Peerless School District 02
Public Water System

PWS ID # MT0001197

DRAFT
Source Water Delineation and Assessment Report

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EXECUTIVE SUMMARY

The drinking water for Peerless School District 02 is supplied by 2 wells, Well #1 is located adjacent to the school on the west side, and Well # 2 is located to the south of the north teachers' apartments. This Source Water Delineation and Assessment Report was prepared under the requirements and guidance of the Federal Safe Drinking Water Act and the US Environmental Protection Agency, as well as a detailed Source Water Assessment Plan developed by a statewide citizen's advisory committee here in Montana. The Department of Environmental Quality (DEQ) is conducting these assessments for all public water systems in Montana. The purpose is to provide information so that the public water system staff/operator, consumers, and community citizens can begin developing strategies to protect your source of drinking water. The information that is provided includes the identification of the area most critical to maintaining safe drinking water, i.e., the Inventory Region, an inventory of potential sources of contamination within this area, and an assessment of the relative threat that these potential sources pose to the water system.

Based on the sanitary survey, well log, and the depth of the well, it appears that a sandstone layer (or layers) of the Fort Union Formation is providing water to the PWS's wells. In accordance with the Montana Source Water Protection Program criteria (1999), the aquifer (source water) is considered to have a low sensitivity to potential contaminant sources since it is a confined aquifer. Sensitivity is defined as the relative ease that contaminants can migrate to source water through the natural materials.

Three types of source water protection management regions for the Peerless School District 02 public water system were mapped as part of this assessment. They are the control zone, inventory region, and the recharge region. Potential sources of contamination were identified within each of these three regions and the results are as follows:

- The goal of management in the control zone is to avoid introducing contaminants directly into the water supply's well or immediate surrounding areas. The control zone is delineated as a 100-foot radius around the wells and all sources of potential contaminants should be excluded in this region. Potential contaminant sources identified within the control zone include: the schools own on-site septic system(s), and any chemical storage or use areas such as the shop or storage building.
- The inventory region should be managed to prevent contaminants from reaching the well before natural processes reduce their concentrations. Since the source water is confined, the inventory region for the well(s) consists of a 1000-foot radius circle around the wells. Significant potential contaminant sources identified within the inventory region include: medium and high-density septic system areas and agricultural land.
- The goal of management in the recharge region is to maintain and improve water quality over long periods of time or increased usage. Potential contaminant sources identified within the recharge region include: a closed landfill, the old railroad right of way, a landing strip, and agricultural land.

Susceptibility is the potential for a public water supply to draw water contaminated by inventoried sources at concentrations that would pose concern. Susceptibility is determined by considering the hazard rating for each potential contaminant source and

the existence of barriers that decrease the likelihood that contaminated water will flow to the public water supply well intakes. The Peerless School District 02 public water supply has a moderate to low susceptibility to the following potential contaminant sources: agricultural land and high septic density; and a moderate susceptibility to the landing strip, and the landfill. Low risk potential sources and potential sources located outside the Inventory Region, but within the Recharge Region may still pose a threat over time, but are not discussed in detail in this assessment. This provides a quick look at the existing potential sources of contamination that could, if improperly managed or released, impact the source water for Peerless School District 02. The susceptibility analysis provides the community and the public water system with information on where the greatest risk occurs and where to focus resources for protection of this valuable drinking water resource.

The costs associated with contaminated drinking water are high. Developing an approach to protect that resource will reduce the risks of a contamination event occurring. In this report, we have summarized the local geology and well construction issued as they pertain to the quality of your drinking water source. We have identified the area we believe to be most critical to preserving your water quality (the Inventory Region) and have identified potential sources of contamination within that area. In addition, we provide you with recommendations, i.e., Best Management Practices, regarding the proper use and practices associated with some common potential contamination sources. We believe public awareness is a powerful tool for protecting drinking water. The information in this report will help you increase public awareness about the relationship between land use activities and drinking water quality.

INTRODUCTION

This Source Water Delineation and Assessment Report (SWDAR) was prepared for the Peerless School District 02 Public Water Supply, PWS ID# MT0001197, located in Daniels County. It was completed by Julie Harvey of the Source Water Protection Program at the Department of Environmental Quality with assistance from intern Bethany Haines. Theodore Birkland, the PWS operator also provided additional assistance.

PURPOSE

This report is intended to meet the technical requirements for the completion of the delineation and assessment report for the Peerless School District 02 Public Water System (PWS) as required by the Montana Source Water Protection Program (DEQ, 1999) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996 (Public Law 104-182). 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 whereby areas that contribute water to aquifers or surface water bodies that are used to supply drinking water are identified on a map. These areas are called source water protection areas. Assessment involves identifying locations in the delineated 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 delineation and assessment report is to provide information that helps Peerless School District 02 protect its drinking water sources.

LIMITATIONS

This report was prepared to assess threats to Peerless School District 02'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 Peerless School District 02 public water supply and not to any other public or private water supply. Also, not all potential or existing sources of groundwater or surface water contamination in the area of the Peerless School District 02 public water supply are identified. Only potential sources of contamination in areas that contribute water to its drinking water source are considered.

The term "contaminant" is 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 to certain constituents that do not have MCLs but are considered to potentially represent health threats.

CHAPTER 1
BACKGROUND

THE COMMUNITY

The Peerless School District 02 is located in Peerless that is in Daniels County, in northern Montana, as shown in Figure 1. The nearest town is Scobey, which is located approximately 20 miles east of Peerless. The U.S. Census Bureau estimates the 2000 population of Daniels County at 2,017 people (http://factfinder.census.gov) with about 150 of these people residing in Peerless.

Peerless School District 02 serves 46 people through six active connections (hook ups). A map showing the layout of the area the PWS serves is included with the sanitary survey in Appendix A. Because the school water supply regularly serves the same nonresidential population consisting of the same people everyday it is classified as a non-transient, non-community public water supply. Drinking water to the school is supplied by 2 wells located west of the school (Figure 1). The Town of Peerless and surrounding properties are served by individual or large-capacity on-site septic systems for its sewage treatment.

GEOGRAPHIC SETTING

Peerless is located in the glaciated central groundwater region of the United States (Heath, 1984) which is a geographic area in northern Montana that extends east roughly from the Rocky Mountain Front to the North Dakota Border. Continental glaciers extended into this region during several episodes of glaciation. The elevation of Peerless is approximately 2860 feet above mean sea level.

Peerless School District 02 is located in the West Fork Poplar River watershed, U.S. Geological Survey (USGS) hydrologic unit code (HUC) Number 10060004, which is located within the Lower Missouri River Watershed Management Region for Montana. The West Fork Poplar River watershed extends from the confluence of the West Fork Poplar River with the Poplar River upstream to the Canada border and includes portions of Daniels, Roosevelt, and Valley Counties.

CLIMATE

The Peerless area climate information area is based on the National Oceanic and Atmospheric Administration's (NOAA) Scobey climate station located at an elevation of 2,370 feet above mean sea level (Western Regional Climate Station). Average temperatures and total precipitation for the period of record are shown in Table 1.

Table 1. Period of Record Monthly Climate Summary Scobey 4 NW Climate Station
Station (247425) Period of Record: 6/ 1/1987 to 3/31/2004

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	21.2	28.3	39.3	56.1	68.3	77.1	82.2	83.7	72.9	56.9	37.3	26.5	54.2
Average Min. Temperature (F)	-2.1	4.8	15.7	27.4	38.7	48.6	51.8	50.2	39.0	27.2	13.8	3.3	26.5
Average Total Precipitation (in.)	0.40	0.23	0.48	0.98	1.59	3.08	2.48	1.52	0.77	0.71	0.36	0.28	12.88
Average Total Snow Fall (in.)	6.0	2.9	2.6	0.2	0.6	0.0	0.0	0.0	0.0	0.6	4.2	3.6	20.7
Average Snow Depth (in.)	4	3	1	0	0	0	0	0	0	0	2	2	1

GENERAL DESCRIPTION OF THE SOURCE WATER

Peerless School District 02's drinking water is supplied by 2 wells located west of the school. Well #1 is drilled to a depth of 224 feet and Well #2 is drilled to 145 feet. The static water level for Well #2 measured at the time of drilling was 100 feet below surface. Static water level for Well #1 was not recorded. The stratigraphy in the area generally consists of alluvial and glacial deposits which overly the bedrock of the fine-grained sandstone, siltstone, and mudstone are layers of the Fort Union Formation. The drinking water source material is interpreted to be confined sandstone layers within the Fort Union Formation bedrock. Recharge to the wells is likely from infiltration of precipitation and surface water through the overlying alluvial materials. Groundwater in the Fort Union formation generally flows from northwest to southeast. Additional detail on the geology and hydrogeology of the area is provided in Chapter 2.

THE PUBLIC WATER SUPPLY

The Peerless School District 02 it is classified as a non-transient, non-community public water (PWS) because the school water supply regularly serves the same nonresident individuals for at least six months a year. Information on the water system was obtained from correspondence in the DEQ Public Water Supply Section files including the most recent sanitary survey Recharge to the wells is likely from infiltration of precipitation and surface water through the overlying alluvial materials. Groundwater in the Fort Union formation generally flows from northwest to southeast completed on May 14, 2002 (report dated May 14, 2002 included in Appendix A) and personal communication with the PWS operator.

Peerless School District 02 serves 46 people through 6 service connections (hook ups). The school uses two wells located west of the school for the drinking water supply. The

pump in each well delivers about 10 gallons per minute. The wells are pumped into a common header then into various buildings (school, teacher apartments, grade school, music building, shop, and house) with pressure maintained by two pressure tanks. One of the pressure tanks is located in the school; the other is in the teacher apartment. A schematic map of the system is provided in the Sanitary Survey in Appendix A.

A preliminary assessment of groundwater sources under the direct influence of surface water (GWUDISW) was completed in 2002 and the water for both wells is classified as groundwater.

WATER QUALITY

Every PWS is required to perform monitoring for contamination to their water supply. The monitoring constituents include coliform and other signs of pathogenic organisms, nitrates, metals and multiple organic chemicals. The monitoring schedule depends on many factors such as the size and source water for a PWS, the number of sources (e.g. wells), and the population served. Each PWS has a specific monitoring program tailored to their system that follows the general protocols for operation of a PWS defined by DEQ. PWS monitoring schedules are available at http://nris.state.mt.us/wis/swap/swapquery.asp. The Peerless School District 02 PWS monitoring data from DEQ's PWS database for the past five years was reviewed and is summarized in this section.

The water system has had one health-based violation (for coliform). Health based violations are issued when the amount of contaminant exceeds the safety standard (maximum contaminant level, MCL) or water was not treated properly. The health based MCL violation occurred in when water samples confirmed the presence of total coliform bacteria in the water supply. A Boil Water Order was posted September 2002 for the system following this detection. The Boil Water Order was subsequently lifted in October 2002 based on the satisfactory bacteriological test results of five additional samples and proof of public notification. Coliform bacteria have not been detected since October 2002.

Other compounds detected in Peerless School District 02's source water monitoring over the past 5 years include nitrite + nitrate (1.82 to 4.61 mg/L), fluoride (0.84 mg/L), selenium (<. 0002 mg/L), and sulfate (39 mg/L). The compounds detected are all below EPA primary maximum contaminant levels (MCLs) where established. The EPA MCL for nitrate is 10 mg/L. Although the nitrate levels detected in the water supply do not exceed the MCL, the PWS should continue to review nitrate monitoring results and try to reduce the future risks from potential source(s) since nitrate levels above 2 mg/L typically indicate impacts from human activities. If nitrate levels exceed 5 mg/L, the PWS should increase monitoring frequency to quarterly. Further information including recommendations for management options are provided in this assessment.

Background Water Quality Monitoring Results

There are limited water quality sampling results from the PWS wells for background parameters. Background water quality sampling typically includes some general water quality parameters including major cations and anions (calcium, magnesium, sodium,

potassium, iron, manganese, silica, bicarbonate, carbonate, chloride, sulfate, nitrate, fluoride and orthophosphate) and trace elements and metals.

Sampling results from 1999 indicated the following constituents in the source water: calcium (33 mg/L), sulfate (39 mg/L), and alkalinity (350 mg/L). None of the analytical results exceeded the primary MCLs where primary MCLs are established. National secondary drinking water standards (SMCLs) are non-enforceable guidelines regarding contaminants that may cause cosmetic effects (such as taste, odor, or color) and are generally not a health risk. No SMCLs were exceeded. No other background water quality results were identified for the Peerless area.

CHAPTER 2
DELINEATION

The source water protection area, the land area that contributes water to the Peerless School District 02's PWS is identified in this chapter. Three management areas are identified for a PWS's source water protection area. These regions, the control zone, inventory region, and recharge region, are delineated for the wells. The control zone, also known as the exclusion zone, is an area at least 100-foot radius around each well. The inventory region represents the zone of contribution of the wells, which is a 1000-foot radius. The recharge region represents the area where the source aquifer for the Peerless School District 02 water system wells is replenished.

GENERAL GEOLOGIC AND HYDROGEOLOGIC SETTING

This section provides an overview of the geology and hydrology of the Peerless School District 02 area and is based on a primarily on a geologic map of the area by Bergantino (1999) and the well logs for the Peerless School District 02 PWS wells and regional well logs available from the Montana Bureau of Mines and Geology (MBMG) Ground-Water Information Center (GWIC). A regional geologic map is provided in Figure 2. The geology of the area can be used to determine the locations, boundaries, and hydraulic properties of local aquifers. An understanding of hydrogeologic conditions also provides an explanation for the sensitivity of local aquifers to potential contaminant sources.

The stratigraphy in the area generally consists of alluvial and glacial deposits which overly the bedrock of the fine-grained sandstone, siltstone, and mudstone are layers of the Fort Union Formation. The alluvium (Qal on Figure 2) is primarily present at the surface in the larger stream valleys (for example along Police Creek) and consists of fine- to coarse-grained floodplain deposits of gravel, sand, silt and clay. The Flaxville Formation (Tf on Figure 2) overlies most of the area and consists of glacially-derived sand and gravel with interbedded clay layers. Based on well logs located within 1000 feet of the school (GWIC ID 146945 for the Peerless Post Office and GWIC ID 175208 for Peerless School)), the Flaxville Formation is about 100 –125 feet thick and is underlain by claystone, lignite (coal beds) and cemented sandstone layers of the Fort Union Formation of Tertiary age. The bedrock in this part of Northeast Montana lies on the western flank of the Willinston Basin which a large-scale structure centered near Williston, North Dakota (Donovan, 1988). The Fort Union Formation underwent structural deformation during the formation of the Williston Basin which resulted in a southeast dip direction of the Fort Union Formation in the vicinity of Peerless. In general, the claystone and shale layers of the Fort Union Formation do not yield water to wells but some of the thin sandstone beds yield small quantities (usually less than 15 gallons per minute) of water. Groundwater in the Fort Union formation generally flows from northwest to southeast following the structural trend of the Williston basin.

PWS WELL INFORMATION

Peerless School District's drinking water is supplied by two wells located west of the school. Well #1 is drilled to a depth of 224 feet and Well #2 is drilled to 145 feet. The static water level for Well #2 measured at the time of drilling was 100 feet below surface. Static water level for Well #1 was not recorded. The well logs are lacking lithology information to help identify the aquifer the well lies in. Based on the general geology described in the previous section, local geologic maps, and a review of other wells listed in Ground Water Information Center (GWIC) that are located within 1000 feet of the Peerless School District 02 wells, the drinking water source material is interpreted to be confined sandstone layers within the Fort Union Formation bedrock. Groundwater is typically not found in the Flaxville gravels in the area and the School district wells surrounding wells are screened in the sandstone layers of the Fort Union Formation.

Based on the geology and static water level measured in surrounding wells, the aquifer in the Fort Union Formation sandstone layers is confined. Recharge to the wells is likely from infiltration of precipitation and surface water through the overlying alluvial materials. Copies of the well logs showing stratigraphic and well construction information are included in Appendix B and are summarized in Table 2.

Table 2. Summary of PWS Well Log Information

Peerless School District 02 Well Number	**Well #1**	**Well #2**
DEQ Well Name/ Source Code	Well #1 WL002	Well #2 WL003
GWIC ID	46571	46569
DNRC Water Right	Not reported	6473
Well Location	NW ¼ SE ¼ SE ¼ Sec.16, T35N, R45E	NW ¼ SE ¼ SE ¼ Sec.16, T35N, R45E
Well Elevation	Approx. 2,860 feet	Approx. 2,860 feet
Date Completed	1952	1975
Total Depth (bgs)	224 feet	145 feet
Well Completion: Casing	4" casing	6" casing
Well Completion: Screen	No completion records currently in GWIC.	Casing perforated from 137-145 feet
Well Completion: Annular Seal	No seal records currently in GWIC.	No seal records currently in GWIC.
Static Water Level (at time of drilling)	No static water level reported in GWIC	100 feet
Well Pump Test Data	No well pump test currently in GWIC records	Pumping water level of 125 feet pumping at 11 gpm

CONCEPTUAL MODEL AND ASSUMPTIONS

Peerless School District 02's production wells are located in the West Fork Poplar watershed (USGS Hydrologic Unit Code 1006000) which is located within the Lower

Missouri River Watershed Management Region for Montana. Peerless School District 02's drinking water source is interpreted to be sandstone layers within the Fort Union Formation. The aquifer in the Fort Union Formation sandstone layers is confined. Recharge to the wells is likely from infiltration of precipitation and surface water through the overlying alluvial materials. Groundwater in the Fort Union formation generally flows from northwest to southeast following the structural trend of the Williston basin.

Using DEQ Source Water Protection Program criteria for ranking aquifer sensitivity (Table 3), the Peerless School District 02 source water is considered as having **Low Source Water Sensitivity** to contamination because the aquifer is a confined aquifer. Sensitivity is defined as the relative ease that contaminants can migrate to source water.

Table 3. Source Water (Aquifer) Sensitivity Criteria
Based on DEQ Source Water Protection Program Criteria (DEQ, 1999)

High	Moderate	Low
• Surface water and GWUDISW • Unconsolidated Alluvium (unconfined) • Fluvial-Glacial Gravel • Terrace and Pediment Gravel • Shallow Fractured or Carbonate Bedrock	• Semi-consolidated Valley Fill sediments (semi-confined) • Unconsolidated Alluvium (semi-confined)	• Consolidated Sandstone Bedrock • Deep Fractured or Carbonate Bedrock • Semi-consolidated • Confined Aquifers

DELINEATION

Methods and criteria for delineating source water protection areas are specified in the Montana Source Water Protection Program (DEQ, 1999). Source water protection areas delineated for the Peerless School District 02 PWS include a control zone, an inventory region and a recharge region. The delineated management zones for the wells are shown on Figure 3.

Control Zone – A 100-foot radius control zone is delineated for Peerless School District 02's wells. All sources of potential contaminants should be excluded in this region.

Inventory Region - For the Peerless School District 02 wells, the DEQ's Source Water Protection Program criteria for a confined aquifer system was followed. The inventory zone was delineated based on a 1000-foot radius. All sources of potential contaminants are inventoried in this region. Since the wells completed in the area in close proximity, the fixed radius circles were combined into a single Inventory Region as shown on Figure 3.

Recharge Region –The recharge region for the Peerless School District 02 wells includes the subbasin of West Fork Poplar watershed upgradient of the PWS wells. In general the subbasin surrounds Police Creek (Figure 3). The inventory for the recharge region focuses on general land uses and large industrial facilities. The goal of management in the recharge region is to maintain and improve the long-term quality of groundwater in the aquifer.

LIMITING FACTORS

Delineation of the source water protection areas for the Peerless School District 02 PWS wells is based on published reports and lithology indicated on the well logs. The interaction of surface water with the alluvial channel deposits and underlying Fort Union Formation is not completely understood and the changes in the flow regime under seasonal conditions are not known. The delineation was completed using conservative assumptions to help ensure that the inventory zone reflects the actual area where contamination to the system may occur.

CHAPTER 3
INVENTORY

INVENTORY METHOD

An inventory of significant potential contaminant sources was conducted to assess the susceptibility of Peerless School District's wells to contamination and to provide a foundation for source water protection planning. The inventory for Peerless School District 02 focuses on facilities that generate, use, or store potential contaminants and certain land uses in the inventory region delineated in the previous section. Sources of all primary drinking water contaminants and pathogens are identified, although only potential sources of contaminants that are the greatest threat to human health were selected for detailed inventory.

It is important to remember that the sites and areas identified in this section are only potential sources of contamination to the drinking water. Contamination of the drinking water is not likely to occur when potential contaminants are properly used and managed. Not all of these inventoried activities pose actual high risks to your public water supply. The day-to-day operating practices and contamination awareness varies considerably from one facility or land use activity to another.

The inventory for the Peerless School District 02 PWS focuses on all activities in the control zones for the wells; certain types of municipal and private facilities or land uses in the inventory region; and general land uses and large facilities in the Recharge Region. Databases were searched to identify businesses and land uses that are potential sources of regulated contaminants. The process for completing the inventory included several steps, which are summarized as follows:

Step 1: Urban and agricultural land uses were identified from the U.S. Geological Survey's Geographic Information Retrieval and Analysis System (http://nris.state.mt.us/gis/datalist.html). Sewered and unsewered residential land uses were identified from boundaries of sewer coverage obtained from municipal wastewater utilities.

Step 2: EPA's Envirofacts System (http://www.epa.gov/enviro/) was queried to identify EPA regulated facilities located in the inventory region. This system accesses facilities listed in the following databases: Resource Conservation and Recovery Information System (RCRIS), Biennial Reporting System (BRS), Toxic Release Inventory (TRI), and Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) and the Permit Compliance System (PCS - for Concentrated Animal Feeding Operations with MPDES permits). The available reports were browsed for facility information including the Handler/Facility Classification to be used in assessing whether a facility should be classified as a significant potential contaminant source.

Step 3: Databases were queried to identify the following in the inventory region:

- Underground Storage Tanks (UST) (http://www.deq.state.mt.us/UST/USTDownloads.asp)
- Hazardous waste contaminated sites (DEQ hazardous waste site cleanup bureau),
- Landfills (http://nris.state.mt.us/gis/datalist.html), and
- Abandoned and active mines including gravel pits (http://nris.state.mt.us/gis/datalist.html)

Any information on past releases and present compliance status was noted.

Step 4: Major road and rail transportation routes were identified throughout the inventory region (http://nris.state.mt.us/gis/datalist.html).

Step 5: Public water system officials, or someone they designated as knowledgeable of the area, were interviewed to identify potential sources that are not listed in databases or on maps elsewhere (such as animal feeding operations that are not required to obtain a permit) and to assist in locating potential sources listed in the state and federal databases.

Step 6. Significant potential contaminant sources were identified in the control zone and inventory region and land uses and facilities that generate, store, or use large quantities of hazardous materials were identified within the recharge region

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. Underground storage tanks.
4. Known groundwater contamination (including open or closed hazardous waste sites, state or federal superfund sites, and UST leak sites).
5. Underground injection well.
6. Major roads or rail transportation routes.
7. Cultivated cropland greater than 20 % of the inventory region.
8. Animal feeding operations.
9. Wastewater treatment facilities, sludge handling sites, or land application areas.
10. Septic systems.
11. Sewer mains.
12. Storm sewer outflows.
13. Abandoned or active mines

CONTROL ZONE INVENTORY RESULTS

The control zone includes the school's storage building that may be storing chemicals; the shop if repair occurs; and the septic tanks.

No information was provided on the well logs to indicate that the wells are sealed or grouted between the borehole and the well casing which may indicate that the wells are highly susceptible to water and other contaminants reaching the aquifer along the well casing. The PWS should be vigilant to ensure that potential sources of contamination are excluded from the control zone and that positive drainage away from each well casing is maintained.

INVENTORY REGION RESULTS

The inventory results for Peerless School District 02's source water are summarized in Table 4 and are shown on Figure 3 and Figure 4. The landing strip is primarily used by crop spraying planes. Significant agricultural chemical usage, handling, and storage occur at the airfield, which can pose a high hazard to groundwater. The PWS operator should verify if these businesses are within the 1000-foot inventory region. Additional point sources of potential pollutants (such as businesses or facilities listed on regulatory databases) were not identified in the inventory region.

Land uses within the inventory region include primarily agricultural land. The primary hazards are chemical spills and excess application of herbicides and pesticides. Septic system density within the inventory region is high to medium and is considered a risk to the PWS drinking water.

Inactive underground storage tanks (USTs) were identified within a "Peerless" address and are listed in Appendix C. DEQ classifies inactive USTs as temporarily out of service and requires that the product in the tank be removed. However, testing of the tanks, distribution lines or soils around the tank is not required to evaluate the potential for historic leaks or spills that may impact subsurface soils and groundwater.

Table 4. Summary of Potential Contaminant Sources in the Control Zone and Inventory Region

Source Type	*Potential Contaminants*	*Description/Concern*
Land Use Cover (Step 1)		
Agricultural Crop Land	Pathogens, nitrates, pesticides and herbicides	Over-application or improper handling of pesticides or fertilizers may impact drinking water. Excessive irrigation may cause transport of contaminants or sediments to groundwater
High and Moderate Septic System Density	Pathogens and nitrates	If not properly designed, installed, and maintained, septic lines and tanks can be a point sources of effluent in groundwater.
EPA Envirofacts Sites (Step 2)		
None Identified		
DEQ Databases (Step 3)		
None Identified		
Miscellaneous Others, including Step 4 and 5		
Landing Strip (agricultural crop spray planes)	Pesticides, herbicides, VOCs, petroleum products	Leaks, spills and improper handling of pesticides, fertilizers and petroleum products may impact drinking water source.
Peerless School District 02 Storage Building and Shop	Pesticides, herbicides, VOCs, petroleum products, and other chemicals	Leaks, spills and improper handling of pesticides, fertilizers, chemicals and petroleum products may impact drinking water source.
Peerless School District 02 on Site Septic System (Large Capacity Septic System)	Pathogens and nitrates	If not properly designed, installed, and maintained, septic lines and tanks can be a point sources of effluent in groundwater.

Notes: Individual sites identified are evaluated in Chapter 4.

RECHARGE REGION INVENTORY RESULTS

Land use in the recharge region is reported in the 1992 National Land Cover dataset (Figure 4) to be primarily agricultural land. There is a closed landfill and railroad right of way in the recharge region. The percentage of agricultural land is considered a high risk to the drinking water supply due to the potential for aquifer contamination by nitrate and pesticides.

Septic system density within the watershed/recharge region is low and is not considered a risk to the PWS drinking water.

Additional point sources of potential pollutions (such as businesses or facilities listed on regulatory databases) were not identified in the recharge region.

INVENTORY UPDATE

To make this SWDAR a useful document for the years to come, the certified water system 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. The complete inventory should be submitted to DEQ every five years to ensure the source water delineation and assessment remains current.

INVENTORY LIMITATIONS

The potential contaminant sources described above are identified from readily available information. Consequently, unregulated activities or unreported contaminant releases may have been overlooked. The use of multiple sources of information, however, should ensure that the major threats to the source water for Peerless School District 02's public water supply have been identified. The lack of identification of a potential contaminant source in the inventory or susceptibility assessment of this report does not mean that the potential for contamination does not exist or there is not a threat. It is highly recommended that the PWS and community "enhance" or refine the identification of the potential contamination sources through further research and local input.

CHAPTER 4
SUSCEPTIBILITY ASSESSMENT

GENERAL DISCUSSION

Susceptibility is the potential for a public water supply to draw water contaminated by inventoried sources at concentrations that would pose a concern. Susceptibility is assessed in order to prioritize potential pollutant sources for management actions by local entities, in this case the Peerless School District 02 PWS managers and operators. The goal of Source Water Management is to protect the source water by 1) controlling activities in the control zone, 2) managing significant potential contaminant sources in the inventory region, and 3) ensuring that major land use activities or other significant activities in the recharge region pose minimal threat to the source water. Management priorities in the inventory region are determined by ranking the significant potential contaminant sources identified in the previous chapter according to susceptibility. Alternative management approaches that could be pursued by the PWS managers and operators to reduce susceptibility are recommended in this chapter.

HAZARD DETERMINATION

The proximity of a potential contaminant source to a spring or well intake, potential contaminant migration pathways, or the density of potential non-point contaminant sources determines the threat of contamination, referred to here as hazard (Table 5). Hazard and the existence of barriers to contamination determine susceptibility, which is described in Table 6. Table 5 below describes the criteria to determine hazard within the inventory region as it was delineated in this SWDAR. Note that this table is specific to PWSs that draw their water from confined aquifers. The determination of hazard is somewhat different for other types of water sources.

Table 5. Hazard of Potential Contaminant Sources for Wells Drawing Water from Confined Aquifers

Type of Potential Contaminant Source within the Inventory Region	**The PWS well is not sealed**	**Other wells in the inventory region are not sealed through the confining layer**	**All wells in the inventory region are sealed through the confining layer**
Point Sources	High	Moderate	Low
Septic System Density (# per square mile)	High: > 300 Moderate: 50 to 300 Low: < 50	Moderate: > 300 Low: < 300	Low
Municipal or Community Sanitary Sewer (% land use)	High: > 50 Moderate: 20 to 50 Low: < 20	Moderate: > 50 Low: < 50	Low
Cropland (% land use)	High: > 50 Moderate: 20 to 50 Low: < 20	Moderate: > 50 Low: < 50	Low

Note: Highlighted areas are those relevant to the Peerless School District 02 inventory region

DISCUSSION OF SUSCEPTIBILITY

Susceptibility is determined by considering the hazard rating for each potential contaminant source and the existence of barriers that decrease the likelihood that contaminated water will flow to the Peerless School District 02 PWS well intakes (Table 6).

Table 6. Susceptibility Based on Hazard and Barriers

Presence Of Barriers	Hazard		
	High	**Moderate**	**Low**
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

Barriers to contamination can be anything that decreases the likelihood that contaminants will reach a spring or well. 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 are considered management barriers. Thick clay-rich soils, a deep water table or a thick unsaturated zone above the well intake can be natural barriers. The Peerless School District 02 wells depth to groundwater of approximately 100 feet (also called unsaturated thickness) serves as a natural barrier. A second barrier it that the well intakes are around 50 feet or more below the water level.

A summary of the susceptibility assessment for Peerless School District 02 PWS production wells is located in Table 7. Because a contaminant source has not been identified in the inventory or susceptibility assessment of this report, it doesn't mean that the potential for contamination does not exist or is not a threat. Table 7 only includes the potential contaminant sources identified in Chapter 3 that were determined to present a significant potential risk to the drinking water supply. It is highly recommended that the PWS operator and community members familiar with the nature of businesses and land use in the area enhance the inventory through further research and local input.

Table 7. Susceptibility Assessment of Significant Potential Contaminant Sources

Potential Contaminant Source	Potential Contaminants	Hazard	Hazard Rating	Barriers	Susceptibility	Management Recommendations
Control and Inventory Region						
Agricultural Land Use (45% of Inventory Region)	SOCs, Nitrates, Pathogens	Contaminants leaching into ground water	***Moderate***	-Intake depth of >50 feet below static water level. -Unsaturated thickness >100'	***Low Susceptibility***	Inform landowners of the well and protection area location. Encourage use of best management practices (BMPs).
Large Capacity Septic System (serving school)	Nitrate, pathogens	Leaks, system failure, or improper maintenance may result in infiltration of untreated effluent	***High***	-Intake depth of >50 feet below static water level. -Unsaturated thickness >100'	***Moderate***	Ensue proper operation and maintenance of system.
Septic systems- High and moderate density area	Nitrates, pathogens	Leaks, system failure, or improper maintenance may result in infiltration of untreated effluent	***High to Moderate***	-Intake depth of >50 feet below static water level. -Unsaturated thickness >100'	***Moderate to low Susceptibility***	Inform landowners of the well and protection area location. Educate public on proper maintenance and replacement of on-site systems; support development of community sewer system.
Vehicle/Equipment Maintenance Areas/Shops	Petroleum products, maintenance products, VOCs, SOCs and others	Spills or leaks of chemicals used	***High**(if maintenance and repair is done in shop)	-Intake depth of >50 feet below static water level. -Unsaturated thickness >100'	***Moderate Susceptibility***	Protect area from fuel or other chemical spills. Maintain sealed concrete floors. Ensure proper chemical and waste use, storage, and disposal/recycling. Ensure good housekeeping.
Chemical/Waste Storage, Handling, Mixing, and Cleaning Areas	Various Chemicals	Spills, leaks, runoff, infiltration into groundwater	***High**(If chemicals are stored in building)	- Intake depth of >50 feet below static water level. -Unsaturated thickness >100'	***Moderate Susceptibility***	Limit volumes stored. Provide containment for large volumes. Ensure prompt and complete cleanup of spills. Maintain sealed concrete floors. Ensure proper chemical and waste use, storage, and disposal/recycling. Follow label instructions. Ensure good housekeeping.

Recharge Region						
Agricultural Crop Land	Nitrate and SOCs from fertilizer, pesticides and herbicides. Pathogens (if grazing occurs)	Contaminants leaching into groundwater	***Not Rated-outside the Inventory Region***	- Intake depth of >50 feet below static water level.	***Not Rated-outside the Inventory Region***	Encourage use of agricultural best management practices (BMPs) in the recharge region
Transportation Corridors: Highways, Roads, and Railroads	Pesticides, fertilizers, VOCs, SOCs, other	Spills, routine spraying, storm water runoff, infiltration into ground water	***Not Rated-outside the Inventory Region***	-Down gradient to well -Intake depth of >50 feet below static water level.	***Not Rated-outside the Inventory Region***	Emergency planning, training of local emergency response personnel use of levees and engineered storm drainage to carry any spills away and prevent infiltration into ground, cooperation with railroad managers or MDOT to reduce herbicide use.
Landfill	Various	Contaminants leaching into groundwater	***Not Rated-outside the Inventory Region***	-Down gradient to well - Intake depth of >50 feet below static water level.	***Not Rated-outside the Inventory Region***	Contact DEQ's Waste and Underground Tank Management Bureau (406-444-5300) to review closure permit requirements (if any) and to find out if site assessment or cleanup is pending or completed.

Notes: The PWS well are assumed to be drawing water from a confined aquifer and the wells are not clearly sealed is not or through the confining units above the confined aquifer. This is because the lithologic logs don't indicate any sealing occurred. It is a conservative assumption that the wells are not well sealed, which will increase the hazard of any contaminat sources within the Inventory Region (see Table 4).

VOCs - Volatile organic compounds (i.e. solvents, fuel components)

SOCs - Synthetic Organic Compounds (i.e. pesticides, herbicides, plasticizers)

BMPs- Best Management Practices

The susceptibility assessment results for each significant potential contaminant source identified within the Control Zone and Inventory Region are described below. Sources located outside the Inventory region but within the Recharge Region may still pose a threat over time, but are not discussed in detail.

Agricultural lands – The potential hazard imposed by SOCs, herbicides, pesticides, pathogens, and nitrate originating from agricultural lands within the Inventory region is moderate. The thick unsaturated zone and the depth of the well intake represent two barriers hence susceptibility is low. In the recharge region the percentage of agricultural land is high and presents an un-quantified hazard to the water supply due to the potential for nitrate or pesticide contamination. It should be noted that nitrate in the Peerless School well appears somewhat elevated.

Individual Domestic Septic Systems – The overall density of septic systems within the inventory region is high (15%), moderate (25%) and low. Two barriers were identified; susceptibility is assigned a moderate to low rating.

Shop and Chemical Storage Area - The potential hazard imposed by the chemicals is a high hazard. There are two barriers, the unsaturated thickness overlying the aquifer and depth of the well intake that makes susceptibility a moderate rating.

Large Capacity On-Site Septic System Serving the School - The location of the septic system is unknown making it a high hazard to the water supply. The thick unsaturated zone and the depth of the well intake represent two barriers hence susceptibility is moderate.

MANAGEMENT RECOMMENDATIONS

It should be noted that even small releases of some chemicals in close proximity to a public water supply well can have significant negative impact on water quality, and therefore are a significant threat to the public water supply. Steps can be taken to reduce the likelihood of releases in the source water for the PWS or in the vicinity of the sources. Some of these steps (considered management recommendations) are listed below.

Some of these management recommendations are detailed in the susceptibility table for the Peerless School District 02 PWS (Table 7). If these, and other, management recommendations are implemented; they may be considered additional barriers that will reduce the susceptibility of the intake to specific sources and contaminants.

Restrict Chemical Handling, Use and Storage in the Control Zone for the Well – The PWS should restrict chemical handling, use and storage within the 100' radius Control Zone of the production well. Ongoing training should be provided to promote safe handling and proper storage, transport, use, and disposal of hazardous materials if these materials are used. Regular maintenance and inspections of the USTs, diesel generators, and concrete floors, should be conducted to protect the area from diesel or other chemical spills. Any USTs that are out of service should be removed and soils should be tested to evaluate potential impact from historic spills or leaks. Conduct tank and line integrity testing for active tanks and ensure proper operation and maintenance.

Agricultural Best Management Practices (BMPs) – The water system should encourage local land users to utilize BMPs to keep the livestock concentrations low in the inventory

region and to keep livestock away from the creeks especially immediately upgradient from the wells.

High Septic System Density Areas –Residents can be encouraged on proper operation and maintenance of septic systems to reduce the susceptibility of the PWS's drinking water to septic wastes. Installation of advanced septic treatment systems such as sand filters can limit contamination from new rural residential development.

Education - Educational workshops provided to the general public by the county or state promote safe handling and proper storage, transport, use, and disposal of hazardous materials. Ongoing training provided to designated emergency personnel would promote the efficiency and effectiveness of emergency responses to hazardous material spills. Likewise, education workshops provided to rural homeowners will promote the proper maintenance and replacement of residential septic systems. The EPA and the State of Montana can provide educational materials on these topics.

Emergency Response Plan – Several counties have compiled Emergency Response Plans that were then adopted by the local communities. The usefulness and effectiveness of a response plan are maximized if it contains a clear listing of all emergency contacts, emergency numbers, and resources available within the county to respond to an emergency situation, such as a hazardous material spill.

CHAPTER 5
MONITORING WAIVERS

WAIVER RECOMMENDATION

The Peerless School District 02 PWS does not currently have waivers. Peerless School District may be eligible for Phase 2 and 5 iorganics, which includes barium, cadmium, chromium, fluoride, mercury, selenium, antimony, thallium, beryllium, nickel and VOC's. The waiver allows Peerless School District 02 to collect one sample round for these constituents every 9-year cycle (the standard is one sample round per 3-year cycle). Information on susceptibility and use waivers is provided in this section to give the PWS operator an opportunity to consider if waives may be feasible.

Before a susceptibility or use wavier is requested, the PWS Operators are encouraged to carefully review the following section on Monitoring Waiver Requirements. If after reviewing this section it is determined that an additional waivers are feasible, the PWS should submit a letter to DEQ requesting the specific monitoring waivers. If requested by DEQ, the PWS may also need to provide additional information regarding chemical use in the area within the Inventory Region. Table 7 shows how identified potential contaminant sources affect the eligibility for monitoring waivers.

Table 8. Susceptibility Assessment as it relates to Waiver Eligibility for Significant Potential Contaminant Sources in the Inventory Region

Source	Contaminant	Susceptibility	Waiver Eligibility
Agricultural Cropped Areas	Nitrates and SOCs	**High**	Chemical use may preclude waivers for some chemicals. The PWS should confirm chemical use/storage history by land parcel.
Septic Systems	Nitrates, pathogens, metals, VOCs, SOCs, and others	**High**	Waivers are not available for pathogens and nitrate
Buildings that may use/store hazardous materials	VOCs, SOCs, and other chemicals	**High**	Chemical use may preclude waivers for some chemicals. Peerless School District PWS should confirm chemical use/storage history by land parcel

MONITORING WAIVER REQUIREMENTS

The 1986 Amendments to the Safe Drinking Water Act require that community and non-community PWSs sample drinking water sources for the presence of volatile organic chemicals (VOCs) and synthetic organic chemicals (SOCs). The US EPA has authorized states to issue monitoring waivers for the organic chemicals to systems that have completed an approved waiver application and review process. All PWSs in the State of Montana are eligible for consideration of monitoring waivers for several organic chemicals. The chemicals diquat, endothall, glyphosate, dioxins, ethylene dibromide (EDB), dibromochloropropane (DBCP), and polychlorinated biphenyls are excluded from monitoring requirements by statewide waivers.

Use Waivers

A Use Waiver can be allowed if through a vulnerability assessment, it is determined that specific organic chemicals were not used, manufactured, or stored in the area of a water source (or source area). If certain organic chemicals have been used, or if the use is unknown, the system would be determined to be vulnerable to organic chemical contamination and ineligible for a Use Waiver for those particular contaminants.

Susceptibility Waivers

If a Use Waiver is not granted, a system may still be eligible for a Susceptibility Waiver, if through a vulnerability assessment it is demonstrated that the water source would not be susceptible to contamination. Susceptibility is based on prior analytical or vulnerability assessment results, environmental persistence, and transport of the contaminants, natural protection of the source, wellhead protection program efforts, and the level of susceptibility indicators (such as nitrate and coliform bacteria). The vulnerability assessment of a surface water source must consider the watershed area above the source, or a minimum fixed radius of 1.5 miles upgradient of the surface water intake. PWSs developed in unconfined aquifers should use a minimum fixed radius of 1.0 mile as an area of investigation for the use of organic chemicals. Vulnerability assessment of spring water sources should use a minimum fixed radius of 1.0 mile as an area of investigation for the use of organic chemicals. Shallow groundwater sources under the direct influence of surface water (GWUDISW) should use the same area of investigation as surface water systems; that is, the watershed area above the source, or a minimum fixed radius of 1.5 miles upgradient of the point of diversion. The purpose of the vulnerability assessment procedures outlined in this section is to determine which of the organic chemical contaminants are in the area of investigation.

Given the wide range of landforms, land uses, and the diversity of groundwater and surface water sources across the state, additional information is often required during the review of a waiver application. Additional information may include will logs, pump test data, or water quality monitoring data from surrounding public water systems; delineation of zones of influence and contribution to a well; time-of-travel or attenuation studies; vulnerability mapping; and the use of computerized groundwater flow and transport models. DEQ's PWS Section and DEQ's Source Water Protection Program will conduct review of an organic chemical monitoring waiver application. Other state agencies may be asked for assistance.

Susceptibility Waiver for Confined Aquifers

Confined groundwater is isolated from overlying material by relatively impermeable geologic formations. A confined aquifer is subject to pressures higher than atmospheric pressure that would exist at the top of the aquifer if the aquifer were not geologically confined. A well that is drilled through the impervious layer into a confined aquifer will enable the water to rise in the borehole to a level that is proportional to the water pressure (hydrostatic head) that exists at the top of a confined aquifer.

The susceptibility of a confined aquifer relates to the probability of an introduced contaminant to travel from the source of contamination to the aquifer. Susceptibility of an aquifer to contamination will be influenced by the hydrogeologic characteristics of the soil, vadose zone (the unsaturated geologic materials between the ground surface and the aquifer), and confining layers. Important hydrogeologic controls include the thickness of

the soil, the depth of the aquifer, the permeability of the soil and vadose zones, the thickness and uniformity of low permeability and confining layers between the surface and the aquifer, and hydrostatic head of the aquifer. These factors will control how readily a contaminant will infiltrate and percolate toward the groundwater.

The Susceptibility waiver has the objective of assessing the potential of contaminants reaching the groundwater used by the PWS. A groundwater source that appears to be confined from surface infiltration in the immediate area of the wellhead may eventually be affected by contaminated groundwater flow from elsewhere in the recharge area. Contaminants could also enter the confined aquifer through improper well construction or abandonment where the well provides a hydraulic connection from the surface to the confined aquifer. The extent of confinement of an aquifer is critical to limiting susceptibility to organic chemical contamination. Regional conditions that define the confinement of a groundwater source must be demonstrated by the PWS in order to be considered for a confined aquifer susceptibility waiver. Confinement of an aquifer can be demonstrated by pump test data (storage coefficient), geologic mapping, and well logs. Site-specific information is required to sufficiently represent the recharge area of the aquifer and the zone of contribution to the PWS well. The following information should be provided:

- Abandoned wells in the region (zone of contribution to the well),
- Other wells in the region (zone of contribution to the well),
- Nitrate/Coliform bacteria analytical history of the PWS well, and
- Organic chemical analytical history of the PWS well.

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Western Regional Climate Center Montana Climate Summaries. wrcc@dri.edu

GLOSSARY*

Acute Health Effect. A negative 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.

Barrier. A physical feature or management plan that reduces the likelihood of contamination of a water source from a potential contaminant source

Best Management Practices (BMPs). Methods for various activities that have been determined to be the most effective, practical means of preventing or reducing non-point source pollution.

Biennial Reporting System (BRS). An EPA database that contains information on hazardous waste sites. The data can be accessed through the EPA Envirofacts website.

Chronic Health Effect. A negative health effect in which symptoms develop over an extended period of time.

Class V Injection Well. Any pit or conduit into the subsurface for disposal of waste waters. The receiving unit for an injection well typically represents the aquifer, or water-bearing interval.

Coliform Bacteria. A general type of bacteria found in the intestinal tracts of animals and humans, and also in soils, vegetation and water. Their presence in water is used as an indicator of pollution and possible contamination by pathogens.

Comprehensive Environmental Cleanup and Responsibility Act (CECRA). Passed in 1989 by the Montana State Legislature, CECRA provides the mechanism and responsibility to clean up hazardous waste sites in Montana.

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.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). A database that provides information about specific sites through the EPA Envirofacts website.

Confined Animal Feeding Operation (CAFO). Any agricultural operation that feeds animals within specific areas, not on rangeland. Certain CAFOs require permits for operation.

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 present above a confined aquifer that inhibits the flow of water and maintains the pressure of the groundwater in the aquifer. The physical properties of a confining unit may range from a five-foot thick clay layer to shale that is hundreds of feet thick.

Delineation. The process of determining and mapping source water protection areas.

Glacial. Of or relating to the presence and activities of ice or glaciers. Also, pertaining to distinctive features and materials produced by or derived from glaciers.

Geographic Information Systems (GIS). A computerized database management and mapping system that allows for analysis and presentation of geographic data.

Hardness. Characteristic of water caused by presence of various calcium and magnesium salts. Hard water may interfere with some industrial processes and prevent soap from lathering.

Hazard. A relative measure of the potential of a contaminant from a facility or associated with a land use to reach the water source for a public water supply. The location, quantity and toxicity of significant potential contaminant sources determine hazard.

Hydraulic Conductivity. A constant number or coefficient of proportionality that describes the rate water can move through an aquifer material.

Hydrology. The study of water and how it flows in the ground and on the surface.

Hydrogeology. The study of geologic formations and how they effect groundwater flow systems.

Inventory Region. A source water management area for groundwater systems that encompasses the area expected to contribute water to a public water supply within a fixed distance or a specified three year groundwater travel time.

Lacustrine. Pertaining to, produced by, or formed in a lake or lakes.

Large Capacity Septic System. Defined by Underground Injection Control regulations as an on-site septic system serving 20 or more persons.

Leaking Underground Storage Tank (LUST). A release from a UST and/or associated piping into the subsurface.

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 to establish concentrations of contaminants in drinking water that are protective of human health.

Montana Bureau of Mines and Geology – Groundwater Information Center (MBMG/GWIC). The database of information on all well drilled in Montana, including stratigraphic data and well construction data, when available.

Montana Pollutant Discharge Elimination System (MPDES). A permitting system that utilizes a database to track entities that discharge wastewater of any type into waters of the State of Montana.

National Pollutant Discharge Elimination System (NPDES). A national permitting system that utilizes a database to track entities that discharge wastewater into waters of the United States.

Nitrate. An important plant nutrient and type of inorganic fertilizer that can be a potential contaminant in water at high concentrations. In water the major sources of nitrates are wastewater treatment effluent, 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. Examples of nonpoint- source pollution include agriculture, forestry, and run-off from city streets. Nonpoint sources of pollution, such as the use of herbicides, can concentrate low levels of these chemicals into surface and/or groundwaters at increased levels that may exceed MCLs.

Pathogens. A microorganism typically found in the intestinal tracts of mammals, capable of producing disease.

Phase II (and IIb) Rules. EPA updated or created legal limits on 38 contaminants. The rules became effective July 30, 1992 and January 1, 1993. Some of these contaminants are frequently-applied agricultural chemicals such as nitrate and others are industrial solvents.

Phase V Rule. EPA set standards for 23 contaminants in addition to those addressed by the Phase II Rules. The Phase V Rule became effective January 17, 1994. Some of these contaminants include inorganic chemicals such as cyanide and other Phase V contaminants are pesticides that enter water supplies through run-off from fields where farmers have applied them or by leaching through the soil into groundwater. Six are probable cancer-causing agents. Others can cause liver and kidney damage, or problems of the nervous system and brain.

Point Source. A stationary location or a fixed facility from which pollutants are discharged. This includes any single identifiable source of pollution, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fracture, container, rolling stock (tanker truck), or vessel or other floating craft, from which pollutants are or may be discharged.

Pollutant. Generally, any substance introduced into the environment that adversely affects the usefulness of a resource (e.g. groundwater used for drinking water).

Permit Compliance System (PCS). An EPA database that provides information on the status of required permits for specific activities for specific facilities. The data can be accessed through the EPA Envirofacts website.

Public Water System (PWS). A system that provides water for human consumption through 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. An area in which water is absorbed that eventually reaches the zone of saturation in one or more aquifers. As a source water management region, the term generally describes 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.

Resource Conservation and Recovery Information System (RCRIS). Is a database that provides information about specific sites through the EPA Envirofacts website.

Secondary Maximum Contaminant Levels (SMCL). The maximum concentration of a substance in water that is recommended to be delivered to users of a public water supply based on aesthetic qualities. SMCLs are non-enforceable guidelines for public water supplies, set by EPA under authority of the Safe Drinking Water Act. Compounds with SMCLs may occur naturally in certain areas, limiting the ability of the public water supply to treat for them.

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. Any surface water, spring, or groundwater source that provides water to a public water supply.

Source Water Delineation and Assessment Report (SWDAR). A report for a public water supply that delineates source water protection areas, provides an inventory of potential contaminant sources within the delineated areas, and evaluates the relative susceptibility of the source water to contamination from the potential contaminant sources under “worst-case” conditions.

Source Water Protection Areas. For surface water sources, the land and surface drainage network that contributes water to a stream or reservoir used by a public water supply. For groundwater sources, the area within a fixed radius or three-year travel time from a well, and the land area where the aquifer is recharged.

Spill Response Region. A source water management area for surface water systems that encompasses the area expected to contribute water to a public water supply within a fixed distance or a specified four-hour water travel time in a stream or river.

Standard Industrial Classification (SIC) Code. A method of grouping industries with similar products or services and assigning codes to these groups.

Static Water Level (SWL). Water level elevation in a well when the pump is not operating.

Susceptibility (of a PWS). The relative 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.

Total Maximum Daily Load (TMDL). The total pollutant load to a surface water body from point, nonpoint, and natural sources. The TMDL program was established by section 303(d) of the Clean Water Act to help states implement water quality standards.

Toxicity. The quality or degree of being poisonous or harmful to plants, animals, or humans.

Toxicity Characteristic Leachate Procedure. A test designed to determine whether a waste is hazardous or requires treatment to become less hazardous.

Toxic Release Inventory (TRI). An EPA database that compiles information about permitted industrial releases of chemicals to air and water. Information about specific sites can be obtained through the EPA Envirofacts website.

Transmissivity. A number that describes the ability of an aquifer to transmit water. The transmissivity is determined by multiplying the hydraulic conductivity time the aquifer thickness.

Turbidity. The cloudy appearance of water caused by the presence of suspended matter.

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, and the associated plumbing system.

Volatile Organic Compounds (VOC). Chemicals such as petroleum hydrocarbons and solvents or other organic chemicals that evaporate readily to the atmosphere.

Watershed. The region drained by, or contributing water to, a stream, lake, or other water body of water.

* With the exception of the definitions for Lacustrine, Phase II and Phase V Rules, and Standard Industrial Classification Code, definitions were adapted from EPA's Term References System (formerly known as Glossary of Selected Terms and Abbreviations) which can be found at: http://www.epa.gov/trs/index.htm . The definitions of glacial and lacustrine were taken from the Glossary of Geology by Robert L. Bates and Julia A. Jackson.

The definitions for Phase II and Phase V Rules were adapted from:

http://www.epa.gov/OGWDW/source/therule.html#PhaseII
http://www.epa.gov/OGWDW/source/therule.html#PhaseV

The definition for Standard Industrial Classification Code was adapted from:
EPA/Office of Enforcement and Compliance Assurance: Guide to Environmental Issues: Glossary of Terms & Acronyms *Term Detail*

Appendix A
PWS Sanitary Survey

The Cadmus Group, Inc
2620 Colonial Drive, Suite A
Helena, MT 59601
Telephone: 406-443-9194
Fax: 406-443-9197

SDWIS 1/28/03 FB

July 19, 2002

Mr. Theodore Birkland
Peerless School District 02
P.O. Box 475
Peerless, MT 59253

DANIELS COUNTY

RE: PWSID # MT001197 – PEERLESS SCHOOL DIST 02 SANITARY SURVEY INSPECTION

Dear Mr. Birkland:

On May 14, 2002, I conducted a sanitary survey of the Peerless School Public Water Supply (PWS) system. I would like to thank you for your assistance with this inspection. The PWS serves the school and school owned buildings on the complex site. This system is classified as a non-transient non-community system due to the regularity but not permanent nature of the population served. This was a routine sanitary survey conducted under contract with the Montana Department of Environmental Quality (MDEQ) Water Quality Division. The State completes sanitary surveys on all Montana public water supply systems at about 3-5 year intervals.

I work for The Cadmus Group, Inc. and Cadmus is a contractor for the MDEQ. The following report contains descriptions of each of the sections of the water system; any recommendations for the system are numbered at the end of the report.

Well #1

Well 1 is located adjacent to the school on the west side. According to the Ground Water Information Center at the Bureau of Mines and Geology, this well was drilled in 1952. The 4-inch well is 224 feet deep. The well yield was unrecorded.

Well #2

Well 2 is located to the south of the north teachers' apartments. According to the Ground Water Information Center at the Bureau of Mines and Geology, this well was drilled in 1975. The 6-inch well is 145 feet deep. The well yield was recorded as 11 gpm.

Distribution System

The piping between the buildings appears to be a combination of galvanized and plastic. The piping within the buildings appears to be a combination of galvanized and copper. The old report indicated that there were 7 service connections in the complex. I was told that the two mobile homes have been abandoned but not moved and the service lines are still in place.

Date Entered FB

Recommendations for Peerless School District 02

1. **Well 1 and 2:** I was unable to obtain complete well logs for the wells. It would be beneficial for you to locate logs for the wells documenting the construction of the wells. If you obtain one, please forward a copy to this office to complete the PWS file.

2. **Service lines:** If the mobile homes are moved off site and the service lines are not used, make sure that you properly abandon the lines to prevent cross connections and/or potential contamination.

3. **Backflow Prevention Assemblies:** We discussed the need to periodically test the backflow devices in the school. The state recommends that the devices be inspected and tested annually. Enclosed is a list of approved testers.

4. **Monitoring:** The monitoring history for this system is acceptable. We discussed the sampling requirements for your system and I left you a copy of the DEQ circular *Summary of Drinking Water Regulations for Non-Transient Non-Community Water Supplies*. If you have any further questions regarding monitoring, please feel free to call me or the State DEQ for assistance.

Please contact me if you have questions about this report or any other concerns. Note that there are items not mentioned in this letter that are covered in the report. I am providing copies of this letter, the report, and the chemical results (if applicable) to the DEQ Drinking Water Program. You may also call DEQ at (406) 444-4400 with any questions you may have. Thank you very much for your time and cooperation during my visit.

Sincerely,

Joe Steiner
The Cadmus Group, Inc.
jsteiner@cadmusgroup.com

cc: County Sanitarian
Sanitary Survey file

SANITARY SURVEY FORM - INVENTORY Page 1 of 9

1/11/2001

DATE OF SURVEY: 5-14-2002 | COUNTY: DANIELS | SURVEYOR NAME: JOE STEINER

PWSID: 01197 | SYSTEM NAME: PEERLESS SCHOOL DIST 02

(SYSTEM REPRESENTATIVE): THEODORE BIRKLAND | (OTHER REPRESENTATIVE): DUSTIN HILL

SYSTEM ADDRESS (Primary Address)
Addressee: PEERLESS SCHOOL DIST 02
Street: PO BOX 475
City: PEERLESS State: MT Zip: 59253
System Phone: (406) 893-4377 Fax: ( )

SYSTEM OWNER (Owners Address)
Addressee: PEERLESS SCHOOL DIST 02
Street: (SAME)
City: State: Zip:
Owner Phone: ( ) Fax: ( )

LOCATION OF SYSTEM
Nearest City: PEERLESS Description or Physical Address

OPERATOR OF SYSTEM
Name: THEODORE BIRKLAND
Certified Operator ☐ No ☒ Yes If, yes
Certification # 5239 Phone (406) 893-4377

ALTERNATE OPERATOR OF SYSTEM
Name:
Certified Operator ☐ No ☐ Yes If, yes
Certification # Phone # ( )

SYSTEM STATUS
☒ A = Active ☐ P = Pending *(Add New System)*
☐ I = Inactive

SYSTEM CLASS
☐ C = Community
☒ NTNC = Non-Transient Non-Community
☐ NC = Transient Non-Community

Total Service Connections: Residential / Non-Transient: 1
Transient: 7

Total Active Connections: Residential / Non-Transient: 1
Transient: 5

Service Connections Metered? ☐ Yes ☒ No %
Metered

Resident Population — Number of permanent residents utilizing PWS daily: Summer: ____ Winter: ____

Non-Transient Population — Number of non-transient persons utilizing PWS daily: Summer: ____ Winter:

Transient Population — Number of transient persons served by PWS daily: Summer: 2 Winter: 46

OWNER TYPE
☐ 1 Federal Government
☐ 2 Private Subdivision, Investor, Trust, Cooperative, Water Association, etc.
☐ 3 State Government
☒ 4 Local Government Authority, Commission, District, Municipality, City, etc.
☐ 5 Mixed Public/Private
☐ 6 Native American Indian Tribes & Reservations

SERVICE AREA CHARACTERISTICS LIST

☐ DC Day Care Center
☐ DI Dispenser
☐ HA Homeowners Assoc.
☐ HM Hotel/Motel
☐ HR Highway Rest Area
☐ IA Industrial/Agricultural
☐ IC Interstate Carrier
☐ IN Institution
☐ MF Medical Facility
☐ MH Mobile Home Park
☐ MP Mobile Home Park, Principle Residence
☐ MU Municipality
☐ OA Other Area
☐ ON Other Non-Transient Area
☐ OR Other Residential Area
☐ OT Other Transient Area
☐ PA Recreation Areas
☐ RA Residential Area
☐ RE Retail Employees
☐ RS Restaurant
☒ SC School
☐ SI Sanitary Improvement District
☐ SK Summer Camp
☐ SR Secondary Residences
☐ SS Service Station
☐ SU Subdivision
☐ WB Water Bottler
☐ WH Wholesaler (Sells Water)

Service Category Description

Comments:

SCHOOL COMPLEX: 35 STUDENTS
11 STAFF

WATER TO:
- SCHOOL
- TEACHER Apt
- GRADE SCHOOL
- MUSIC BUILDING
- SHOP
- HOUSE
- 2 CONNECTIONS TO ABANDONED MOBILE HOMES

SANITARY SURVEY FORM - WATER SYSTEM FACILITIES

Water System Facilities (WSF) numbers are WSF Type Codes plus an assigned number. (i.e. source facility numbering starts with 002 and all non-source facilities start with 001). See instruction sheet for a list of WSF Type Codes. When a source is operational it is considered **A**ctive, this includes systems that are seasonal. **I**nactive sources are those which are shut down but can return to active status, such as a system out of business. **P**roposed sources are those that have been identified through the Plan Review process, but are not connected to the water system.

*A **water source facility** is a well, spring, intake, infiltration gallery or consecutive connections from which a system draws or purchases water:*

Total Number of Source Facilities 2

WATER SYSTEM FACILITIES SUMMARY (WSF)

WSF ID	Facility Name	Water Type Code	Purchased	Seller PWSID
DS 001	Distribution System			
WL002	WELL #1	GW	☐ Yes ☐ No	
WL003	WELL #2	GW	☐ Yes ☐ No	
PC001	PRESSURE TANK IN SCHOOL		☐ Yes ☐ No	
PC002	" " TEACHER APT		☐ Yes ☐ No	
CH001	COMMON LINE		☐ Yes ☐ No	
			☐ Yes ☐ No	
			☐ Yes ☐ No	
			☐ Yes ☐ No	
			☐ Yes ☐ No	
			☐ Yes ☐ No	

Description of Water System Facility flow:

WELL 1 (WL002) AND WELL 2 (WL003) ARE PUMPED TO A COMMON HEADER (CH001). THE WATER FLOWS TO THE VARIOUS BUILDINGS W/PRESSURE MAINTAINED BY 2 PRESSURE TANKS (PC001 & PC002).

Example: Well 1(WL002) is pumped into pumphouse where chlorine is applied (TP001) and from there to the storage tank (ST001). The treated water flows by gravity to the Distribution System (DS001)

EMERGENCY POWER

Does the system have emergency power? ☐ Yes ☒ No

If yes, what type:

Frequency of testing: _____

Record of primary power failures: _____ in last year.

Switchover: ☐ Automatic ☐ Manual

Comments:

SANITARY SURVEY FORM - WELLS & PUMPS Page 3 of 9

(Please copy this sheet for additional wells & pumps)

COMPLETE ONE SECTION FOR EACH SOURCE — **STATUS OF SOURCE** ☒ (A)ctive ☐ (I)nactive ☐ (P)roposed

WSF ID WL002 (These are state assigned identification numbers) Entry Point ID EP 502

Source Name WELL #1 (Name of Source - Example: Well 1 or South well, etc.)

Location of Water Source (TRS or street address) ADJACENT TO SCHOOL (WEST SIDE

Entry Point Name EP WELL 1&2 (Name of EP - Example: Entry point for North Well 1 & South Well 2)

Location of Entry Point WH SCHOOL

Available ☒ Perm ☐ Emerg ☐ Interim ☐ Seasonal ☐ Other
If seasonal: _____ to _____

GWUDISW PA Completed ☒ Yes ☐ No * GWIC

Log Available? ☒ Yes* ☐ No

Average Production UNK (indicate units)

Maximum Production UNK (indicate units)

Date Drilled 1/1/1952 (if well, date drilled)

Casing Size 4" (size of casing installed in well)

Case Depth UNK (depth of casing installed in well)

Well Depth 224 (depth of well expressed in feet)

Grout Depth UNK (depth of grout used to seal well walls)

Log SWL UNK (static) expressed in feet below ground elevation

Log PWL UNK (pumping) expressed in feet below ground elevation:

Pump Capacity UNK (capacity of pump installed expressed in gallons per min)

Intake Type UNK (type of intake mechanism)

Screened Interval UNK (expressed in feet below ground elevation)

Well Yield UNK (pump tested in gallons per minute)

Latitude 48.47.06 (latitude of source)

Longitude 105.49.99 (longitude of source)

WELLS - COMPLETE ONE SECTION FOR EACH SOURCE

WSF ID WL002 (WELL 1) (Example: WL002)

Is well site subject to flooding? ☐ Yes ☒ No

Is well located in proximity of a potential source of pollution (includes surface water, known chemical spills, agricultural use, etc.)? ☐ Yes ☒ No

If yes . . explain _____

Does casing extend at least ☒ 18 inches above outside ground level; ☐ 12 inches above finished floor inside well house; and ☐ 3 feet above 100 year flood elevation? (Check for appropriate distance) ☒ Yes ☐ No

Is top of the well casing properly sealed? (sanitary seal) ☒ Yes* ☐ No

Is the well vent properly screened and terminated in a downward position? ☐ Yes ☒ No

Does well have suitable sampling tap? WH SCHOOL ☐ Yes ☒ No

Are check valves, blow-off valves and water meters maintained and operating properly? N.A ☐ Yes ☐ No

Is upper termination of well protected (housed or fenced)? WH SCHOOL YARD ☒ Yes ☐ No

Is intake located below the maximum drawdown? ☒ Yes ☐ No

PUMPS - COMPLETE ONE SECTION FOR EACH SOURCE

WSF ID WL 002 (WELL 1)

Type SUBMERSIBLE 3/4 HP (example: 30 hp line shaft turbine)

Rated Capacity ~10 GPM

Are pumps operable? ☒ Yes ☐ No

How frequently has pumps(s) been replaced? AS NEEDED 1995 - REPLACED

Are backup pumps/motors provided? ☐ Yes ☒ No

Are controls functioning properly and adequately protected? ☒ Yes ☐ No

Do underground compartments have a drain? N.A ☐ Yes ☐ No

Is facility properly protected against trespassing and vandalism? ☒ Yes ☐ No

Are pump records maintained (amp, drawdown, discharge, pressure, maintenance schedule, manuals, etc.)? ☐ Yes ☒ No

Is the plumbing adequately painted to prevent excessive corrosion? ☒ Yes ☐ No

Is adequate heating, lighting, and ventilation provided? N.A ☐ Yes ☐ No

Is a preventive maintenance program in operation? ☐ Yes ☒ No

Are recommended spare parts on hand? N.A. ☐ Yes ☒ No

Comments: (Such as, detailed information on any items with identified deficiencies)

* CASING WAS SEALED WITH CONCRETE FILLED CAP.

Comments: (Such as, detailed information on any items with identified deficiencies)

SANITARY SURVEY FORM - WELLS & PUMPS Page 4 of 9

(Please copy this sheet for additional wells & pumps)

COMPLETE ONE SECTION FOR EACH SOURCE — **STATUS OF SOURCE** ☒ (A)ctive ☐ (I)nactive ☐ (P)roposed

WSF ID WL 003 (These are state assigned identification numbers) — *Entry Point ID* EP502

Source Name WELL 2 (Name of Source - Example: Well 1 or South well, etc.)

Location of Water Source (TRS or street address) So. TEACHERS Apt

Entry Point Name EP WELL 1 & 2 (Name of EP - Example: Entry point for North Well 1 & South Well 2)

Location of Entry Point IN TEACHERS APT.

Available ☒ Perm ☐ Emerg ☐ Interim ☐ Seasonal ☐ Other
If seasonal: _____ to _____

GWUDISW PA Completed ☒ Yes ☐ No * GWIC

Log Available? ☒ Yes* ☐ No

Average Production UNK (indicate units)

Maximum Production UNK (indicate units)

Date Drilled 1/1/1975 (if well: date drilled)

Casing Size 6" (size of casing installed in well)

Case Depth UNK (depth of casing installed in well)

Well Depth 145' (depth of well expressed in feet)

Grout Depth UNK (depth of grout used to seal well walls)

Log SWL 100 FEET (static) expressed in feet below ground elevation

Log PWL 125 FEET (pumping) expressed in feet below ground elevation

Pump Capacity UNK (capacity of pump installed expressed in gallons per min)

Intake Type UNK (type of intake mechanism)

Screened Interval (expressed in feet below ground elevation)

Well Yield 11 GPM (pump tested in gallons per minute)

Latitude 48.47.06 (latitude of source)

Longitude 105.49.99 (longitude of source)

WELLS - COMPLETE ONE SECTION FOR EACH SOURCE

WSF ID WL003 (Example: WL002)

Is well site subject to flooding? ☐ Yes ☒ No

Is well located in proximity of a potential source of pollution (includes surface water, known chemical spills, agricultural use, etc.)? ☐ Yes ☒ No

If yes . . explain ____

Does casing extend at least ☒ 18 inches above outside ground level; ☐ 12 inches above finished floor inside well house; and ☐ 3 feet above 100 year flood elevation? (Check for appropriate distance) ☒ Yes ☐ No

Is top of the well casing properly sealed? (sanitary seal) ☐ Yes ☒ No

Is the well vent properly screened and terminated in a downward position? ☐ Yes ☒ No

Does well have suitable sampling tap? WH TEACHER APT ☐ Yes ☒ No

Are check valves, blow-off valves and water meters maintained and operating properly? N/A ☐ Yes ☐ No

Is upper termination of well protected (housed or fenced)? ☒ Yes ☐ No

Is intake located below the maximum drawdown? N.A. ☐ Yes ☐ No

PUMPS - COMPLETE ONE SECTION FOR EACH SOURCE

WSF ID WL003

Type SUBMERSIBLE 3/4 HP (example: 30 hp line shaft turbine)

Rated Capacity ~10 GPM

Are pumps operable? ☒ Yes ☐ No

How frequently has pumps(s) been replaced? AS NEEDED LAST 1997

Are backup pumps/motors provided? ☐ Yes ☒ No

Are controls functioning properly and adequately protected? ☒ Yes ☐ No

Do underground compartments have a drain? N.A. ☐ Yes ☐ No

Is facility properly protected against trespassing and vandalism? ☒ Yes ☐ No

Are pump records maintained (amp, drawdown, discharge, pressure, maintenance schedule, manuals, etc.)? ☐ Yes ☒ No

Is the plumbing adequately painted to prevent excessive corrosion? ☒ Yes ☐ No

Is adequate heating, lighting, and ventilation provided? ☒ Yes ☐ No

Is a preventive maintenance program in operation? ☐ Yes ☒ No

Are recommended spare parts on hand? ☐ Yes ☒ No

Comments: (Such as, detailed information on any items with identified deficiencies)

____

Comments: (Such as, detailed information on any items with identified deficiencies)

SANITARY SURVEY FORM - PRESSURE CONTROL ASSEMBLIES Page 5 of 9

COMPLETE ONE SECTION FOR EACH PRESSURE CONTROL ASSEMBLY

CAPTIVE AIR TANK(S)

WSF ID PC001 Location, Description IN SCHOOL (FURNACE ROOM)

Is there a pressure relief valve? ☐ Yes ☒ No

Is there an operable pressure gauge? 56 psi ☒ Yes ☐ No

Does low pressure level provide adequate pressure? ☒ Yes ☐ No

Are there water-logged tanks? ☐ Yes ☒ No

Is the exterior surface of the tanks in good physical condition? ☒ Yes ☐ No

Can tank(s) be by-passed for repair? * ☒ Yes ☐ No

Pump run time _____

Time of Day _____ Cut-In _____ psi

Cut-Out _____ psi

Pump Type: _____

Comments: _____

* CAN BE ISOLATED AND USE ONLY TEACHER APT TANK

WELL X TROL - 302

PRESSURE TANK(S)

WSF ID _____ Location, Description _____

Is there an operable pressure gauge? ☐ Yes ☐ No

Does low pressure level provide adequate pressure? ☐ Yes ☐ No

Pump recharge rate _____ Cut-In _____ psi

Time of day _____ Cut-Out _____ psi

Is the tank water logged? ☐ Yes ☐ No

Is air charge system adequate? ☐ Yes ☐ No

Is the exterior surface of the pressure tank in good physical condition? ☐ Yes ☐ No

Is there a water level sight glass? ☐ Yes ☐ No

Is there a bottom drain valve? ☐ Yes ☐ No

Is there a pressure relief valve? ☐ Yes ☐ No

Can tank(s) be by-passed for repair? ☐ Yes ☐ No

Pump type:

Comments: _____

CAPTIVE AIR TANK(S)

WSF ID PC002 Location, Description IN TEACHER APT BASEMENT

Is there a pressure relief valve? ☐ Yes ☒ No

Is there an operable pressure gauge? 45 psi ☒ Yes ☐ No

Does low pressure level provide adequate pressure? ☒ Yes ☐ No

Are there water-logged tanks? ☐ Yes ☒ No

Is the exterior surface of the tanks in good physical condition? ☒ Yes ☐ No

Can tank(s) be by-passed for repair? ☒ Yes ☐ No

Pump run time _____

Time of Day _____ Cut-In _____ psi

Cut-Out _____ psi

Pump Type: _____

Comments: _____

WELL X TROL 203

PRESSURE TANK(S)

WSF ID _____ Location, Description _____

Is there an operable pressure gauge? ☐ Yes ☐ No

Does low pressure level provide adequate pressure? ☐ Yes ☐ No

Pump recharge rate _____ Cut-In _____ psi

Time of day _____ Cut-Out _____ psi

Is the tank water logged? ☐ Yes ☐ No

Is air charge system adequate? ☐ Yes ☐ No

Is the exterior surface of the pressure tank in good physical condition? ☐ Yes ☐ No

Is there a water level sight glass? ☐ Yes ☐ No

Is there a bottom drain valve? ☐ Yes ☐ No

Is there a pressure relief valve? ☐ Yes ☐ No

Can tank(s) be by-passed for repair? ☐ Yes ☐ No

Pump type:

Comments: _____

SANITARY SURVEY FORM - MISCELLANEOUS Page 6 of 9

DISTRIBUTION SYSTEM EVALUATION

System description TWO WELLS INTERCONNECTED BY COMMON HEADER

System drawings available? ☐ Yes ☒ No

Lines adequately sized? ☒ Yes ☐ No

Adequate pressure maintained? ☒ Yes ☐ No

Mains subject to freezing? ☐ Yes ☒ No

Distribution system leaks? ☐ Yes ☒ No

Cross-connections noted? ☐ Yes ☒ No

Comments:

RPZ ON FURNACE - OPERATOR DID NOT KNOW WHEN LAST INSPECTED

SAFETY

Note any safety deficiencies (consider items such as ladders, tank supports, guards on rotating electrical equipment, lightning protection for pumps, etc.)

———

MONITORING EVALUATION

Bacti monitoring satisfactory? ☒ Yes ☐ No

Familiar with repeat sampling? ☒ Yes ☐ No

Chemical monitoring satisfactory? ☒ Yes ☐ No

Monitoring records maintained? ☒ Yes ☐ No

Bacti Sample Site Plan submitted to state? (Community Systems Only) N.A. ☐ Yes ☐ No

Did Surveyor take a bacteriological sample? ☐ Yes ☒ No

If Yes,

Date of Sample(s): _____ Time of Sample(s): ____

Sample Result(s)

Comments:

BACT SAMPLE COLLECTED IN FURNACE ROOM - NO SMOOTH RIMMED SAMPLING TAP

MANAGEMENT

Are personnel adequately trained? ☒ Yes ☐ No

Are operators properly certified? ☒ Yes ☐ No

Are there sufficient personnel? ☒ Yes ☐ No

Is an emergency plan available and workable? 2 WELLS ☒ Yes ☐ No

Are abandoned wells present? ☐ Yes ☒ No

Do abandoned wells appear to be properly abandoned? ☐ Yes ☐ No

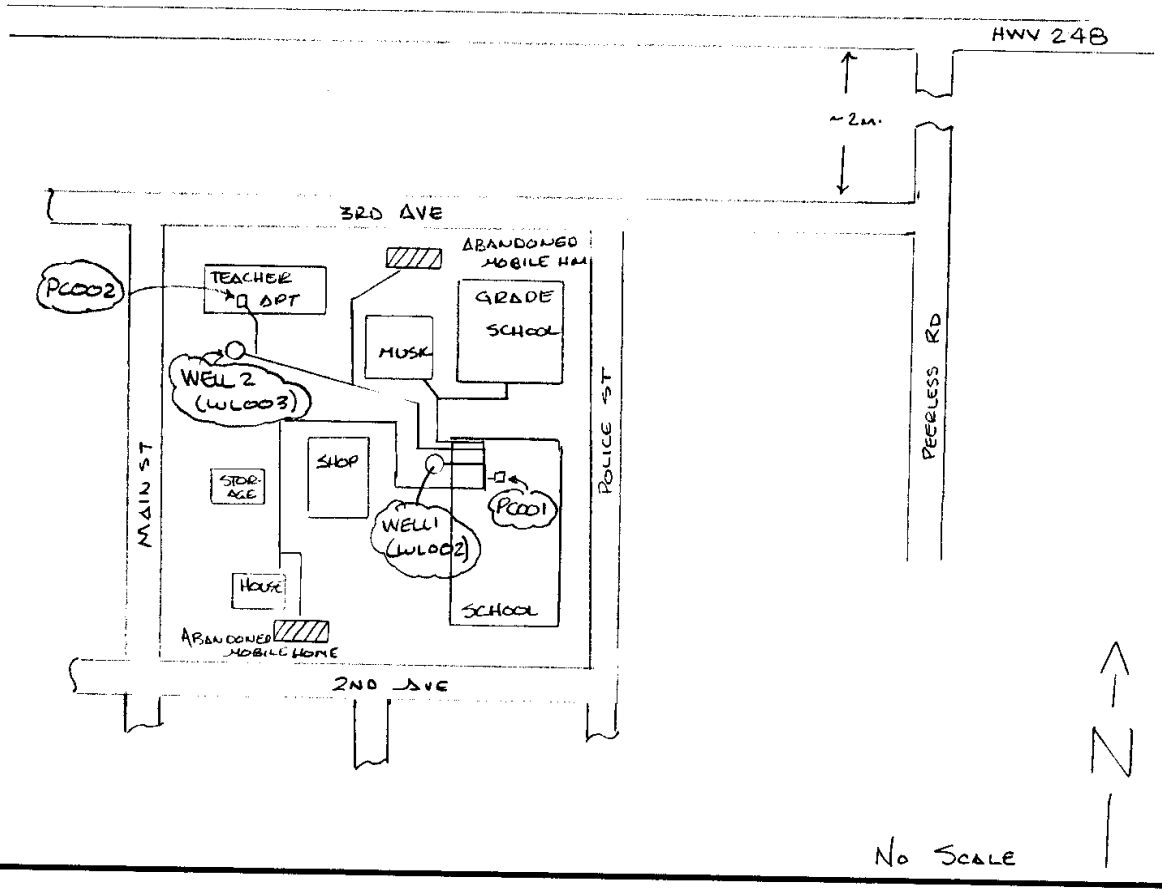
Is operator aware of rules regarding well abandonment? ☐ Yes ☐ No

Does the system have a current DEQ Monitoring Schedule? ☐ Yes ☒ No

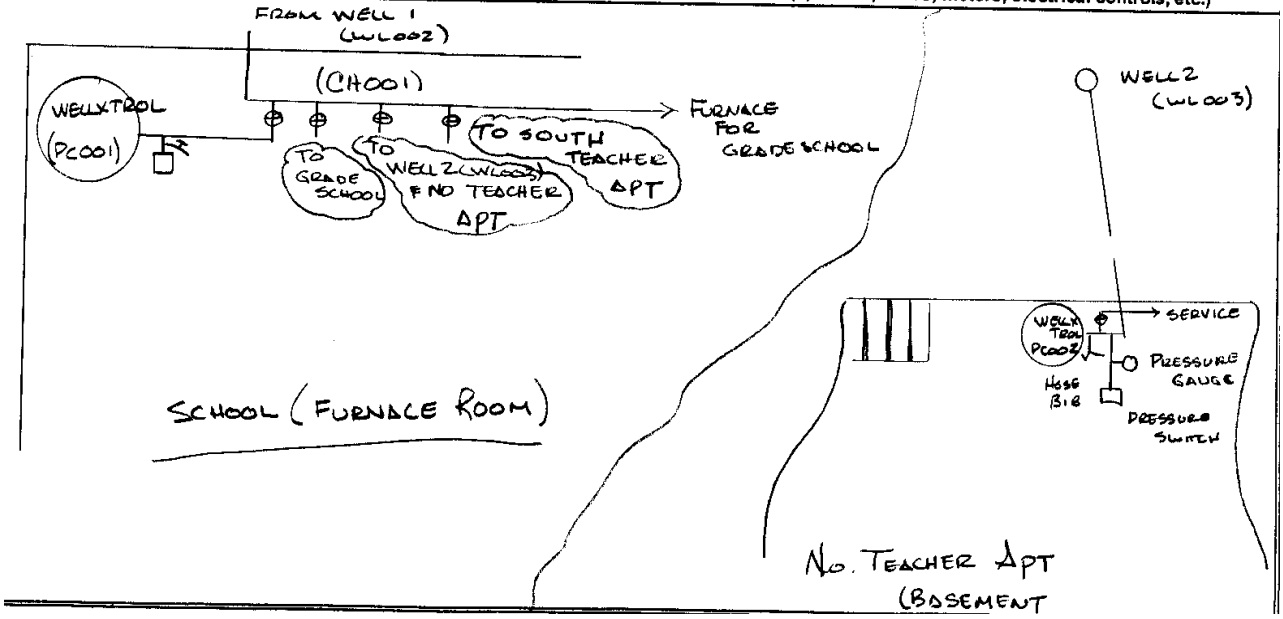
Comments:

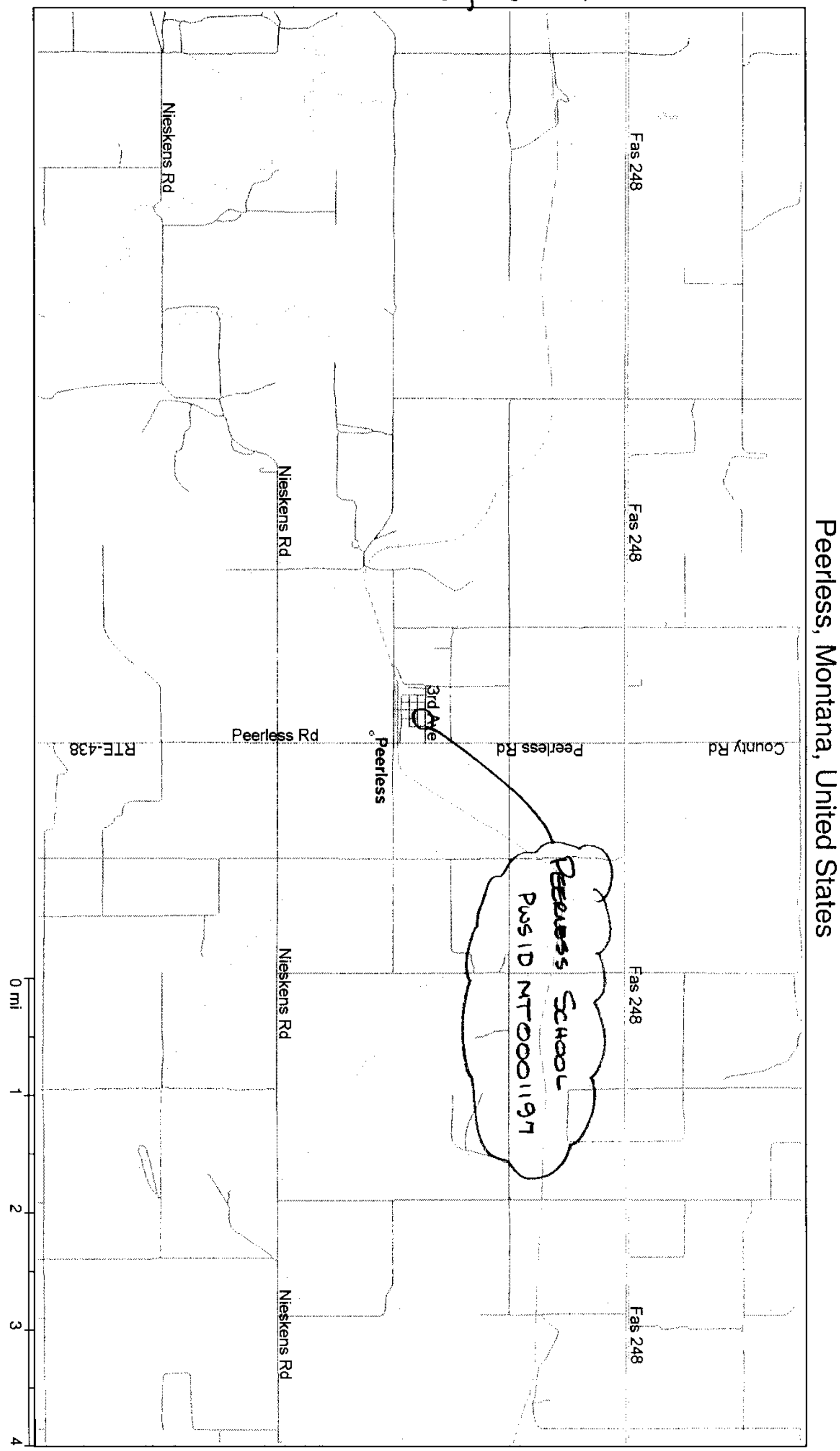
SANITARY SURVEY FORM - DIAGRAMS Page 7 of 9

Draw brief site plan showing location of well(s), springs(s), water storage, distribution system, pumphouse(s), entry point(s), treatment, etc. and label with appropriate facility designation. (See example on instruction sheet)

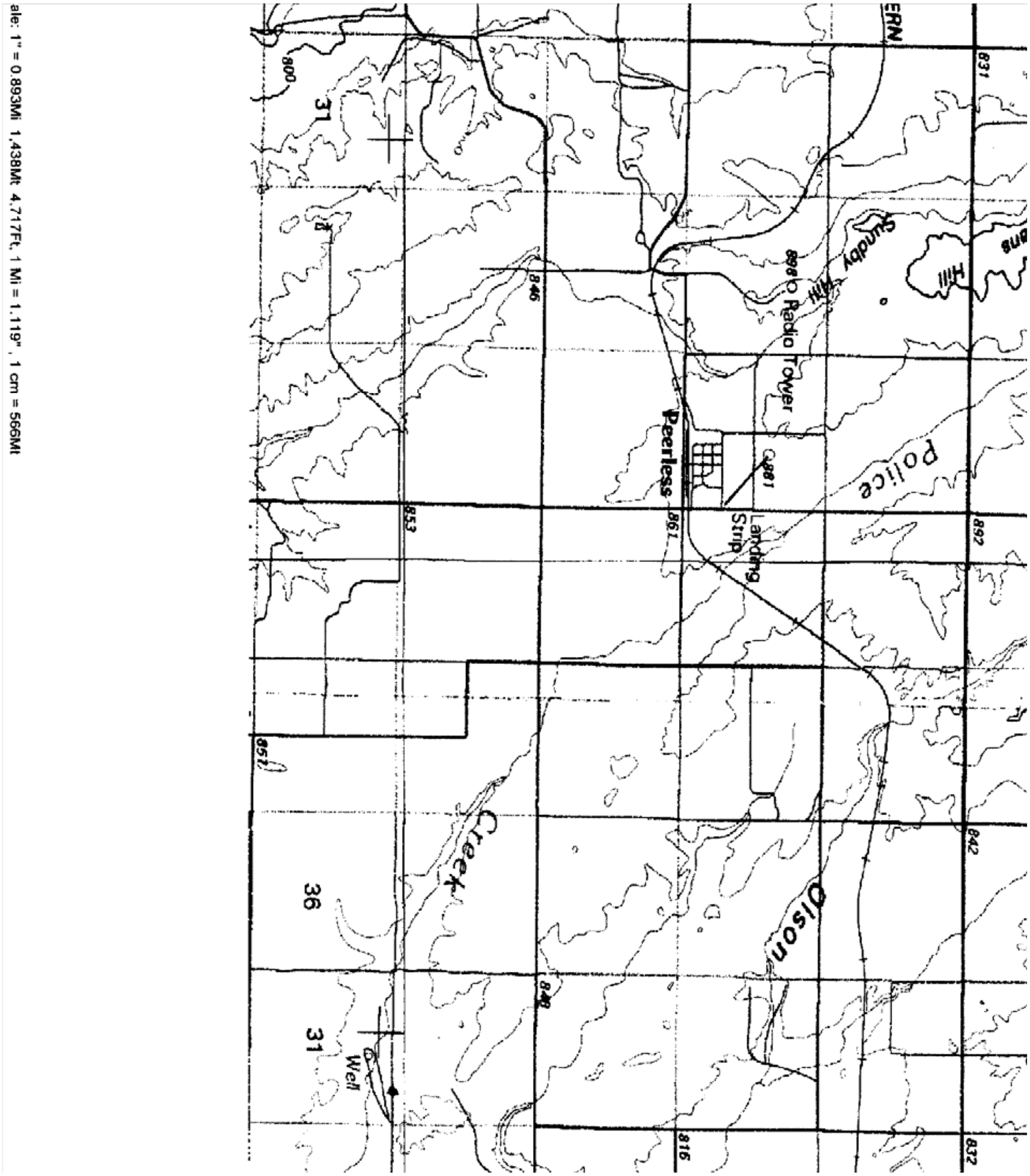


Draw brief schematic of pumphouse facilities (pressure control assemblies, treatment(s) valves, filters, meters, electrical controls, etc.)





Page 1


ale: 1" = 0.893Mi 1,438Mt 4,717Ft, 1 Mi = 1.119", 1 cm = 566Mt
Peerless
Radio Tower
Landing Strip
Sundby Hill
Police
Creek
Olson
Well
31
36
31
800
846
853
861
881
892
831
857
842
848
816
832
ERN

Appendix B
PWS Well Logs

Montana Bureau of Mines and Geology
Ground-Water Information Center Site Report
SCHOOL DIST. #2 02 Well #1

Location Information

GWIC Id:	46571	Source of Data:	
Location (TRS):	35N 45E 16 DCA	Latitude (dd):	48.7818
County (MT):	DANIELS	Longitude (dd):	-105.8328
DNRC Water Right:		Geomethod:	TRS-TWN
PWS Id:		Datum:	NAD27
Block:		Altitude (feet):	2860.00
Lot:		Certificate of Survey:	
Addition:		Type of Site:	WELL

Well Construction and Performance Data

Total Depth (ft):	224.00	How Drilled:	
Static Water Level (ft):		Driller's Name:	
Pumping Water Level (ft):		Driller License:	
Yield (gpm):		Completion Date (m/d/y):	1/1/1952
Test Type:		Special Conditions:	
Test Duration:		Is Well Flowing?:	
Drill Stem Setting (ft):		Shut-In Pressure:	
Recovery Water Level (ft):		Geology/Aquifer:	125FRUN
Recovery Time (hrs):		Well/Water Use:	PUBLIC WATER SUPPLY
Well Notes:			

Hole Diameter Information

No Hole Diameter Records currently in GWIC.

Casing Information[1]

From	To	Dia	Wall Thickness	Pressure Rating	Joint	Type
0.0	0.0	4.0				

Annular Seal Information

No Seal Records currently in GWIC.

Completion Information[1]

No Completion Records currently in GWIC.

Lithology Information

No Lithology Records currently in GWIC.

[1] - All diameters reported are **inside** diameter of the casing.

These data 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. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted. Note: non-reported casing, completion, and lithologic records may exist in paper files at GWIC.

Montana Bureau of Mines and Geology
Ground-Water Information Center Site Report
PEERLESS PUBLIC S.05 Well # 2

Location Information

GWIC Id:	46569	Source of Data:	
Location (TRS):	35N 45E 16 DCA	Latitude (dd):	48.7818
County (MT):	DANIELS	Longitude (dd):	-105.8328
DNRC Water Right:	6473	Geomethod:	TRS-TWN
PWS Id:		Datum:	NAD27
Block:		Altitude (feet):	2860.00
Lot:		Certificate of Survey:	
Addition:		Type of Site:	WELL

Well Construction and Performance Data

Total Depth (ft):	145.00	How Drilled:	
Static Water Level (ft):	100.00	Driller's Name:	
Pumping Water Level (ft):	125.00	Driller License:	235
Yield (gpm):	11.00	Completion Date (m/d/y):	1/1/1975
Test Type:		Special Conditions:	
Test Duration:		Is Well Flowing?:	
Drill Stem Setting (ft):		Shut-In Pressure:	
Recovery Water Level (ft):		Geology/Aquifer:	125FRUN
Recovery Time (hrs):		Well/Water Use:	PUBLIC WATER SUPPLY
Well Notes:			

Hole Diameter Information

No Hole Diameter Records currently in GWIC.

Casing Information[1]

From	To	Dia	Wall Thickness	Pressure Rating	Joint	Type
0.0	0.0	6.0				

Annular Seal Information

No Seal Records currently in GWIC.

Completion Information[1]

From	To	Dia	# of Openings	Size of Openings	Description
137.0	145.0	0.0			

Lithology Information

No Lithology Records currently in GWIC.

[1] - All diameters reported are **inside** diameter of the casing.

These data 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. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted. Note: non-reported casing, completion, and lithologic records may exist in paper files at GWIC.

Wells within the 1000-foot Inventory Region

Montana Bureau of Mines and Geology
Ground-Water Information Center Site Report
PEERLESS SCHOOL

Location Information

GWIC Id:	175208	Source of Data:	LOG

Location (TRS):	35N 45E 16 DB	Latitude (dd):	48.7845
County (MT):	DANIELS	Longitude (dd):	-105.8342
DNRC Water Right:	C109544-00	Geomethod:	TRS-TWN
PWS Id:		Datum:	NAD27
Block:		Altitude (feet):	
Lot:		Certificate of Survey:	
Addition:		Type of Site:	WELL

Well Construction and Performance Data

Total Depth (ft):	225.00	How Drilled:	ROTARY
Static Water Level (ft):	129.00	Driller's Name:	ADAIR
Pumping Water Level (ft):		Driller License:	WWC547
Yield (gpm):	3.00	Completion Date (m/d/y):	10/5/1999
Test Type:	AIR	Special Conditions:	
Test Duration:	3.00	Is Well Flowing?:	
Drill Stem Setting (ft):	220.00	Shut-In Pressure:	
Recovery Water Level (ft):	129.00	Geology/Aquifer:	Not Reported
Recovery Time (hrs):	2.00	Well/Water Use:	Not Reported
Well Notes:			

Hole Diameter Information

From	To	Diameter
0.0	230.0	9.0

Casing Information[1]

From	To	Dia	Wall Thickness	Pressure Rating	Joint	Type
-2.0	19.0	5.0				STEEL
19.0	185.0	5.0				PLASTIC

Annular Seal Information

From	To	Description
0.0	20.0	ENVIRO PLUG

Completion Information[1]

From	To	Dia	# of Openings	Size of Openings	Description
185.0	225.0	5.0			SCREEN

Lithology Information

From	To	Description
0.0	1.0	TOPSOIL
1.0	18.0	FINE SAND
18.0	40.0	CLAY
40.0	100.0	FINE SAND
100.0	118.0	SAND & GRAVEL
118.0	125.0	CLAYS
125.0	130.0	FINE SANDSTONE
130.0	190.0	CLAYS
190.0	230.0	SANDSTONES & COAL LEDGES- VERY FINE WATERBEARING

[1] - All diameters reported are **inside** diameter of the casing.

Montana Bureau of Mines and Geology
Ground-Water Information Center Site Report
PEERLESS POST OFFICE

Location Information

GWIC Id:	146945	Source of Data:	LOG
Location (TRS):	35N 45E 16 DB	Latitude (dd):	48.7845
County (MT):	DANIELS	Longitude (dd):	-105.8342
DNRC Water Right:	91933	Geomethod:	TRS-TWN
PWS Id:		Datum:	NAD27
Block:	10	Altitude (feet):	
Lot:	9	Certificate of Survey:	
Addition:	ORIGINAL TOWNSITE OF PEERLESS	Type of Site:	WELL

Well Construction and Performance Data

Total Depth (ft):	180.00	How Drilled:	ROTARY
Static Water Level (ft):	73.00	Driller's Name:	AGRI
Pumping Water Level (ft):	102.00	Driller License:	WWC537
Yield (gpm):	5.00	Completion Date (m/d/y):	9/28/1994
Test Type:	PUMP	Special Conditions:	
Test Duration:	2.00	Is Well Flowing?:	YES
Drill Stem Setting (ft):		Shut-In Pressure:	
Recovery Water Level (ft):		Geology/Aquifer:	Not Reported
Recovery Time (hrs):		Well/Water Use:	DOMESTIC
Well Notes:			

Hole Diameter Information

No Hole Diameter Records currently in GWIC.

Casing Information[1]

From	To	Dia	Wall Thickness	Pressure Rating	Joint	Type
0.0	21.0	5.0				STEEL
21.0	105.0	5.0				PVC

Annular Seal Information

From	To	Description
0.0	100.0	PURE GOLD CHIPS

Completion Information[1]

From	To	Dia	# of Openings	Size of Openings	Description
105.0	115.0	5.0			HOUSTON SCREEN

Lithology Information

From	To	Description
0.0	45.0	SAND YELLOW
45.0	55.0	CLAY-LIGHT YELLOW
55.0	70.0	GRAVEL & SAND (DRY)
70.0	75.0	CLAY-YELLOW SANDY
75.0	101.0	CLAY-GRAY
101.0	112.0	SAND FINE-GRAY
112.0	114.0	LIGNITE
114.0	120.0	CLAYSTONE-GRAY

120.0	131.0	LIGNITE
131.0	140.0	CLAYSTONE-GRAY
140.0	157.0	CLAYSTONE-GREENISH-GRAY
157.0	158.0	CEMENTED SANDSTONE
158.0	174.0	CLAYSTONE-GRAY
174.0	176.0	CEMENTED SANDSTONE
176.0	180.0	CLAYSTONE-GRAY SHALY

[1] - All diameters reported are **inside** diameter of the casing.

These data 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. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted. Note: non-reported casing, completion, and lithologic records may exist in paper files at GWIC.

Appendix C
List of Potential Contaminant Sources

DEQ UST List

http://www.deq.state.mt.us/UST/USTDownloads.asp

Notes:
Active USTs have usually been upgraded to 1998 standards (which includes leak detection and monitoring) Spills or improper handling during tank filling or product distribution at these facilities may impact the drinking water supply.

DEQ classifies inactive USTs as temporarily out of service and requires that the product in the tank be removed. However, testing of the tanks, distribution lines or soils around the tank is not required to evaluate the potential for historic leaks or spills that may impact subsurface soils and groundwater.

Alt Facility ID	Facility Name	Facility Location Address	City	County	Active Tanks	Non Active Tanks
10-09525	BN Peerless – Depot	Railroad & Main Street	Peerless	Daniels		1
10-00647	Fladager Enterprises Inc.	1 Mile E of Peerless	Peerless	Daniels		1
10-07820	Karl Waitschies	Address Unknown	Peerless	Daniels		1
10-05458	Pro Co-Op (Peerless)	S Main	Peerless	Daniels		1
10-03901	R. C. Kasuske	PO Box 554	Peerless	Daniels		1
10-04085	Ray L. Brandt	PO Box H20	Peerless	Daniels		1
10-08000	Terry Michel	B-11-2	Peerless	Daniels		1

Appendix D
Concurrence Letter