Steer Inn Restaurant and Teasers Lounge

SOURCE WATER DELINEATION AND ASSESSMENT REPORT

Steer Inn Restaurant and Teasers Lounge
Public Water Supply System

PWSID #MT0002564

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FINAL DOCUMENT

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Steer Inn Restaurant and Lounge

Introduction

This delineation and assessment report is intended to meet the technical requirements of the Montana Source Water Protection Program (DEQ, 1999) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996 (P.L. 104-182). Department of Environmental Quality (DEQ) Hydrogeologist James Swierc and DEQ Water Quality Specialist Carolyn DeMartino prepared the final report with the assistance of intern Aubrey Smartt. Information on land use and potential contaminant sources comes from a variety of sources including preliminary land cover data, sanitary surveys, and other sources of public information. A web-based GIS application was also used to query and generate maps to support the report text. This application is called the Source Water Protection Program Query System and is available at the following internet address: http://nris.state.mt.us/wis/swap/swapquery.asp. The application provides access to data from the U.S.EPA, DEQ, Montana Bureau of Mines and Geology (MBMG), and other sources.

Purpose

The purpose of this delineation and assessment report is to assess the threat of potential contaminant sources to the Steer Inn Restaurant and Lounge public water supply (PWS) using information obtained from the most recent sanitary survey completed April 1997 by South Hills Environmental Management Consultants, LLP (available from DEQ upon request), from published reports, and the PWS operator. Delineation is a process whereby areas that contribute water to aquifers or surface waters used as drinking water sources are identified on a map. Specific source water protection management areas are delineated based on the hydrogeologic setting and type of system, in accordance with the requirements of the Montana SWAP (DEQ, 1999). Assessment involves identifying the location of potential contaminant sources within the source water protection areas that may impact water quality under "worst-case" conditions. The potential for contamination to the drinking water source is evaluated based on the amount and toxicity of the potential contaminants and barriers that may be present to mitigate the effects in case of a spill or accident.

The Steer Inn Restaurant and Lounge is one of several PWSs located west of Three Forks (Figure 1). This PWS is classified as a transient non-community system because it does not serve as a community water supply, and does not regularly serve a minimum of 25 of the same people for at least 6 months of the year.

Public Water Supply Information

The Steer Inn Restaurant and Teasers Lounge is located at the intersection of Highway 287 and Interstate 90 in the NW¼SW¼ of Section 15, Township 2 N. and Range 1 E. of Broadwater County (Figure 2). The Department of Natural Resources and Conservation (DNRC) water right identification number is 19635. The Montana Bureau of Mines and Geology Ground Water Information Center (GWIC) identification number

for this source is 12477. The well (Source 002) serves the restaurant/bar facility. Water for the establishment is drawn through 8-inch diameter well casing by a submersible pump. A pressure tank and a water softening system are located in the rear of the building. Cartridge filters for particulate removal are installed between the pressure tank and ion-exchange filters. The well yield is seven gallons per minute. See Appendix A for a diagram of the site layout.

Approximately 80 people per day use the restaurant/lounge facilities in the summer and 30 in the winter. Water demand in the summer is approximately 960 gallons per day assuming 12 gallons per day per person (EPA, 1991). Water demand in the winter is approximately 360 gallons per day. The Steer Inn utilizes a large capacity on-site septic system to treat and dispose of sanitary wastes.

There is a well log available for Steer Inn Restaurant and Teasers Lounge well and the lithologic intervals are known. Based upon this log and other area well logs, there does appear to be a continuous confining layer beneath the site (Figure 3). Tertiary sediment is indicated as the aquifer. Clay layers separating coarser grained water-bearing layers within the Tertiary sediments provide a natural protective barrier of contamination from the surface. Based on this criterion, the aquifer is classified as having a low sensitivity to potential contaminant sources.

Water Quality

The source of drinking water for the Steer Inn Restaurant and Lounge is groundwater. This PWS is classified as a transient non-community public water supply; therefore, the only regulated contaminants that are required to be routinely monitored in the drinking water include nitrate and microbial pathogens. It should be noted that other potential contaminant sources for example, area underground fuel storage tanks, may impact the well if leaks or spills were to occur. Nitrate plus nitrite levels detected in the public water supply well within the past five years have ranged from 0.005 to 2.59 milligrams per liter (mg/L). These levels are well below the Environmental Protection Agency mandated maximum contaminant level of 10 mg/L. Based on review of DEQ's Drinking Water Database for this PWS there were 5 detections of coliform bacteria and no detection of fecal coliform bacteria in the last five years.

Delineation

Groundwater in the vicinity of the Steer Inn Restaurant and Lounge well appears to flow southeast. A 100-foot fixed radius control zone and 1,000-foot fixed radius inventory region were delineated around the well that serves the Steer Inn Restaurant and Lounge PWS as required for a transient, non-community PWSs under the Montana Source Water Protection Program (DEQ, 1999). The 100-foot radius control zone surrounding the well head is the most critical area within which direct introduction of contaminants into the well or the immediate area can occur. The Inventory Region encompasses the area that water or contaminants can flow to Steer Inn Restaurant and Lounge well over a period of months to years (Figure 2).

Inventory

The Montana Source Water Protection Program (DEQ, 1999) requires that land uses and all potential sources of nitrate and microbial pathogens be identified within the control zone and inventory region of transient, non-community public water supplies. Note, that other potential contaminant sources, such as underground fuel storage tanks may be located within the control zone and inventory region for the Steer Inn Restaurant and Lounge but are not considered as regulated potential contaminant sources because this is classified as a transient non-community public water supply.

Land use within the 100-foot control zone of the Steer Inn Restaurant and Lounge well includes the roads and restaurant/bar along with two adjacent homes, a parking lot, and a frost free hydrant. The large capacity on-site septic system is located adjacent to the shed and mobile home (Appendix A).

Land use within the 1,000-foot inventory region includes mainly agricultural land, fallow land, and Highway 287 along with a portion of grassland (Figure 4). The percentages of each land use type are identified in the pie chart on Figure 4. Septic density in the region is 100% low; however, the large capacity on site septic system at Sharky's Travel Shop may contribute nitrates and pathogens to groundwater serving the Steer Inn as it is in close proximity and upgrade to the Steer Inn well. The most significant potential contaminant sources of nitrate and pathogens in the Steer Inn Restaurant and Lounge 1,000-foot inventory region includes the hydrant, large capacity on-site septic system, agricultural land, and agricultural chemical transport along Highway 287. Fertilizer and pesticides could runoff agricultural land into the surface water and leach contaminants into the groundwater. Nitrates and pathogens could leach from the on-site septic system effluent into the groundwater. Spills of fertilizers could occur along Highway 287, in the vicinity of the Steer Inn Restaurant and Lounge, due to traffic accidents and also leach into the groundwater.

Susceptibility Assessment

The proximity of a potential contaminant source to a well or the density of non-point potential contaminant sources determines the threat of contamination, referred to as hazard. The hazard rankings for agricultural lands, the on-site septic system and Interstate/Highway are based on the percentage of each within the inventory region. The hazard rankings of all potential significant contaminant sources identified within the Steer Inn Restaurant and Lounge inventory region are presented in Table 1.

Table 1. Hazard Rankings of Significant Potential Contaminant Sources in the Steer Inn Restaurant and Lounge PWS Inventory Region

Potential Contaminant Source	Contaminants	Description	Hazard Rating
Agricultural Land	Nitrates and pathogens	Leaching to groundwater	High
Large Capacity On-Site Septic System	Nitrates and pathogens	Potential system leakage	High
Frost-free Hydrant	Nitrates and pathogens	Well is too close to hydrant allowing periodic contamination because the hydrant drains into a gravel bed upon shut-off which creates the possibility that contaminated water may be disposed of nest to the casing and below the protective grout (South Hills, 1997)	High
Highway 287	Nitrates and pathogens	Fertilizer spills	High

Hazard and the existence of barriers to prevent contamination determine the susceptibility of an aquifer to potential contamination. Barriers can be engineered, management actions, or natural. Examples of engineered barriers are spill containment structures for industrial facilities and leak detection for underground storage tanks. Examples of management barriers include the adoption of local ordinances to keep potential contaminant sources out of the control zone for wells, completion of an emergency response plan, or the use of best management practices to manage particular potential contaminant sources. Clay rich soils or a laterally continuous clay layer are examples of natural barriers. There are natural clay barriers to contamination for the Steer Inn Restaurant and Lounge PWS well. Table 2 identifies the susceptibility ranking for each potential contaminant source in the Steer Inn Restaurant and Lounge inventory region and also includes management recommendations for these potential contaminant sources. If implemented, these management recommendations may be considered barriers.

Table 2. Susceptibility Assessment Ratings of Significant Potential Contaminant Sources in the Steer Inn Restaurant and Lounge PWS Inventory Region

Source	Potential Contaminant	Hazard Rating	Barriers	Susceptibility	Recommendations
Agricultural Land	Nitrates and pathogens	High	Clay-rich soils	High	Use Best Management Practices (BMPs)
Large Capacity On-Site Septic System	Nitrates and pathogens	High	Clay-rich soils	High	Conduct regular maintenance
Frost-free Hydrant	Nitrates and pathogens	High	Clay-rich soils	High	Move hydrant at least 20 feet from wellhead
Highway 287	Nitrates and pathogens	High	Clay-rich soils	High	Implement emergency spill response plan

Limitations

Identification of potential contaminant sources for Steer Inn Restaurant and Lounge is limited to those contaminants (nitrates and pathogens) regulated for this class of PWS and is generally based on readily available information and reports. Unregulated activities or unreported contaminant releases may not be considered in this report. The delineation method utilizes simplifying assumptions that may not fully represent complex ground water flow systems but is intended to be conservative and protective of public health.

Summary

This report was prepared to assist the owner/ operator of the Steer Inn Restaurant and Lounge to better understand the public water system for which they are responsible. The report provides information concerning the aquifer that supplies water to the well, well construction data (if available), identifies the control zone and inventory region, and within each of these protection areas identifies the significant potential contaminants that may impact the well water. Also provided in the table are recommendations regarding how the potential sources of nitrates and pathogenic contaminants could be better managed to prevent impacts to the Steer Inn Restaurant and Lounge well. A recommendation that the Steer Inn Restaurant and Lounge itself could implement is to develop an emergency spill response plan that identifies the procedures that employees should follow in the event that the well is in danger of contamination from any type of contaminant and also re-locating the frost-free hydrant.

References:

Montana Bureau of Mines and Geology Ground Water Information Center, Butte Montana.

Montana Cadastral Mapping Project, Revised July 2001. GIS Services Section, Information Services Division, Helena, MT.

Montana Department of Environmental Quality, 1999. Montana Source Water Protection Program, Approved by EPA in November 1999.

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Ross, Clyde; Andrews, David; and Witkind, Irving. 1955. Geologic Map of Montana, Montana Bureau of Mines and Geology Ground Water.

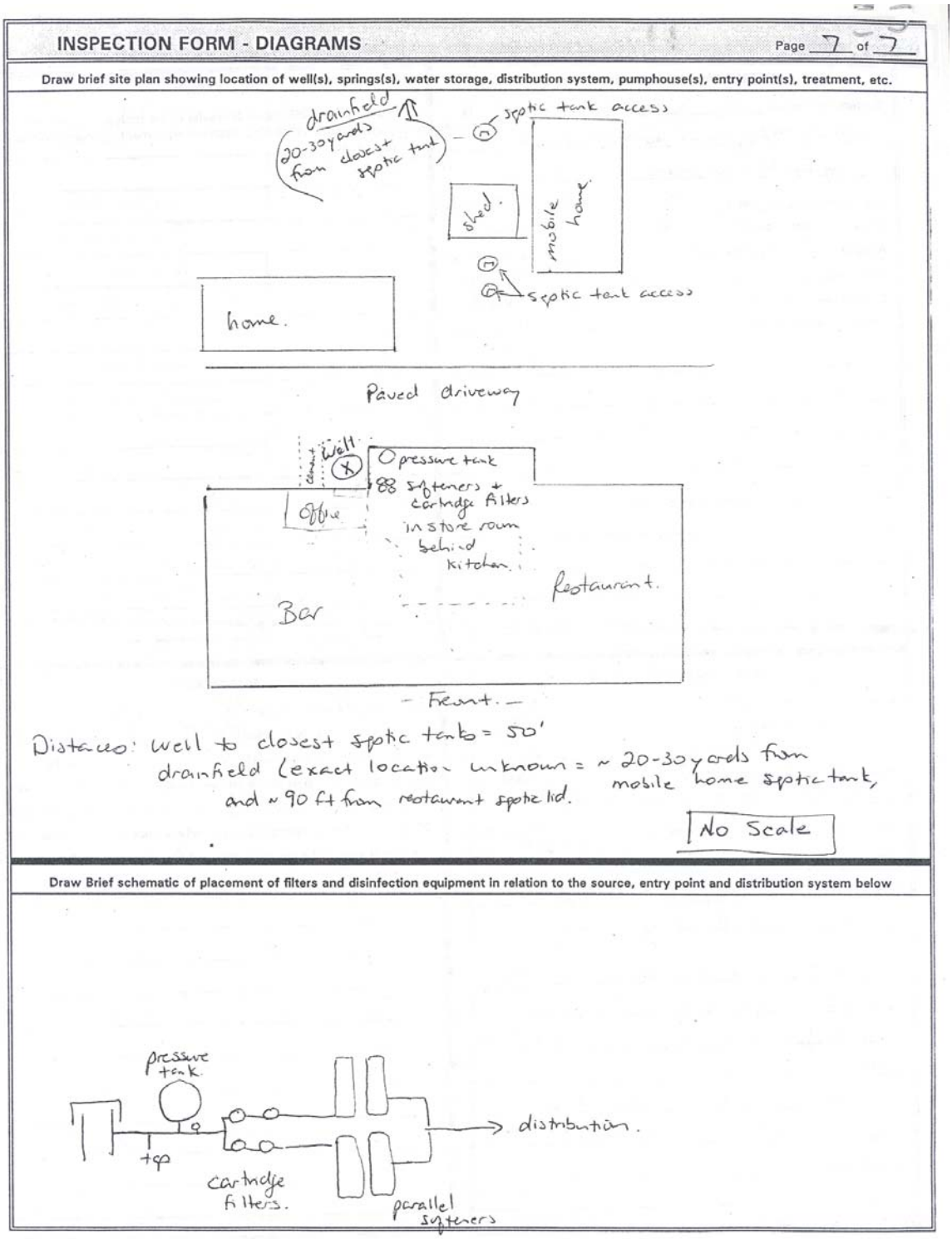
South Hills Environmental Management Consultants, LLP, April 1997. Steer Inn Restaurant and Lounge Sanitary Survey.

U.S. EPA, Office of Water, 1991. Manual of Small Public Water Supply Systems, EPA 571/9-91-003, 221p.

U.S.Geological Survey, 2000, National Landcover Dataset, Montana.

Appendix A

Site Layout


INSPECTION FORM - DIAGRAMS
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Draw brief site plan showing location of well(s), springs(s), water storage, distribution system, pumphouse(s), entry point(s), treatment, etc.
drainfield
20-30 yards from closest septic tank
septic tank access
shed
mobile home
home
septic tank access
Paved driveway
well
pressure tank
88 softeners + cartridge filters in store room behind kitchen
Office
Bar
Restaurant
Front
Distances: well to closest septic tank = 50'
drainfield (exact location unknown = ~ 20-30 yards from mobile home septic tank, and ~ 90 ft from restaurant septic lid.
No Scale
Draw Brief schematic of placement of filters and disinfection equipment in relation to the source, entry point and distribution system below
pressure tank
tap
cartridge filters.
parallel softeners
distribution.

Appendix B

Well Log

Appendix C

Concurrence Letter