

**Whitewater School District 20 AA D
Public Water System**

PWS ID # MT0002062

***Source Water Delineation
and Assessment Report***

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Table of Contents

EXECUTIVE SUMMARY	<i>i</i>
INTRODUCTION	<i>1</i>
Purpose	1
Limitations	1
BACKGROUND	<i>2</i>
The Community	2
Geographic Setting	2
Geologic and Hydrogeologic Setting	3
Climate	4
General Description of the Source Water	4
The Public Water Supply	4
PWS Well Information	5
Water Quality	5
DELINEATION	<i>7</i>
Conceptual Model and Assumptions	7
Delineation	7
Limiting Factors	8
INVENTORY	<i>1</i>
Inventory Method	1
Control Zone Inventory Results	2
Inventory Region Results	2
Recharge Region Inventory Results	3
Inventory Update	3
Inventory Limitations	3
SUSCEPTIBILITY ASSESSMENT	<i>4</i>
Hazard Determination	4
Discussion of Susceptibility	4
Management Recommendations	4
Conclusions	<i>1</i>
REFERENCES	<i>3</i>
GLOSSARY	<i>1</i>

Tables

Table 1. Monthly Climate Summary: Fork Climate Station	<i>4</i>
Table 2. Summary of PWS Well Information	<i>5</i>
Table 3. Summary of Potential Contaminant Sources in the Inventory Region	<i>2</i>
Table 4. Susceptibility Based on Hazard and Barriers	<i>4</i>
Table 5. Susceptibility Assessment of Significant Potential Contaminant Sources	<i>1</i>

Figures

[Figure 1. Vicinity Map and Well Locations](#)

[Figure 2. Geology of the Area](#)

[Figure 3. Source Water Management Areas and Potential Sources of Contamination](#)

[Figure 4. Land Use in the Protection Areas](#)

[Figure 5. Potential Sources of Contamination in the Protection Areas](#)

Appendices

APPENDIX A – PWS Sanitary Survey and Site Plan

APPENDIX B – PWS Well Log

APPENDIX C – Whitewater Sewer Map

APPENDIX D – List of Potential Contaminant Sources

APPENDIX E – Monitoring Waivers

APPENDIX F – Concurrence Letter

EXECUTIVE SUMMARY

This Source Water Delineation and Assessment Report (SWDAR) 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.

The drinking water for Whitewater School District 20 AA D is supplied by one well located southwest of the school in the yard of one of the residence. Based on the sanitary survey, well log, and the depth of the well, it appears that the unconsolidated alluvium is providing water to the PWS's well(s). In accordance with the Montana Source Water Protection Program criteria (1999), the aquifer (source water) is considered to have a high sensitivity to potential contaminant sources since it is fluvial-glacial gravel. Sensitivity is defined as the relative ease that contaminants can migrate to source water through the natural materials.

As part of this assessment, three types of source water protection management areas were mapped for the Whitewater School District 20 AA D public water system. They are: the control zone, the inventory region, and the recharge region. Potential sources of contamination were identified within each of these three regions and the results are as follows:

- Potential contaminant sources identified within the control zone(s) include: sewer mains. 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 well and all sources of potential contaminants should be excluded in this region.
- Significant potential contaminant sources identified within the inventory region include: sewer mains and gas wells.
The inventory region should be managed to prevent contaminants from reaching the well before natural processes reduce their concentrations. The inventory region includes the area of land overlying the aquifer upgradient north/northwest of the well that is expected to supply groundwater recharge to the well over the next three years.
- Potential contaminant sources identified within the recharge region include: agricultural land and oil and gas wells and test holes.
The goal of management in the recharge region is to maintain and improve water quality over long periods of time or increased usage. Recharge to the wells is likely from infiltration of precipitation and surface water into the alluvial aquifer upgradient north/northwest of the well.

The Whitewater School District 20 AA D public water supply has a high to very high susceptibility to the following potential contaminant sources: sewer mains and a moderate susceptibility to gas and oil test holes.

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 Whitewater School District 20 AA D. 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, and prevention is preferable to treatment. Public awareness is a powerful tool for protecting drinking water. The information in this report will help 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 Whitewater School District 20 AA D Public Water Supply (PWS), PWS ID No. MT0002062, located in Phillips County. It was completed by Joe Meek of the Source Water Protection Program at the Department of Environmental Quality (DEQ); with assistance from intern Bethany Haines.

PURPOSE

The primary purpose of this source water delineation and assessment report is to provide information that helps the Whitewater School District 20 AA D protect its drinking water source. A major component of the Montana Source Water Protection Program is '*delineation and assessment*'. Delineation is the process of identifying areas that contribute water to aquifers or surface water bodies used as drinking water supplies. The delineated areas are referred to as source water protection areas. Assessment involves identifying and inventorying potential sources of contamination within the source water protection areas, and then determining the potential for contamination of drinking water by these sources. This report is intended to meet the technical requirements for the completion of a source water delineation and assessment report for the Whitewater School District 20 AA D public water system, 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.

LIMITATIONS

This report was prepared to assess threats to Whitewater School District 20 AA D'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 Whitewater School District 20 AA D 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 vicinity of the Whitewater School District 20 AA D public water supply are identified. Potential sources of contamination are considered only in areas that contribute water to the source of the public water supply.

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 Whitewater School District 20AA D is in the town of Whitewater located in Phillips County, in northeastern Montana, as shown in [Figure 1](#). The area along the Milk River in north-central and northeastern Montana is informally referred to as the “Hi-Line”. The nearest town is Malta, approximately 32 miles northeast of Whitewater. Malta is the county seat for Phillips County, and is the largest community within the central part of the Hi-Line. The population of Malta is estimated at 2,209 people in 1998.

Wastewater from the facility is collected in a sewer system. The system was in place of July 2003. The lagoon is southeast of town ([Figure 5](#) and Appendix C).

GEOGRAPHIC SETTING

Whitewater is located in the northern glaciated plains region of central Montana, in the Glaciated Missouri Plateau section of the Great Plains Province. The area around Whitewater is relatively flat within the Milk River floodplain, with rolling hills outside of the floodplain. The approximate elevation of Whitewater is 2,300 feet above mean sea level. Whitewater Creek flows southward along the southern and southeastern edges of town.

Whitewater School District 20 AA D is located in the Whitewater Watershed, U.S. Geological Survey (USGS) hydrologic unit code (HUC) No.10050012, which is located within the Lower Missouri River Watershed Management Region for Montana. The Whitewater Watershed extends from the Canadian Border to the Milk River. The headwaters of the Milk River are located in Glacier National Park, in the Rocky Mountains of Montana west of Whitewater.

GEOLOGIC AND HYDROGEOLOGIC SETTING

This section provides an overview of the geology and hydrology of the Whitewater School District 20 AA D area and is based primarily on a geologic map of the area by Bergantino (2002) and the well log for the Whitewater School District 20 AA D PWS well 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.

Whitewater is located in the ancestral valley of the Missouri River, before the last glaciers covered the area and shifted the Missouri River to its present position. The ancestral Missouri River valley runs in a general west to east direction with the Milk River present in the valley south of Whitewater. The development of the major drainage pattern around the Whitewater area as a result of the glaciers is depicted in [Figure 2](#). The ancestral drainage system cut valleys into the area bedrock system, which has large quantities of fine-grained shales with a limited number of sandstones that can be developed as local aquifers. These valleys were filled with alluvium and glacial sediments representing a relatively shallow aquifer developed by several Hi-Line communities for their drinking water source.

The bedrock in the hills around Whitewater comprises the Cretaceous Judith River Formation overlying the Cretaceous Claggett Shale. The shales are exposed in the valley walls both north and south of Whitewater, with the Judith River Formation present on top of the hills. The shales contain varying levels of bentonite, clay derived from volcanic ash. Erosion of these shales into the Milk River valley has resulted in clay-rich soils of varying thickness. The soils have a high capacity to adsorb water. Glacial deposits typically cap the upland areas adjacent to the valley. These deposits are largely unmapped.

The source aquifer for the Whitewater School PWS is interpreted as an unconsolidated alluvial aquifer present within the valley. While a thin surficial clay layer covers the aquifer, the well logs in the area indicate a variable thickness to the unit. Based on this criteria, the aquifer is considered to be generally unconfined and likely is in communication with Whitewater Creek, recognizing that the aquifer may be locally confined or semi-confined in some areas. Based on this criteria and classification as an unconfined aquifer in communication with surface water, the aquifer is considered to have high source water sensitivity to contamination.

Ground water in the Whitewater area is interpreted to flow in a general northwestern to southeastern direction, based on the interaction of ground water with surface water in the area. Recharge to the aquifer occurs from direct infiltration of precipitation, and from stream loss. Significant recharge may occur where tributary streams cross into the valley, with vertical flow occurring at the interface between the bedrock and the valley fill sediments. Groundwater flow in the valley is considered likely to have a very shallow (flat) gradient, similar to the gradient of the Whitewater Creek

CLIMATE

Information on climate in the Whitewater School District 20 AA D area is based on the National Oceanic and Atmospheric Administration's (NOAA) Forks climate station located at an elevation of 2,600 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. Monthly Climate Summary: Fork Climate Station

Station 243089 Period of Record: 1/ 1/1915 to 1/31/1996

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	20.0	24.8	36.6	54.3	66.8	74.7	83.2	81.7	69.3	56.7	37.8	25.3	52.6
Average Min. Temperature (F)	-1.0	3.6	15.0	28.7	39.3	47.6	53.1	51.0	40.8	30.5	16.3	5.0	27.5
Average Total Precipitation (in.)	0.33	0.29	0.46	0.88	1.84	2.90	1.83	1.41	1.07	0.57	0.34	0.33	12.25
Average Total Snow Fall (in.)		4.1	4.9	2.8	0.6	0.0	0.0	0.0	0.4	1.6	3.4	4.8	27.9
Average Snow Depth (in.)	5	7	5	1	0	0	0	0	0	0	1	3	2

Percent of possible observations for period of record.

Max. Temp.: 97.8% Min. Temp.: 97.9% Precipitation: 98% Snowfall: 95.8% Snow Depth: 68.5%

GENERAL DESCRIPTION OF THE SOURCE WATER

The source aquifer is unconfined and the interpreted groundwater flow direction in the vicinity of the well is to the southeast. Recharge to the wells is likely from infiltration of precipitation and surface water through the overlying alluvial materials.

THE PUBLIC WATER SUPPLY

Whitewater School District 20 AA D serves 125 people through 6 service connections (hook ups). The Whitewater School District 20 AA D is classified as a non-community public water system (PWS) due to the non-permanent nature of the population served. Information on the water system was obtained from correspondence in the DEQ Public Water Supply Section files, including the most recent sanitary surveys completed on 2002 (attached as Appendix A).

The PWS serves the school and five adjoining residents. The water system is pressurized by one captive air pressure tank located in the vault next to the well. The water is distributed from this vault to the five residences and the school. In the school a portion of the water is treated with reverse osmosis and cartridge carbon filtration. This water only serves one water fountain and a water container filling station and ice machine. 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) indicated that the groundwater might be influenced by surface water. A formal determination of GWUDISW will be based an evaluation of well construction and site layout (i.e. quality of the well bore annular seal, potential for flooding, and other potential routes for surface water to influence the groundwater quality.)

PWS WELL INFORMATION

Whitewater School District 20 AA D's drinking water is supplied by one well located southeast of the school in the yard of a residence. The well was completed to a relatively shallow depth of about 27 feet and is perforated from 23 to 27 feet across a sand and gravel layer. The well has a 6-inch steel casing that extends to the depth of the well. The static water level measured at the time of drilling was 18 feet below surface. The pumping water level was 20 feet below surface when pumping 30 gallons per minute. A copy of the well log showing encountered stratigraphy and well construction is attached as Appendix B and is summarized in Table 2.

Table 2. Summary of PWS Well Information

Well ID	Well No. 1
DEQ Well Name/ Source Code	Well #1 WL002
GWIC ID	46414
DNRC Water Right	W022328
Well Location	SE¼, NW¼, SW¼, Sec.26, T35N, R31E
Well Elevation	Approx. 2,300 feet
Date Completed	6/29/1968
Total Depth (bgs)	27 feet
Well Completion: Casing	6" casing from 0 to 27 feet below surface
Well Completion: Screen	Casing perforated from 23-27 feet in "sand and gravel"
Well Completion: Annular Seal	No seal records currently in GWIC.
Static Water Level (at time of drilling)	18 feet
Well Pump Test Data	Pumping water level of 20 feet after 2.33 hours of pumping at 30 gpm

WATER QUALITY

Every PWS is required to perform regular sampling of their water supply to detect any contamination. The analytical parameters include: coliform bacteria and other pathogenic organisms, nitrates, metals, petroleum hydrocarbons, and other organic chemicals. The monitoring schedule depends on factors such as the size and source water of a PWS, the number of supplies (e.g. wells), and the population served. Each PWS has a specific monitoring program tailored to their system that follows the general protocols defined by DEQ for operation of a PWS. PWS monitoring schedules are available at: <http://nris.state.mt.us/wis/swap/swapquery.asp>. The Whitewater School District 20 AA D PWS monitoring data from DEQ's database for the past five years was reviewed and is summarized in this section.

No health-based violations have been reported in the last five years. Health based violations are issued when the amount of contaminant in the treated drinking water exceeds the safety standard (maximum contaminant level or MCL), or water was not treated properly. The water system has had numerous monitoring violations in the previous five years (for missing monthly coliform, and other sampling).

Other compounds detected during Whitewater School District 20 AA D's water sampling over the past

five years include nitrite + nitrate (0.22 to 5.58 mg/L (milligrams per liter)), fluoride (0.29 to 0.32 mg/L), and selenium (0.002 mg/L). The compounds detected are all below established EPA primary maximum contaminant levels (MCLs). 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. Since nitrate levels exceed 5 mg/L at the school, the PWS has increased their nitrate monitoring frequency to quarterly. Further information including recommendations for management options are provided in this assessment.

Background Water Quality Monitoring Results

Groundwater analytical data characterizing untreated groundwater quality was not identified for Whitewater School District 20 AA. Background water quality sampling typically includes some general water quality parameters including major dissolved ions (calcium, magnesium, sodium, potassium, iron, manganese, silica, bicarbonate, carbonate, chloride, sulfate, nitrate, fluoride and orthophosphate), trace elements, and metals.

CHAPTER 2 DELINEATION

This report delineates three source water management areas. The goal of source water management is protecting 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.

CONCEPTUAL MODEL AND ASSUMPTIONS

Whitewater School District 20 AA D's production wells are located in the Whitewater watershed (USGS Hydrologic Unit Code 10050012), which is located within Montana's Lower Missouri River watershed (Heath, 1984). As detailed above, Whitewater School District 20 AA D's drinking water source is interpreted to be unconsolidated alluvium. The direction of groundwater flow beneath the site is presumed to be from the northwest towards the southeast along Whitewater Creek. The aquifer is unconfined and recharge to the wells is primarily from infiltration of surface water and precipitation through the overlying sand and gravel.

A conceptual hydrogeologic model is a simplified representation of the hydrogeologic system. For the Whitewater area, ground water occurs in Milk River alluvial sand and gravel deposits. The alluvium is covered by a discontinuous surficial clay layer that may result in locally confined conditions. On a regional basis, the aquifer is recharged by direct infiltration of precipitation, and stream loss.

As the aquifer is unconfined, it is considered to have **High Source Water Sensitivity** to contamination. Sensitivity is defined as the degree of ease with which contaminants may migrate to the source water aquifer. This determination is according to the DEQ Source Water Protection Program criteria for ranking aquifer sensitivity (DEQ 1999).

DELINEATION

Methods and criteria for delineating source water protection areas are specified in the Montana Source Water Protection Program (DEQ, 1999). The delineated management zones for the wells are shown on [Figure 3](#).

Control Zone – A 100-foot radius control zone is delineated for Whitewater School District 20 AA D's wells. All sources of potential contaminants should be excluded in this region.

Inventory Region – According to the DEQ's Source Water Protection Program criteria for an unconfined aquifer (DEQ, 1999), the lateral extent of the inventory region was limited to the alluvial channel deposits as mapped by Bergantino (2002) and shown on [Figure 2](#). All sources of potential contaminants are inventoried in this region. Conservative estimates for aquifer properties were made using available data from published reports and the information on the well logs. All sources of potential contaminants are inventoried in this region.

Recharge Region –The recharge region for the Whitewater School District 20 AA D well includes the alluvial channel material upgradient (north and northeast) of the PWS wells. In general, the alluvial materials mapped by Bergantino (2002) ([Figure 2](#)) are about ½ mile wide so a buffer of ¼-mile was

applied to the creek. The upgradient extent of the recharge region was limited to approximately ten miles along the creek upstream of the well. 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 Whitewater School District 20 AA D PWS well is based on published reports and lithology indicated on the well logs. The interaction of surface water with the alluvial deposits 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

Significant potential contaminant sources in the source water management areas were inventoried to assess the susceptibility of Whitewater School District 20 AA D's wells to contamination, and to provide a foundation for source water protection planning. The inventory for Whitewater School District 20 AA D focuses on facilities or features that generate, use, store, or transport potential contaminants, as well as certain land uses in the inventory and recharge regions. 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 drinking water sources is less likely when potential contaminants are properly used and managed.

The inventory focus is slightly different in each of the delineated management areas. The inventory for Whitewater School District 20 AA D focuses on all activities in the control zones for the wells; certain types of facilities and land uses in the inventory region; potential sources of nitrates and pathogens in the surface water buffer; and general land uses and large facilities in the Recharge Region. Information on facilities and land uses that are potential sources of regulated contaminants was obtained from a number of databases, described below. 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 (USGS) 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: The US Environmental Protection Agency's (EPA) Envirofacts System <<http://www.epa.gov/enviro/>> was queried to identify EPA-regulated facilities located in the management areas. 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: Montana DEQ databases were queried to identify any of the following in the management areas:

- Underground storage tanks (USTs) <<http://www.deq.state.mt.us/UST/USTDownloads.asp>>
- Hazardous waste contaminated sites, above ground storage tanks (ASTs), landfills, and abandoned and active mines, including gravel pits <<http://nris.state.mt.us/gis/bundler/>>

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/gisdata/lib/gisDataList.aspx>>.

Potential contaminant sources are designated to be significant if they fall into one or more 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 leaking UST sites).
5. Underground injection well.
6. Major roads or rail transportation routes.
7. Cultivated cropland exceeding 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 100-foot control zone for the well includes the well house, two residences, and sewer mains. 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 Whitewater School District 20 AA D’s source water is summarized in Table 4 and is shown on [Figure 4](#) and [Figure 5](#). The inventory region includes the school, including a shop, sewer mains and oil and gas wells and test holes. The highest hazard to the drinking water source probably comes from sewer mains. Additional point sources of potential pollutants (such as businesses or facilities listed on regulatory databases) were not identified in the inventory region. (Note: the railroad line identified on the topographic map is no longer active).

Table 3. Summary of Potential Contaminant Sources in the Inventory Region

<i>Source Type</i>	<i>Potential Contaminants</i>	<i>Description/Concern</i>
Land Use Cover (Step 1)		
Sewer Mains	Nitrates, Pathogens	Ongoing or catastrophic leakage of sewage into groundwater
EPA Envirofacts Sites (Step 2)		
None Identified		
DEQ Databases (Step 3)		
None Identified		
Miscellaneous Others, including Step 4		
Oil and Gas Wells and Test Holes	Total Dissolved Solids (TDS), Petroleum hydrocarbons	Improperly sealed or abandoned wells may facilitate contaminant transport to shallow or deeper aquifers.

Notes: Individual sites identified are evaluated in Chapter 4.

RECHARGE REGION INVENTORY RESULTS

According to the 1992 National Land Cover dataset, the primary land uses in the recharge region are grasslands, with agricultural land in a small section. Several oil and gas wells or test holes are identified. The percentage of agricultural land is considered a low risk to the drinking water supply. Grasslands or forests are not considered potential sources of contamination unless there are significant grazing operations in the area. The highly variable nature of nitrate monitoring results at Whitewater School may suggest agricultural impacts to surface or groundwater in the Whitewater watershed.

Additional 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 review the inventory every year. Changes in land uses or potential contaminant sources should be noted and additions made as appropriate. 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 Whitewater School District 20 AA D'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

HAZARD DETERMINATION

The threat of contamination is referred to as *hazard*. The degree of hazard is determined either by the proximity of a potential contaminant source to a spring or well intake, potential contaminant migration pathways, or by the density of potential non-point contaminant sources.

DISCUSSION OF SUSCEPTIBILITY

Susceptibility is the degree of likelihood for a public water supply to be impacted by inventoried contaminant sources, at concentrations that would pose a concern. Susceptibility is assessed to prioritize potential pollutant sources for local management, in this case the Whitewater School District 20 AA D PWS managers and operators. Alternative management approaches that could be used by the PWS managers and operators to reduce susceptibility are recommended in this chapter.

Susceptibility is determined by considering the hazard rating for each potential contaminant source relative to any contaminant barriers (Table 4). Barriers to contamination are 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 include spill catchment structures and leak detection for underground storage tanks. Emergency planning and best management practices (BMPs) are considered management barriers. Thick clay-rich soils, a deep water table or a thick unsaturated zone above the well intake are examples of natural barriers. No barriers have been identified for Whitewater School District 20 AA D.

Table 4. 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

A summary of the susceptibility assessment for Whitewater School District 20 AA D production well is provided in Table 5. This table only includes the potential contaminant sources (identified in Chapter 3) that were determined to present a significant potential risk to the drinking water supply. Therefore, this list is not exhaustive, and 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.

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. Management recommendations for protecting the Whitewater School District 20 AA D drinking water supply are detailed in the susceptibility table (Table 5). 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.

Table 5. Susceptibility Assessment of Significant Potential Contaminant Sources

Potential Contaminant Source	Potential Contaminants	Hazard	Hazard Rating	Barriers	Susceptibility	Management Recommendations
<i>Inventory Region</i>						
Sewer Mains	VOCs, SOCs, metals, pathogens, nitrates, others	Ongoing or catastrophic leakage of sewage into groundwater	<i>High</i>	None	<i>High</i>	Support maintenance, rehabilitation, or replacement of existing sewer mains; use of sewer main liners; and rapid response planning for leaks or ruptures.
Oil and Gas Wells and Test Holes	Total Dissolved Solids (TDS), Petroleum hydrocarbons	Improperly sealed or abandoned wells may facilitate contaminant transport to shallow or deeper aquifers.	<i>Moderate</i>	Producing areas appear to be primarily gas and not oil.	<i>Moderate</i>	Encourage monitoring of drilling activities and oil field development near or adjacent the Inventory and Recharge Regions.
<i>Recharge Region</i>						
Agricultural Crop Land	Nitrate and SOCs from fertilizer, pesticides and herbicides. Pathogens (if grazing occurs)	Contaminants leaching into groundwater	<i>Low</i>	- Distance From Well	<i>Low</i>	Encourage use of agricultural best management practices (BMPs) in the recharge region

Notes: VOCs - Volatile organic compounds (i.e. solvents, fuel components) SOCs - Synthetic Organic Compounds (i.e. pesticides, herbicides, plasticizers)
 UST - Underground Storage Tank LUST - Leaking Underground Storage Tank
 BMPs - Best Management Practices DEQ- Montana Department of Environmental Quality
 RR – Recharge Region SIC - Standard Industrial Code

CONCLUSIONS

This Source Water Delineation and Assessment Report (SWDAR) 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.

The drinking water for Whitewater School District 20 AA D is supplied by one well located southwest of the school in the yard of one of the residence. Based on the sanitary survey, well log, and the depth of the well, it appears that the unconsolidated alluvium is providing water to the PWS's well(s). In accordance with the Montana Source Water Protection Program criteria (1999), the aquifer (source water) is considered to have a high sensitivity to potential contaminant sources. Sensitivity is defined as the relative ease that contaminants can migrate to source water through the natural materials.

As part of this assessment, three types of source water protection management areas were mapped for the Whitewater School District 20 AA D public water system. They are: the control zone, the inventory region, and the recharge region. Potential sources of contamination were identified within each of these three regions and the results are as follows:

- Potential contaminant sources identified within the control zone(s) includes: the sewer mains. 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 well and all sources of potential contaminants should be excluded in this region.
- Significant potential contaminant sources identified within the inventory region include: the sewer mains and gas wells.
The inventory region should be managed to prevent contaminants from reaching the well before natural processes reduce their concentrations. The inventory region includes the area of land overlying the aquifer upgradient north/northwest of the well that is expected to supply groundwater recharge to the well over the next three years.
- Potential contaminant sources identified within the recharge region include: agricultural land and oil and gas wells and test holes.
The goal of management in the recharge region is to maintain and improve water quality over long periods of time or increased usage. Recharge to the wells is likely from infiltration of precipitation and surface water into the alluvial aquifer upgradient north/northwest of the well.

The Whitewater School District 20 AA D public water supply has a high to very high susceptibility to the following potential contaminant sources: the sewer system and a moderate susceptibility to gas and oil test holes.

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 Whitewater School District 20 AA D. 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, and prevention is preferable to treatment. Public awareness is a powerful tool for protecting drinking water. The information in this report will help increase public awareness about the relationship between land use activities and drinking water quality.

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- Western Regional Climate Center Montana Climate Summaries. wrc@dr.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 (e.g. dry well). 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*

August 2, 2002

*SDWIS
1-30-03
South Hills*

Mr. Dan Grabowska
Whitewater School Dist 20 AA D
P.O. Box 46
Whitewater, MT

PHILLIPS COUNTY

RE: PWSID # MT002062 – WHITEWATER SCHOOL DISTRICT 20AA D SANITARY SURVEY INSPECTION

Dear Mr. Grabowska:

On May 16, 2002, I conducted a sanitary survey of the Whitewater School Public Water Supply (PWS) system. I would like to thank Janna Jesson for her assistance with this inspection. The PWS serves the school and 5 adjoining residents. This system is classified as a non-transient non-community public water supply due to the non-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 southwest of the school in the yard of one of the residences. This well was drilled in 1968 to a depth of 27 feet. The 6-inch well had a yield of about 30 gpm at that time.

Distribution System

The water system is pressurized by one captive air pressure tank located in the vault next to the well. The water is distributed from this vault to the five residences and the school. In the school a portion of the water is treated with reverse osmosis and cartridge carbon filtration. This water only serves one water fountain and a water container filling station.

Recommendations for Whitewater School District 20AA D


1. **Well 1:** The past reports for this system have identified the lack of a sanitary seal on the well casing as a deficiency that needs to be corrected. The District has done their best to rectify this deficiency by plugging holes and caulking cracks. This solves the immediate problem of potential contamination, however, I would recommend that if you ever pull the well pump, you replace the cap with a sanitary seal designed for well casings.

Handwritten signature

2. **RO Treatment Unit:** My discussions with Ms Jesson and a review of the water files did not indicate a record of maintenance for the RO unit. I recommend that since the unit is rented, you keep a record of the maintenance of the unit and the cartridge filters and keep this log available and near the unit.
3. **Well Vault:** The vault is a confined space that should only be entered after taking the proper precautions. Also there are open electrical connections that are open in the vault that constitute a hazard to anyone that enters the vault. These should be corrected.
4. **Monitoring:** The monitoring history for this system is acceptable. However, I could not determine whether the samples were being rotated throughout the system or always being collected after the RO unit. As has been mentioned before, a sampling plan for the system needs to be developed for the school and the residents. This plan needs to be submitted to the MDEQ for approval. 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 Sanitarians
Sanitary Survey file

SANITARY SURVEY FORM - INVENTORY Page 1 of 9

1/11/2001

DATE OF SURVEY MAY 16, 2002	COUNTY PHILLIPS	SURVEYOR NAME JOE STEINER
---------------------------------------	---------------------------	-------------------------------------

PWSID MT002062	SYSTEM NAME WHITEWATER SCHOOL DIST 20AA D
--------------------------	---

(SYSTEM REPRESENTATIVE) GENE SALVESON	(OTHER REPRESENTATIVE) DAN GRABOWSKA
---	--

<p>SYSTEM ADDRESS</p> <p>Addressee WHITEWATER SCHOOL DIST 20AA D</p> <p>Street P.O. BOX 46</p> <p>City WHITEWATER State MI Zip 59544-0046</p> <p>System Phone (406) 674-5417 Fax ()</p>	<p>SYSTEM OWNER</p> <p>Addressee</p> <p>Street ~ SAME ~</p> <p>City _____ State _____ Zip _____</p> <p>Owner Phone () Fax ()</p>
---	--

LOCATION OF SYSTEM

Nearest City **WHITEWATER** Description or Physical Address _____

<p>OPERATOR OF SYSTEM</p> <p>Name Gene Salveson</p> <p>Certified Operator <input type="checkbox"/> No <input type="checkbox"/> Yes If, yes</p> <p>Certification # _____ Phone ()</p>	<p>ALTERNATE OPERATOR OF SYSTEM</p> <p>Name _____</p> <p>Certified Operator <input type="checkbox"/> No <input type="checkbox"/> Yes If, yes</p> <p>Certification # _____ Phone # ()</p>
---	--

<p>SYSTEM STATUS</p> <p><input checked="" type="checkbox"/> A = Active <input type="checkbox"/> P = Pending (Add New System)</p> <p><input type="checkbox"/> I = Inactive</p>	<p>SYSTEM CLASS</p> <p><input type="checkbox"/> C = Community <input type="checkbox"/> NTNC = Non-Transient Non-Community</p> <p><input checked="" type="checkbox"/> NC = Transient Non-Community</p>
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<p>Total Service Connections: Residential / Non-Transient: _____</p> <p>Transient: 6</p> <p>Total Active Connections: Residential / Non-Transient: _____</p> <p>Transient: 6</p> <p>Service Connections Metered? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No %</p>	<p>Resident Population Summer: 6</p> <p>Number of permanent residents utilizing PWS daily Winter: 6</p> <p>Non-Transient Population Summer: _____</p> <p>Number of non-transient persons utilizing PWS daily Winter: _____</p> <p>Transient Population Summer: 2</p> <p>Number of transient persons served by PWS daily Winter: 125</p>
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OWNER TYPE

<input type="checkbox"/> 1 Federal Government	<input checked="" type="checkbox"/> 4 Local Government Authority, Commission, District, Municipality, City, etc.
<input type="checkbox"/> 2 Private Subdivision, Investor, Trust, Cooperative, Water Association, etc.	<input type="checkbox"/> 5 Mixed Public/Private
<input type="checkbox"/> 3 State Government	<input type="checkbox"/> 6 Native American Indian Tribes & Reservations

<p>SERVICE AREA CHARACTERISTICS LIST</p> <table border="0"> <tr> <td><input type="checkbox"/> DC Day Care Center</td> <td><input type="checkbox"/> RS Restaurant</td> </tr> <tr> <td><input type="checkbox"/> DI Dispenser</td> <td><input checked="" type="checkbox"/> SC School</td> </tr> <tr> <td><input type="checkbox"/> HA Homeowners Assoc.</td> <td><input type="checkbox"/> SI Sanitary Improvement District</td> </tr> <tr> <td><input type="checkbox"/> HM Hotel/Motel</td> <td><input type="checkbox"/> SK Summer Camp</td> </tr> <tr> <td><input type="checkbox"/> HR Highway Rest Area</td> <td><input type="checkbox"/> SR Secondary Residences</td> </tr> <tr> <td><input type="checkbox"/> IA Industrial/Agricultural</td> <td><input type="checkbox"/> SS Service Station</td> </tr> <tr> <td><input type="checkbox"/> IC Interstate Carrier</td> <td><input type="checkbox"/> SU Subdivision</td> </tr> <tr> <td><input type="checkbox"/> IN Institution</td> <td><input type="checkbox"/> WB Water Bottler</td> </tr> <tr> <td><input type="checkbox"/> MF Medical Facility</td> <td><input type="checkbox"/> WH Wholesaler (Sells Water)</td> </tr> <tr> <td><input type="checkbox"/> MH Mobile Home Park</td> <td></td> </tr> <tr> <td><input type="checkbox"/> MP Mobile Home Park, Principle Residence</td> <td></td> </tr> <tr> <td><input type="checkbox"/> MU Municipality</td> <td></td> </tr> <tr> <td><input type="checkbox"/> OA Other Area</td> <td></td> </tr> <tr> <td><input type="checkbox"/> ON Other Non-Transient Area</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> OR Other Residential Area</td> <td></td> </tr> <tr> <td><input type="checkbox"/> OT Other Transient Area</td> <td></td> </tr> <tr> <td><input type="checkbox"/> PA Recreation Areas</td> <td></td> </tr> <tr> <td><input type="checkbox"/> RA Residential Area</td> <td></td> </tr> <tr> <td><input type="checkbox"/> RE Retail Employees</td> <td></td> </tr> </table> <p>Service Category Description _____</p>	<input type="checkbox"/> DC Day Care Center	<input type="checkbox"/> RS Restaurant	<input type="checkbox"/> DI Dispenser	<input checked="" type="checkbox"/> SC School	<input type="checkbox"/> HA Homeowners Assoc.	<input type="checkbox"/> SI Sanitary Improvement District	<input type="checkbox"/> HM Hotel/Motel	<input type="checkbox"/> SK Summer Camp	<input type="checkbox"/> HR Highway Rest Area	<input type="checkbox"/> SR Secondary Residences	<input type="checkbox"/> IA Industrial/Agricultural	<input type="checkbox"/> SS Service Station	<input type="checkbox"/> IC Interstate Carrier	<input type="checkbox"/> SU Subdivision	<input type="checkbox"/> IN Institution	<input type="checkbox"/> WB Water Bottler	<input type="checkbox"/> MF Medical Facility	<input type="checkbox"/> WH Wholesaler (Sells Water)	<input type="checkbox"/> MH Mobile Home Park		<input type="checkbox"/> MP Mobile Home Park, Principle Residence		<input type="checkbox"/> MU Municipality		<input type="checkbox"/> OA Other Area		<input type="checkbox"/> ON Other Non-Transient Area		<input checked="" type="checkbox"/> OR Other Residential Area		<input type="checkbox"/> OT Other Transient Area		<input type="checkbox"/> PA Recreation Areas		<input type="checkbox"/> RA Residential Area		<input type="checkbox"/> RE Retail Employees		<p>Comments:</p> <p>SYSTEM SERVES</p> <ul style="list-style-type: none"> • SCHOOL • 5 UNITS
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SANITARY SURVEY FORM - WATER SYSTEM FACILITIES Page 2 of 9

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 Active, this includes systems that are seasonal. Inactive sources are those which are shut down but can return to active status, such as a system out of business. Proposed 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 1

WATER SYSTEM FACILITIES SUMMARY (WSF)

WSF ID	Facility Name	Water Type Code	Purchased	Seller PWSID
DS 001	Distribution System			
<u>WL002</u>	<u>WELL 1</u>	<u>GW</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
			<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
<u>PO001</u>	<u>PRESSURE CONTROL ASS.</u>		<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
			<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
			<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
			<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
			<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
			<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
			<input type="checkbox"/> Yes <input type="checkbox"/> No	_____

Description of Water System Facility flow: _____

WELL 1 IS PUMPED INTO VAULT. ONE CAPTIVE AIR PRESSURE TANK MAINTAINS THE PRESSURE WITHIN THE SYSTEM

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)inactive (P)roposed

WSF ID W1002 Entry Point ID 502
 These are state assigned identification numbers
 Source Name WELL
 Name of Source - Example: Well 1 or South well, etc.
 Location of Water Source (TRS or street address) IN RESIDENCE
YARD (SW OF SCHOOL)
 Entry Point Name EPWELL1
 Name of EP - Example: Entry point for North Well 1 & South Well 2
 Location of Entry Point IN NEAR RESIDENCE
 Available Perm Emerg Interim Seasonal Other
 If seasonal: _____ to _____
 GWUDISW PA Completed Yes No

Log Available? Yes No
 Average Production UNK
Indicate units
 Maximum Production UNK
Indicate units
 Date Drilled 6/29/68
f well - date drilled
 Casing Size 6"
size of casing installed in well
 Case Depth 27'
depth of casing installed in well
 Well Depth 27'
depth of well expressed in feet
 Grout Depth _____
depth of grout used to seal well walls

Log SWL _____
(static) expressed in feet below ground elevation
 Log PWL _____
(pumping) expressed in feet below ground elevation
 Pump Capacity _____
capacity of pump expressed in gallons per min
 Intake Type _____
type of intake mechanism
 Screened Interval _____
expressed in feet below ground elevation
 Well Yield 30 GPM
pump output in gallons per minute
 Latitude _____
latitude of source
 Longitude _____
longitude of source

WELLS - COMPLETE ONE SECTION FOR EACH SOURCE

PUMPS - COMPLETE ONE SECTION FOR EACH SOURCE

WSF ID W1002
 Example: W1002
 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? Yes No
 Are check valves, blow-off valves and water meters maintained and operating properly? NA Yes No
 Is upper termination of well protected (housed or fenced)? Yes No
 Is intake located below the maximum drawdown? Yes No

WSF ID WELL 1
 Type SUBMERSIBLE 1 HP
(example: 30 hp line shaft turbine)
 Rated Capacity _____
 Are pumps operable? Yes No
 How frequently has pumps(s) been replaced? AS NEEDED
 Are backup pumps/motors provided? Yes No
 Are controls functioning properly and adequately protected? Yes No
 Do underground compartments have a drain? 1 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? UNK Yes No
 Are recommended spare parts on hand? UNK Yes No

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

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

* CAP IS SEALED - USING CAULKING AND CAPS - WOULD BE BETTER IF USED A SANITARY SEAL -

SANITARY SURVEY FORM - TREATMENT Page 4 of 9

<p>Treatment Objective</p> <p>B = Disinfection By - Product Control C = Corrosion Control D = Disinfection E = Dechlorination F = Iron Removal I = Inorganics Removal M = Manganese Removal N = No Treatment at Source O = Organics Removal P = Particulate Removal R = Radionuclides Removal S = Softening (Hardness Removal) T = Taste / Odor Control Z = Other _____</p> <p>Treatment Codes</p> <p>(See separate sheet of Treatment Codes)</p> <p style="text-align: right;">Example -</p>	<p>WATER TREATMENT FACILITIES</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:15%;">WSE ID</th> <th style="width:45%;">Treatment Plant Name</th> <th style="width:30%;">Treatment Objective and Code</th> <th style="width:10%;"></th> </tr> </thead> <tbody> <tr> <td>TP 001</td> <td>Chlorination for Well 1</td> <td>D421</td> <td>Example</td> </tr> <tr> <td>TP 002</td> <td>Filtration and Disinfection for Spring</td> <td>P341 D720 D421</td> <td>Example</td> </tr> <tr> <td>TP001</td> <td>R.O. UNIT / CARTRIDGE FILTER</td> <td>I 640 P341</td> <td></td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	WSE ID	Treatment Plant Name	Treatment Objective and Code		TP 001	Chlorination for Well 1	D421	Example	TP 002	Filtration and Disinfection for Spring	P341 D720 D421	Example	TP001	R.O. UNIT / CARTRIDGE FILTER	I 640 P341																									
WSE ID	Treatment Plant Name	Treatment Objective and Code																																							
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TP 002	Filtration and Disinfection for Spring	P341 D720 D421	Example																																						
TP001	R.O. UNIT / CARTRIDGE FILTER	I 640 P341																																							

Treatment Description / Comments:
WELL WATER IS PIPED TO SCHOOL. A PORTION OF THE WATER IS FILTERED AND TREATED W/ R.O. THIS WATER SERVES ONE DRINKING FOUNTAIN AND A WATER FILLING STATION

<p>FOR SYSTEMS EMPLOYING FULL-TIME DISINFECTION</p> <p>What disinfectant is used? _____</p> <p>Do you record the amount of disinfectant used? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, amount used: _____ lbs/day _____ ppm _____ other (give units)</p> <p>Do you compare disinfectant use with water pumped to verify concentration? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is chemical storage adequate and safe? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If no, explain _____</p> <p>Is disinfectant residual being monitored daily? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are residual reports submitted to the State monthly? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is the disinfection equipment being operated and maintained properly? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is operational standby equipment provided? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If not, are critical spare parts on hand? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Have there been any interruptions in disinfection during the past year due to disinfection system failure? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Dates _____</p> <p>Describe provisions for providing contact time between disinfection point and the first point of use. _____</p>	<p>IF USING GAS CHLORINATION</p> <p>Is a manifold provided to allow feeding gas from more than one cylinder? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is there automatic switchover from cylinder to cylinder? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are scales provided for weighing of containers? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are chlorine storage and use areas isolated from other work areas? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are caps on stored cylinders? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is room vented to the outdoors by exhaust grills located no more than 6 inches above the floor level? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is vent inlet near the ceiling? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is room containing chlorination treatment labeled sufficiently (DANGER signs, etc.)? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is a view port provided into the room storing chlorine? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is a means of leak detection provided? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is a self-contained breathing apparatus available for use during repair of leaks? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are personnel trained to use apparatus? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are all doors hinged outward and equipped with panic bars? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are all gas cylinders restrained near the top and about half way down by chaining to wall or by other means? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Comments:</p>
---	---

SANITARY SURVEY FORM - PRESSURE CONTROL ASSEMBLIES Page 5 of 9

COMPLETE ONE SECTION FOR EACH PRESSURE CONTROL ASSEMBLY

CAPTIVE AIR TANK(S)	PRESSURE TANK(S)
<p>WSF ID <u>R001</u> Location, Description <u>IN PIT ADJACENT TO WELL</u></p> <p>Is there a pressure relief valve? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Is there an operable pressure gauge? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Does low pressure level provide adequate pressure? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are there water-logged tanks? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Is the exterior surface of the tanks in good physical condition? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Can tank(s) be by-passed for repair? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Pump run time _____</p> <p>Time of Day _____ Cut-In _____ psi</p> <p>Cut-Out _____ psi</p> <p>Pump Type: _____</p> <p>Comments: <u>AO. SMITH Aqua D12</u></p>	<p>WSF ID _____ Location, Description _____</p> <p>Is there an operable pressure gauge? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Does low pressure level provide adequate pressure? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Pump recharge rate _____ Cut-In _____ psi</p> <p>Time of day _____ Cut-Out _____ psi</p> <p>Is the tank water logged? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is air charge system adequate? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is the exterior surface of the pressure tank in good physical condition? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is there a water level sight glass? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is there a bottom drain valve? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is there a pressure relief valve? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Can tank(s) be by-passed for repair? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Pump type: _____</p> <p>Comments: _____</p>
CAPTIVE AIR TANK(S)	PRESSURE TANK(S)
<p>WSF ID <u>R002</u> Location, Description <u>IN UTILITY ROOM</u></p> <p>Is there a pressure relief valve? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Is there an operable pressure gauge? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Does low pressure level provide adequate pressure? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are there water-logged tanks? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Is the exterior surface of the tanks in good physical condition? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Can tank(s) be by-passed for repair? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Pump run time _____</p> <p>Time of Day _____ Cut-In _____ psi</p> <p>Cut-Out _____ psi</p> <p>Pump Type: _____</p> <p>Comments: <u>SEWER R.O. TREATED WATER</u></p>	<p>WSF ID _____ Location, Description _____</p> <p>Is there an operable pressure gauge? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Does low pressure level provide adequate pressure? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Pump recharge rate _____ Cut-In _____ psi</p> <p>Time of day _____ Cut-Out _____ psi</p> <p>Is the tank water logged? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is air charge system adequate? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is the exterior surface of the pressure tank in good physical condition? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is there a water level sight glass? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is there a bottom drain valve? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is there a pressure relief valve? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Can tank(s) be by-passed for repair? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Pump type: _____</p> <p>Comments: _____</p>

SANITARY SURVEY FORM - MISCELLANEOUS Page 6 of 9

DISTRIBUTION SYSTEM EVALUATION

System description POLYETHYLENE BETWEEN BUILDINGS
 System drawings available? COPPER & PLASTIC IN BUILDINGS 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:

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? Yes No
(Community Systems Only)
 Did Surveyor take a bacteriological sample? Yes No

If Yes,

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

Sample Result(s)

Comments:

I COULD NOT TELL WHERE SAMPLING POINTS WERE. DO NOT KNOW IF SAMPLE SITES ARE ROTATED

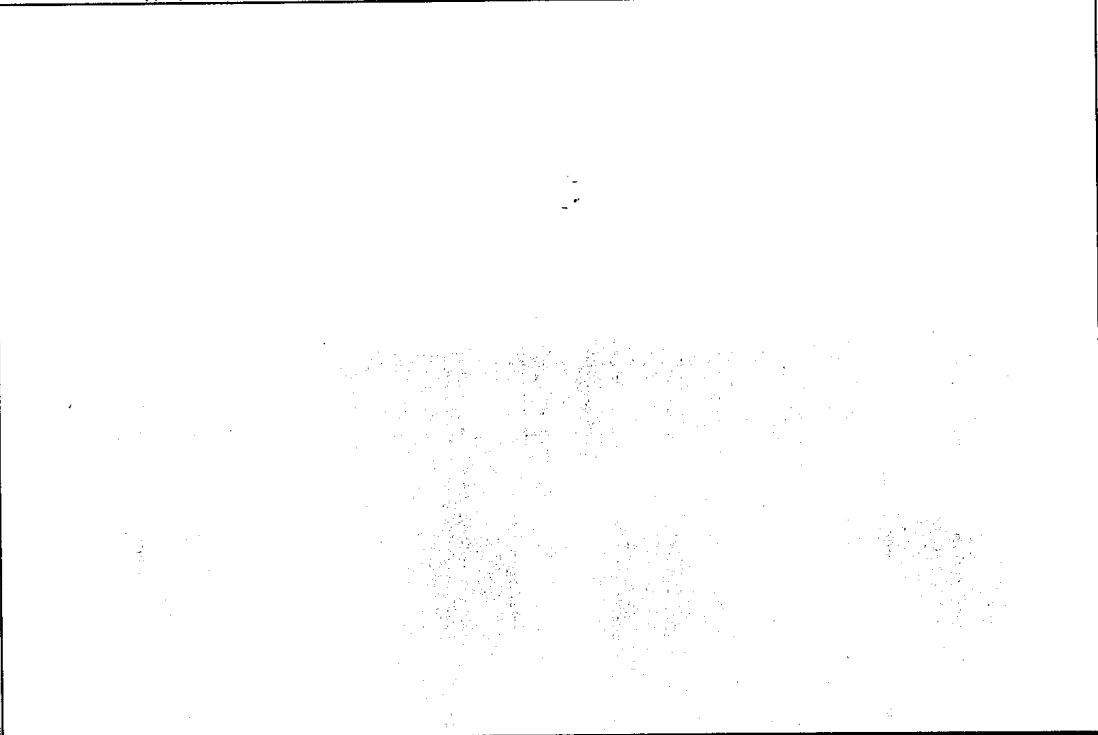
MANAGEMENT

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? 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

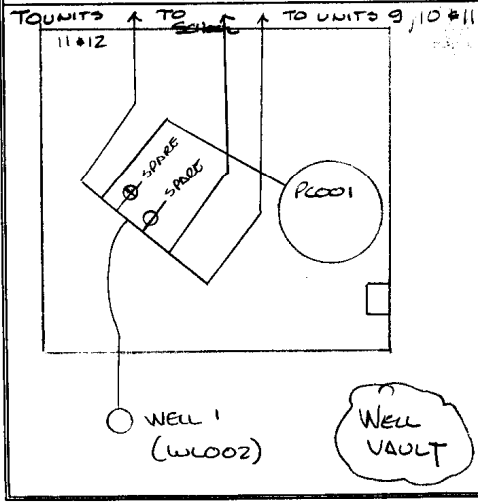
Comments:

SANITARY SURVEY FORM - DIAGRAMS Page 1 of 9

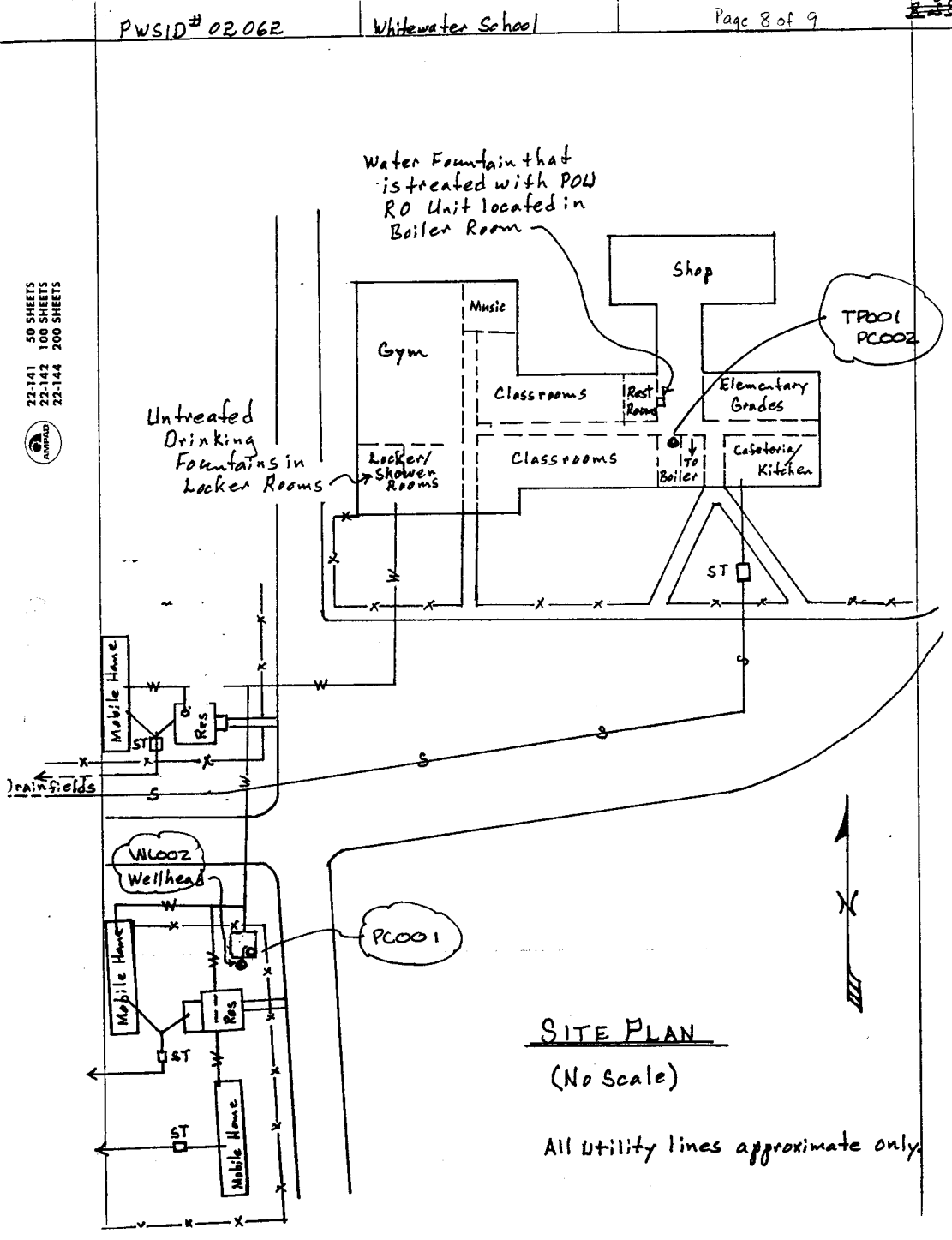
Draw brief site plan showing location of well(s), springs(s), water storage, distribution system, pumphouse(s), entry point(s), treatment, etc. and label with appropriate facility designation. (See example on instruction sheet)



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

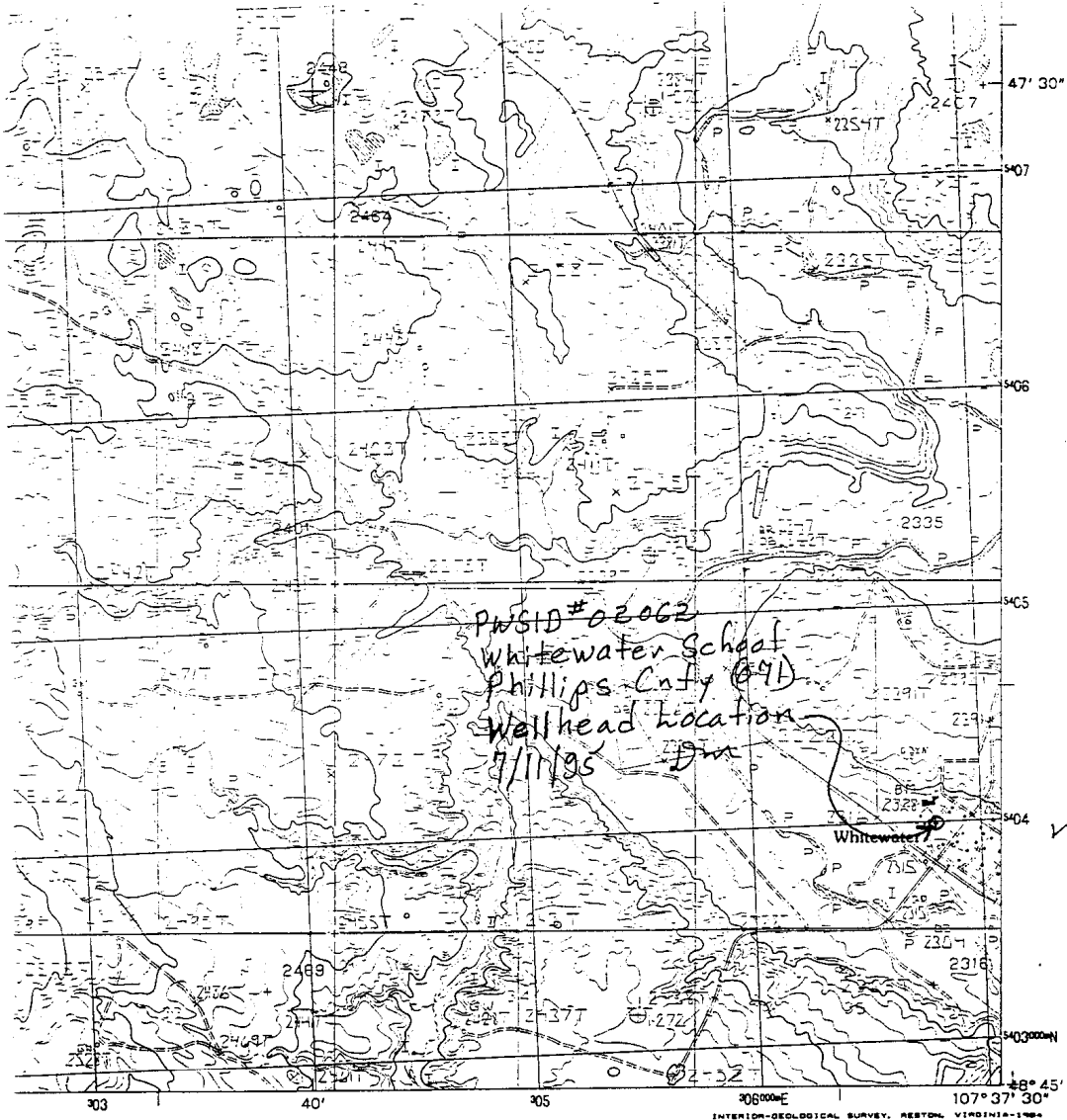


22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS

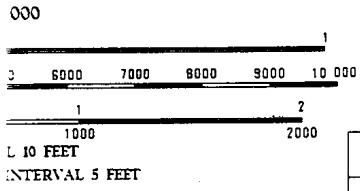


SITE PLAN
(No Scale)

All utility lines approximate only.



REPLINE COPY SHIP



MAP ACCURACY STANDARDS
DENVER, COLORADO 80225
1:1A 22092



QUADRANGLE LOCATION

1	2	3	1 Morgan
			2 Gemin Condes
			3 Pine Lake
4		5	4 Lovins
			5 Whitewater East
			6 Assin Condes
6	7	8	7 Assin Lake
			8 Tomard

ADJOINING 7.5' QUADRANGLE NAMES

ROAD LEGEND

- Improved Road
- Unimproved Road
- Trail
- Interstate Route □ U.S. Route ○ State Route

WHITEWATER WEST, MONTANA
PROVISIONAL EDITION 1984

48107-G6-TF-024

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
 Metcalf Building
 1520 E. 6th St.
 Helena, MT 59620-0901

Preliminary Assessment (PA) of Ground water Sources that may be Under the Direct Influence of Surface Water

SYSTEM NAME Whitewater School Dist PWS ID# MT002062

SOURCE NAME Well 1 COUNTY Phillips

DATE 8/2/2002 C NTNC C POPULATION 125

Index Points

FILES
 C ___ N ___ P
 PWSID # _____
 Bacti _____
 Correspondence _____
 Chlorine/Turbidity _____
 Lead & Copper _____
 Phase II & V _____
 GWUDISW
 Initials AK

A. TYPE OF STRUCTURE (Circle One)
 Well **GO TO SECTION B**
 Spring 40
 Infiltration Gallery/Horizontal Well 40

B. HISTORICAL PATHOGENIC ORGANISM CONTAMINATION
 History or suspected outbreak of *Giardia*, or other pathogenic organisms associated with surface water, with current system configuration 40
 No history or suspected outbreak of *Giardia* or other *pathogenic organisms* 0

C. HISTORICAL MICROBIOLOGICAL CONTAMINATION / TURBIDITY
 1). Record of acute MCL violations of the Total Coliform Rule during the last 3 years (circle the one that applies)
 No violations 0
 One violation 5
 Two violations 10
 Three violations 15

2). Record of non-acute MCL violations of the Total Coliform Rule during the last 3 years (circle the one that applies)
 One violation or none 0
 Two violations 5
 Three violations 10

3). DEQ-verified complaints about turbidity 5

D. HYDROLOGICAL FEATURES
 Horizontal distance between a surface water and the source greater than
 250 feet 0
 175 - 250 feet 5
 100 - 174 feet 10
 less than 100 feet 15
 unknown 15

E. WELL CONSTRUCTION

1). Poorly constructed well (uncased, or casing not sealed to depth of at least 18 feet below land surface), or casing construction is unknown 15

(Complete E. 2 if well log is available)

2). In wells tapping unconfined or semi-confined aquifers, depth below land surface to top of perforated interval or screen greater than 100 feet 0
50 - 100 feet 5
25 - 49 feet 10
0 - 24 feet 15
unknown 15

23-27

F. STATIC WATER LEVEL (SWL) / SANITARY SEAL / TOTAL SCORE

1). In wells tapping unconfined or semi-confined aquifers, depth to static water level below land surface greater than 100 feet 0
50 - 100 feet 5
0 - 49 feet 10
unknown 10

18'

2). Poor sanitary seal, seal without acceptable material, or unknown sanitary seal type 15

3). TOTAL SCORE OF PA 40

G. PRELIMINARY ASSESSMENT DETERMINATION (Circle the one that applies)

- 1. PASS: Well is classified as ground water.
- 2. FAIL: Well must undergo further GWUDISW analysis.
- 3. FAIL: Spring or Infiltration Gallery; must undergo further GWUDISW analysis.
- 4. FAIL: Well will PASS if well construction deficiencies are repaired.
- 5. FAIL: Well may PASS if well log details (section E or F) become available.

ANALYST STEINER ANALYST AFFILIATION CADMUS

COMMENTS: _____
WELL IS GROUNDWATER - CAN NOT TELL FROM
LOG WHETHER CASING IS SEALED -

PWS10MT 00 2002
WHITEWATER SCHOOL DIST 20
WELL 1

Appendix B
PWS Well Log

**Montana Bureau of Mines and Geology
Ground-water Information Center Site Report
WHITEWATER SCHOOL DISTRICT #20AA-D**

Plot this site on a topographic map

Location Information

GWIC Id: 46414
 Location (TRS): 35N 31E 26 DBCD
 County (MT): PHILLIPS
 DNRC Water Right: W022328
 PWS Id: 02062002
 Block: Not Reported
 Lot: Not Reported
 Certificate of Survey: Not Reported

Source of Data: LOG
 Latitude (dd): 48.7608
 Longitude (dd): -107.6296
 Geomethod: MAP
 Datum: 1927
 Addition: Not Reported
 Type of Site: WELL

Well Construction and Performance Data (measurements are reported below land surface)

Total Depth (ft): 27.00	How Drilled: CHURN
Static Water Level (ft): 18.00	Driller's Name: SIMPSON
Pumping Water Level (ft): 20.00	Driller License: WWC015
Yield (gpm): 30.00	Completion Date: Jun 29, 1968
Test Type: PUMP	Special Conditions: None Reported
Test Duration: 2.33	Is Well Flowing?: No
Drill Stem Setting (ft):	Shut-In Pressure:
Recovery Water Level (ft):	Geology/Aquifer: 112DRFT
Recovery Time (hrs):	Well/Water Use: PUBLIC WATER SUPPLY

Hole Diameter Information

From (ft)	To (ft)	Dia (in)	From (ft)	To (ft)	Dia (in)	Description
0.0	27.0	6.0	0.0	27.0	6.0	19 LB STEEL

Casing Information

Annular Seal Information

No annular seal records were found.

Completion Information

From (ft)	To (ft)	Dia (in)	Description
23.0	27.0	6.0	5/32 DRILLED HOLES

Lithology Information

From (ft)	To (ft)	Description
0.0	2.0	BROWN CLAY AND SMALL ROCKS
2.0	27.0	SAND AND GRAVEL

Site Notes

TRACT LOCATION BASED ON LAT\LONG FROM DEQ.

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.

File No. 1
TRIPPLICATE

T 25 R 31

County Blaine

STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

Notice of Completion of Groundwater
Appropriation by Means of Well

Under Chapter 23, Montana Session Laws, 1961

Owner 27 AA Address Whitewater, Montana

Driller Impco Drilling Co Address Malta, Montana

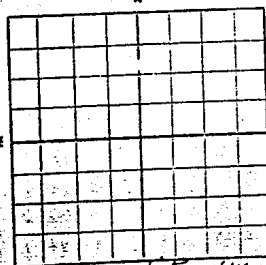
Date of Notice of appropriation of ground water June 29, 1968
Date well started June 29, 1968 Date Completed June 29, 1968

Type of well drilled Equipment used churn
(dug, driven, bored or
orilled) Churn, drill, rotary or
other)

Water use: Domestic Municipal Stock Irrigation
Industrial Drainage Other

Indicate on the diagram the character and thickness of the different strata met with in drilling, such as soil, clay, shale, gravel, rock or sand, etc. Show depth at which water is encountered, thickness and character of water-bearing strata and height to which the water rises in the well.

Size of Drilled Hole	Size and Weight of Casing	From (Feet)	To (Feet)	PERFORATIONS		
				Kind	From (Feet)	To (Feet)
	6" 19#	0	27	drilled	25	27
				holes		



Section 16, Ch. 6, Montana Session Laws, 1961, Sec. 2, T. 25 R. 31
Indicate location of well and place of use, if possible. Each small square represents 10 acres.

27 feet
Show exact depth of bottom.

Static Water Level for non-flowing well 17' feet

Shut-in Pressure for Flowing Well _____ feet

Pumping Water Level _____ feet

at _____ gal. per minute.

Discharge in gal. per min. of flowing well _____

How Tested constant

Length of Test 2 hours 20 minutes

Remarks: (Gravel packing, cementing, packers, type of shutoff, location of place of use of groundwater if not at well, and any other similar pertinent information, including number of acres irrigated, if used for irrigation)

Driller's License Number 15

Driller's Signature Robert C. Simpson

This form to be prepared by driller, and three copies to be filed by the owner with the County Clerk and Recorder in the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the School of Mines

Appendix C
Whitewater Sewer Map

Appendix D
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
36-02924	Airport Road	Address Unknown	Whitewater	Phillips		1
36-09590	BN Whitewater Depot	Railroad Ave & Main St	Whitewater	Phillips		1
36-01762	Farm Supply Vhdwe	Address Unknown	Whitewater	Phillips		3
36-04082	Farmers Union Oil Co Whitewater	Main St	Whitewater	Phillips	4	4
36-03355	K N Energy Inc Whitewater	Address Unknown	Whitewater	Phillips		1
36-05532	Michael D Hammond	23 miles NE of Whitewater	Whitewater	Phillips		1
36-04156	Olsen Grain & Livestock	HC 60 Box 102	Whitewater	Phillips		1
36-05705	Whitewater School Dist 20 Aa&D	N End of Whitewater	Whitewater	Phillips		1

DEQ LUST List

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

City	SiteName	Location	AltEventID	Date	Confirmed Release Date	Project Officer	Active
Whitewater	Farmers Union Oil Co Whitewater	Main St	3604082*3567	28-Oct-98	28-Oct-98		No
Whitewater	Phillips County Road Maintenance Fac	4	3612997*1486	20-Nov-92	20-Nov-92		No

Appendix E
Monitoring Waivers

MONITORING WAIVERS

Waiver Recommendation

The PWS was grandfathered under the radionuclide rule and is only required to sample once every 9-years. Based on past monitoring results and the susceptibility assessment, the Whitewater School District 20 AA D PWS may be eligible for other waivers as well. Information on susceptibility and use waivers is provided in this section to give the PWS operators an opportunity to consider if waivers may be feasible.

Before a susceptibility or use waiver is requested, the PWS Operators are encouraged to carefully review the Monitoring Waiver Requirements, described below. 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. The PWS must be in compliance with monitoring requirements to be considered. If requested by DEQ, the PWS may also need to provide additional information regarding chemical use in the area within the Inventory Region. The table below shows how identified potential contaminant sources affect the eligibility for monitoring waivers.

Susceptibility Assessment as it relates to Waiver Eligibility

Source	Contaminant	Susceptibility	Waiver Eligibility
Sewer System/ Wastewater Treatment	Nitrates, pathogens		Waivers are not available for pathogens and nitrate.

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 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 (PCBs) 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.

Appendix F
Concurrence Letter