GASB Statement No. 73 - Accounting and Financial Reporting for Pensions and Related Assets that are not within the scope of GASB Statement 68

Plan Description
The Town of Geraldine Fire Department Relief Association is a single-employer defined benefit pension plan. The Association was formed in accordance with 19-18-102 MCA. The assets of the Fire Department Disability and Pension Fund are not in a trust or an equivalent arrangement. The accumulated assets do not offset the liabilities of the pension and disability plan per GASB Statement No. 73. The employer should recognize the total pension liability (TPL) as its pension liability.

Total Pension Liability
Town management did not feel there was justification to encur the cost of an actuarial valuation. Therefore, total pension liability related to the Geraldine Fire Department Relief Association pension plan was not recorded as of June 30, 2019.

Title 19, Chapter 18, Part 5 of the Montana Code Annotated (MCA) requires the Town to contribute funds to assure the Association's after-assets are maintained at a level equal to at least three times but no more than five times the benefits paid by the Association in the preivous or current fiscal year whichever is less.

F. Fund Balance

The Governmental Accounting Standards Board issued Statement No. 54 *Fund Balance Reporting and Governmental Fund Type Definitions* , which defines governmental fund types and requires presentation of governmental fund balances on the Balance Sheet-Governmental Funds by classification. Fund balance classifications are as follows:

The non-spendable fund balance classification represents the portion of fund balances that cannot be spent either because it is not in spendable form such as inventories, the long term portion of notes & loans receivable, land held for resale of which the future proceeds are not committed, pre-paid expenses, or legal or contractual constraints were placed on assets held such as the corpus of a permanent fund.

The restricted fund balance classification includes amounts that can be spent only for specific purposes which are externally imposed either by: a) providers such as creditors, grantors, contributors, and laws/regulations of other governments; or b) imposed by law through constitutional provisions or enabling legislation.

The committed fund balance classification includes amounts that are constrained for specific purposes internally imposed by majority vote by quorum of Town's governing body (highest level of decision-making authority). The governing body can, by adoption of an ordinance or resolution prior to the end of the fiscal year, commit fund balance to a specific purpose. Once adopted, the limitation imposed by the ordinance or resolution remains in place until a similar action is taken (a subsequent adoption of a ordinance or resolution) to remove or revise the limitation.

The assigned fund balance classification includes amounts that are intended to be used by the government for a specific purpose that do not meet the criteria to be classified as restricted or committed. An appropriation of existing fund balance to eliminate a projected budgetary deficit in the subsequent year‘s budget in an amount no greater than the projected excess of expected expenditures over expected revenues are reported as an assignment of fund balance. Assignments of fund balance may also be

Unassigned fund balance is the residual classification for the government's general fund and includes all spendable amounts not contained in other classifications. In governmental funds other than the general fund, the unassigned classification is only used to report a deficit balance resulting from overspending for specific purposes for which amounts had been restricted, committed, or assigned.

Fund Balance Classifications by Specific Purpose
GASB Statement No 54 requires presentation of specific purpose details by fund balance classification either on the face of the balance sheet-governmental funds, in the notes to the financial statements, or a combination of both.

Fund balance classifications are presented on the Balance Sheet-Governmental Funds by function. The function represents the specific purpose.

NOTE 3. DETAILED NOTES ON ALL FUNDS

G. Spending policy

The Town receives inflows from multiple revenue sources for use in the general fund. The intention of a spending policy is to identify the expenditure hierarchy when both restricted and unrestricted (committed, assigned, or unassigned) amounts are available in the general fund. When both restricted and unrestricted amounts are available in the general fund, the following spending policy will apply:

1st: Restricted
2nd: Committed
3rd: Assigned
4th: Unassigned

The Town receives inflows from multiple revenue sources for use in governmental funds, other than the general fund. The intention of a spending policy is to identify the expenditure hierarchy when both restricted and unrestricted (committed, or assigned) amounts are available in these funds. When both restricted and unrestricted amounts are available in governmental funds, other than the general fund, the following spending policy will apply:

1st: Restricted
2nd: Committed
3rd: Assigned

H. Minimum Fund Balance Policy

The Town does not have a minimum fund balance policy in place.

BOC SUPPLEMENT SCHEDULE

1. **Intergovernmental expenditures** - Of the expenditures reported, detail below those expenditures made to other governments on a cost-sharing basis.

Purpose	Amount - Omit Cents	
	Paid to local governments	Paid to state
	M01	
Airports	$ -	$ -
	M52	
Libraries	$ -	$ -
	M32	
Health	$ -	$ -
	M12	
Local schools	$ -	$ -
	M79	L79
Welfare	$ -	$ -
	M89	L89
Other	$ -	$ -

2. **Salaries and Wages** - Report here the total salaries and wages paid to all employees of your government before deductions for social security, retirement, etc. Include also salaries and wages paid to employees of any utility owned and operated by your government.

Amount - Omit cents
$56,237

3. **Debt outstanding**

A. Long-term debt outstanding, issued and retired

Purpose	Bonds Outstanding as of June 30, 2018	Amount -- Omit cents: Bonds during the fiscal year		Bonds Outstanding as of June 30, 2019	
		Issued	Retired	General Obligation	Revenue bonds
	19A	29A	39A	41A	44A
Water utility	$ 189,694	$ -	$ 12,251	$ -	$ 177,443
	19X	29X	39X	41X	44X
Sewer utility	$ 27,000	$ -	$ 7,000	$ -	$ 20,000
	19C	29C	39C	41C	44C
Gas utility	$ -	$ -	$ -	$ -	$ -
	19B	29B	39B	41B	44B
Electric utility	$ -	$ -	$ -	$ -	$ -
	19X	29X	39X	41X	44X
All other	$ -	$ -	$ -	$ -	$ -

B. Short-term debt

Type	Beginning of fiscal year	End of fiscal year
	61V	64V
Registered warrants	$ -	$ -
Contracts payable	$ -	$ -
Notes payable	$ -	$ -
Totals	$ -	$ -

4. **Cash balances by fund type** - Cash may consist of cash on hand, checking, savings, repurchase agreements, certificates of deposit, securities, or any other cash related item.

Type of funds	Amount - Omits cents
	W61
General fund (1000)	$ 173,817
	W61
Special revenue funds (2000)	$ 23,701
	W01
Debt Service funds (3000)	$ -
	W31
Capital projects funds (4000)	$ -
	W61
Enterprise funds (5000)	$ 111,217
Internal services funds (6000)	$ -
Trust and agency funds (7000)	$ 8,888
Permanent funds (8000)	$ -
Total cash all funds	$ 317,622

REQUIRED SUPPLEMENTARY INFORMATION

Town of Geraldine
Statement of Revenues, Expenditures, and Changes in Fund Balance - Budget and Actual (Budgetary Basis)
For Fiscal Year Ended
June 30, 2019

	GENERAL FUND			
	BUDGETED AMOUNTS			VARIANCE WITH FINAL BUDGET POSITIVE
	ORIGINAL	FINAL	ACTUAL AMOUNTS	(NEGATIVE)
REVENUES				
Taxes and Assessments	$ 10,000.00	$ 10,000.00	$ 94,744.82	$ 84,744.82
Licenses and permits	906.00	906.00	50.00	(856.00)
Intergovernmental	34,350.00	34,350.00	33,984.56	(365.44)
Miscellaneous	8,500.00	8,500.00	2,320.92	(6,179.08)
Investment and Royalty Earnings	100.00	100.00	331.04	231.04
Total revenues	53,856.00	53,856.00	131,431.34	77,575.34
EXPENDTIURES				
Current:				
General Government				
Personal services	56,500.00	56,500.00	30,092.37	26,407.63
Operations and maintenance	18,300.00	18,300.00	27,435.67	(9,135.67)
Public Safety				
Operations and maintenance	2,000.00	2,000.00	4,362.32	(2,362.32)
Public Works				
Personal services	35,000.00	35,000.00	-	35,000.00
Operations and maintenance	5,000.00	5,000.00	35,474.42	(30,474.42)
Public Health				
Operations and maintenance	1,850.00	1,850.00	1,650.00	200.00
Culture and Recreation				
Personal services	1,100.00	1,100.00	320.56	779.44
Operations and maintenance	1,400.00	1,400.00	200.12	1,199.88
Internal Services				
Operations and maintenance	-	-	10,348.20	(10,348.20)
Miscellaneous	12,000.00	12,000.00	-	12,000.00
Debt Service				
Debt service - principal	-	-	10,986.79	(10,986.79)
Debt service - interest and other charges	4,330.00	4,330.00	872.80	3,457.20
Total expenditures	137,480.00	137,480.00	121,743.25	15,736.75
Excess (deficiency) of revenues over (under) expenditures	(83,624.00)	(83,624.00)	9,688.09	93,312.09
OTHER FINANCING SOURCES (USES)				
Transfers (out)	(2,000.00)	(2,000.00)	-	2,000.00
Total other financing sources (uses)	(2,000.00)	(2,000.00)	-	2,000.00
Net change in fund balance	$ (85,624.00)	$ (85,624.00)	9,688.09	$ 95,312.09
Fund balances - beginning			164,128.57	
Fund balances - ending			$ 173,816.66	

The notes to the financial statements are an integral part of this statement.

Required Supplementary Information
Public Employees Retirement System
Schedule of Proportionate Share of the Net Pension Liability
For the Last Ten Fiscal Years*

As of measurement date	2018	2017	2016	2015	2014
Employer's proportion of the Net Pension Liability (percentage)	0.0027%	0.0040%	0.0031%	0.0031%	0.0030%
Employer's Net Pension Liability (amount)	$57,075	$77,479	$52,782	$43,537	$37,127
State's Net Pension Liability (amount)	19,030	927	645	535	453
Total	$76,105	$78,406	$53,427	$44,072	$37,580
Employer's Covered Payroll	$44,973	$49,350	$37,118	$36,347	$33,730
Employer's Proportionate Share as a percent of Covered Payroll	126.91%	157.00%	142.20%	119.78%	111.22%
Plan Fiduciary Net Position as a percent of Total Pension Liability	73.47%	73.75%	74.71%	78.40%	79.87%

**The amounts presented for each fiscal year were determined as of June 30, the measurement date.*
Schedule is intended to show information for 10 years. Additional years will be displayed as they become available

Required Supplementary Information
Public Employees Retirement System
Schedule of Contributions
For the Last Ten Fiscal Years*

As of most recent FYE (reporting date)	2019	2018	2017	2016	2015
Contractually Required DB Contributions	$3,560	$3,809	$4,131	$3,102	$2,995
Plan Choice Rate Required Contributions	$0	$0	$0	$0	$0
Contributions in Relation to the Contractually Required Contributions	$3,560	$3,809	$4,131	$3,102	$2,995
Contribution Deficiency (Excess)	$0	$0	$0	$0	$0
Employer's Covered Payroll	$41,541	$44,973	$49,350	$37,118	$36,347
Contributions as a percent of Covered Payroll	8.57%	8.47%	8.37%	8.36%	8.24%

**The amounts presented for each fiscal year were determined as of June 30, the most recent fiscal year end.*
Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

Public Employees Retirement System
Notes to Required Supplementary Information
for the Year ended June 30, 2018

Changes of Benefit Terms

The following changes to the plan provisions were made as identified:

2017:

Working Retiree Limitations – for PERS

Effective July 1, 2017, if a PERS retiree returns as an independent contractor to what would otherwise be PERS-covered employment, general contractor overhead costs are excluded from PERS working retiree limitations.

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Refunds

1) Terminating members eligible to retire may, in lieu of receiving a monthly retirement benefit, refund their accumulated contributions in a lump sum.
2) Terminating members with accumulated contributions between $200 and $1,000 who wish to rollover their refund must do so within 90 days of termination of service.
3) Trusts, estates, and charitable organizations listed as beneficiaries are entitled to receive only a lump-sum payment.

Interest credited to member accounts – Effective July 1, 2017, the interest rate credited to member accounts increased from 0.25% to 0.77%.

Lump-sum payouts

Effective July 1, 2017, lump-sum payouts in all systems are limited to the member's accumulated contributions rate than the present value of the member's benefit.

Disabled PERS Defined Contribution (DC) Members

PERS members hired after July 1, 2011 have a normal retirement age of 65. PERS DC members hired after July 1, 2011 who became disabled were previously only eligible for a disability benefit until age 65. Effective July 1, 2017, these individuals will be eligible for a disability benefit until they reach 70, thus ensuring the same 5-year time period available to PERS DC disabled members hired prior to July 1, 2011 who have a normal retirement age of 60 and are eligible for a disability benefit until age 65.

Changes in Actuarial Assumptions and Methods

Method and assumptions used in calculations of actuarially determined contributions

The following Actuarial Assumptions were adopted from the June 2016 Experience Study:

General Wage Growth*	3.50%
Investment Rate of Return*	7.65%
*Includes inflation at	2.75%
Merit salary increase	0% to 6.30%
Asset valuation method	Four-year smoothed market
Actuarial cost method	Entry age Normal
Amortization method	Level percentage of payroll, open
Remaining amortization period	30 years
Mortality (Healthy members)	For Males and Females: RP 2000 Combined Employee and Annuitant Mortality Table projected to 2020 using Scale BB, males set back 1 year
Mortality (Disabled members)	For Males and Females: RP 2000 Combined Mortality Table, with no projections
Admin Expense as % of Payroll	0.26%

Administrative expenses are recognized by an additional amount added to the normal cost contribution rate for the System. This amount varies from year to year based on the prior year's actual administrative expenses.

SUPPLEMENTAL INFORMATION

Town of Geraldine
Combining Balance Sheet
Nonmajor Special Revenue Funds
June 30, 2019

	2810 Police Reserve Training	2821 Gas Tax-special	Total Nonmajor Special Revenue Funds
ASSETS			
Current assets			
Cash and investments	$ 13,863.00	$ 9,838.05	$ 23,701.05
Name	-	-	-
Total current assets	13,863.00	9,838.05	23,701.05
Total assets	13,863.00	9,838.05	23,701.05
FUND BALANCES			
Restricted for:			
Public safety	13,863.00	-	13,863.00
Public works	-	9,838.05	9,838.05
Total Fund Balance	$ 13,863.00	$ 9,838.05	$ 23,701.05
Total Liabilities, Deferred Outflow of Resources and Fund Balance	$ 13,863.00	$ 9,838.05	$ 23,701.05

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Combining Statement of Revenues, Expenditures, and Changes in Fund Balances - Budget and Actual (Budgetary Basis)
Nonmajor Special Revenue Funds
For Fiscal Year Ended
June 30, 2019

	2810 Police Reserve Training				2821 Gas Tax-special			
	BUDGETED AMOUNTS		ACTUAL AMOUNTS	VARIANCE WITH FINAL BUDGET POSITIVE (NEGATIVE)	BUDGETED AMOUNTS		ACTUAL AMOUNTS	VARIANCE WITH FINAL BUDGET POSITIVE (NEGATIVE)
	ORIGINAL	FINAL			ORIGINAL	FINAL		
REVENUES								
Intergovernmental	-	-	-	-	14,230.00	14,230.00	14,232.76	2.76
Total revenues	-	-	-	-	14,230.00	14,230.00	14,232.76	2.76
EXPENDTIURES								
Current:								
Public Safety								
Operations and maintenance	3,000.00	3,000.00	-	3,000.00	-	-	-	-
Public Works								
Operations and maintenance	-	-	-	-	14,230.00	14,230.00	4,394.71	9,835.29
Total expenditures	3,000.00	3,000.00	-	3,000.00	14,230.00	14,230.00	4,394.71	9,835.29
Excess (deficiency) of revenues over (under) expenditures	(3,000.00)	(3,000.00)	-	3,000.00	-	-	9,838.05	9,838.05
Net change in fund balance	$ (3,000.00)	$ (3,000.00)	-	$ 3,000.00	$ -	$ -	9,838.05	$ 9,838.05
Fund balances - beginning			13,863.00				-	
Fund balances - ending			$ 13,863.00				$ 9,838.05	

Town of Geraldine
Combining Statement of Revenues, Expenditures, and Changes in Fund Balances - Budget and Actual (Budgetary Basis)
Nonmajor Special Revenue Funds
For Fiscal Year Ended
June 30, 2019

	Total Non-Major Special Revenue Funds			
	BUDGETED AMOUNTS		ACTUAL	VARIANCE WITH FINAL BUDGET POSITIVE
	ORIGINAL	FINAL	AMOUNTS	(NEGATIVE)
REVENUES				
Intergovernmental	14,230.00	14,230.00	14,232.76	2.76
Total revenues	14,230.00	14,230.00	14,232.76	2.76
	-	-	-	
EXPENDTIURES	-	-	-	
Current:				
Public Safety				
Operations and maintenance	3,000.00	3,000.00	-	3,000.00
Public Works				
Operations and maintenance	14,230.00	14,230.00	4,394.71	9,835.29
Total expenditures	17,230.00	17,230.00	4,394.71	12,835.29
Excess (deficiency) of revenues over (under) expenditures	(3,000.00)	(3,000.00)	9,838.05	12,838.05
Net change in fund balance	$ (3,000.00)	$ (3,000.00)	9,838.05	$ 12,838.05
Fund balances - beginning			13,863.00	
Fund balances - ending			$ 23,701.05	

TOWN OF GERALDINE

Schedule of Federal/State Grants, Entitlements, and Shared Revenues
for Fiscal Year Ended June 30, 2019

Accounts 330000-336999

Account Object Fund	Opening Balance	Change	Closing Balance
330000 INTERGOVERNMENTAL REVENUE			
335040 Gas Tax			
1000 GENERAL FUND	0.00	11,791.44	11,791.44
Account Total:	0.00	11,791.44	11,791.44
335041 gas tax special			
2821 gas tax special	0.00	14,232.76	14,232.76
Account Total:	0.00	14,232.76	14,232.76
335050 Insurance Premium			
1000 GENERAL FUND	0.00	359.00	359.00
Account Total:	0.00	359.00	359.00
335120 Gambling Machine Permit			
1000 GENERAL FUND	0.00	300.00	300.00
Account Total:	0.00	300.00	300.00
335230 State Entitlement			
1000 GENERAL FUND	0.00	21,534.12	21,534.12
Account Total:	0.00	21,534.12	21,534.12
Account Group Total:	0.00	48,217.32	48,217.32
Grand Total:	0.00	48,217.32	48,217.32

TOWN OF GERALDINE
Schedule of Cash Receipts & Disbursements
For the Year 2018-2019

Fund/Account	Beginning Balance	Received	Transfers In	Disbursed	Transfers Out	Ending Balance
1000 GENERAL FUND						
101000 CASH-OPERATIONS	104,785.78	132,690.71	7.96	492.00	94,644.18	142,348.27
102140 GAS TAX - RESTRIC. CASH	48,895.85	11,791.44	0.00	0.00	29,218.90	31,468.39
Total Fund	153,681.63	144,482.15	7.96	492.00	123,863.08	173,816.66
Total 1000 GENERAL FUND	153,681.63	144,482.15	7.96	492.00	123,863.08	173,816.66
2810 POLICE RESERVE TRAINING						
101000 CASH-OPERATIONS	13,863.00	0.00	0.00	0.00	0.00	13,863.00
2821 gas tax special						
102140 GAS TAX - RESTRIC. CASH	0.00	14,232.76	0.00	0.00	4,394.71	9,838.05
Total 2000	13,863.00	14,232.76	0.00	0.00	4,394.71	23,701.05
5210 WATER FUND						
101000 CASH-OPERATIONS	10,544.13	102,688.49	519.69	0.00	89,150.52	24,601.79
102100 RESTRICTED CASH	55,000.00	0.00	0.00	0.00	0.00	55,000.00
102220 RESTRICTED - BOND RESERVE	23,895.00	0.00	1,008.00	0.00	0.00	24,903.00
102240 RESTRICTED - REPL & DEPR	668.00	0.00	0.00	0.00	0.00	668.00
Total Fund	90,107.13	102,688.49	1,527.69		89,150.52	105,172.79
5310 SEWER FUND						
101000 CASH-OPERATIONS	0.00	37,924.67	1,685.69	13,050.81	34,584.61	-8,025.06
102210 RESTRICTED -REV BOND ACCT	196.28	0.00	0.00	0.00	0.00	196.28
102220 RESTRICTED - BOND RESERVE	8,780.48	0.00	0.00	0.00	0.00	8,780.48
102230 RESTRICTED - loan/tsep	0.00	48,799.44	0.00	0.00	48,799.44	0.00
Total Fund	8,976.76	86,724.11	1,685.69	13,050.81	83,384.05	951.70
5410 GARBAGE FUND						
101000 CASH-OPERATIONS	5,401.01	40,893.91	260.00	0.00	41,462.30	5,092.62
Total 5000	104,484.90	230,306.51	3,473.38	13,050.81	213,996.87	111,217.11
7910 PAYROLL CLEARING FUND						
101000 CASH-OPERATIONS	289.33	0.00	64,465.06	64,459.78	16.84	277.77
7930 CLAIMS CLEARING FUND						
101000 CASH-OPERATIONS	0.00	0.00	274,325.10	265,715.27	0.00	8,609.83
Total 7000	289.33	0.00	338,790.16	330,175.05	16.84	8,887.60
Totals	272,318.86	389,021.42	342,271.50	343,717.86	342,271.50	317,622.42

GENERAL

INFORMATION

SECTION

Town of Geraldine
June 30, 2019

GENERAL INFORMATION	
1. Class of city	Town
2. Date of incorporation	1914
3. County seat	Chouteau County, Fort Benton, MT
4. Form of government	Council-Mayor
5. Population (most recent estimate)	295
6. Land area	4 square mile
7. Miles of roads/streets/alleys	12
8. Taxable valuation	$ 241,234
9. Number of water consumers	165
10. Number of full-time employees	2

B. PROPERTY TAX MILL LEVIES -
Town funds only (For fiscal year being reported)

FUND NUMBER	FUND NAME	MILLS
1000	General	263.17
	TOTAL MILLS	263.17

TOWN OF GERALDINE
ALL FUNDS
CASH RECONCILIATION
FISCAL YEAR ENDING JUNE 30, 2019

		BANK NAME			
Account Description (not full acct #)	Stockman cking	Stockman saving			**Cash in all depositories**
BALANCE PER STATEMENTS	127,891.58	189,730.84			317,622.42
ADD					
Deposits in transit					0.00
Service charges					0.00
Other					0.00
					0.00
					0.00
					0.00
Total to add	0.00	0.00	0.00	0.00	0.00
SUBTRACT					
Outstanding checks					0.00
Other					0.00
					0.00
					0.00
					0.00
					0.00
Total to subtract	0.00	0.00	0.00	0.00	0.00
TOTAL CASH IN DEPOSITS	127,891.58	189,730.84	0.00	0.00	317,622.42
ADD					
Investments					0.00
					0.00
					0.00
					0.00
					0.00
					0.00
					0.00
					0.00
					0.00
Total to add	0.00	0.00	0.00	0.00	0.00
TOTAL IN DEPOSITORIES	127,891.58	189,730.84	0.00	0.00	317,622.42
ADD					
Cash and cash items on hand					0.00
					0.00
					0.00
					0.00
					0.00
					0.00
					0.00
					0.00
Total to add	0.00	0.00	0.00	0.00	0.00
****TOTAL ACCOUNTED FOR**	127,891.58	189,730.84	0.00	0.00	317,622.42

***Total cash must agree with total cash reported within report**

Cash reconciles _____ Cash does not reconcile _____

Town of Geraldine
Montana

172 Collins East Avenue
Geraldine, Montana 59446

ANNUAL FINANCIAL REPORT

Fiscal Year Ended
June 30, 2020

Entity #020803

Town of Geraldine
Annual Financial Report
June 30, 2020

Table of Contents

INTRODUCTORY

SECTION

Town of Geraldine
Elected Officials/Officers

OFFICE	CITY/TOWN OFFICIALS/OFFICERS	DATE TERM EXPIRES
Mayor	Perry Joyce	2024
Councilperson/Commissioner	Marty Clark	2024
Councilperson/Commissioner	Monica Rice	2024
Councilperson/Commissioner	Karen Fairbanks	2022
Councilperson/Commissioner	Tammey Ludeman	2022
Clerk/Treasurer	Rosemary Scott	

In accordance with State law, I hereby transmit the
Town of Geraldine
Annual Financial Report for the fiscal year ended
June 30, 2020

Respectfully submitted;

Rosemary Scott

Town Clerk-Treasurer

October 30, 2020

Date

FINANCIAL SECTION

BASIC FINANCIAL STATEMENTS AND NOTES TO FINANCIAL STATEMENTS

GOVERNMENT-WIDE FINANCIAL STATEMENTS

Town of Geraldine
Statement of Net Position
June 30, 2020

	Primary Government		
	Governmental Activities	Business-type Activities	Total
ASSETS			
Current assets:			
Cash and investments	$ 189,117.24	$ 45,755.25	$ 234,872.49
Taxes and assessments receivable, net	12,755.74	2,496.00	15,251.74
Internal balances	1,348.87	(1,348.87)	-
Accounts receivable	-	14,901.78	14,901.78
Due from other governments	-	24,558.63	24,558.63
Total current assets	203,221.85	86,362.79	289,584.64
Noncurrent assets:			
Restricted cash and investments	19,834.73	102,428.06	122,262.79
Capital assets - land	6,700.00	29,212.00	35,912.00
Capital assets - construction in progress	-	423,858.71	423,858.71
Capital assets - net of depreciation	29,080.75	1,814,290.57	1,843,371.32
Capital assets-infrastructure net of depreciation	9,842.00	-	9,842.00
Total noncurrent assets	65,457.48	2,369,789.34	2,435,246.82
Total Assets	268,679.33	2,456,152.13	2,724,831.46
DEFERRED OUTFLOWS OF RESOURCES			
Pensions	2,616.63	6,209.38	8,826.01
Total deferred outflows of resources	2,616.63	6,209.38	8,826.01
LIABILITIES			
Current liabilities:			
Accounts payable	-	68,771.13	68,771.13
Capital debt	6,966.22	21,344.00	28,310.22
Compensated absences payable	983.15	2,375.08	3,358.23
Total current liabilities	7,949.37	92,490.21	100,439.58
Noncurrent liabilities:			
Capital debt	6,215.68	179,163.38	185,379.06
Compensated absences payable	983.14	2,375.06	3,358.20
Net pension liability	15,602.22	37,024.78	52,627.00
Total noncurrent liabilities	22,801.04	218,563.22	241,364.26
Total Liabilities	30,750.41	311,053.43	341,803.84
DEFERRED INFLOWS OF RESOURCES			
Pensions	3,535.38	8,389.62	11,925.00
Total deferred inflows of resources	3,535.38	8,389.62	11,925.00
NET POSITION			
Net investment in capital assets	32,440.85	2,066,853.90	2,099,294.75
Restricted for:			
Public safety	13,863.00		13,863.00
Public works	29,672.78		29,672.78
Debt service	-	43,596.76	43,596.76
Replacement and depreciation	-	48,171.00	48,171.00
Capital projects	-	10,670.30	10,670.30
Unrestricted	161,033.54	(26,373.50)	134,660.04
Total net position	$ 237,010.17	$ 2,142,918.46	$ 2,379,928.63

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Activities
For the Fiscal Year Ended
June 30, 2020

Functions/Programs	Expenses	Program Revenues: Charges for Services	Program Revenues: Operating Grants and Contributions	Program Revenues: Capital Grants and Contributions	Net (Expense) Revenue and Changes in Net Position: Primary Government: Governmental Activities	Primary Government: Business-Type Activities	Primary Government: Total
Primary government:							
Governmental activities:							
General government	$ 50,121.14	$ -	$ 343.31	$ -	$ (49,777.83)		$ (49,777.83)
Public safety	2,578.00	-	-	-	(2,578.00)		(2,578.00)
Public works	26,963.50	-	11,678.28	-	(15,285.22)		(15,285.22)
Public health	1,100.00	9,072.28	-	-	7,972.28		7,972.28
Culture and recreation	2,096.53	-	-	-	(2,096.53)		(2,096.53)
Debt service - interest and other charges	632.73	-	-	-	(632.73)		(632.73)
Internal services	9,985.55	-	-	-	(9,985.55)		(9,985.55)
Total governmental activities	93,477.45	9,072.28	12,021.59	-	(72,383.58)		(72,383.58)
Business-type activities:							
Water	98,862.45	90,861.88	470.45	-		$ (7,530.12)	(7,530.12)
Sewer	43,251.87	47,409.49	344.24	340,143.07		344,644.93	344,644.93
Garbage	45,283.99	36,907.38	-	-		(8,376.61)	(8,376.61)
Total business-type activities	187,398.31	175,178.75	814.69	340,143.07		328,738.20	328,738.20
Total primary government	$ 280,875.76	$ 184,251.03	$ 12,836.28	$ 340,143.07	(72,383.58)	328,738.20	256,354.62
General revenues:							
Property taxes for general purposes					73,894.15	-	73,894.15
Unrestricted federal/state shared revenues					22,857.56	-	22,857.56
Unrestricted investment earnings					307.71	-	307.71
Miscellaneous					2,208.26	2,348.51	4,556.77
Transfers - net					-	-	-
Total general revenues and transfers					99,267.68	2,348.51	101,616.19
Change in net position					26,884.10	331,086.71	357,970.81
Net position - beginning					210,126.07	1,811,831.75	2,021,957.82
Net position - ending					$ 237,010.17	$ 2,142,918.46	$ 2,379,928.63

The notes to the financial statements are an integral part of this statement

FUND FINANCIAL STATEMENTS

Town of Geraldine
Balance Sheet
Governmental Funds
June 30, 2020

	Major Governmental Funds		
	General Fund	Total Nonmajor Governmental Funds	Total Governmental Funds
ASSETS			
Current assets			
Cash and investments	$ 165,416.19	$ 23,701.05	$ 189,117.24
Taxes and assessments receivable, net	12,755.74	-	12,755.74
Due from other funds	1,348.87	-	1,348.87
Total current assets	179,520.80	23,701.05	203,221.85
Noncurrent assets			
Restricted cash and investments	19,834.73	-	19,834.73
Total noncurrent assets	19,834.73	-	19,834.73
Total assets	199,355.53	23,701.05	223,056.58
DEFERRED INFLOWS OF RESOURCES			
Property tax/special assessment revenue	12,755.74	-	12,755.74
Total deferred inflows of resources	12,755.74	-	12,755.74
FUND BALANCES			
Restricted for:			
Public safety	-	13,863.00	13,863.00
Public works	19,834.73	9,838.05	29,672.78
Unassigned	166,765.06	-	166,765.06
Total fund balances	$ 186,599.79	$ 23,701.05	$ 210,300.84
Total liabilities, deferred inflows of resources and fund balance	$ 199,355.53	$ 23,701.05	$ 223,056.58

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Reconciliation of the Governmental Funds Balance Sheet
to the Statement of Net Position
June 30, 2020

Total fund balances - governmental funds		$	210,300.84
Capital assets used in governmental activities are not financial resources and, therefore, are not reported in the funds.			
Land	6,700.00		
Depreciable capital assets (net)	38,922.75		
			45,622.75
Taxes and Assessments receivable that will be collected but are not available soon enough to pay for current-period expenditures are deferred inflows of resources in the funds.			12,755.74
Long-term liabilities (current and non-current portions) are not due and payable in the current period and therefore are not reported as liabilities in the funds.			
Capital debt	(13,181.90)		
Compensated absences payable	(1,966.29)		
Pension liability	(15,602.22)		
			(30,750.41)
Employer contributions to a plan during the reporting period not recognized as of the plan's measurement date and the proportionate share of collective plan expense that is applicable to future periods are reported as deferred outflows of resouces on the Statement of Net Position.			
Pensions			2,616.63
The proportionate share of reductions to collective plan expense that are applicable to future periods is reported as deferred inflows of resouces on the Statement of Net Position.			
Pensions			(3,535.38)
Total net position - governmental activities		$	237,010.17

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Revenues, Expenditures, and Changes in Fund Balances
Governmental Funds
For Fiscal Year Ended
June 30, 2020

	Major Governmental Funds		
	General Fund	Total Nonmajor Governmental Funds	Total Governmental Funds
REVENUES			
Taxes and assessments	$ 79,164.24	$ -	$ 79,164.24
Licenses and permits	18.00	-	18.00
Intergovernmental	34,535.84	-	34,535.84
Miscellaneous	2,208.26	-	2,208.26
Investment earnings	307.71	-	307.71
Total revenues	116,234.05	-	116,234.05
EXPENDITURES			
Current:			
General government	46,696.79	-	46,696.79
Public safety	2,578.00	-	2,578.00
Public works	24,260.50	-	24,260.50
Public health	1,100.00	-	1,100.00
Culture and recreation	796.53	-	796.53
Internal services	9,985.55	-	9,985.55
Debt service - principal	6,855.82	-	6,855.82
Debt service - interest and other charges	632.73	-	632.73
Capital outlay	10,545.00	-	10,545.00
Total expenditures	103,450.92	-	103,450.92
Excess (deficiency) of revenues over (under) expenditures	12,783.13	-	12,783.13
Net change in fund balance	12,783.13	-	12,783.13
Fund balances - beginning	173,816.66	23,701.05	197,517.71
Fund balances - ending	$ 186,599.79	$ 23,701.05	$ 210,300.84

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Reconciliation of the Statement of Revenues, Expenditures, and Changes in Fund Balances of Governmental Funds to the Statement of Activities
For the Fiscal Year Ended June 30, 2020

Net change in fund balances - total governmental funds		$	12,783.13
Governmental funds report capital outlays as expenditures. However, in the Statement of Activities, the cost of those assets is allocated over their estimated useful lives and reported as depreciation expense.			
Capital assets purchased - capital outlay	10,545.00		
Depreciation expense	(4,921.75)		
			5,623.25
Revenues reported in the Statement of Activities that do not provide current financial resources are not reported as revenues in governmental funds:			
Tax and assessment revenue			3,784.19
The change in compensated absences payable is reported as an increase or decrease to expense on the Statement of Activities, but is not recognized as an increase or decrease to expenditures on the Statement of Revenues, Expenditures and Changes in Fund Balance:			
Change in compensated absence liability			(830.50)
Repayment of debt principal during the reporting period consumes current financial resources and are recognized as expenditures in the governmental funds, but the repayment of long-term debt principle balances reduces the liability in the Statement of Net Position:			
Long-term debt principal payments			6,855.82
Employer contributions made to pension plans during the reporting period consume current financial resources, thus are reported as expenditures in the Statement of Revenues, Expenditures, and Changes in Fund Balances. However, only the amount of pension expense recognized by the plan during the measurement period is reported as expenses in the Statement of Activities.			(1,675.10)
The difference between on-behalf contributions to fund pension liabilities recognized as revenue during the reporting period in the Statement of Revenues, Expenditures, and Changes in Fund Balances and on-behalf contributions recognized during the measurement period increases (decreases) operating grants and contributions reported on the Statement of Activities.			343.31
Change in net position - Statement of Activities		$	26,884.10

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Net Position
Proprietary Funds
June 30, 2020

	Business-Type Activities			
	Major Enterprise Funds			
	5210 Water	5310 Sewer	5410 Garbage	Total Enterprise Funds
ASSETS				
Current assets				
Cash and investments	$ 39,958.03	$ 5,797.22	$ -	$ 45,755.25
Taxes and assessments receivable, net	-	-	2,496.00	2,496.00
Accounts receivable	8,918.83	5,465.25	517.70	14,901.78
Due from other governments	-	24,558.63	-	24,558.63
Total current assets	48,876.86	35,821.10	3,013.70	87,711.66
Noncurrent assets				
Restricted cash and investments	82,781.00	19,647.06	-	102,428.06
Capital assets - land	5,512.00	23,700.00	-	29,212.00
Capital assets - construction in progress	-	423,858.71	-	423,858.71
Capital assets - net of depreciation	1,284,716.99	529,573.58	-	1,814,290.57
Total noncurrent assets	1,373,009.99	996,779.35	-	2,369,789.34
Total assets	1,421,886.85	1,032,600.45	3,013.70	2,457,501.00
DEFERRED OUTFLOWS OF RESOURCES				
Pensions	3,585.67	2,623.71	-	6,209.38
Total deferred outflows of resources	3,585.67	2,623.71	-	6,209.38
LIABILITIES				
Current liabilities				
Accounts payable	-	68,771.13	-	68,771.13
Due to other funds	-	-	1,348.87	1,348.87
Capital debt	13,344.00	8,000.00	-	21,344.00
Compensated absences payable	1,379.77	995.31	-	2,375.08
Total current liabilities	14,723.77	77,766.44	1,348.87	93,839.08
Noncurrent liabilities				
Capital debt	151,363.94	27,799.44	-	179,163.38
Compensated absences payable	1,379.76	995.30	-	2,375.06
Net pension liability	21,380.34	15,644.44	-	37,024.78
Total noncurrent liabilities	174,124.04	44,439.18	-	218,563.22
Total liabilities	188,847.81	122,205.62	1,348.87	312,402.30
DEFERRED INFLOWS OF RESOURCES				
Pensions	4,844.67	3,544.95	-	8,389.62
Total deferred inflows of resources	4,844.67	3,544.95	-	8,389.62
NET POSITION				
Net investment in capital assets	1,125,521.05	941,332.85	-	2,066,853.90
Debt service	34,620.00	8,976.76	-	43,596.76
Replacement and depreciation	48,171.00	-	-	48,171.00
Capital projects	-	10,670.30	-	10,670.30
Unrestricted	23,467.99	(51,506.32)	1,664.83	(26,373.50)
Total net position	$ 1,231,780.04	$ 909,473.59	$ 1,664.83	$ 2,142,918.46

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Revenues, Expenses, and Changes in Net Position
Proprietary Funds
For Fiscal Year Ended
June 30, 2020

	Business-Type Activities			
	Major Enterprise Funds			
	5210 Water	5310 Sewer	5410 Garbage	Totals
OPERATING REVENUES				
Charges for services	$ 92,616.63	$ 47,409.49	$ 7,481.56	$ 147,507.68
Miscellaneous revenues	-	569.16	24.60	593.76
Special assessments	-	-	29,425.82	29,425.82
On-behalf - pensions	470.45	344.24	-	814.69
Total operating revenues	93,087.08	48,322.89	36,931.98	178,341.95
OPERATING EXPENSES				
Personal services	27,387.66	20,465.34	-	47,853.00
Supplies	13,289.77	1,147.93	-	14,437.70
Purchased services	10,020.08	4,347.25	45,283.99	59,651.32
Building materials	2,806.34	-	-	2,806.34
Fixed charges	298.00	-	-	298.00
Depreciation	37,671.66	15,949.55	-	53,621.21
Total operating expenses	91,473.51	41,910.07	45,283.99	178,667.57
Operating income (loss)	1,613.57	6,412.82	(8,352.01)	(325.62)
NON-OPERATING REVENUES (EXPENSES)				
Debt service interest expense	(7,388.94)	(1,341.80)	-	(8,730.74)
Total non-operating revenues (expenses)	(7,388.94)	(1,341.80)	-	(8,730.74)
Income (loss) before contributions, transfers, special & extraordinary items	(5,775.37)	5,071.02	(8,352.01)	(9,056.36)
Capital contributions	-	340,143.07	-	340,143.07
Change in net position	(5,775.37)	345,214.09	(8,352.01)	331,086.71
Net position - beginning	1,237,555.41	564,259.50	10,016.84	1,811,831.75
Net position - ending	$ 1,231,780.04	$ 909,473.59	$ 1,664.83	$ 2,142,918.46

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Cash Flows
Proprietary Fund
For Fiscal Year Ended
June 30, 2020

	Business-type Activities			
	Major Enterprise Funds			
	5210 Water	5310 Sewer	5410 Garbage	Total Enterprise Funds
Cash Flows from Operating Activities:				
Cash received from customers	$ 91,961.00	$ 46,154.97	$ 38,817.90	$ 176,933.87
Cash received from miscellaneous sources	-	569.16	24.60	593.76
Cash paid to suppliers of goods and services	(26,414.19)	(4,815.43)	(45,283.99)	(76,513.61)
Cash paid to employees	(27,856.57)	(16,690.87)	-	(44,547.44)
Net cash provided (used) by operating activities	37,690.24	25,217.83	(6,441.49)	56,466.58
Cash Flows from Non-Capital and Related Financing Activities:				
Short-term loans from other funds	-	-	1,348.87	1,348.87
Net cash provided (used) by non-capital and related financing activities	-	-	1,348.87	1,348.87
Cash Flows from Capital and Related Financing Activities:				
Principal paid on capital debt	(12,735.06)	(8,000.00)	-	(20,735.06)
Interest paid on capital debt	(7,388.94)	(1,341.80)	-	(8,730.74)
Acquisition and construction of capital assets	(0.00)	(306,967.89)	-	(306,967.89)
Capital Contributions received	-	315,584.44	-	315,584.44
Net cash provided (used) by non-capital and related financing activities	(20,124.00)	(725.25)	-	(20,849.25)
Net increase (decrease) in cash and cash equivalents	17,566.24	24,492.58	(5,092.62)	36,966.20
Cash and cash equivalents as of:				
July 1, 2019	105,172.79	951.70	5,092.62	111,217.11
June 30, 2020	$ 122,739.03	$ 25,444.28	$ -	$ 148,183.31
Displayed on Statement of Net Position-Proprietary Funds as:				
Cash and investments	$ 39,958.03	$ 5,797.22	$ -	$ 45,755.25
Restricted cash and investments	82,781.00	19,647.06	-	102,428.06
Total at end of year	$ 122,739.03	$ 25,444.28	$ -	$ 148,183.31
Reconciliation of operating income to net cash provided by operating activity:				
Operating income (loss)	$ 1,613.57	$ 6,412.82	$ (8,352.01)	$ (325.62)
Adjustments to reconcile operating income to net cash provided (used) by operating activities:				
Depreciation expense	37,671.66	15,949.55	-	53,621.21
Change in assets, deferred outflows of resources, liabilities, and deferred inflows of resources:				
(Increase) decrease in assessments receivable	-	-	1,944.00	1,944.00
(Increase) decrease in accounts receivable	(655.63)	(1,254.52)	(33.48)	(1,943.63)
Increase (decrease) in warrants/accounts payable	-	679.75	-	679.75
Increase (decrease) in compensated absences payable	1,162.45	840.22	-	2,002.67
Increase (decrease) in net pension liability	(4,815.28)	847.18	-	(3,968.10)
(Increase) decrease in deferred outflows-pension	2,267.55	682.63	-	2,950.18
Increase (decrease) in deferred inflows-pension	445.92	1,060.20	-	1,506.12
Net cash provided (used) by operating activities	$ 37,690.24	$ 25,217.83	$ (6,441.49)	$ 56,466.58
Schedule of non-cash transactions				
Depreciation	37,671.66	15,949.55	-	53,621.21

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Fiduciary Net Position
Fiduciary Funds
June 30, 2020

		Agency Funds
ASSETS		
Cash and cash equivalents	$	416.30
Total assets		416.30
LIABILITIES		
Warrants payable		416.30
Total liabilities		416.30

The notes to the financial statements are an integral part of this statement.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The financial statements of the Town have been prepared in conformity with accounting principles generally accepted in the United States of America (US GAAP) as applied to governmental units. The Governmental Accounting Standards Board (GASB) is the accepted standard-setting body for governmental accounting and financial reporting principles.

For the fiscal year ending June 30, 2020, the government adopted the provisions of the following new accounting pronouncements issued by the GASB:

GASB Statement No. 95, *Postponement of the Effective Dates of Certain Authoritative Guidance.* The primary objective of this Statement is to provide temporary relief to governments and other stakeholders in light of the COVID-19 pandemic by postponing the effective dates of certain provisions in Statements and Implementation Guides that first became effective or are scheduled to become effective for periods beginning after June 15, 2018, and later.

The Town's significant accounting policies are described below.

A. Reporting Entity

The Town of Geraldine is a political subdivision of the State of Montana governed by a Mayor and Council (Commission) duly elected by the registered voters of the Town. The accompanying financial statements present the primary government.

GASB Statement No. 14, as amended, sets forth the criteria for and reporting component units. The Town has determined there are no outside entity's that meet the criteria set forth by the GASB that would require the Town to include such entities as a blended or discretely presented component unit in the Town's financial statements.

B. Basis of Presentation

Government-Wide Financial Statements

The government-wide financial statements (i.e., the Statement of Net Position and the Statement of Activities) report information of the primary government. They include all funds of the primary government except fiduciary funds. Governmental activities are financed by taxes, intergovernmental revenues, and other non-exchange revenues. Business-type Activities are financed, in whole or in part, by fees charged to external parties for goods or services.

Internal service fund activity is eliminated to avoid "doubling up" amounts reported as revenues and expenses. The statements distinguish between governmental and business-type activities.

The Statement of Net Position presents the financial condition of the governmental and business-type activities of the Town at year-end. As a general rule, interfund activities, interfund payables and receivables, have been removed from this statement except those representing balances between the governmental activities and the business-type activities, which are presented as internal balances and eliminated in the total primary government column. Exceptions to this general rule are payments-in-lieu of taxes and other charges between the governments' enterprise functions and various other functions of the government. Elimination of these charges would distort the direct costs and program revenues reported for the various functions.

The Statement of Activities demonstrates the degree to which the direct expenses of a given function or program are offset by program revenues. Direct expenses are those that are clearly identifiable with a specific function. Program revenues include: 1) charges to customers who purchase, use, or directly benefit from goods, services, or privileges provided by a given function and 2) grants and contributions that are restricted to meeting the operational or capital requirements of a particular function. Taxes revenues and other items not properly included among program revenues are reported as general revenues. The Town does not allocate indirect expenses to functions or programs.

Fund Financial Statements

Unlike a private business, which is accounted for as a single entity, a governmental unit is accounted for through several separate funds. A fund is a fiscal and accounting entity with a self-balancing set of accounts. Fund accounting segregates specific activities according to their intended purpose and is used to aid management in demonstrating compliance with finance-related, legal, and contractual provisions. Funds are classified into three categories: governmental, proprietary, and fiduciary. Each fund category presents separate fund financial statements. The fund financial statements presenting a fund category may contain one or more ‘fund types'. The governmental and proprietary fund financial statements emphasis is on major funds. Internal service funds are combined and the totals are presented in a single column on the face of the proprietary fund statements. Fiduciary fund financial statements report by fiduciary fund type. Interfund activity is reported on the fund financial statements.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

B. Basis of Presentation-cont.

Fund Financial Statements-cont.

Each major fund is reported in a separate column in the respective fund financial statements. A fund is considered major if it is the primary operating fund of the Town or meets the following criteria:

a. Total assets and deferred outflows of resources, the total liabilities and deferred inflows of resources, revenues, or expenditures/expenses of that individual governmental or enterprise fund are at least 10 percent of the corresponding total for all funds of that category or type; and

b. The same element(s) that met the 10 percent criterion above is at least 5 percent of the corresponding total for all governmental and enterprise funds combined.

Per GAAP, the government's officials are allowed to present any individual fund that does not meet the criteria as a major fund in the respective fund financial statements if they believe the fund is particularly important to financial statement users.

All of the remaining funds are aggregated and reported in the respective governmental and proprietary fund financial statements in a single column as '*nonmajor funds'.*

The Town maintains the minimum number of governmental funds consistent with legal and managerial requirements.

The Town reports the following major governmental funds:

General Fund - The general fund is the primary operating fund of the Town. It accounts for all financial resources traditionally associated with the Town's operations except those required to be accounted for in other funds.

The Town reports the following major proprietary funds:

Water Fund - An enterprise fund used to account for the operating and nonoperating revenues and expenses of the public water utility system.

Sewer Fund - An enterprise fund used to account for the operating and nonoperating revenues and expenses of the public sewer utility system.

Solid Waste Fund - An enterprise fund used to account for the operating and nonoperating revenues and expenses of solid waste disposal.

Additionally, the Town reports the following fund types:

Agency Funds - These funds are custodial in nature and used to account for assets held by the Town in a trustee capacity or as an agent for individuals, private organizations, other governments.

The Governmental Accounting Standards Board (GASB) issued Statement No. 62. The Statement codifies the requirements of all pre-November 30, 1989 FASB and AICPA pronouncements that apply to state and local governments. The government has adopted and applied the provisions of GASB Statement No. 62 to both the government-wide and proprietary fund financial statements. Governments may continue to apply post-November 30, 1989 FASB pronouncements or other accounting literature that do not conflict with or contradict with GASB pronouncements, including Statement No. 62.

C. Measurement Focus and Basis of Accounting

The government-wide financial statements, and the proprietary and fiduciary fund financial statements are reported using the economic resources measurement focus and the accrual basis of accounting. Revenues are recorded when earned, except for grant revenue and similar voluntary nonexchange revenues received prior to meeting imposed time requirements. Property tax revenue is recognized when levied. Expenses are recorded when a liability is incurred, regardless of the timing of related cash flows.

The Statement of Revenues, Expenses, and Changes in Net Position-Proprietary Funds, distinguishes operating revenues and expenses from nonoperating items. Operating revenues and expenses generally result from providing services and producing and delivering goods in connection with a proprietary fund's principal ongoing operations. Revenues of proprietary funds are defined as operating vs nonoperating based on how individual transactions are categorized on the statement of cash flows for proprietary funds. All cash receipts that do not result from transactions defined as operating activities are considered nonoperating and reported on the statement of cash flows as capital and related financing, noncapital financing, or investing activities.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

C. Measurement Focus and Basis of Accounting-cont.

Governmental fund financial statements are reported using the current financial resources measurement focus and the modified accrual basis of accounting. Under this method, revenues are recognized when measurable and available. “Measurable” means the amount of the transaction can be determined. “Available” means collectible within the current period or soon enough thereafter to be used to pay liabilities of the current period.

The Town considers revenues to be available if they are collected within 60 days of the end of the current fiscal period. Property taxes, license, and interest associated with the current fiscal period are all considered to be susceptible to accrual and so have been recognized as revenues of the current fiscal period. Only the portion of special assessments receivable due within the current fiscal period are considered to be susceptible to accrual as revenue of the current period. Entitlements and shared revenues are recorded at the time of receipt or earlier if the susceptible to accrual criteria is met.
Property tax revenue is considered available upon receipt. Taxes and assessments receivable due within the current period and remaining uncollected at year end are offset by deferred tax/assessment revenue, a deferred inflow of resources account, since they are not considered available to pay liabilities of the current period. All other revenue items, other than grant revenue and similar voluntary nonexchange revenues, are considered to be both measurable and available only when cash is received by the government.

Expenditures are recorded when the related fund liability is incurred, except for principal and interest on general long-term debt, claims and judgments, and compensated absences, which are recognized as expenditures to the extent they have matured. General capital asset acquisitions are reported as expenditures in governmental funds. Issuance of general long-term debt and acquisitions under capital leases are reported as other financing sources.

Both financial statements presented on the accrual basis and modified accrual basis of accounting recognize grant revenue and similar voluntary nonexchange revenues, pending purely routine requirements such as filing reimbursement and/or progress reports where all eligibility requirements other than time requirements imposed by the provider have been met, as revenue of the current period. Grant revenue and similar voluntary nonexchange revenues received prior to meeting imposed time requirements but after all eligibility requirements are met, are offset by deferred grant revenues, a deferred inflows of resources account, until use is required or first permitted.

D. Assets, deferred outlflows of resources, liabilities, deferred inflows of resources, and fund balance/net position

1. Deposits and investments

Allowable deposit and investment of public funds is governed by Title 7, Chapter 6, Part 2 of the Montana Code Annotated (MCA). Deposits and investments may include demand, time, and savings deposits, direct obligations of the United States Government, securities issued by agencies of the United States, investments in the Montana Short-Term Investment Program (STIP), repurchase agreements, and registered warrants.

In the statement of cash flows for proprietary funds, the term cash and cash equivalents is used. Cash equivalents are short-term, highly liquid investments that are both readily convertible to known amounts of cash, and investments with original maturities of three months or less at the time of purchase.

Investments, with limited exceptions, are reported at fair value. Investments in nonparticipating certificates of deposit are reported at cost. Money market investments, including U.S. Treasury and Agency obligations, that mature within one year of acquisition are reported at amortized cost. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is determined annually, and requires the use of valuation techniques, a specific method or combination of methods using one or more of three approaches: market, cost or income approach.

2. Receivables

Activity between funds that are representative of lending/borrowing arrangements outstanding at fiscal year-end are referred to as either "due to/from other funds" or "advances to/from other funds". The non-current portion of advances between funds are not available for appropriation and are not expendable available financial resources.

Accounts receivables are shown net of allowance for uncollectible amounts. Property tax receivables are offset by deferred inflows of resource accounts since they are not available to pay liabilities of the current period. All property tax levies are set at the time of the adoption of the annual budget. The real estate taxes are payable in two installments, the first due by November 30 and the second by May 31. Personal property taxes are assessed in April or May and are payable within 30 days of the issuance of the notice.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

D. Assets, deferred outlflows of resources, liabilities, deferred inflows of resources, and fund balance/net position-cont.

3. Restricted assets

Certain assets of the enterprise funds are restricted for specific use as required by the bond indenture agreement covenants established with the issuance and sale of the revenue bonds representing a liability to the enterprise funds. These restricted assets represent cash and cash equivalents restricted for use to establish a reserve for future debt and to establish a replacement and depreciation reserve for the purpose of replacing the system's short lived assets in the future.

4. Capital assets

Capital assets which include property, plant, equipment, and infrastructure are reported in the applicable governmental or business-type activities columns in the government-wide financial statements. Capital assets, other than infrastructure assets, are defined by the Town as assets with an initial cost of more than $5,000 and an estimated useful life of three years or more. Such assets are recorded at historical cost. Donated capital assets are recorded at acquisition value at the date of donation.

Generally accepted accounting principles (GAAP) require the recording of infrastructure assets (i.e. roads, bridges, and similar assets). The Town did not meet the required annual revenue limitation as set forth by the GASB for retroactive reporting of such assets. However, prospectively the Town does capitalize new construction of infrastructure assets in accordance with the standard.

The costs of normal maintenance and repairs that do not add to the value of the asset or materially extend assets lives are not capitalized.

GAAP also requires Town management to estimate the useful life of capital assets and record annual depreciation expense using the straight-line depreciation method . These estimates affect the reported amounts of capital assets -net of depreciation. The range of estimated useful lives of property, plant, equipment, and infrastructure assets are as follows :

Buildings	30 years
Improvement other than Buildings	15 - 50 years
Machinery & Equipment	7 - 20 years
Infrastructure	15 years
Utility Systems (i.e. source of supply, plants, transmission & distribution)	50 years

5. Deferred outflows of resources

Deferred outflow of resources is a financial statement element. A deferred outflow of resources is a consumption of net assets by the government that is applicable to a future reporting period. The government-wide statement of net position, proprietary fund statement of net position, and governmental fund balance sheet report a separate section for deferred outflows of resources.

Deferred outflows of resources are disclosed by type on the face of the financial statements and in the respective notes to the financial statements to augment understanding of the deferral.

6. Long-term obligations

In the government-wide financial statements and in proprietary fund types in the fund financial statements, long-term debt and other long-term obligations are reported as liabilities in the applicable governmental activity or business-type activity column or proprietary fund financial statement. Principal payments on long-term obligations due within the next fiscal year are reported as current liabilities. Bond premiums and discounts are deferred and amortized over the life of the bond issue using the straight-line method that approximates the effective interest method. Bonds payable are reported net of the applicable bond premium or discount. Bond issuance costs, except for prepaid insurance costs, are expensed in the reporting period in which they are incurred. Prepaid insurance costs are expensed over the life of the debt.

In the governmental fund financial statements, governmental funds recognize bond premiums and discounts, as well as bond issuance costs, during the current period. The face amount of debt issued is reported as other financing sources. Premiums received on debt issuances are reported as other financing sources while discounts on debt issuance are reported as other financing uses. Issuance costs, whether or not withheld from the actual debt proceeds received, are reported as debt service expenditures.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

D. Assets, deferred outlflows of resources, liabilities, deferred inflows of resources, and fund balance/net position-cont.

7. Compensated absences

As required by State law, the Town allows employees to accumulate earned vacation and sick leave benefits.

Vacation Leave: Full time employees earn vacation leave at the rate of 15 working days per year for the first 10 years of service. Employees with 10 to 20 years of service earn vacation leave at an increasing rate, to a maximum rate of 24 working days per year after 20 years of service. Employees may accumulate a total not to exceed two times the maximum number of days earned annually as of the end of the first pay period of the next calendar year.

Sick Leave: Full time employees earn sick leave at the rate of 12 working days per year. There is no restriction as to the number of working days that may be accumulated. Upon termination, employees in good standing are entitled to a cash payout of 25% of their sick leave balance.

Such amounts are reported in the Town's government-wide financial statements and in proprietary fund types in the fund financial statements as an expense and a liability for compensated absences as the leave is earned. The portion of accumulated leave that is estimated to be used within the next fiscal year is presented as a current liability.

In the governmental fund financial statements, governmental funds report vacation and sick leave as expenditures when used.

8. Deferred inflows of Resources

A deferred inflow of resources is an acquisition of net assets by the government that is applicable to a future reporting period. The government-wide statement of net position, proprietary fund statement of net position, and governmental fund balance sheet report a separate section for deferred inflows of resources.

Deferred inflows of resources are disclosed by type on the face of the financial statements and in the respective notes to the financial statements to augment understanding of the deferral.

9. Net Position/Fund Balance

Net Position

The government-wide and proprietary fund financial statements report net position. Net position represents the difference between assets plus deferred outflow of resources and liabilities plus deferred inflows of resources. Components of net position are net investment in capital assets, restricted, and unrestricted.

Net investment in capital assets consists of capital assets net of accumulated depreciation plus capital related deferred outflows of resources, less the outstanding balance of any related borrowing used for the acquisition, construction, or improvement of those assets and capital related deferred inflows of resources.

Restricted net position represents constraints on resources that can be spent only for specific purposes which are externally imposed either by: a) providers such as creditors, grantors, contributors, and laws/regulations of other governments; or b) imposed by law through constitutional provisions or enabling legislation.

Unrestricted net position is any portion of net position that does not meet the definition of net investment in capital assets and restricted.

The Town applies restricted resources first for purposes for which both restricted and unrestricted net position are available.

Fund Balances

The governmental fund financial statements report fund balance. Fund balance is composed of five classifications designed to disclose the hierarchy of constraints that control how specific amounts can be spent. See Note 3. G and H for further information on fund balance classifications and the Town's spending hierarchy.

NOTE 2. COMPLIANCE AND ACCOUNTABILITY

A. Budgetary Information

The Town adopts an annual budget for each of its funds in accordance with Title 7, Chapter 6, Part 40 of the Montana Code Annotated. Statute requires the preparation of a preliminary budget, public hearings on the preliminary budget and adoption of the budget by the later of the first Thursday after the first Tuesday in September or within 30 calendar days of the receipt of the certified taxable valuations from the Department of Revenue. The Town must also submit a copy of the final budget to the Department of Administration by the later of October 1 or 60 days after the receipt of taxable values from the Department of Revenue.

Appropriations are created by fund, function, and activity and may further be detailed by department. State statute limits the incurrence of fund obligations or making of expenditures from the fund to the amount of the fund's total appropriations in the final budget as adopted or as amended. Expenditure limitations imposed by law extend to the department level which is identified as the legal level of budgetary control. Budget transfers may be made by designated individuals between and among the general classifications of operations, provided that total expenditures do not exceed the fund's total budgeted appropriations as adopted or amended.

Budget transfers and amendments are authorized by law, and in some instances, may require further public hearings and a majority vote of the governing board. Budget amendments providing for additional appropriations required to be passed by resolution must identify the resource, such as unanticipated/unbudgeted revenue received or fund reserves, that will be used to finance the appropriation.

The 'original' budgeted amounts reported on the fund's Budget and Actual statement represent the original adopted budget. The 'final' budgeted amounts may differ as the amount includes all transfers and amendments made during the fiscal year subsequent to the adoption of the original budget and represents the final budget for the fiscal year.

B. Excess of expenditures over appropriations

At fiscal year-end the Town had no funds where expenditures exceeded total appropriations.

C. Deficit fund equity

At fiscal year-end the Town had no funds with deficit fund equity.

NOTE 3. DETAILED NOTES ON ALL FUNDS

A. Deposits and Investments

At year end, the Town's cash, cash equivalents and investments are reported in the basic financial statements as follows:

Governmental Activities		208,951.97
Business-Type Activities		148,183.31
Fiduciary Funds		416.30
Total - Primary Government	$	357,551.58
Discretely Presented Component Unit(s)		-
Total cash, cash equivalents and investments	$	357,551.58

The composition of cash and investments held by the Town at fiscal year-end is as follows:

	June 30, 2020
Deposits	
Demand deposits	357,551.58
Total deposits	$ 357,551.58

Custodial Credit Risk-Deposits
The custodial credit risk for deposits is the risk that, in the event of the failure of a depository financial institution, a government will not be able to recover deposits or will not be able to recover pledged (collateral) securities that are in the possession of an outside party.

The Town does not have a formal deposit policy that addresses custodial credit risk.

B. Interfud receivables and payables

Due from/Due to other funds consist(s) of the following:

Due from other Funds		**Due to other Funds**	
Fund Name	Amount	Fund Name	Amount
General Fund	1,348.87	Garbage Fund	1,348.87
Total	1,348.87	Total	1,348.87

The general fund made a short-term loan to the garbage fund to eliminate a negative cash balance in the garbage fund. The loan will be paid back with future special assessment revenue.

NOTE 3. DETAILED NOTES ON ALL FUNDS

C. Capital assets

Capital asset activity for the fiscal year ended June 30, 2020

	Balance as of 6/30/2019	Acquisitions/ Increases	Disposals/ Decreases	Reclassifications	Balance as of June 30, 2020
Governmental activities:					
Capital assets not being depreciated					
Land	6,700				6,700
Total capital assets not being depreciated	$ 6,700	$ -	$ -	$ -	$ 6,700
Capital assets being depreciated					
Buildings	12,000				12,000
Improvements other than buildings	34,550				34,550
Machinery and equipment	173,389				173,389
Infrastructure	-	10,545			10,545
Total capital assets being depreciated	$ 219,939	$ 10,545	$ -	$ -	$ 230,484
Less accumulated depreciation for:					
Buildings	(12,000)				(12,000)
Improvements other than buildings	(18,550)	(2,000)			(20,550)
Machinery and equipment	(156,089)	(2,219)			(158,308)
Infrastructure	-	(703)			(703)
Total accumulated depreciation	$ (186,639)	$ (4,922)	$ -	$ -	$ (191,561)
Total capital assets being depreciated	$ 33,300	$ 5,623	$ -	$ -	$ 38,923
Governmental activities capital assets net	$ 40,000	$ 5,623	$ -	$ -	$ 45,623
Business-type activities:					
Capital assets not being depreciated					
Land	29,212				29,212
Construction in progress	48,799	375,059			423,858
Total capital assets not being depreciated	$ 78,011	$ 375,059	$ -	$ -	$ 453,070
Capital assets being depreciated					
Buildings	38,738				38,738
Improvements other than buildings	603,049				603,049
Pumping plant	1,209,036				1,209,036
Treatment plant	785,022				785,022
Transmission and distribution	400,620				400,620
Total capital assets being depreciated	$ 3,036,465	$ -	$ -	$ -	$ 3,036,465
Less accumulated depreciation for:					
Buildings	(21,952)	(1,291)			(23,243)
Improvements other than buildings	(434,152)	(4,436)			(438,588)
Pumping plant	(333,043)	(24,181)			(357,224)
Treatment plant	(251,207)	(15,700)			(266,907)
Transmission and distribution	(128,198)	(8,012)			(136,210)
Total accumulated depreciation	$ (1,168,552)	$ (53,621)	$ -	$ -	$ (1,222,173)
Total capital assets being depreciated	$ 1,867,913	$ (53,621)	$ -	$ -	$ 1,814,292
Business-Type activities capital assets net	$ 1,945,924	$ 321,438	$ -	$ -	$ 2,267,362

NOTE 3. DETAILED NOTES ON ALL FUNDS - cont.

D. Long-term debt

GASB Statement No. 88 defines debt as a liability that arises from a contractual obligation to pay cash (or other assets that may be used in lieu of cash) in one or more payments to settle an amount that is fixed at the date the contractual obligation is established.

Debt obligations are classified as either direct borrowings (when a government engages in a loan with a lender for funding (e.g. bank, credit union, private mortgage company, etc.), direct placements (when a government issues a debt security directly to an investor), or other debt.

During the year ended June 30, 2020, the following changes occurred in long-term debt:

Governmental Activities

	Balance as of 6/30/2019	Additions	Deletions	Balance as of June 30, 2020	Due Within One Year
Notes/Loans payable	$ 20,037.72		(6,855.82)	13,181.90	6,966.22
Compensated Absences payable	1,135.79	830.50		1,966.29	983.15
Total	$ 21,173.51	830.50	(6,855.82)	15,148.19	7,949.37

Business-type Activities

	Balance as of 6/30/2019	Additions	Deletions	Balance as of June 30, 2020	Due Within One Year
Revenue bonds	$ 197,443.00		(20,735.06)	176,707.94	21,344.00
Notes/Loans payable	23,799.44			23,799.44	-
Compensated Absences payable	2,747.47	2,002.67		4,750.14	2,375.07
Total	$ 223,989.91	2,002.67	(20,735.06)	205,257.52	23,719.07

Revenue Bond Debt - direct placements

Revenue bonds are payable from the collection of fees charged for services. The fees collected are expected to produce amounts sufficient to pay all principal of and interest on the bonds when due. The bonds are issued with specific maturity dates and interest rates.

Purpose	Issue Date	Interest Rate	Term of years	Final maturity	Bonds issued	Outstanding June 30, 2020
Water RD Loan #1	July-03	4.250%	40	November-41	140,200	103,502
Water RD Loan #2	June-05	4.250%	20	December-23	103,500	24,715
Water RD Loan #4	April-04	4.375%	40	March-29	95,000	36,491
Sewer Bonds	July-02	3.000%	20	January-22	113,000	12,000
				Total revenue bonds	$ 311,500	$ 176,708

Revenue Bond debt limitations

Title 7, Part 7, Chapter 42 of the Montana Code Annotated limits revenue bond debt for the purpose of constructing a sewer system, procuring a water supply, or constructing or acquiring water and sewer systems. Total indebtedness for such purposes may not in the aggregate exceed 55% over and above 2.5% of the total assessed (market) value of taxable property within the Town as ascertained by the last assessment. Based on the 2020 certified taxabale valuations, the maximum indebtedness the Town was allowed to incur for such purposes at June 30, 2020 is $526,914 which is in excess of the Town's current outstanding debt of $176.708.

NOTE 3. DETAILED NOTES ON ALL FUNDS - cont.

D. Long-term debt-cont.

Revenue Bond Debt - direct placements-cont.

Debt service requirements on revenue bond debt are as follows:

	Business-Type Activities		
For Fiscal Year Ended	Principal	Interest	Total Payments
2021	21,345	7,079	28,424
2022	17,927	6,257	24,184
2023	14,536	5,588	20,124
2024	10,890	4,998	15,888
2025	7,790	4,631	12,421
2026-2030	37,777	17,876	55,653
2031-2035	25,360	11,558	36,918
2036-2040	31,349	5,569	36,918
2041-2045	9,734	301	10,035
Total	$ 176,708	$ 63,857	$ 240,565

Notes/Loans Debt - direct borrowings

Purpose	Issue Date	Interest Rate	Term of years	Final maturity	Amount issued	Outstanding June 30, 2020
Intercap-Sidewalks	December-12	1.95%-3.37%	10 years	February-23	30,000	9,348
Intercap-Software	December-15	1.95%-3.37%	6 years	February-21	18,000	3,834
Intercap-Sewer project	September-18	3.370%	3 years	August-21	50,000	23,799
			Total notes/loans/contracts		$ 68,000	$ 36,981

The Town completed the preliminary engineering requirements for the sewer project in fiscal year 2019. Work began on the project in fiscal year 2020. The Town has received TSEP, RRGL and Rural Development grants and a loan commitment from USDA, Rural Development (RD) to fund the project. Proceeds from the RD loan will be used to pay the principal balance of interim financing received from Intercap. The sewer project is in progress with an anticipated completion in fiscal year 2021 or early fiscal year 2022.

Debt service requirements on notes/loans/contract debt are as follows:

	Governmental Activities			Business-Type Activities		
For Fiscal Year Ended	Principal	Interest	Total Payments	Principal	Interest	Total Payments
2021	6,928	290	7,218		802	802
2022	3,132	281	3,413	23,799	804	24,603
2023	3,122	78	3,200			
Total	$ 13,182	$ 649	$ 13,831	$ 23,799	$ 1,606	$ 25,405

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. State-wide Pension Plan

Plan Description: The Public Employees Retirement System (PERS)-Defined Benefit Retirement Plan (DBRP), administered by the Montana Public Employee Retirement Administration (MPERA), is a multiple-employer, cost-sharing plan established July 1, 1945, and governed by Title 19, chapters 2 & 3, Montana Code Annotated (MCA). This plan provides retirement benefits to covered employees of the State, and local governments, and certain employees of the Montana University System, and school districts. Benefits are established by state law and can only be amended by the Legislature. The Town reports plan amounts at June 30, 2020 based on plan amounts measured at June 30, 2019.

Summary of Significant Accounting Policies

MPERA prepared financial statements using the accrual basis of accounting. The same accrual basis was used by MPERA for the purposes of determining the Net Pension Liability (NPL); Deferred Outflows of Resources and Deferred Inflows of Resources related to pensions; Pension Expense; the Fiduciary Net Position; and, Additions to or Deductions from Fiduciary Net Position. Member contributions are recognized in the period in which contributions are due. Employer contributions are recognized when due and the employer has made a formal commitment to provide the contributions. Revenues are recognized in the accounting period they are earned and become measurable. Benefit payments and refunds are recognized in the accounting period in which they are due and payable in accordance with the benefit terms. Expenses are recognized in the period incurred. Investments are reported at fair value. MPERA adhered to all accounting principles generally accepted by the United States of America. MPERA applied all applicable pronouncements of the Governmental Accounting Standards Board (GASB).

General Information about the Pension Plan

All new members are initially members of the PERS-DBRP and have a 12-month window during which they choose to remain in the PERS -DBRP or join the PERS-DCRP by filing an irrevocable election. Members may not be participants of both the *defined benefit* and *defined contribution* retirement plans. All new members from the universities also have a third option to join the university system's Montana University System Retirement Program (MUS-RP).

Benefits provided: The PERS-DBRP provides retirement, disability, and death benefits to plan members and their beneficiaries. Benefits are based on eligibility, years of service, and highest average compensation (HAC). Member rights are vested after five years of service.

Service retirement:

- Hired prior to July 1, 2011:
  - Age 60, 5 years of membership service
  - Age 65, regardless of membership service
  - Any age, 30 years of membership service
- Hired on or after July 1, 2011:
  - Age 65, 5 years of membership service
  - Age 70, regardless of membership service

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. State-wide Pension Plan-cont.

Early Retirement:

- Hired prior to July 1, 2011:
  - Age 50, 5 years of membership service
  - Any age, 25 years of membership service
- Hired on or after July 1, 2011:
  - Age 55, 5 years of membership service

Second Retirement: (requires returning to PERS-covered employer or PERS service)

- Retired before January 1, 2016 and accumulate less than 2 years additional service credit or retired on or after January 1, 2016 and accumulate less than 5 years additional service credit:
  - A refund of member's contributions plus return interest (currently 2.02% effective July 1, 2018).
  - No service credit for second employment;
  - Start the same benefit amount the month following termination; and
  - Guaranteed Annual Benefit Adjustment (GABA) starts again in the January immediately following the second retirement.
- Retired before January 1, 2016 and accumulate at least 2 years of additional service credit:
  - A recalculated retirement benefit based on provisions in effect after the initial retirement; and
  - GABA starts on the recalculated benefit in the January after receiving the new benefit for 12 months.
- Retired on or after January 1, 2016 and accumulate 5 or more years of service credit:
  - The same retirement as prior to the return to service;
  - A second retirement benefit as prior to the second period of service based on laws in effect upon the rehire date; and
  - GABA starts on both benefits in the January after receiving the original and the new benefit for 12 months.

Member's highest average compensation (HAC)

- Hired prior to July 1, 2011 highest average compensation during any consecutive 36 months;
- Hired on or after July 1, 2011 – highest average compensation during any consecutive 60 months;

Compensation Cap

- Hired on or after July 1, 2013 – 110% annual cap on compensation considered as a part of a member's highest average compensation.

Monthly benefit formula

- Members hired prior to July 1, 2011
  - Less than 25 years of membership service: 1.785% of HAC per year of service credit;
  - 25 years of membership service or more: 2% of HAC per year of service credit.
- Members hired on or after July 1, 2011
  - Less than 10 years of membership service: 1.5% of HAC per year of service credit;
  - 10 years or more, but less than 30 years of membership service: 1.785% of HAC per year of service credit;
  - 30 years or more of membership service: 2% of HAC per year of service credit.

Guaranteed Annual Benefit Adjustment (GABA)

After the member has completed 12 full months of retirement, the member's benefit increases by the applicable percentage (provided below) each January, **inclusive** of all other adjustments to the member's benefit.

- 3.0% for members hired **prior to** July 1, 2007
- 1.5% for members hired between July 1, 2007 and June 30, 2013
- Members hired on or after July 1, 2013:
  - (a) 1.5% for each year PERS is funded at or above 90%;
  - (b) 1.5% reduced by 0.1% for each 2.0% PERS is funded below 90%; and
  - (c) 0% whenever the amortization period for PERS is 40 years or more.

Contributions : The state Legislature has the authority to establish and amend contribution rates. Member and employer contribution rates are specified by Montana Statute and are a percentage of the member's compensation . Contributions are deducted from each member's salary and remitted by participating employers.

Special Funding: The state of Montana, as the non-employer contributing entity, paid to the Plan, additional contributions that qualify as *special funding*. Those employers who received *special funding* are all participating employers.

Not Special Funding: Per Montana law, state agencies and universities paid their own additional contributions. The employer paid contributions are *not* accounted for as special funding for state agencies and universities but are reported as employer contributions.

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. State-wide Pension Plan-cont.

Member and employer contribution rates are shown in the table below.

Fiscal Year	Member		State & Universities	Local Government		School Districts	
	Hired < 07/01/11	Hired > 07/01/11	Employer	Employer	State	Employer	State
2020	7.900%	7.900%	8.770%	8.670%	0.100%	8.400%	0.370%
2019	7.900%	7.900%	8.670%	8.570%	0.100%	8.300%	0.370%
2018	7.900%	7.900%	8.570%	8.470%	0.100%	8.200%	0.370%
2017	7.900%	7.900%	8.470%	8.370%	0.100%	8.100%	0.370%
2016	7.900%	7.900%	8.370%	8.270%	0.100%	8.000%	0.370%
2015	7.900%	7.900%	8.270%	8.170%	0.100%	7.900%	0.370%
2014	7.900%	7.900%	8.170%	8.070%	0.100%	7.800%	0.370%
2012 – 2013	6.900%	7.900%	7.170%	7.070%	0.100%	6.800%	0.370%
2010 – 2011	6.900%		7.170%	7.070%	0.100%	6.800%	0.370%
2008 – 2009	6.900%		7.035%	6.935%	0.100%	6.800%	0.235%
2000 - 2007	6.900%		6.900%	6.800%	0.100%	6.800%	0.100%

1. Member contributions to the system of 7.9% are temporary and will be decreased to 6.9% on January 1 following actuary valuation results that show the amortization period has dropped below 25 years and would remain below 25 years following the reduction of both the additional employer and additional member contribution rates.

2. Employer contributions to the system:
   a. Effective July 1, 2014, following the 2013 Legislative session, PERS-employer contributions increase an additional 0.1% a year and will continue over 10 years through 2024. The additional employer contributions including the 0.27% added in 2007 and 2009, will terminate on January 1 following actuary valuation results that show the amortization period has dropped below 25 years and would remain below the 25 years following the reduction of both the additional employer and additional member contributions rates.
   b. Effective July 1, 2013, employers are required to make contributions on working retirees' compensation. Member contributions for working retirees are not required.
   c. The portion of employer contributions allocated to the Plan Choice Rate (PCR) are included in the employers reporting. The PCR was paid off effective March 2016 and the contributions previously directed to the PCR are now directed to member accounts.

3. Non-Employer Contributions:
   a. Special Funding
      i. The state contributed 0.1% of members' compensation on behalf of local government entities.
      ii. The state contributed 0.37% of members' compensation on behalf of school district entities.
      iii. The state contributed a Statutory Appropriation from the General Fund of $33,615,000.

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. State-wide Pension Plan-cont.

Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

GASB Statement 68 allows a measurement date of up to 12 months before the employer's fiscal year-end can be utilized to determine the Plan's TPL. The basis for the TPL as of June 30, 2019, was determined by taking the results of the June 30, 2018, actuarial valuation and applying standard roll forward procedures. The roll forward procedure uses a calculation that adds the annual normal cost (also called the service cost), subtracts the actual benefit payments and refunds for the plan year, and then applies the expected investment rate of return for the year. The roll forward procedure will include the effects of any assumption changes and legislative changes. The update procedures are in conformity with Actuarial Standards of Practice issued by the Actuarial Standards Board.

The Total Pension Liability (TPL) minus the Fiduciary Net Position equals the Net Pension Liability (NPL). The proportionate shares of the employer's and the state of Montana's NPL for June 30, 2019, and 2018, are displayed below. The employer's proportionate share equals the ratio of the employer's contributions to the sum of all employer and non-employer contributions during the measurement period. The state's proportionate share for a particular employer equals the ratio of the contributions for the particular employer to the total state contributions paid. The employer recorded a liability of $52,627 and the employer's proportionate share was 0.002518 percent.

As of measurement date	Net Pension Liability as of 6/30/2019	Net Pension Liability as of 6/30/2018	Percent of Collective NPL as of 6/30/2019	Percent of Collective NPL as of 6/30/2018*	Change in Percent of Collective NPL
TOWN OF GERALDINE Proportionate Share	$ 52,627	$ 57,075	0.002518%	0.002735%	(0.000217)%
State of Montana Proportionate Share associated with Employer	$ 17,061	$ 19,030	0.000816%	0.000912%	(0.000096)%
Total	$ 69,688	$ 76,105	0.003334%	0.003647%	(0.000313)%

*To be consistent with this year's calculation of the *State of Montana Proportionate Share Associated with Employer Percent of Collective NPL,* the June 30, 2018 percentage has been recalculated using the actual State percentage presented on the allocation calculation instead of the 100% displayed last year. This does not change the dollar amount of the Net Pension Liability as of 6/30/2018, just the percentage.

Changes in actuarial assumptions and methods: There were no changes in assumptions or other inputs that affected the measurement of the TPL.

Changes in benefit terms: There have been no changes in benefit terms since the previous measurement date.

Changes in proportionate share: There were no changes between the measurement date of the collective NPL and the employer's reporting date that are expected to have a significant effect on the employer's proportionate share of the collective NPL.

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. State-wide Pension Plan-cont.

Pension Expense : At June 30, 2019, the employer recognized $5,292 for its proportionate share of the Plan's pension expense and recognized grant revenue of $39 for the state of Montana proportionate share of the pension expense associated with the employer. Additionally, the employer recognized grant revenue of $1,120 from the State Statutory Appropriation from the General Fund.

As of measurement date	Pension Expense as of 6/30/2019	Pension Expense as of 6/30/2018
TOWN OF GERALDINE's Proportionate Share	$5,292	$6,137
Employer Grant Revenue – State of Montana Proportionate Share for employer	39	1,270
Employer Grant Revenue – State of Montana State Appropriation for employer	1,120	0
Total	$6,450	$7,407

Recognition of Deferred Inflows and Outflows: At June 30, 2019, the employer reported its proportionate share of the Plan's deferred outflows of resources and deferred inflows of resources from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Expected vs. Actual Experience	$2,495	$2,476
Projected Investment Earnings vs. Actual Investment Earnings	638	0
Changes in Assumptions	2,234	0
Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	0	9,449
Employer Contributions Subsequent to the Measurement Date	3,459	
Total	$8,826	$11,926

Other amounts reported as deferred outflows and inflows of resources related to pensions are recognized in the employer's pension expense as follows:

For the Measurement Year ended June 30:	Recognition of Deferred Outflows and Deferred Inflows in future years as an increase or (decrease) to Pension Expense
2020	$21
2021	$(7,389)
2022	$237
2023	$573
Thereafter	$ 0

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. State-wide Pension Plan-cont.

Actuarial Assumptions: The total pension liability in the June 30, 2019 actuarial valuation was determined using the following actuarial assumptions.

Investment Return (net of admin expense)	7.65%
Admin Expense as % of Payroll	0.26%
General Wage Growth * *includes Inflation at	3.50% 2.75%
Merit Increases	0% to 6.30%
Postretirement Benefit Increases 1. Guaranteed Annual Benefit Adjustment (GABA) each January • After the member has completed 12 full months of retirement, the member's benefit increases by the applicable percentage (provided below) each January, inclusive of all other adjustments to the member's benefit. • Members hired prior to July 1, 2007 • Members hired between July 1, 2007 & June 30, 2013 • Members hired on or after July 1, 2013 • For each year PERS is funded at or above 90% • The 1.5% is reduced by 0.1% for each 2.0% PERS is funded below 90% • 0% whenever the amortization period for PERS is 40 years or more	 3.0% 1.5% 1.5% 0%
Mortality: • Contributing members, , service retired members & beneficiaries • Disabled Members	 RP-2000 Combined Employee and Annuitant Mortality Tables projected to 2020 with scale BB, set back one year for males RP-2000 Combined Mortality Tables, with no projections

The most recent experience study, performed for the period covering fiscal years 2011 through 2016, is outlined in a report dated May 5, 2017 and can be located on the MPERA website. The long-term expected return on pension plan assets is reviewed as part of the regular experience studies prepared for the Plan. Several factors are considered in evaluating the long-term rate of return assumption including historical rates of return, rate of return assumptions adopted by similar public-sector systems, and by using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges were combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the target asset allocation as of June 30, 2019, are summarized in the table below.

Asset Class	Target Asset Allocation	Long-Term Expected Real Rate of Return Arithmetic Basis
Cash Equivalents	3.0%	4.09%
Domestic Equity	36.0%	6.05%
Foreign Equity	18.0%	7.01%
Fixed Income	23.0%	2.17%
Private Equity	12.0%	10.53%
Real Estate	8.0%	5.65%
Total	100.0%	

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. State-wide Pension Plan-cont.

Discount Rate: The discount rate used to measure the TPL was 7.65%. The projection of cash flows used to determine the discount rate assumed that contributions from participating plan members, employers, and non-employer contributing entities would be made based on the Board's funding policy, which established the contractually required rates under the Montana Code Annotated. The state contributed 0.10% of the salaries paid by local governments and 0.37% paid by school districts. In addition, the state contributed a statutory appropriation from the general fund. Based on those assumptions, the Plan's fiduciary net position was projected to be adequate to make all the projected future benefit payments of current plan members through the year 2122. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the TPL. A municipal bond rate was not incorporated in the discount rate.

Sensitivity of the proportionate share of the net pension liability to changes in the discount rate: The following presents the employer 's sensitivity of the NPL to the discount rate in the table below. A small change in the discount rate can create a significant change in the liability. The NPL was calculated using the discount rate of 7.65%, as well as what the NPL would be if it were calculated using a discount rate 1.00% lower or 1.00% higher than the current rate.

As of measurement date	1.0% Decrease (6.65%)	Current Discount Rate	1.0% Increase (8.65%)
TOWN OF GERALDINE's Net Pension Liability	$75,610	$52,627	$33,313

Pension plan fiduciary net position: The stand-alone financial statements (76d) of the Montana Public Employees Retirement Board (PERB) *Comprehensive Annual Financial Report* (CAFR) and the GASB 68 Report disclose the Plan's fiduciary net position. The reports are available from the PERB at PO Box 200131, Helena MT 59620-0131, (406) 444-3154 or both are available on the MPERA website at http://mpera.mt.gov/index.shtml

NOTE 3. DETAILED NOTES ON ALL FUNDS

F. Pension Plans within the scope of GASB Statement No. 73 - Accounting and Financial Reporting for Pensions and Related Assets that are not within the scope of GASB Statement 68

Plan Description

The Town of Geraldine Fire Department Relief Association is a single-employer defined benefit pension plan. The Association was formed in accordance with 19-18-102 MCA. The assets of the Fire Department Disability and Pension Fund are not in a trust or an equivalent arrangement. The accumulated assets do not offset the liabilities of the pension and disability plan per GASB Statement No. 73. The Town is responsible for funding the pension plan and should recognize the total pension liability (TPL), as determined by an actuarial valuation, as its pension liability.

Total Pension Liability

Town management did not feel there was justification to incur the cost of an actuarial valuation. Therefore, total pension liability related to the Geraldine Fire Department Relief Association pension plan was not recorded as of June 30, 2020.

Title 19, Chapter 18, Part 5 of the Montana Code Annotated (MCA) requires the Town to contribute funds to assure the Association's after-assets are maintained at a level equal to at least three times but no more than five times the benefits paid by the Association in the preivous or current fiscal year whichever is less.

G. Fund Balance

The Governmental Accounting Standards Board issued Statement No. 54 *Fund Balance Reporting and Governmental Fund Type Definitions* , which defines governmental fund types and requires presentation of governmental fund balances on the Balance Sheet-Governmental Funds by classification. Fund balance classifications are as follows:

The non-spendable fund balance classification represents the portion of fund balances that cannot be spent either because it is not in spendable form such as inventories, the long term portion of notes & loans receivable, land held for resale of which the future proceeds are not committed, pre-paid expenses, or legal or contractual constraints were placed on assets held such as the corpus of a permanent fund.

The restricted fund balance classification includes amounts that can be spent only for specific purposes which are externally imposed either by: a) providers such as creditors, grantors, contributors, and laws/regulations of other governments; or b) imposed by law through constitutional provisions or enabling legislation.

The committed fund balance classification includes amounts that are constrained for specific purposes internally imposed by majority vote by quorum of Town's governing body (highest level of decision-making authority). The governing body can, by adoption of an ordinance or resolution prior to the end of the fiscal year, commit fund balance to a specific purpose. Once adopted, the limitation imposed by the ordinance or resolution remains in place until a similar action is taken (a subsequent adoption of a ordinance or resolution) to remove or revise the limitation.

The assigned fund balance classification includes amounts that are intended to be used by the government for a specific purpose that do not meet the criteria to be classified as restricted or committed. An appropriation of existing fund balance to eliminate a projected budgetary deficit in the subsequent year‘s budget in an amount no greater than the projected excess of expected expenditures over expected revenues are reported as an assignment of fund balance. Assignments of fund balance may also be created by designated individuals.

Unassigned fund balance is the residual classification for the government's general fund and includes all spendable amounts not contained in other classifications. In governmental funds other than the general fund, the unassigned classification is only used to report a deficit balance resulting from overspending for specific purposes for which amounts had been restricted, committed, or assigned.

Fund Balance Classifications by Specific Purpose

GASB Statement No 54 requires presentation of specific purpose details by fund balance classification either on the face of the balance sheet-governmental funds, in the notes to the financial statements, or a combination of both.

Fund balance classifications are presented on the Balance Sheet-Governmental Funds by function. The function represents the specific purpose.

NOTE 3. DETAILED NOTES ON ALL FUNDS

H. Spending policy

The Town receives inflows from multiple revenue sources for use in the general fund. The intention of a spending policy is to identify the expenditure hierarchy when both restricted and unrestricted (committed, assigned, or unassigned) amounts are available in the general fund. When both restricted and unrestricted amounts are available in the general fund, the following spending policy will apply:

1st: Restricted
2nd: Committed
3rd: Assigned
4th: Unassigned

The Town receives inflows from multiple revenue sources for use in governmental funds, other than the general fund. The intention of a spending policy is to identify the expenditure hierarchy when both restricted and unrestricted (committed, or assigned) amounts are available in these funds. When both restricted and unrestricted amounts are available in governmental funds, other than the general fund, the following spending policy will apply:

1st: Restricted
2nd: Committed
3rd: Assigned

I. Minimum Fund Balance Policy

The Town does not have a minimum fund balance policy in place.

5. BOC SUPPLEMENT SCHEDULE

1. **Intergovernmental expenditures** - Of the expenditures reported, detail below those expenditures made to other governments on a cost-sharing basis.

Purpose	Amount - Omit Cents	
	Paid to local governments	Paid to state
Airports	M01 $ -	$ -
Libraries	M52 $ -	$ -
Health	M32 $ -	$ -
Local schools	M12 $ -	$ -
Welfare	M79 $ -	L79 $ -
Other	M89 $ -	L89 $ -

2. **Salaries and Wages** - Report here the total salaries and wages paid to all employees of your government before deductions for social security, retirement, etc. Include also salaries and wages paid to employees of any utility owned and operated by your government.

Amount - Omit cents
$61,317

3. **Debt outstanding**

A. Long-term debt outstanding, issued and retired

Purpose	Bonds Outstanding as of June 30, 2019	Amount -- Omit cents			
		Bonds during the fiscal year		Bonds Outstanding as of June 30, 2020	
		Issued	Retired	General Obligation	Revenue bonds
Water utility	19A $ 177,443	29A $ -	39A $ (12,735)	41A $ -	44A $ 164,708
Sewer utility	19X $ 20,000	29X $ -	39X $ (8,000)	41X $ -	44X $ 12,000
Gas utility	19C $ -	29C $ -	39C $ -	41C $ -	44C $ -
Electric utility	19B $ -	29B $ -	39B $ -	41B $ -	44B $ -
All other	19X $ -	29X $ -	39X $ -	41X $ -	44X $ -

B. Short-term debt

Type	Beginning of fiscal year	End of fiscal year
Registered warrants	61V $ -	64V $ -
Contracts payable	$ -	$ -
Notes payable	$ -	$ -
Totals	$ -	$ -

4. **Cash balances by fund type** - Cash may consist of cash on hand, checking, savings, repurchase agreements, certificates of deposit, securities, or any other cash related item.

Type of funds	Amount - Omits cents
General fund (1000)	W61 $ 185,251
Special revenue funds (2000)	W61 $ 23,701
Debt Service funds (3000)	W01 $ -
Capital projects funds (4000)	W31 $ -
Enterprise funds (5000)	W61 $ 148,183
Internal services funds (6000)	$ -
Trust and agency funds (7000)	$ 416
Permanent funds (8000)	$ -
Total cash all funds	$ 357,552

REQUIRED SUPPLEMENTARY INFORMATION

35. STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE- BUDGET AND ACTUAL - GENERAL FUND

For the year ending June 30, 2020

1000 GENERAL FUND

	Original Budget	Final Budget	Actual Amounts	Variance with Final Budget Positive (Neg)
REVENUES				
Taxes				
Property Taxes	63,486.00	63,486.00	70,109.96	6,623.96
Local option taxes	12,000.00	12,000.00	0.00	(12,000.00)
Special assessments	14,000.00	14,000.00	9,054.28	(4,945.72)
Licenses and permits				
Animal licenses	0.00	0.00	18.00	18.00
Intergovernmental revenue (See supplemental section for detail)				
State shared revenues	35,159.00	35,159.00	34,535.84	(623.16)
Charges for services				
Fines and forfeitures				
Miscellaneous	2,000.00	2,000.00	2,208.26	208.26
Investment and royalty earnings	350.00	350.00	307.71	(42.29)
Total revenues	126,995.00	126,995.00	116,234.05	(10,760.95)
EXPENDITURES				
Current:				
General Government:				
Legislative services				
Personal services	4,000.00	4,000.00	5,167.36	(1,167.36)
Supplies/services/materials, etc	0.00	0.00	747.08	(747.08)
Executive services				
Judicial services				
Administrative services				
Financial services				
Supplies/services/materials, etc	15,600.00	15,600.00	7,894.95	7,705.05
Elections				
Purchasing services				
Personnel services				
Records administration				
Legal services				
Planning and research services				
Facilities administration				
Personal services	46,000.00	46,000.00	17,783.65	28,216.35
Supplies/services/materials, etc	0.00	0.00	22,592.30	(22,592.30)
Estate Administration				
Public school administration				
Other general government services				
Public Safety:				
Law enforcement services				
Supplies/services/materials, etc	0.00	0.00	2,578.00	(2,578.00)

35. STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE- BUDGET AND ACTUAL - GENERAL FUND

For the year ending June 30, 2020

1000 GENERAL FUND

	Original Budget	Final Budget	Actual Amounts	Variance with Final Budget Positive (Neg)
Detention and correction				
Probation and parole				
Fire protection				
Supplies/services/materials, etc	1,000.00	1,000.00	0.00	1,000.00
Protective inspections				
Civil defense				
Emergency services				
Other public safety services				
Public Works:				
Public works administration				
Road and street services				
Personal services	131,450.00	131,450.00	2,416.74	129,033.26
Supplies/services/materials, etc	2,000.00	2,000.00	21,843.76	(19,843.76)
Capital outlay	0.00	0.00	10,545.00	(10,545.00)
Airport				
Transit systems				
Water utilities				
Sewer utilities				
Natural gas/electric				
Solid waste services				
Cemetery services				
Public scales				
Weed control				
Flood control				
Central shop services				
Other public works services				
Public Health:				
Public health services				
Hospitals				
Nursing homes				
Mental health center				
Animal control services				
Insect and pest controls				
Supplies/services/materials, etc	1,700.00	1,700.00	1,100.00	600.00
Other public health services				
Social and Economic Services:				
Welfare				
Veteran's services				
Aging services				
Extension services				
Other social and economic services				
Culture and Recreation:				
Library services				
Fairs				

35. STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE- BUDGET AND ACTUAL - GENERAL FUND

For the year ending June 30, 2020

1000 GENERAL FUND

	Original Budget	Final Budget	Actual Amounts	Variance with Final Budget Positive (Neg)
Other community events				
Parks				
Personal services	1,000.00	1,000.00	32.44	967.56
Supplies/services/materials, etc	0.00	0.00	764.09	(764.09)
Participant recreation				
Spectator recreation				
Other culture and recreation services				
Housing and Community Development:				
Community public facility projects				
Housing rehabilitation				
Economic development				
TSEP/Home/Infrastructure rehabilitation				
HOME - tenant based rental assistance				
Other housing and community development				
Conservation of Natural Resources:				
Soil conservation				
Water quality control				
Air quality control				
Other natural resources conservation				
Debt Service:				
Miscellaneous	0.00	0.00	9,985.55	(9,985.55)
Total expenditures	202,750.00	202,750.00	103,450.92	99,299.08
Excess of revenues over (under) expenditures	(75,755.00)	(75,755.00)	12,783.13	88,538.13
OTHER FINANCING SOURCES (USES)				
Net change in fund balance	(75,755.00)	(75,755.00)	12,783.13	88,538.13
Fund balance - July 1, 2019 -				
-As previously reported	173,816.66	173,816.66	173,816.66	0.00
Fund balance - July 1, 2019 - As restated	173,816.66	173,816.66	173,816.66	0.00
Fund balance - June 30, 2020	98,061.66	98,061.66	186,599.79	88,538.13

Town of Geraldine
Required Supplementary Information
Public Employees Retirement System

Schedule of Proportionate Share of the Net Pension Liability
For the Last Ten Fiscal Years*

As of measurement date	2019	2018	2017	2016	2015	2014
Employer's proportion of the Net Pension Liability (percentage)	0.002518%	0.002735%	0.003978%	0.003099%	0.003115%	0.002980%
Employer's Net Pension Liability (amount)	$52,627	$57,075	$77,479	$52,782	$43,537	$37,127
State's Net Pension Liability (amount)	17,061	19,030	927	645	535	453
Total	$69,688	$76,105	$78,406	$53,427	$44,072	$37,580
Employer's Covered Payroll	$41,541	$44,973	$49,350	$37,118	$36,347	$33,730
Employer's Proportionate Share as a percent of Covered Payroll	126.69%	126.91%	157.00%	142.20%	119.78%	111.22%
Plan Fiduciary Net Position as a percent of Total Pension Liability	73.85%	73.47%	73.75%	74.71%	78.40%	79.87%

**The amounts presented for each fiscal year were determined as of June 30, the measurement date.*
Schedule is intended to show information for 10 years. Additional years will be displayed as they become available

Town of Geraldine
Required Supplementary Information
Public Employees Retirement System

Schedule of Contributions
For the Last Ten Fiscal Years*

As of most recent FYE (reporting date)	2020	2019	2018	2017	2016	2015
Contractually Required DB Contributions	$3,459	$3,573	$3,809	$4,131	$3,102	$2,995
Plan Choice Rate Required Contributions	$0	$ 0	$ 0	$ 0	$ 0	$ 0
Contributions in Relation to the Contractually Required Contributions	$3,459	$3,573	$3,809	$4,131	$3,102	$2,995
Contribution Deficiency (Excess)	$0	$ 0	$ 0	$ 0	$ 0	$ 0
Employer's Covered Payroll	$39,759	$41,541	$44,973	$49,350	$37,118	$36,347
Contributions as a percent of Covered Payroll	8.70%	8.60%	8.47%	8.37%	8.36%	8.24%

**The amounts presented for each fiscal year were determined as of June 30, the most recent fiscal year end.*
Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

Changes of Benefit Terms

The following changes to the plan provisions were made as identified:

2017:

Working Retiree Limitations – for PERS

Effective July 1, 2017, if a PERS retiree returns as an independent contractor to what would otherwise be PERS-covered employment, general contractor overhead costs are excluded from PERS working retiree limitations.

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Refunds

1) Terminating members eligible to retire may, in lieu of receiving a monthly retirement benefit, refund their accumulated contributions in a lump sum.
2) Terminating members with accumulated contributions between $200 and $1,000 who wish to rollover their refund must do so within 90 days of termination of service.
3) Trusts, estates, and charitable organizations listed as beneficiaries are entitled to receive only a lump-sum payment.

Interest credited to member accounts – Effective July 1, 2017, the interest rate credited to member accounts increased from 0.25% to 0.77%.

Lump-sum payouts

Effective July 1, 2017, lump-sum payouts in all systems are limited to the member's accumulated contributions rate than the present value of the member's benefit.

Disabled PERS Defined Contribution (DC) Members

PERS members hired after July 1, 2011 have a normal retirement age of 65. PERS DC members hired after July 1, 2011 who became disabled were previously only eligible for a disability benefit until age 65. Effective July 1, 2017, these individuals will be eligible for a disability benefit until they reach 70, thus ensuring the same 5-year time period available to PERS DC disabled members hired prior to July 1, 2011 who have a normal retirement age of 60 and are eligible for a disability benefit until age 65.

Changes in Actuarial Assumptions and Methods

Method and assumptions used in calculations of actuarially determined contributions

The following Actuarial Assumptions were adopted from the June 2016 Experience Study:

General Wage Growth*	3.50%
Investment Rate of Return*	7.65%
*Includes inflation at	2.75%
Merit salary increase	0% to 8.47%
Asset valuation method	Four-year smoothed market
Actuarial cost method	Entry age Normal
Amortization method	Level percentage of payroll, open
Remaining amortization period	30 years
Mortality (Healthy members)	For Males and Females: RP 2000 Combined Employee and Annuitant Mortality Table projected to 2020 using Scale BB, males set back 1 year
Mortality (Disabled members)	For Males and Females: RP 2000 Combined Mortality Table, with no projections
Admin Expense as % of Payroll	0.26%

Administrative expenses are recognized by an additional amount added to the normal cost contribution rate for the System. This amount varies from year to year based on the prior year's actual administrative expenses.

SUPPLEMENTAL INFORMATION

Town of Geraldine
Combining Balance Sheet
Nonmajor Special Revenue Funds
June 30, 2020

	2810 Police Reserve Training	2821 Gas Tax-special	Total Nonmajor Special Revenue Funds
ASSETS			
Current assets			
Cash and investments	$ 13,863.00	$ 9,838.05	$ 23,701.05
Total current assets	13,863.00	9,838.05	23,701.05
Total assets	13,863.00	9,838.05	23,701.05
FUND BALANCES			
Restricted for:			
Public safety	13,863.00	-	13,863.00
Public works	-	9,838.05	9,838.05
Total Fund Balance	$ 13,863.00	$ 9,838.05	$ 23,701.05
Total Liabilities, Deferred Outflow of Resources and Fund Balance	$ 13,863.00	$ 9,838.05	$ 23,701.05

The notes to the financial statements are an integral part of this statement.

49. COMBINING STMT OF REV, EXPEND, & CHANGES IN FUND BALANCES - BUDGET & ACTUAL - NONMAJOR SPECIAL REVENUE FUNDS

For the year ending June 30, 2020

2810 POLICE RESERVE TRAINING

	Original Budget	Final Budget	Actual Amounts	Variance with Final Budget Positive (Neg)
REVENUES				
Taxes				
Licenses and permits				
Intergovernmental revenue (See supplemental section for detail)				
Charges for services				
Fines and forfeitures				
EXPENDITURES				
Current:				
General Government				
Public Safety				
Public Works				
Public Health				
Social and Economic Services				
Culture and Recreation				
Housing and Community Development				
Conservation of Natural Resources				
Debt Service				
OTHER FINANCING SOURCES (USES)				
Fund balance - July 1, 2019 -				
-As previously reported	13,863.00	13,863.00	13,863.00	0.00
Fund balance - July 1, 2019 - As restated	13,863.00	13,863.00	13,863.00	0.00
Fund balance - June 30, 2020	13,863.00	13,863.00	13,863.00	0.00

49. COMBINING STMT OF REV, EXPEND, & CHANGES IN FUND BALANCES - BUDGET & ACTUAL - NONMAJOR SPECIAL REVENUE FUNDS

For the year ending June 30, 2020

2821 gas tax special

	Original Budget	Final Budget	Actual Amounts	Variance with Final Budget Positive (Neg)
REVENUES				
Taxes				
Licenses and permits				
Intergovernmental revenue (See supplemental section for detail)				
Charges for services				
Fines and forfeitures				
EXPENDITURES				
Current:				
General Government				
Public Safety				
Public Works				
Public Health				
Social and Economic Services				
Culture and Recreation				
Housing and Community Development				
Conservation of Natural Resources				
Debt Service				
OTHER FINANCING SOURCES (USES)				
Fund balance - July 1, 2019 -				
-As previously reported	9,838.05	9,838.05	9,838.05	0.00
Fund balance - July 1, 2019 - As restated	9,838.05	9,838.05	9,838.05	0.00
Fund balance - June 30, 2020	9,838.05	9,838.05	9,838.05	0.00

49. COMBINING STMT OF REV, EXPEND, & CHANGES IN FUND BALANCES - BUDGET & ACTUAL - TOTAL NONMAJOR SPECIAL REVENUE FUNDS

For the year ending June 30, 2020

	Original Budget	Final Budget	Actual Amounts	Variance with Final Budget Positive (Neg)
REVENUES				
Taxes				
Licenses and permits				
Intergovernmental revenue (See supplemental section for detail)				
Charges for services				
Fines and forfeitures				
EXPENDITURES				
Current:				
General Government				
Public Safety				
Public Works				
Public Health				
Social and Economic Services				
Culture and Recreation				
Housing and Community Development				
Conservation of Natural Resources				
Debt Service				
OTHER FINANCING SOURCES (USES)				
Fund balance - July 1, 2019 -				
-As previously reported	23,701.05	23,701.05	23,701.05	0.00
Fund balance - July 1, 2019 - As restated	23,701.05	23,701.05	23,701.05	0.00
Fund balance - June 30, 2020	23,701.05	23,701.05	23,701.05	0.00

Town of Geraldine
Schedule of Federal/State Grants
Entitlements, and Shared Revenues
For Fiscal Year Ended
June 30, 2020

	REVENUE CODE	RECEIVING FUND	AMOUNT
FEDERAL GRANTS/ENTITLEMENTS - (LIST)			
USDA-RD Grant	331xxx	5311	20,000.00
Total Federal Grants/Entitlements			20,000.00
FEDERAL SHARED REVENUES - (LIST)			
Total Federal Shared Revenues			0.00
STATE GRANTS/ENTITLEMENTS - (LIST)			
TSEP grants	334120	5311	209,303.02
RRGL grants	334121	5311	110,840.05
Total State Grants/Entitlements			320,143.07
STATE SHARED REVENUES - (LIST)			
Gas tax	335040	1000	11,678.28
Gambling Machine permit	335120	1000	300.00
State entitlement	335230	1000	22,557.56
Total State Shared Revenues			34,535.84
TOTAL			374,678.91

Fund/Account	Beginning Balance	Received	Transfers In	Disbursed	Transfers Out	Ending Balance
1000 GENERAL FUND						
101000 CASH-OPERATIONS	142,348.27	105,528.96	4.23	1,348.87	81,116.40	165,416.19
102140 GAS TAX - RESTRIC. CASH	31,468.39	10,705.09	0.00	0.00	22,338.75	19,834.73
Total Fund	173,816.66	116,234.05	4.23	1,348.87	103,455.15	185,250.92
Total 1000 GENERAL FUND	173,816.66	116,234.05	4.23	1,348.87	103,455.15	185,250.92
2810 POLICE RESERVE TRAINING						
101000 CASH-OPERATIONS	13,863.00	0.00	0.00	0.00	0.00	13,863.00
2821 gas tax special						
102140 GAS TAX - RESTRIC. CASH	9,838.05	0.00	0.00	0.00	0.00	9,838.05
Total 2000	23,701.05	0.00	0.00	0.00	0.00	23,701.05
5210 WATER FUND						
101000 CASH-OPERATIONS	24,601.79	94,642.11	0.00	0.00	77,075.87	42,168.03
102100 RESTRICTED CASH	55,000.00	0.00	0.00	0.00	0.00	55,000.00
102220 RESTRICTED - BOND RESERVE	24,903.00	0.00	0.00	0.00	0.00	24,903.00
102240 RESTRICTED - REPL & DEPR	668.00	0.00	0.00	0.00	0.00	668.00
Total Fund	105,172.79	94,642.11			77,075.87	122,739.03
5310 SEWER FUND						
101000 CASH-OPERATIONS	-8,025.06	44,375.02	2,349.11	0.00	32,901.85	5,797.22
102210 RESTRICTED -REV BOND ACCT	196.28	0.00	0.00	0.00	0.00	196.28
102220 RESTRICTED - BOND RESERVE	8,780.48	0.00	0.00	0.00	0.00	8,780.48
Total Fund	951.70	44,375.02	2,349.11		32,901.85	14,773.98
5311 sewer construction fund						
101010 sewer project checking	0.00	315,584.44	0.00	0.00	304,914.14	10,670.30
5410 GARBAGE FUND						
101000 CASH-OPERATIONS	5,092.62	39,859.37	332.00	0.00	45,283.99	0.00
Total 5000	111,217.11	494,460.94	2,681.11	0.00	460,175.85	148,183.31
7120 FIREMEN'S DISABILITY						
101000 CASH-OPERATIONS	0.00	371.00	0.00	0.00	371.00	0.00
7910 PAYROLL CLEARING FUND						
101000 CASH-OPERATIONS	277.77	0.00	69,703.24	69,564.67	0.04	416.30
7930 CLAIMS CLEARING FUND						
101000 CASH-OPERATIONS	8,609.83	0.00	491,630.13	500,239.96	0.00	0.00
Total 7000	8,887.60	371.00	561,333.37	569,804.63	371.04	416.30
Totals	317,622.42	611,065.99	564,018.71	571,153.50	564,002.04	357,551.58

Town of Geraldine
ALL FUNDS
CASH RECONCILIATION
June 30, 2020

Description	BANK NAME		
	Operating-Checking Acct	Sewer Construction-checking account	**Cash in all depositories**
BALANCE PER STATEMENTS	346,881.28	10,670.30	357,551.58
ADD			
Deposits in transit			0.00
Service charges			0.00
Other			0.00
			0.00
			0.00
			0.00
Total to add	0.00	0.00	0.00
SUBTRACT			
Outstanding checks	138.52		138.52
Other-payroll liabilities	277.78		277.78
			0.00
			0.00
			0.00
			0.00
Total to subtract	416.30	0.00	416.30
TOTAL CASH IN DEPOSITS	346,464.98	10,670.30	357,135.28
ADD			
Investments			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
Total to add	0.00	0.00	0.00
TOTAL IN DEPOSITORIES	346,464.98	10,670.30	357,135.28
ADD			
Cash and cash items on hand			0.00
Cash held in claims/payroll clearing funds	416.30		416.30
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
Total to add	416.30	0.00	416.30
****TOTAL ACCOUNTED FOR**	346,881.28	10,670.30	357,551.58

GENERAL

INFORMATION

SECTION

Town of Geraldine
June 30, 2020

GENERAL INFORMATION

1. Class of city	Town
2. Date of incorporation	1914
3. County seat	Chouteau County, Fort Benton, MT
4. Form of government	Council-Mayor
5. Population (most recent estimate)	295
6. Land area	4 square mile
7. Miles of roads/streets/alleys	12
8. Taxable valuation	$ 247,274
9. Number of water consumers	165

PROPERTY TAX MILL LEVIES

Fund Nunber	Fund Name	Mills
1000	General	259.66
	Total Mills:	259.66

ANNUAL FINANCIAL REPORT FILING FEE & AUDIT DETERMINATION
FISCAL YEAR ENDING
June 30, 2021

Page 1 - Information / Instructions

FEE REQUIREMENT: As provided by 2-7-514, MCA, each local government required to have an audit under 2-7-503, MCA, shall pay an annual filing fee to the department; the fee schedule shall be based upon the local government's annual revenue amounts. Administrative Rule 2.4.402 defines "revenue" as all receipts of a local government entity from any source excluding the proceeds from bond issuances and other long-term debt.

AUDIT REQUIREMENT: As provided by 2-7-503, MCA, each local government receiving revenue or financial assistance in excess of $750,000, regardless of the source of revenue or financial assistance, shall have an audit. "Financial Assistance" is defined as including assistance provided by a federal, state, or local government entity in the form of loans and loan guarantees.
Part II - Determination of Audit Requirement. Loan proceeds received in the fiscal year that were used to refinance (payoff) existing debt will not be considered as "Financial Assistance" when determining the current audit requirement.

Page 2 - *Determination of Filing Fee & Audit Requirement Form*

1) **Part I - Determination of filing fee is designed to self-calculate your filing fee in Box #1.**

***If a filing fee is owed, as indicated in Box #1, please print the completed *Determination of FilingFee & Audit Requirement Form* , page 2 only, and mail with your check or warrant made payable to "State Treasurer" in the amount of the required fee to:**

Montana Department of Administration
Local Government Services Bureau
Mitchell Bldg. - Room 270
PO Box 200547
Helena, MT 59620-0547

****If no filing fee is owed, you must complete Part II to determine if an audit is required. *Please* assure a copy of the completed *Determination of Filing Fee & Audit Requirement* form is either included in your Annual Financial Report (AFR) or if not, a completed copy of the form is uploaded along with your AFR in the portal to ensure we enter the correct amount of adjusted debt proceeds in our system.**

2) **Part II- Determination of audit requirement w/ No Filing Fee is designed to self-calculate debt proceeds recieved by your government in the fiscal year. If debt proceeds recieved in the fiscal year were used to refinance (payoff) an existing debt, you must *manually* enter the reduction.**

LOCAL GOVERNMENT ANNUAL FILING FEE SCHEDULE

Annual Resources In Excess of:	Annual Resources Equal to or Less Than:	Filing Fee
$0	$750,000	$0
$750,000	$1,000,000	$550
$1,000,000	$1,500,000	$800
$1,500,000	$2,500,000	$950
$2,500,000	$5,000,000	$1,300
$5,000,000	$10,000,000	$1,700
$10,000,000	$50,000,000	$2,500
$50,000,000		$3,000

REVISED 8/2017

ANNUAL FINANCIAL REPORT FILING FEE & AUDIT DETERMINATION

FISCAL YEAR ENDING

June 30, 2021

ENTITY #: _____	If the local government entity name or mailing address on the Department's mailing list is inaccurate or has changed recently please note the correction below.
Town of Geraldine	
Street or PO	
City or Town	
Montana Zip code	

Part I - Determination of Filing Fee

GOVERNMENTAL FUNDS - *(STATEMENT OF REVENUES, EXPENDITURES, AND CHANGES IN FUND BALANCES)*	
Total Revenues	163,862.63
Other Financing Sources - Proceeds from Sale of Capital Assets	0.00
Other Financing Sources - other revenues	0.00
Special and/or Extraordinary Items (Revenues only)	0.00
ENTERPRISE FUNDS - *(STATEMENT OF REVENUES, EXPENSES AND CHANGES IN FUND NET POSITION)* *Note: Do not include revenues of Internal Service Funds*	
Total Operating Revenues	195,610.11
Non-Operating Revenues: (Do not include Gain on Sale of Capital Assets)	
Taxes/Assessments	0.00
Licenses/Permits	0.00
Intergovernmental Revenues	0.00
Interest Revenues	0.00
Other Non-operating Revenues not included above	0.00
Capital Contributions	1,077,496.39
Special and/or Extraordinary Items (Revenues only)	0.00
ENTERPRISE FUNDS - *(STATEMENT OF CASH FLOWS)*	
Proceeds from Sale of Capital Assets	0.00
TRUST FUNDS - *(STATEMENT OF CHANGES IN FIDUCIARY NET POSITION)* *NOTE: Do not include additions to Investment Trust Funds*	
Total Additions to **Pension & Private Purpose** Trust Funds Only	0.00
Total Revenues for Calculation of Filing Fee:	**$1,436,969.13**

Box #1

Filing Fee Owed **$800.00**

If total revenues are equal to or less than $750,000, no filing fee is required to be paid. However, your entity may be subject to audit requirements.

Must* Review and complete Part II** below to determine if there is an audit requirement. ***Must manually subtract proceeds received to refinance an existing debt to exclude from audit determination.

If total revenues plus adjusted debt proceeds in the fiscal year exceed $750,000 your entity will be subject to audit requirements .

Part II - Determination of Audit Requirement w/ No Filing Fee (Must make applicable adjustments in yellow cells manually)

Add: Proceeds from Debt provided by a Federal agency,a State agency, another local government. [*DOES NOT* include proceeds received from non-governmental entities (e.g. Banks, savings & Loans)]	
Governmental Funds (Statement of Revenues, Expenditures, and Changes in Fund Balances-Proceeds from general long-term debt)	0.00
Proprietary Funds (Statement of Cash Flows-Major & Non Major Enterprise funds-Proceeds from debt)	1,045,284.29
Manually subtract amount of debt proceeds received from non-governmental financial institutions (e.g. banks, savings & loans) included above. **(enter as a negative)**	
Subtotal - Proceeds received from Debt:	$1,045,284.29
Manually subtract amount of debt proceeds received from government agencies used to refinance (pay-off) an existing debt **(enter as a negative)**	(467,519.63)
Adjusted Debt Proceeds	$577,764.66
Total Revenues + Adjusted Debt Proceeds	**$2,014,733.79**

Box #2

Audit Required? **YES**

If total revenues plus adjusted debt proceeds are in excess of $750,000, you are required to have an audit for the fiscal year.

Town of Geraldine
Montana

172 Collins East Avenue
Geraldine, Montana 59446

ANNUAL FINANCIAL REPORT

Fiscal Year Ended
June 30, 2021

Entity #020803

Town of Geraldine
Annual Financial Report
Table of Contents
June 30, 2021

INTRODUCTORY

SECTION

Town of Geraldine
Elected Officials/Officers

OFFICE	CITY/TOWN OFFICIALS/OFFICERS	DATE TERM EXPIRES
Mayor	Perry Joyce	2024
Councilperson/Commissioner	Marty Clark	2024
Councilperson/Commissioner	Monica Rice	2024
Councilperson/Commissioner	Karen Fairbanks	2022
Councilperson/Commissioner	Tammey Ludeman	2022
Clerk/Treasurer	Rosemary Scott	

In accordance with State law, I hereby transmit the
Town of Geraldine
Annual Financial Report for the fiscal year ended
June 30, 2021

Respectfully submitted;

Rosemary Scott

Town Clerk-Treasurer

October 22, 2021

Date

FINANCIAL SECTION

BASIC FINANCIAL STATEMENTS AND NOTES TO FINANCIAL STATEMENTS

GOVERNMENT-WIDE FINANCIAL STATEMENTS

Town of Geraldine
Statement of Net Position
June 30, 2021

	Primary Government		
	Governmental Activities	Business-type Activities	Total
ASSETS			
Current assets:			
Cash and investments	$ 266,065.71	$ 137,409.49	$ 403,475.20
Taxes and assessments receivable, net	8,730.07	5,966.17	14,696.24
Internal balances	6,676.04	(6,676.04)	-
Accounts receivable	-	13,535.68	13,535.68
Due from other governments	4,608.19	468,360.48	472,968.67
Total current assets	286,080.01	618,595.78	904,675.79
Noncurrent assets:			
Restricted cash and investments	25,136.64	96,396.74	121,533.38
Capital assets - land	6,700.00	29,212.00	35,912.00
Capital assets - net of depreciation	24,862.00	3,788,333.37	3,813,195.37
Capital assets-infrastructure net of depreciation	9,139.00	-	9,139.00
Total noncurrent assets	65,837.64	3,913,942.11	3,979,779.75
Total Assets	351,917.65	4,532,537.89	4,884,455.54
DEFERRED OUTFLOWS OF RESOURCES			
Pensions	4,239.76	10,151.95	14,391.71
Total deferred outflows of resources	4,239.76	10,151.95	14,391.71
LIABILITIES			
Current liabilities:			
Accounts payable	-	570,951.44	570,951.44
Revenues collected in advance	31,802.20	-	31,802.20
Capital debt	3,132.42	26,032.00	29,164.42
Compensated absences payable	1,238.12	3,002.62	4,240.74
Unemployment insurance payable	344.19	-	344.19
Total current liabilities	36,516.93	599,986.06	636,502.99
Noncurrent liabilities:			
Capital debt	3,122.09	700,949.17	704,071.26
Compensated absences payable	1,238.12	3,002.60	4,240.72
Net pension liability	18,478.92	44,247.08	62,726.00
Total noncurrent liabilities	22,839.13	748,198.85	771,037.98
Total Liabilities	59,356.06	1,348,184.91	1,407,540.97
DEFERRED INFLOWS OF RESOURCES			
Pensions	2,962.18	7,092.82	10,055.00
Total deferred inflows of resources	2,962.18	7,092.82	10,055.00
NET POSITION			
Net investment in capital assets	34,446.49	3,090,564.20	3,125,010.69
Restricted for:			
Public safety	13,863.00		13,863.00
Public works	40,377.86		40,377.86
Debt service	-	20,607.00	20,607.00
Replacement and depreciation	-	683.50	683.50
Capital projects	-	75,106.24	75,106.24
Unrestricted	205,151.82	451.17	205,602.99
Total net position	$ 293,839.17	$ 3,187,412.11	$ 3,481,251.28

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Activities
For the Fiscal Year Ended
June 30, 2021

Functions/Programs	Expenses	Program Revenues: Charges for Services	Program Revenues: Operating Grants and Contributions	Program Revenues: Capital Grants and Contributions	Net (Expense) Revenue and Changes in Net Position: Primary Government: Governmental Activities	Primary Government: Business-Type Activities	Primary Government: Total
Primary government:							
Governmental activities:							
General government	$ 48,139.76	$ -	$ 948.01	$ -	$ (47,191.75)		$ (47,191.75)
Public safety	603.00	-	-	-	(603.00)		(603.00)
Public works	49,055.88	8,847.37	27,853.11	-	(12,355.40)		(12,355.40)
Public health	550.00	-	-	-	(550.00)		(550.00)
Culture and recreation	4,370.43	-	3,000.00	-	(1,370.43)		(1,370.43)
Debt service - interest and other charges	205.90	-	-	-	(205.90)		(205.90)
Total governmental activities	102,924.97	8,847.37	31,801.12	-	(62,276.48)		(62,276.48)
Business-type activities:							
Water	101,876.30	94,876.54	1,315.08	-		$ (5,684.68)	(5,684.68)
Sewer	81,385.14	54,856.10	954.91	1,077,496.39		1,051,922.26	1,051,922.26
Garbage	44,296.27	41,855.60	-	-		(2,440.67)	(2,440.67)
Total business-type activities	227,557.71	191,588.24	2,269.99	1,077,496.39		1,043,796.91	1,043,796.91
Total primary government	$ 330,482.68	$ 200,435.61	$ 34,071.11	$ 1,077,496.39	(62,276.48)	1,043,796.91	981,520.43
General revenues:							
Property taxes for general purposes					80,830.75	-	80,830.75
Unrestricted federal/state shared revenues					35,075.46	-	35,075.46
Unrestricted investment earnings					482.69	-	482.69
Miscellaneous					2,716.58	1,751.88	4,468.46
Transfers - net					-	-	-
Total general revenues and transfers					119,105.48	1,751.88	120,857.36
Change in net position					56,829.00	1,045,548.79	1,102,377.79
Net position - beginning					237,010.17	2,142,918.46	2,379,928.63
Restatements					-	(1,055.14)	(1,055.14)
Net position - beginning restated					237,010.17	2,141,863.32	2,378,873.49
Net position - ending					$ 293,839.17	$ 3,187,412.11	$ 3,481,251.28

The notes to the financial statements are an integral part of this statement

FUND FINANCIAL STATEMENTS

Town of Geraldine
Balance Sheet
Governmental Funds
June 30, 2021

	Major Governmental Funds			
		2821		
	General Fund	Gas Tax-special	Total Nonmajor Governmental Funds	Total Governmental Funds
ASSETS				
Current assets				
Cash and investments	$ 205,159.29	$ 15,241.22	$ 45,665.20	$ 266,065.71
Taxes and assessments receivable, net	8,730.07	-	-	8,730.07
Due from other funds	6,676.04	-	-	6,676.04
Due from other governments	4,608.19	-	-	4,608.19
Total current assets	225,173.59	15,241.22	45,665.20	286,080.01
Noncurrent assets				
Restricted cash and investments	25,136.64	-	-	25,136.64
Total noncurrent assets	25,136.64	-	-	25,136.64
Total assets	250,310.23	15,241.22	45,665.20	311,216.65
LIABILITIES				
Current liabilities				
Revenues collected in advance	-	-	31,802.20	31,802.20
Unemployment insurance payable	344.19	-	-	344.19
Total current liabilities	344.19	-	31,802.20	32,146.39
Total liabilities	344.19	-	31,802.20	32,146.39
DEFERRED INFLOWS OF RESOURCES				
Property tax/special assessment revenue	8,730.07	-	-	8,730.07
Total deferred inflows of resources	8,730.07	-	-	8,730.07
FUND BALANCES				
Restricted for:				
Public safety	-	-	13,863.00	13,863.00
Public works	25,136.64	15,241.22	-	40,377.86
Unassigned	216,099.33	-	-	216,099.33
Total fund balances	$ 241,235.97	$ 15,241.22	$ 13,863.00	$ 270,340.19
Total liabilities, deferred inflows of resources and fund balance	$ 250,310.23	$ 15,241.22	$ 45,665.20	$ 311,216.65

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Reconciliation of the Governmental Funds Balance Sheet
to the Statement of Net Position
June 30, 2021

Total fund balances - governmental funds		$	270,340.19
Capital assets used in governmental activities are not financial resources and, therefore, are not reported in the funds.			
Land	6,700.00		
Depreciable capital assets (net)	34,001.00		
			40,701.00
Taxes and Assessments receivable that will be collected but are not available soon enough to pay for current-period expenditures are deferred inflows of resources in the funds.			8,730.07
Long-term liabilities (current and non-current portions) are not due and payable in the current period and therefore are not reported as liabilities in the funds.			
Capital debt	(6,254.51)		
Compensated absences payable	(2,476.24)		
Pension liability	(18,478.92)		
			(27,209.67)
Employer contributions to a plan during the reporting period not recognized as of the plan's measurement date and the proportionate share of collective plan expense that is applicable to future periods are reported as deferred outflows of resouces on the Statement of Net Position.			
Pensions			4,239.76
The proportionate share of reductions to collective plan expense that are applicable to future periods is reported as deferred inflows of resouces on the Statement of Net Position.			
Pensions			(2,962.18)
Total net position - governmental activities		$	293,839.17

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Revenues, Expenditures, and Changes in Fund Balances
Governmental Funds
For Fiscal Year Ended
June 30, 2021

	Major Governmental Funds			
		2821		
	General Fund	Gas Tax-special	Total Nonmajor Governmental Funds	Total Governmental Funds
REVENUES				
Taxes and assessments	$ 93,703.79	$ -	$ -	$ 93,703.79
Intergovernmental	36,106.46	27,853.11	-	63,959.57
Miscellaneous	5,716.58	-	-	5,716.58
Investment earnings	482.69	-	-	482.69
Total revenues	136,009.52	27,853.11	-	163,862.63
EXPENDITURES				
Current:				
General government	46,113.68	-	-	46,113.68
Public safety	603.00	-	-	603.00
Public works	22,510.28	23,842.60	-	46,352.88
Public health	550.00	-	-	550.00
Culture and recreation	3,070.43	-	-	3,070.43
Debt service - principal	6,927.39	-	-	6,927.39
Debt service - interest and other charges	205.90	-	-	205.90
Total expenditures	79,980.68	23,842.60	-	103,823.28
Excess (deficiency) of revenues over (under) expenditures	56,028.84	4,010.51	-	60,039.35
OTHER FINANCING SOURCES (USES)				
Transfers in	-	1,392.66	-	1,392.66
Transfers (out)	(1,392.66)	-	-	(1,392.66)
Total other financing sources (uses)	(1,392.66)	1,392.66	-	-
Net change in fund balance	54,636.18	5,403.17	-	60,039.35
Fund balances - beginning	186,599.79	9,838.05	13,863.00	210,300.84
Fund balances - ending	$ 241,235.97	$ 15,241.22	$ 13,863.00	$ 270,340.19

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Reconciliation of the Statement of Revenues, Expenditures, and
Changes in Fund Balances of Governmental Funds
to the Statement of Activities
For the Fiscal Year Ended
June 30, 2021

Net change in fund balances - total governmental funds		$ 60,039.35
Governmental funds report capital outlays as expenditures. However, in the Statement of Activities, the cost of those assets is allocated over their estimated useful lives and reported as depreciation expense.		
Depreciation expense	(4,921.75)	
		(4,921.75)
Revenues reported in the Statement of Activities that do not provide current financial resources are not reported as revenues in governmental funds:		
Tax and assessment revenue		(4,025.67)
The change in compensated absences payable is reported as an increase or decrease to expense on the Statement of Activities, but is not recognized as an increase or decrease to expenditures on the Statement of Revenues, Expenditures and Changes in Fund Balance:		
Change in compensated absence liability		(509.95)
Repayment of debt principal during the reporting period consumes current financial resources and are recognized as expenditures in the governmental funds, but the repayment of long-term debt principle balances reduces the liability in the Statement of Net Position:		
Long-term debt principal payments		6,927.39
Employer contributions made to pension plans during the reporting period consume current financial resources, thus are reported as expenditures in the Statement of Revenues, Expenditures, and Changes in Fund Balances. However, only the amount of pension expense recognized by the plan during the measurement period is reported as expenses in the Statement of Activities.		(597.38)
The difference between on-behalf contributions to fund pension liabilities recognized as revenue during the reporting period in the Statement of Revenues, Expenditures, and Changes in Fund Balances and on-behalf contributions recognized during the measurement period increases (decreases) operating grants and contributions reported on the Statement of Activities.		(82.99)
Change in net position - Statement of Activities		$ 56,829.00

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Net Position
Proprietary Funds
June 30, 2021

	Business-Type Activities			
	Major Enterprise Funds			
	5210 Water	5310 Sewer	5410 Garbage	Total Enterprise Funds
ASSETS				
Current assets				
Cash and investments	$ 125,188.08	$ 12,221.41	$ -	$ 137,409.49
Taxes and assessments receivable, net	566.17	-	5,400.00	5,966.17
Accounts receivable	8,170.71	4,850.77	514.20	13,535.68
Due from other governments	-	468,360.48	-	468,360.48
Total current assets	133,924.96	485,432.66	5,914.20	625,271.82
Noncurrent assets				
Restricted cash and investments	20,124.00	76,272.74	-	96,396.74
Capital assets - land	5,512.00	23,700.00	-	29,212.00
Capital assets - net of depreciation	1,247,045.33	2,541,288.04	-	3,788,333.37
Total noncurrent assets	1,272,681.33	2,641,260.78	-	3,913,942.11
Total assets	1,406,606.29	3,126,693.44	5,914.20	4,539,213.93
DEFERRED OUTFLOWS OF RESOURCES				
Pensions	5,881.37	4,270.58	-	10,151.95
Total deferred outflows of resources	5,881.37	4,270.58	-	10,151.95
LIABILITIES				
Current liabilities				
Accounts payable	-	570,951.44	-	570,951.44
Due to other funds	-	-	6,676.04	6,676.04
Capital debt	13,872.00	12,160.00	-	26,032.00
Compensated absences payable	1,747.45	1,255.17	-	3,002.62
Total current liabilities	15,619.45	584,366.61	6,676.04	606,662.10
Noncurrent liabilities				
Capital debt	138,599.73	562,349.44	-	700,949.17
Compensated absences payable	1,747.44	1,255.16	-	3,002.60
Net pension liability	25,633.83	18,613.25	-	44,247.08
Total noncurrent liabilities	165,981.00	582,217.85	-	748,198.85
Total liabilities	181,600.45	1,166,584.46	6,676.04	1,354,860.95
DEFERRED INFLOWS OF RESOURCES				
Pensions	4,109.11	2,983.71	-	7,092.82
Total deferred inflows of resources	4,109.11	2,983.71	-	7,092.82
NET POSITION				
Net investment in capital assets	1,100,085.60	1,990,478.60	-	3,090,564.20
Debt service	20,124.00	483.00	-	20,607.00
Replacement and depreciation	-	683.50	-	683.50
Capital projects	-	75,106.24	-	75,106.24
Unrestricted	106,568.50	(105,355.49)	(761.84)	451.17
Total net position	$ 1,226,778.10	$ 1,961,395.85	$ (761.84)	$ 3,187,412.11

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Revenues, Expenses, and Changes in Net Position
Proprietary Funds
For Fiscal Year Ended
June 30, 2021

	Business-Type Activities			
	Major Enterprise Funds			
	5210 Water	5310 Sewer	5410 Garbage	Totals
OPERATING REVENUES				
Charges for services	$ 96,614.42	$ 54,856.10	$ 41,855.60	$ 193,326.12
Miscellaneous revenues	-	-	14.00	14.00
On-behalf - pensions	1,315.08	954.91	-	2,269.99
Total operating revenues	97,929.50	55,811.01	41,869.60	195,610.11
OPERATING EXPENSES				
Personal services	26,672.37	14,215.46	-	40,887.83
Supplies	23,320.97	935.91	9.95	24,266.83
Purchased services	4,887.02	2,706.50	33,937.61	41,531.13
Building materials	2,491.63	-	10,348.71	12,840.34
Depreciation	37,671.66	59,085.55	-	96,757.21
Total operating expenses	95,043.65	76,943.42	44,296.27	216,283.34
Operating income (loss)	2,885.85	(21,132.41)	(2,426.67)	(20,673.23)
NON-OPERATING REVENUES (EXPENSES)				
Debt service interest expense	(6,832.65)	(4,441.72)	-	(11,274.37)
Total non-operating revenues (expenses)	(6,832.65)	(4,441.72)	-	(11,274.37)
Income (loss) before contributions, transfers, special & extraordinary items	(3,946.80)	(25,574.13)	(2,426.67)	(31,947.60)
Capital contributions	-	1,077,496.39	-	1,077,496.39
Change in net position	(3,946.80)	1,051,922.26	(2,426.67)	1,045,548.79
Net position - beginning	1,231,780.04	909,473.59	1,664.83	2,142,918.46
Restatements	(1,055.14)	-	-	(1,055.14)
Net position - beginning restated	1,230,724.90	909,473.59	1,664.83	2,141,863.32
Net position - ending	$ 1,226,778.10	$ 1,961,395.85	$ (761.84)	$ 3,187,412.11

The notes to the financial statements are an integral part of this statement.

Town of Geraldine
Statement of Cash Flows
Proprietary Fund
For Fiscal Year Ended
June 30, 2021

	Business-type Activities			
	Major Enterprise Funds			
	5210 Water	5310 Sewer	5410 Garbage	Total Enterprise Funds
Cash Flows from Operating Activities:				
Cash received from customers	$ 96,796.37	$ 55,470.58	$ 38,955.10	$ 191,222.05
Cash received from miscellaneous sources	-	-	14.00	14.00
Cash paid to suppliers of goods and services	(30,699.62)	498,537.90	(44,296.27)	423,542.01
Cash paid to employees	(23,399.70)	(11,980.13)	-	(35,379.83)
Net cash provided (used) by operating activities	42,697.05	542,028.35	(5,327.17)	579,398.23
Cash Flows from Non-Capital and Related Financing Activities:				
Short-term loans from other funds	-	-	5,327.17	5,327.17
Net cash provided (used) by non-capital and related financing activities	-	-	5,327.17	5,327.17
Cash Flows from Capital and Related Financing Activities:				
Principal paid on capital debt	(13,291.35)	(506,574.29)	-	(519,865.64)
Proceeds from capital debt	-	1,045,284.29	-	1,045,284.29
Interest paid on capital debt	(6,832.65)	(4,441.72)	-	(11,274.37)
Acquisition and construction of capital assets	(0.00)	(1,646,941.30)	-	(1,646,941.30)
Capital Contributions received	-	633,694.54	-	633,694.54
Net cash provided (used) by non-capital and related financing activities	(20,124.00)	(478,978.48)	-	(499,102.48)
Net increase (decrease) in cash and cash equivalents	22,573.05	63,049.87	0.00	85,622.92
Cash and cash equivalents as of:				
June 30, 2020	122,739.03	25,444.28	-	148,183.31
June 30, 2021	$ 145,312.08	$ 88,494.15	$ 0.00	$ 233,806.23
Displayed on Statement of Net Position-Proprietary Funds as:				
Cash and investments	$ 125,188.08	$ 12,221.41	$ -	$ 137,409.49
Restricted cash and investments	20,124.00	76,272.74	-	96,396.74
Total at end of year	$ 145,312.08	$ 88,494.15	$ -	$ 233,806.23
Reconciliation of operating income to net cash provided by operating activity:				
Operating income (loss)	$ 2,885.85	$ (21,132.41)	$ (2,426.67)	$ (20,673.23)
Adjustments to reconcile operating income to net cash provided (used) by operating activities:				
Depreciation expense	37,671.66	59,085.55	-	96,757.21
Change in assets, deferred outflows of resources, liabilities, and deferred inflows of resources:				
(Increase) decrease in assessments receivable	(566.17)	-	(2,904.00)	(3,470.17)
(Increase) decrease in accounts receivable	748.12	614.48	3.50	1,366.10
Increase (decrease) in warrants/accounts payable	-	502,180.31	-	502,180.31
Increase (decrease) in compensated absences payable	735.36	519.72	-	1,255.08
Increase (decrease) in net pension liability	4,253.49	2,968.81	-	7,222.30
(Increase) decrease in deferred outflows-pension	(2,295.70)	(1,646.87)	-	(3,942.57)
Increase (decrease) in deferred inflows-pension	(735.56)	(561.24)	-	(1,296.80)
Net cash provided (used) by operating activities	$ 42,697.05	$ 542,028.35	$ (5,327.17)	$ 579,398.23
Schedule of non-cash transactions				
Depreciation	37,671.66	59,085.55	-	96,757.21

The notes to the financial statements are an integral part of this statement.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The financial statements of the Town have been prepared in conformity with accounting principles generally accepted in the United States of America (US GAAP) as applied to governmental units. The Governmental Accounting Standards Board (GASB) is the accepted standard-setting body for governmental accounting and financial reporting principles.

For the fiscal year ending June 30, 2021, the government adopted the provisions of the following new accounting pronouncements issued by the GASB:

GASB Statement No. 84, *Fiduciary Activities.* This Statement establishes criteria for identifying fiduciary activities of all state and local governments and provides for recognition of a liability to the beneficiaries in a fiduciary fund when an event has occurred that compels the government to disburse fiduciary resources.The focus of the criteria generally is on (1) whether a government is controlling the assets of the fiduciary activity and (2) the beneficiaries with whom a fiduciary relationship exists. Separate criteria are included to identify fiduciary component units and postemployment benefit arrangements that are fiduciary activities.

GASB Statement No. 90, *Majority Equity Interests* . This Statement defines a majority equity interest and specifies that a majority equity interest in a legally separate organization should be reported as an investment if a government's holding of the equity interest meets the definition of an investment and requires that a component unit in which a government has a 100% equity interest account for its assets, deferred outflows of resources, liabilities, and deferred inflows of resources at acquisition value at the date the government aquired a 100% equity interest in the component unit.

GASB Statement No. 93, *Interbank Offered Rates* (except LIBOR removal and lease modification requirements). This Statement is to address those and other accounting and financial reporting implications that result from the replacement of an interbank offered rate (IBOR) as the reference rate for certain hedging derivative instruments.

The Town's significant accounting policies are described below.

A. Reporting Entity

The Town of Geraldine is a political subdivision of the State of Montana governed by a Mayor and Council (Commission) duly elected by the registered voters of the Town. The accompanying financial statements present the primary government.

GASB Statement No. 14, as amended, sets forth the criteria for and reporting component units. The Town has determined there are no outside entity's that meet the criteria set forth by the GASB that would require the Town to include such entities as a blended or discretely presented component unit in the Town's financial statements.

B. Basis of Presentation

Government-Wide Financial Statements
The government-wide financial statements (i.e., the Statement of Net Position and the Statement of Activities) report information of the primary government. They include all funds of the primary government except fiduciary funds. Governmental activities are financed by taxes, intergovernmental revenues, and other non-exchange revenues. Business-type Activities are financed, in whole or in part, by fees charged to external parties for goods or services.

The Statement of Net Position presents the financial condition of the governmental and business-type activities of the Town at year-end. As a general rule, interfund activities, interfund payables and receivables, have been removed from this statement except those representing balances between the governmental activities and the business-type activities, which are presented as internal balances and eliminated in the total primary government column. Exceptions to this general rule are payments-in-lieu of taxes and other charges between the governments' enterprise functions and various other functions of the government. Elimination of these charges would distort the direct costs and program revenues reported for the various functions.

The Statement of Activities demonstrates the degree to which the direct expenses of a given function or program are offset by program revenues. Direct expenses are those that are clearly identifiable with a specific function. Program revenues include: 1) charges to customers who purchase, use, or directly benefit from goods, services, or privileges provided by a given function and 2) grants and contributions that are restricted to meeting the operational or capital requirements of a particular function. Taxes revenues and other items not properly included among program revenues are reported as general revenues. The Town does not allocate indirect expenses to functions or programs.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

B. Basis of Presentation-cont.

Fund Financial Statements

Unlike a private business, which is accounted for as a single entity, a governmental unit is accounted for through several separate funds. A fund is a fiscal and accounting entity with a self-balancing set of accounts. Fund accounting segregates specific activities according to their intended purpose and is used to aid management in demonstrating compliance with finance-related, legal, and contractual provisions. Funds are classified into three categories: governmental, proprietary, and fiduciary. Each fund category presents separate fund financial statements. The fund financial statements presenting a fund category may contain one or more 'fund types'. The governmental and proprietary fund financial statements emphasis is on major funds.

Each major fund is reported in a separate column in the respective fund financial statements. A fund is considered major if it is the primary operating fund of the Town or meets the following criteria:

a. Total assets and deferred outflows of resources, the total liabilities and deferred inflows of resources, revenues, or expenditures/expenses of that individual governmental or enterprise fund are at least 10 percent of the corresponding total for all funds of that category or type; and

b. The same element(s) that met the 10 percent criterion above is at least 5 percent of the corresponding total for all governmental and enterprise funds combined.

Per GAAP, the government's officials are allowed to present any individual fund that does not meet the criteria as a major fund in the respective fund financial statements if they believe the fund is particularly important to financial statement users.

All of the remaining funds are aggregated and reported in the respective governmental and proprietary fund financial statements in a single column as 'nonmajor funds'.

The Town maintains the minimum number of governmental funds consistent with legal and managerial requirements.

The Town reports the following major governmental funds:

General Fund - The general fund is the primary operating fund of the Town. It accounts for all financial resources traditionally associated with the Town's operations except those required to be accounted for in other funds.

Gas Tax-special Fund - A special revenue fund that accounts for state shared revenue and the Town match restricted for operations and maintenance of roads and bridges.

The Town reports the following major proprietary funds:

Water Fund - An enterprise fund used to account for the operating and nonoperating revenues and expenses of the public water utility system.

Sewer Fund - An enterprise fund used to account for the operating and nonoperating revenues and expenses of the public sewer utility system.

Garbage Fund - An enterprise fund used to account for the operating and nonoperating revenues and expenses of solid waste disposal.

The Governmental Accounting Standards Board (GASB) issued Statement No. 62. The Statement codifies the requirements of all pre-November 30, 1989 FASB and AICPA pronouncements that apply to state and local governments. The government has adopted and applied the provisions of GASB Statement No. 62 to both the government-wide and proprietary fund financial statements. Governments may continue to apply post-November 30, 1989 FASB pronouncements or other accounting literature that do not conflict with or contradict with GASB pronouncements, including Statement No. 62.

C. Measurement Focus and Basis of Accounting

The government-wide financial statements and the proprietary fund financial statements are reported using the economic resources measurement focus and the accrual basis of accounting. Revenues are recorded when earned, except for grant revenue and similar voluntary nonexchange revenues received prior to meeting imposed time requirements. Property tax revenue is recognized when levied. Expenses are recorded when a liability is incurred, regardless of the timing of related cash flows.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

C. Measurement Focus and Basis of Accounting-cont.

The Statement of Revenues, Expenses, and Changes in Net Position-Proprietary Funds, distinguishes operating revenues and expenses from nonoperating items. Operating revenues and expenses generally result from providing services and producing and delivering goods in connection with a proprietary fund's principal ongoing operations. Revenues of proprietary funds are defined as operating vs nonoperating based on how individual transactions are categorized on the statement of cash flows for proprietary funds. All cash receipts that do not result from transactions defined as operating activities are considered nonoperating and reported on the statement of cash flows as capital and related financing, noncapital financing, or investing activities.

Governmental fund financial statements are reported using the current financial resources measurement focus and the modified accrual basis of accounting. Under this method, revenues are recognized when measurable and available. “Measurable” means the amount of the transaction can be determined. “Available” means collectible within the current period or soon enough thereafter to be used to pay liabilities of the current period.

The Town considers revenues to be available if they are collected within 60 days of the end of the current fiscal period. Property taxes, license, and interest associated with the current fiscal period are all considered to be susceptible to accrual and so have been recognized as revenues of the current fiscal period. Only the portion of special assessments receivable due within the current fiscal period are considered to be susceptible to accrual as revenue of the current period. Entitlements and shared revenues are recorded at the time of receipt or earlier if the susceptible to accrual criteria is met.
Property tax revenue is considered available upon receipt. Taxes and assessments receivable due within the current period and remaining uncollected at year end are offset by deferred tax/assessment revenue, a deferred inflow of resources account, since they are not considered available to pay liabilities of the current period. All other revenue items, other than grant revenue and similar voluntary nonexchange revenues, are considered to be both measurable and available only when cash is received by the government.

Expenditures are recorded when the related fund liability is incurred, except for principal and interest on general long-term debt, claims and judgments, and compensated absences, which are recognized as expenditures to the extent they have matured. General capital asset acquisitions are reported as expenditures in governmental funds. Issuance of general long-term debt and acquisitions under capital leases are reported as other financing sources.

Both financial statements presented on the accrual basis and modified accrual basis of accounting recognize grant revenue and similar voluntary nonexchange revenues, pending purely routine requirements such as filing reimbursement and/or progress reports where all eligibility requirements other than time requirements imposed by the provider have been met, as revenue of the current period. Grant revenue and similar voluntary nonexchange revenues received prior to meeting imposed time requirements but after all eligibility requirements are met, are offset by deferred grant revenues, a deferred inflows of resources account, until use is required or first permitted.

D. Assets, deferred outlflows of resources, liabilities, deferred inflows of resources, and fund balance/net position

1. Deposits and investments

Allowable deposit and investment of public funds is governed by Title 7, Chapter 6, Part 2 of the Montana Code Annotated (MCA). Deposits and investments may include demand, time, and savings deposits, direct obligations of the United States Government, securities issued by agencies of the United States, investments in the Montana Short-Term Investment Program (STIP), repurchase agreements, and registered warrants.

In the statement of cash flows for proprietary funds, the term cash and cash equivalents is used. Cash equivalents are short-term, highly liquid investments that are both readily convertible to known amounts of cash, and investments with original maturities of three months or less at the time of purchase.

Investments, with limited exceptions, are reported at fair value. Investments in nonparticipating certificates of deposit are reported at cost. Money market investments, including U.S. Treasury and Agency obligations, that mature within one year of acquisition are reported at amortized cost. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is determined annually, and requires the use of valuation techniques, a specific method or combination of methods using one or more of three approaches: market, cost or income approach.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

D. Assets, deferred outlflows of resources, liabilities, deferred inflows of resources, and fund balance/net position-cont.

2. Receivables and payables

Accounts receivables are shown net of allowance for uncollectible amounts. Property tax receivables are offset by deferred inflows of resource accounts since they are not available to pay liabilities of the current period. All property tax levies are set at the time of the adoption of the annual budget. The real estate taxes are payable in two installments, the first due by November 30 and the second by May 31. Personal property taxes are assessed in April or May and are payable within 30 days of the issuance of the notice.

Activity between funds that are representative of lending/borrowing arrangements outstanding at fiscal year-end are presented as "due to/due from other funds".

3. Restricted assets

Certain assets of the enterprise funds are restricted for specific use as required by the bond indenture agreement covenants established with the issuance and sale of the revenue bonds representing a liability to the enterprise funds. These restricted assets represent cash and cash equivalents restricted for use to establish a reserve for future debt, to establish a replacement and depreciation reserve for the purpose of replacing the system's short lived assets in the future, and cash held restricted to capital projects.

4. Capital assets

Capital assets which include property, plant, equipment, and infrastructure are reported in the applicable governmental or business-type activities columns in the government-wide financial statements. Capital assets, other than infrastructure assets, are defined by the Town as assets with an initial cost of more than $5,000 and an estimated useful life of three years or more. Such assets are recorded at historical cost. Donated capital assets are recorded at acquisition value at the date of donation.

Generally accepted accounting principles (GAAP) require the recording of infrastructure assets (i.e. roads, bridges, and similar assets). The Town [did] [did not] meet the required annual revenue limitation as set forth by the GASB for retroactive reporting of such assets. However, prospectively the Town does capitalize new construction of infrastructure assets in accordance with the standard.

The costs of normal maintenance and repairs that do not add to the value of the asset or materially extend assets lives are not capitalized.

GAAP also requires Town management to estimate the useful life of capital assets and record annual depreciation expense using the straight-line depreciation method . These estimates affect the reported amounts of capital assets -net of depreciation. The range of estimated useful lives of property, plant, equipment, and infrastructure assets are as follows :

Buildings	30 years
Improvement other than Buildings	15 - 50 years
Machinery & Equipment	7 - 20 years
Infrastructure	15 years
Utility Systems (i.e. source of supply, plants, transmission & distribution)	50 years

5. Deferred outflows of resources

Deferred outflow of resources is a financial statement element. A deferred outflow of resources is a consumption of net assets by the government that is applicable to a future reporting period. The government-wide statement of net position, proprietary fund statement of net position, and governmental fund balance sheet report a separate section for deferred outflows of resources.

Deferred outflows of resources are disclosed by type on the face of the financial statements and in the respective notes to the financial statements to augment understanding of the deferral.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

D. Assets, deferred outlflows of resources, liabilities, deferred inflows of resources, and fund balance/net position-cont.

6. Revenues Collected in Advance

The Town reports $31,802.20 as revenues collected in advance, a liability account. The amount represents American Rescue Plan Act (ARPA) federal resources received during the fiscal year. GASB Statement No. 33 requires that resources from government voluntary nonexchange transactions received in advance of meeting all eligibility requirements, including time requirements, be reported as a liability. The Town has until the end of December 2024 to incurr and obligate the resources received in accordance with the purpose restrictions set forth by the ARPA, and by December 31, 2026 all work must be completed and the resources must be expended to cover the obligations. The Town will recognize the ARPA revenue in the fiscal year the expenditure/expense is recorded. Unexpended resources at January 1, 2027 must be returned to the Federal Department of Treasury..

7. Long-term obligations

In the government-wide financial statements and in proprietary fund types in the fund financial statements, long-term debt and other long-term obligations are reported as liabilities in the applicable governmental activity or business-type activity column or proprietary fund financial statement. Principal payments on long-term obligations due within the next fiscal year are reported as current liabilities. Bond premiums and discounts are deferred and amortized over the life of the bond issue using the straight-line method that approximates the effective interest method. Bonds payable are reported net of the applicable bond premium or discount. Bond issuance costs, except for prepaid insurance costs, are expensed in the reporting period in which they are incurred. Prepaid insurance costs are expensed over the life of the debt.

In the governmental fund financial statements, governmental funds recognize bond premiums and discounts, as well as bond issuance costs, during the current period. The face amount of debt issued is reported as other financing sources. Premiums received on debt issuances are reported as other financing sources while discounts on debt issuance are reported as other financing uses. Issuance costs, whether or not withheld from the actual debt proceeds received, are reported as debt service expenditures.

8. Compensated absences

As required by State law, the Town allows employees to accumulate earned vacation and sick leave benefits.

Vacation Leave: Full time employees earn vacation leave at the rate of 15 working days per year for the first 10 years of service. Employees with 10 to 20 years of service earn vacation leave at an increasing rate, to a maximum rate of 24 working days per year after 20 years of service. Employees may accumulate a total not to exceed two times the maximum number of days earned annually as of the end of the first pay period of the next calendar year.

Sick Leave: Full time employees earn sick leave at the rate of 12 working days per year. There is no restriction as to the number of working days that may be accumulated. Upon termination, employees in good standing are entitled to a cash payout of 25% of their sick leave balance.

Such amounts are reported in the Town's government-wide financial statements and in proprietary fund types in the fund financial statements as an expense and a liability for compensated absences as the leave is earned. The portion of accumulated leave that is estimated to be used within the next fiscal year is presented as a current liability.

In the governmental fund financial statements, governmental funds report vacation and sick leave as expenditures when used.

9. Deferred inflows of Resources

A deferred inflow of resources is an acquisition of net assets by the government that is applicable to a future reporting period. The government-wide statement of net position, proprietary fund statement of net position, and governmental fund balance sheet report a separate section for deferred inflows of resources.

Deferred inflows of resources are disclosed by type on the face of the financial statements and in the respective notes to the financial statements to augment understanding of the deferral.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

D. Assets, deferred outlflows of resources, liabilities, deferred inflows of resources, and fund balance/net position-cont.

10. Restatements/Prior Period Adjustments

The Town reports a restatement/prior period adjustment to beginning net position in the water fund of $1,055.14. The Town restated prior year(s) debt service interest expense and the offset was an increase in the outstanding principal balance on capital debt at fiscal year-end.

11. Net Position/Fund Balance

Net Position

The government-wide and proprietary fund financial statements report net position. Net position represents the difference between assets plus deferred outflow of resources and liabilities plus deferred inflows of resources. Components of net position are net investment in capital assets, restricted, and unrestricted.

Net investment in capital assets consists of capital assets net of accumulated depreciation plus capital related deferred outflows of resources, less the outstanding balance of any related borrowing used for the acquisition, construction, or improvement of those assets and capital related deferred inflows of resources.

Restricted net position represents constraints on resources that can be spent only for specific purposes which are externally imposed either by: a) providers such as creditors, grantors, contributors, and laws/regulations of other governments; or b) imposed by law through constitutional provisions or enabling legislation.

Unrestricted net position is any portion of net position that does not meet the definition of net investment in capital assets and restricted.

The Town applies restricted resources first for purposes for which both restricted and unrestricted net position are available.

Fund Balances

The governmental fund financial statements report fund balance. Fund balance is composed of five classifications designed to disclose the hierarchy of constraints that control how specific amounts can be spent. See Note 3. G. and H. for further information on fund balance classifications and the Town's spending hierarchy.

NOTE 2. COMPLIANCE AND ACCOUNTABILITY

A. Budgetary Information

The Town adopts an annual budget for each of its funds in accordance with Title 7, Chapter 6, Part 40 of the Montana Code Annotated. Statute requires the preparation of a preliminary budget, public hearings on the preliminary budget and adoption of the budget by the later of the first Thursday after the first Tuesday in September or within 30 calendar days of the receipt of the certified taxable valuations from the Department of Revenue. The Town must also submit a copy of the final budget to the Department of Administration by the later of October 1 or 60 days after the receipt of taxable values from the Department of Revenue.

Appropriations are created by fund, function, and activity and may further be detailed by department. State statute limits the incurrence of fund obligations or making of expenditures from the fund to the amount of the fund's total appropriations in the final budget as adopted or as amended. Expenditure limitations imposed by law extend to the department level which is identified as the legal level of budgetary control. Budget transfers may be made by designated individuals between and among the general classifications of operations, provided that total expenditures do not exceed the fund's total budgeted appropriations as adopted or amended.

Budget transfers and amendments are authorized by law, and in some instances, may require further public hearings and a majority vote of the governing board. Budget amendments providing for additional appropriations required to be passed by resolution must identify the resource, such as unanticipated/unbudgeted revenue received or fund reserves, that will be used to finance the appropriation.

The 'original' budgeted amounts reported on the fund's Budget and Actual statement represent the original adopted budget. The 'final' budgeted amounts may differ as the amount includes all transfers and amendments made during the fiscal year subsequent to the adoption of the original budget and represents the final budget for the fiscal year.

B. Excess of expenditures over appropriations

At fiscal year-end the Town had no funds where expenditures exceeded total appropriations.

C. Deficit fund equity

At fiscal year-end the Town's garbage fund had a deficit fund equity balance in the amount of $761.84. During the current fiscal year, the Town loaned, on a short-term basis, $6,676.04 from the general fund to cover the garbage fund's operating costs. The Town will consider raising assessments to eliminate the deficit fund equity.

NOTE 3. DETAILED NOTES ON ALL FUNDS

A. Deposits and Investments

At year end, the Town's cash, cash equivalents and investments are reported in the basic financial statements as follows:

Governmental Activities		291,202.35
Business-Type Activities		233,806.23
Total cash, cash equivalents and investments	$	525,008.58

The composition of cash and investments held by the Town at fiscal year-end is as follows:

	June 30, 2021
Deposits	
Demand deposits, savings deposits, and/or certificate of deposits	525,008.58
Total deposits	$ 525,008.58

Custodial Credit Risk-Deposits
The custodial credit risk for deposits is the risk that, in the event of the failure of a depository financial institution, a government will not be able to recover deposits or will not be able to recover pledged (collateral) securities that are in the possession of an outside party.

The Town does not have a formal deposit policy that addresses custodial credit risk.

B. Interfud receivables and payables

Due from/Due to other funds and Advance to/Advance from other funds consist(s) of the following:

Due from other Funds		**Due to other Funds**	
Fund Name	Amount	Fund Name	Amount
General Fund	6,676.04	Garbage Fund	6,676.04
Total	6,676.04	Total	6,676.04

The general fund made a short-term loan to the garbage fund to eliminate a negative cash balance in the garbage fund. The loan will be paid back with future special assessment revenue.

NOTE 3. DETAILED NOTES ON ALL FUNDS

C. Capital assets

The Town's capital asset activity for the fiscal year ended June 30, 2021 is as follows:

	Balance as of 6/30/2020	Acquisitions/ Increases	Reclassifications	Balance as of June 30, 2021
Governmental activities:				
Capital assets not being depreciated				
Land	6,700			6,700
Total capital assets not being depreciated	$ 6,700	$ -	$ -	$ 6,700
Capital assets being depreciated				
Buildings	12,000			12,000
Improvements other than buildings	34,550			34,550
Machinery and equipment	173,389			173,389
Infrastructure	10,545			10,545
Total capital assets being depreciated	$ 230,484	$ -	$ -	$ 230,484
Less accumulated depreciation for:				
Buildings	(12,000)			(12,000)
Improvements other than buildings	(20,550)	(2,000)		(22,550)
Machinery and equipment	(158,308)	(2,219)		(160,527)
Infrastructure	(703)	(703)		(1,406)
Total accumulated depreciation	$ (191,561)	$ (4,922)	$ -	$ (196,483)
Total capital assets being depreciated	$ 38,923	$ (4,922)	$ -	$ 34,002
Governmental activities capital assets net	$ 45,623	$ (4,922)	$ -	$ 40,702
Business-type activities:				
Capital assets not being depreciated				
Land	29,212			29,212
Construction in progress	423,859		(423,859)	-
Total capital assets not being depreciated	$ 453,071	$ -	$ (423,859)	$ 29,212
Capital assets being depreciated				
Buildings	38,738			38,738
Improvements other than buildings	603,049			603,049
Machinery and equipment	-	16,500		16,500
Pumping plant	1,209,035			1,209,035
Treatment plant	785,022	603,570		1,388,592
Transmission and distribution	400,620	1,026,871	423,859	1,851,350
Total capital assets being depreciated	$ 3,036,464	$ 1,646,941	$ 423,859	$ 5,107,264
Less accumulated depreciation for:				
Buildings	(23,243)	(1,291)		(24,534)
Improvements other than buildings	(438,588)	(4,436)		(443,024)
Machinery and equipment	-	(2,050)		(2,050)
Pumping plant	(357,224)	(24,181)		(381,405)
Treatment plant	(266,907)	(27,772)		(294,679)
Transmission and distribution	(136,211)	(37,027)		(173,238)
Total accumulated depreciation	$ (1,222,173)	$ (96,758)	$ -	$ (1,318,930)
Total capital assets being depreciated	$ 1,814,291	$ 1,550,183	$ 423,859	$ 3,788,334
Business-Type activities capital assets net	$ 2,267,362	$ 1,550,183	$ -	$ 3,817,546

Depreciation expense was charged to functions/programs of the primary government as follows:

Governmental activities:	
General government	919
Public works	2,703
Culture and recreation	1,300
Total depreciation expense - governmental activities	$ 4,922
Business-type activities:	
Water utilities	37,672
Sewer utilities	59,086
Total depreciation expense - business-type activities	$ 96,758

NOTE 3. DETAILED NOTES ON ALL FUNDS

D. Long-term debt

GASB Statement No. 88 defines debt as a liability that arises from a contractual obligation to pay cash (or other assets that may be used in lieu of cash) in one or more payments to settle an amount that is fixed at the date the contractual obligation is established.

Debt obligations are classified as either direct borrowings (when a government engages in a loan with a lender for funding (e.g. bank, credit union, private mortgage company, etc.), direct placements (when a government issues a debt security directly to an investor), or other debt.

During the year ended June 30, 2020, the following changes occurred in long-term debt:

Governmental Activities

	Balance as of 6/30/2020	Additions	Deletions	Adjustment	Balance as of June 30, 2021	Due Within One Year
Notes/Loans payable	$ 13,181.90		(6,927.39)	-	6,254.51	3,132.42
Compensated Absences payable	1,966.29	509.95		-	2,476.24	1,238.12
Total	$ 15,148.19	509.95	(6,927.39)	-	8,730.75	4,370.54

Notes/Loans Debt - direct borrowings

Purpose	Issue Date	Interest Rate	Term of years	Final maturity	Amount issued	Outstanding June 30, 2021
Intercap-Sidewalks	December-12	1.65%-3.37%	10 years	February-23	30,000	6,255
			Total notes/loans/contracts		$ 30,000	$ 6,255

Debt service requirements on notes/loans/contract debt are as follows:

	Governmental Activities		
For Fiscal Year Ended	Principal	Interest	Total Payments
2022	3,133	90	3,223
2023	3,122	38	3,160
Total	$ 6,255	$ 129	$ 6,384

Business-type Activities

	Balance as of 6/30/2020	Additions	Deletions	Adjustment	Balance as of June 30, 2021	Due Within One Year
Revenue bonds	$ 176,707.94	577,764.66	(28,546.57)	1,055.14	726,981.17	26,032.00
Notes/Loans payable	23,799.44	467,519.63	(491,319.07)	-	-	-
Compensated Absences payable	4,750.14	1,255.08	-	-	6,005.22	3,002.61
Total	$ 205,257.52	1,046,539.37	(519,865.64)	1,055.14	732,986.39	29,034.61

Revenue Bond Debt - direct placements

Revenue bonds are payable from the collection of fees charged for services. The fees collected are expected to produce amounts sufficient to pay all principal of and interest on the bonds when due. The bonds are issued with specific maturity dates and interest rates.

Purpose	Issue Date	Interest Rate	Term of years	Final maturity	Bonds issued	Outstanding June 30, 2021
Water RD Bond #1	July-03	4.250%	40	November-41	140,200	100,716
Water RD Bond #2	June-05	4.250%	20	December-23	103,500	18,489
Water RD Bond #4	April-04	4.375%	40	March-29	95,000	33,267
Sewer RD Bond #6	March-21	1.250%	40	October-58	606,000	574,509
				Total revenue bonds	$ 804,500	$ 726,981

NOTE 3. DETAILED NOTES ON ALL FUNDS

D. Long-term debt-cont.

Revenue Bond Debt - direct placements-cont.

Debt service requirements on revenue bond debt are as follows:

	Business-Type Activities		
For Fiscal Year Ended	Principal	Interest	Total Payments
2022	26,032	13,364	39,396
2023	26,791	12,605	39,396
2024	23,941	11,880	35,821
2025	20,382	11,310	31,692
2026	20,882	10,810	31,692
2027-2031	100,916	46,477	147,393
2032-2036	96,933	36,327	133,260
2037-2041	107,733	25,527	133,260
2042-2046	83,365	16,368	99,733
2047-2051	85,192	11,168	96,360
2052-2056	90,684	5,676	96,360
2057-2061	44,128	668	44,796
Total	$ 726,981	$ 202,178	$ 929,159

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. Pension Plan(s) within the scope of GASB Statement No. 68, as amended

In accordance with GASB Statement 68, *Accounting and Financial Reporting for Pensions*, the Town and the non-employer contributing entity are required to recognize and report certain amounts associated with participation in the Public Employees' Retirement System Defined Benefit Retirement Plan (the Plan). This includes the proportionate share of the collective Net Pension Liability; Pension Expense; and Deferred Outflows and Deferred Inflows of Resources associated with pensions. For the fiscal year ending June 30, 2021, the Town reports amounts as determined by an actuarial valuation with a measurement date of June 30, 2020.

Summary of Significant Accounting Policies

MPERA prepared financial statements using the accrual basis of accounting. The same accrual basis was used by MPERA for the purposes of determining the Net Pension Liability (NPL); Deferred Outflows of Resources and Deferred Inflows of Resources related to pensions; Pension Expense; the Fiduciary Net Position; and, Additions to or Deductions from Fiduciary Net Position. Member contributions are recognized in the period in which contributions are due. Employer contributions are recognized when due and the employer has made a formal commitment to provide the contributions. Revenues are recognized in the accounting period they are earned and become measurable. Benefit payments and refunds are recognized in the accounting period in which they are due and payable in accordance with the benefit terms. Expenses are recognized in the period incurred. Investments are reported at fair value. MPERA adhered to all accounting principles generally accepted by the United States of America. MPERA applied all applicable pronouncements of the Governmental Accounting Standards Board (GASB).

General Information about the Pension Plan

Plan Description: The PERS-Defined Benefit Retirement Plan (DBRP), administered by the Montana Public Employee Retirement Administration (MPERA), is a multiple-employer, cost-sharing plan established July 1, 1945, and governed by Title 19, chapters 2 & 3, Montana Code Annotated (MCA). This plan provides retirement benefits to covered employees of the State, and local governments, and certain employees of the Montana University System, and school districts. Benefits are established by state law and can only be amended by the Legislature.

All new members are initially members of the PERS-DBRP and have a 12-month window during which they choose to remain in the PERS-DBRP or join the PERS-DCRP by filing an irrevocable election. Members may not be participants of both the *defined benefit* and *defined contribution* retirement plans. All new members from the universities also have a third option to join the university system's Montana University System Retirement Program (MUS-RP).

Benefits provided: The PERS-DBRP provides retirement, disability, and death benefits to plan members and their beneficiaries. Benefits are based on eligibility, years of service, and highest average compensation (HAC). Member rights are vested after five years of service.

Service retirement:

- Hired prior to July 1, 2011:
  - Age 60, 5 years of membership service
  - Age 65, regardless of membership service
  - Any age, 30 years of membership service
- Hired on or after July 1, 2011:
  - Age 65, 5 years of membership service
  - Age 70, regardless of membership service

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. Pension Plan(s) within the scope of GASB Statement No. 68, as amended-cont.

Early Retirement:

- Hired prior to July 1, 2011:
  - Age 50, 5 years of membership service
  - Any age, 25 years of membership service
- Hired on or after July 1, 2011:
  - Age 55, 5 years of membership service

Second Retirement: (requires returning to PERS-covered employer or PERS service)

- Retired before January 1, 2016 and accumulate less than 2 years additional service credit or retired on or after January 1, 2016 and accumulate less than 5 years additional service credit:
  - A refund of member's contributions plus return interest (currently 2.02% effective July 1, 2018).
  - No service credit for second employment;
  - Start the same benefit amount the month following termination; and
  - Guaranteed Annual Benefit Adjustment (GABA) starts again in the January immediately following the second retirement.
- Retired before January 1, 2016 and accumulate at least 2 years of additional service credit:
  - A recalculated retirement benefit based on provisions in effect after the initial retirement; and
  - GABA starts on the recalculated benefit in the January after receiving the new benefit for 12 months.
- Retired on or after January 1, 2016 and accumulate 5 or more years of service credit:
  - The same retirement as prior to the return to service;
  - A second retirement benefit as prior to the second period of service based on laws in effect upon the rehire date; and
  - GABA starts on both benefits in the January after receiving the original and the new benefit for 12 months.

Member's highest average compensation (HAC)

- Hired prior to July 1, 2011 highest average compensation during any consecutive 36 months;
- Hired on or after July 1, 2011 – highest average compensation during any consecutive 60 months;

Compensation Cap

- Hired on or after July 1, 2013 – 110% annual cap on compensation considered as a part of a member's highest average compensation.

Monthly benefit formula

- Members hired prior to July 1, 2011
  - Less than 25 years of membership service: 1.785% of HAC per year of service credit;
  - 25 years of membership service or more: 2% of HAC per year of service credit.
- Members hired on or after July 1, 2011
  - Less than 10 years of membership service: 1.5% of HAC per year of service credit;
  - 10 years or more, but less than 30 years of membership service: 1.785% of HAC per year of service credit;
  - 30 years or more of membership service: 2% of HAC per year of service credit.

Guaranteed Annual Benefit Adjustment (GABA)

After the member has completed 12 full months of retirement, the member's benefit increases by the applicable percentage (provided below) each January, **inclusive** of all other adjustments to the member's benefit.

- 3.0% for members hired **prior to** July 1, 2007
- 1.5% for members hired between July 1, 2007 and June 30, 2013
- Members hired on or after July 1, 2013:
  - (a) 1.5% for each year PERS is funded at or above 90%;
  - (b) 1.5% reduced by 0.1% for each 2.0% PERS is funded below 90%; and
  - (c) 0% whenever the amortization period for PERS is 40 years or more.

Contributions : The State Legislature has the authority to establish and amend contribution rates. Member and employer contribution rates are specified by Montana Statute and are a percentage of the member's compensation. Contributions are deducted from each member's salary and remitted by participating employers.

Special Funding: The state of Montana, as the non-employer contributing entity, paid to the Plan, additional contributions that qualify as *special funding*. Those employers who received *special funding* are all participating employers.

Not Special Funding: Per Montana law, state agencies and universities paid their own additional contributions. The employer paid contributions are *not* accounted for as special funding for state agencies and universities but are reported as employer contributions.

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. Pension Plan(s) within the scope of GASB Statement No. 68, as amended-cont.

Member and employer contribution rates are shown in the table below.

Fiscal Year	Member		State & Universities	Local Government		School Districts	
	Hired < 07/01/11	Hired > 07/01/11	Employer	Employer	State	Employer	State
2021	7.900%	7.900%	8.870%	8.770%	0.100%	8.500%	0.370%
2020	7.900%	7.900%	8.770%	8.670%	0.100%	8.400%	0.370%
2019	7.900%	7.900%	8.670%	8.570%	0.100%	8.300%	0.370%
2018	7.900%	7.900%	8.570%	8.470%	0.100%	8.200%	0.370%
2017	7.900%	7.900%	8.470%	8.370%	0.100%	8.100%	0.370%
2016	7.900%	7.900%	8.370%	8.270%	0.100%	8.000%	0.370%
2015	7.900%	7.900%	8.270%	8.170%	0.100%	7.900%	0.370%
2014	7.900%	7.900%	8.170%	8.070%	0.100%	7.800%	0.370%
2012 – 2013	6.900%	7.900%	7.170%	7.070%	0.100%	6.800%	0.370%
2010 – 2011	6.900%		7.170%	7.070%	0.100%	6.800%	0.370%
2008 – 2009	6.900%		7.035%	6.935%	0.100%	6.800%	0.235%
2000 - 2007	6.900%		6.900%	6.800%	0.100%	6.800%	0.100%

1. Member contributions to the system of 7.9% are temporary and will be decreased to 6.9% on January 1 following actuary valuation results that show the amortization period has dropped below 25 years and would remain below 25 years following the reduction of both the additional employer and additional member contribution rates.

2. Employer contributions to the system:
   a. Effective July 1, 2014, following the 2013 Legislative session, PERS-employer contributions increase an additional 0.1% a year and will continue over 10 years through 2024. The additional employer contributions including the 0.27% added in 2007 and 2009, will terminate on January 1 following actuary valuation results that show the amortization period has dropped below 25 years and would remain below the 25 years following the reduction of both the additional employer and additional member contributions rates.
   b. Effective July 1, 2013, employers are required to make contributions on working retirees' compensation. Member contributions for working retirees are not required.
   c. The portion of employer contributions allocated to the Plan Choice Rate (PCR) are included in the employers reporting. The PCR was paid off effective March 2016 and the contributions previously directed to the PCR are now directed to member accounts.

3. Non-Employer Contributions:
   a. Special Funding
      i. The state contributed 0.1% of members' compensation on behalf of local government entities.
      ii. The state contributed 0.37% of members' compensation on behalf of school district entities.
      iii. The state contributed a Statutory Appropriation from the General Fund of $33,951,150.

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. Pension Plan(s) within the scope of GASB Statement No. 68, as amended-cont.

Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

GASB Statement 68 allows a measurement date of up to 12 months before the employer's fiscal year-end can be utilized to determine the Plan's TPL. The basis for the TPL as of June 30, 2020, was determined by taking the results of the June 30, 2019, actuarial valuation and applying standard roll forward procedures. The roll forward procedure uses a calculation that adds the annual normal cost (also called the service cost), subtracts the actual benefit payments and refunds for the plan year, and then applies the expected investment rate of return for the year. The roll forward procedure will include the effects of any assumption changes and legislative changes. The update procedures are in conformity with Actuarial Standards of Practice issued by the Actuarial Standards Board.

The Total Pension Liability (TPL) minus the Fiduciary Net Position equals the Net Pension Liability (NPL). The proportionate shares of the employer's and the State of Montana's NPL for June 30, 2020, and 2019, are displayed below. The employer's proportionate share equals the ratio of the employer's contributions to the sum of all employer and non-employer contributions during the measurement period. The state's proportionate share for a particular employer equals the ratio of the contributions for the particular employer to the total state contributions paid. The employer recorded a liability of $62,726 and the employer's proportionate share was 0.002378 percent.

As of measurement date	Net Pension Liability as of 6/30/2020	Net Pension Liability as of 6/30/2019	Percent of Collective NPL as of 6/30/2020	Percent of Collective NPL as of 6/30/2019	Change in Percent of Collective NPL
TOWN OF GERALDINE Proportionate Share	$ 62,726	$ 52,627	0.002378%	0.002518%	(0.000140)%
State of Montana Proportionate Share associated with Employer	$ 19,679	$ 17,061	0.000746%	0.000816%	(0.000070)%
Total	$ 82,405	$ 69,688	0.003124%	0.003334%	(0.000210)%

Changes in actuarial assumptions and methods: The following changes in assumptions or other inputs were made that affected the measurement of the TPL.

1. The discount rate was lowered from 7.65% to 7.34%
2. The investment rate of return was lowered from 7.65% to 7.34%
3. The inflation rate was reduced from 2.75% to 2.40%

Changes in benefit terms: There have been no changes in benefit terms since the previous measurement date.

Changes in proportionate share: There were no changes between the measurement date of the collective NPL and the employer's reporting date that are expected to have a significant effect on the employer's proportionate share of the collective NPL. However, each employer may have unique circumstances that will impact the employer's proportionate share of the collective net pension. If there were changes that are expected to have an impact on the net pension liability, the employer should disclose the amount of the expected resultant change in the employer's proportionate share of the collective net pension liability, if known.

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. Pension Plan(s) within the scope of GASB Statement No. 68, as amended-cont.

Pension Expense: At June 30, 2020, the employer recognized a Pension Expense of $6,303 for its proportionate share of the Plan's pension expense. The employer also recognized grant revenue of $3,218 for the support provided by the State of Montana for its proportionate share of the pension expense associated with the employer.

As of measurement date	Pension Expense as of 6/30/2020	Pension Expense as of 6/30/2019
TOWN OF GERALDINE's Proportionate Share	$6,303	$5,292
State of Montana Proportionate Share associated with the Employer	3,218	1,158
Total	$9,521	$6,450

Recognition of Deferred Inflows and Outflows: At June 30, 2020, the employer reported its proportionate share of the Plan's deferred outflows of resources and deferred inflows of resources from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Expected vs. Actual Experience	$1,013	$1,793
Projected Investment Earnings vs. Actual Investment Earnings	5,431	0
Changes in Assumptions	4,344	0
Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	0	8,262
Employer Contributions Subsequent to the Measurement Date	3,603.72	
Total	$14,391.72	$10,055

Other amounts reported as deferred outflows and inflows of resources related to pensions are recognized in the employer's pension expense as follows:

For the Measurement Year ended June 30:	Recognition of Deferred Outflows and Deferred Inflows in future years as an increase or (decrease) to Pension Expense
2021	$(5,041)
2022	$2,518
2023	$1,898
2024	$1,357
Thereafter	$0

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. Pension Plan(s) within the scope of GASB Statement No. 68, as amended-cont.

Actuarial Assumptions: The total pension liability in the June 30, 2020 actuarial valuation was determined using the following actuarial assumptions.

Investment Return (net of admin expense)	7.34%
Admin Expense as % of Payroll	0.30%
General Wage Growth * *includes Inflation at	3.50% 2.40%
Merit Increases	0% to 4.80%
Postretirement Benefit Increases 1. Guaranteed Annual Benefit Adjustment (GABA) each January • After the member has completed 12 full months of retirement, the member's benefit increases by the applicable percentage (provided below) each January, inclusive of all other adjustments to the member's benefit. • Members hired prior to July 1, 2007 • Members hired between July 1, 2007 & June 30, 2013 • Members hired on or after July 1, 2013 • For each year PERS is funded at or above 90% • The 1.5% is reduced by 0.1% for each 2.0% PERS is funded below 90% • 0% whenever the amortization period for PERS is 40 years or more	 3.0% 1.5% 1.5% 0%
Mortality: • Contributing members, , service retired members & beneficiaries • Disabled Members	 RP-2000 Combined Employee and Annuitant Mortality Tables projected to 2020 with scale BB, set back one year for males RP-2000 Combined Mortality Tables, with no projections

0

The most recent experience study, performed for the period covering fiscal years 2011 through 2016, is outlined in a report dated May 5, 2017 and can be located on the MPERA website. The long-term expected return on pension plan assets is reviewed as part of the regular experience studies prepared for the Plan. The long-term rate of return as of June 30, 2020, was calculated using the average long-term capital market assumptions published in the *Survey of Capital Market Assumptions 2020 Edition* by Horizon Actuarial Service, LLC, yielding a median real rate of return of 4.94%. The assumed inflation is based on the intermediate inflation of 2.4% in the *2020 OASDI Trustees Report* by the Chief Actuary for Social Security to produce 75-year cost projections. Combining these two results yields a nominal return of 7.34%. Best estimates of arithmetic real rates of return for each major asset class included in the target asset allocation as of June 30, 2020, are summarized in the table below.

Asset Class	Target Asset Allocation	Long-Term Expected Real Rate of Return Arithmetic Basis
Cash	2.0%	0.11%
Domestic Equity	30.0%	6.19%
International Equity	16.0%	6.92%
Private Investments	14.0%	10.37%
Natural Resources	4.0%	3.43%
Real Estate	9.0%	5.74%
Core Fixed Income	20.0%	1.57%
Non-Core Fixed Income	5.0%	3.97%
Total	100.0%	

NOTE 3. DETAILED NOTES ON ALL FUNDS

E. Pension Plan(s) within the scope of GASB Statement No. 68, as amended-cont.

Discount Rate: The discount rate used to measure the TPL was 7.34%. The projection of cash flows used to determine the discount rate assumed that contributions from participating plan members, employers, and non-employer contributing entities would be made based on the Board's funding policy, which established the contractually required rates under the Montana Code Annotated. The state contributed 0 .10% of the salaries paid by local governments and 0.37% paid by school districts . In addition , the state contributed a statutory appropriation from the general fund. Based on those assumptions , the Plan's fiduciary net position was projected to be adequate to make all the projected future benefit payments of current plan members through the year 2123. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the TPL**.** A municipal bond rate was not incorporated in the discount rate.

Sensitivity of the proportionate share of the net pension liability to changes in the discount rate: The following presents the employer's sensitivity of the NPL to the discount rate in the table below . A small change in the discount rate can create a significant change in the liability. The NPL was calculated using the discount rate of 7.34%, as well as what the NPL would be if it were calculated using a discount rate 1.00% lower or 1.00% higher than the current rate.

As of measurement date	1.0% Decrease (6.34%)	Current Discount Rate	1.0% Increase (8.34%)
TOWN OF GERALDINE's Net Pension Liability	$86,338	$62,726	$42,891

Pension plan fiduciary net position: The stand-alone financial statements (76d) of the Montana Public Employees Retirement Board (PERB) *Comprehensive Annual Financial Report* (CAFR) and the GASB 68 Report disclose the Plan's fiduciary net position. The reports are available from the PERB at PO Box 200131, Helena MT 59620-0131, (406) 444-3154 or both are available on the MPERA website at http://mpera.mt.gov/index.shtml.

NOTE 3. DETAILED NOTES ON ALL FUNDS

F. Pension Plans within the scope of GASB Statement No. 73 - Accounting and Financial Reporting for Pensions and Related Assets that are not within the scope of GASB Statement 68

Plan Description
The Town of Geraldine Fire Department Relief Association is a single-employer defined benefit pension plan. The Association was formed in accordance with 19-18-102 MCA. The assets of the Fire Department Disability and Pension Fund are not in a trust or an equivalent arrangement. The accumulated assets do not offset the liabilities of the pension and disability plan per GASB Statement No. 73. The employer should recognize the total pension liability (TPL) as its pension liability.

Total Pension Liability
Town management did not feel there was justification to encur the cost of an actuarial valuation. Therefore, total pension liability related to the Geraldine Fire Department Relief Association pension plan was not recorded as of June 30, 2021.

Title 19, Chapter 18, Part 5 of the Montana Code Annotated (MCA) requires the Town to contribute funds to assure the Association's after-assets are maintained at a level equal to at least three times but no more than five times the benefits paid by the Association in the preivous or current fiscal year whichever is less.

G. Fund Balance

The Governmental Accounting Standards Board issued Statement No. 54 *Fund Balance Reporting and Governmental Fund Type Definitions* , which defines governmental fund types and requires presentation of governmental fund balances on the Balance Sheet-Governmental Funds by classification. Fund balance classifications are as follows:

The non-spendable fund balance classification represents the portion of fund balances that cannot be spent either because it is not in spendable form such as inventories, the long term portion of notes & loans receivable, land held for resale of which the future proceeds are not committed, pre-paid expenses, or legal or contractual constraints were placed on assets held such as the corpus of a permanent fund.

The restricted fund balance classification includes amounts that can be spent only for specific purposes which are externally imposed either by: a) providers such as creditors, grantors, contributors, and laws/regulations of other governments; or b) imposed by law through constitutional provisions or enabling legislation.

The committed fund balance classification includes amounts that are constrained for specific purposes internally imposed by majority vote by quorum of Town's governing body (highest level of decision-making authority). The governing body can, by adoption of an ordinance or resolution prior to the end of the fiscal year, commit fund balance to a specific purpose. Once adopted, the limitation imposed by the ordinance or resolution remains in place until a similar action is taken (a subsequent adoption of a ordinance or resolution) to remove or revise the limitation.

The assigned fund balance classification includes amounts that are intended to be used by the government for a specific purpose that do not meet the criteria to be classified as restricted or committed. An appropriation of existing fund balance to eliminate a projected budgetary deficit in the subsequent year‘s budget in an amount no greater than the projected excess of expected expenditures over expected revenues are reported as an assignment of fund balance. Assignments of fund balance may also be created by designated individuals.

Unassigned fund balance is the residual classification for the government's general fund and includes all spendable amounts not contained in other classifications. In governmental funds other than the general fund, the unassigned classification is only used to report a deficit balance resulting from overspending for specific purposes for which amounts had been restricted, committed, or assigned.

Fund Balance Classifications by Specific Purpose
GASB Statement No 54 requires presentation of specific purpose details by fund balance classification either on the face of the balance sheet-governmental funds, in the notes to the financial statements, or a combination of both.

Fund balance classifications are presented on the Balance Sheet-Governmental Funds by function. The function represents the specific purpose.

NOTE 3. DETAILED NOTES ON ALL FUNDS

H. Spending policy

The Town receives inflows from multiple revenue sources for use in the general fund. The intention of a spending policy is to identify the expenditure hierarchy when both restricted and unrestricted (committed, assigned, or unassigned) amounts are available in the general fund. When both restricted and unrestricted amounts are available in the general fund, the following spending policy will apply:

1st: Restricted
2nd: Committed
3rd: Assigned
4th: Unassigned

The Town receives inflows from multiple revenue sources for use in governmental funds, other than the general fund. The intention of a spending policy is to identify the expenditure hierarchy when both restricted and unrestricted (committed, or assigned) amounts are available in these funds. When both restricted and unrestricted amounts are available in governmental funds, other than the general fund, the following spending policy will apply:

1st: Restricted
2nd: Committed
3rd: Assigned

I. Minimum Fund Balance Policy

The Town does not have a minimum fund balance policy in place.

BOC SUPPLEMENT SCHEDULE

1. **Intergovernmental expenditures** - Of the expenditures reported, detail below those expenditures made to other governments on a cost-sharing basis.

Purpose	Amount - Omit Cents	
	Paid to local governments	**Paid to state**
Airports	M01 $ -	$ -
Libraries	M52 $ -	$ -
Health	M32 $ -	$ -
Local schools	M12 $ -	$ -
Welfare	M79 $ -	L79 $ -
Other	M89 $ -	L89 $ -

2. **Salaries and Wages** - Report here the total salaries and wages paid to all employees of your government before deductions for social security, retirement, etc. Include also salaries and wages paid to employees of any utility owned and operated by your government.

Amount - Omit cents
$64,382

3. **Debt outstanding**

A. Long-term debt outstanding, issued and retired

Purpose	Bonds Outstanding as of June 30, 2020	Amount -- Omit cents			
		Bonds during the fiscal year		Bonds Outstanding as of June 30, 2021	
		Issued	**Retired**	**General Obligation**	**Revenue bonds**
Water utility	19A $ 165,763	29A	39A $ (13,291)	41A $ -	44A $ 152,472
Sewer utility	19X $ 12,000	29X $ 577,764	39X $ (15,255)	41X $ -	44X $ 574,509
Gas utility	19C $ -	29C $ -	39C $ -	41C $ -	44C $ -
Electric utility	19B $ -	29B $ -	39B $ -	41B $ -	44B $ -
All other	19X $ -	29X $ -	39X $ -	41X $ -	44X $ -

B. Short-term debt

Type	Beginning of fiscal year	End of fiscal year
Registered warrants	61V $ -	64V $ -
Contracts payable	$ -	$ -
Notes payable	$ -	$ -
Totals	$ -	$ -

4. **Cash balances by fund type** - Cash may consist of cash on hand, checking, savings, repurchase agreements, certificates of deposit, securities, or any other cash related item.

Type of funds	Amount - Omits cents
General fund (1000)	W61 $ 230,296
Special revenue funds (2000)	W61 $ 60,906
Enterprise funds (5000)	W61 $ 233,806
Trust and agency funds (7000)	$ 403
Total cash all funds	$ 525,412

Form BOC-1

REQUIRED SUPPLEMENTARY INFORMATION

Town of Geraldine
Statement of Revenues, Expenditures, and Changes in Fund Balance - Budget and Actual (Budgetary Basis)
For Fiscal Year Ended
June 30, 2021

	GENERAL FUND			
	BUDGETED AMOUNTS			VARIANCE WITH FINAL BUDGET POSITIVE (NEGATIVE)
	ORIGINAL	FINAL	ACTUAL AMOUNTS	
REVENUES				
Taxes and Assessments	$ 9,000.00	$ 9,000.00	$ 93,703.79	$ 84,703.79
Licenses and permits	20.00	20.00	-	(20.00)
Intergovernmental	35,336.00	35,336.00	36,106.46	770.46
Miscellaneous	2,200.00	2,200.00	5,716.58	3,516.58
Investment and Royalty Earnings	300.00	300.00	482.69	182.69
Total revenues	46,856.00	46,856.00	136,009.52	89,153.52
EXPENDTIURES				
Current:				
General Government				
Personal services	6,547.00	6,547.00	17,962.00	(11,415.00)
Operations and maintenance	57,500.00	57,500.00	28,151.68	29,348.32
Public Safety				
Operations and maintenance	3,400.00	3,400.00	603.00	2,797.00
Public Works				
Personal services	90,000.00	90,000.00	5,912.85	84,087.15
Operations and maintenance	3,450.00	3,450.00	16,597.43	(13,147.43)
Public Health				
Operations and maintenance	1,700.00	1,700.00	550.00	1,150.00
Culture and Recreation				
Operations and maintenance	2,000.00	2,000.00	3,070.43	(1,070.43)
Miscellaneous	11,000.00	11,000.00	-	11,000.00
Debt Service				
Debt service - principal	44,100.00	44,100.00	6,927.39	37,172.61
Debt service - interest and other charges	-	-	205.90	(205.90)
Total expenditures	219,697.00	219,697.00	79,980.68	139,716.32
Excess (deficiency) of revenues over (under) expenditures	(172,841.00)	(172,841.00)	56,028.84	228,869.84
OTHER FINANCING SOURCES (USES)				
Transfers (out)	(1,000.00)	(1,000.00)	(1,392.66)	(392.66)
Total other financing sources (uses)	(1,000.00)	(1,000.00)	(1,392.66)	(392.66)
Net change in fund balance	$ (173,841.00)	$ (173,841.00)	54,636.18	$ 228,477.18
Fund balances - beginning			186,599.79	
Fund balances - ending			$ 241,235.97	

The notes to the financial statements are an integral part of this statement.

TOWN OF GERALDINE

STATEMENT OF REVENUE, EXPENDITURE, & CHANGES IN FUND BALANCES - BUDGET & ACTUAL - MAJOR SPECIAL REVENUE FUNDS

For the year ending June 30, 2021

2821 gas tax special

	Original Budget	Final Budget	Actual Amounts	Variance with Final Budget Positive (Neg)
REVENUES				
Taxes				
Licenses and permits				
Intergovernmental revenue (See supplemental section for detail)				
State shared revenues	21,000.00	21,000.00	27,853.11	6,853.11
Charges for services				
Fines and forfeitures				
Total revenues	21,000.00	21,000.00	27,853.11	6,853.11
EXPENDITURES				
Current:				
General Government				
Public Safety				
Public Works				
Personal services	0.00	0.00	16,004.64	(16,004.64)
Supplies/services/materials, etc	21,000.00	21,000.00	7,837.96	13,162.04
Public Health				
Social and Economic Services				
Culture and Recreation				
Housing and Community Development				
Conservation of Natural Resources				
Debt Service				
Total expenditures	21,000.00	21,000.00	23,842.60	(2,842.60)
Excess of revenues over (under) expenditures	0.00	0.00	4,010.51	4,010.51
OTHER FINANCING SOURCES (USES)				
Net change in fund balance	0.00	0.00	4,010.51	4,010.51
Fund balance - July 1, 2020 - -As previously reported	9,838.05	9,838.05	9,838.05	0.00
Fund balance - July 1, 2020 - As restated	9,838.05	9,838.05	9,838.05	0.00
Fund balance - June 30, 2021	9,838.05	9,838.05	13,848.56	4,010.51

Town of Geraldine
Required Supplementary Information
Schedule of Proportionate Share of the Net Pension Liability
For the Last Ten Fiscal Years*

As of measurement date	2020	2019	2018	2017	2016	2015	2014
Employer's proportion of the Net Pension Liability (percentage)	0.002378%	0.002518%	0.002735%	0.003978%	0.003099%	0.003115%	0.002980%
Employer's Net Pension Liability (amount)	$62,726	$52,627	$57,075	$77,479	$52,782	$43,537	$37,127
State's Net Pension Liability (amount)	19,679	17,061	19,030	927	645	535	453
Total	$82,405	$69,688	$76,105	$78,406	$53,427	$44,072	$37,580
Employer's Covered Payroll[1]	$39,892	$41,541	$44,973	$49,350	$37,118	$36,347	$33,730
Employer's Proportionate Share as a percent of Covered Payroll	157.24%	126.69%	126.91%	157.00%	142.20%	119.78%	111.22%
Plan Fiduciary Net Position as a percent of Total Pension Liability	68.90%	73.85%	73.47%	73.75%	74.71%	78.40%	79.87%

**The amounts presented for each fiscal year were determined as of June 30, the measurement date.*

[1]All employer adjustments made in the current fiscal year 2020 but are adjusting a payroll with a pay date in a prior fiscal year, are considered prior year adjustments and are removed from the covered payroll report before the actuary calculates the employers proportionate share.

Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

Town of Geraldine
Required Supplementary Information
Schedule of Contributions
For the Last Ten Fiscal Years*

As of most recent FYE (reporting date)	2021	2020	2019	2018	2017	2016	2015
Contractually Required DB Contributions	$3,604	$3,495	$3,573	$3,809	$4,131	$3,102	$2,995
Plan Choice Rate Required Contributions	$0	$0	$0	$0	$0	$0	$0
Contributions in Relation to the Contractually Required Contributions	$3,604	$3,495	$3,573	$3,809	$4,131	$3,102	$2,995
Contribution Deficiency (Excess)	$0	$0	$0	$0	$0	$0	$0
Employer's Covered Payroll[1]	$41,902	$39,892	$41,541	$44,973	$49,350	$37,118	$36,347
Contributions as a percent of Covered Payroll	8.77%	8.76%	8.60%	8.47%	8.37%	8.36%	8.24%

**The amounts presented for each fiscal year were determined as of June 30, the most recent fiscal year end.*

[1]All employer adjustments made in the current fiscal year 2020 but are adjusting a payroll with a pay date in a prior fiscal year, are considered prior year adjustments and are removed from the covered payroll report before the actuary calculates the employers proportionate share.

Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

Changes of Benefit Terms

The following changes to the plan provisions were made as identified:

2017:

Working Retiree Limitations – for PERS

Effective July 1, 2017, if a PERS retiree returns as an independent contractor to what would otherwise be PERS-covered employment, general contractor overhead costs are excluded from PERS working retiree limitations.

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Refunds

1) Terminating members eligible to retire may, in lieu of receiving a monthly retirement benefit, refund their accumulated contributions in a lump sum.
2) Terminating members with accumulated contributions between $200 and $1,000 who wish to rollover their refund must do so within 90 days of termination of service.
3) Trusts, estates, and charitable organizations listed as beneficiaries are entitled to receive only a lump-sum payment.

Interest credited to member accounts – Effective July 1, 2017, the interest rate credited to member accounts increased from 0.25% to 0.77%.

Lump-sum payouts

Effective July 1, 2017, lump-sum payouts in all systems are limited to the member's accumulated contributions rate than the present value of the member's benefit.

Disabled PERS Defined Contribution (DC) Members

PERS members hired after July 1, 2011 have a normal retirement age of 65. PERS DC members hired after July 1, 2011 who became disabled were previously only eligible for a disability benefit until age 65. Effective July 1, 2017, these individuals will be eligible for a disability benefit until they reach 70, thus ensuring the same 5-year time period available to PERS DC disabled members hired prior to July 1, 2011 who have a normal retirement age of 60 and are eligible for a disability benefit until age 65.

Changes in Actuarial Assumptions and Methods

Method and assumptions used in calculations of actuarially determined contributions

The following Actuarial Assumptions were adopted from the June 30, 2019 actuarial valuation:

General Wage Growth*	3.50%
Investment Rate of Return*	7.65%
*Includes inflation at	2.75%
Merit salary increase	0% to 8.47%
Asset valuation method	Four-year smoothed market
Actuarial cost method	Entry age Normal
Amortization method	Level percentage of payroll, open
Remaining amortization period	30 years
Mortality (Healthy members)	For Males and Females: RP 2000 Combined Employee and Annuitant Mortality Table projected to 2020 using Scale BB, males set back 1 year
Mortality (Disabled members)	For Males and Females: RP 2000 Combined Mortality Table, with no projections
Admin Expense as % of Payroll	0.30%

Administrative expenses are recognized by an additional amount added to the normal cost contribution rate for the System. This amount varies from year to year based on the prior year's actual administrative expenses.

SUPPLEMENTAL INFORMATION

TOWN OF GERALDINE
COMBINING BALANCE SHEET - NONMAJOR SPECIAL REVENUE FUNDS
For the year ending June 30, 2021

	2810 POLICE RESERVE TRA	2990 arpa funds	Total Nonmajor Spec. Rev. Funds
ASSETS			
Cash and cash equivalents	13,863.00	0.00	13,863.00
Investments	0.00	31,802.20	31,802.20
Taxes receivable:			
TOTAL ASSETS	13,863.00	31,802.20	45,665.20
Deferred Outflows of Resources			
LIABILITIES			
Revenues collected in advance		31,802.20	31,802.20
FUND BALANCES			
Unassigned (negative balance only)	13,863.00	0.00	13,863.00
Total Fund Balances	13,863.00	0.00	13,863.00
Total Liabilities, Deferred inflows of resources and Fund Balances	13,863.00	31,802.20	45,665.20

TOWN OF GERALDINE

COMBINING STMT OF REV, EXPEND, & CHANGES IN FUND BALANCES - BUDGET & ACTUAL - NONMAJOR SPECIAL REVENUE FUNDS

For the year ending June 30, 2021

2810 POLICE RESERVE TRAINING

	Original Budget	Final Budget	Actual Amounts	Variance with Final Budget Positive (Neg)
REVENUES				
Taxes				
Licenses and permits				
Intergovernmental revenue (See supplemental section for detail)				
Federal grants	0.00	0.00	0.00	0.00
Charges for services				
Fines and forfeitures				
Total revenues	0.00	0.00	0.00	0.00
EXPENDITURES				
Current:				
General Government				
Public Safety				
Public Works				
Public Health				
Social and Economic Services				
Culture and Recreation				
Housing and Community Development				
Conservation of Natural Resources				
Debt Service				
Excess of revenues over (under) expenditures	0.00	0.00	0.00	0.00
OTHER FINANCING SOURCES (USES)				
Net change in fund balance	0.00	0.00	0.00	0.00
Fund balance - July 1, 2020 - -As previously reported	13,863.00	13,863.00	13,863.00	0.00
Fund balance - July 1, 2020 - As restated	13,863.00	13,863.00	13,863.00	0.00
Fund balance - June 30, 2021	13,863.00	13,863.00	13,863.00	0.00

TOWN OF GERALDINE

COMBINING STMT OF REV, EXPEND, & CHANGES IN FUND BALANCES - BUDGET & ACTUAL - NONMAJOR SPECIAL REVENUE FUNDS

For the year ending June 30, 2021

2990 arpa funds

	Original Budget	Final Budget	Actual Amounts	Variance with Final Budget Positive (Neg)
REVENUES				
Taxes				
Licenses and permits				
Intergovernmental revenue (See supplemental section for detail)				
Federal grants	0.00	0.00	0.00	0.00
Charges for services				
Fines and forfeitures				
Total revenues	0.00	0.00	0.00	0.00
EXPENDITURES				
Current:				
General Government				
Public Safety				
Public Works				
Public Health				
Social and Economic Services				
Culture and Recreation				
Housing and Community Development				
Conservation of Natural Resources				
Debt Service				
Excess of revenues over (under) expenditures	0.00	0.00	0.00	0.00
OTHER FINANCING SOURCES (USES)				
Net change in fund balance	0.00	0.00	0.00	0.00
Fund balance - July 1, 2020 -				
-As previously reported	0.00	0.00	0.00	0.00
Fund balance - July 1, 2020 - As restated	0.00	0.00	0.00	0.00
Fund balance - June 30, 2021	0.00	0.00	0.00	0.00

TOWN OF GERALDINE

COMBINING STMT OF REV, EXPEND, & CHANGES IN FUND BALANCES - BUDGET & ACTUAL - TOTAL NONMAJOR SPECIAL REVENUE FUNDS

For the year ending June 30, 2021

	Original Budget	Final Budget	Actual Amounts	Variance with Final Budget Positive (Neg)
REVENUES				
Taxes				
Licenses and permits				
Intergovernmental revenue (See supplemental section for detail)				
Federal grants	0.00	0.00	0.00	0.00
Charges for services				
Fines and forfeitures				
Total revenues	0.00	0.00	0.00	0.00
EXPENDITURES				
Current:				
General Government				
Public Safety				
Public Works				
Public Health				
Social and Economic Services				
Culture and Recreation				
Housing and Community Development				
Conservation of Natural Resources				
Debt Service				
Excess of revenues over (under) expenditures	0.00	0.00	0.00	0.00
OTHER FINANCING SOURCES (USES)				
Net change in fund balance	0.00	0.00	0.00	0.00
Fund balance - July 1, 2020 - -As previously reported	13,863.00	13,863.00	13,863.00	0.00
Fund balance - July 1, 2020 - As restated	13,863.00	13,863.00	13,863.00	0.00
Fund balance - June 30, 2021	13,863.00	13,863.00	13,863.00	0.00

Town of Geraldine
Schedule of Federal/State Grants
Entitlements, and Shared Revenues
For Fiscal Year Ended
June 30, 2021

	REVENUE CODE	RECEIVING FUND	AMOUNT
FEDERAL GRANTS/ENTITLEMENTS - (LIST)			
CDBG grant	331010	5311	441,000.00
RD grant	331072	5311	353,949.67
Total Federal Grants/Entitlements			794,949.67
FEDERAL SHARED REVENUES - (LIST)			
Total Federal Shared Revenues			0.00
STATE GRANTS/ENTITLEMENTS - (LIST)			
State Entitlement	335230	1000	23,549.16
DNRC RRGL grant	334122	5311	744.68
TSEP grant	334120	5311	281,802.04
Total State Grants/Entitlements			306,095.88
STATE SHARED REVENUES - (LIST)			
Gas Tax	335040	1000	11,457.16
Gas Tax-Special BaRSSA	335041	2821	27,853.11
Oil & Gas	335065	1000	29.14
Total State Shared Revenues			39,339.41
TOTAL			1,140,384.96

TOWN OF GERALDINE
Schedule of Cash Receipts & Disbursements
For the Year 2020-2021

Fund/Account	Beginning Balance	Received	Transfers In	Disbursed	Transfers Out	Ending Balance
1000 GENERAL FUND						
101000 CASH-OPERATIONS	165,416.19	157,947.02	344.19	667.00	117,881.11	205,159.29
101150 clearing account	-	-	200.00	200.00	-	-
102140 GAS TAX - RESTRIC. CASH	19,834.73	9,572.85	-	-	4,270.94	25,136.64
Total Fund	185,250.92	167,519.87	200.00	867.00	120,759.39	230,295.93
Total 1000 GENERAL FUND	185,250.92	167,519.87	200.00	867.00	120,759.39	230,295.93
2810 POLICE RESERVE TRAINING						
101000 CASH-OPERATIONS	13,863.00	-	-	-	-	13,863.00
2821 gas tax special						
102140 GAS TAX - RESTRIC. CASH	9,838.05	27,853.11	1,392.66	16,004.64	7,837.96	15,241.22
2990 arpa funds						
101150 clearing account	-	31,802.20	-	-	-	31,802.20
Total 2000	23,701.05	59,655.31	-	16,004.64	7,837.96	60,906.42
5210 WATER FUND						
101000 CASH-OPERATIONS	42,168.03	107,134.41	207.27	225.48	84,543.15	64,741.08
102100 RESTRICTED CASH	55,000.00	-	-	-	-	55,000.00
102220 RESTRICTED - BOND RESERVE	24,903.00	-	-	-	-	24,903.00
102240 RESTRICTED - REPL & DEPR	668.00	-	-	-	-	668.00
Total Fund	122,739.03	107,134.41	207.27	225.48	84,543.15	145,312.08
5310 SEWER FUND						
101000 CASH-OPERATIONS	5,797.22	56,903.17	3,398.97	30.17	52,877.56	13,191.63
102210 RESTRICTED -REV BOND ACCT	196.28	-	-	-	-	196.28
102220 RESTRICTED - BOND RESERVE	8,780.48	-	-	-	8,780.48	-
Total Fund	14,773.98	56,903.17	3,398.97	30.17	61,658.04	13,387.91
5311 sewer construction fund						
101000 CASH-OPERATIONS	-	-	298.93	-	298.93	-
101010 sewer project checking	10,670.30	1,203,696.93	-	-	1,139,260.99	75,106.24
Total Fund	10,670.30	1,203,696.93	298.93		1,139,559.92	75,106.24
5410 GARBAGE FUND						
101000 CASH-OPERATIONS	-	38,657.37	5,638.90	-	44,296.27	-
Total 5000	148,183.31	1,406,391.88	9,544.07	255.65	1,330,057.38	233,806.23
7120 FIREMEN'S DISABILITY						
101000 CASH-OPERATIONS	-	383.00	-	-	383.00	-
7910 PAYROLL CLEARING FUND						
101000 CASH-OPERATIONS	416.30	-	73,179.27	72,974.34	344.19	277.04
7930 CLAIMS CLEARING FUND						
101000 CASH-OPERATIONS	-	-	1,376,114.39	1,375,988.43	-	125.96
Total 7000	416.30	383.00	1,449,293.66	1,448,962.77	383.00	403.00
Totals	357,551.58	1,633,950.06	1,459,037.73	1,466,090.06	1,459,037.73	525,411.58

Reconciliation for Bank Account sewer project checking - 5710000329

Reconciliation Period 6/21

Account # 5710000329
Cash Account 101010 - sewer project checking

Balance from Bank Statement	75,106.24
Deposits in Transit	0.00
Outstanding Checks	0.00
Other Cash Items	0.00
OS Payroll Liabilities	0.00
Adjusted Bank Balance	75,106.24
General Ledger Balance	75,106.24
Manual Adjustments to bank balance	0.00
Difference	0.00
Total checks and other credit items cleared:	214,152.26
Total deposits and other debit items cleared:	279,520.75

Reconciliation for Bank Account clearing account - 121160

Reconciliation Period 6/21

Account # 121160
Cash Account 101150 - clearing account

Balance from Bank Statement	31,802.20
Deposits in Transit	0.00
Outstanding Checks	0.00
Other Cash Items	0.00
OS Payroll Liabilities	0.00
Adjusted Bank Balance	31,802.20
General Ledger Balance	31,802.20
Manual Adjustments to bank balance	0.00
Difference	0.00
Total checks and other credit items cleared:	0.00
Total deposits and other debit items cleared:	31,802.20

Reconciliation for Bank Account CASH-OPERATIONS - 121347

Reconciliation Period 6/21

Account # 121347
Cash Account 101000 - CASH-OPERATIONS
Cash Account 102100 - RESTRICTED CASH
Cash Account 102140 - GAS TAX - RESTRIC. CASH
Cash Account 102210 - RESTRICTED -REV BOND ACCT
Cash Account 102220 - RESTRICTED - BOND RESERVE ACCT
Cash Account 102230 - RESTRICTED - loan/tsep sewer
Cash Account 102240 - RESTRICTED - REPL & DEPR

Balance from Bank Statement	418,633.14
Deposits in Transit	0.00
Outstanding Checks	-403.00
Other Cash Items	0.00
OS Payroll Liabilities	-344.19
Adjusted Bank Balance	417,885.95
General Ledger Balance	417,755.95
Manual Adjustments to bank balance	-130.00
Difference	0.00
Total checks and other credit items cleared:	50,492.47
Total deposits and other debit items cleared:	79,926.11

Notes: waiting for state to take their money

GENERAL

INFORMATION

SECTION

Town of Geraldine
June 30, 2021

GENERAL INFORMATION

1. Class of city	Town
2. Date of incorporation	1914
3. County seat	Chouteau County, Fort Benton, MT
4. Form of government	Council-Mayor
5. Population (most recent estimate)	261
6. Land area	7 square mile
7. Miles of roads/streets/alleys	12
8. Taxable valuation	$ 256,046
9. Number of water consumers	165

PROPERTY TAX MILL LEVIES

Fund Nunber	Fund Name	Mills
1000	General	264.10
	Total Mills:	264.10

ITEMS TO BE PROVIDED TO ENGINEER BY GERALDINE FOR WATER PER

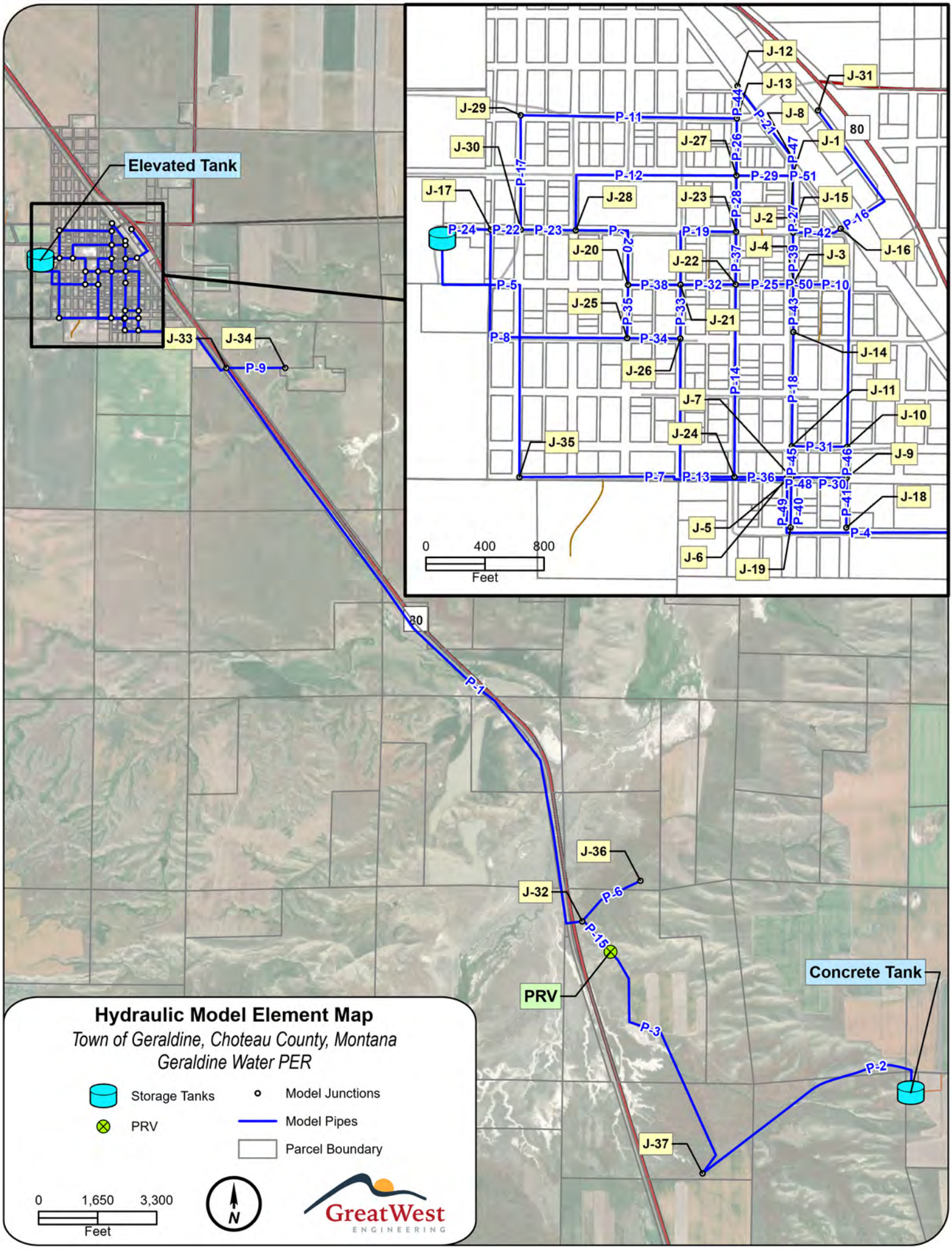
18-19 236,977.22
19-20 16,199.73
20-21 17,312.21

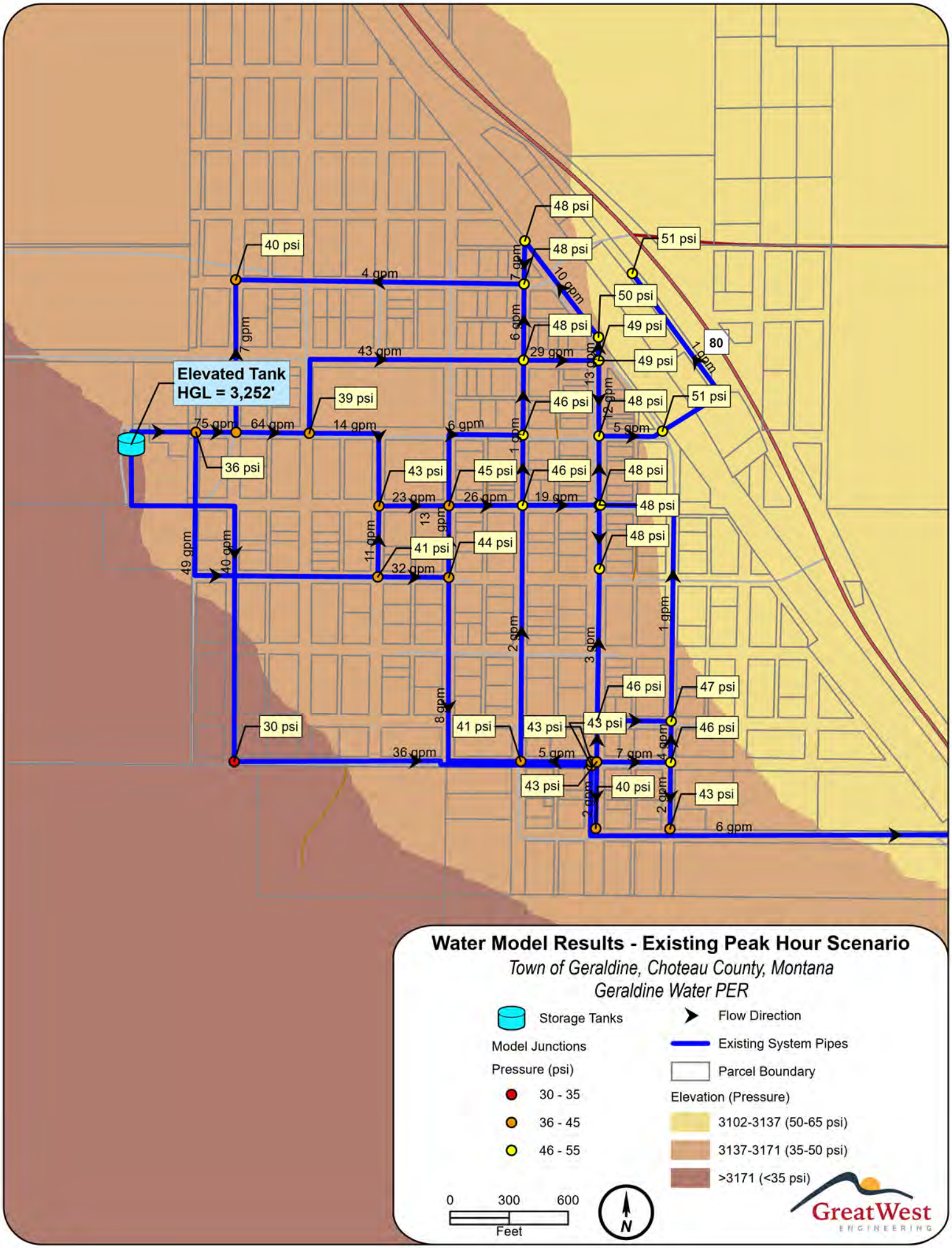
1. Residential & business water meter usage records (last three years) – if system is metered
   a. (ie. black mountain reports)
2. Information on the water sold at bulk sales. 2418 FY 21
3. Water supply flow records (last three years)
4. Water System Maintenance logs (major repairs, if available)
5. Operation & Maintenance budget (last three years) O & M Not Separate on Budget
6. Sanitary Surveys and DEQ inspections
7. DEQ violations
8. System Information
   a. Total water system annual revenue (last three years) 18/19 99,293.- 19/20 88,760 20/21 96379
   b. Total water system annual operation & maintenance costs (last three years)
   c. Number of 18/19 85363 19/20 74,439 20/21 74,225
   d. Total residential hookups per service connection inside diameter (inches)
      i. ¾" 122
      ii. 1" ~~1~~
      iii. 1 ½"
      iv. 2"
      v. 2 ½"
      vi. 3"
   e. Total water (business) hookups per service connection inside diameter (inches)
      i. ¾" 39
      ii. 1" 12
      iii. 1 ½"
      iv. 2"
      v. 2 ½"
      vi. 3"
      vii. 4"
   f. Existing debt service on water and wastewater system Sewer 606,000
   g. Average monthly residential water rate 36.04
   h. Average monthly water rate including business 36.04
   i. Average monthly residential sewer rate 33.-
   j. Average monthly wastewater rate include business 33.-
9. Any AutoCad drawings of the District and its infrastructure
10. Annual revenue from water residential hookups 54,095
11. Water system as-builts
12. Any pump information from the well (serial number, manufactures, rating, TDH, etc.)
13. O&M issues of the water system

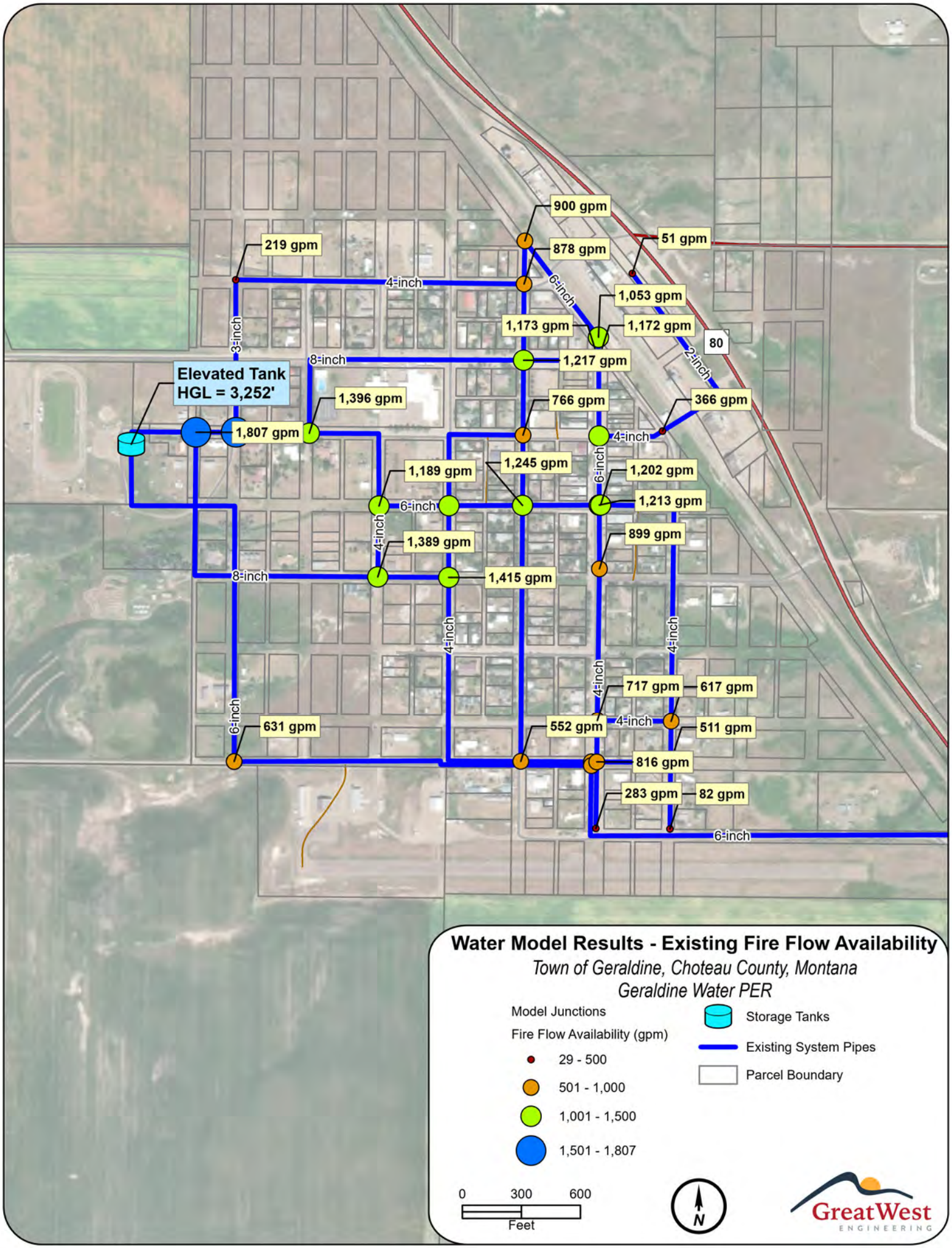
Rd #1 100, @472.64
#2 17,954.08
#3 32,989.87

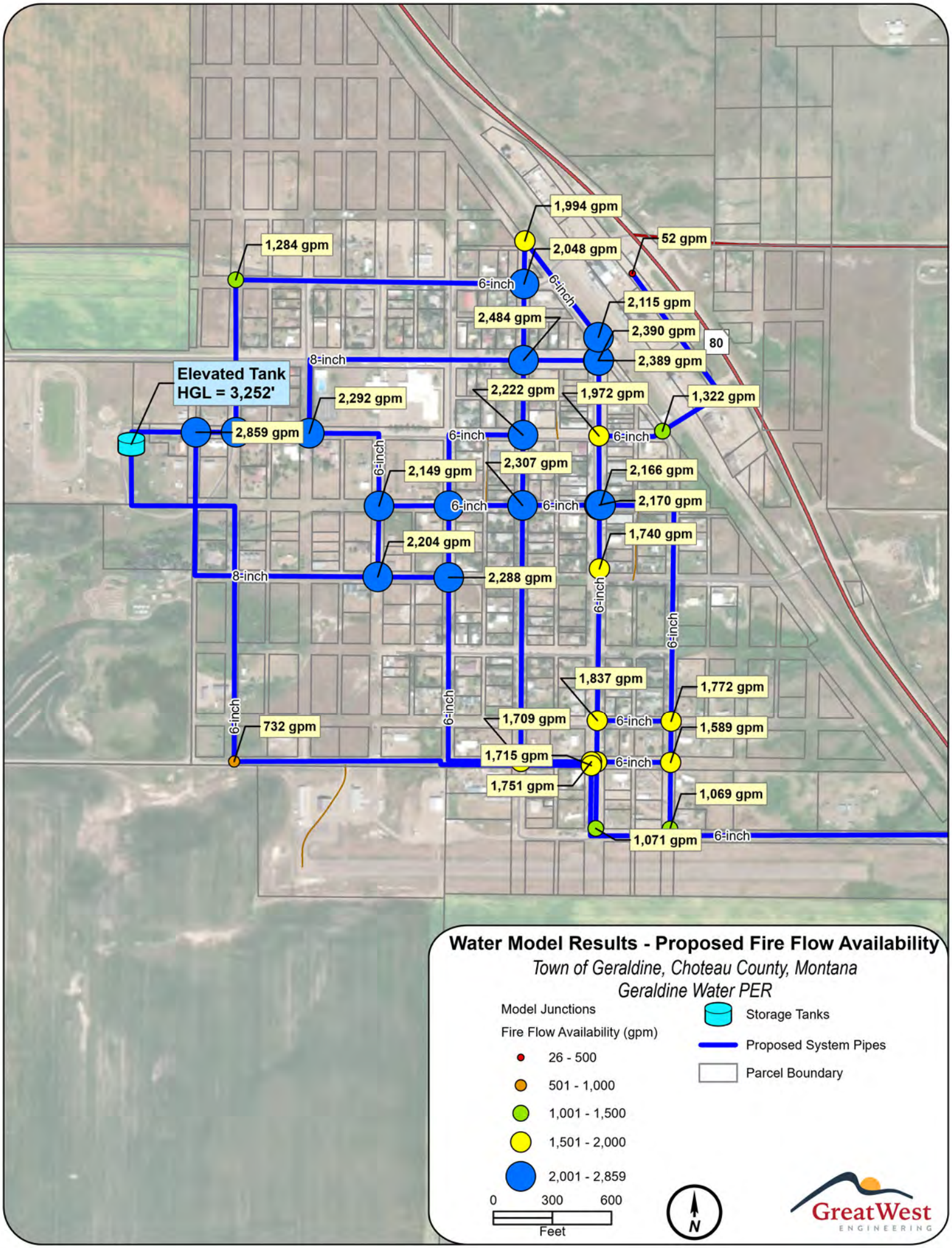
APPENDIX P

Water Modeling Results


Elevated Tank
J-33
J-34
P-9
J-12
J-13
J-31
J-29
P-11
P-44
J-8
80
J-30
J-27
P-26
P-47
J-1
P-17
P-12
P-29
P-51
J-17
J-28
J-23
P-28
J-15
J-2
P-24
P-22
P-23
P-19
P-27
P-42
P-16
J-20
J-4
J-16
J-22
P-37
P-39
J-3
P-5
P-38
P-32
P-25
P-50
P-10
J-25
P-35
P-33
J-21
P-43
P-8
P-34
J-14
J-26
P-14
P-18
J-11
J-7
J-10
J-24
P-31
J-35
P-45
P-46
J-9
P-7
P-13
P-36
P-48
P-30
J-18
P-49
P-40
P-41
J-5
P-4
J-6
J-19
0
400
800
Feet
80
P-1
J-36
J-32
P-6
P-15
PRV
Concrete Tank
P-3
P-2
J-37
Hydraulic Model Element Map
Town of Geraldine, Choteau County, Montana
Geraldine Water PER
Storage Tanks
Model Junctions
PRV
Model Pipes
Parcel Boundary
0
1,650
3,300
Feet
N
GreatWest
ENGINEERING


Elevated Tank
HGL = 3,252'
80
40 psi
48 psi
48 psi
51 psi
50 psi
49 psi
49 psi
48 psi
51 psi
48 psi
46 psi
39 psi
43 psi
45 psi
46 psi
48 psi
48 psi
41 psi
44 psi
30 psi
41 psi
43 psi
43 psi
46 psi
47 psi
46 psi
43 psi
40 psi
43 psi
4 gpm
7 gpm
10 gpm
6 gpm
43 gpm
29 gpm
13 gpm
12 gpm
1 gpm
75 gpm
64 gpm
14 gpm
6 gpm
1 gpm
5 gpm
36 psi
23 gpm
26 gpm
19 gpm
13 gpm
11 gpm
49 gpm
40 gpm
32 gpm
2 gpm
3 gpm
1 gpm
8 gpm
36 gpm
5 gpm
7 gpm
1 gpm
2 gpm
2 gpm
6 gpm
Water Model Results - Existing Peak Hour Scenario
Town of Geraldine, Choteau County, Montana
Geraldine Water PER
Storage Tanks
Model Junctions
Pressure (psi)
30 - 35
36 - 45
46 - 55
Flow Direction
Existing System Pipes
Parcel Boundary
Elevation (Pressure)
3102-3137 (50-65 psi)
3137-3171 (35-50 psi)
>3171 (<35 psi)
0
300
600
Feet
N
GreatWest
ENGINEERING


Elevated Tank
HGL = 3,252'
219 gpm
900 gpm
878 gpm
51 gpm
1,053 gpm
1,173 gpm
1,172 gpm
1,217 gpm
1,396 gpm
766 gpm
366 gpm
1,807 gpm
1,189 gpm
1,245 gpm
1,202 gpm
1,213 gpm
1,389 gpm
899 gpm
1,415 gpm
717 gpm
617 gpm
631 gpm
552 gpm
511 gpm
816 gpm
283 gpm
82 gpm
4-inch
6-inch
8-inch
3-inch
2-inch
80
Water Model Results - Existing Fire Flow Availability
Town of Geraldine, Choteau County, Montana
Geraldine Water PER
Model Junctions
Fire Flow Availability (gpm)
29 - 500
501 - 1,000
1,001 - 1,500
1,501 - 1,807
Storage Tanks
Existing System Pipes
Parcel Boundary
0
300
600
Feet
N
GreatWest
ENGINEERING


1,994 gpm
1,284 gpm
2,048 gpm
52 gpm
6-inch
6-inch
2,115 gpm
2,484 gpm
2,390 gpm
80
8-inch
2,389 gpm
Elevated Tank
HGL = 3,252'
2,292 gpm
2,222 gpm
1,972 gpm
1,322 gpm
2,859 gpm
6-inch
6-inch
6-inch
2,149 gpm
2,307 gpm
2,166 gpm
6-inch
6-inch
2,170 gpm
2,204 gpm
1,740 gpm
8-inch
2,288 gpm
6-inch
6-inch
1,837 gpm
1,772 gpm
6-inch
732 gpm
1,709 gpm
1,589 gpm
1,715 gpm
6-inch
1,751 gpm
1,069 gpm
1,071 gpm
6-inch
Water Model Results - Proposed Fire Flow Availability
Town of Geraldine, Choteau County, Montana
Geraldine Water PER
Model Junctions
Fire Flow Availability (gpm)
26 - 500
501 - 1,000
1,001 - 1,500
1,501 - 2,000
2,001 - 2,859
Storage Tanks
Proposed System Pipes
Parcel Boundary
0
300
600
Feet
N
GreatWest
ENGINEERING

Existing System Average Day Demand (52 pgm)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (Absolute) (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	19,168	J-32	J-33	6.0	PVC	135.0	5	0.06	0.000
P-2	7,424	Concrete Tank	J-37	6.0	PVC	135.0	11	0.12	0.000
P-3	7,427	J-37	PRV	6.0	PVC	135.0	11	0.12	0.000
P-4	3,803	J-5	J-33	6.0	PVC	135.0	0	0.00	0.000
P-5	2,136	Elevated Tank	J-35	6.0	PVC	135.0	9	0.11	0.000
P-6	2,020	J-32	J-36	3.0	PVC	135.0	5	0.25	0.000
P-7	1,834	J-35	J-5	6.0	PVC	135.0	8	0.09	0.000
P-8	1,657	J-17	J-25	8.0	PVC	135.0	12	0.08	0.000
P-9	1,646	J-33	J-34	2.0	PVC	135.0	5	0.54	0.001
P-10	1,469	J-10	J-4	4.0	Asbestos Cement	85.0	1	0.01	0.000
P-11	1,465	J-13	J-29	4.0	Asbestos Cement	85.0	1	0.03	0.000
P-12	1,460	J-28	J-27	8.0	Asbestos Cement	85.0	11	0.07	0.000
P-13	1,302	J-26	J-24	4.0	Asbestos Cement	85.0	2	0.05	0.000
P-14	1,302	J-24	J-22	4.0	Asbestos Cement	85.0	1	0.02	0.000
P-15	1,181	PRV	J-32	6.0	PVC	135.0	11	0.12	0.000
P-16	1,114	J-16	J-31	2.0	Poly	135.0	0	0.02	0.000
P-17	774	J-30	J-29	3.0	Asbestos Cement	85.0	2	0.08	0.000
P-18	773	J-11	J-14	4.0	Asbestos Cement	85.0	1	0.02	0.000
P-19	737	J-21	J-23	4.0	Asbestos Cement	85.0	2	0.04	0.000
P-20	721	J-28	J-20	6.0	Asbestos Cement	85.0	3	0.04	0.000
P-21	615	J-8	J-12	6.0	PVC	135.0	3	0.03	0.000
P-22	204	J-17	J-30	8.0	Asbestos Cement	85.0	18	0.12	0.000
P-23	372	J-30	J-28	8.0	Asbestos Cement	85.0	16	0.10	0.000
P-24	391	Elevated Tank	J-17	8.0	Asbestos Cement	85.0	32	0.20	0.000
P-25	390	J-22	J-3	6.0	Asbestos Cement	85.0	5	0.05	0.000
P-26	387	J-27	J-13	4.0	Asbestos Cement	85.0	2	0.04	0.000
P-27	383	J-2	J-15	6.0	Asbestos Cement	85.0	3	0.03	0.000
P-28	380	J-23	J-27	4.0	Asbestos Cement	85.0	0	0.01	0.000
P-29	380	J-27	J-1	8.0	Asbestos Cement	85.0	7	0.04	0.000
P-30	375	J-7	J-9	4.0	Asbestos Cement	85.0	2	0.05	0.000
P-31	375	J-11	J-10	4.0	Asbestos Cement	85.0	0	0.01	0.000
P-32	374	J-21	J-22	6.0	Asbestos Cement	85.0	6	0.07	0.000
P-33	364	J-26	J-21	4.0	Asbestos Cement	85.0	3	0.08	0.000
P-34	361	J-25	J-26	8.0	PVC	135.0	8	0.05	0.000

Existing System Average Day Demand (52 pgm)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (Absolute) (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-35	360	J-25	J-20	4.0	Asbestos Cement	85.0	3	0.07	0.000
P-36	359	J-6	J-24	4.0	Asbestos Cement	85.0	2	0.04	0.000
P-37	357	J-22	J-23	4.0	Asbestos Cement	85.0	0	0.01	0.000
P-38	355	J-20	J-21	6.0	Asbestos Cement	85.0	6	0.06	0.000
P-39	351	J-3	J-15	6.0	Asbestos Cement	85.0	1	0.01	0.000
P-40	338	J-7	J-19	4.0	Asbestos Cement	85.0	0	0.01	0.000
P-41	338	J-9	J-18	2.0	Poly	135.0	1	0.06	0.000
P-42	330	J-15	J-16	4.0	Asbestos Cement	85.0	1	0.03	0.000
P-43	324	J-3	J-14	6.0	Asbestos Cement	85.0	2	0.02	0.000
P-44	219	J-12	J-13	8.0	Asbestos Cement	85.0	2	0.01	0.000
P-45	210	J-7	J-11	4.0	Asbestos Cement	85.0	3	0.08	0.000
P-46	209	J-9	J-10	4.0	Asbestos Cement	85.0	1	0.03	0.000
P-47	118	J-1	J-8	6.0	Asbestos Cement	85.0	3	0.04	0.000
P-48	27	J-6	J-7	4.0	Asbestos Cement	85.0	6	0.15	0.000
P-49	19	J-5	J-6	6.0	PVC	135.0	8	0.09	0.000
P-50	7	J-3	J-4	6.0	Asbestos Cement	85.0	1	0.01	0.000
P-51	2	J-1	J-2	8.0	Asbestos Cement	85.0	3	0.02	0.000

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	3,137.56	<None>	<Collection: 1 item>	1	3,252.26	50
J-2	3,137.54	<None>	<Collection: 1 item>	0	3,252.26	50
J-3	3,141.78	<None>	<Collection: 1 item>	1	3,252.26	48
J-4	3,141.63	<None>	<Collection: 1 item>	1	3,252.26	48
J-5	3,152.13	<None>	<Collection: 1 item>	0	3,252.27	43
J-6	3,151.57	<None>	<Collection: 1 item>	0	3,252.27	44
J-7	3,151.30	<None>	<Collection: 1 item>	1	3,252.26	44
J-8	3,136.82	<None>	<Collection: 1 item>	1	3,252.26	50
J-9	3,145.70	<None>	<Collection: 1 item>	0	3,252.26	46
J-10	3,143.45	<None>	<Collection: 1 item>	1	3,252.26	47
J-11	3,145.76	<None>	<Collection: 1 item>	2	3,252.26	46
J-12	3,139.54	<None>	<Collection: 1 item>	1	3,252.26	49
J-13	3,140.24	<None>	<Collection: 1 item>	2	3,252.26	48
J-14	3,141.64	<None>	<Collection: 1 item>	3	3,252.26	48

Existing System Average Day Demand (52 pgm)

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-15	3,139.75	<None>	<Collection: 1 item>	2	3,252.26	49
J-16	3,134.68	<None>	<Collection: 1 item>	1	3,252.25	51
J-17	3,167.87	<None>	<Collection: 1 item>	2	3,252.28	37
J-18	3,153.01	<None>	<Collection: 1 item>	1	3,252.25	43
J-19	3,159.69	<None>	<Collection: 1 item>	0	3,252.26	40
J-20	3,152.80	<None>	<Collection: 1 item>	1	3,252.27	43
J-21	3,148.45	<None>	<Collection: 1 item>	1	3,252.26	45
J-22	3,145.39	<None>	<Collection: 1 item>	2	3,252.26	46
J-23	3,144.33	<None>	<Collection: 1 item>	2	3,252.26	47
J-24	3,157.38	<None>	<Collection: 1 item>	3	3,252.26	41
J-25	3,157.92	<None>	<Collection: 1 item>	1	3,252.28	41
J-26	3,149.75	<None>	<Collection: 1 item>	3	3,252.28	44
J-27	3,141.71	<None>	<Collection: 1 item>	2	3,252.26	48
J-28	3,162.32	<None>	<Collection: 1 item>	2	3,252.27	39
J-29	3,159.77	<None>	<Collection: 1 item>	3	3,252.25	40
J-30	3,167.00	<None>	<Collection: 1 item>	1	3,252.28	37
J-31	3,133.68	<None>	<Collection: 1 item>	0	3,252.25	51
J-32	3,079.01	<None>	<Collection: 0 items>	0	3,252.34	75
J-33	3,132.62	<None>	<Collection: 0 items>	0	3,252.27	52
J-34	3,126.68	<None>	<Collection: 1 item>	5	3,250.81	54
J-35	3,181.77	<None>	<Collection: 1 item>	1	3,252.28	31
J-36	3,099.72	<None>	<Collection: 1 item>	5	3,252.07	66
J-37	3,111.90	<None>	<Collection: 0 items>	0	3,431.89	138

Tank Table - Time: 0.00 hours

Label	Elevation (Base) (ft)	Elevation (Minimum) (ft)	Elevation (Initial) (ft)	Elevation (Maximum) (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)	Elevation (ft)
Concrete Tank	3,417.50	3,417.50	3,432.00	3,432.00	11	3,432.00	3,434.00
Elevated Tank	3,171.77	3,241.77	3,252.31	3,262.85	41	3,252.31	3,171.77

PRV Table - Time: 0.00 hours

Existing System Average Day Demand (52 pgm)

PRV Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Diameter (Valve) (in)	Minor Loss Coefficient (Local)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)	Pressure (From) (psi)	Pressure (To) (psi)
32	PRV	3,118.63	6.0	0.000	3,252.31	58	11	3,431.78	3,252.36	179.42	135	58

Existing System Maximum Day Demand (155 gpm)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (Absolute) (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	19,168	J-32	J-33	6.0	PVC	135.0	11	0.13	0.000
P-2	7,424	Concrete Tank	J-37	6.0	PVC	135.0	(N/A)	(N/A)	(N/A)
P-3	7,427	J-37	PRV	6.0	PVC	135.0	(N/A)	(N/A)	(N/A)
P-4	3,803	J-5	J-33	6.0	PVC	135.0	5	0.05	0.000
P-5	2,136	Elevated Tank	J-35	6.0	PVC	135.0	30	0.34	0.000
P-6	2,020	J-32	J-36	3.0	PVC	135.0	16	0.75	0.001
P-7	1,834	J-35	J-5	6.0	PVC	135.0	27	0.30	0.000
P-8	1,657	J-17	J-25	8.0	PVC	135.0	35	0.22	0.000
P-9	1,646	J-33	J-34	2.0	PVC	135.0	16	1.62	0.007
P-10	1,469	J-10	J-4	4.0	Asbestos Cement	85.0	1	0.02	0.000
P-11	1,465	J-13	J-29	4.0	Asbestos Cement	85.0	4	0.09	0.000
P-12	1,460	J-28	J-27	8.0	Asbestos Cement	85.0	34	0.22	0.000
P-13	1,302	J-26	J-24	4.0	Asbestos Cement	85.0	5	0.14	0.000
P-14	1,302	J-24	J-22	4.0	Asbestos Cement	85.0	2	0.05	0.000
P-15	1,181	PRV	J-32	6.0	PVC	135.0	28	0.31	0.000
P-16	1,114	J-16	J-31	2.0	Poly	135.0	1	0.06	0.000
P-17	774	J-30	J-29	3.0	Asbestos Cement	85.0	5	0.21	0.000
P-18	773	J-11	J-14	4.0	Asbestos Cement	85.0	2	0.05	0.000
P-19	737	J-21	J-23	4.0	Asbestos Cement	85.0	4	0.11	0.000
P-20	721	J-28	J-20	6.0	Asbestos Cement	85.0	11	0.12	0.000
P-21	615	J-8	J-12	6.0	PVC	135.0	8	0.10	0.000
P-22	204	J-17	J-30	8.0	Asbestos Cement	85.0	57	0.36	0.000
P-23	372	J-30	J-28	8.0	Asbestos Cement	85.0	49	0.32	0.000
P-24	391	Elevated Tank	J-17	8.0	Asbestos Cement	85.0	97	0.62	0.001
P-25	390	J-22	J-3	6.0	Asbestos Cement	85.0	14	0.16	0.000
P-26	387	J-27	J-13	4.0	Asbestos Cement	85.0	4	0.11	0.000
P-27	383	J-2	J-15	6.0	Asbestos Cement	85.0	9	0.11	0.000
P-28	380	J-23	J-27	4.0	Asbestos Cement	85.0	0	0.00	0.000
P-29	380	J-27	J-1	8.0	Asbestos Cement	85.0	22	0.14	0.000
P-30	375	J-7	J-9	4.0	Asbestos Cement	85.0	6	0.14	0.000
P-31	375	J-11	J-10	4.0	Asbestos Cement	85.0	0	0.01	0.000
P-32	374	J-21	J-22	6.0	Asbestos Cement	85.0	19	0.22	0.000
P-33	364	J-26	J-21	4.0	Asbestos Cement	85.0	10	0.24	0.000
P-34	361	J-25	J-26	8.0	PVC	135.0	23	0.15	0.000

Existing System Maximum Day Demand (155 gpm)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (Absolute) (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-35	360	J-25	J-20	4.0	Asbestos Cement	85.0	8	0.20	0.000
P-36	359	J-6	J-24	4.0	Asbestos Cement	85.0	5	0.12	0.000
P-37	357	J-22	J-23	4.0	Asbestos Cement	85.0	1	0.02	0.000
P-38	355	J-20	J-21	6.0	Asbestos Cement	85.0	17	0.19	0.000
P-39	351	J-3	J-15	6.0	Asbestos Cement	85.0	1	0.01	0.000
P-40	338	J-7	J-19	4.0	Asbestos Cement	85.0	1	0.03	0.000
P-41	338	J-9	J-18	2.0	Poly	135.0	2	0.18	0.000
P-42	330	J-15	J-16	4.0	Asbestos Cement	85.0	4	0.10	0.000
P-43	324	J-3	J-14	6.0	Asbestos Cement	85.0	7	0.08	0.000
P-44	219	J-12	J-13	8.0	Asbestos Cement	85.0	6	0.04	0.000
P-45	210	J-7	J-11	4.0	Asbestos Cement	85.0	8	0.21	0.000
P-46	209	J-9	J-10	4.0	Asbestos Cement	85.0	3	0.07	0.000
P-47	118	J-1	J-8	6.0	Asbestos Cement	85.0	10	0.12	0.000
P-48	27	J-6	J-7	4.0	Asbestos Cement	85.0	17	0.42	0.001
P-49	19	J-5	J-6	6.0	PVC	135.0	22	0.25	0.000
P-50	7	J-3	J-4	6.0	Asbestos Cement	85.0	3	0.04	0.000
P-51	2	J-1	J-2	8.0	Asbestos Cement	85.0	11	0.07	0.000

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	3,137.56	<None>	<Collection: 1 item>	2	3,251.88	49
J-2	3,137.54	<None>	<Collection: 1 item>	1	3,251.88	49
J-3	3,141.78	<None>	<Collection: 1 item>	3	3,251.87	48
J-4	3,141.63	<None>	<Collection: 1 item>	4	3,251.87	48
J-5	3,152.13	<None>	<Collection: 1 item>	1	3,251.94	43
J-6	3,151.57	<None>	<Collection: 1 item>	1	3,251.93	43
J-7	3,151.30	<None>	<Collection: 1 item>	2	3,251.91	44
J-8	3,136.82	<None>	<Collection: 1 item>	2	3,251.87	50
J-9	3,145.70	<None>	<Collection: 1 item>	1	3,251.88	46
J-10	3,143.45	<None>	<Collection: 1 item>	2	3,251.87	47
J-11	3,145.76	<None>	<Collection: 1 item>	6	3,251.87	46
J-12	3,139.54	<None>	<Collection: 1 item>	2	3,251.87	49
J-13	3,140.24	<None>	<Collection: 1 item>	7	3,251.87	48
J-14	3,141.64	<None>	<Collection: 1 item>	9	3,251.86	48

Existing System Maximum Day Demand (155 gpm)

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-15	3,139.75	<None>	<Collection: 1 item>	6	3,251.87	49
J-16	3,134.68	<None>	<Collection: 1 item>	3	3,251.85	51
J-17	3,167.87	<None>	<Collection: 1 item>	5	3,252.10	36
J-18	3,153.01	<None>	<Collection: 1 item>	2	3,251.84	43
J-19	3,159.69	<None>	<Collection: 1 item>	1	3,251.91	40
J-20	3,152.80	<None>	<Collection: 1 item>	2	3,251.97	43
J-21	3,148.45	<None>	<Collection: 1 item>	3	3,251.94	45
J-22	3,145.39	<None>	<Collection: 1 item>	6	3,251.89	46
J-23	3,144.33	<None>	<Collection: 1 item>	5	3,251.89	47
J-24	3,157.38	<None>	<Collection: 1 item>	8	3,251.91	41
J-25	3,157.92	<None>	<Collection: 1 item>	4	3,252.04	41
J-26	3,149.75	<None>	<Collection: 1 item>	8	3,252.04	44
J-27	3,141.71	<None>	<Collection: 1 item>	7	3,251.89	48
J-28	3,162.32	<None>	<Collection: 1 item>	5	3,252.00	39
J-29	3,159.77	<None>	<Collection: 1 item>	8	3,251.80	40
J-30	3,167.00	<None>	<Collection: 1 item>	3	3,252.06	37
J-31	3,133.68	<None>	<Collection: 1 item>	1	3,251.83	51
J-32	3,079.01	<None>	<Collection: 0 items>	0	3,252.25	75
J-33	3,132.62	<None>	<Collection: 0 items>	0	3,251.92	52
J-34	3,126.68	<None>	<Collection: 1 item>	16	3,240.81	49
J-35	3,181.77	<None>	<Collection: 1 item>	3	3,252.09	30
J-36	3,099.72	<None>	<Collection: 1 item>	16	3,250.22	65
J-37	3,111.90	<None>	<Collection: 0 items>	(N/A)	(N/A)	(N/A)

Tank Table - Time: 0.00 hours

Label	Elevation (Base) (ft)	Elevation (Minimum) (ft)	Elevation (Initial) (ft)	Elevation (Maximum) (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)	Elevation (ft)
Concrete Tank	3,417.50	3,417.50	3,432.00	3,432.00	28	3,432.00	3,434.00
Elevated Tank	3,171.77	3,241.77	3,252.31	3,262.85	127	3,252.31	3,171.77

PRV Table - Time: 0.00 hours

Existing System Maximum Day Demand (155 gpm)

PRV Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Diameter (Valve) (in)	Minor Loss Coefficient (Local)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)	Pressure (From) (psi)	Pressure (To) (psi)
32	PRV	3,118.63	6.0	0.000	3,252.31	58	28	3,430.66	3,252.36	178.30	135	58

Existing System Peak Hour Demand (206 gpm)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (Absolute) (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	19,168	J-32	J-33	6.0	PVC	135.0	15	0.17	0.000
P-2	7,424	Concrete Tank	J-37	6.0	PVC	135.0	37	0.42	0.000
P-3	7,427	J-37	PRV	6.0	PVC	135.0	37	0.42	0.000
P-4	3,803	J-5	J-33	6.0	PVC	135.0	6	0.07	0.000
P-5	2,136	Elevated Tank	J-35	6.0	PVC	135.0	40	0.45	0.000
P-6	2,020	J-32	J-36	3.0	PVC	135.0	22	1.00	0.002
P-7	1,834	J-35	J-5	6.0	PVC	135.0	36	0.41	0.000
P-8	1,657	J-17	J-25	8.0	PVC	135.0	49	0.31	0.000
P-9	1,646	J-33	J-34	2.0	PVC	135.0	21	2.16	0.012
P-10	1,469	J-10	J-4	4.0	Asbestos Cement	85.0	1	0.03	0.000
P-11	1,465	J-13	J-29	4.0	Asbestos Cement	85.0	4	0.10	0.000
P-12	1,460	J-28	J-27	8.0	Asbestos Cement	85.0	43	0.28	0.000
P-13	1,302	J-26	J-24	4.0	Asbestos Cement	85.0	8	0.20	0.000
P-14	1,302	J-24	J-22	4.0	Asbestos Cement	85.0	2	0.06	0.000
P-15	1,181	PRV	J-32	6.0	PVC	135.0	37	0.42	0.000
P-16	1,114	J-16	J-31	2.0	Poly	135.0	1	0.08	0.000
P-17	774	J-30	J-29	3.0	Asbestos Cement	85.0	7	0.31	0.000
P-18	773	J-11	J-14	4.0	Asbestos Cement	85.0	3	0.07	0.000
P-19	737	J-21	J-23	4.0	Asbestos Cement	85.0	6	0.16	0.000
P-20	721	J-28	J-20	6.0	Asbestos Cement	85.0	14	0.16	0.000
P-21	615	J-8	J-12	6.0	PVC	135.0	10	0.12	0.000
P-22	204	J-17	J-30	8.0	Asbestos Cement	85.0	75	0.48	0.000
P-23	372	J-30	J-28	8.0	Asbestos Cement	85.0	64	0.41	0.000
P-24	391	Elevated Tank	J-17	8.0	Asbestos Cement	85.0	130	0.83	0.001
P-25	390	J-22	J-3	6.0	Asbestos Cement	85.0	19	0.22	0.000
P-26	387	J-27	J-13	4.0	Asbestos Cement	85.0	6	0.16	0.000
P-27	383	J-2	J-15	6.0	Asbestos Cement	85.0	12	0.14	0.000
P-28	380	J-23	J-27	4.0	Asbestos Cement	85.0	1	0.02	0.000
P-29	380	J-27	J-1	8.0	Asbestos Cement	85.0	29	0.18	0.000
P-30	375	J-7	J-9	4.0	Asbestos Cement	85.0	7	0.19	0.000
P-31	375	J-11	J-10	4.0	Asbestos Cement	85.0	1	0.02	0.000
P-32	374	J-21	J-22	6.0	Asbestos Cement	85.0	26	0.30	0.000
P-33	364	J-26	J-21	4.0	Asbestos Cement	85.0	13	0.34	0.000
P-34	361	J-25	J-26	8.0	PVC	135.0	32	0.20	0.000

Existing System Peak Hour Demand (206 gpm)

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (Absolute) (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-35	360	J-25	J-20	4.0	Asbestos Cement	85.0	11	0.28	0.000
P-36	359	J-6	J-24	4.0	Asbestos Cement	85.0	5	0.14	0.000
P-37	357	J-22	J-23	4.0	Asbestos Cement	85.0	1	0.03	0.000
P-38	355	J-20	J-21	6.0	Asbestos Cement	85.0	23	0.26	0.000
P-39	351	J-3	J-15	6.0	Asbestos Cement	85.0	2	0.02	0.000
P-40	338	J-7	J-19	4.0	Asbestos Cement	85.0	2	0.04	0.000
P-41	338	J-9	J-18	2.0	Poly	135.0	2	0.24	0.000
P-42	330	J-15	J-16	4.0	Asbestos Cement	85.0	5	0.14	0.000
P-43	324	J-3	J-14	6.0	Asbestos Cement	85.0	9	0.10	0.000
P-44	219	J-12	J-13	8.0	Asbestos Cement	85.0	7	0.05	0.000
P-45	210	J-7	J-11	4.0	Asbestos Cement	85.0	11	0.28	0.000
P-46	209	J-9	J-10	4.0	Asbestos Cement	85.0	4	0.09	0.000
P-47	118	J-1	J-8	6.0	Asbestos Cement	85.0	13	0.14	0.000
P-48	27	J-6	J-7	4.0	Asbestos Cement	85.0	22	0.57	0.001
P-49	19	J-5	J-6	6.0	PVC	135.0	28	0.32	0.000
P-50	7	J-3	J-4	6.0	Asbestos Cement	85.0	4	0.05	0.000
P-51	2	J-1	J-2	8.0	Asbestos Cement	85.0	14	0.09	0.000

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	3,137.56	<None>	<Collection: 1 item>	2	3,251.60	49
J-2	3,137.54	<None>	<Collection: 1 item>	2	3,251.60	49
J-3	3,141.78	<None>	<Collection: 1 item>	4	3,251.58	48
J-4	3,141.63	<None>	<Collection: 1 item>	5	3,251.58	48
J-5	3,152.13	<None>	<Collection: 1 item>	1	3,251.67	43
J-6	3,151.57	<None>	<Collection: 1 item>	1	3,251.67	43
J-7	3,151.30	<None>	<Collection: 1 item>	2	3,251.64	43
J-8	3,136.82	<None>	<Collection: 1 item>	2	3,251.59	50
J-9	3,145.70	<None>	<Collection: 1 item>	2	3,251.59	46
J-10	3,143.45	<None>	<Collection: 1 item>	3	3,251.58	47
J-11	3,145.76	<None>	<Collection: 1 item>	8	3,251.58	46
J-12	3,139.54	<None>	<Collection: 1 item>	3	3,251.58	48
J-13	3,140.24	<None>	<Collection: 1 item>	9	3,251.58	48
J-14	3,141.64	<None>	<Collection: 1 item>	12	3,251.57	48

Existing System Peak Hour Demand (206 gpm)

Junction Table - Time: 0.00 hours

Label	Elevation (ft)	Zone	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-15	3,139.75	<None>	<Collection: 1 item>	9	3,251.58	48
J-16	3,134.68	<None>	<Collection: 1 item>	5	3,251.55	51
J-17	3,167.87	<None>	<Collection: 1 item>	7	3,251.95	36
J-18	3,153.01	<None>	<Collection: 1 item>	2	3,251.53	43
J-19	3,159.69	<None>	<Collection: 1 item>	2	3,251.64	40
J-20	3,152.80	<None>	<Collection: 1 item>	2	3,251.75	43
J-21	3,148.45	<None>	<Collection: 1 item>	4	3,251.69	45
J-22	3,145.39	<None>	<Collection: 1 item>	9	3,251.62	46
J-23	3,144.33	<None>	<Collection: 1 item>	7	3,251.62	46
J-24	3,157.38	<None>	<Collection: 1 item>	11	3,251.64	41
J-25	3,157.92	<None>	<Collection: 1 item>	5	3,251.85	41
J-26	3,149.75	<None>	<Collection: 1 item>	11	3,251.84	44
J-27	3,141.71	<None>	<Collection: 1 item>	9	3,251.62	48
J-28	3,162.32	<None>	<Collection: 1 item>	6	3,251.79	39
J-29	3,159.77	<None>	<Collection: 1 item>	11	3,251.52	40
J-30	3,167.00	<None>	<Collection: 1 item>	4	3,251.88	37
J-31	3,133.68	<None>	<Collection: 1 item>	1	3,251.53	51
J-32	3,079.01	<None>	<Collection: 0 items>	0	3,252.18	75
J-33	3,132.62	<None>	<Collection: 0 items>	0	3,251.65	51
J-34	3,126.68	<None>	<Collection: 1 item>	21	3,232.71	46
J-35	3,181.77	<None>	<Collection: 1 item>	4	3,251.94	30
J-36	3,099.72	<None>	<Collection: 1 item>	22	3,248.71	64
J-37	3,111.90	<None>	<Collection: 0 items>	0	3,430.88	138

Tank Table - Time: 0.00 hours

Label	Elevation (Base) (ft)	Elevation (Minimum) (ft)	Elevation (Initial) (ft)	Elevation (Maximum) (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)	Elevation (ft)
Concrete Tank	3,417.50	3,417.50	3,432.00	3,432.00	37	3,432.00	3,434.00
Elevated Tank	3,171.77	3,241.77	3,252.31	3,262.85	170	3,252.31	3,171.77

PRV Table - Time: 0.00 hours

Existing System Peak Hour Demand (206 gpm)

PRV Table - Time: 0.00 hours

ID	Label	Elevation (ft)	Diameter (Valve) (in)	Minor Loss Coefficient (Local)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)	Headloss (ft)	Pressure (From) (psi)	Pressure (To) (psi)
32	PRV	3,118.63	6.0	0.000	3,252.31	58	37	3,429.76	3,252.36	177.40	135	58

Existing System Fire Flow Availability

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow Iterations	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)
J-34	13	29	21	30	J-35	30	J-35
J-31	13	51	21	30	J-35	30	J-35
J-36	3	122	20	30	J-35	30	J-35
J-33	5	598	22	20	J-34	20	J-34
J-32	11	683	30	20	J-36	20	J-36
J-37	2	712	20	30	J-35	30	J-35
J-35	3	631	20	34	J-19	34	J-19
J-18	14	82	20	30	J-35	30	J-35
J-19	3	283	20	29	J-35	29	J-35
J-29	3	219	20	30	J-35	30	J-35
J-16	3	366	20	20	J-31	20	J-31
J-9	5	511	23	20	J-18	20	J-18
J-24	3	552	20	28	J-35	28	J-35
J-5	22	898	24	20	J-35	20	J-35
J-14	3	899	20	27	J-35	27	J-35
J-6	6	901	24	20	J-35	20	J-35
J-7	5	816	24	20	J-19	20	J-19
J-10	3	617	20	22	J-18	22	J-18
J-11	3	717	20	25	J-35	25	J-35
J-15	3	1,140	20	22	J-16	22	J-16
J-12	5	900	23	20	J-29	20	J-29
J-13	5	878	23	20	J-29	20	J-29
J-8	5	1,053	24	20	J-29	20	J-29
J-20	3	1,189	20	27	J-35	27	J-35
J-4	3	1,202	20	21	J-3	21	J-3
J-3	3	1,213	20	20	J-4	20	J-4
J-25	3	1,389	20	24	J-26	24	J-26
J-23	3	766	20	29	J-35	29	J-35
J-26	5	1,415	20	20	J-25	20	J-25
J-28	3	1,396	20	24	J-30	24	J-30
J-22	3	1,245	20	26	J-35	26	J-35
J-21	3	1,270	20	25	J-20	25	J-20
J-2	5	1,173	25	20	J-29	20	J-29
J-1	5	1,172	25	20	J-29	20	J-29
J-30	3	1,520	20	23	J-28	23	J-28

Existing System Fire Flow Availability

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow Iterations	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)
J-27	5	1,217	23	20	J-29	20	J-29
J-17	4	1,807	20	20	J-30	20	J-30

Proposed System Fire Flow Availability

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow Iterations	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)
J-34	12	26	21	30	J-35	30	J-35
J-31	13	52	21	30	J-35	30	J-35
J-36	3	118	20	30	J-35	30	J-35
J-33	5	613	24	20	J-34	20	J-34
J-32	10	682	30	20	J-36	20	J-36
J-37	3	712	20	30	J-35	30	J-35
J-35	3	732	20	36	J-17	36	J-17
J-18	3	1,069	20	26	J-35	26	J-35
J-19	3	1,071	20	26	J-35	26	J-35
J-29	3	1,284	20	28	J-35	28	J-35
J-16	3	1,322	20	20	J-31	20	J-31
J-9	5	1,589	23	20	J-18	20	J-18
J-24	3	1,709	20	23	J-35	23	J-35
J-5	6	1,715	24	20	J-35	20	J-35
J-14	3	1,740	20	23	J-35	23	J-35
J-6	8	1,751	24	20	J-35	20	J-35
J-7	6	1,755	24	20	J-19	20	J-19
J-10	6	1,772	22	20	J-18	20	J-18
J-11	6	1,837	22	20	J-19	20	J-19
J-15	4	1,972	20	22	J-16	22	J-16
J-12	4	1,994	20	22	J-13	22	J-13
J-13	4	2,048	20	21	J-12	21	J-12
J-8	4	2,115	20	23	J-35	23	J-35
J-20	4	2,149	20	23	J-35	23	J-35
J-4	40	2,166	20	20	J-35	20	J-35
J-3	24	2,170	21	20	J-35	20	J-35
J-25	4	2,204	20	23	J-35	23	J-35
J-23	4	2,222	20	21	J-35	21	J-35
J-26	4	2,288	20	20	J-25	20	J-25
J-28	4	2,292	20	23	J-30	23	J-30
J-22	6	2,307	20	20	J-35	20	J-35
J-21	4	2,345	20	21	J-35	21	J-35
J-2	4	2,389	20	20	J-1	20	J-1
J-1	4	2,390	20	20	J-2	20	J-2
J-30	4	2,448	20	23	J-28	23	J-28

Proposed System Fire Flow Availability

Fire Flow Report - Time: 0.00 hours

Label	Fire Flow Iterations	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)
J-27	4	2,484	20	20	J-35	20	J-35
J-17	4	2,859	20	20	J-30	20	J-30

APPENDIX Q

Disinfection DEQ Corrective Action

DEQ
Montana Department of Environmental Quality

August 2, 2018

CERTIFIED MAIL

TOWN OF GERALDINE
JON HELBERG
P O BOX 211
GERALDINE, MT 59446

Re: Ground Water Rule Corrective Action Required for Fecal Indicator Positive Source Samples. TOWN OF GERALDINE, PWSID: MT0000225.

Dear Mr. Helberg:

The Montana Department of Environmental Quality (DEQ) was notified on July 16, 2018, of a positive total coliform sample from the Town of Geraldine. The sample was taken on July 10, 2018, in the distribution system. Successive repeat and source water samples were taken on July 17, 2018. The results of the repeat samples from the distribution system were negative for total coliform and *E. coli* bacteria. The source water sample was reported as *E. coli* positive. The system is using disinfection at the common header with a minimum chlorine residual of 0.8 mg/L. DEQ spoke with Mr. Helberg on July 20, 2018, and requested five source water confirmation samples under the Ground Water Rule. These samples were collected on July 23, 2018, and reported on July 26, 2018. The results of three of the samples were negative for total coliform and *E. coli* bacteria. Of the remaining two, one was positive for total coliform and the other was positive for *E. coli*. These samples confirm the presence of the fecal indicator *E. coli* in your source water.

The Administrative Rules of Montana 17.38.211 and 17.38.104 requires public water supplies with fecal indicator positive source samples to comply with certain treatment technique requirements. Your springs have been identified as having fecal contamination and are considered high risk. This is a significant deficiency under the Ground Water Rule. DEQ is sending this letter to notify you that these significant deficiencies must be addressed through corrective action.

Your public water system will need to begin corrective action to return to compliance.

Corrective action can consist of one or more of the following responses:

- Replacement of the contaminated source(s),
- Eliminate the source(s) of contamination,

Installation of treatment that achieves 4-log virus inactivation, or

Purchase water from another appropriate public water supply to be delivered to a new cistern storage facility at the Town of Geraldine.

Please be aware, you may not construct, alter, extend, or modify a public water system without prior DEQ engineering and approval.

You must respond to me, in writing, within 30 days (**September 1, 2018**) of receiving this letter and indicate:

1) The corrective action(s) the system plans to complete, and
2) The schedule you will use to implement the corrective action.

In addition, you must either complete the corrective actions(s) or be on an approved corrective action plan within 120 days (**November 30th, 2018**) of receiving this letter. Failure to meet these requirements will result in a violation.

If you would like to discuss this further or have other relevant information, documentation or any questions please contact me at (406) 444-3425 or cfetkavich@mt.gov.

Craig Fetkavich
Ground Water Rule Manager
Public Water Supply Section

cc: Helena PWS file
Chouteau County Sanitarian
Elizabeth Henrikson-email
Rachel Clark-email
Eugene Pizzini-email

Town of
Geraldine

Perry Joyce. Mayor

Council Members: Marty Clark Michael Qunell Anita Klein Will Muir

P.O. Box 211 Geraldine, MT 59446 (406) 737-4361 gertown@itstriangle.com

8/17/2018

Craig Fetkavich,Ground Water Mgr.
Public Water Supply Section
PO Box 200901
Helena, Mt. 59620-0901

RE: water system treatment

Dear Sir:

The town of Geraldine has decided on treatment that achieves 4-log virus inactivation.

We will be in contact with Great West Engineering.

Sincerely,

Jon Helberg
Town Operator #8638
Town of Geraldine

HELENA
PO Box 4817 ▪ 2501 Belt View Drive
Helena, MT 59604
406.449.8627 ▪ Fax 406.449.8631
www.greatwesteng.com

November 16, 2018

Craig Fetkavich
Montana Department of Environmental Quality
Ground Water Rule Manager
PO Box 200901
Helena, Montana 59620-0901

RE: **Ground Water Rule Corrective Action Required for Fecal Indicator Positive Source Sample. TOWN OF GERALDINE, PWSID: MT0000225**
Response and CT Calculations

Dear Mr. Fetkavich:

This letter is in response to your letter dated August 2, 2018 regarding the referenced corrective action requirements for compliance. The Town of Geraldine's intent is to verify 4-log virus inactivation is achieved in the existing water treatment system and water infrastructure after chlorination. The Town has retained Great West Engineering to provide the necessary calculations to support this effort.

Specific responses to the items listed in the follow-up email with Denver Fraser on October 18, 2018, are provided below in bold. Please reference the attached documents for supporting documentation.

1. The length and inside diameter (ID) of the pipe being used for CT volume is needed.

   According to water system record drawings, the distance from the chlorination station (Sta. 510+00) to the first service public connection (215+00) is approximately 29,500 feet (5.6 pipeline miles) with 6-inch PVC piping. This connection point is to the Hawarden rural public water system supply (PWS #MT0003522). The first water user is several hundred feet beyond this point according Geraldine operators.

   See attached record drawing copies.

2. The minimum water temperature. DEQ generally uses average air temperature for the area for ground water systems (~45.5 °F or 7.5 °C for Geraldine), unless temperature measurements will be done. With that air temperature, CT required would be 7.0 mg*min/L.

   The water temperature was measured at 15.3 °C (59.8 °F) on October 15, 2018 at 8:30am. However, for the conservative basis of design, the DEQ method of average air temperature at 45.5 °F or 7.5 °C was used for CT calculations.

BILLINGS
6780 Trade Center Ave
Billings, MT 59101
406.652.5000
Fax 406.248.1363

BOISE
3050 N. Lakeharbor Ln
Suite 201
Boise, ID 83703
208.576.6646

MISSOULA
112 W. Front Street
Missoula, MT 59802
406.493.0312

3. CT for 4.0-log inactivation is the same for water with a pH between 6.0 and 9.0.

   The water pH was measured at 8.2 on October 15, 2018, which is within the 6-9 standard unit range.

4. Where and how will monitoring be performed? The monitoring point must be after contact time.

   The monitoring point is an accessible sample tap near the Town of Square Butte (Approximately Sta. 375+00). This location is about 13,500 feet downstream of the chlorination point. This location is upstream of the connection to Hawarden and downstream of the required minimum CT for 4-log viral disinfection. This sampling tap location is also the common sampling point for other testing parameters in the water system.

5. There can be no service connections prior to the point where CT is achieved.

   The Geraldine public water system (PWS MT0000225), and downstream public systems (Hawarden MT0003522), and (North Geraldine MT0003521) are connected after disinfection CT is achieved.

   The Town of Geraldine desires to achieve compliance for 4-log viral removal for the Geraldine public water system (PWS MT0000225), Hawarden MT0003522, and North Geraldine MT0003521 connections as demonstrated in the calculations attached.

   A private water service connection to the spring supply pipe is made by the Meissner Ranch. It is reported that the tap is upstream of the treatment building. The Meissner Ranch is a private, non-paying connection to the Geraldine system and does not receive chlorinated water by choice and as per agreement in exchange for providing the spring supply to the Town and rural water systems.

6. For this size system, peak hour demand is likely appropriate for CT requirements. With that, peak demand information will be necessary. I do not know if the system has meter on the spring line or the ability to determine peak hour demand, but that will be required.

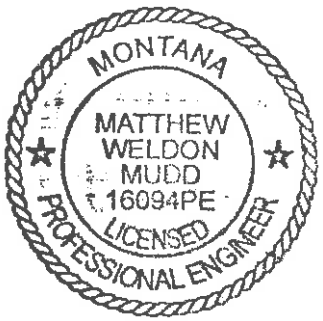
   Peak instantaneous flows are used for the CT calculations. A peak instantaneous flow of 200 gpm has been recorded and is verified by the SCADA system.

   CT calculation summary sheets are attached to this document.

Please contact me at (406) 495-6196 or mmudd@greatwesteng.com if I can be of any assistance.

Sincerely,

Great West Engineering, Inc.



Matt Mudd, PE
Project Manager

Enclosures

cc: Mayor Perry Joyce, Town of Geraldine
Denver Fraser, Montana DEQ
Rachel Clark, Montana DEQ

GREAT WEST ENGINEERING

PROJECT	Geraldine Water System CT Caculation Project #1-15283
SUBJECT	Water System Verification for 4-log viral reduction
MADE BY	Matthew Mudd 11.13.18 MM
CHECKED	Joel Pilcher 11.15.18

BACKGROUND

- The disinfection injection point is located in the existing pump chlorine building
-maintain 0.5 mg/L - 2.0 (0.8 mg/l avg.) injection chlorine residual at entry point to the distribution system
-Maintain 0.2 mg/L chlorine residual at the termination points of the distribution system
- the water temperature was measured at (59.8 deg F) 15.3 deg C on 10/15/18, 8:30am
- Per DEQ the area for ground water systems (~45.5 ºF or 7.5 ºC for Geraldine)
- influent pH is 8.2 per measurement on 10/15/18, 8:30am
- maximum daily flow demand is approximately 120,000 gpd (83 gpm)
- peak instantaneous flow is 200 gpm as recorded by SCADA flow meter
-treatment uses sodium hypochlorite injected by positive displacement pump. Pump is flow paced to flow meter.

ANALYSIS

- the required contact time for a 4-log inactivation of viruses was determined from Table E-7 from the 1991 EPA publication "*Guidance Manual For Compliance With The Filtration And Disinfection Requirements For Public Water Systems Using Surface Water Sources*"

Determine Required Contact Time:

- From Table E-7, a CT value of 8.0 is associated with a Temperature of 5ºC and a pH of 6-9.

CT =	8	mg/L * min	
Min. Residual (C) =	0.5	mg/L	*(DEQ letter reports 0.8 mg/l)*
Required Contact Time (T_r) =	16.00	min	

Determine Required Contact Volume:

Flow rate (Q) =	200	gpm	*(Max flow rate)*
Contact Time (T) =	16.00	min	
Volume (V) =	3,200	gal	
Required Volume (V_r) =	428	ft^3	

Determine Available Contact Time and Volume:

- refer to the attached calculation sheet for the available contact time

Available Contact Time (T_a) =	216.52	min	*(available exceeds required)*
Available Contact Volume (V_a) = $Q*T_a$ =	5,789	ft^3	*(available exceeds required)*

SOLUTIONS

- The proposed flow through the existing infrastructure to first downstream connection provides adequate contact time for 4-log virus, and therefore **no additional volume is required.** The max flow rate was used in the analysis.

GREAT WEST ENGINEERING

PROJECT	Geraldine
SUBJECT	Water System Verification for 4-log viral reduction
MADE BY	Matthew Mudd 11.13.18 MM
CHECKED	Joel Pilcher 11.15.18

CONTACT TIME CALCULATION

- Contact time shall be determined by calculating the volume (capacity) of the water system and then dividing by the flow rate.

Peak Water Supply Flows:
(measured from flow meter)
Max (Q) = 200 gpm

Peak Demand Flows:
(from available flow data)
Maximum Day (Q) = 120,000 gpd 83.3 gpm
160 connections x 2.5 = 400 people
400 x 100 gpcd = 40,000 gpd avererage day flow
max day = 40,000 x 2.5 (peaking factor) = 120,000 gpd

Pipe and Tank Volumes:

equ. (1) $V = \pi/4(D)^2 \times L$

Pipe Volumes:

	P 1			P 2	
D =	6	in	D =		in
L =	29500	ft	L =		ft
V =	5789.4	ft^3	V =		ft^3
V =	43304.5	gal	V =		gal

Tank Volume:

	T 1		
D =		ft	
L =		ft	*(min. tank level; low water alarm)*
V =		ft^3	
V =		gal	
V_B =		gal	*(incl. baffle factor of 0.1 for std. tank)*

Total Available Volume (V_a) = $V_{P1} + V_{P2} + V_{T1}$ = 43,304.5 gal

Contact Times:

equ. (2) $T_a = V/Q$ *(available contact time in existing system)*

	(gal)	(gpm)	(min.)
T_{P1}	43,304.5	200	*216.52*
T_{P2}	0.0	0	*0.00*
T_{T1}	0.0	0	*0.00*

Total Available Contact Time (T_a) = $T_{P1} + T_{P2} + T_{T1}$ = 216.52 min.

EPA TABLE E-7
OF GUIDANCE MANUAL (1991)

TABLE E-7

CT VALUES FOR
INACTIVATION OF VIRUSES BY FREE CHLORINE[1]

	Log Inactivation					
	2.0 pH		3.0 pH		4.0 pH	
Temperature (C)	6-9	10	6-9	10	6-9	10
0.5	6	45	9	66	12	90
5	4	30	6	44	8	60
10	3	22	4	33	6	45
15	2	15	3	22	4	30
20	1	11	2	16	3	22
25	1	7	1	11	2	15

Notes:

1. Basis for values given in Appendix F.

Matthew Mudd

From: Fraser, Denver <Dfraser@mt.gov>
Sent: Wednesday, October 17, 2018 11:01 AM
To: Matthew Mudd; Clark, Rachel
Cc: Fetkavich, Craig; Fraser, Denver
Subject: RE: Geraldine Water System (MT0000225)

Matt:

We will need a report showing how CT will be achieved and how and will monitoring will be done. The following items will be required:

1. The length and ID of the pipe being used for CT volume is needed.
2. The minimum water temperature. DEQ generally uses average air temperature for the area for ground water systems (~45.5 ºF or 7.5 ºC for Geraldine), unless temperature measurements will be done. With that air temperature, CT required would be 7.0 mg*min/L.
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Denver Fraser, PE
1520 East Sixth Avenue
PO Box 200901
Helena, MT 59620-0901
Tel: 406-444-5318

From: Matthew Mudd [mailto:mmudd@greatwesteng.com]
Sent: Tuesday, October 16, 2018 2:14 PM
To: Clark, Rachel <rclark@mt.gov>
Cc: Fraser, Denver <Dfraser@mt.gov>; Fetkavich, Craig <CFetkavich@mt.gov>
Subject: Geraldine Water System (MT0000225)

Good Afternoon Rachel:

The Town of Geraldine hired Great West to look into and assist with a response to the attached letter copy from DEQ.. Regarding the letter's list of corrective actions, the Town would like to pursue verification of achieving 4-log virus inactivation.

I have spoken briefly with Craig Fetkavich recently about the letter and the Town's intent. I have also spoken to Denver directly in the past more specifically regarding the spring source, yet who is also familiar with the water system. According to Craig, it was recommended I check with you on what specifically would be needed from DEQ engineering to bring the system into compliance.

I have been provided information (pH, pipe, Temp) from the Town to do an4-log virus inactivation calculation from the existing treatment building for contact time in the distribution piping.

Can you help inform myself and the Town on what DEQ would need to address the letter and bring the system into compliance?

Feel free to contact me if you have any questions.

Regards,

Matthew Mudd, PE | Project Manager

Great West Engineering, Inc.
PO Box 4817
2501 Belt View Drive
Helena, MT 59604

DIRECT: 406.495.6196
FAX: 406.449.8631
OFFICE: 406.449.8627
www.greatwesteng.com

DEQ
Montana Department of Environmental Quality

August 2, 2018

CERTIFIED MAIL

TOWN OF GERALDINE
JON HELBERG
P O BOX 211
GERALDINE, MT 59446

Re: Ground Water Rule Corrective Action Required for Fecal Indicator Positive Source Samples. TOWN OF GERALDINE, PWSID: MT0000225.

Dear Mr. Helberg:

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- Eliminate the source(s) of contamination,

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2) The schedule you will use to implement the corrective action.

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If you would like to discuss this further or have other relevant information, documentation or any questions please contact me at (406) 444-3425 or cfetkavich@mt.gov.

Craig Fetkavich
Ground Water Rule Manager
Public Water Supply Section

cc: Helena PWS file
Chouteau County Sanitarian
Elizabeth Henrikson-email
Rachel Clark-email
Eugene Pizzini-email

Town of
Geraldine

Perry Joyce. Mayor

Council Members: Marty Clark Michael Qunell Anita Klein Will Muir

P.O. Box 211 Geraldine, MT 59446 (406) 737-4361 gertown@itstriangle.com

8/17/2018

Craig Fetkavich,Ground Water Mgr.
Public Water Supply Section
PO Box 200901
Helena, Mt. 59620-0901

RE: water system treatment

Dear Sir:

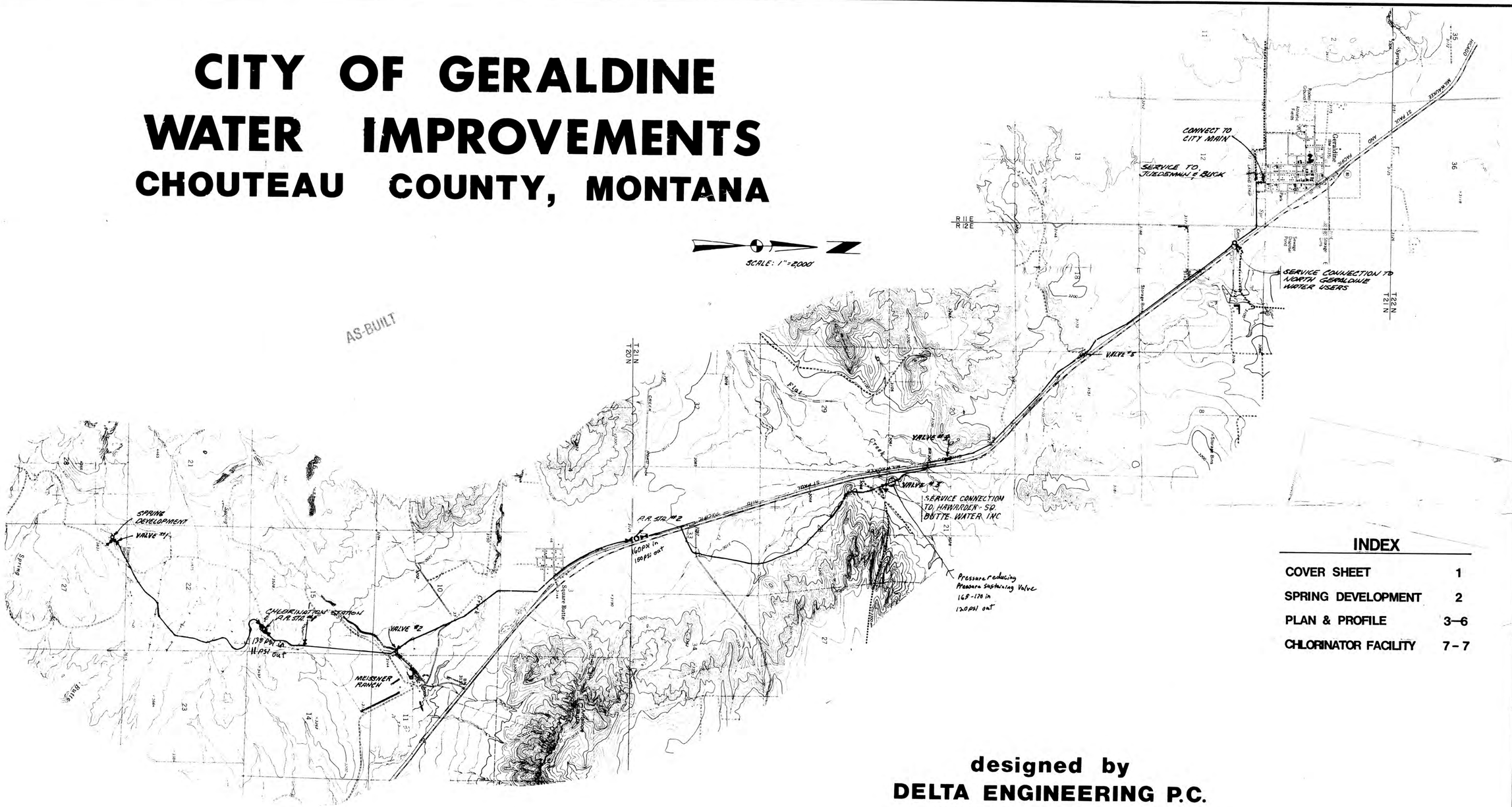
The town of Geraldine has decided on treatment that achieves 4-log virus inactivation.

We will be in contact with Great West Engineering.

Sincerely,

Jon Helberg
Town Operator #8638
Town of Geraldine

CITY OF GERALDINE
WATER IMPROVEMENTS
CHOUTEAU COUNTY, MONTANA

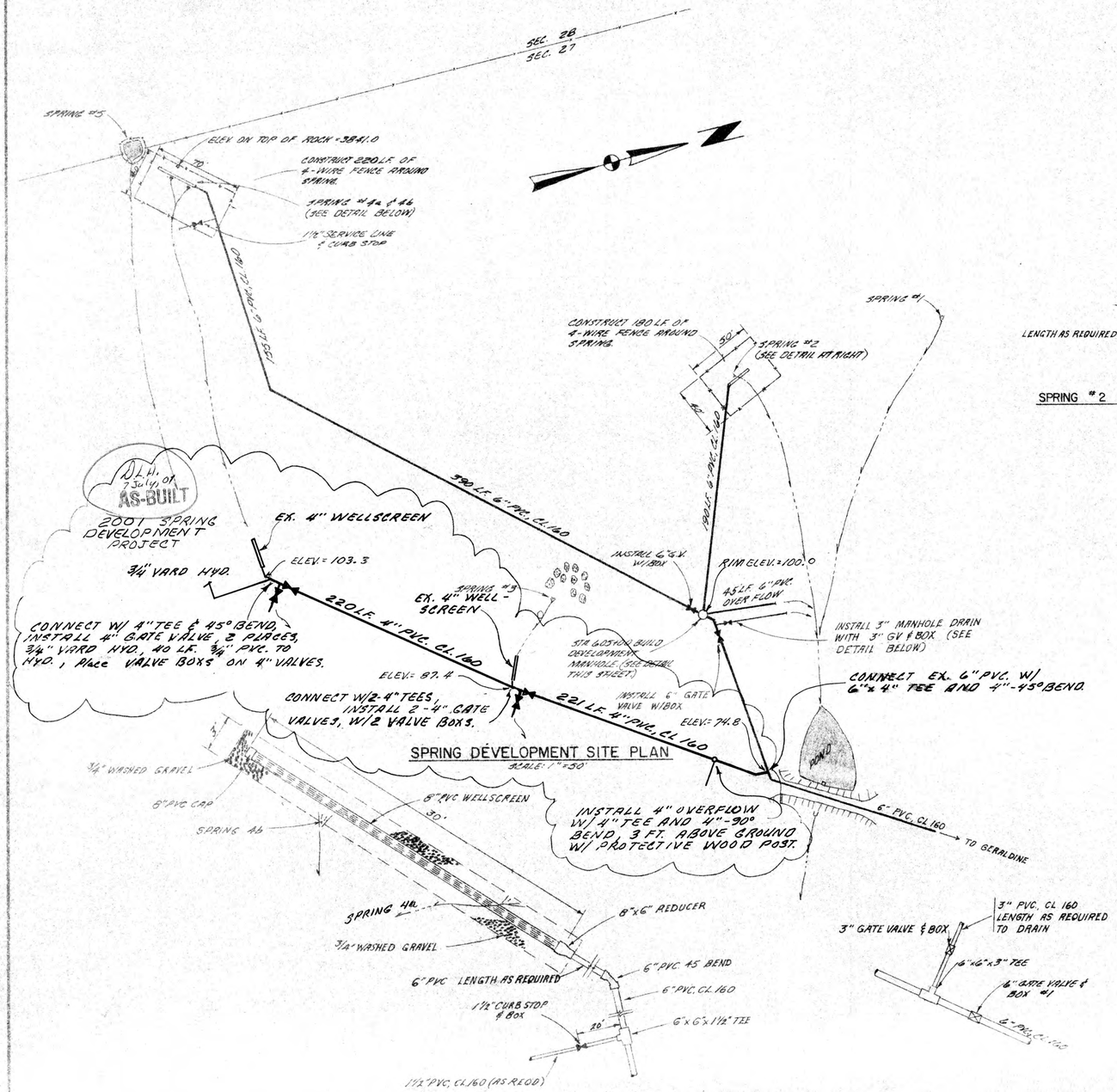


INDEX

designed by
DELTA ENGINEERING P.C.
GREAT FALLS, MONTANA
PH. 453–2209

AS-BUILT

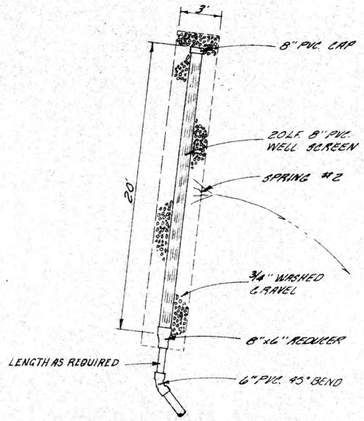
Job No. 2-85	File No.	Sheet 1 of 7



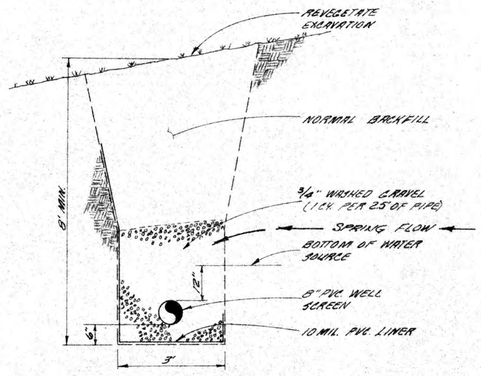
SPRING DEVELOPMENT SITE PLAN
SCALE: 1" = 50'

SPRING #4 DEVELOPMENT DETAIL
SCALE: 1" = 5'

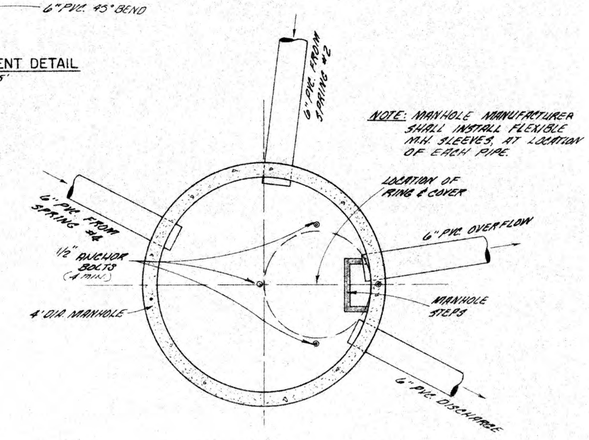
MANHOLE DRAIN DETAIL
SCALE: 1" = 5'



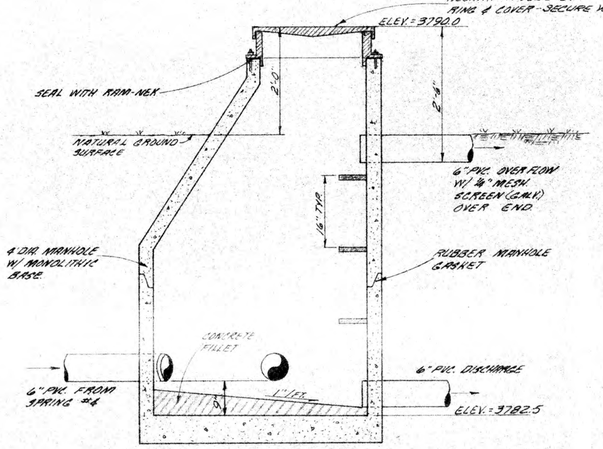
SPRING #2 DEVELOPMENT DETAIL
SCALE: 1" = 5'



TYPICAL SPRING DEVELOPMENT TRENCH
SCALE: 1" = 2'



PLAN



SPRING DEVELOPMENT MANHOLE
SCALE: 3/4" = 1'

Add Two Spring Developments 7/2001

REVISION DATE INITIAL

GERALDINE WATER IMPROVEMENTS AND SPRING DEVELOPMENT

SECTION 27, R12E, T20N

CHOUTEAU COUNTY, MONTANA

DESIGNED	D.L.H. & C.L.N.
DRAWN	D.L.H.
CHECKED	G.L.K.
SCALE	AS SHOWN
DATE	July, 2001
JOB NO.	
FILE NO.	
SHEET	2 OF 7

CIVIL · MINING · GEOLOGY

DELTA ENGINEERING
Water Resource Specialists
GREAT FALLS, MONTANA

PLAN
SURVEYED
PLOTTED
NOTE BOOK
No.
ALIGNMENT CHECKED
R/W CHECKED
BY
DATE

PROFILE
SURVEYED
PLOTTED
NOTE BOOK
No.
GRADES CHECKED
R. M.'s NOTED
STRUCTURE NOTATIONS CHECKED
BY
DATE

STA. 346+00 MATCH LINE-THIS SHEET

INSTALL AIR RELEASE VALVE #3A 1' EAST

INSTALL AIR RELEASE VALVE #4 1' SOUTH

GATE

PASTURE OUTLET #2 100' FROM 6" LINE

ROAD TO SPRINGS

STA. 310+00 BUILD PRESSURE REDUCTION STATION #1 ELEV. = 3460.0 CONSTRUCT CHLORINATION FACILITY - SEE SHEET 7 of 7

ROAD TO MEISSNER'S

PASTURE OUTLET #3

1500'

1½" VALVE 12" FROM 6" LINE

6"

6" PVC, CL. 160

GATE

W2"

PRIVATE WATER LINE

195'

SEC. 15
SEC. 22

SEC. 22
SEC. 15

SEC. 23
SEC. 14

SEC. 14
SEC. 11

STA. 406+00 MATCH TO SHEET 4

525
510
495
480
465
540

3720
3700
3680
3660
3640
3620
3600
3560
3540
3480
3460
3380
3360
3280
3240
3220
3200
3180
3160
3140

AIR VALVE #3A

AIR VALVE #4

P.R. STA. #1 ELEV. = 3460.0

STA. 346+00 MATCH LINE

STA. 406+00 MATCH TO SHEET 4

AS-BUILT

SEC. 28
SEC. 27

SEC. 22

ROAD TO MEISSNER'S

FLOWING WELL

600

585

570

555

6" PVC, CL. 160

PASTURE OUTLET #1 1' EAST

GATE

INSTALL AN AUTOM. AIR RELEASE VALVE #1 (SEE DRW. W-22)

INSTALL AIR RELEASE VALVE #3 WITH PROTECTION (SEE DRW. W-18) 1' EAST

INSTALL AIR RELEASE VALVE #2 (SEE DRW. W-19) 1' WEST

SEC. 22
SEC. 23

STA. 346+00 MATCH LINE-THIS SHEET

NOTE: SEE SHEET 2 FOR SPRING DEVELOPMENT PLAN.

3840
3820
3800
3760
3740
3720
3700
3680
3660
3640

SPRING DEVELOPMENT MANHOLE

A.R. VALVE #1

A.R. VALVE #2

A.R. VALVE #3

STA. 346+00 MATCH LINE-THIS SHEET

4.4%

20'

300'

AS-BUILT

HIGHWAY FEDERAL AID SHEET
PLATE 2-DOUBLE PLAN AND PROFILE-FULL LINE
TELEDYNE
PRINTED IN U.S.A.

DESIGNED: O.L.A.C.I.N.
DRAWN: O.L.A.
CHECKED: G.A.R.
DATE: MARCH, 1965

CIVIL ENGINEERING SURVEYING

DELTA ENGINEERING

JOB NO. 2-65
FILE NO.

SHT. 3 OF 7

PLAN
SURVEYED
PLOTTED
NOTE BOOK
No.
GRADES CHECKED
R. M.'s NOTED
STRUCTURE NOTATIONS CHECKED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
BY
DATE

STA 363+00 MATCH LINE - THIS SHEET
MANUAL AIR RELEASE - 8' WEST #5
℄ RAIL ROAD
6" PVC, CL 160
PRESSURE REDUCTION STATION #2
SEC 4
SEC 9
T20N
T21N
ROAD
SEC 33
STA 327+00 AH = STA 330+00 BK
BORING OF RAIL ROAD AND HIGHWAY. INSTALL 50' OF 12" STEEL CASING UNDER EACH.
PASTURE OUTLET ON FENCE # 6 (PETERS) ⊄ 50
℄ RAIL ROAD
HIGHWAY
STA 312+00 AH = STA 315+00 BK
PASTURE OUTLET #7 (70' FROM 6" LINE
INSTALL AIR RELEASE VALVE WITH PROTECTION #6, 1' WEST
6" PVC, CL 160
SEC 28
SEC 29
STA 297+00 MATCH LINE - THIS SHEET

STA 363+00 MATCH LINE THIS SHEET
A.R. VALVE #3
PRESS. REDUCTION STA #2
STA 330+00 BK
STA. EQUATION 1 FOOT
STA 327+00 AH
6" TEE
COUNTY ROAD
A.R. VALVE #6
STA 297+00 MATCH LINE - THIS SHEET
3160
3140
3120
3100
3120
3100
3080
3060
360
345
330
315
300
285

STA 456+00 MATCH TO SHEET 3
STA 449+80 INSTALL 2" TAP TO MEISSNER RANCH AND 6" GATE VALVE & BOX #2
GATE
INSTALL PASTURE OUTLET ON FENCE #4 9' WEST
GATES
TO MEISSNER'S
SEC 10
SEC 11
6" PVC, CL 160
STA 417 MATCH
GATE
AS-BUILT
STA 417 MATCH
PASTURE OUTLET #5, 1' EAST
COWBOY CREEK
SEC 10
SEC 3
405
390
6" PVC, CL 160
℄ RAIL ROAD
BROADWAY AVE
SQUARE BUTTE WATER & TELE. CROSSING
375
STA 396+00 MATCH LINE - THIS SHEET

STA 456+00 MATCH TO SHEET 3
6" GATE VALVE #2
PASTURE OUTLET ON FENCE LINE
SCALE
20'
300'
SQUARE BUTTE BROADWAY AVE
STA 396+00 MATCH LINE - THIS SHEET
AS-BUILT
450
435
420
405
390
375

PROFILE
SURVEYED
PLOTTED
NOTE BOOK
No.
GRADES CHECKED
R. M.'s NOTED
STRUCTURE NOTATIONS CHECKED
BY
DATE

HIGHWAY FEDERAL AID SHEET
PLATE 2-DOUBLE PLAN AND PROFILE-FULL LINE
TELEDYNE
PRINTED IN U.S.A.

DESIGNED D.L.R.C.
DRAWN D.L.R.
CHECKED G.L.S.
DATE NOV 21, 1975

CIVIL
LANDSCAPE
GEOLOGY

DELTA ENGINEERING

JOB NO. 285
FILE NO.
SHT. 4
OF 7

PLAN — SURVEYED — PLOTTED — NOTE BOOK — No. — QUANTITY CHECKED — R/ OF WAY CHECKED — BY — DATE

STA. 184+00 MARCH LINE

STA. 184+50 INSTALL 6"GATE VALVE & BOX. #9

INSTALL AIR RELEASE VALVE #8 WITH PROTECTION (SEE DRW. W-18)

SEC. 20 / SEC. 17

¾" TAP W/ ¾" VALVE & BOX MEEKS 10' SO.

AIR RELEASE VALVE #8A WITH PROTECTION 1' WEST

6" PVC, CL 160

℄ RAIL ROAD

6" GATE VALVE & BOX #4

SEC. 18 / SEC. 17

INSTALL AIR RELEASE VALVE #9 WITH PROTECTION. 1' WEST

INSTALL AUTO AIR RELEASE VALVE #10 (SEE DRAWING W-22)

STA. 96+00 MATCH LINE - THIS SHEET

180 165 150 135 120 105

3080 3060

STA. 184+00 MATCH LINE - THIS SHEET

6" GATE V. #9

A.R. VALVE #8

MEEKS TAP

A.R. VALVE #8A

EXISTING GROUND

6" GATE V. #4

A.R. VALVE #9

A.R. VALVE #10

STA. 96+00 MATCH LINE - THIS SHEET

3140 3120 3100 3080

180 165 150 135 120 105

PROFILE — SURVEYED — PLOTTED — NOTE BOOK — No. — CURVES CHECKED — B. M.'s NOTED — STRUCTURE NOTATIONS CHECKED — BY — DATE

SEC. 33 / SEC. 28

STA. 279+00 MATCH TO SHEET 4

AS-BUILT

PASTURE OUTLET #8 30' WEST OF LINE ON FENCE

INSTALL MANUAL AIR RELEASE VALVE WITH PROTECTION #7

240

INSTALL AIR RELEASE VALVE WITH PROTECTION #7A 1' EAST

SEC. 29 / SEC. 20

℄ RAIL ROAD

℄ HIGHWAY

FLAT CREEK

INSTALL 3" SERVICE CONNECTION W/ 3" GATE VALVE & BOX. INSTALL 6" GATE VALVE WITH BOX ON MAIN LINE (HAWARDEN-SQUARE BUTTE SERVICE)

SEC. 28 / SEC. 21

INSTALL 6" LINE UNDER NORTH END OF RAIL ROAD & HIGHWAY BRIDGES PIPE IS TO HAVE 2" INSULATION AND BURIED 3' BELOW EXISTING GROUND LEVEL UNDER BRIDGES

SEC. 20 / SEC. 21

STA. 184+00 MATCH LINE - THIS SHEET

270 255 240 225 210 195

STA. 279+00 MATCH TO SHEET 4

A.R. VALVE #7

A.R. VALVE #7A

EXISTING GROUND

6" GATE VALVE & SERVICE CONNECTION FOR HAWARDEN-SO. BUTTE WATER SYSTEM

CROSSING UNDER BRIDGES

300'

AS-BUILT

3100 3080 3060 3040

270 255 240 225 210 195

HIGHWAY FEDERAL AID SHEET
PLATE 2-DOUBLE PLAN AND PROFILE-FULL LINE
TELEDYNE
PRINTED IN U.S.A.

DESIGNED DLA/GLK | DRAWN DLA | CHECKED GLK | DATE MARCH, 1985

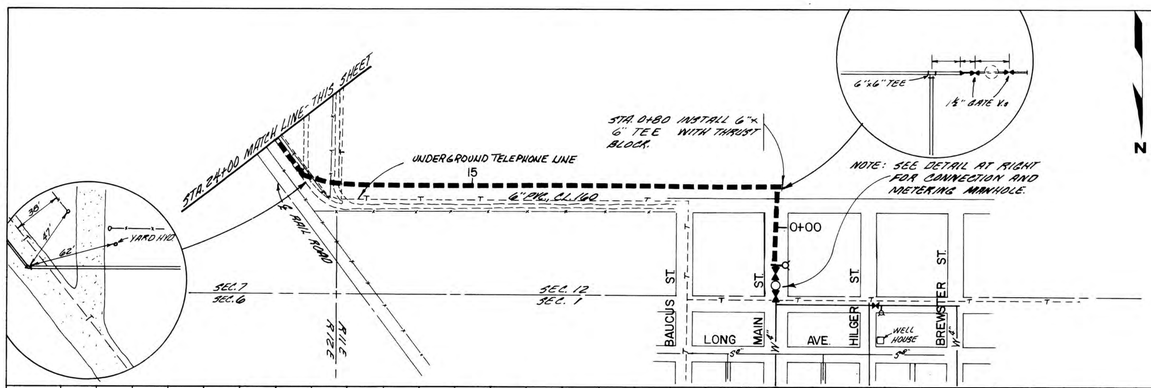
CIVIL ENGINEERING LOGICOM

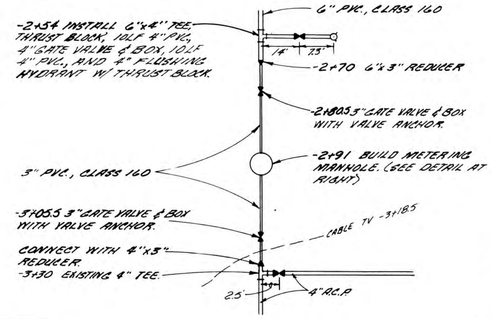
DELTA ENGINEERING

JOB NO. 2-85 | FILE NO.

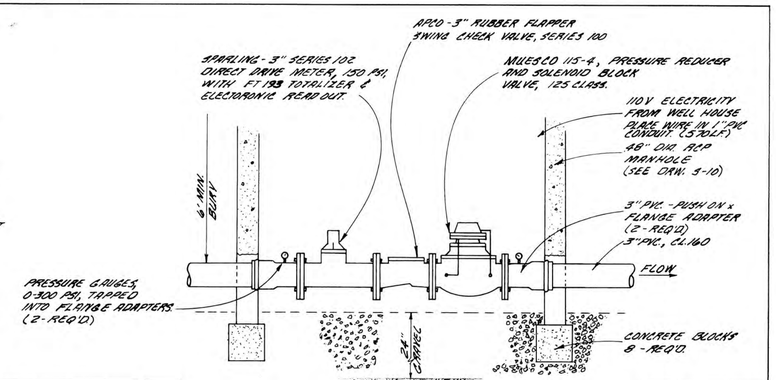
SHT. 5 OF 7

PLAN
SURVEYED
PLOTTED
NOTE BOOK
No.
ALIGNMENT CHECKED
RT. OF WAY CHECKED
BY
DATE

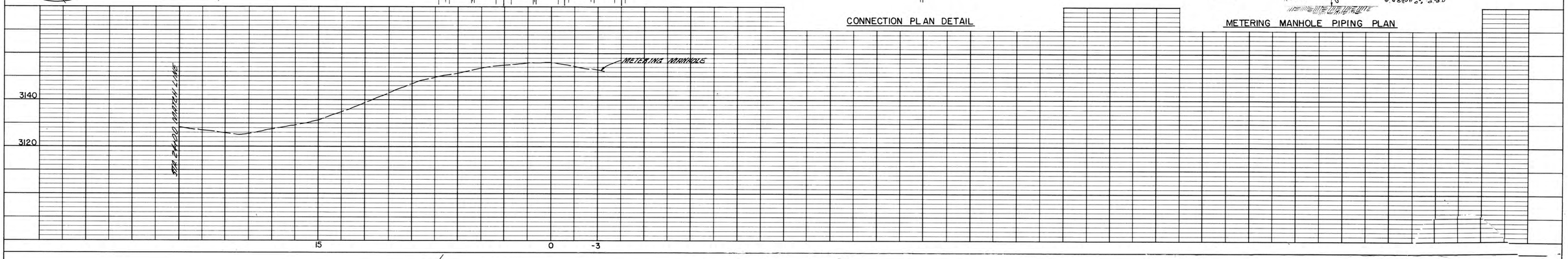




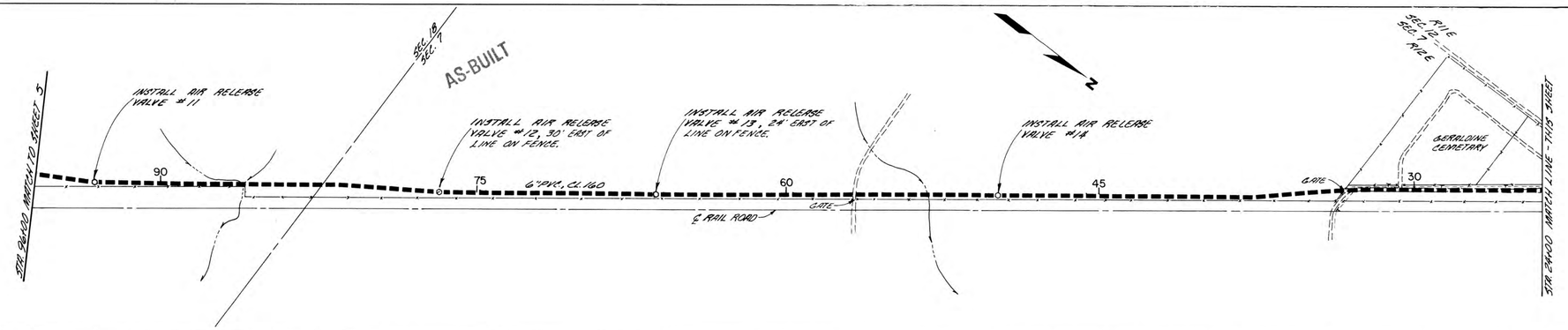
CONNECTION PLAN DETAIL

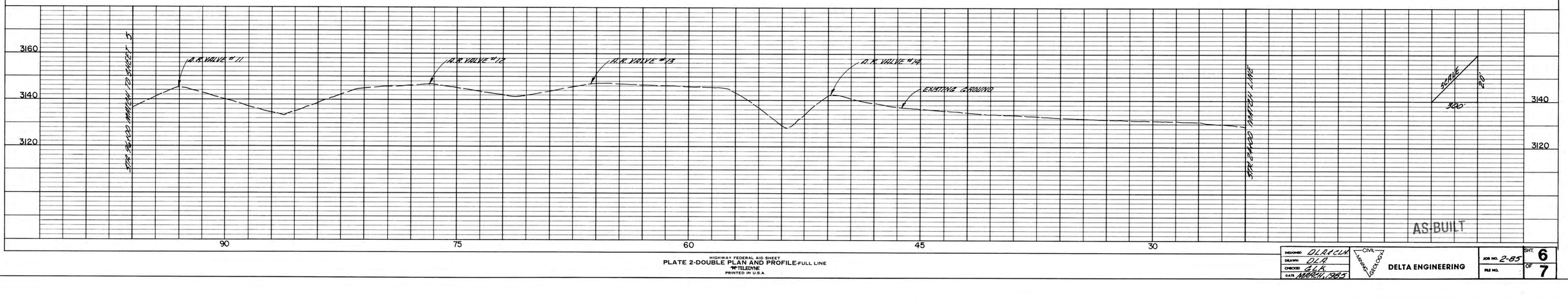


METERING MANHOLE PIPING PLAN



PROFILE
SURVEYED
PLOTTED
NOTE BOOK
No.
GRADES CHECKED
R. M.'s NOTED
STRUCTURE NOTATIONS CHECKED
BY
DATE





PROFILE
SURVEYED
PLOTTED
NOTE BOOK
No.
GRADES CHECKED
R. M.'s NOTED
STRUCTURE NOTATIONS CHECKED
BY
DATE

HIGHWAY FEDERAL AID SHEET
PLATE 2-DOUBLE PLAN AND PROFILE-FULL LINE
TELEDYNE
PRINTED IN U.S.A.

DESIGNED DLA/CLK
DRAWN DLA
CHECKED CLK
DATE MARCH, 1985

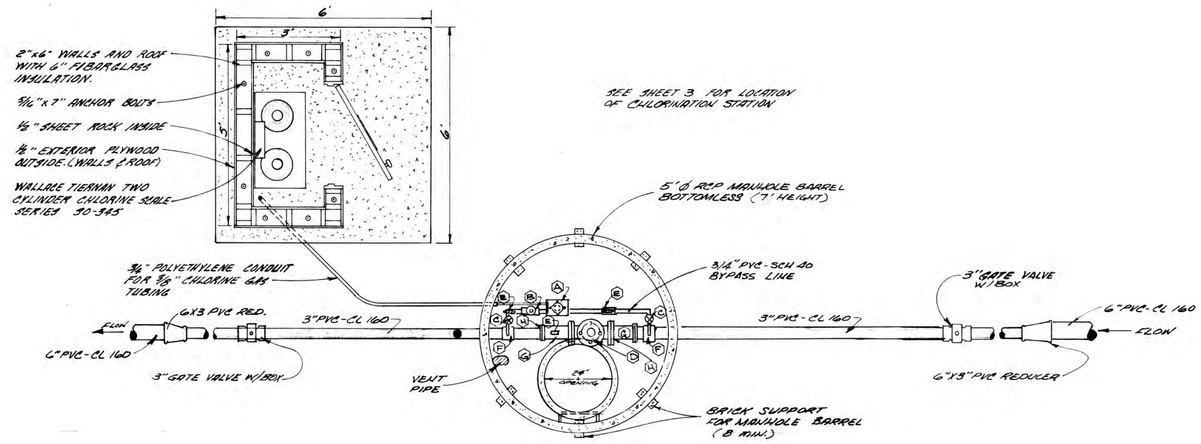
CIVIL MINING GEOLOGY

DELTA ENGINEERING

JOB NO. 2-85
FILE NO.

SHT. 6 OF 7

Obsolete

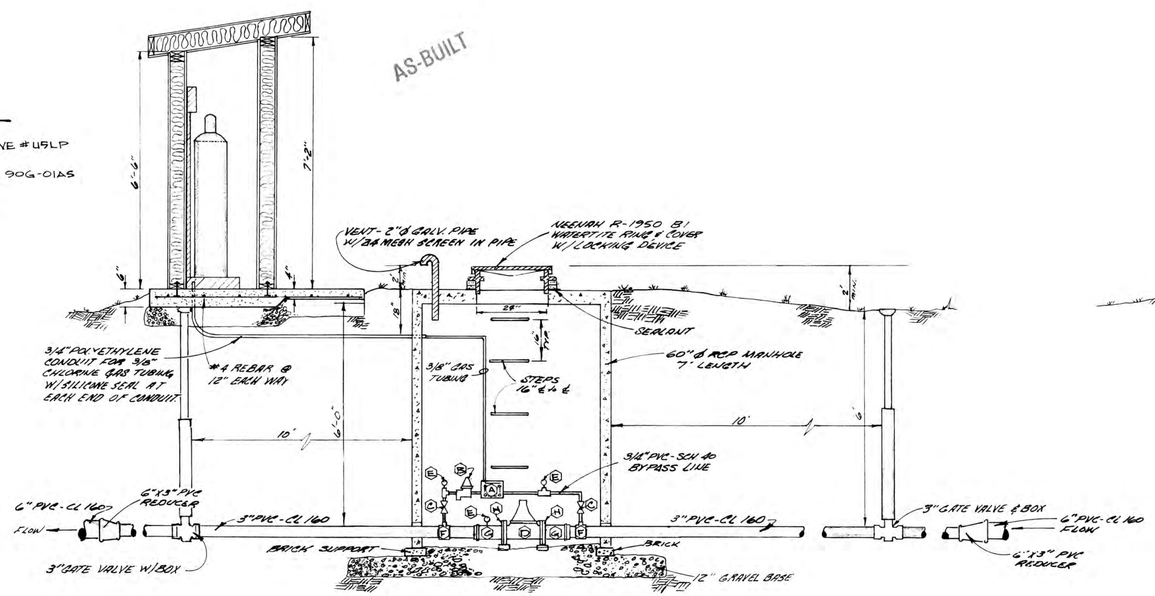


PLAN

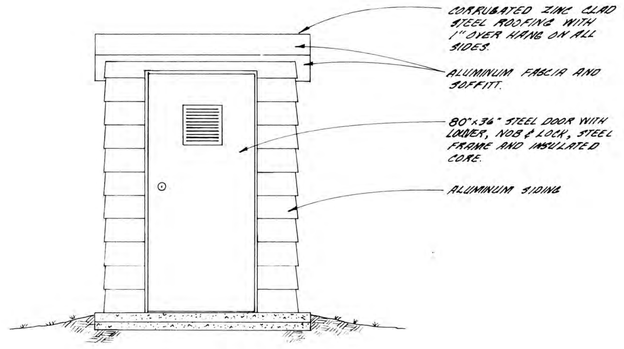
LEGEND

- (A) CHLORINE GAS EJECTOR
- (B) 3/4" WATTS PRESS. RED. VALVE #U5LP
- (C) 3/4" GATE VALVE
- (D) 3" CLA-VAL PRESS. RED. VALVE 90G-01AS
- (E) PRESS. GAUGE W/PETCOCK
- (F) 2" X 3/4" PVC SADDLE TEE
- (G) 3" GASK. X MIPT ADAPTER
- (H) 3" FIPT X FLANGE ADAPTER

AS-BUILT



SECTION



FRONT VIEW

AS-BUILT

REVISION	DATE	INITIAL

CITY OF GERALDINE

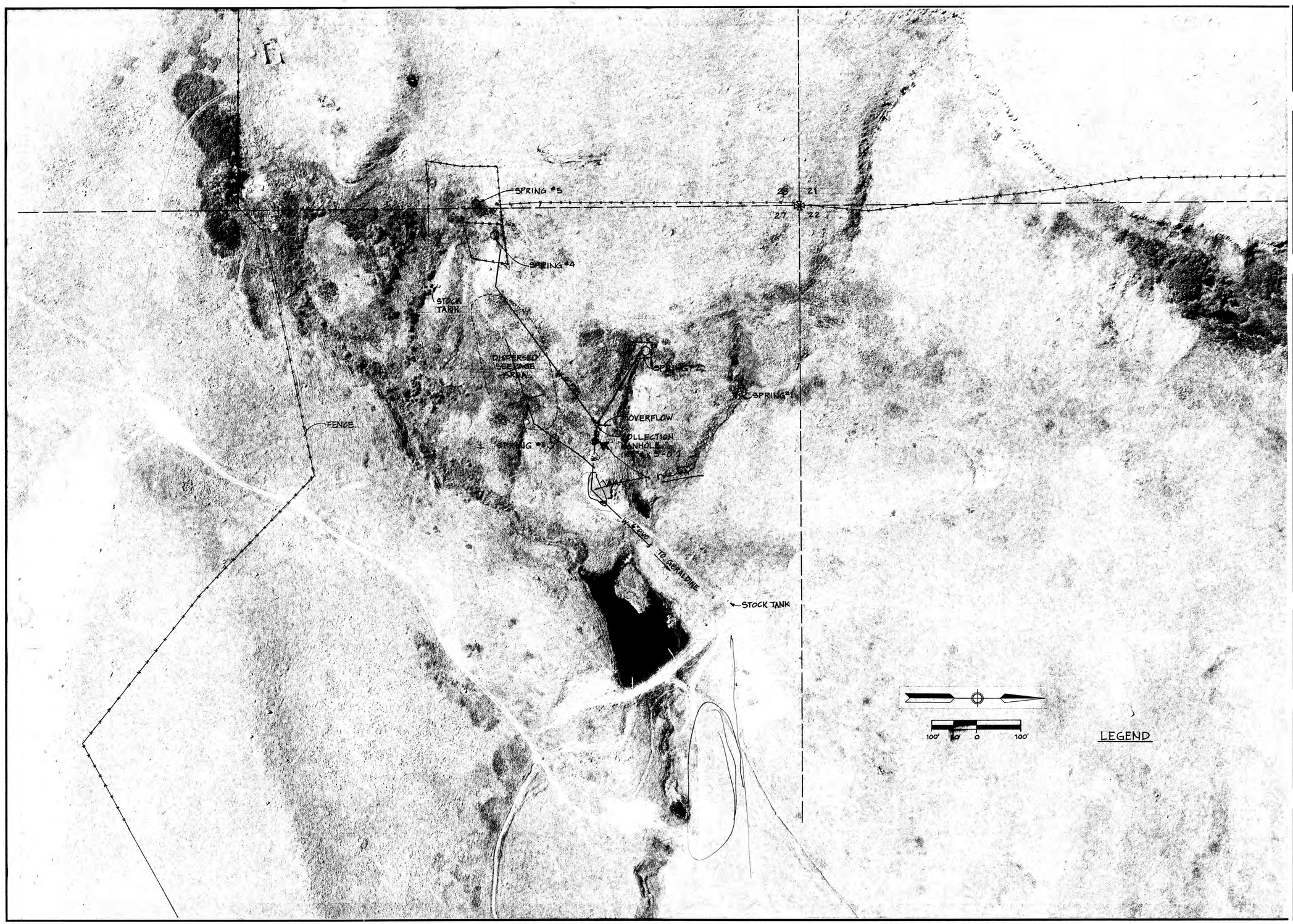
WATER DEVELOPMENT

CHLORINATOR

DESIGNED	GLK
DRAWN	DLA
CHECKED	GLK
SCALE	1"=2'
DATE	AUGUST, 1984

DELTA ENGINEERING
"Water Resource Specialists"
GREAT FALLS, MONTANA 59403

JOB NO. 13-84 | FILE NO. | SHEET 7 OF 7



Revisions	By	Date

File No.	Job No.
102.16	9718 9718-03
Date	Scale
11-11-97	AS SHOWN
Drawn	Approved
POINTER	NEIL
Designed	Checked
MEEKS	MCGILLIVRAY

Professional Seal

ENGINEERS
PLANNERS
DESIGNERS

NEIL CONSULTANTS, INC.
4509 North Star Boulevard
P.O. Box 6350
Great Falls, MT 59406
Phone 406-453-5478
Fax 406-453-2009
Email: jneil@mcn.net

Owner
TOWN OF GERALDINE

Location
CHOTEAU COUNTY, MONTANA

Project Title
WATER AND WASTEWATER IMPROVEMENTS

Sheet Title
SPRING DEVELOPMENT SITE PLAN

Sheet	Of
3	

File # 102.16

7.5 MINUTE SERIES (TOPOGRAPHIC)

GEOLOGICAL SURVEY

HAWARDEN WUA TAP

MEISSNER RANCH TAP

EXISTING CHLORINATION STATION

SPRING SOURCE

---------- EXISTING WATER TRANSMISSION LINE

Revisions	By	Date

File No.	Job No.
102.16	9718 9718_USGS
Date	**Scale**
9-22-99	AS SHOWN
Drawn	**Approved**
POINTER	NEIL
Designed	**Checked**
MEEKS	MCGILLIVRAY

Professional Seal

ENGINEERS

PLANNERS

DESIGNERS

NEIL CONSULTANTS, INC.

4509 North Star Boulevard
P.O. Box 6350
Great Falls, MT 59406
Phone 406-453-5478
Fax 406-453-2009
Email: jneil@mcn.net

Owner
TOWN OF GERALDINE

Location
CHOUTEAU COUNTY, MONTANA

Project Title
WATER SYSTEM MASTER PLAN

Matthew Mudd

From: Matthew Mudd
Sent: Tuesday, October 16, 2018 2:14 PM
To: Clark, Rachel (DEQ)
Cc: Fraser, Denver; 'cfetkavich@mt.gov'
Subject: Geraldine Water System (MT0000225)
Attachments: Geraldine Water DEQ notice 8.2.18.pdf

Good Afternoon Rachel:

The Town of Geraldine hired Great West to look into and assist with a response to the attached letter copy from DEQ.. Regarding the letter's list of corrective actions, the Town would like to pursue verification of achieving 4-log virus inactivation.

I have spoken briefly with Craig Fetkavich recently about the letter and the Town's intent. I have also spoken to Denver directly in the past more specifically regarding the spring source, yet who is also familiar with the water system. According to Craig, it was recommended I check with you on what specifically would be needed from DEQ engineering to bring the system into compliance.

I have been provided information (pH, pipe, Temp) from the Town to do an4-log virus inactivation calculation from the existing treatment building for contact time in the distribution piping.

Can you help inform myself and the Town on what DEQ would need to address the letter and bring the system into compliance?

Feel free to contact me if you have any questions.

Regards,

Matthew Mudd, PE | Project Manager

Great West Engineering, Inc.
PO Box 4817
2501 Belt View Drive
Helena, MT 59604

DIRECT: 406.495.6196
FAX: 406.449.8631
OFFICE: 406.449.8627
www.greatwesteng.com

Matthew Mudd

From: Fraser, Denver <Dfraser@mt.gov>
Sent: Wednesday, October 17, 2018 11:01 AM
To: Matthew Mudd; Clark, Rachel
Cc: Fetkavich, Craig; Fraser, Denver
Subject: RE: Geraldine Water System (MT0000225)

Matt:

We will need a report showing how CT will be achieved and how and will monitoring will be done. The following items will be required:

1. The length and ID of the pipe being used for CT volume is needed.
2. The minimum water temperature. DEQ generally uses average air temperature for the area for ground water systems (~45.5 ºF or 7.5 ºC for Geraldine), unless temperature measurements will be done. With that air temperature, CT required would be 7.0 mg*min/L.
3. CT for 4.0-log inactivation is the same for water with a pH between 6.0 and 9.0.
4. Where and how will monitoring be peformed? The monitoring point must be after contact time.
5. There can be no service connections prior to the point where CT is achieved.
6. For this size system, peak hour demand is likely appropriate for CT requirements. With that, peak demand information will be necessary. I do not know if the system has meter on the spring line or the ability to determine peak hour demand, but that will be required.

Denver Fraser, PE
1520 East Sixth Avenue
PO Box 200901
Helena, MT 59620-0901
Tel: 406-444-5318

From: Matthew Mudd [mailto:mmudd@greatwesteng.com]
Sent: Tuesday, October 16, 2018 2:14 PM
To: Clark, Rachel <rclark@mt.gov>
Cc: Fraser, Denver <Dfraser@mt.gov>; Fetkavich, Craig <CFetkavich@mt.gov>
Subject: Geraldine Water System (MT0000225)

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Regards,

Matthew Mudd, PE | Project Manager

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PO Box 4817
2501 Belt View Drive
Helena, MT 59604

DIRECT: 406.495.6196
FAX: 406.449.8631
OFFICE: 406.449.8627
www.greatwesteng.com

APPENDIX R

Spring Hydrogeologic Assessment

Presented by:

GreatWest ENGINEERING

Preliminary Hydrogeologic Evaluation

TOWN OF GERALDINE

May 11, 2022

Client Commitment *Empowered Employees* *Quality Solutions*

TOWN OF GERALDINE

Preliminary Hydrogeologic Evaluation

May 11, 2022

GreatWest
ENGINEERING

TECHNICAL MEMORANDUM

PREPARED FOR:	Town of Geraldine
PREPARED BY:	Bruce Lauerman, RG, CHG
REVIEWED BY:	Matt Mudd, PE
DATE:	May 11, 2022
PROJECT NUMBER:	1-15283
APPROVED BY:	Matt Mudd, PE

This Technical Memorandum (TM) presents the findings of GWE's preliminary hydrogeologic investigation for the Town of Geraldine (Town), Chouteau County, Montana. The scope of work included a desktop review of relevant and available records/literature generally related to area groundwater resources, and specifically to the Town's spring water and water well records. In addition, two site visits were made to the Town's existing spring water collection facility located on the eastern flank of Square Butte. This TM also provides recommendations to inform GWE's Preliminary Engineering Report (PER) for the Town.

This effort was authorized by the Town effective January 11, 2022 under *Amendment No. 1 to Owner-Engineer Agreement* (October 12, 2021).

Background

Geography and Climate

The Town of Geraldine is a small, agricultural community located on Hwy 80 in southern Chouteau County, Montana (**Figure 1**). The 2020 Census lists the population of Geraldine as 207 people. The Town is situated in open prairie land south and west of the Missouri River and northeast of the Highwood Mountains at an elevation of approximately 3,150 feet amsl. The primary economic activity in the area is wheat farming and cattle ranching.

The climate of Geraldine is marked by cold, windy and snowy winters and short, moderately hot and dry summers. According to the *Western Regional Climate Center*, over a 100+ period of record average min/max monthly temperatures range from approximately 10.7/34.1 degrees F in December to 50.1/82.4 degrees F in July. Average annual precipitation is reported to be 11.61 inches and average total snowfall 40.6 inches. https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?mt1737

However, Chouteau County, and surrounding counties are experiencing an extended period of drought; As of April Chouteau County is listed by the *Montana Governor's Drought and Water Supply Advisory Committee* as Extremely Dry (D3). The county was listed as D3 from September 2021 to November 2021, and Exceptionally Dry (D4) from December 2021 to March 2022 (**Figure 2**).
https://mslservices.mt.gov/geographic_information/maps/drought/

Geology

Southern Chouteau County is located in the Glaciated Missouri Plateau region of the Great Plains Physiographic Province. **Figure 3** is a localized geologic map. The vicinity of Geraldine is characterized by a thick sequence of Cretaceous sandstones and shales. Surficial deposits include the Kevin Member (Kmk) of the Marias River Formation (Kmr), and the Eagle (Ke) and Telegraph Creek (Ktc) Formations visible in the Chalk Cliffs to the east.

The area is also within the Central Montana Alkalic Province; a geologic region of extensive volcanic activity occurring during the late Cretaceous and early Tertiary. The Highwood Mountains to the southwest of Geraldine are the eroded remains of a Tertiary-age volcanic center. Square Butte and Round Butte are igneous intrusive (laccolith) features associated with dikes emanating from the

Highwoods. The buttes are granitic; shonkinite capped by syenite, and flanked by various Quaternary (Q) units including landslide and debris flow derived deposits, alluvium and colluvium.

Spring Water Supply

Occurrence

The communities of Geraldine, North Geraldine, Hawarden and Square Butte along with some rural users are served by the municipal water system which is sole-sourced from several springs, herein referred to as the Meissner Ranch/Square Butte Springs. The springs are located about 14 miles southeast of Town. The springs occur at an elevation of approximately 3,800 ft amsl on the east flank of the 5,700-foot Square Butte. Review of published information and maps suggest the Meissner Ranch/Square Butte Springs, like numerous spring expressions on the flanks of these alkalic intrusive features are “contact springs”. Recharged by precipitation and snowmelt at elevation, groundwater moves through fractures and other secondary porosity mechanisms to discharge near the contact of the igneous rock with the uplifted sedimentary host rock. The presence of Quaternary landslide deposits mapped near the springs may be the result of failure of sedimentary deposits due to the movement of groundwater to the sloping hillside.

Configuration

GWE has reviewed available drawings and records of the spring development. **Figure 4** represents the best current documentation of spring catchments and piping. There are at least five (5) individual spring collectors (Springs 2, 3, 4A, 4B and 4C). These springs are field-identified and are reported to be constructed as PVC collector pipes (commonly referred to as “french drains”).

An additional spring collector (Spring 5) is reported to connected to the municipal system but the piping/valving configuration is unclear; it may be connected to the Spring 4A/4B discharge line. The Spring 5 catchment is identified at ground surface by a concrete vault and lid near (downgradient of) Springs 4A/4B. **Figure 5** is a planned drawing of this spring catchment provided by the Town. The Town’s records are incomplete; more research is needed and is currently being sought by the Town from prior contractors to verify the actual configuration and connection of Spring 5.

Collected spring water flows by gravity through a 6-inch PVC pipeline for about 2 miles to a chlorination station located at the Meissner Ranch headquarters. From there chlorinated spring water gravity-feeds to either a 200,000-gallon concrete storage reservoir 6 miles downstream or flows 8 miles further to an 80,000-gallon steel storage tower located in Town. The location of the Meissner Ranch/Square Butte Springs, transmission line, chlorination station and storage tanks are shown on **Figure 1**.

Ground Movement Concerns

Areas in and around the Meissner Ranch/Square Butte Springs are mapped at Quaternary landslide deposits (Qls). In 2018 the Town expressed concerns to GWE over observed ground movement in the vicinity of the springs catchments evidenced by canting of valve risers and vaults and slumping of earth in the area of the spring collection galleries. GWE investigated at the time and concurred some ground movement was occurring, which could be a concern long term, but that it did not appear to represent an immediate threat.

As part of this assessment, GWE observed that plumbness to risers and vaults did not look significantly different from 2018 photo documentation. However, during a February site visit the system operators indicated that in recent years visible changes were occurring around the collection system. Observed new areas of water seepage/ponding, growth of phreatophytes (cattails and willows) and ice formation in winter could be an indication that ground movement is rerouting spring pathways or causing changes to the collectors.

In February the Town exposed and straightened the valve risers at Spring 3 and 4C. In doing so it was reported that the valves themselves were intact which may suggest the ground movement is more

surficial, but this is speculative at this point. The section below describes long term monitoring efforts which could shed light on potential ground movement effects on the spring collection system.

Spring Flows

The Town has provided GWE with documentation of historic spring water production and use. Totalized flow data collected at a flow meter in the chlorination system accounts for spring water which enters the 6-inch PVC transmission line. Over the period from January 2019 to November 2021, calculated volumes of spring water *production* appear to range between 32 and 111 gallons per minute (gpm), averaging 57 gpm. However, this data omits spring water captured by the collectors but discharged through an overflow pipe located at the spring site when storage tanks are full, and therefor is not representative of developed spring *flows*.

As part of this assessment, an effort is being made by the Town to initiate routine (monthly) flow measurements of the individual spring collectors. This data collection is considered Long Term Monitoring (LTM) activity and is an important tool to better:

- observe and record changes and trends in spring flows attributable to seasonal and climatic conditions
- document the contribution of individual spring collectors
- identify over time potential changes to spring production potentially associated with observed, gradual land movement at the springs site, or clogging of the collector pipes by roots or siltation

While LTM efforts are inherently a longer-term data collection program, it is particularly timely for Geraldine to initiate spring flow LTM at this time to observe the response of the springs to runoff and recharge events in the coming months.

Springs 2, 3, 4A/4B and 4C are equipped with bypass valves which allow for isolating and measuring spring flows from the individual collectors, using a bucket and stopwatch. The locations of the valves and bypass pipes are shown on **Figure 4.** It is noted that although the configuration and connection the Spring 5 catchment mentioned above is not verified, the proposed LTM provides meaningful baseline data. The LTM can be improved as additional information is obtained regarding the unverified catchment.

The first such flow measurements were performed on March 1, 2022. No further measurements have been provided by the Town.

Estimated Spring Discharge (gpm) - March 1, 2022

Date	Spring 2	Spring 3	Spring 4A/4B/5	Spring 4C	Total
3/1/22	50	33	50	15	148

Given the relative drought conditions reported in recent months, and concerns of the integrity of the spring collectors, spring flows approaching 150 gpm at these locations in early spring time are encouraging.

Spring Water Quality

The general water quality of the Meissner Ranch/Square Butte Springs is reported to be good, as would be expected given the host geology and source of recharge. The water quality is considered exceptional when compared to area water supply wells completed within the Cretaceous sedimentary rocks.

However, review of spring water quality data for this report was limited to one sample collected from an undisclosed location in September 1993 (**Appendix A**). The report is minimal but suggests the sample could be characterized as a calcium bicarbonate water, moderately mineralized and slightly alkaline (pH = 7.75). The recommendations of this report include baseline water quality sampling at the individual bypass pipes of the springs, to evaluate current concentrations of anion/cations and indicators.

Springs Source Water Protection

The Meissner Ranch/Square Butte Springs are located remotely and not subject to anthropogenic sources of contamination. However, contamination threats do exist.

Barbed-wire fencing surrounds the spring developments but is not well-maintained and does not provide sufficient lateral buffer around the springs or spring galleries. Cattle grazing occurs in summer months immediately up to the fence line. Abundant wildlife inhabit the springs area year round including deer, elk, coyotes, antelope, perhaps bear and a variety of game birds, smaller mammals, rodents and reptiles/amphibians. Current fencing does not effectively inhibit animal activity; animal feces poses a bacterial threat to spring water quality.

The spring developments are relatively shallow and record drawings do not indicate collector pipes (galleries) were covered with a liner or impermeable materials beneath grade to inhibit surface contamination.

Settling of soils above the infiltration galleries has resulted in topographic depressions which can retain snowmelt and surface water. The spring galleries lie beneath significant vegetative growth including grasses, weeds, cattails, willows and other wetlands type flora. This lush vegetation provides habitat for rodents and other animals. Decomposition of this vegetation over time has resulted in a significant soil profile over the spring galleries. These dark, nutrient-rich soils are an additional concern for spring water quality protection, given the lack of a protective subsurface liner.

Groundwater Wells

Groundwater supply wells in and around Geraldine generally produce water from the underlying Cretaceous rocks. Wells typically yield low amounts of lower quality, mineralized water, often with elevated sulfate or sulfur concentrations.

In the past, the Town of Geraldine sourced municipal water from deep bedrock wells and some springs proximal to Town. As well yields have declined over time, the Town has migrated solely to the higher quality, higher output Meissner Ranch/Square Butte Springs as the municipal water supply.

Figure 6 illustrates the locations of area water wells listed on the Montana Bureau of Mines & Geology (MBMG) Groundwater Information Center (GWIC) database. Four (4) deep wells of interest are associated with the Town of Geraldine. None of these wells currently produce water for the Town. The drilling logs and available water quality data for the four wells are included as **Appendix B**.

Well 2547 (aka Well #2 or Football Field Well) and Well 2556 (aka Well #3 or Knedler Well) are located within the Town of Geraldine. The wells were drilled in 1959 and 1960, respectively, and completed to depths of approximately 1,900 ft bgs. Both wells were once municipal well sources but have been disconnected due to decreased yields and unfavorable water quality; both wells produce relatively low yields of water elevated in minerals including iron and sulfate exceeding secondary drinking water standards.

In 2004 Well 213077 was drilled by the Town about 5 miles south of Geraldine. The well was drilled to a depth of 2,500 ft bgs and reportedly encountered significant amounts (estimated 500 gpm) of groundwater elevated in sulfur or sulfate before the driller lost drill tools down hole. The well was never utilized by the Town and it remains capped and unused.

The Town attempted a second deep well in 2006. Well 231681 was completed to a depth of over 2,629 ft bgs just west of the concrete water storage tank southeast of Town. This well was reportedly tested at 350 gpm for at least 8 hours, but yielded water significantly elevated in sulfur/sulfate and other minerals and determined to be unusable for the municipal supply. It remains capped and unused.

The Town's experience supports the expected poor prospects, risk and significant cost of obtaining a suitable municipal supply of groundwater in the area of Geraldine, even at depth.

Recommendations

Meissner Ranch/Square Butte Springs

GWE recommends a phased approach to managing the municipal spring source. Cost estimates are provided in the 2022 PER.

Phase 1

- The Town has recently initiated a Long Term Monitoring (LTM) program including monthly measurements of discrete spring discharges. Existing valves can be used to isolate individual spring flows and record/observe seasonal and climatic variations in spring discharge response. In addition, limited historical data has been collected with respect to spring source water quality. Baseline inorganic water quality samples are currently being collected, and may be repeated at some frequency if appropriate. This LTM program should continue and become standard spring management protocol.
- The livestock fencing in the immediate vicinity of the spring collection galleries is in disrepair and inadequate to prevent potential fecal contamination of the springs due to cattle grazing activity. Barbed-wire fencing at the springs site should be improved and expanded to protect the larger footprint of the area of spring discharge.

Phase 2

- The design and configuration/connection of the Spring 5 catchment is not well understood. Structural movement of the Spring 5 catchment is apparent and represents risk. If it is determined that the Spring 5 collector is connected to the municipal system, this poses a potential further risk to spring piping associated with Springs 4A/4B. A renewed record search should be performed if possible to document the as-built construction and configuration and support careful restoration of the Spring 5 catchment and associated piping/valveworks.

Phase 3

- The spring collection galleries do not appear to be constructed with impermeable liners or materials to inhibit surface water infiltration. A plan should be developed to remove overlying vegetation and topsoil, install impermeable membranes and cap the spring galleries with a protective layer of clay and gravel.

Groundwater Exploration

Further groundwater exploration is not recommended at this time given the expected poor water quality, and the significant risk and cost of drilling and constructing a well suitable for a municipal supply of groundwater in the area of Geraldine.

FIGURES

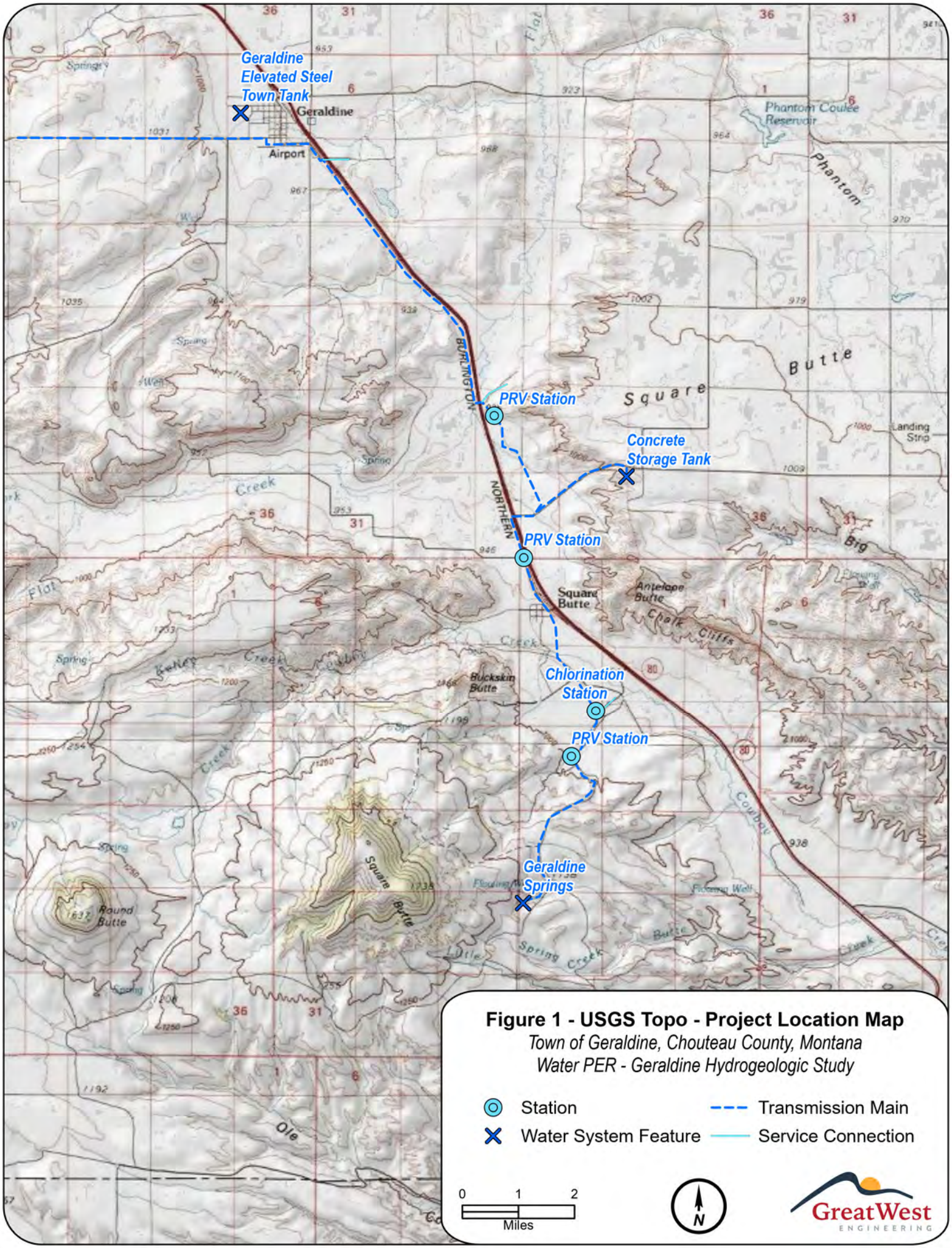


Figure 1 - USGS Topo - Project Location Map

Town of Geraldine, Chouteau County, Montana

Water PER - Geraldine Hydrogeologic Study

Station

Water System Feature

Transmission Main

Service Connection

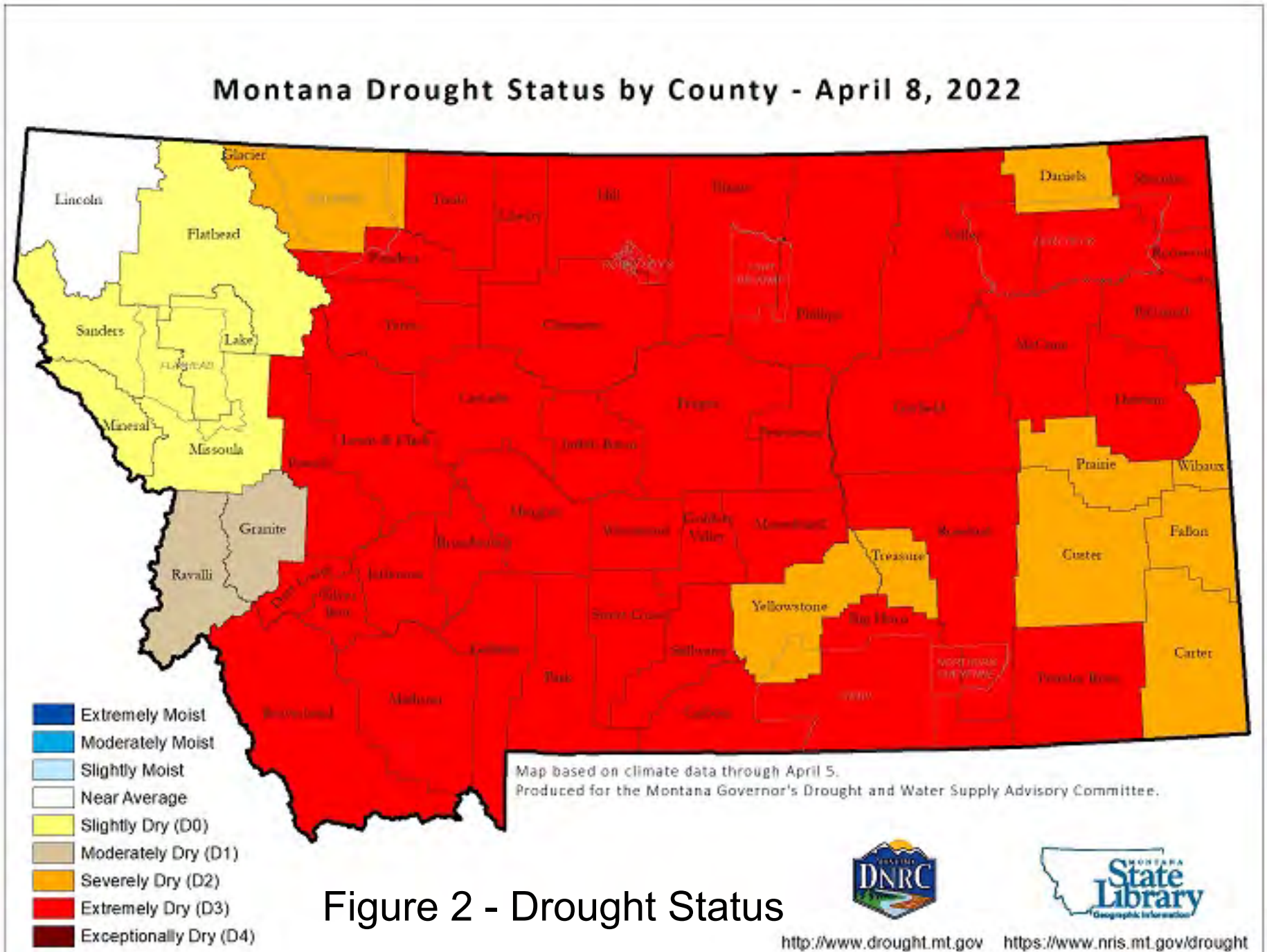


Figure 2 - Drought Status

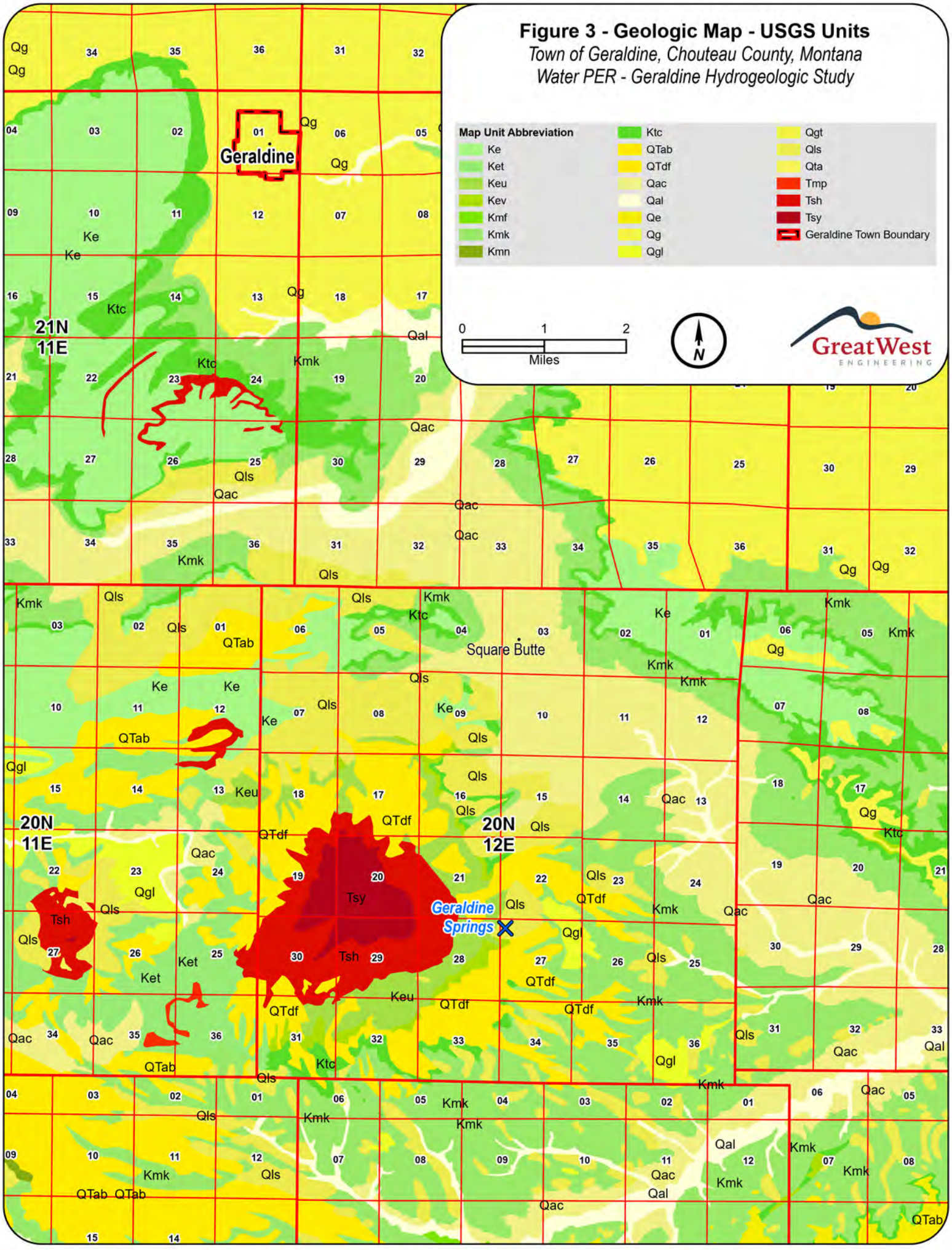


Figure 3 - Geologic Map - USGS Units
Town of Geraldine, Chouteau County, Montana
Water PER - Geraldine Hydrogeologic Study
Map Unit Abbreviation
Ke
Ket
Keu
Kev
Kmf
Kmk
Kmn
Ktc
QTab
QTdf
Qac
Qal
Qe
Qg
Qgl
Qgt
Qls
Qta
Tmp
Tsh
Tsy
Geraldine Town Boundary
0
1
2
Miles
N
GreatWest
ENGINEERING
Geraldine
Square Butte
Geraldine Springs
21N
11E
20N
11E
20N
12E

ELEV. ON TOP OF ROCK = 3841.0

CONSTRUCT 220 L.F. OF 4-WIRE FENCE AROUND SPRING.

SPRING #4 & #6 (SEE DETAIL BELOW)

1½" SERVICE LINE & CURB STOP

190 L.F. 6" PVC. CL. 160

D.L.H. 7 July, 01

AS-BUILT

2001 SPRING DEVELOPMENT PROJECT

EX. 4" WELLSCREEN

SPRING 4C

ELEV. = 103.3

¾" YARD HYD.

CONNECT W/ 4" TEE & 45° BEND, INSTALL 4" GATE VALVE, 2 PLACES, 4" YARD HYD., 40 L.F. ¾" PVC. TO YD., PLACE VALVE BOXS ON 4" VALVES.

590 L.F. 6" PVC. CL. 160

220 L.F. 4" PVC. CL. 160

SPRING #3

EX. 4" WELL-SCREEN

ELEV. = 87.4

CONNECT W/2-4" TEES, INSTALL 2-4" GATE VALVES, W/2 VALVE BOXS.

¾" WASHED GRAVEL

LEGEND

SPRING/COLLECTOR BOX

BYPASS VALVE

DISTRIBUTION VALVE

SPRING #1

CONSTRUCT 180 L.F. OF 4-WIRE FENCE AROUND SPRING.

SPRING #2 (SEE DETAIL AT RIGHT)

INSTALL 6" G.V. W/BOX

RIM ELEV. = 100.0

45 L.F. 6" PVC. OVER FLOW

INSTALL 3" MANHOLE DRAIN WITH 3" GV & BOX (SEE DETAIL BELOW)

STA 6+05+00 BUILD DEVELOPMENT MANHOLE (SEE DETAIL THIS SHEET.)

INSTALL 6" GATE VALVE W/BOX

ELEV. = 74.8

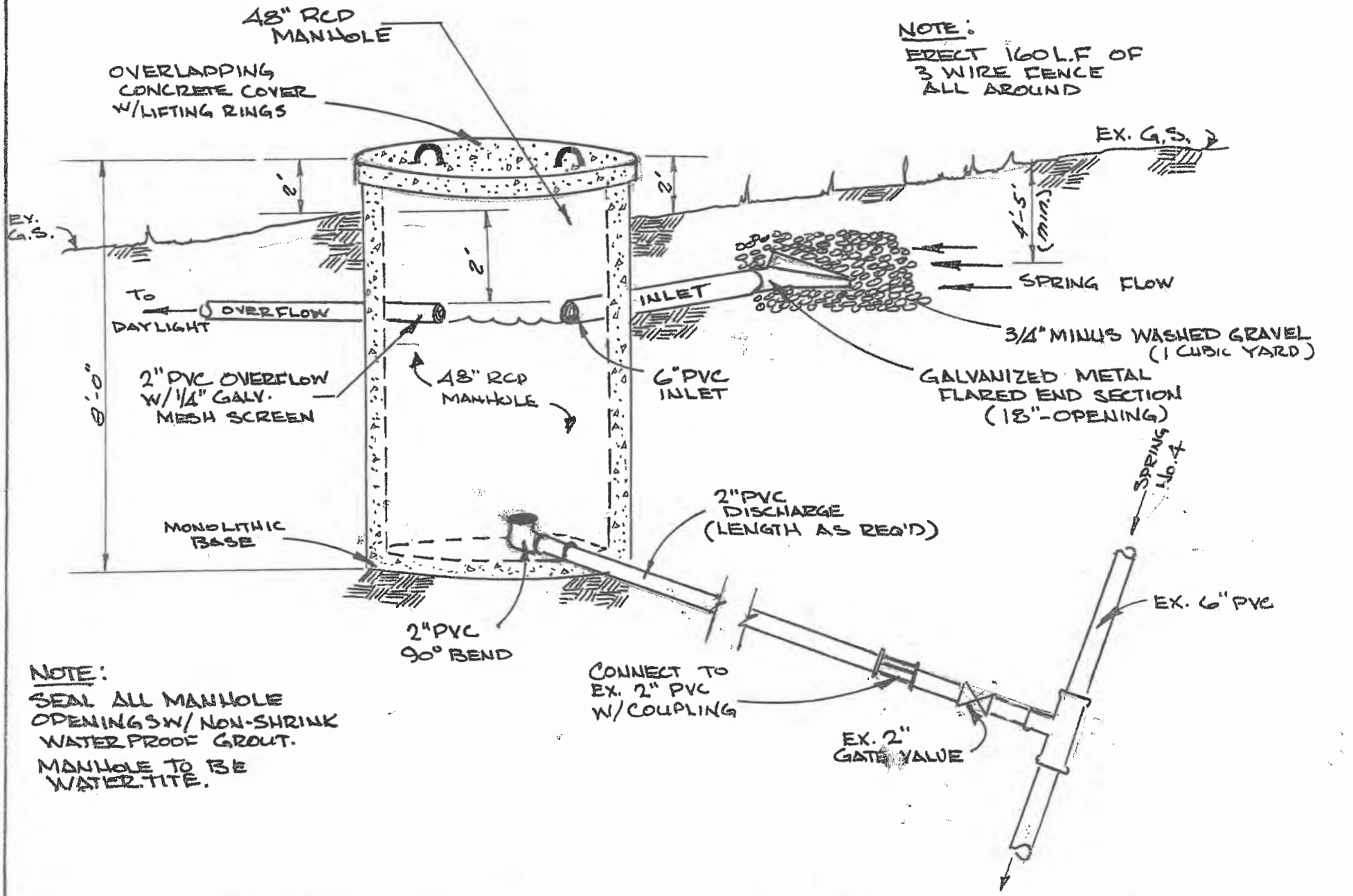
CONNECT EX. 6" PVC. W/ 6" x 4" TEE AND 4"-45° BE

221 L.F. 4" PVC. CL 160

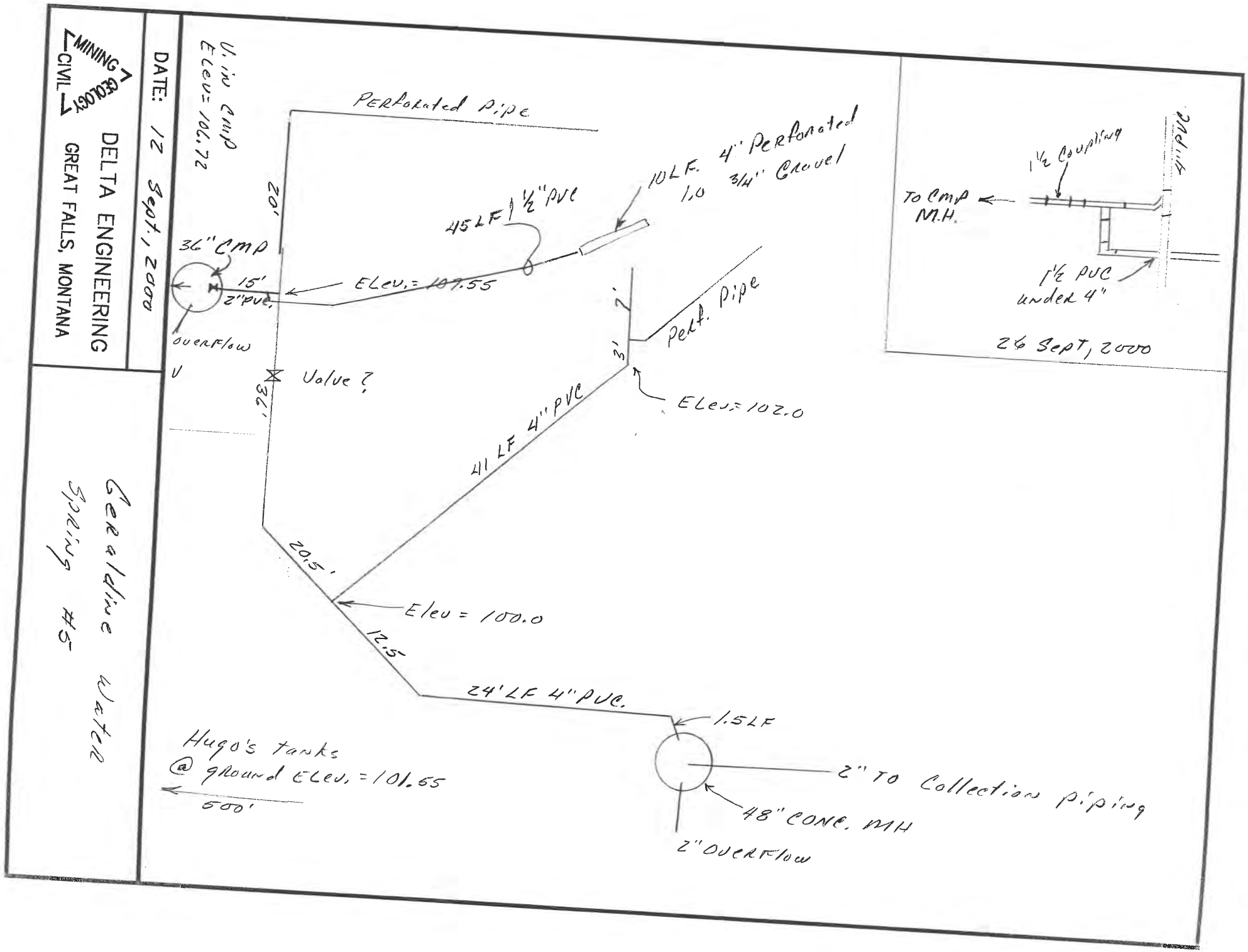
SPRING DEVELOPMENT SITE PLAN

Figure 4 - Spring Schematic

Figure 5 - Spring 5 Vault Sketch



DELTA ENGINEERING GREAT FALLS, MT	CONSTRUCTION DRAWING	TOWN OF GERALDINE SPRING DEVELOPMENT


DELTA ENGINEERING
GREAT FALLS, MONTANA
MINING
CIVIL
DATE: 12 Sept, 2000
Geraldine Water
Springs #5
U. in cmp
Elev= 101.72
Perforated Pipe
20'
36" CMP
15'
2" PVC
overflow
Elev.= 101.55
45 LF 1½" PVC
10 LF. 4" Perforated
1.0 3/4" Gravel
Valve ?
32'
3'
7'
Perf. Pipe
Elev.= 102.0
41 LF 4" PVC
20.5'
Elev = 100.0
12.5'
24' LF 4" PVC.
1.5 LF
Hugo's tanks
@ ground Elev. = 101.65
500'
2" To Collection piping
48" CONC. MH
2" overflow
1½ Coupling
To CMP
M.H.
1½ PVC
under 4"
24 Sept, 2000

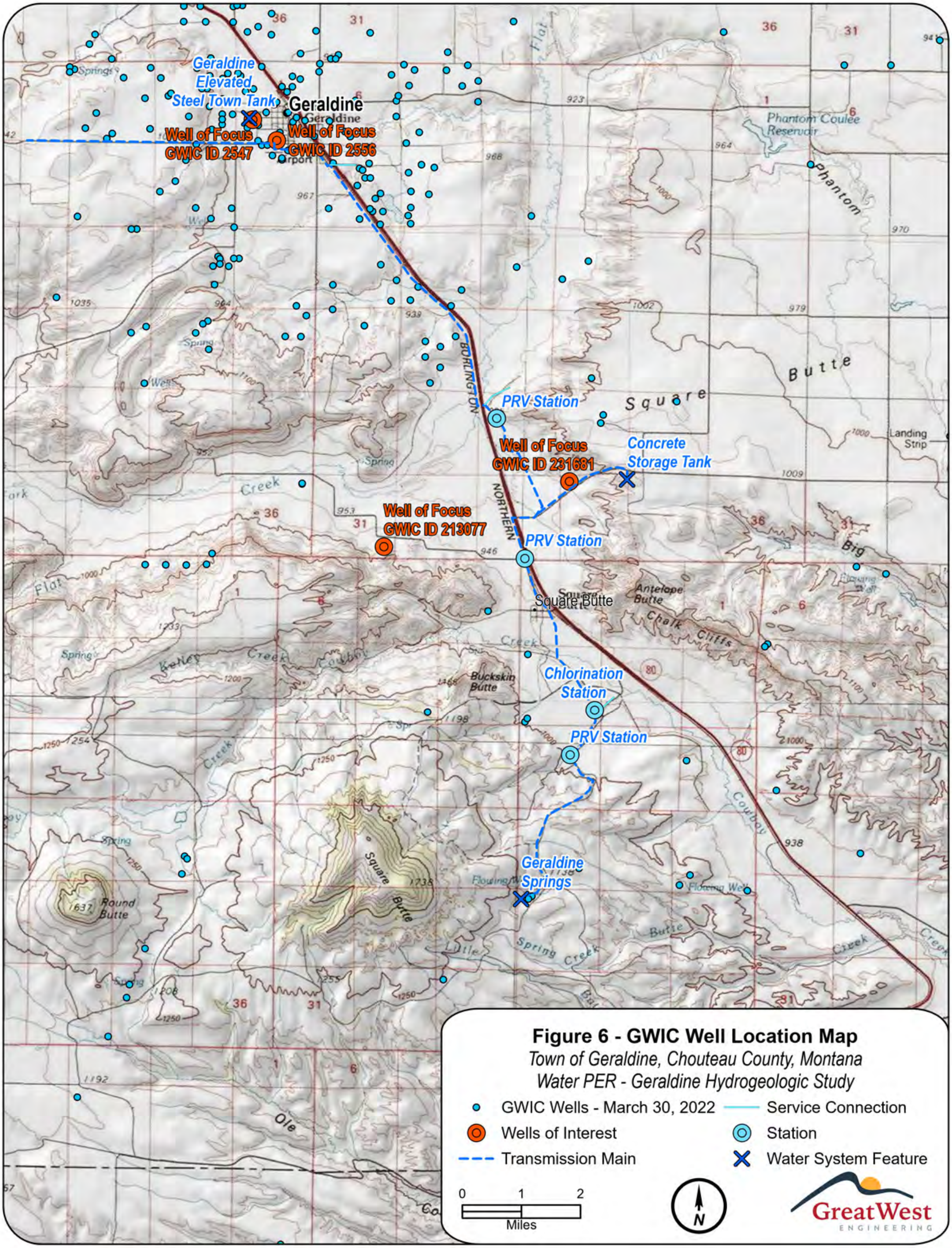

Geraldine Elevated Steel Town Tank
Geraldine
Well of Focus GWIC ID 2547
Well of Focus GWIC ID 2556
PRV Station
Well of Focus GWIC ID 231681
Concrete Storage Tank
Well of Focus GWIC ID 213077
PRV Station
Square Butte
Chlorination Station
PRV Station
Geraldine Springs
Phantom Coulee Reservoir
Square Butte
Antelope Butte
Chalk Cliffs
Buckskin Butte
Round Butte
Landing Strip
BURLINGTON
NORTHERN
GWIC Wells - March 30, 2022
Wells of Interest
Transmission Main
Service Connection
Station
Water System Feature
0
1
2
Miles
N
GreatWest
ENGINEERING

Figure 6 - GWIC Well Location Map

Town of Geraldine, Chouteau County, Montana

Water PER - Geraldine Hydrogeologic Study

APPENDIX A

Spring Water Quality

STATE OF MONTANA
DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES
COGSWELL BUILDING
HELENA MONTANA, 59620-0901

LABORATORY SYSTEM

REVIEW LMH 1/20/94
INITIAL DATE
JAN 18 1994
ENTERED [illegible] 1/20/94
INITIAL DATE

ACCOUNT: 00225001 ATTN:

GERALDINE TOWN OF
CITY HALL - BOX 211
GERALDINE MT 59446

FOR: GERALDINE TOWN OF

This is the spring water from Square Butte

SAMPLE ANALYSIS REPORT

January 18, 1994

lab#	testname	sampleid	date	reported	units
					G
C9309-104855	ALKALINITY IN WATER	001	09/24/93	139	MG/L
C9309-104855	ARSENIC	001	09/24/93	< 0.001	MG/L
C9309-104855	BARIUM	001	09/24/93	0.032	MG/L
C9309-104855	BERYLLIUM	001	09/24/93	< 0.001	MG/L
C9309-104855	CALCIUM	001	09/24/93	35.8	MG/L
C9309-104855	CADMIUM	001	09/24/93	< 0.001	MG/L
C9309-104855	CYANIDE IN WATER-COMPOSITE OF 5	001	09/24/93	< 0.005	
C9309-104855	CHROMIUM	001	09/24/93	< 0.001	MG/L
C9309-104855	SOC'S BY EPA 505/504	001	09/24/93	ATTACHED	
C9309-104855	HERBICIDES IN WATER-COMPOSITE OF 5	001	09/24/93	ATTACHED	
C9309-104855	SOC'S BY EPA 525	001	09/24/93	ATTACHED	
C9309-104855	CARBAMATES IN WATER-COMPOSITE OF 5	001	09/24/93	ATTACHED	
C9309-104855	FLUORIDE IN WATER	001	09/24/93	0.29	MG/L
C9309-104855	IRON	001	09/24/93	< 0.01	MG/L
C9309-104855	HARDNESS GRAINS PER GALLON	001	09/24/93	7.2	G/PG
C9309-104855	TOTAL HARDNESS AS CACO3	001	09/24/93	123	MG/L
C9309-104855	MERCURY IN WATER-COMPOSITE OF 5	001	09/24/93	< 0.001	MG/L
C9309-104855	MAGNESIUM	001	09/24/93	8.1	MG/L
C9309-104855	MANGANESE	001	09/24/93	< 0.005	MG/L
C9309-104855	SODIUM	001	09/24/93	24.4	MG/L
C9309-104855	NICKEL	001	09/24/93	< 0.02	MG/L
C9309-104855	NITRATE PLUS NITRITE AS N	001	09/24/93	0.14	MG/L
C9309-104855	LEAD	001	09/24/93	< 0.001	MG/L
C9309-104855	pH IN WATER	001	09/24/93	7.75	UNITS

APPROVED BY: JCB

***FOR QUESTIONS CONCERNING THIS ANALYSIS CALL: 406-444-2642

lab#	testname	sampleid	date	reported	unit
C9309-104855	ANTIMONY	001	09/24/93	<0.001	MG/
C9309-104855	SELENIUM	001	09/24/93	0.002	MG/
C9309-104855	SULFATE IN WATER	001	09/24/93	26	MG/
C9309-104855	SPECIFIC CONDUCTANCE	001	09/24/93	351	UMH
C9309-104855	THALLIUM	001	09/24/93	< 0.001	MG/
C9309-104855	VOLATILE ORGANIC COMPOSITE OF 5	001	09/24/93	ATTACHED	UG/

REVIEW INITIAL DATE
JAN 18 1994
ENTERED 11/9/94
INITIAL DATE

APPROVED BY: DLB

***FOR QUESTIONS CONCERNING THIS ANALYSIS CALL: 406-444-2642

APPENDIX B

Well Logs and Water Quality

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View scanned well log (7/12/2006 1:33:20 PM)

Site Name: TOWN OF GERALDINE
GWIC Id: 213077

Section 1: Well Owner(s)

1) TOWN OF GERALDIN (MAIL)
301 EAST COLLINS AVE
GERALDINE MT 59446 [06/16/2004]

Section 2: Location

Township	Range	Section	Quarter Sections
21N	12E	31	SE¼ SE¼

County
CHOUTEAU

Geocode

Latitude	Longitude	Geomethod	Datum
47.526949	-110.239334	TRS-SEC	NAD83

Ground Surface Altitude **Ground Surface Method** **Datum** **Date**

Addition **Block** **Lot**

Section 3: Proposed Use of Water

TEST WELL (1)

Section 4: Type of Work

Drilling Method: ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Wednesday, June 16, 2004

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	120	10
120	1400	9
1400	2500	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-3	1391	7		20.00	THREADED	STEEL
0	120	10		20.00	THREADED	STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
1391	2500	7			OPEN HOLE

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	1391	CEMENT	

Section 7: Well Test Data

Total Depth: 2500
Static Water Level: -415.8
Closed-in Pressure: 180 psi
Water Temperature:

Unknown Test Method *

Yield 500 gpm.
Pumping water level _ feet.
Time of recovery _ hours.
Recovery water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

ALL WATER ENCOUNTERED IN WELL HAD A STRONG SULFER SMELL

Section 9: Well Log

Geologic Source

Unassigned

From	To	Description
0	25	TAN SILT AND TOPSOIL SOFT
25	90	BLACK SHALES AND TAN SAND SOFT
90	120	BLACK SHALE SOFT
120	170	BLACK VOLCANICS HARD
170	290	BLACK SHALE WITH WHITE CLAY STRINGERS SOFT
290	445	BLACK SHALE WITH GRAY CLAY SOFT
445	1100	BLACK SHALES WITH TAN SANDSTONE MED
1100	1260	BLACK SHALE WITH DENSE GRAY CLAY MED SOFT
1260	1365	BLACK SHALE WITH STICKY GRAY CLAY WITH SANDSTONE STRINGERS MED
1365	1575	RED AND BLACK SHALES MED
1575	1590	RED AND BLACK SHALE WITH TAN SANDTONE MED
1590	1638	RED AND BLACK SHALES WITH BLUISH GREEN CLAY MED
1638	1698	RED AND BLACK SHALE WITH WHITE CLAY STRINGERS MED
1698	1701	BLACK COAL SOFT
1701	1762	BLACK SHALE WITH GRAY CLAY AND SALT AND PEPPERED SAND MED

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name: NICHOLAS STRICKER
Company: AK DRILLING INC
License No: WWD-144
Date Completed: 6/16/2004

Site Name: TOWN OF GERALDINE
GWIC Id: 213077
Additional Lithology Records

From	To	Description
1762	1875	BLACK SHALE WITH SALT AND PEPPERED GRAY CLAY MED
1875	1902	GRAY CLAY WITH SALT AND PEPPERED COURSE SAND WATER WITH SULFER SMELL
1902	1916	TAN LIMESTONE WATER WITH SULFER SMELL
1916	1945	BLACK BROKEN SHALES WITH TAN SANDSTONE MED
1945	1973	TAN CALCYTIC SANDSTONE SOFT
1973	1980	TAN SANDSTONE MED
1980	2500	BLACK AND RED SHALE WITH SMALL WHITE SAND MED

MONTANA WELL LOG REPORT

Well ID# 206

Form No. 603 R2-99

This log reports the activities of a licensed Montana well driller and serves as the official record of work done within the borehole and casing and describes the amount of water encountered. **This form is to be completed by the driller and filed with DNRC within 60 days of completion of the work. Acquiring Water Rights is the well owner's responsibility and is not accomplished by the filing of this report.**

Well log information is stored in the Groundwater Information Center at the Montana Bureau of Mines and Geology (Butte) and water right information is stored in the Water Rights Bureau records (Helena).

For fields that are not applicable, enter NA. Optional fields have a grayed background. Record additional information in the REMARKS section.

1. WELL OWNER:
Name Town of Geraldine

MAILING ADDRESS 301 East Collins Ave.

Geraldine, MT 59446

2. WELL LOCATION: List ¼ from smallest to largest

____ ¼ ____ ¼ SE ¼ SE ¼, Section 31

Township 21N N/S Range 12E E/W County Chouteau

Lot ____, Tract/Blk ____ Subdivision Name ____

Well Address ____

GPS ☐ Yes ☒ No

Latitude ____ Longitude ____

Error as reported by GPS locator (± feet) ____

Horizontal datum ☐ NAD27 ☐ WGS84

3. PROPOSED USE: ☐ Domestic ☐ Stock ☐ Irrigation ☐ Public Water Supply ☐ Monitoring Well ☒ Other: Test Well

4. TYPE OF WORK:
☒ New well ☐ Deepen existing well ☐ Abandon existing well

Method: ☐ Cable ☒ Rotary ☐ Other: ____

5. WELL CONSTRUCTION DETAIL:

Borehole:
Dia. 10 in. from 0 ft. to 120 ft.
Dia. 9 7/8 in. from 120 ft. to 1400 ft.
Dia. 6 1/4 in. from 1400 ft. to 2500 ft.

Casing:
Steel: Wall thickness 20 lb. ☒ Threaded ☐ Welded
Dia. 10 in. from 0 ft. to 120 ft.
Dia. 7 in. from +3 ft. to 1391 ft.

Plastic: Pressure Rating ____ lbs. ☐ Threaded ☐ Welded
Dia. ____ in. from ____ ft. to ____ ft.

Perforations/Slotted Pipe:
Type of perforator used ____
Size of perforations/slots ____ in. by ____ in.
____ no. of perforations/slots from ____ ft. to ____ ft.
____ no. of perforations/slots from ____ ft. to ____ ft.

Screens: ☐ Yes ☒ No
Material ____
Dia. ____ Slot size ____ from ____ ft. to ____ ft.
Dia. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel Packed: ☐ Yes ☒ No
Size of gravel ____
Gravel placed from ____ ft. to ____ ft.

Packer: ☐ Yes ☒ No
Type ____ Depth(s) ____

Grout: Material used Cement
Depth from 0 ft. to 1391 ft. OR ☐ Continuous feed

6. WELL TEST DATA:
A well test is required for all wells. (See details on well log report cover.)

☐ Static water level ____ ft. below top of casing or

☒ Closed-in artesian pressure 180 psi.

How was test flow measured:
bucket/stopwatch, weir, flume, flowmeter, etc Bucket/ Stopwatch

Yellowstone groundwater closure area only - Water Temperature ____ °F

☐ AQUIFER TEST DATA FORM ATTACHED

Test - 1 hour minimum
Drawdown is the amount water level is lowered below static level.
All depth measurements shall be from the top of the well casing.
Time of recovery is hours/minutes since pumping stopped.

Air test*
____ gpm with drill stem set at ____ ft. for ____ hours
Time of recovery ____ hrs/min. Recovery water level ____ ft.

OR Bailer test*
____ gpm with ____ ft. of drawdown after ____ hours
Time of recovery ____ hrs/min. Recovery water level ____ ft.

OR Pump test*
Depth pump set for test ____ ft.
____ gpm pump rate with ____ ft. of drawdown after ____ hrs pumping
Time of recovery ____ hrs/min. Recovery water level ____ ft.

OR Flowing Artesian*
500 gpm for 24 hours
Flow controlled by 2- 4 inch val

*During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.

7. WELL LOG: DB

Depth, Feet From	Depth, Feet To	Material: color/rock and type/descriptor (example: blue/shale/hard, or brown/gravel/water, or brown/sand/heaving)
All water encountered in well had a strong sulfer smell.		
0	25	Tan/ Silt and Top Soil/ Soft
25	90	Black Shales and Tan Sand/ Soft
90	120	Black/ Shale/ Soft
120	170	Black/ Volcanics/ Hard
170		Black/ Shale w/ White Clay Stringers/
	290	Soft
290	445	Black/ Shale w/ Gray Clay/ Soft
445	1100	Black/ Shales w/ Tan Sandstone/ Med
1100		Black/ Shale w/ Dense Gray Clay/ Med.
	1260	Soft
1260		Black/ Shale w/ Sticky Gray Clay w/
	1365	Sandstone Stringers/ Med
1365	1575	Red & Black/ Shales/ Med
1575	1590	Red & Black/ Shale w/ Tan Sandstone/ Med
1590		Red & Black/ Shales w/ Bluish Green
	1638	Clay/ Med
1638		Red & Black/ Shale w/ White Clay
	1698	Stringers/ Med
1698	1701	Black/ Coal/ Soft

RECEIVED
AUG 05 2004

☒ ADDITIONAL SHEETS ATTACHED

8. DATE WELL COMPLETED: 6/16/2004

9. REMARKS: M.B.M.G.

10. DRILLER/CONTRACTOR'S CERTIFICATION:
All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name, firm, or corporation (print)
AK Drilling, Inc.

Address 185 S. Parkmont Butte, MT 59701

Signature Nicholas Stricker

Date 8/4/2004 License no. 604/ 369 144

MBMG ID# 213077

Montana DNRC P.O. BOX 201601 HELENA, MT 59620-1601 444-6610

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

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Site Name: TOWN OF GERALDINE
GWIC Id: 231681

Section 1: Well Owner(s)

1) TOWN OF GERALDIN (MAIL)
P.O. BOX 211
GERALDINE MT 59446 [11/03/2006]

Section 2: Location

Township	Range	Section	Quarter Sections
21N	12E	34	NW¼ NW¼

County: CHOUTEAU
Geocode:

Latitude	Longitude	Geomethod	Datum
47.538744	-110.191116	TRS-SEC	NAD83

Ground Surface Altitude: Ground Surface Method: Datum: Date:

Addition: Block: Lot:

Section 3: Proposed Use of Water

PUBLIC WATER SUPPLY (1)

Section 4: Type of Work

Drilling Method:
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Friday, November 3, 2006

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	107	14
107	2222	10
2222	2629	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	2222	7	0.237		THREADED	STEEL
0	107	10	0.237		THREADED	STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
2222	2629	7			OPEN HOLE

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	2222	CEMENT	

Section 7: Well Test Data

Total Depth: 2629
Static Water Level:
Closed-in Pressure: 183 psi
Water Temperature:

Artesian/Flow Test *

350 gpm for 8 hours.
Flow controlled by valve.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

330MDSN - MADISON GROUP OR LIMESTONE

From	To	Description
0	86	UNCONSOLIDATED DEPOSITS OF ALLUVIUM AND COLLUVIUM CONSISTING OF CLAY AND SAND
86	1104	DARK GRAY SHALE WITH MINOR AMOUNTS OF SILTSTONE AND BENTONITE
1104	1530	BLACK SHALE, ARGILLACEOUS LIGHT GREY SHALE, BENTONITE BEDS IN UPPER PART, FEW BEDS OF VERY FINE-GRAINED LITHIC SAND
1530	1590	WHITE, VERY FINE-GRAINED, QUARTZ SANDSTONE. LOCALLY CALLED FIRST CAT CREEK
1590	1770	REDDISH-BROWN SHALE AND MUDSTONE, ARGILLACEOUS SOFT GRAY SHALE, HARD BLACK SHALE, MINOR RED SILTSTONE, TRACES OF LITHIC SANDSTONE, TRACES PYRITE
1770	1790	WHITE MEDIUM TO COARSE GRAINED QUARTZ SANDSTONE WITH 10-15% DARK CHERT OR LITHIC GRAINS. LOCALLY CALLED SECOND CAT CREEK
1790	1850	TAN MICROCRYSTALLINE LIMESTONE IN UPPER PART AND DARK GRAY SHALE IN LOWER PART
1850	1934	WHITE, SALT AND PEPPER, MEDIUM TO COARSE GRAINED, CONGLOMERATIC SANDSTONE WITH 10-15% DARK CHERT GRAINS. LOCALLY CALLED THIRD CAT CREEK SAND
1934	2120	BLACK SUBBITUMINOUS COAL BED FROM 1934-1935 FT., LIGHT GRAY TO DARK GRAY SHALE AND MUDSTONE, TRACES OF CEMENTED SANDSTONE, TRACES PYRITE.
2120	2160	TAN, FINE TO MEDIUM GRAINED QUARTZ SANDSTONE, MOSTLY CALCAREOUS, WITH 10% DARK LITHIC GRAINS, TRACE GLAUCONITE
2160	2227	WHITE AND LIGHT TAN MICROCRYSTALLINE LIMESTONE INTERBEDDED WITH PARTINGS, LAMINAE, AND THIN BEDS OF SOFT, CHALKY, WHITE GYPSUM. HARD CRYSTALLINE ANHYDRITE COMPRISES 1-2% OF SAMPLES NEAR BASE
2227	2629	DENSE CRYSTALLINE LIMESTONE WITH VARYING POROSITY INCREASING WITH DEPTH

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name: CHRIS BOLAND
Company: BOLAND DRILLING
License No: WWC-482
Date Completed: 11/3/2006

21N 12E 34 BB

MONTANA WELL LOG REPORT

Well ID# _____

Form No. 603 R2-04

This log reports the activities of a licensed Montana well driller and serves as the official record of work done within the borehole and casing and describes the amount of water encountered. **This form is to be completed by the driller and filed with MBMG within 60 days of completion of the work. Acquiring Water Rights is the well owner's responsibility and is not accomplished by the filing of this report.**

Well log information is stored in the Groundwater Information Center at the Montana Bureau of Mines and Geology (Butte) and water right information is stored in the Water Rights Bureau records (Helena).

For fields that are not applicable, enter NA. [redacted] Record additional information in the REMARKS section.

1. WELL OWNER:

Name Town Of Geraldine

Mailing address P.O. Box 211

Geraldine, MT 59446

2. WELL LOCATION: List ¼ from smallest to largest

[redacted] NW ¼ NW ¼, Section 34

Township 21 N/S Range 12 E/W County Choteau

[redacted]

3. PROPOSED USE: ☐ Domestic ☐ Stock ☐ Irrigation

☒ Public water supply ☐ Monitoring Well ☐ Other:

4. TYPE OF WORK:

☒ New well ☐ Deepen existing well ☐ Abandon existing well

Method: ☐ Cable ☐ Rotary ☐ Other: _____

5. WELL CONSTRUCTION DETAILS:

Borehole:

Dia. 14 in. from 0 ft. to 107 ft.

Dia. 10 in. from 107 ft. to 2222 ft.

Dia. 6 in. from 2222 ft. to 2629 ft.

Casing:

Steel: Wall thickness .231 ☒ Threaded ☐ Welded

Dia. 10 in. from 0 ft. to 107 ft.

Dia. 7 in. from +2 ft. to 2222 ft.

Plastic: Pressure Rating _____ lbs. ☐ Threaded ☐ Welded

Dia. _____ in. from _____ ft. to _____ ft.

Perforations/Slotted Pipe:

Type of perforator used _____

Size of perforations/slots _____ in. by _____ in.

_____ no. of perforations/slots from _____ ft. to _____ ft.

_____ no. of perforations/slots from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No

Material _____

Dia. _____ Slot size _____ from _____ ft. to _____ ft.

Dia. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel Packed: ☐ Yes ☒ No

Size of gravel _____

Gravel placed from _____ ft. to _____ ft.

Packer: ☐ Yes ☒ No

Test - 1 hour minimum

Drawdown is the amount water level is lowered below static level.

All depth measurements shall be from the top of the well casing.

Time of recovery is hours/minutes since pumping stopped.

Air test*

_____ gpm with drill stem set at _____ ft. for _____ hours

Time of recovery _____ hrs/min. Recovery water level _____ ft.

OR Bailer test*

_____ gpm with _____ ft. of drawdown after _____ hours

Time of recovery _____ hrs/min. Recovery water level _____ ft.

OR Pump test*

Depth pump set for test _____ ft.

___ gpm pump rate with ____ ft. of drawdown after __ hrs pumping

Time of recovery _____ hrs/min. Recovery water level _____ ft.

OR Flowing Artesian*

350 gpm for 8 hours

Flow controlled by valve

**During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the resevoir of the well casing.*

7. WELL LOG: DB

Depth, Feet From	Depth, Feet To	Material: color/rock and type/descriptor (example: blue/shale/hard, or brown/gravel/water, or brown/sand/heaving)
		Please See Attached

RECEIVED

DEC 18 2006

M.B.M.G.

☒ ADDITIONAL SHEETS ATTACHED

Geraldine Well WW#2: Geologic Log

Depth (feet)	Geologic Unit	Generalized Description
0 - 86	Surface Deposits	Unconsolidated deposits of alluvium and colluvium consisting of clay and sand.
86 - 1104	Marias River Shale	Dark gray shale with minor amounts of siltstone and bentonite.
1104 - 1530	Blackleaf Formation	Black shale, argillaceous lt. gray shale, bentonite beds in upper part, few beds of very fine-grained lithic sand.
1530 - 1590	Dakota Sandstone	White, very fine-grained, quartz sandstone. Locally called First Cat Creek sand.
1590 - 1770	Fifth & Fourth Members of the Kootenai Formation	Reddish-brown shale and mudstone, argillaceous soft gray shale, hard black shale, minor red siltstone, traces of lithic sandstone, traces pyrite.
1770 - 1790	Sunburst Sandstone Kootenai Formation	White medium- to coarse-grained quartz sandstone w/10-15% dark chert or lithic grains. Locally called Second Cat Creek sand.
1790 - 1850	Second Member Kootenai Fm	Tan microcrystalline limestone in upper part and dark gray shale in lower part.
1850 - 1934	Cutbank Sandstone	White, salt and pepper, medium- to coarse-grained, conglomeratic sandstone w/10-15% dark chert grains. Locally called Third Cat Creek sand.
1934 – 2120	Morrison Formation	Black, subbituminous coal bed from 1934-1935 ft, lt. gray to dark gray shale and mudstone, traces of cemented sandstone, traces pyrite.
2120 – 2160	Swift Formation	Tan, fine- to medium-grained quartz sandstone, mostly calcareous, w/10% dark lithic grains, trace glauconite.
2160 – 2227	Charles Formation	White and lt. tan microcrystalline limestone interbedded with partings, laminae, and thin beds of soft, chalky, white gypsum. Hard crystalline anhydrite comprises 1-2% of samples near base.
2227 - 2829	Mission Canyon Limestone	Dense crystalline limestone with varying porosity increasing with depth.

MONTANA WELL LOG REPORT

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Other Options

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View water quality for this site
View scanned well log (7/13/2006 10:22:12 AM)

Site Name: CITY OF GERALDINE * WELL #2
GWIC Id: 2547

Section 1: Well Owner(s)

1) TOWN OF GERALDIN (MAIL)
N/A
GERALDINE MT 59446 [04/10/1959]

Section 2: Location

Township	Range	Section	Quarter Sections
21N	11E	1	SE¼ SE¼ NW¼ SW¼

County: CHOUTEAU
Geocode:

Latitude	Longitude	Geomethod	Datum
47.6022	-110.2738	MAP	NAD27

Ground Surface Altitude	Ground Surface Method	Datum	Date
3170			

Addition: **Block:** **Lot:**

Section 3: Proposed Use of Water

PUBLIC WATER SUPPLY (1)

Section 4: Type of Work

Drilling Method: ROTARY DRILL
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Friday, April 10, 1959

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
0	1908	2				GALVANIZED

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
1858	1908	2			PERF SCREEN

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 1908
Static Water Level: -277.1
Closed-in Pressure: 120 psi
Water Temperature:

Unknown Test Method *

Yield 10.9 gpm.
Pumping water level _ feet.
Time of recovery _ hours.
Recovery water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

217KOTN - KOOTENAI FORMATION

From	To	Description
0	36	OVERBURDEN AND SURFACE CLAY
36	44	BLUE SHALE
44	145	GREY SHALE WITH SOME THIN SAND STREAKS
145	295	GREY TO BLUE SHALE WITH SOME LAYERS OF HARD BLACK SLATELY SANDSTONE AND BENTONITE OR TALC
295	568	GREY SHALE
568	775	LAYERS OF SANDSTONE AND SHALE
775	850	HARD SANDY SHALE
850	885	SANDSTONE
885	910	LAYERS OF SOFT SHALE AND HARD SANDY SHALE
910	1040	LAYERS OF HARD SHALE AND SANDSTONE
1040	1130	BLUE SHALE
1130	1210	HARD SANDY SHALE WITH LAYERS OF SANDSTONE
1210	1270	SANDSTONE
1270	1405	SANDY SHALE
1405	1460	HARD SANDY SHALE

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: THATCHER DRILLING CO
License No: -
Date Completed: 4/10/1959

Site Name: CITY OF GERALDINE * WELL #2
GWIC Id: 2547
Additional Lithology Records

From	To	Description
1460	1565	SANDY GREY SHALE WITH LAYERS OF SANDSTONE
1565	1600	RED SHALE
1600	1650	SANDSTONE
1650	1685	RED SHALE
1685	1705	HARD SANDSTONE
1705	1720	SHALE
1720	1784	LAYERS OF HARD SANDSTONE AND SHALE
1784	1815	HARD SANDSTONE
1815	1830	SHALE
1830	1858	VERY HARD SANDSTONE
1858	1901	SOFT COARSE SANDSTONE(WATER)
1901	1905	HARD SANDSTONE

015 21N 11E Chouteau 015 T 21N R 11E - 1 CBOD CBOD

County Chouteau

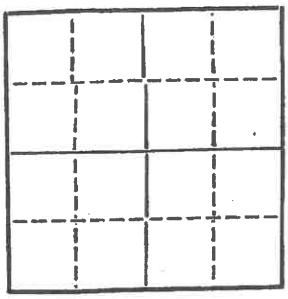
1 CODED

MONTANA BUREAU OF MINES AND GEOLOGY

Butte, Montana

~~Mt. 3150-2~~

WATER WELL LOG



Owner Geraldine, City Address Geraldine Mont

Driller O.C. Thatcher Address Stanford, Mont

Date Started March 26, 1959 Date Completed April 10, 1959

Location: Sec. 1 T. 21N R. 11E ¼ sec. NW 1/4 of the SW 1/4

Type of well Drilled (Dug, driven, bored, or drilled) Equipment used Rotary (Churn drill, rotary, other)

Water use: Domestic ☐ Municipal ☒ Stock ☐ Irrigation ☐

Industrial ☐ Drainage ☐ Other:

Casing: 0 ft. to 1908 ft. Type Galvanized Size 2"

Casing: ft. to ft. Type Size

Casing: ft. to ft. Type Size

Perforated or Screened: Ft. 1858 to ft. 1908 Ft. to ft.

Type of screen or perforations Galvanized Pipe Slot Perforations

Static Water level, for non-flowing well: feet.

Shut-in pressure, for flowing well: 120 lb./sq. in. on: May 1, 1959 (date)

Pumping water level feet at gal. per min.

How tested:

Length of test

Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

Hole Cased with 1908' of 2" Gal. pipe Cemented in Producing approx. 60 gal. per min. free flow.

LAB: 8300362
AFT: 3170 <10
GEO: 21 KOTN
IND: 0501983

(over)

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JAN 6 1961
Montana Bureau of Mines and Geology

M: 2547

Log of Well

Depth, feet From	Depth, feet To	Description of Material Drilled
0	36	Overburden and surface clay
36	44	Blue shale
44	145	Grey shale with some thin sand streaks
145	295	Grey to blue shale with some layers of hard black slatey sandstone and bentonite or talc.
295	568	Grey shale
568	775	Layers of sandstone and shale
775	850	Hard sandy shale
850	885	Sandstone
885	910	Layers of soft shale and hard sandy shale
910	1040	Layers of hard shale and sandstone
1040	1130	Blue shale
1130	1210	Hard sandy shale with layers of sandstone
1210	1270	Sandstone
1270	1405	Sandy shale
1405	1460	Hard sandy shale
1460	1565	Sandy grey shale with layers of sandstone
1565	1600	Red shale
1600	1650	Sandstone
1650	1685	Red shale
1685	1705	Hard sandstone
1705	1720	Shale
1720	1784	Layers of hard sandstone and shale
1784	1815	Hard sandstone
1815	1830	Shale
1830	1858	Very hard sandstone
1858	1901	Soft coarse sandstone (Water)
1901	1905	Hard sandstone

Koot

43'

Kootenai ?

Ground-Water Information Center Water Quality Report
Report Date: 5/4/2022

Site Name: CITY OF GERALDINE * WELL #2
Compare to Water Quality Standards

Location Information

Sample Id/Site Id:	1983Q0352 / 2547	Sample Date:	5/24/1983 1:55:00 PM
Location (TRS):	21N 11E 01 CBDD	Agency/Sampler:	MBMG / TED
Latitude/Longitude:	47° 36' 7" N 110° 16' 25" W	Field Number:	CITY #2
Datum:	NAD27	Lab Date:	8/11/1983
Altitude:	3170	Lab/Analyst:	MBMG / FNA
County/State:	CHOUTEAU / MT	Sample Method/Handling:	GRAB / 3120
Site Type:	WELL	Procedure Type:	DISSOLVED
Geology:	217KOTN	Total Depth (ft):	1908
USGS 7.5' Quad:	GERALDINE	SWL-MP (ft):	NR
PWS Id:	00225003	Depth Water Enters (ft):	1858
Project:	GERALD, RADON, PWSINV		

Major Ion Results

	mg/L	meq/L		mg/L	meq/L
Calcium (Ca)	76.000	3.792	Bicarbonate (HCO3)	313.000	5.130
Magnesium (Mg)	28.700	2.362	Carbonate (CO3)	0.000	0.000
Sodium (Na)	95.800	4.167	Chloride (Cl)	15.000	0.423
Potassium (K)	21.400	0.547	Sulfate (SO4)	250.000	5.208
Iron (Fe)	0.540	0.019	Nitrate (as N)	0.020	0.001
Manganese (Mn)	0.013	0.000	Fluoride (F)	3.800	0.200
Silica (SiO2)	10.000		Orthophosphate (as P)	NR	0.000
Total Cations		10.938	**Total Anions**		10.962

Trace Element Results (µg/L)

Aluminum (Al):	<30.	Cesium (Cs):	NR	Molybdenum (Mo):	<20.	Strontium (Sr):	1,220.000
Antimony (Sb):	NR	Chromium (Cr):	<2.	Nickel (Ni):	<10.	Thallium (Tl):	NR
Arsenic (As):	0.200	Cobalt (Co):	NR	Niobium (Nb):	NR	Thorium (Th):	NR
Barium (Ba):	NR	Copper (Cu):	6.000	Neodymium (Nd):	NR	Tin (Sn):	NR
Beryllium (Be):	NR	Gallium (Ga):	NR	Palladium (Pd):	NR	Titanium (Ti):	9.000
Boron (B):	230.000	Lanthanum (La):	NR	Praseodymium (Pr):	NR	Tungsten (W):	NR
Bromide (Br):	NR	Lead (Pb):	<40.	Rubidium (Rb):	NR	Uranium (U):	NR
Cadmium (Cd):	<2.	Lithium (Li):	310.000	Silver (Ag):	<2.	Vanadium (V):	2.000
Cerium (Ce):	NR	Mercury (Hg):	NR	Selenium (Se):	<.1	Zinc (Zn):	<3.
						Zirconium (Zr):	<4.

Field Chemistry and Other Analytical Results

**Total Dissolved Solids (mg/L):	655.89	Field Hardness as CaCO3 (mg/L):	NR	Ammonia (mg/L):	NR
**Sum of Diss. Constituents (mg/L):	814.71	Hardness as CaCO3:	307.9	T.P. Hydrocarbons (µg/L):	NR
Field Conductivity (µmhos):	1010	Field Alkalinity as CaCO3 (mg/L):	NR	PCP (µg/L):	NR
Lab Conductivity (µmhos):	1009	Alkalinity as CaCO3 (mg/L):	256.71	Phosphorus, TD (mg/L):	NR
Field pH:	7.42	Ryznar Stability Index:	6.819	Field Nitrate (mg/L):	NR
Lab pH:	7.6	Sodium Adsorption Ratio:	2.3806	Field Dissolved O2 (mg/L):	NR
Water Temp (°C):	19.8	Langlier Saturation Index:	0.390	Field Chloride (mg/L):	NR
Air Temp (°C):	NR	Nitrite (mg/L as N):	NR	Field Redox (mV):	NR
Nitrate + Nitrite (mg/L as N)	NR	Hydroxide (mg/L as OH):	NR	Lab, Dissolved Organic Carbon (mg/L):	NR
Total Kjeldahl Nitrogen (mg/L as N)	NR	Lab, Dissolved Inorganic Carbon (mg/L):	NR	Lab, Total Organic Carbon (mg/L):	NR
Total Nitrogen (mg/L as N)	NR	Acidity to 4.5 (mg/L CaCO3)	NR	Acidity to 8.3 (mg/L CaCO3)	NR
As(III) (ug/L)	NR	As(V) (ug/L)	NR	Total Susp Solids (mg/L)	NR

Additional Parameters

Phosphate Tot (As P) 0.100

Sample Condition:

Field Remarks: SMALL AMOUNT DISCOLORATION ON FILTER * SAMPLED BEFORE CHLORINATION * WELL NEAR WATER TANK * PUMPED TO SAME BUILDING AS #4 FOR CHLORINATION * REPORTED Q=60 GPM *

Lab Remarks:

Notes

Explanation: **mg/L** = milligrams per Liter; **µg/L** = micrograms per Liter; **ft** = feet; **NR** = No Reading in GWIC

Qualifiers: **A** = Hydride atomic absorption; **E** = Estimated due to interference; **H** = Exceeded holding time; **J** = Estimated quantity above detection limit but below reporting limit; **K** = Na+K combined; **N** = Spiked sample recovery not within control limits; **P** = Preserved sample; **S** = Method of standard additions; **U** = Undetected quantity below detection limit; * = Duplicate analysis not within control limits; ** = Sum of Dissolved Constituents is the sum of major cations (Na, Ca, K, Mg, Mn, Fe) and anions (HCO3, CO3, SO4, Cl, SiO2, NO3, F) in mg/L. Total Dissolved Solids is reported as equivalent weight of evaporation residue.

Drinking water limits are based on U.S. Environmental Protection Agency primary and secondary standards for public water supplies (**view their standards**). Stock water and irrigation water recommendations are from U.S. Department of Agriculture Natural Resources Conservation Service water-quality guidelines. The guidelines are general and may vary depending on specific applications. Irrigation guidelines are based on continuous irrigation.

Sample Id	GWIC Id	Sample Date	Site Name	Location	Site Type
1983Q0352	2547	5/24/1983 1:55:00 PM	CITY OF GERALDINE * WELL #2	21N 11E 01 CBDD	WELL

Constituent	This Sample	Drinking Water	Stock Water	Irrigation Water
Calcium (Ca)	76.000 mg/L	---	---	---
Magnesium (Mg)	28.700 mg/L	---	2,000 mg/L	---
Sodium (Na)	95.800 mg/L	---	2,000 mg/L	see SAR
Potassium (K)	21.400 mg/L	---	---	---
Iron (Fe)	0.540 mg/L	0.3 mg/L [smcl]	---	---
Manganese (Mn)	0.013 mg/L	0.05 mg/L [smcl]	---	2.0 mg/L
Silica (SiO2)	10.000 mg/L	---	---	---
Bicarbonate (HCO3)	313.000 mg/L	---	---	---
Carbonate (CO3)	0.000 mg/L	---	---	---
Chloride (Cl)	15.000 mg/L	250 mg/L [smcl]	1,500 mg/L	---
Sulfate (SO4)	250.000 mg/L	250 mg/L [smcl]	1,500 mg/L	[b]
Nitrate (NO3 as N)	0.020 mg/L	10 mg/L [mcl]	100 mg/L	---
Fluoride (F)	3.800 mg/L	4 mg/L [mcl]	2 mg/L	---
Ortho-Phosphate (as P)	NR mg/L	---	---	---
Aluminum (Al)	<30. ug/L	50-200 ug/L [smcl]	---	1,000 ug/L
Antimony (Sb)	NR ug/L	6 ug/L [mcl]	---	---
Arsenic (As)	0.200 ug/L	10 ug/L [mcl]	50 ug/L	100 ug/L
Barium (Ba)	NR ug/L	2,000 ug/L [mcl]	---	---
Boron (B)	230.000 ug/L	---	---	---
Cadmium (Cd)	<2. ug/L	5 ug/L [mcl]	10 ug/L	5 ug/L
Chromium (Cr)	<2. ug/L	100 ug/L [mcl]	1,000 ug/L	100 ug/L
Cobalt (Co)	NR ug/L	---	1,000 ug/L	50 ug/L
Copper (Cu)	6.000 ug/L	1,300 ug/L [mcl]	500 ug/L	200 ug/L
Lead (Pb)	<40. ug/L	15 ug/L [mcl]	50 ug/L	5,000 ug/L
Lithium (Li)	310.000 ug/L	---	---	2,500 ug/L
Molybdenum (Mo)	<20. ug/L	---	---	5 ug/L
Nickel (Ni)	<10. ug/L	---	---	200 ug/L
Phosphate (P)	NR ug/L	---	---	---
Selenium (Se)	<.1 ug/L	50 ug/L [mcl]	50 ug/L	20 ug/L
Silver (Ag)	<2. ug/L	100 ug/L [smcl]	---	---
Strontium (Sr)	1,220.000 ug/L	---	---	---
Thallium (Tl)	NR ug/L	2.0 ug/L	---	---
Titanium (Ti)	9.000 ug/L	---	---	---
Uranium (U)	NR ug/L	30 ug/L	---	---
Vanadium (V)	2.000 ug/L	---	---	---
Zinc (Zn)	<3. ug/L	5,000 ug/L [smcl]	24,000 ug/L	2,000 ug/L
Zirconium (Zr)	<4. ug/L	---	---	---

Key: **NR** = No reading in GWIC; **mg/L** = milligrams per Liter; **ug/L** = micrograms per Liter; **---** = Currently no standard for this constituent; **[b]** = High concentrations of sulfate may restrict calcium uptake by crops; **[c]** = Varies with crop, generally dissolved solids should be less than 2,000 mg/L (equivalent to specific conductance of about 2,000 to 3,000 micromhos/cm); **[d]** = Dependent upon other variables such as type of clay in soil and salt content of water. (See SAR); **[mcl]** = U.S. Environmental Protection Agency maximum contaminant level or action level: revised October 13, 1999; **[smcl]** = U.S. Environmental Protection Agency maximum contaminant level or action level: revised October 13, 1999. This standard is based on aesthetic quality of water (i.e. odor, color, etc.) and is not a health standard.

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site in State Library Digital Atlas
Plot this site in Google Maps
View field visits for this site
View water quality for this site
View scanned well log (7/13/2006 10:25:16 AM)

Site Name: CITY OF GERALDINE * WELL #3
GWIC Id: 2556

Section 1: Well Owner(s)

1) TOWN OF GERALDIN (MAIL)
N/A
GERALDINE MT 59446 [01/01/1960]

Section 2: Location

Township	Range	Section	Quarter Sections
21N	11E	1	SW¼ SW¼ SW¼ SE¼

County: CHOUTEAU
Geocode:

Latitude	Longitude	Geomethod	Datum
47.5986	-110.2675	MAP	NAD27

Ground Surface Altitude	Ground Surface Method	Datum	Date
3150			

Addition: **Block:** **Lot:**

Section 3: Proposed Use of Water

PUBLIC WATER SUPPLY (1)

Section 4: Type of Work

Drilling Method: ROTARY DRILL
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Friday, January 1, 1960

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
0	1756	4				GAL & BLK
1746	1872	3				BLACK

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
1746	1872	0			BLK PIPE SLOT

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
1965	1965	PACKER SET AT DEPTH	

Section 7: Well Test Data

Total Depth: 1965
Static Water Level: -323.4
Closed-in Pressure: 140 psi
Water Temperature:

Unknown Test Method *

Yield 65 gpm.
Pumping water level _ feet.
Time of recovery _ hours.
Recovery water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

217KOTN - KOOTENAI FORMATION

From	To	Description
0	105.5	SHALE WITH GRAVEL FIRST 5 FT THEN YELLOW CLAY OVR
105.5	110	GRAYISH SHALE
110	120	LAYERS OF BENTNTITE AND SANDY SHALE
120	220	BLUE SANDY SHALE
220	450	BLUE SANDY SHALE
450	515	HARD SANDY SHALE
515	565	HARD SANDSTONE
565	632	BLUE SHALE
632	687	HARD SANDSTONE AND SHALE
687	737	HARD SANDY SHALE
737	780	HARD SANDSTONE
780	820	SANDSTONE AND LAYERS OF SANDY SHALE SOME SOFT SHAL
820	882	HARD SANDSTONE WTIH LAYERS OF SANDY SHALE
882	902	SOFT BLUE SHALE (MUDDY)
902	940	LAYERS OF SANDY SHALE AND SANDSTONE

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: THATCHER DRILLING CO
License No: -
Date Completed: 1/1/1960

Site Name: CITY OF GERALDINE * WELL #3
GWIC Id: 2556
Additional Lithology Records

From	To	Description
940	1030	ALTERNATE HARD SANDSTONE AND SANDY SHALE
1030	1070	SANDY BLUE SHALE
1070	1135	SANDY SHALE WITH LAYERS OF SANDSTONE
1135	1195	SOFT SANDY BLUE SHALE AND SANDSTONE
1195	1198	HARD SANDSTONE
1198	1315	MUDDY BLUE SHALE
1315	1449	SANDY SHALE
1449	1510	ALTERNATE HARD SANDSTONE AND SANDY SHALE
1510	1515	SOFT SANDSTONE
1515	1600	ALTERNATE HARD SANDSTONE AND SANDY SHALE
1600	1610	RED SHALE
1610	1618	GRAY SANDY SHALE
1618	1623	HARD SANDSTONE AND SANDY SHALE
1623	1662	HARD SANDSTONE
1662	1667	GRAY AND RED SHALE
1667	1728	SANDSTONE
1728	1790	SANDY SHALE AND SANDSTONE
1790	1835	HARD SANDSTONE 1 GAL WATER/MIN
1835	1855	BLACK AND WHITE SAND APPROX 60 GPM
1855	1918	SOFT SANDSTONE
1918	1987	HARD SANDSTONE (WHITE)
1987	2015	HARD SANDSTONE
2015	2050	SANDSTONE GRAY WITH SMALL AMOUNT OF RED
2050	2080	HARD GRAY SANDSTONE
2080	2117	WHITE SANDSTONE
2117	2151	HARD ROUGH SANDSTONE
2151	2187	HARD ROUGH SANDSTONE
2187	2216	HARD SANDSTONE
2216	2217.5	SOFT SANDSTONE APPROX 20 GPM SULPHUR WATER

015 21N 11E 1DC Chouteau DCC

CODED

015

T 21 N R 11 E - 1DA DCC

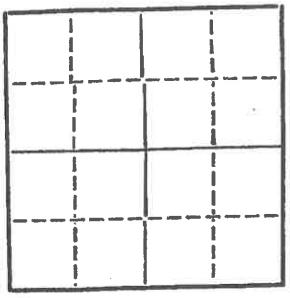
County Chouteau

All. 3150 2

MONTANA BUREAU OF MINES AND GEOLOGY

Butte, Montana

WATER WELL LOG (1)



Owner Geraldine, City Address Geraldine, Mont

Driller O.C. Thatcher Address Stanford, Mont

Date Started Nov. 19, 1959 Date Completed Jan. 1, 1960

Location: Sec. 1 T. 21 N R. 11 E ¼ sec. NW 1/4 of the SE 1/4

Type of well Drilled (Dug, driven, bored, or drilled) Equipment used Rotary (Churn drill, rotary, other)

Water use: Domestic ☐ Municipal ☒ Stock ☐ Irrigation ☐

Industrial ☐ Drainage ☐ Other:

Casing: 0 ft. to 1756 ft. Type Galvanized Size 4 1/2 " O.D.

Casing: 1746 ft. to 1872 ft. Type Black Size 3"

Casing: ft. to ft. Type Size

Perforated or Screened: Ft. 1746 to ft. 1872 Ft. to ft.

Type of screen or perforations Black Pipe Slot Perforations

Static Water level, for non-flowing well: feet.

Shut-in pressure, for flowing well: 140 lb./sq. in. on: Jan. 10, 1960 (date)

Pumping water level feet at gal. per min.

How tested:

Length of test

Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

Well Drilled to 2217 1/2 ft. Sulphur water at this Depth. Packer set at 1965 ft. cemented in with 20 sacks cement. Sulphur water shut off leaving a flow of aprox. 65 to 70 gal. a min . of good water.

LAB: 8390350
ART: 3150<10
GEO: 9N7K6TN
IND: 05101983

(over)

M:2556

Log of Well

Depth, feet From	Depth, feet To	Description of Material Drilled
0	105 1/2	Shale with gravel first 5 ft. then Yellow clay overburden
105 1/2	110	Grayish shale
110	120	Layers of bentonite and sandy shale
120	220	Blue sandy shale
220	450	Blue sandy shale
450	515	Hard sandy shale
515	565	Hard sandstone
565	632	Blue shale
632	687	Hard sandstone and shale
687	737	Hard sandy shale
737	780	Hard sand stone
780	820	Sandstone and layers of sandy shale some soft shale
820	882	Hard sandstone with layers of sandy shale
882	902	Soft blue shale (muddy)
902	940	Layers of sandy shale and sandstone
940	1030	Alternate hard sandstone and sandy shale
1030	1070	Sandy blue shale
1070	1135	Sandy shale with layers of sandstone
1135	1195	Soft sandy blue shale and sandstone
1195	1198	Hard sandstone
1198	1315	Muddy blue shale
1315	1449	Sandy shale
1449	1510	Alt. sandy shale and hard sandstone
1510	1515	Soft sandstone
1515	1600	Alt. hard sandstone and sandy shale
1600	1610	Red shale
1610	1618	Gray sandy shale
1618	1623	Hard sandstone and sandy shale
1623	1662	Hard sandstone
1662	1667	Gray and red shale
1667	1728	Sandstone
1728	1790	Sandy shale and sandstone
1790	1835	Hard sandstone 1 gal. water per min.
1835	1855	Black and white sand approx. 60 gal. water per min.
1855	1918	Soft sandstone
1918	1987	Hard sandstone (white)
1987	2015	Hard sandstone
2015	2080	Sandstone, gray with small amount of red
2080	2080 H	Hard gray sandstone
2080	2117	White sandstone
2117	2151	Hard rough sandstone
2151	2187	" " "
2187	2216	Hard Sandstone
2216	2217 1/2	Soft sandstone Approx. 20 gal per min. Sulphur water

Ground-Water Information Center Water Quality Report

Report Date: 5/4/2022

Site Name: CITY OF GERALDINE * WELL #3

Compare to Water Quality Standards

Location Information

Sample Id/Site Id:	1983Q0350 / 2556	Sample Date:	5/24/1983 2:45:00 PM
Location (TRS):	21N 11E 01 DCCC	Agency/Sampler:	MBMG / TED
Latitude/Longitude:	47° 35' 54" N 110° 16' 3" W	Field Number:	CITY #3
Datum:	NAD27	Lab Date:	8/11/1983
Altitude:	3150	Lab/Analyst:	MBMG / FNA
County/State:	CHOUTEAU / MT	Sample Method/Handling:	PUMPED / 3120
Site Type:	WELL	Procedure Type:	DISSOLVED
Geology:	217KOTN	Total Depth (ft):	1965
USGS 7.5' Quad:	GERALDINE	SWL-MP (ft):	NR
PWS Id:		Depth Water Enters (ft):	1746
Project:	GERALD		

Major Ion Results

	mg/L	meq/L		mg/L	meq/L
Calcium (Ca)	68.200	3.403	Bicarbonate (HCO3)	320.000	5.245
Magnesium (Mg)	25.100	2.065	Carbonate (CO3)	0.000	0.000
Sodium (Na)	99.600	4.333	Chloride (Cl)	18.400	0.519
Potassium (K)	16.800	0.430	Sulfate (SO4)	215.000	4.478
Iron (Fe)	0.490	0.018	Nitrate (as N)	<.02	0.000
Manganese (Mn)	0.011	0.000	Fluoride (F)	3.700	0.195
Silica (SiO2)	11.100		Orthophosphate (as P)	NR	0.000
Total Cations		10.296	**Total Anions**		10.437

Trace Element Results (µg/L)

Aluminum (Al):	<30.	Cesium (Cs):	NR	Molybdenum (Mo):	<20.	Strontium (Sr):	1,140.000
Antimony (Sb):	NR	Chromium (Cr):	<2.	Nickel (Ni):	<10.	Thallium (Tl):	NR
Arsenic (As):	0.200	Cobalt (Co):	NR	Niobium (Nb):	NR	Thorium (Th):	NR
Barium (Ba):	NR	Copper (Cu):	6.000	Neodymium (Nd):	NR	Tin (Sn):	NR
Beryllium (Be):	NR	Gallium (Ga):	NR	Palladium (Pd):	NR	Titanium (Ti):	14.000
Boron (B):	220.000	Lanthanum (La):	NR	Praseodymium (Pr):	NR	Tungsten (W):	NR
Bromide (Br):	NR	Lead (Pb):	<40.	Rubidium (Rb):	NR	Uranium (U):	NR
Cadmium (Cd):	<2.	Lithium (Li):	260.000	Silver (Ag):	<2.	Vanadium (V):	<1.
Cerium (Ce):	NR	Mercury (Hg):	NR	Selenium (Se):	<.1	Zinc (Zn):	<3.
						Zirconium (Zr):	<4.

Field Chemistry and Other Analytical Results

**Total Dissolved Solids (mg/L):	615.94	Field Hardness as CaCO3 (mg/L):	NR	Ammonia (mg/L):	NR
**Sum of Diss. Constituents (mg/L):	778.31	Hardness as CaCO3:	273.61	T.P. Hydrocarbons (µg/L):	NR
Field Conductivity (µmhos):	980	Field Alkalinity as CaCO3 (mg/L):	NR	PCP (µg/L):	NR
Lab Conductivity (µmhos):	961.9	Alkalinity as CaCO3 (mg/L):	262.45	Phosphorus, TD (mg/L):	NR
Field pH:	7.46	Ryznar Stability Index:	6.964	Field Nitrate (mg/L):	NR
Lab pH:	7.53	Sodium Adsorption Ratio:	2.6307	Field Dissolved O2 (mg/L):	NR
Water Temp (°C):	24	Langlier Saturation Index:	0.283	Field Chloride (mg/L):	NR
Air Temp (°C):	25.5	Nitrite (mg/L as N):	NR	Field Redox (mV):	NR
Nitrate + Nitrite (mg/L as N)	NR	Hydroxide (mg/L as OH):	NR	Lab, Dissolved Organic Carbon (mg/L):	NR
Total Kjeldahl Nitrogen (mg/L as N)	NR	Lab, Dissolved Inorganic Carbon (mg/L):	NR	Lab, Total Organic Carbon (mg/L):	NR
Total Nitrogen (mg/L as N)	NR	Acidity to 4.5 (mg/L CaCO3)	NR	Acidity to 8.3 (mg/L CaCO3)	NR
As(III) (ug/L)	NR	As(V) (ug/L)	NR	Total Susp Solids (mg/L)	NR

Additional Parameters

Phosphate Tot (As P) 0.200

Sample Condition: SMALL AMOUNT DISCOLORATION *

Field Remarks: WELL IS NORTH OF AIRPORT AND EAST OF WINDSOCK S END OF TOWN * 4.5 IN TOWN * 4.5 IN PIPE TO 1756 FT 3 IN BLACK PIPE 1746-1877 FT * REPORTED Q=65-70 GPM *

Lab Remarks:

Notes

Explanation: **mg/L** = milligrams per Liter; **µg/L** = micrograms per Liter; **ft** = feet; **NR** = No Reading in GWIC

Qualifiers: **A** = Hydride atomic absorption; **E** = Estimated due to interference; **H** = Exceeded holding time; **J** = Estimated quantity above detection limit but below reporting limit; **K** = Na+K combined; **N** = Spiked sample recovery not within control limits; **P** = Preserved sample; **S** = Method of standard additions; **U** = Undetected quantity below detection limit; * = Duplicate analysis not within control limits; ** = Sum of Dissolved Constituents is the sum of major cations (Na, Ca, K, Mg, Mn, Fe) and anions (HCO3, CO3, SO4, Cl, SiO2, NO3, F) in mg/L. Total Dissolved Solids is reported as equivalent weight of evaporation residue.

Drinking water limits are based on U.S. Environmental Protection Agency primary and secondary standards for public water supplies (**view their standards**). Stock water and irrigation water recommendations are from U.S. Department of Agriculture Natural Resources Conservation Service water-quality guidelines. The guidelines are general and may vary depending on specific applications. Irrigation guidelines are based on continuous irrigation.

Sample Id	GWIC Id	Sample Date	Site Name	Location	Site Type
1983Q0350	2556	5/24/1983 2:45:00 PM	CITY OF GERALDINE * WELL #3	21N 11E 01 DCCC	WELL

Constituent	This Sample	Drinking Water	Stock Water	Irrigation Water
Calcium (Ca)	68.200 mg/L	---	---	---
Magnesium (Mg)	25.100 mg/L	---	2,000 mg/L	---
Sodium (Na)	99.600 mg/L	---	2,000 mg/L	see SAR
Potassium (K)	16.800 mg/L	---	---	---
Iron (Fe)	0.490 mg/L	0.3 mg/L [smcl]	---	---
Manganese (Mn)	0.011 mg/L	0.05 mg/L [smcl]	---	2.0 mg/L
Silica (SiO2)	11.100 mg/L	---	---	---
Bicarbonate (HCO3)	320.000 mg/L	---	---	---
Carbonate (CO3)	0.000 mg/L	---	---	---
Chloride (Cl)	18.400 mg/L	250 mg/L [smcl]	1,500 mg/L	---
Sulfate (SO4)	215.000 mg/L	250 mg/L [smcl]	1,500 mg/L	[b]
Nitrate (NO3 as N)	<.02 mg/L	10 mg/L [mcl]	100 mg/L	---
Fluoride (F)	3.700 mg/L	4 mg/L [mcl]	2 mg/L	---
Ortho-Phosphate (as P)	NR mg/L	---	---	---
Aluminum (Al)	<30. ug/L	50-200 ug/L [smcl]	---	1,000 ug/L
Antimony (Sb)	NR ug/L	6 ug/L [mcl]	---	---
Arsenic (As)	0.200 ug/L	10 ug/L [mcl]	50 ug/L	100 ug/L
Barium (Ba)	NR ug/L	2,000 ug/L [mcl]	---	---
Boron (B)	220.000 ug/L	---	---	---
Cadmium (Cd)	<2. ug/L	5 ug/L [mcl]	10 ug/L	5 ug/L
Chromium (Cr)	<2. ug/L	100 ug/L [mcl]	1,000 ug/L	100 ug/L
Cobalt (Co)	NR ug/L	---	1,000 ug/L	50 ug/L
Copper (Cu)	6.000 ug/L	1,300 ug/L [mcl]	500 ug/L	200 ug/L
Lead (Pb)	<40. ug/L	15 ug/L [mcl]	50 ug/L	5,000 ug/L
Lithium (Li)	260.000 ug/L	---	---	2,500 ug/L
Molybdenum (Mo)	<20. ug/L	---	---	5 ug/L
Nickel (Ni)	<10. ug/L	---	---	200 ug/L
Phosphate (P)	NR ug/L	---	---	---
Selenium (Se)	<.1 ug/L	50 ug/L [mcl]	50 ug/L	20 ug/L
Silver (Ag)	<2. ug/L	100 ug/L [smcl]	---	---
Strontium (Sr)	1,140.000 ug/L	---	---	---
Thallium (Tl)	NR ug/L	2.0 ug/L	---	---
Titanium (Ti)	14.000 ug/L	---	---	---
Uranium (U)	NR ug/L	30 ug/L	---	---
Vanadium (V)	<1. ug/L	---	---	---
Zinc (Zn)	<3. ug/L	5,000 ug/L [smcl]	24,000 ug/L	2,000 ug/L
Zirconium (Zr)	<4. ug/L	---	---	---

Key: **NR** = No reading in GWIC; **mg/L** = milligrams per Liter; **ug/L** = micrograms per Liter; **---** = Currently no standard for this constituent; **[b]** = High concentrations of sulfate may restrict calcium uptake by crops; **[c]** = Varies with crop, generally dissolved solids should be less than 2,000 mg/L (equivalent to specific conductance of about 2,000 to 3,000 micromhos/cm); **[d]** = Dependent upon other variables such as type of clay in soil and salt content of water. (See SAR); **[mcl]** = U.S. Environmental Protection Agency maximum contaminant level or action level: revised October 13, 1999; **[smcl]** = U.S. Environmental Protection Agency maximum contaminant level or action level: revised October 13, 1999. This standard is based on aesthetic quality of water (i.e. odor, color, etc.) and is not a health standard.

APPENDIX S

EPA Cross Connection Manual

Public Health Significance of Cross-Connections

Public health officials have long been aware of the impact that cross-connections play as a threat to the public health. Because plumbing defects are so frequent and the opportunity for contaminants to invade the public drinking water through cross-connections are so general, enteric illnesses caused by drinking water may occur at most any location and at any time.

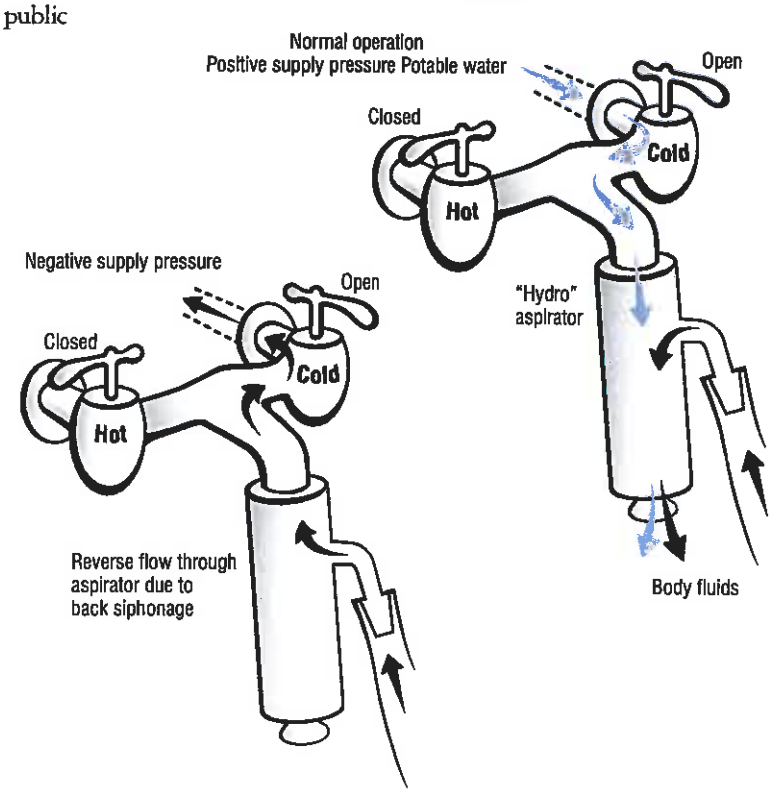
The following documented cases of cross-connection problems illustrate and emphasize how actual cross-connections have compromised the water quality and the public health.

Human Blood in the Water System

Health Department officials cut off the water supply to a funeral home located in a large southern city, after it was determined that human blood had contaminated the fresh water supply. City water and plumbing officials said that they did not think that the blood contamination had spread beyond the building, however, inspectors were sent into the neighborhood to check for possible contamination. The chief plumbing inspector had received a telephone call advising that blood was coming from drinking fountains within the building. Plumbing and county health department inspectors went to the scene and found evidence that the blood had been circulating in the water system within the building. They immediately ordered the building cut off from the water system at the meter.

Investigation revealed that the funeral home had been using a hydraulic aspirator to drain fluids from the bodies of human "remains" as part of the embalming process. The aspirator directly connected to the water supply system at a faucet outlet located on a sink in the "preparation" (embalming) room. Water flow through the aspirator created suction that was utilized to draw body fluids through a hose and needle attached to the suction side of the aspirator.

The contamination of the funeral home potable water supply was caused by a combination of low water pressure in conjunction with the simultaneous use of the aspirator. Instead of the body fluids flowing into the sanitary drain, they were drawn in the opposite direction—into the potable water supply of the funeral home!



Burned in the Shower

A resident of a small town in Alabama, jumped in the shower at 5 a.m. one morning in October, 1986, and when he got out his body was covered with tiny blisters. "The more I rubbed it, the worse it got," the 60 year old resident said. "It looked like someone took a blow torch and singed me."

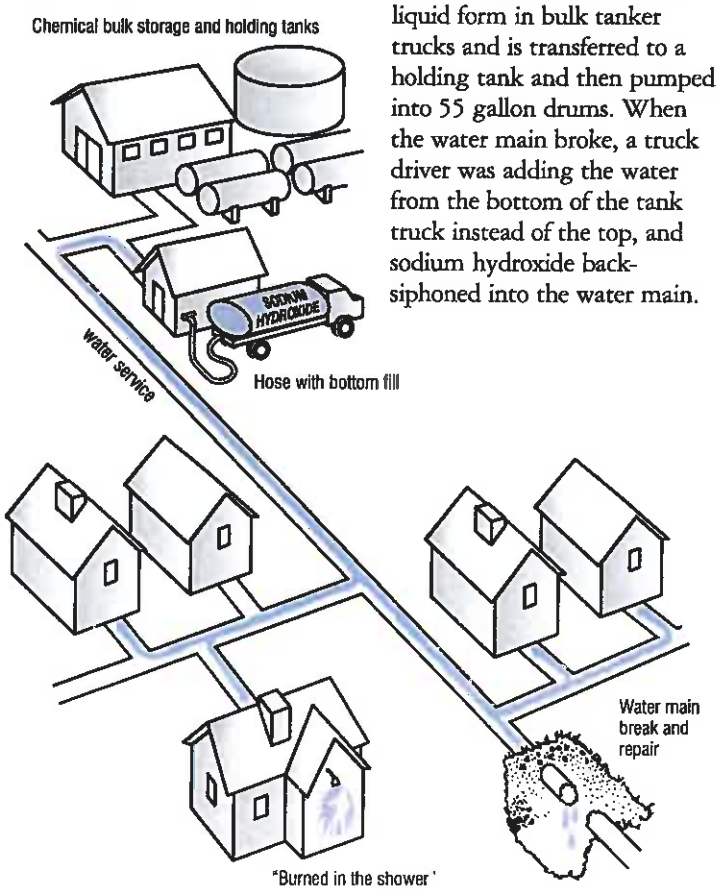
He and several other residents received medical treatment at the emergency room of the local hospital after the water system was contaminated with sodium hydroxide, a strong caustic solution.

Other residents claimed that, "It (the water) bubbled up and looked like Alka Seltzer. I stuck my hand under the faucet and some blisters came up."

One neighbor's head was covered with blisters after she washed her hair and others complained of burned throats or mouths after drinking the water.

The incident began after an 8-inch water main, that fed the town, broke and was repaired. While repairing the water main, one workman suffered leg burns from a chemical in the water and required medical treatment. Measurements of the ph of the water were as high as 13 in some sections of the pipe.

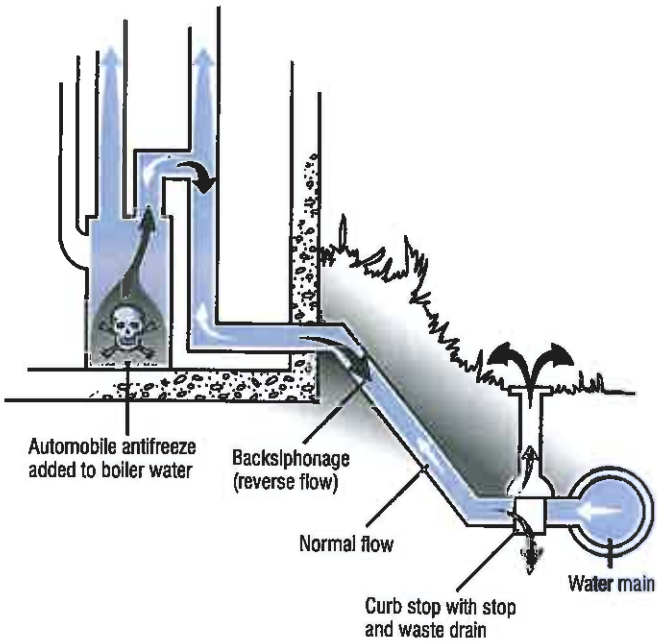
Investigation into the cause of the problem led to a possible source of the contamination from a nearby chemical company that distributes chemicals such as sodium hydroxide. The sodium hydroxide is brought to the plant in liquid form in bulk tanker trucks and is transferred to a holding tank and then pumped into 55 gallon drums. When the water main broke, a truck driver was adding the water from the bottom of the tank truck instead of the top, and sodium hydroxide back-siphoned into the water main.



"Burned in the shower"

Heating System Anti-Freeze into Potable Water

Bangor Maine Water Department employees discovered poisonous antifreeze in a homeowner's heating system and water supply in November, 1981. The incident occurred when they shut off the service line to the home to make repairs. With the flow of water to the house cut off, pressure in the lines in the house dropped and the anti-freeze, placed in the heating system to prevent freeze-up of an unused hot water heating system, drained out of the heating system into house water lines, and flowed out to the street. If it had not been noticed, it would have entered the homeowner's drinking water when the water pressure was restored.

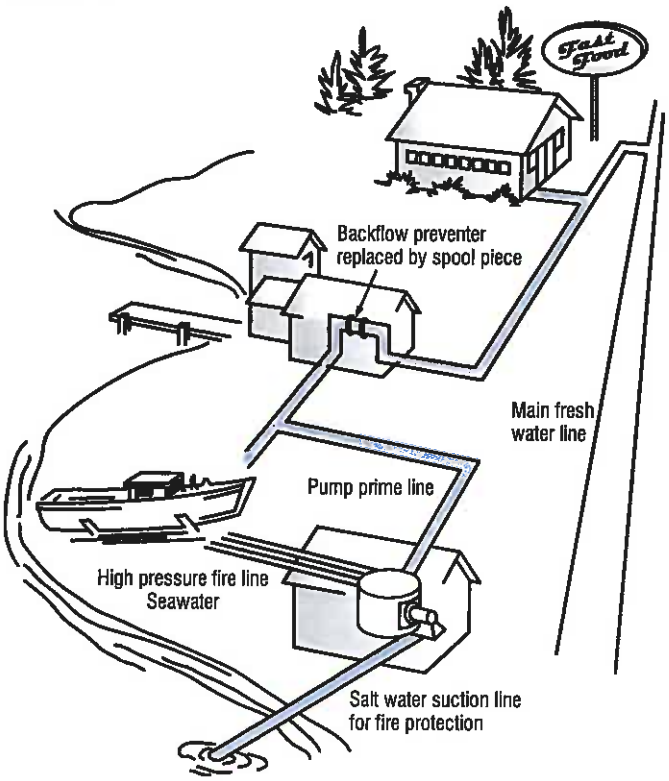


Salty Drinks

In January, 1981, a nationally known fast food restaurant located in southeastern United States, complained to the water department that all their soft drinks were being rejected by their customers as tasting "salty." This included soda fountain beverages, coffee, orange juice, etc. An investigation revealed that an adjacent water customer complained of salty water occurring simultaneously with the restaurant incident. This second complaint came from a water front ship repair facility that was also being served by the same water main lateral. The (investigation centered on the ship repair facility and revealed the following:

- A backflow preventer that had been installed on the service line to the shipyard had frozen and had been replaced with a spool piece sleeve.
- The shipyard fire protection system utilized sea water that was pumped by both electric and diesel driven pumps.
- The pumps were primed by potable city water.

With the potable priming line left open and the pumps maintaining pressure in the fire lines, raw salt water was pumped through the priming lines, through the spool sleeve piece, to the ship repair facility and the restaurant.



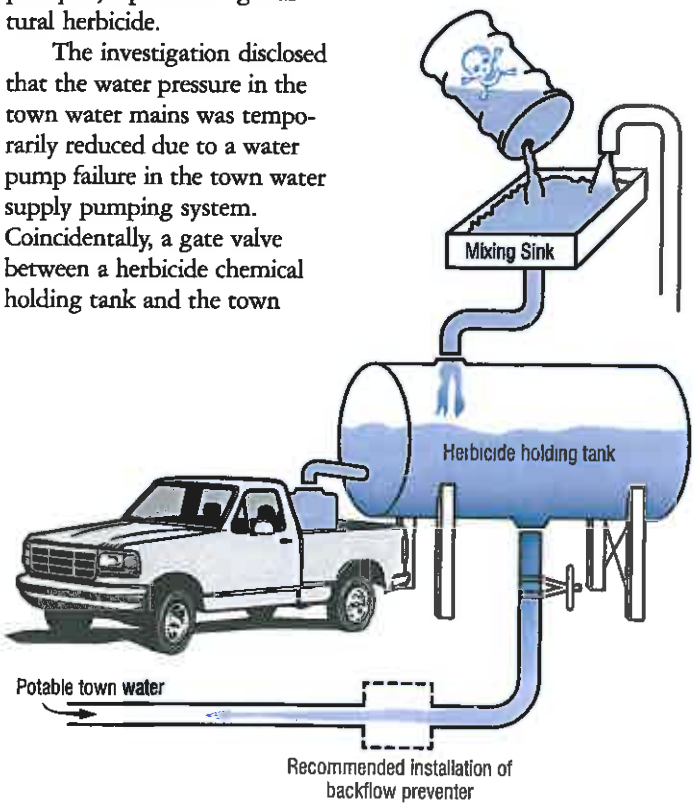
Paraquat in the Water System

"Yellow gushy stuff" poured from some of the faucets in a small town in Maryland, and the State of Maryland placed a ban on drinking the water supply. Residents were warned not to use the water for cooking, bathing, drinking or any other purpose except for flushing toilets.

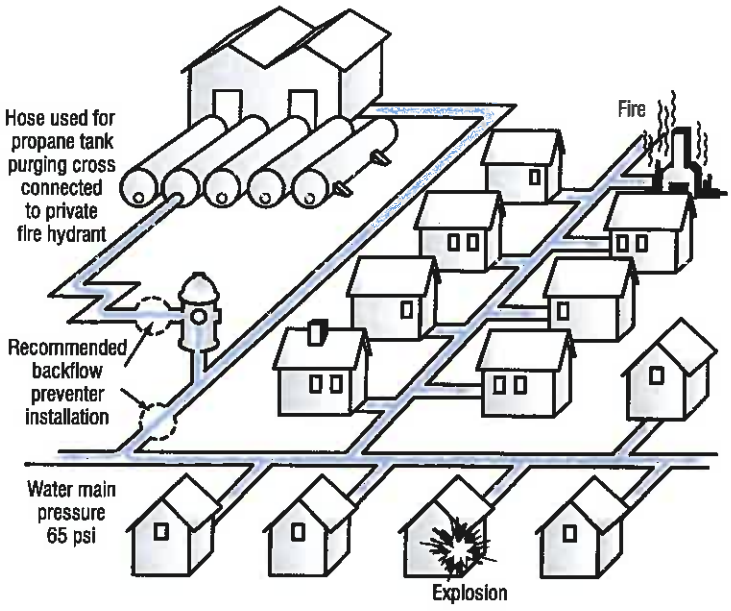
The incident drew widespread attention and made the local newspapers. In addition to being the lead story on the ABC news affiliate in Washington, D.C. and virtually all the Washington/Baltimore newspapers that evening. The news media contended that lethal pesticides may have contaminated the water supply and among the contaminants was paraquat, a powerful agricultural herbicide.

The investigation disclosed that the water pressure in the town water mains was temporarily reduced due to a water pump failure in the town water supply pumping system. Coincidentally, a gate valve between a herbicide chemical holding tank and the town water supply piping had been left open. A lethal cross-connection had been created that permitted the herbicide to flow into the potable water supply system. Upon restoration of water pressure, the herbicides flowed into the many faucets and outlets on the town water distribution system.

This cross-connection created a needless and costly event that fortunately did not result in serious illness or loss of life. Door-to-door public notification, extensive flushing, water sample analysis, emergency arrangements to provide temporary potable water from tanker trucks, all contributed to an expensive and unnecessary town burden.



Propane Gas in the Water Mains



Hundreds of people were evacuated from their homes and businesses on an August afternoon in a town in Connecticut in 1982 as a result of propane entering the city water supply system. Fires were reported in two homes and the town water supply was contaminated. One five-room residence was gutted by a blaze resulting from propane gas "bubbling and hissing" from a bathroom toilet and in another home a washing machine explosion blew a woman against a wall. Residents throughout the area reported hissing, bubbling noises, coming from washing machines, sinks and toilets. Faucets sputtered out small streams of water mixed with gas and residents in the area were asked to evacuate their homes.

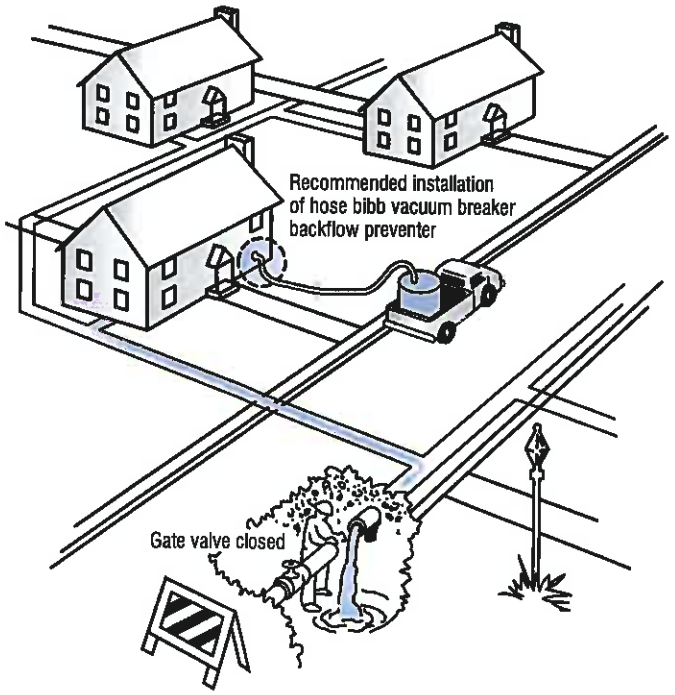
This near-disaster occurred in one, 30,000 gallon capacity liquid propane tank when the gas company initiated immediate repair procedures. To start the repair, the tank was "purged" of residual propane by using water from one of two private fire hydrants located on the property. Water purging is the preferred method of purging over the use of carbon dioxide since it is more positive and will float out any sludge as well as any gas vapors. The "purging" consisted of hooking up a hose to one of the private fire hydrants located on the property and initiating flushing procedures.

Since the vapor pressure of the propane residual in the tank was 85 to 90 psi., and the water pressure was only 65 to 70 psi., propane gas backpressure backflowed into the water main. It was estimated that the gas flowed into the water mains for about 20 minutes and that about 2,000 cubic feet of gas was involved. This was approximately enough gas to fill one mile of an 8-inch water main.

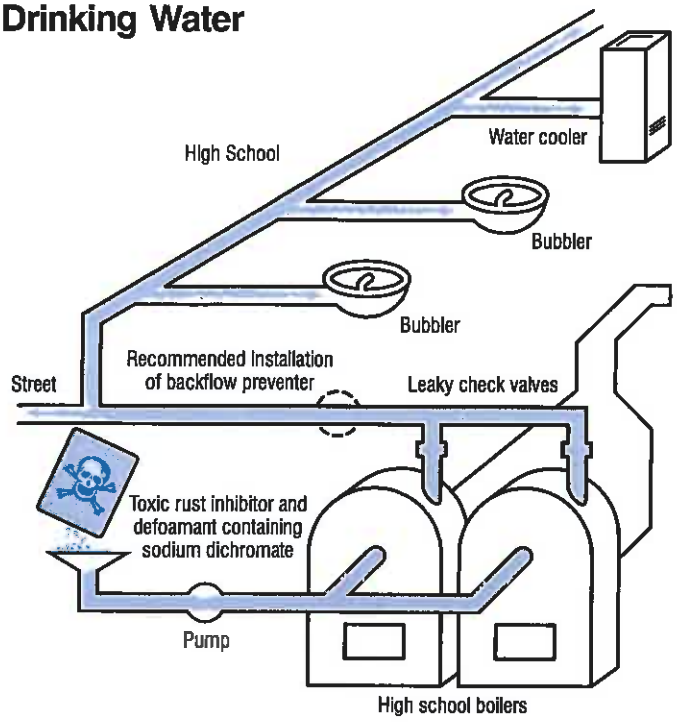
Chlordane and Heptachlor at the Housing Authority

The services to seventy five apartments housing approximately three hundred people were contaminated with chlordane and heptachlor in a city in Pennsylvania, in December, 1980. The insecticides entered the water supply system while an exterminating company was applying them as a preventative measure against termites. While the pesticide contractor was mixing the chemicals in a tank truck with water from a garden hose coming from one of the apartments, a workman was cutting into a 6-inch main line to install a gate valve. The end of the garden hose was submerged in the tank containing the pesticides, and at the same time, the water to the area was shut off and the lines being drained prior to the installation of the gate valve. When the workman cut the 6-inch line, water started to drain out of the cut, thereby setting up a backsiphonage condition. As a result, the chemicals were siphoned out of the truck, through the garden hose, and into the system, contaminating the seventy five apartments.

Repeated efforts to clean and flush the lines were not satisfactory and it was finally decided to replace the water line and all the plumbing that was affected. There were no reports of illness, but residents of the housing authority were told not to use any tap water for any purpose and they were given water that was trucked into the area by volunteer fire department personnel. They were without their normal water supply for 27 days.



Boiler Water Enters High School Drinking Water



A high school in New Mexico, was closed for several days in June 1984 when a home economics teacher noticed the water in the potable system was yellow. City chemists determined that samples taken contained levels of chromium as high as 700 parts per million, "astronomically higher than the accepted levels of .05 parts per million." The head chemist said that it was miraculous that no one was seriously injured or killed by the high levels of chromium. The chemical was identified as sodium dichromate, a toxic form of chromium used in heating system boilers to inhibit corrosion of the metal parts.

No students or faculty were known to have consumed any of the water; however, area physicians and hospitals advised that if anyone had consumed those high levels of chromium, the symptoms would be nausea, diarrhea, and burning of the mouth and throat. Fortunately, the home economics teacher, who first saw the discolored water before school started, immediately covered all water fountains with towels so that no one would drink the water.

Investigation disclosed that chromium used in the heating system boilers to inhibit corrosion of metal parts entered the potable water supply system as a result of backflow through leaking check valves on the boiler feed lines.

Pesticide in Drinking Water

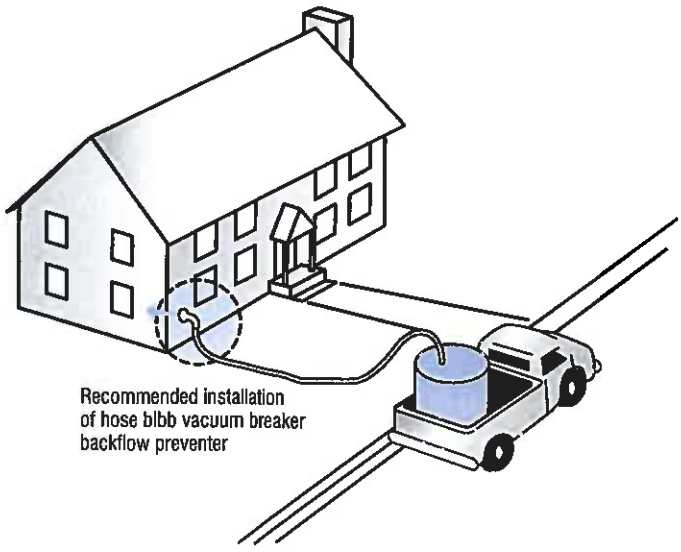
A pesticide contaminated a North Carolina water system in April, 1986, prompting the town to warn residents of 23 households not to drink the water. The residents in the affected area were supplied drinking water from a tank truck parked in the parking lot of a downtown office building until the condition could be cleared up. Residents complained of foul smelling water but there were no reports of illness from ingesting the water that had been contaminated with a pesticide containing chlordane and heptachlor.

Authorities stated that the problem occurred when a water main broke at the same time that a pest control service was filling a pesticide truck with water. The reduction in pressure caused the pesticide from inside the tank to be sucked into the building's water main. The pesticide contaminated the potable water supply of the office building and neighborhood area.

Car Wash Water in the Water Main Street

This car wash cross-connection and back-pressure incident, which occurred in February, 1979, in the state of Washington, resulted in backflow chemical contamination of approximately 100 square blocks of water mains. Prompt response by the water department prevented a potentially hazardous water quality degradation problem without a recorded case of illness.

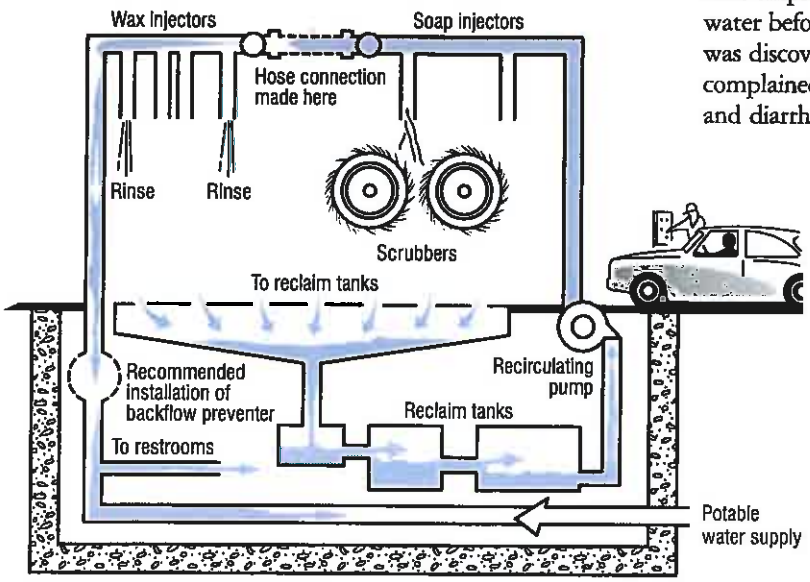
Numerous complaints of grey-green and "slippery" water were received by the water department coming from the same general area of town. A sample brought to the water department by a customer confirmed the reported problem and preliminary analysis indicated contamination with what appeared to be a detergent solution. While emergency crews initiated flushing operations, further investigation within the contaminated area signaled the problem was probably caused by a car wash,



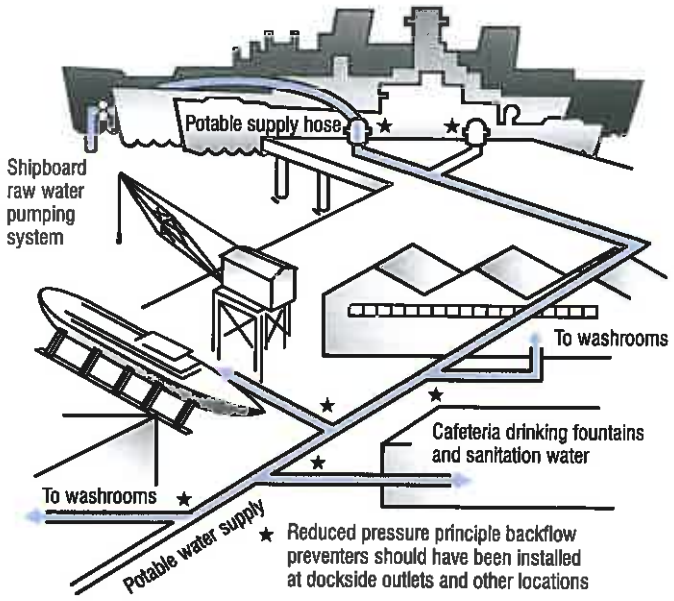
or laundry, based upon the soapy nature of the contaminant. The source was quickly narrowed down to a car wash and the proprietor was extremely cooperative in admitting to the problem and explaining how it had occurred. The circumstances leading up to the incident were as follows:

- On Saturday, February 10, 1979, a high pressure pump broke down at the car wash. This pump recycled reclaimed wash and rinse water and pumped it to the initial scrubbers of the car wash. No potable plumbing connection is normally made to the car wash's scrubber system.
- After the pump broke down, the car wash owner was able to continue operation by connecting a 2-inch hose section temporarily between the potable supply within the car wash, and the scrubber cycle piping.
- On Monday, February 12, 1979, the owner repaired the high pressure pump and resumed normal car wash operations. The 2-inch hose connection (cross-connection) was not removed!
- Because of the cross-connection, the newly repaired high pressure pump promptly pumped a large quantity of the reclaimed wash/rinse water out of the car wash and into a 12-inch water main in the street. This in turn was delivered to the many residences and commercial establishments connected to the water main.

Within 24 hours of the incident, the owner of the car wash had installed a 2-inch reduced pressure principle backflow preventer on his water service and all car wash establishments in Seattle that used a wash water reclaim system were notified of the state requirement for backflow prevention.



Shipyard Backflow Contamination



Water fountains at an East Coast Shipyard were posted "No Drinking" as workers flushed the water lines to eliminate raw river water that had entered the shipyard following contamination from incorrectly connected water lines between ships at the pier and the shipyard. Some third shift employees drank the water before the pollution was discovered and later complained of stomach cramps and diarrhea.

The cause of the problem was a direct cross-connection between the on-board salt water fire protection water system and the fresh water connected to one of the ships at the dock. While the shipyard had been aware of the need for backflow protection at the dockside tie up area, the device had not been delivered and installed prior to the time of the incident. As a result, the salt water on-board fire protection system, being at a greater pressure than the potable supply, forced the salt water, through backpressure, into the shipyard potable supply.

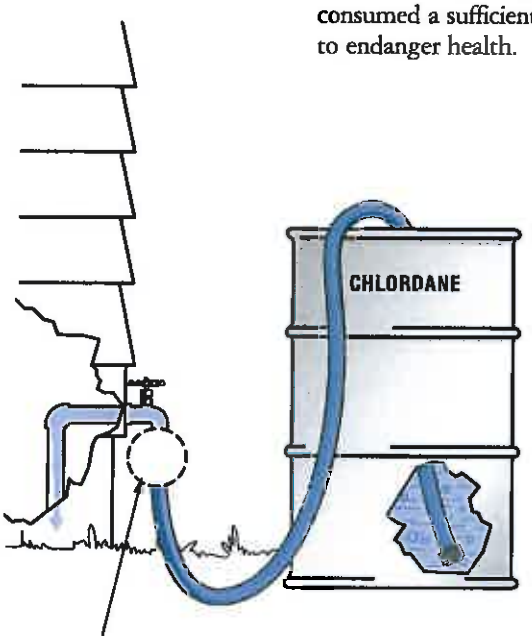
Fortunately, a small demand for potable water at the time of the incident prevented widespread pollution in the shipyard and the surrounding areas.

Chlordane in the Water Main

In October, 1979, approximately three gallons of chlordane, a highly toxic insecticide, was sucked back (back-siphoned) into the water system of a residential area of a good sized eastern city. Residents complained that the water "looked milky, felt greasy, foamed and smelled," and as one woman put it, "It was similar to a combination of kerosene and Black Flag pesticide."

The problem developed while water department personnel were repairing a water main. A professional exterminator, meanwhile, was treating a nearby home with chlordane for termite elimination. The workman for the exterminator company left one end of a garden hose that was connected to an outside hose bibb tap in a barrel of diluted pesticide. During the water service interruption, the chlordane solution was back-siphoned from the barrel through the house and into the water mains.

Following numerous complaints, the water department undertook an extensive program of flushing of the water mains and hand delivered letters telling residents to flush their lines for four hours before using the water. Until the water lines were clear of the contaminant, water was hand-hauled into homes, and people went out of their homes for showers, meals and every other activity involving potable water. Fortunately, due to the obvious bad taste, odor and color of the contaminated water, no one consumed a sufficient quantity to endanger health.



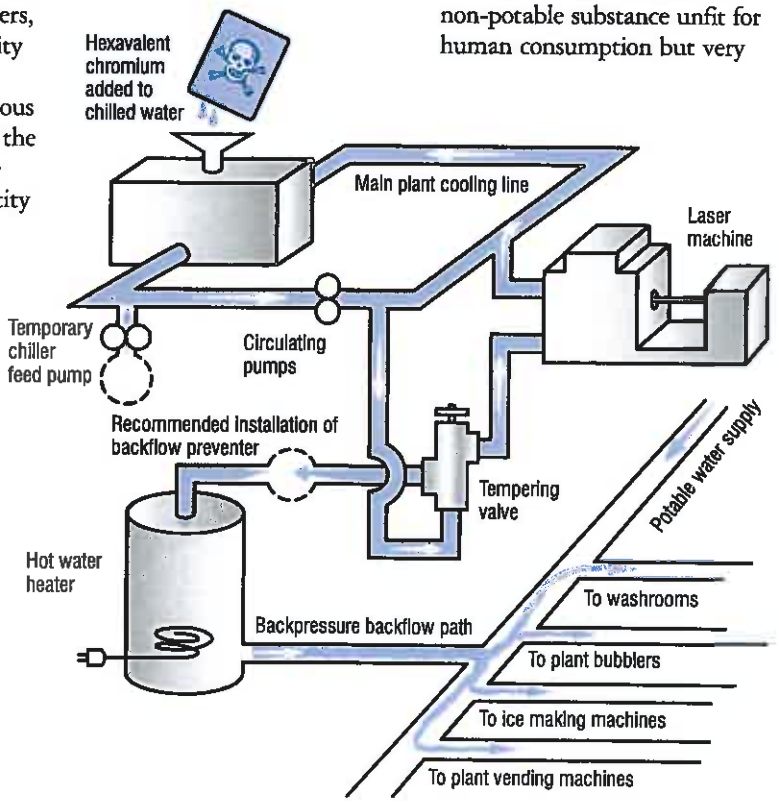
Recommended installation of hose bibb vacuum breaker backflow preventer

Hexavalent Chromium in Drinking Water

In July, 1982, a well meaning maintenance mechanic, in attempting to correct a fogging lens in an overcooled laser machine, installed a tempering valve in the laser cooling line, and inadvertently set the stage for a backpressure backflow incident that resulted in hexavalent chromium contaminating the potable water of a large electronic manufacturing company in Massachusetts employing 9,000 people. Quantities of 50 parts per million hexavalent chromium were found in the drinking water which is sufficient to cause severe vomiting, diarrhea, and intestinal sickness. Maintenance crews working during the plant shutdown were able to eliminate the cross-connection and thoroughly flush the potable water system, thereby preventing a serious health hazard from occurring.

The incident occurred as follows:

- Laser machine lenses were kept cool by circulating chilled water that came from a large refrigeration chiller. The water used in the chiller was treated with hexavalent chromium, a chemical additive used as an anticorrosive agent and an algicide. As a result, the chilled water presented a toxic, non-potable substance unfit for human consumption but very



acceptable for industrial process water. No health hazard was present as long as the piping was identified, kept separate from potable drinking water lines, and not cross-connected to the potable water supply.

• A maintenance mechanic correctly reasoned that by adding a tempering valve to the chilled water line, he could heat up the water a bit and eliminate fogging of the laser lenses resulting from the chilled water being too cold. The problem with the installation of the tempering valve was that a direct cross-connection had been inadvertently made between the toxic chilled water and the potable drinking water line!

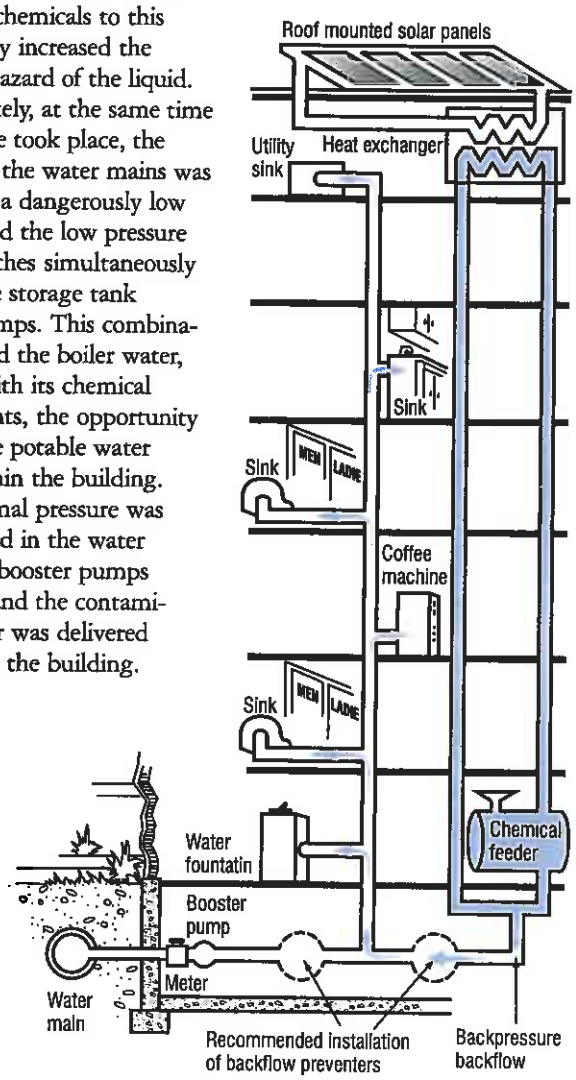
• Periodic maintenance to the chiller system was performed in the summer, requiring that an alternate chiller feed pump be temporarily installed. This replacement pump had an outlet pressure of 150 psi, and promptly established an imbalance of pressure at the tempering valve, thereby overpressurizing the 60 psi, potable supply. Backpressure backflow resulted and pushed the toxic chilled water from the water heater and then into the plant's potable drinking water supply. Yellowish green water started pouring out of the drinking fountains, the washroom, and all potable outlets.

Employee Health Problems due to Cross-Connection

A cross-connection incident occurring in a modern seven-story office building located in a large city in New Hampshire, in March, 1980, resulted in numerous cases of nausea, diarrhea, loss of time and employee complaints as to the poor quality of the water.

On Saturday, March 1, 1980, a large fire occurred two blocks away from a seven-story office building in this large New Hampshire city. On Sunday, March 2, 1980, the maintenance crew of the office building arrived to perform the weekly cleaning, and after drinking the water from the drinking fountains, and sampling the coffee from the coffee machines, noticed that the water smelled rubbery and had a strong bitter taste. Upon notifying the Manchester Water Company, water samples were taken and preliminary analysis disclosed that the contaminants found were not the typical contaminants associated with fire line disturbances. Investigating teams suspected that either the nearby fire could have siphoned contaminants from adjacent buildings into the water mains, or the contamination could have been caused by a plumbing deficiency occurring within the seven story building itself.

Water ph levels of the building water indicated that an injection of chemicals had probably taken place within the seven-story building. Tracing of the water lines within the building pinpointed a 10,000 gallon hot-water storage tank that was used for heat storage in the solar heating system. It did not have any backflow protection on the make-up supply line! As the storage tank pressure increased above the supply pressure, as a result of thermal expansion, the potential for backpressure backflow was present. Normally, this would not occur because a boost pump in the supply line would keep the supply pressure to the storage tank always greater than the highest tank pressure. The addition of rust inhibiting chemicals to this tank greatly increased the degree of hazard of the liquid. Unfortunately, at the same time that the fire took place, the pressure in the water mains was reduced to a dangerously low pressure and the low pressure cutoff switches simultaneously shut off the storage tank booster pumps. This combination allowed the boiler water, together with its chemical contaminants, the opportunity to enter the potable water supply within the building. When normal pressure was reestablished in the water mains, the booster pumps kicked in, and the contaminated water was delivered throughout the building.



Dialysis Machine Contamination

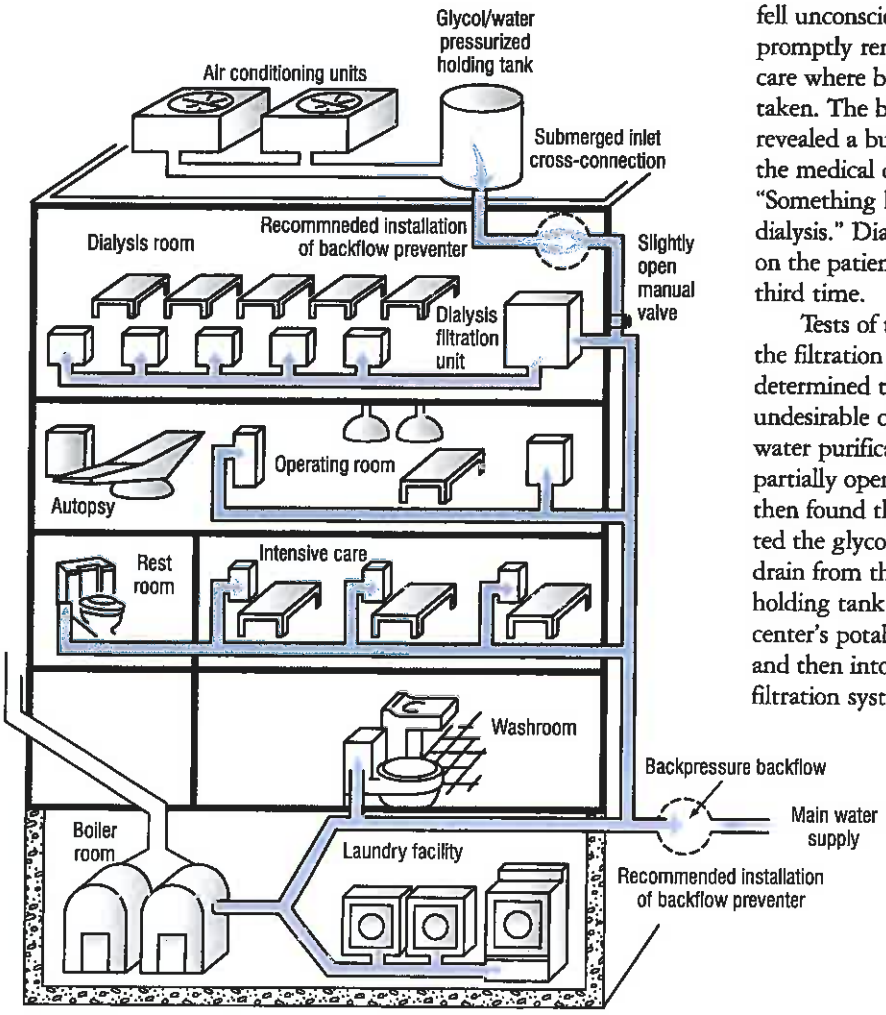
Ethylene glycol, an anti-freeze additive to air conditioning cooling tower water, inadvertently entered the potable water supply system in a medical center in Illinois in September, 1982, and two of six dialysis patients succumbed as a direct or indirect result of the contamination.

The glycol was added to the air conditioning water, and the glycol/water mix was stored in a holding tank that was an integral part of the medical center's air conditioning cooling system. Pressurized make-up water to the holding tank was supplied by a medical center potable supply line and fed through a manually operated control valve. With this valve open, or partially open, potable make-up water flowed slowly into the glycol/water mixture in the holding tank until it filled to the point where the pressure in the closed tank equaled the pressure in the potable water supply feed line. As long as the potable feed line pressure was at least equal to, or greater than, the holding tank pressure, no backflow could occur. The stage was set for disaster, however.

It was theorized that someone in the medical center flushed a toilet or turned on a faucet, which in turn dropped the pressure in the potable supply line to the air conditioning holding tank. Since the manually operated fill valve was partially open, this allowed the glycol/water mixture to enter the medical center potable pipelines and flow into the dialysis equipment. The dialysis filtration system takes out trace chemicals such as those used in the city water treatment plant, but the system could not handle the heavy load of chemicals that it was suddenly subjected to.

The effect upon the dialysis patients was dramatic: patients became drowsy, confused and fell unconscious, and were promptly removed to intensive care where blood samples were taken. The blood samples revealed a build-up of acid and the medical director stated that, "Something has happened in dialysis." Dialysis was repeated on the patients a second and third time.

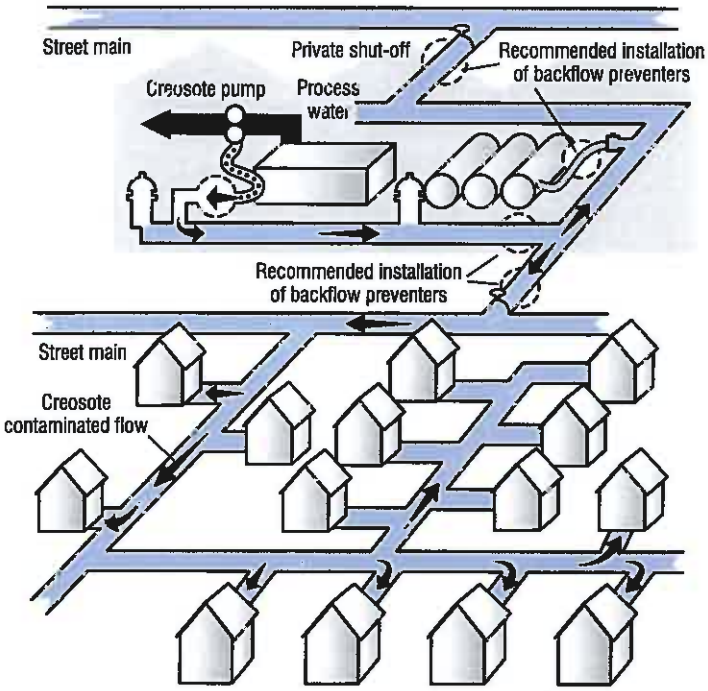
Tests of the water supply to the filtration system quickly determined the presence of "an undesirable chemical in the water purification system." The partially open fill valve was then found that it had permitted the glycol water mix to drain from the air conditioning holding tank into the medical center's potable supply lines and then into the dialysis filtration system equipment.



Creosote in the Water Mains

Creosote entered the water distribution system of a southeastern county water authority in Georgia, in November, 1984, as a result of cross-connection between a ¾-inch hose that was being used as a priming line between a fire service connection and the suction side of a creosote pump. The hose continually supplied water to the pump to ensure the pump was primed at all times. However, while repairs were being made to a private fire hydrant, the creosote back-siphoned into the water mains and contaminated a section of the water distribution system.

Detailed investigation of the cause of the incident disclosed that the wood preservative company, as part of their operation, pumped creosote from collective pits to other parts of their operation. The creosote pump would automatically shut off when the creosote in the pit was lowered to a predetermined level. After the creosote returned to a higher level, the pump would restart. This pump would lose its prime quite often prior to the pit refilling, and to prevent the loss of prime, the wood preservative company would connect a hose from a ¾-inch hose bibb, located on the fire service line, to the suction side of the pump. The hose bibb remained open at all times in an effort to continuously keep the pump primed.



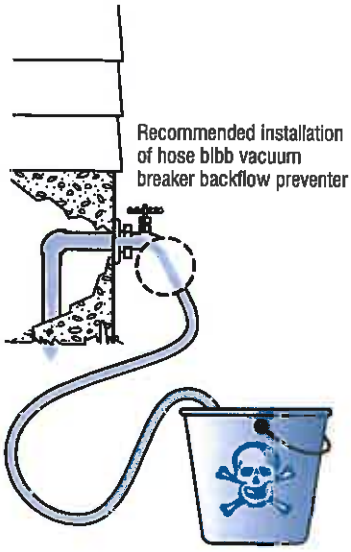
Repairs were necessary to one of the private fire hydrants on the wood preservative company property, necessitating the shutting down of one of two service lines and removal of the damaged fire hydrant for repair. Since the hydrant was at a significantly lower level than the creosote pit, the creosote back-siphoned through a ¾-inch pump priming hose connecting the creosote pit to the fire service line.

After the repairs were made to the hydrant, and the water service restored, the creosote, now in the fire lines, was forced into the main water distribution system.

Kool-Aid Laced With Chlordane

In August, 1978, a professional exterminator was treating a church located in a small town in South Carolina, for termite and pest control. The highly toxic insecticide chlordane was being mixed with water in small buckets, and garden hoses were left submerged in the buckets while the mixing was being accomplished. At the same time, water department personnel came by to disconnect the parsonage's water line from the church to install a separate water meter for the parsonage. In the process, the water was shut off in the area of the church building. Since the church was located on a steep hill, and as the remaining water in the lines was used by residents in the area, the church was among the first places to experience a negative pressure.

The chlordane was quickly siphoned into the water lines within the church and became mixed with the Kool-Aid being prepared by women for the vacation bible school. Approximately a dozen children and three adults experienced dizziness and nausea. Fortunately, none required hospitalization or medical attention.



APPENDIX T

Geraldine New Tank Options and Information

Geraldine Water Tank Considerations

(Discussed at Town Council/Work Session 4/12/22)

Reasons for needing new tank, problems, grant app considerations:

(Underwater video inspection did not show major deficiencies for in Town tank)

- Age of tank could be concern. Having a new up to date tank for the foreseeable future is a priority. Existing tank 65 years old.
- Cost to recoat the tank with epoxy coating is a concern. Epoxy coating can be $200k-$300k to do. (Fort Benton looked at recoating all of their 3 tanks and it was over $1 mil.)
- Length of pipe (7 miles of 6") and intermediate high usage rural connections (Hawarden and North Geraldine) between the existing out of town 200,000 gal concrete tank and the Town is a concern.
    - Hawarden and North Geraldine can use and average of 20% of the total system capacity and higher during the summer high agricultural usage and when fires are the greatest concern.
- Hydraulic Pressures. Static pressures from tank are in the 40-45 psi range. Like to see 60 psi. There is also a low pressure zone in town.
- Town desires to have sufficient fire flow and reserve capacity at the Town core without having to rely on the other tank and miles of transmission piping.
- Unless a tank is in a failing state or deficient, think that pipe replacement would be more competitive.
    - However, consider the funding climate.

Questions:

- Does current tank run low now?
- Is there an issue with available flows at hydrants? (This is related to piping issues)
- What are the greatest concerns? Having reliable storage for foreseeable future?
- Does the existing tank leak?
- Any input from the local fire authority. Fire Chief letter?
    - What can the town's fire equipment realistically handle for pumping? That is the max limit.

Capacity:

For systems providing fire capacity, DEQ standards require a minimum storage capacity equal to average day flow plus fire demand.

- For Geraldine:
    - Future average day (potable demand) for entire system = 89,000 gallons.
    - Recommended fire flow is 1,000 gpm for 2 hours = 120,000 gallons.
    - **For estimating purposes, assume a new tank at 210,000 gallons**

Is the issue the tank or the piping?:

- There are multiple areas of Town with less than 1,000 gpm fire flow availability and several areas with less than 500 gpm.
- Low fire flow availability within the Town can be attributed to small diameter water lines (4-inch and less) coupled with aging water lines with reduced C factors.
- Hydraulic Model shows fire flows can get up to 2,000 gpm with replacing all 4" w/ 6" piping.

Tank Alternatives Information

Steel Tanks (Epoxy Coated or Glass Lined)

Typically, the least costly method of tank construction in the 200,000- to 500,000-gallon range is a ground level steel tank. However, operation and maintenance costs for steel tanks can be considerable with welded and epoxy coated bolted steel tanks, which require periodic recoating to extend the service life. Relatively recent improvements to the coatings on these tanks, including glass-lined interior and/or exterior coatings reduce the cost of maintenance. Glass-lined bolted steel tanks have a typical design life of around 40 years and do not require recoating. The initial tank coating is applied in a controlled environment at the factory. The glass coating forms a hard, chemically inert layer that protects the steel surface from corrosion. Glass-lined steel tanks can be expanded if needed in the future and generally have lower life cycle costs than other types of steel tanks. In glass-lined tanks, vertical and horizontal seams must be resealed every 20 years. Use of the glass-fused lining for the Choteau tank would eliminate recoating requirements.

One concern with glass lined tanks is potential damage to the glass surface during shipping and installation. The glass lining is fused to the steel at very high temperatures in a factory, a process that cannot be replicated in the field. If the glass lining is compromised, it must be repaired with a putty mastic that can peel off over time. Additionally, it is not uncommon for bolted tanks to leak and the operator often must spend time each year managing those leaks. Lastly, freezing can be a problem for steel tanks, but can usually be controlled through design, mixing and operations.

Buried Concrete Tanks

Buried concrete tanks offer many advantages over steel tanks, including their 100-year design life, protection from freezing, no need for painting, low visibility, and very little, if any, exposure for vandalism. The only anticipated operation and maintenance would include regular tank cleaning and an inspection every few years by a dive team to examine the tank for cracks and periodic removal of sediment buildup.

The design of buried concrete storage tanks is based on the hoop stresses realized around the circumference of the tank. Generally, the actual strength of the tank is determined by the steel within the walls, as concrete works well under compression while steel works well under tension. Concrete tanks typically use pre-tensioned (or pre-stressed) steel wires to wrap the tank and provide this strength.

Elevated Steel Tanks

- Welded Multileg or Pedisphere Type Tank Options
- Rule of thumb has been that elevated tanks are not more cost effective than a on-grade tank if the on-grade option is less than a mile from Town.
- Multi-leg Tanks are more costly (O&M) to maintain that pedisphere but pedisphere is less capital cost.
- Shelby is looking at a new $250k elevated pedisphere tank. Estimated project cost over $3.3 mil

Geraldine site specific tank design criteria and considerations:

- Need to match existing hydraulic grade line (HGL)
- Ground level tank options would need to be on a hill (about 100' HGL higher)
- If on hillside on edge of Town, then need to consider transmission extension to tank and distribution line from the tank. (3,000 feet each way at closest point).
- Would need to consider land acquisitions and easements
- See Google Earth Markups, below and discussion
- Need to consider Telemetry and Controls
- Electrical to site, single phase for controls
- Access road to tank
- Recent bid tabs to be considered for costs
- Consider recent inflation and costs
- GWE usually bid projects both ways: on-grade glass line steel and on-grade concrete
- Foundation costs can vary depending on the soil types. Detailed geotechnical evaluation required with bore holes.

- Steel (Epoxy Coated, Glass Lined). Can be at grade or elevated.
    - Elevated tanks do not usually pencil out in for cost for small volume tanks
- Concrete Tanks are the least O&M in the long run
- Preliminary Total Project Cost Estimate (210k gal. buried concrete) = $2.8 million
    - Cascade bid tab on 200,000 gal concrete tank (2020 was $1.1 million in const. alone consider inflation and also needing to add piping to/from tank, power, roads, etc.)


Contour, where an at grade tank needs to be for HGL
Shortest path to existing distribution
Existing Geraldine Elevated Steel Tank
Conoco
Geraldine
Geraldine
Main St
St Margarets Catholic Church
Shonkin Rd
Geraldine Ave W

APPENDIX U

PRV Options and Proposal

P.O. BOX 1404 RATHDRUM, ID 83858 PHONE: 208-691-7430
EMAIL:MARTY@PRESTIGEWWT.COM

TO: GREAT WEST ENGINEERS
ATTN: MATTHEW MUDD
PROJECT: GERALDINE MT.

QUOTED BY: MARTY WALKER
QUOTE DATE: 04-06-2022
SHIP VIA: TRUCK
F.O.B. Job Site 8 to 10 weeks

****QUOTATION PRICES ARE FIRM FOR 30 DAYS FROM QUOTED DATE****

THIS QUOTE IS BASED OFF A DRAWING OF PWWT 6" X 2" STANDARD SPEC STATION
THIS IS A FULLY ASSEMBLED CONTROL VALVE VAULT STATION.

1EA – 6" X 2" PACKAGED P.R.V. VALVE STATION PER DRAWING **$ 58,000.00 NET**
1EA – FREIGHT TO BE DETERMINED AT TIME OF DELIVERY

1. VAULT SIZE IS 11' L X 7'W (O.D. DIMENSIONS) 6" WALL THICKNESS (6'6" HEIGHT I.D.)
2. VAULT HAS 1EA – 12" X 12" SUMP 6" DEEP
3. 10' LADDER WITH SAFETY POST AT VAULT OPENING
4. 2 KNOCK OUTS PER VAULT FOR PIPE PENETRANTIONS
5. EACH TANK WILL BE DELIVERED AND HAS 1HR OF OFF- LOADING TIME (EXTENDED TIME COULD ACCRUE ADDITIONAL CHARGES)
6. HATCH IS A 36" X 72" H20 RATED FOR OCCASIONAL OFF STREET DRIVING
7. 5 YEAR FULL SYSTEM WARRANTY
8. VAULT IS H20 LOADED
9. PIPING STRING IS 6" SST.
10. WHITE INTERIOR/ WITH BLACK SEALANT EXTERIOR
11. COMPLETE SUBMITTAL PACKAGE FOR EACH PACKAGED STATION (INCLUDES SHOP DRAWINGS)
12. ONE DAY START-UP SERVICE PROVIDED BY PRESTIGE WWT.
13. PIPE IS 6" SST. IN AND OUT

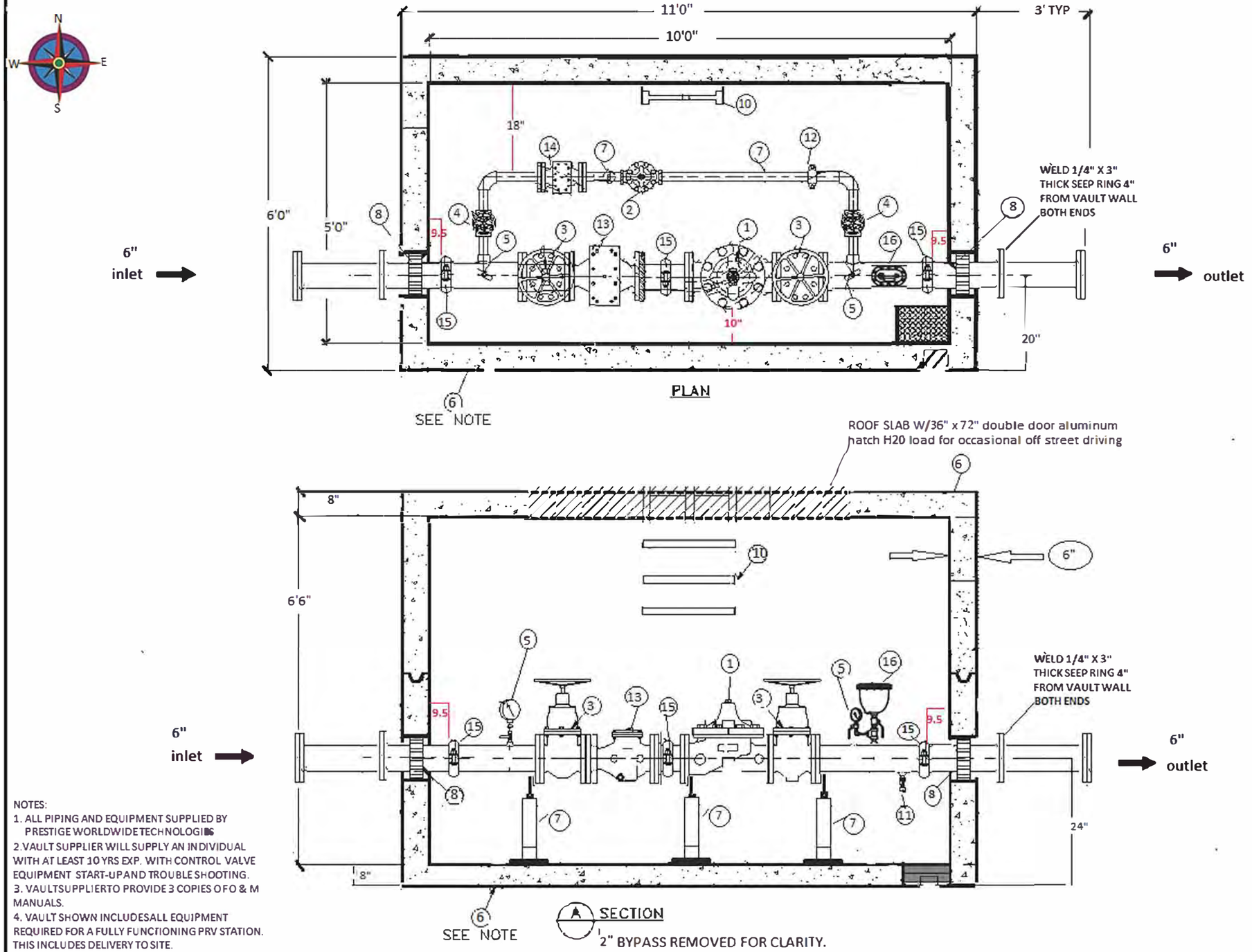
VAULT WILL BE DELIVERED WITH SST.STEEL PLANE ENDS EXTENDING THREE FEET FROM BOTH ENDS OF VAULT AND FINIAL CONNECTIONS WILL HAVE TO BE MADE. CONTRACTOR WILL PROVIDE THE EQUIPMENT TO OFF LOAD AND SET THE VAULT AND IT'S PIPING STRING. PIPING WILL BE FULLY ASSEMBLED IN BOTTOM SECTION OF VAULT. CONTRACTOR WILL HAVE TO INSTALL LADDER AND MAKE ALL FINIAL OUTSIDE CONNECTIONS. LADDER WILL BE IN BOTTOM SECTION OF VAULT UPON ARRIVAL.

IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT OUR OFFICE. (208)691-7430

THANK YOU
MARTY WALKER
C.E.O. PRESTIGE WORLDWIDE TECHNOLOGIES

THIS QUOTE FOR BUDGET PURPOSES ONLY

FOR REFERENCE



NOTES:
1. ALL PIPING AND EQUIPMENT SUPPLIED BY PRESTIGE WORLDWIDE TECHNOLOGIES
2. VAULT SUPPLIER WILL SUPPLY AN INDIVIDUAL WITH AT LEAST 10 YRS EXP. WITH CONTROL VALVE EQUIPMENT START-UP AND TROUBLE SHOOTING.
3. VAULT SUPPLIER TO PROVIDE 3 COPIES OF O & M MANUALS.
4. VAULT SHOWN INCLUDES ALL EQUIPMENT REQUIRED FOR A FULLY FUNCTIONING PRV STATION. THIS INCLUDES DELIVERY TO SITE.
5. INSTALLER WILL OFF LOAD VAULT AND CORDINATE WITH SUPPLIER DELIVERY. INSTALLER MUST PROVIDE ALL EXCAVATION AND FINAL CONNECTIONS.
6. DISINFECTION, FINAL GRADE AND ANY CONNECTIONS OUTSIDE OF THE VAULT ARE THE INSTALLERS RESPONSIBILITY.

NOTE:
PRESTIGE WWT 6" WALLED H20 LOADED VAULT
INSIDE DIMENSIONS: 10'L X 5'W X 6'6" TALL I.D.

DRAWING NOT TO SCALE

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION
1	1	6" CLA-VAL 92G-01YBCSDVKC PRESSURE REDUCING VALVE 150 FLG W/CHECK AND EPOXY COATED DISST TRIM WITH X101 POSITION INDICATOR 15/75 spring
2	1	2" CLA-VAL 90G-01YBCSDVKC PRESSURE REDUCING 150 FLG W/CHECK & EPOXY COATED DISST. TRIM WITH X101 POSITION INDICATOR 15/75 spring
3	2	6" R/S GATE VALVE 150 FLXFL C-509 NSF-61 ANSI/AWWA WITH HAND WHEELS.
4	2	2" R/S GATE VALVE 150 FLXFL C-509 NNSF-61
5	2	4" 0-200 PSI GAUGE LIQUID FILLED WITH 1/4 SST. ISOLATION VALVE.
6	1	PRESTIGE WWT 6" WALLED METER VAULT WHITE INTERIOR AND BLACK EXTERIOR SEALANT 12" x 12" sump w/4" knockout
7	5	ADJUSTABLE STEEL PIPE SUPPORTS FLANGE TYPE
8	2	6" LINK SEAL ASSEMBLY
9	1	ROOF SLAB W/36" x 72" double door aluminum hatch H20 load for occasional off street driving
10	1	8' ALUMINUM LADDER WITH SAFETY POST
11	1	3/4 HOSE BIB WITH BALL VALVE
12	1	2" GROOVED COUPLING
13	1	6" CLA-VAL H STRAINER
14	1	2" CLA-VAL H STRAINER
15	3	6" GROOVED COUPLING
16	1	1" AIR.VAC WITH ISOLATION VALVE

CHILD ROAD PACKAGED PRV STATIONS

TITLE: 6' x 2" PSI REDUCING VALVE STATION

PROJECT: RIVER GROVE WATER DIST.

PRESTIGE WORLDWIDE TECHNOLOGIES
P.O. Box 1404
Rathdrum, ID 83858 208-691-7430
E-mail: MARTY@PRESTIGEWWT.COM
Web: PRESTIGEWWT.COM

ALL PIPING IS SCHEDULE 40 304 SST.

APPENDIX V

Resolutions

RESOLUTION NO. 317

A RESOLUTION OF THE TOWN OF GERALDINE TO ADOPT THE SUMMARY OF FINDINGS OF THE PRELIMINARY ENGINEERING REPORT PREPARED BY GREAT WEST ENGINEERING, INC.

WHEREAS Great West Engineering did prepare a summary of the Preliminary Engineering Report findings to the Town of Geraldine describing the condition and performance of its existing water system; developed, evaluated, and recommended preferred alternatives for improvements, and

WHEREAS, the Town of Geraldine did meet with Great West Engineering to review the findings of the Preliminary Engineering Report; and

WHEREAS, the Town of Geraldine, Town Council has conducted a public meeting and Great West Engineering has incorporated information from the meeting in the Preliminary Engineering Report.

NOW, THEREFORE, BE IT RESOLVED THAT:

1. The Town of Geraldine, Town Council has reviewed the summary of findings from the draft Preliminary Engineering Report (PER) and submitted change requests necessary to effectuate the final PER version and hereby declares the PER findings presented by the Engineer acceptable to the Town of Geraldine; and

2. That the Town Council hereby authorizes Kathy Bond, Mayor, to execute and attest any documents required to adopt the summary of the PER findings in a final version and effectuate its submission to the appropriate governing agencies:

PASSED AND ADOPTED by the Town of Geraldine at a meeting thereof held on the 19th day of April 2022.

APPROVED

Kathy L Bond

Kathy Bond, Chair

ATTEST:

Name/Title:

RESOLUTION NO. 319.

A RESOLUTION OF THE TOWN OF GERALDINE TO ACCEPT THE DETERMINATION THAT AN ENVIRONMENTAL ASESSMENT IS APPROPRIATE FOR THE GERALDINE WATER SYSTEM IMPROVEMENTS PROJECT

WHEREAS, the Town of Geraldine has completed an assessment to identify potential environmental impacts of water system upgrades;

WHEREAS the draft Environmental Assessment was made available for public comment and the findings were presented and reviewed at a public meeting;

WHEREAS the Town of Geraldine did not receive substantive public comment;

WHEREAS the Town of Geraldine has determined that the improvements to its water system will not significantly affect the quality of the human environment and accordingly the Town of Geraldine has determined the preparation of an Environmental Impact Statement is not necessary;

NOW, THEREFORE, BE IT RESOLVED by the Town of Geraldine, Town Council to adopt the final Environmental Assessment for the water system improvements project.

PASSED AND ADOPTED by the Town of Geraldine at a posted meeting thereof held on the 19th of April 2022.

APPROVED

Kathy Bond, Mayor

ATTEST:

Name/Title:

RESOLUTION NO. 318

A RESOLUTION OF TOWN OF GERALDINE TO AUTHORIZE SUBMISSION OF AN APPICATION TO MCEP

WHEREAS the Town of Geraldine is applying to the Montana Department of Commerce for financial assistance from the Montana Coal Endowment Program (MCEP) to complete water system upgrades;

WHEREAS, the Town of Geraldine has the legal authority to construct, finance, operate, and maintain a public water system;

That the Town of Geraldine agrees to comply with all State laws and regulations and the requirements described in the MCEP Application Guidelines and those that will be described in the MCEP Project Administration Manual;

That the Town of Geraldine commits to provide the amount of matching funds as proposed in the MCEP application; and

That Kathy Bond, Chair, is authorized to submit this application to the Montana Department of Commerce, on behalf of the Town of Geraldine, to act on its behalf and to provide such additional information as may be required.

PASSED AND ADOPTED by the Town of Geraldine at a meeting thereof held on the 19th of April 2022.

APPROVED

Kathy Bond, Mayor

ATTEST:

Name/Title:

Authorizing Statement

A. Grant Authorization

I certify that the information and the statements in this application are true, complete, and accurate to the best of my knowledge. I certify that the project or activity as described in this application complies with all applicable state, local and federal laws and regulations. By my signature below, I certify that I have knowledge of and understand the content of this application and that I am fully authorized to apply to the Department of Natural Resources and Conservation (DNRC) for the grant specified in the submitted materials.

I further declare that, for The Town of Geraldine, I am legally authorized to enter into a binding contract with the DNRC to obtain funding of this application, Town of Geraldine Water System Improvements, is approved. I understand that all funds must be both authorized by the Montana Legislature and available in the natural resources project account before grants are available.

A facsimile, photocopy or electronic copy of the signature below shall have the same force and effect as an original signature and an electronic signature shall be regarded as an original signature. 30-18-102, MCA.

/s/ Kathy L. Bond
Signature and Title of Authorized Representative

4/19/22
Date

Kathy Bond, Mayor
Printed Name and Title of Representative

Town of Geraldine
Entity Name

APPENDIX W

Funding Agency Coordination

Matthew Mudd

From: Carlson, Craig - RD, State Office <craig.carlson@usda.gov>
Sent: Tuesday, May 3, 2022 3:58 PM
To: Matthew Mudd
Subject: RE: [External Email]Town of Geraldine - Water Improvement Project

Matt,

In my review of Geraldine's MHI and financials for the general fund and water enterprise, I find that Geraldine will qualify for the intermediate interest rate. I also believe that it is reasonable that RD would have at least a 45 percent grant on the expected $1,418,000 portion that may be funded by USDA Rural Development.

Craig Carlson
US Department of Agriculture
12 3rd Street NW, Suite 300
Great Falls, MT 59404
406 - 770 - 4316
www.rd.usda.gov/mt
"Together, America Prospers"

From: Matthew Mudd <mmudd@greatwesteng.com>
Sent: Tuesday, May 3, 2022 3:17 PM
To: Carlson, Craig - RD, State Office <craig.carlson@usda.gov>
Cc: LaNette Jones <ljones@greatwesteng.com>; Susan Brurud <sbrurud@bearpaw.org>
Subject: [External Email]Town of Geraldine - Water Improvement Project

Hi Craig,

Good Afternoon, Craig:

As you are aware, we typically send emails about future protects for the intent to apply to document reaching out to the agencies. Also, as you know, we are process of applying for MCEP and RRGL funding for the Geraldine water project. These funding programs require us to reach out to RD and/or SRF to determine if a funding package is reasonable. Can you review the below and let us know if the potential funding package seems reasonable for the proposed Geraldine Water Project? Thanks!

Attached to this email is a problem summary that is currently listed in the Water PER.

The Town charges $33.04/month for sewer and about $50/month ($36 base + metered usage) for drinking water. Geraldine's 2010 MHI was $36.786. The 2015-2019 ACS MHI is $39,583. Geraldine is 77% LMI, and 9.5% of its residents live in poverty. The water system has approximately 153 water connections (128 residential, 2 schools, 10 businesses, 2 (2-3")rural water consecutive PWS connections, and a few others, see

attached breakdown), and the water system is metered. (More detailed financial information is available if needed)

A project priority list of the potential identified projects that will address the Town's deficiencies, is listed in the table below: (Note the order can be shifted and reprioritized based on funding availability and Town input) Pipe in Town is a high priority given water leakage/loss, ruptures, fire flow, etc.

Project Priority List		
Priority	Alternative	Total Project Cost
1	D-2: Phase 1 – Replacement of Problematic 4" AC and 6" AC in contaminated soils	$2,660,000
2	D-3: Phase 2 – Replacement of Remaining 4" AC	$2,503,000
3	S-2: Phase 2 Springs Assessment, Spring 5 Rehab	$140,000
4	R-3: New 210,000 Concrete On Grade Storage Tank	$2,879,000
5	T-2: Construction of a New Chlorination Station	$378,000
6	D-5: Replacement of Pressure Reducing Valves and Air Release Valves	$408,000
7	R-2: Repairing the Existing Concrete and Steel Tanks	$186,000
8	D-4: Phase 3 – Replacement of Remaining Pipe in Town	$2,656,000
9	D-6: Replacing System Control and Data Acquisition (SCADA) System	$30,000
10	S-3: Phase 3 Spring Collection Rehabilitation	TBD ($150,000 - $200,000 Est.)

The Town is going to receive and ARPA grant award to fund the Phase 1 (Alt D-2) Water Project to replace over 6,000 feet of undersized and poor AC mains.

We are reaching out to RD regarding Phase 2 project (AltD-2 and Alt S-2) totaling $2,643,000.. Phase 2 will replace the remaining 4-inch AC mains – over 6,500 feet.

Future phased projects can be completed as funding is made available.

We think Geraldine could win $1.225 million in MCEP, CDBG, and RRGL grant funding for Phase 2.

The remaining $1,418,000 could come from Rural Development or SRF. Based on the condition of the system and Geraldine's demographics, is it reasonable to assume the community could at least qualify for RD's intermediate rate with a funding package that is 55% loan and 45% grant?

Please let us know if you have any questions.

Regards,

GreatWest ENGINEERING

We're Hiring!

Matthew Mudd, PE
Project Manager

d: (406) 495-6196
c: (406) 490-3909

2501 Belt View Drive
Helena, MT 59601