

**Fireside Inn
Public Water System**

PWSID # MT0001876

**SOURCE WATER DELINEATION AND
ASSESSMENT REPORT**

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Introduction

This Source Water Delineation and Assessment Report (SWDAR) is intended to meet the technical requirements of the Montana Source Water Protection Program (DEQ, 2001) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996 (P.L. 104-182). Carolyn DeMartino, a Water Quality Specialist with the Montana Department of Environmental Quality (DEQ), prepared the final report. Information on land use and potential contaminant sources comes from a variety of sources including a preliminary land cover data layer produced by the United States Geological Survey (USGS), DEQ Public Water Supply files (including sanitary surveys), and other public sources of information. A web-based GIS application was also used to query and generate maps to support writing the report. This application is found at the Montana State Library Natural Resources Information System's (NRIS) website called the Source Water Protection Program Query System and is available at the following URL: <http://nris.state.mt.us/wis/swap/swapquery.asp>. The application was developed by the DEQ Source Water Protection Program (SWPP) to provide access to data from the U.S. EPA, DEQ, Montana Bureau of the Mines and Geology (MBMG) and other sources.

Purpose

The purpose of the Source Water Delineation and Assessment Report (SWDAR) is to assess the degree of susceptibility of the Fireside Inn Public Water System (PWS) well to significant potential contaminant sources. The community of Simms will then be able to use this report to make informed decisions about protecting the public water supply to ensure the continued delivery of high quality water. It should be noted that the purpose of this assessment is to protect the public drinking water supply from contaminants by being aware of possible sources and ensuring that reasonable and protective management practices are applied; it should not be assumed that listed potential contaminant sources are actively contaminating groundwater in Simms.

This assessment utilized information obtained from the Fireside Inn Sanitary Survey Inspection completed in February 1999 by Brian Clifton of City-County Health Department Great Falls, Montana (Appendix A). In addition, Montana Department of Environmental Quality water quality data for the last five years was utilized, as well as other published reports.

Delineation is a process whereby areas that contribute water to aquifers or surface waters used for drinking water are identified on a map and are referred to as source water protection areas. Assessment involves identifying locations or regions in source water protection areas or vicinities where contaminants may be generated, stored or transported and then determining the potential for contamination of drinking water by these sources.

Delineation and assessment is the foundation of source water protection for the Fireside Inn PWS source. Source water protection plans are the ultimate focus of source water delineation and assessment. This delineation and assessment report is written to

encourage and facilitate the Fireside Inn water operator and the community to be involved in source water protection planning that meets their specific needs.

The Community

The population of Simms is approximately 373 people. Simms is located in Cascade County approximately 22 miles west of Great Falls ([Figure 1](#)). Highways 21 and 200 intersect at Simms. The A community sewer system with a two-cell lagoon is utilized to treat and dispose of sanitary wastes.

Area Geography and Geology

Fireside Inn is located in Cascade County, approximately 25 miles west of Great Falls, along State Highway 200. The legal location for the Fireside Inn PWS well is the NW¹/₄NW¹/₄NW¹/₄NE¹/₄ Section 13, Township 20 North, Range 3 W. ([Figure 2](#)). A copy of the well log is in Appendix B. The elevation at Simms is approximately 3,566 feet above sea level.

Based on the well log for the Fireside Inn PWS well, the well is completed in an unconfined, Quaternary-aged alluvial sand and gravel aquifer ([Figure 3](#)). In accordance with the Source Water Protection Program (MT DEQ, 1999) an aquifer of this type has a high sensitivity to significant potential contaminant sources in the vicinity.

Public Water Supply Information

The Fireside Inn PWS well serves a bar, restaurant, and a residence. The PWS is classified as a transient non-community water system as it does not serve the same 25 people for six months of the year. The Inn well serves two permanent year-round residents and approximately 40 transient customers daily. Water demand for the Fireside Inn PWS Well is approximately 580 gallons per day based on 50 gallons per day per non-transient residents and 12 gallons per day per customer (EPA).

The Fireside Inn PWS well (PWSID WL002), was drilled March 23, 1995 to a total depth of 36 feet. The well is 36 feet deep with 6-inch diameter steel casing from two to 35 feet below ground surface. The well is located on the west side of the building (Patrick Merja, personal communication, June 20, 2006).

According to the most recent sanitary survey, the well was equipped with a ½-horsepower Starite submersible pump in 1995 (Clifton, 1999). At the time the well was drilled, the yield was thirty gallons per minute. A forty gallon Well-X-Troll pressure tank located is located in the back room of the Inn. The tank has a cut-in rating at 40 pounds per square inch (psi) and a cut-out rating at 60 psi. The entry point for the water is in the dry storage area of the restaurant. No water treatment is conducted.

Figure 1. Fireside Inn PWS Vicinity Map

Figure 2: Fireside Inn PWS Well Location Map

Figure 3: Fireside Inn Aerial Map

Figure 4. Fireside Inn PWS Well Inventory Region

Water Quality

Because the Fireside Inn well is classified as a transient non-community public water supply the only regulated contaminants that the water is monitored for nitrates and coliform bacteria. The drinking water is sampled for nitrates annually and for coliform bacteria monthly. The most recent monitoring results on file from July 22, 2004 indicate that the nitrate concentration was at 0.78 milligrams per liter (mg/L). This is below the maximum contaminant level (MCL) of 10 mg/L. Coliform bacteria were detected during the July 22, 2004 monitoring period.

Delineation

Two source water protection areas, a 100-foot fixed radius control zone and a modified one-mile fixed radius inventory region have been delineated for the Fireside Inn PWS Well ([Figure 4](#)). An irrigation canal is located within the inventory region. Pursuant to the Montana Source Water Protection Program, a surface water buffer should be delineated followed by an inventory of the buffer to identify any large, significant sources of coliform bacteria or nitrate that could enter the ground water system. Because no additional significant potential contaminant sources were identified in the surface water buffer, in addition to those already identified in the inventory region, the surface water buffer was not mapped.

Inventory

The Montana Source Water Protection Program (Montana DEQ, 1999) requires that land uses and all potential sources of nitrate and microbial pathogens within the control zone and inventory region be identified.

Land use in the control zone for the Fireside PWS Well includes the Fireside Inn building and a portion of the county road. No significant potential contaminant sources were identified in the control zone.

Land use within the modified one-mile fixed radius inventory region includes approximately 65% irrigated cropland and 35% residential land ([Figure 5](#)). Community sewer mains underlie approximately 35% of the inventory region ([Figure 6](#)). While not a source of regulated contaminants for a transient PWS it should be noted that an underground fuel storage tank is located in the inventory region.

Susceptibility Assessment

Susceptibility is the potential for a public water supply to draw water contaminated by inventoried sources at concentrations that would pose a health threat. Susceptibility is assessed in order to prioritize potential pollutant sources for management actions by local entities, in this case the Fireside Inn.

Figure 5. Significant Potential Contaminant Sources in the Fireside Inn PWS Well Inventory Region

Figure 6. Septic Density in the Fireside Inn PWS Well Inventory Region

The goal of Source Water Management is to protect the source water by 1) controlling activities in the Control Zone, 2) managing significant potential contaminant sources in the Inventory Region, and 3) ensuring that major land use activities in the Recharge Region pose minimal threat to the source water. Management priorities in the Inventory Region are determined by ranking the significant potential contaminant sources identified in the previous section according to susceptibility (Table 1). Management options that could be pursued by the Fireside Inn to reduce susceptibility are also recommended in Table 1.

Hazard, Barrier, and Susceptibility Determination

The susceptibility of the Fireside Inn PWS well to contamination is assessed in this section. The proximity of a significant potential contaminant source to the well, or the density of potential non-point contaminant sources determines the threat of contamination, referred to here as hazard. Barriers are natural or man-made attributes of the well or of the well setting that tend to inhibit movement of regulated contaminants into the aquifer or well. Susceptibility is assessed through consideration of the hazard of each significant potential contaminant source relative to identified barriers (see Table 1). It should be remembered that the purpose of this assessment is to protect the public drinking water supply from contaminants by being aware of possible sources and ensuring that reasonable and protective management practices are applied; it should not be assumed that listed potential contaminant sources are actively contaminating groundwater in and around Simms.

Table 1. Susceptibility Assessment for the Fireside Inn PWS-Inventory Region

Potential Contaminant Source	Contaminants	Hazard	Hazard Rating	Barriers	Susceptibility	Management Options
Irrigated Crop Land	Nitrate and pathogens	Nitrates and pathogens could leach into area groundwater due to fertilizer over application or excessive irrigation	High	None	Very High	Encourage area producers to use BMPs to properly manage fertilizer and irrigation practices

Potential Contaminant Source	Contaminants	Hazard	Hazard Rating	Barriers	Susceptibility	Management Options
Community Sewer Mains	Nitrate and Pathogens	Discharge of untreated effluent to area groundwater	Moderate	None	High	Encourage the Town of Simms to periodically inspect sewer mains to ensure they are functioning properly; Fireside Inn could prepare a emergency spill response plan
Sewage Treatment Lagoons	Nitrate and pathogens	Discharge of untreated effluent to area groundwater	High	Groundwater flow direction	High	Encourage the Town of Simms to properly operate and maintain the lagoons
Septic Density	Nitrate and Pathogens	Discharge of untreated effluent to shallow groundwater	Low	None	Moderate	Encourage area property owners with septic systems to properly operate and maintain their septic systems

Irrigated Crop Land – underlies approximately 65% of the inventory region. Hazard for is ranked high based on the percentage of irrigated cropland coverage in the inventory region. Overall, susceptibility is ranked very high, because no barriers to contamination were identified.

Community Sewer Mains – underlie approximately 35% of the inventory region. Hazard is ranked moderate based on the coverage percentage. Overall, the susceptibility of the Fireside Inn PWS well is ranked high, because no barriers to contamination were identified.

Sewage Lagoons – are located within the inventory region therefore the hazard is ranked high. However, because one barrier to contamination, the lagoons appear to be located cross-gradient to the well, was identified the overall susceptibility to contamination of is high.

Septic Density – based on less than 50 septic systems per square mile (DEQ SWPP, 1999) found within the modified 1-mile fixed radius inventory region the hazard is ranked low. Overall, susceptibility is ranked as moderate because no barriers to contamination were identified.

Management Options

Proper operation and maintenance of the community sewer mains by the Town of Simms and proper operation and maintenance of area septic systems by their owners can reduce the potential to contamination of the Fireside Inn well from these potential contaminant sources. An option that the Fireside Inn owners could implement would be to prepare an emergency spill response plan and train all employees about the procedures to follow and who to call in the event the well becomes threatened by any potential contaminant sources.

References:

Environmental Protection Agency, Office of Water, Manual of Small Public Water Supply Systems 1991, PB-92-117936, EPA 570/9-91-003, 211 p.

City-County Health Department, Great Falls, 1999, Fireside Inn Sanitary Survey Inspection-PWS ID #MT0001876, DEQ Permitting and Compliance Division.

Montana Bureau of Mines and Geology Ground Water Information Center (GWIC), 2006, well logs.

Montana Department of Environmental Quality Source Water Protection Program, 1999, Program Document.

Montana Department of Environmental Quality Underground Storage Tank Database, 2006.

Montana Department of Environmental Quality Safe Drinking Water Information System (SDWIS), 2006.

Montana State Library Natural Resources Information System (NRIS), 2006.

Ross, Clyde P., Andrews, David A., and Witkind, Irving J., 1955, Geologic Map of Montana, Montana Bureau of Mines and Geology.

APPENDIX A: Sanitary Survey

APPENDIX B: Well Log

**Montana Bureau of Mines and Geology
Ground-Water Information Center Site Report
FIRESIDE INN**

[Plot this site on a topographic map](#)

Location Information

GWIC Id: 149847 Location (TRS): 20N 03W 13 AB BB County (MT): CASCADE DNRC Water Right: C094898-00 PWS Id: 01876002 Block: Lot: 1 Addition: FINESIDE INN	Source of Data: LOG Latitude (dd): 47.4949 Longitude (dd): -111.9318 Geomethod: MAP Datum: NAD27 Altitude (feet): Certificate of Survey: Type of Site: WELL
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Well Construction and Performance Data

Total Depth (ft): 36.00 Static Water Level (ft): 23.00 Pumping Water Level (ft): 30.00 Yield (gpm): 30.00 Test Type: AIR LIFT Test Duration: 4.00 Drill Stem Setting (ft): 30.00 Recovery Water Level (ft): 22.90 Recovery Time (hrs): 0.50 Well Notes: POVERTY DRILLING FILE NO: 2316	How Drilled: ROTARY Driller's Name: POVERTY Driller License: WWC302 Completion Date (m/d/y): 3/22/1995 Special Conditions: Is Well Flowing?: Shut-In Pressure: Geology/Aquifer: Not Reported Well/Water Use: PUBLIC WATER SUPPLY
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Hole Diameter Information

From	To	Diameter
0.0	20.0	8.0
20.0	35.0	6.0

Annular Seal Information

From	To	Description	Cont. Feed
0.0	36.0	CONTINUOUS BENTONITE	

Casing Information¹

From	To	Dia	Wall Thickness	Pressure Rating	Joint	Type
2.0	35.0	6.0	0.250			STEEL

Completion Information¹

From	To	Dia	# of Openings	Size of Openings	Description
35.0	35.0	6.0			BENTONITE

Lithology Information

From	To	Description
0.0	3.0	TOPSOIL
3.0	7.0	SAND
7.0	36.0	GRAVEL

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

These data represent the contents of the GWIC databases at the Montana Bureau of Mines and Geology at the time and date of the retrieval. The information is considered unpublished and is subject to correction and review on a daily basis. The Bureau warrants the accurate transmission of the data to the original end user. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted. Note: non-reported casing, completion, and lithologic records may exist in paper files at GWIC.

APPENDIX C: Concurrence Letter