Source Water Delineation and Assessment Report

Public Water Supply: **Holland Lake Lodge (PWSID #MT0000841)**
Report Date: **April 17, 2006**
Contact Person: **Christian Wohlfeil**
1947 Holland Lake Road
Condon, MT 59826
(406) 754-2282

Introduction & Purpose

Bethany Haines, an intern with the Montana Department of Environmental Quality (DEQ) Source Water Protection Section completed the Holland Lake Lodge Source Water Delineation and Assessment Report (SWDAR), with review and assistance from Joe Meek. This report is intended to satisfy the requirements of the Montana Source Water Protection Program (DEQ, 1999) and the Federal Safe Drinking Water Act amendments of 1996.

The primary purpose of this source water delineation and assessment report is to provide information that helps the PWS protect its drinking water source. The Montana Source Water Protection Program is intended to be a practical and cost-effective approach to protect public drinking water supplies from contamination. Information for this report came from DEQ files and the Montana state library's online GIS database (http://nris.state.mt.us).

Public Water Supply Information

Holland Lake Lodge is located off Montana Highway 83; it is 75 miles southeast of Kalispell, Montana, and 75 miles northeast of Missoula at the end of Holland Lake Road (Figure 1). The lodge is on USFS leased land. The water system consists of one well that serves water to six cabins, a lake house, a restaurant with a nine room motel and an office. The Holland Lake Lodge water supply serves a transient population of about 103 people daily through eight active service connection. Because the facility does not regularly serve the same 25 persons for at least six months a year, it is classified as a transient, non-community public water supply (TNCWS). Water demand is approximately 2,595 gallons per day, assuming water use is 40 gallons per day per person for cabin or motel users (six cabins maximum occupancy is four people and nine motel rooms maximum occupancy is two people) and 15 gallons per day per nonresident user (EPA, 1991).

The well log (GWIC #142309) indicates that well was drilled in 1994 to a depth of 45 feet below ground surface with a six-inch casing that extends to 36 feet below ground surface. The static water level was 7 feet below ground surface with a pumping water level of 30 feet below ground surface (Appendix B). The depth of the well and the lithology of the well suggest the aquifer is

unconfined and is assigned a high sensitivity rating to potential contaminant sources in the area, in accordance with the Source Water Protection Guidance document (MT DEQ, 1999).

As a transient non-community PWS, the system samples only for coliform bacteria and nitrate plus nitrite as nitrogen. Coliform bacteria have been detected a couple of times in the last five years. Follow-up sampling did not confirm the presence of coliform. The PWS is now on a quarterly coliform monitoring schedule. Nitrate was reported at 2.5 mg/L in June 2005, below the EPA MCL for nitrate which is 10 mg/L.

Delineation

For a transient PWS, source water protection areas are delineated: the control zone and the inventory region. The control zone overlies the zone of immediate contribution to the well. Ideally, all sources of potential contaminants are excluded from this area. The inventory region represents the area expected to provide water to the well over a longer period.

Methods and criteria for delineating these areas are specified in the Montana Source Water Protection Program (DEQ, 1999). The control zone is the area within a 100-foot radius of the wellhead. For a transient PWS tapping an unconfined aquifer, the inventory region is the area within a one-mile radius modified to exclude area down-gradient. Delineated source water protection areas are shown on Figure 2.

Inventory

Since the Holland Lake Lodge is a TNC PWS, the inventory is limited to potential sources of nitrate and coliform bacteria. Land use information was used to inventory potential contaminants sources in the control zones and inventory region. A susceptibility assessment is completed for any potential contaminant sources that the DEQ's Source Water Protection Section considers to be significant (as established in the Source Water Protection Program document (1999)).

The well is located in front of the office building. Generally, the control zone should be isolated from traffic, parking, and drainage away from the wellhead should be maintained.

The lodge ustilizes a sewage holding tank and grinder pump that discharges via a pipeline to a lagoon (see Figure 2). The lagoon system is maintained by the US Forest Service. There are no septic tanks or drainfield on the lodge property.

Susceptibility Assessment

The sewage collection and treatment system is considered a potential source of contaminants and presents a high to low hazard to the PWS source water. The sewage holding tank and the pressure sewer main on the grounds nearest the lodge present the highest susceptibility. Leak detection at the tank and pressure testing of the force main should be continued as routine maintenance items.

Table 1: Significant Potential Contaminant Sources

Source	Contaminant	Hazard Rating	Barriers	Susceptibility	Recommended Management Options
Sewage Holding Tank	Nitrates, Pathogens	***High***	None	***Very High***	Continue proper operation and maintenance of on-site holding tank including leak monitoring
Sewage pipeline	Nitrates, Pathogens	***High***	None	***Very High***	Encourage proper operation and maintenance of pressure sewer main to lagoons, including pressure testing.
Lagoons	Nitrates, Pathogens	***High***	Large separation distance	***Low***	Encourage proper operation and maintenance. Monintoring leakage rate. Ensure integrity of liner.

LIMITATIONS

This Source Water Delineation and Assessment Report is intended to meet the technical requirements for delineation and assessment as required by the Montana Source Water Protection Program (DEQ, 1999) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996 [U.S. Code Title 42, Chapter 6A, Subchapter XII, Part E, § 300j-13-(a) Source Water Assessment]. The following limitations should be noted:

- Not every source of contamination to the PWS well has been identified. Consideration was limited to potential sources of contamination within the inventory region. Additionally, sources of contaminants that are not regulated for a transient PWS (*i.e*. petroleum hydrocarbons) were not inventoried or assessed.
- No site inspection was performed, and the inventory was developed from available sources of information, including DEQ files and NRIS.
- The potential contaminant sources described in the inventory are identified from readily available information. Consequently, unregulated activities or unreported contaminant releases may have been overlooked. The inventory is not exhaustive.
- Some management recommendations are fairly site-specific and can be implemented by the public water supply. However, other management options can only be implemented by federal, state, county or local governmental entities. When the latter options are mentioned, it is not implied or suggested that this public water supply should lead or spearhead the effort to implement the management option. It is assumed that representatives from this public water supply would participate in the public process sponsored by various governmental entities to develop and implement any of these management options.

References:

Montana Bureau of Mines and Geology, 2005. Ground Water Information Center (GWIC), lithologic well logs. http://mbmggwic.mtech.edu/

Montana Department of Environmental Quality Public Water Supply Section, 2005. Safe Drinking Water Information System (SDWIS).

Montana DEQ, 1999. Montana Source Water Protection Program, Approved by EPA in November 1999.

Montana DEQ, 2000. Montana Source Water Protection Program, Template for Non-Community Transient Public Water Supplies, Revised 2002.

Montana DEQ Permitting and Compliance Division, 2001. Sanitary Survey for Holland Lake Lodge, Inc. PWS- PWS ID: #MT0000841.

Montana Natural Resources Information Interactive Map website. 2005. http://nris.state.mt.us/interactive.html

Montana State Library - Natural Resources Information System (NRIS) 2000 map base of the USGS Topographical coverage at 1:24,000 scale in MrSID format.

Safe Drinking Water Act (SDWA) Amendments of 1996 [U.S. Code Title 42, Chapter 6A, Subchapter XII, Part E, § 300j-13-(a) Source Water Assessment].

United States Environmental Protection Agency, 1991. Manual of Small Public Water Supply Systems. EPA 570/9/919003, 211 p.

U.S. Geological Survey, 2000. National Landcover Dataset, Montana. 30-meter electronic digital landcover/land use dataset interpreted from satellite imagery.

Various Authors, 2000-2005. Correspondence in DEQ's PWS files regarding the Holland Lake Lodge Water Supply.

APPENDIX A: Figures

Figure 1

Figure 2

Appendix B: Well Log

Montana Bureau of Mines and Geology
Ground-Water Information Center Site Report
HOLLAND LAKE LODGE

Location Information

GWIC Id:	142309	Source of Data:	LOG
Location (TRS):	20N 16W 35 BDBD	Latitude (dd):	47.4506
County (MT):	MISSOULA	Longitude (dd):	-113.6048
DNRC Water Right:		Geomethod:	MAP
PWS Id:	00841002	Datum:	NAD27
Block:		Altitude (feet):	4045.00
Lot:		Certificate of Survey:	
Addition:		Type of Site:	WELL

Well Construction and Performance Data

Total Depth (ft):	45.00	How Drilled:	ROTARY
Static Water Level (ft):	7.00	Driller's Name:	BILLMAYER
Pumping Water Level (ft):	30.00	Driller License:	WWC047
Yield (gpm):	35.00	Completion Date (m/d/y):	3/25/1994
Test Type:	AIR LIFT	Special Conditions:	
Test Duration:	2.50	Is Well Flowing?:	
Drill Stem Setting (ft):		Shut-In Pressure:	
Recovery Water Level (ft):		Geology/Aquifer:	112OTSH
Recovery Time (hrs):		Well/Water Use:	PUBLIC WATER SUPPLY
Well Notes:			

Hole Diameter Information

From	To	Diameter
0.0	18.0	10.0
18.0	36.0	7.0

Casing Information[1]

From	To	Dia	Wall Thickness	Pressure Rating	Joint	Type
-2.0	36.0	6.0				STEEL

Annular Seal Information

From	To	Description
0.0	18.0	BENTONITE

Completion Information[1]

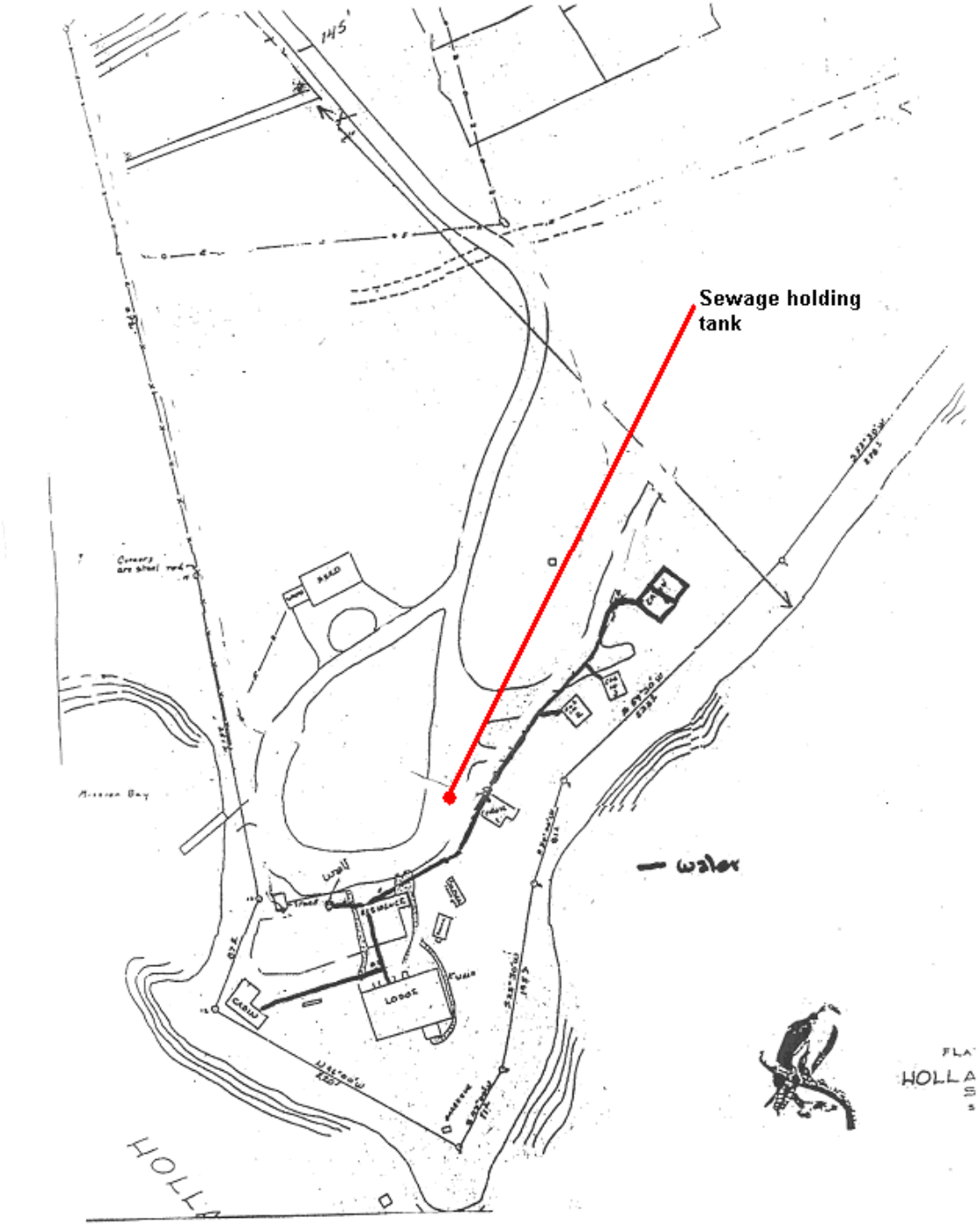
From	To	Dia	# of Openings	Size of Openings	Description
32.0	35.0	6.0		1/8X4	TORCH CUTS

Lithology Information

From	To	Description
0.0	1.0	TOPSOIL
1.0	16.0	BROWN SILT; WATER & SMALL GRAVEL
16.0	29.0	BROWN CLAY AND GRAVEL
29.0	32.0	SAND GRAVEL AND WATER
32.0	36.0	GRAVEL AND WATER
36.0	45.0	BROWN CLAY

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

Appendix C: Sitemap



HOLLAND LAKE LODGE PWSID 0841