

## **MADISON RIVER RECREATION AREA**

# ***SOURCE WATER DELINEATION AND ASSESSMENT REPORT***

**Public Water System:** MADISON RIVER RECREATION AREA

**PWSID #** MT0062201

**Date of Report:** 12/19/2001

**Contact Person:** Dale Ragain  
Beaverhead-Deerlodge National Forest  
Madison Ranger District  
5 Forest Service Road, Ennis MT 59729  
406/682-4253

## **INTRODUCTION**

This report is intended to meet the technical requirements for the completion of the delineation and assessment report for the Madison River Recreation Area as required by the Montana Source Water Protection Program and the federal Safe Drinking Water Act (SDWA). Joe Gurrieri, Hydrogeologist with the USDA, Forest Service prepared the final report. Information for the well was taken from sanitary surveys, well log, and from research of public documents.

The purpose of this delineation and assessment report is to assess threats to the Madison River Recreation Area water supply using information obtained from those familiar with the surrounding area and from published reports. The emphasis of this delineation and assessment report is identifying significant potential contaminant threats to public drinking water sources and providing the information needed to develop a source water protection plan. Delineation is a process whereby areas that contribute water to aquifers or surface waters used for drinking water, called source water protection areas, are identified on a map. Assessment involves identifying locations or regions in source water protection areas where contaminants may be generated, stored, or transported and then determining the potential for contamination of drinking water by these sources.

## **PUBLIC WATER SUPPLY INFORMATION**

The Madison River Recreation Area is owned and operated by the USDA, Forest Service. The Beaverhead-Deerlodge National Forest, Madison Ranger District has the responsibility for operation, maintenance, and sampling of the water supply. The Madison River Recreation Area includes three Forest Service campgrounds: Madison River Campground, West Fork Campground, and Riverview Campground. The three campgrounds are served by one well. Major re-construction and expansion work was completed at the Madison River

Recreation Area in 1996 and 1997. The Montana Bureau of Mines & Geology well identification number is 106565 and the DNRC water right identification number is 1E 41F W054078. The Madison River Recreation Area is located 20 miles south of Cameron along the Madison River (T11S R1E Sec. 14) in Madison County ([Figure 1](#)).

The water system ([Figure 2](#)) serves 1 resident and 100 non-resident visitors per day from May 20 through October 1. The site is classified as a transient, non-community public water supply because it serves 25 or more persons per day but does not regularly serve the same persons for at least 6 months per year. Water demand is approximately 1500 gallons per day through 11 service connections (Attachment I). No treatment is applied to this system. Sanitary waste is contained in a vault toilets.

Geologic materials in the area consist of Tertiary age sediments (MBMG, 1955). Lithologic information on the well report (Attachment II) shows that the aquifer is composed of sand, gravel and clay. The well is 102 feet deep with a static water level at 6 ft and a yield of 15 gpm. The well casing is perforated from near the surface to 97 feet. The Beaverhead-Deerlodge National Forest is required to monitor for nitrate and coliform bacteria. Nitrate levels detected in the water supply during the period 1996-2000 have ranged from 0.01 to 0.05 mg/L, well below the maximum contaminant level of 10 mg/L and coliform bacteria were not detected.

## **DELINEATION**

A 100-foot radius control zone, a one-mile radius inventory region, and a surface water buffer zone were delineated for the Madison River Recreation Area wells as required for transient, non-community public water supplies under the Montana Source Water Protection Program (DEQ, 1999). The control zone is the most critical area within which direct introduction of contaminants can occur. The Inventory Region encompasses the area that water or contaminants can flow to the well over a period of months to years. The surface water buffer zone is delineated because the Madison River crosses the inventory region approximately 150 feet from the well, creating the possibility that a hydraulic connection exists between the wells and the river. If potential contaminant sources exist upstream from the public water supply well, dissolved contaminants, nitrate for example, or transported pathogens, like viruses and cryptosporidium, could enter the river and be transported into the alluvial aquifer in which the well is completed. The contaminated ground water could then be drawn into the well. The surface water buffer zone is used to identify potential contaminant sources upstream from the well and extends 10 miles upstream and one half mile from each riverbank (Montana DEQ, 2000, Table 1).

## **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, inventory region, and surface water buffer zone of non-community, transient public water supplies. Analysis of the area surrounding the Madison River Recreation Area well reveals that the inventory region and surface water buffer zone consists of rangeland and forest. Neither type of land cover is considered a significant potential contaminant source. The upper 3 miles of the surface water buffer zone is within the Gallatin National Forest and the remainder is rural private and state land. The on-site restrooms at this facility are small capacity vault toilets and are not considered to be a significant potential contaminant source. A small area of medium density septic systems occurs  $\frac{3}{4}$  mile northwest of the well but are not considered a potential contaminant source because they are hydraulically downgradient from the well ([Figure 3](#)).

According to information gathered from existing DEQ databases and the most recent sanitary survey (Attachment I), there are no potential sources of pathogens or nitrates in the control zone. Within the one-mile inventory region, 55 percent of the land is administered by the U.S. Forest Service and the remaining area is

private ([Figure 1](#)). There are no animal feeding operations, wastewater treatment facilities, sanitary sewer mains, irrigated cropland, or unsewered commercial areas within one mile of the Madison River Recreation Area.

## **SUSCEPTIBILITY ASSESSMENT**

Susceptibility is the potential for a public water supply to draw water contaminated by inventoried sources at concentrations that would pose concern. In this case, susceptibility is assessed in order to prioritize potential pollutant sources for management actions by the Beaverhead-Deerlodge National forest in managing the Madison River Recreation Area.

Susceptibility to potential contaminant sources is assessed for both the aquifer and the public water supply well. According to the Montana Source Water Protection Program criteria, an aquifer consisting of unconsolidated alluvium that is unconfined is rated as highly sensitive to potential sources of contamination (Montana DEQ, 2000, Table 2). The fact that the well is perforated over its entire length and is close to the Madison River (no barriers), indicates a potential that surface water contaminants could be drawn into the well. Susceptibility of the Madison River Recreation Area water supply is low for nitrates and microbial contaminant due to a general absence of sources.

## **REFERENCES**

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

Montana Department of Environmental Quality, 2000. Montana Source Water Protection Program, Template for Non-Community Transient Public Water Supplies.

Montana Bureau of Mines and Geology, 1955, Geologic Map of Montana.

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



# ATTACHMENT I

## SANITARY SURVEY FOR GROUNDWATER SYSTEMS

### SECTION: I

DATE OF SURVEY 6-25-98 SURVEYOR Thomas W. Keyes - P.E.

PWSID 62201 STATUS Active CLASS TNC COUNTY Madison

### ACTUAL SYSTEM INFORMATION

SYSTEM NAME MADISON RIVER RECREATION AREA (USDA Forest Service)

SYSTEM ADDRESS (Street) Madison Ranger District 5 Forest Service Road  
(City) Ennis (State) MT (Zip) 59729

SYSTEM PHONE 406-682-4253 FAX 406-682-4233

CERTIFIED OPERATOR No CERTIFICATION#

OTHER OPERATOR Dale Ragain

OPERATOR ADDRESS (Street) Madison Ranger District 5 Forest Service Road

(City) Ennis (State) MT (Zip) 59729 OPERATOR PHONE 406-682-4253

OWNER OF SYSTEM (If different) \_\_\_\_\_

OWNER'S ADDRESS(Street) \_\_\_\_\_ (Phone) \_\_\_\_\_  
(City) \_\_\_\_\_ (State) \_\_\_\_\_ (Zip) \_\_\_\_\_

### OWNER TYPE

- (1) Federal government
- (2) Private (subdivisions, investors, trusts, cooperatives, water assoc., etc.)
- (3) State government
- (4) Local government
- (5) Mixed public/private
- (6) Native American (Indian tribes and reservations)

### REGULATOR

(s) State only  (F) Federal  Other (note specifically)

### SERVICE CATEGORY

- |   |  |
|---|--|
| <input type="checkbox"/> Airport  | <input type="checkbox"/> Rest Area           |
| <input checked="" type="checkbox"/> Campground  | <input type="checkbox"/> Recreational        |
| <input type="checkbox"/> Bathing/swimming   | <input type="checkbox"/> Residential         |
| <input type="checkbox"/> Day Care Center  | <input type="checkbox"/> Restaurant          |
| <input type="checkbox"/> Interstate Bottler   | <input type="checkbox"/> School              |
| <input type="checkbox"/> Industrial/Agricultural <input type="checkbox"/> Subdivision |  |
| <input type="checkbox"/> Institution  | <input type="checkbox"/> Ski Area            |
| <input type="checkbox"/> Local Bottler  | <input type="checkbox"/> Service Station     |
| <input type="checkbox"/> Lodge  | <input type="checkbox"/> Water User's Assoc. |
| <input type="checkbox"/> Marina   | <input type="checkbox"/> Visitor Center      |
| <input type="checkbox"/> Mobile Home Park <input type="checkbox"/> Vending Machine    |  |
| <input type="checkbox"/> Motel/Hotel  | <input type="checkbox"/> Water Hauler        |
| <input type="checkbox"/> Picnic Area  | <input type="checkbox"/> Other               |

SERVICE

DESCRIPTION

**SOURCE NUMBER I.D.** Sources for this system are identified with a three digit code. The source codes are used for data entry and federal data reporting. The distribution system is always classified as Source 001 since there are specific monitoring requirements for the distribution system. Where appropriate use the correct source number I.D. (on well data, pump data, etc.). On the lines below, update the sources for this system. Designate (A) active or (I) inactive for each source and give identification name.

SOURCE	STATUS	DESCRIPTION
001		<u>Distribution System</u>
002	<u>A</u>	<u>Well No. 1 6 in. well, submersible pump</u>
003		
004		
005		
006		
007		

**SECTION II: SOURCE**

What type of source(s)?

- (G) Groundwater, non-purchased
- (W) Groundwater, purchased
- (P) Surface, purchased
- (S) Surface, non-purchased

1. Water purchased from \_\_\_\_\_
2. Water sold to (other than within the system) \_\_\_\_\_
3. Average daily production(GPD)? Summer 1500 Winter 0
4. Does the system have an operational master meter?  Yes  No
5. How many service connections are there? 11 Active 11 Total Available (campground hydrants)
6. Are the service connections metered?  Yes  No  % Metered
7. What is the estimated number of the population served daily?
  - Resident: Summer \_\_\_\_\_ Winter Closed
  - Non-resident: Summer 100 Winter Closed
8. Water usage (put source I.D. number on blank following criteria).\*
  - Emergency utilization \_\_\_\_\_
  - Permanent utilization \_\_\_\_\_
  - Seasonal utilization 002
9. If seasonal: May 20 Start date October 1 End date
10. Does the system have a written emergency contingency Plan?  Yes  No  
 Explain if yes \_\_\_\_\_

SECTION III: WELLS (Complete one page for each well)

SOURCE ID NO. 002 STATUS A DESCRIPTION Well No. 1  
LOCATION: LATITUDE 44/52/37.0 LONGITUDE 111/34/13.0

Yes No

1. Has the recharge area been identified?        X

2. What is the nature of recharge zones?

Agricultural        Industrial        Residential        Other National Forest

3. Is well site subject to flooding?        X

4. Is well located in proximity of a potential source of pollution (includes surface water, known chemical spills, agricultural use, underground storage tanks, etc.)?        X  
If yes, explain \_\_\_\_\_

5. Is well log available? Yes or No (circle as appropriate). If "yes" fill in the information below; if "no" fill in information based on operator memory.

Depth of well 103 feet. Date drilled 1967  
Drawdown 42 feet. Date in service 1971  
Depth of casing 103 feet. Casing size 6 inches.  
Depth of grout ? feet. Pump setting 80 feet.  
Static water level 6 feet. Length of well screen N/A feet  
Test pumping Rate 10 GPM

Yes No

6. Does casing extend at least 18 inches above the ground; 12 inches above the floor; or 3 feet above maximum flood level? X       

(Circle appropriate distance)

7. Is top of the well casing properly sealed? (sanitary seal) X       

8. Does well vent terminate with return bend facing downward and screened OK       

9. Does well have suitable sampling tap? X       

10. Is upper termination of well protected (housed or fenced)? X

11. COMMENTS: (Describe well and identified deficiencies)

The Madison River Recreation Area includes three Forest Service campgrounds: Madison River Campground, West Fork Campground, and Riverview Campground. The three campgrounds are served by one well. Major re-construction and expansion work was completed at the Madison River Recreation Area in 1996 and 1997. Major items of work included the following:

1. Re-construction of roads and spurs in Madison River Campground
2. Construction of Riverview Campground roads and spurs.
3. Replacement of existing water lines and hydrants in Madison River Campground
4. Construction of new water lines and hydrants in Riverview Campground
5. Installation of a new submersible pump, piping, and electrical at the existing pump house
6. Removal of existing vault toilets in Madison River Campground.
7. Installation of new precast concrete vault toilets in Madison River Campground and Riverview Campground
8. No work was completed at West Fork Campground

**SECTION IV: SPRINGS AND INFILTRATION GALLERIES**

Note: Section omitted; not pertinent.

**SECTION V: PUMPS** (wells - include one per source and identify each source with the Source I.D.)

SOURCE ID NO. 002 STATUS A DESCRIPTION Well No. 1

1. Pump Type, Make & Model No. A.Y. McDonald, V series, 7 gpm

Location Madison River Campground pump house

2. Rated Capacity 7 gpm

3. Comments, if any, regarding state of repair of pumps.  
New pump installed in 1997.

4. Emergency power  
What type None  
Frequency of testing \_\_\_\_\_  
Record of primary power failures: \_\_\_\_\_ in last year  
Switchover: \_\_\_\_\_ Automatic \_\_\_\_\_ Manual

Yes No

5. Are backup pumps/motors provided? \_\_\_\_\_ X

6. Is facility properly protected against trespassing and vandalism? X \_\_\_\_\_

7. Is a preventive maintenance program in operation? X \_\_\_\_\_

8. Are recommended spare parts on hand? X

9. Comments:

All mechanical and electrical systems installed new in 1997. No deficiencies noted.

**SECTION VI: STORAGE**

NOTE: This section omitted; not pertinent.

**SECTION VII: HYDROPNEUMATIC PRESSURE TANKS**

1. **System No. 1** description (describe pump and tank(s)):

One submersible well pump rated 7 gpm. Two Well-X-Trol WX-405 pressure tanks.

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- |  | Yes      | No       |
|--|----------|----------|
| 2. Is tank(s) a captive air type tank?   | <u>X</u> | ___      |
| 3. If not, does tank(s) have automatic air charging system?                    | ___      | ___      |
| 4. Does tank(s) water log?   | ___      | <u>X</u> |
| 5. Is tank(s) in good physical condition?                                      | <u>X</u> | ___      |
| 6. Are tank supports in good physical condition?                               | <u>X</u> | ___      |
| 7. Are pump and tank appropriately sized?                                      | <u>X</u> | ___      |
| 8. Can individual tanks be isolated from the system for maintenance or repair? | <u>X</u> | ___      |
| 9. Operating pressure: Minimum <u>30</u> psi Maximum <u>40</u> psi.            |          |          |
| 10. Comments: <u>Pump and tanks new in 1997.</u>                               |          |          |
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**SECTION VIII: TREATMENT DATA**

NOTE: This section omitted; not pertinent.

**SECTION IX: DISTRIBUTION SYSTEM**

- |  | Yes      | No       |
|--|----------|----------|
| 1. Is proper pressure maintained throughout the system?<br>Minimum <u>30</u> psi Maximum <u>40</u> psi         | <u>X</u> | ___      |
| 2. What types of construction materials are used? <u>Water lines are 200 psi polyethylene.</u>                 |          |          |
| 3. Are plans or map of water system available and current?   | <u>X</u> | ___      |
| 4. Is the system interconnected with any other system?   | ___      | <u>X</u> |
| 5. Describe the maintenance plan for the system, if there is one, and any other comments regarding the system. |          |          |

COMMENTS:

A campground host is on site during the entire use period. Maintenance problems are reported to the Forest Service District Office. On date of this survey, District personnel and the campground concessionaire were repairing two leaks in the water line at Riverview Campground. Both leaks were at valve boxes and were caused by cracked ball valves. The first leak was at the valve box at top of hill before the water line enters the south end of Riverview Campground. The second leak was at Valve Box 5 in Riverview Campground. Both leaks were repaired on 6-25-98. The cracked ball valves were probably due to incomplete drainage of the valve boxes at winter shutdown.

CROSS-CONNECTIONS

Yes No

- 1. Are backflow prevention devices installed at all appropriate locations? [X]
2. Were any cross-connections identified at the time of inspection? [X]

COMMENTS:

MONITORING

Yes No

- 1. Is the operator familiar with bacteriological repeat sampling requirements? [X]
2. Has a sample site plan for bacteriological monitoring been submitted to the State (community PWS only)? [N/A]
3. Was operator informed by inspector of chemical sampling requirements and of sampling procedures. [X]

COMMENTS:

SECTION X: MANAGEMENT

Miscellaneous comments regarding training of personnel, number of personnel, safety and personal protective equipment, safety hazards, etc.

COMMENTS:

SURVEY CHECKLIST

- 1. Attendance Thomas W. Keyes Title Environmental Engineer
2. O&M Plan/as-builts available and reviewed? Yes
3. Test records available and reviewed? Yes
4. Operator training and knowledge Acceptable

5. Diagram prepared? Yes
6. Locate well(s) on USGS quads No
7. Photos taken? Yes Numbers Many
8. Regulations (circular) available and discussed? No
9. Complete time-line planning calendar? No
10. Collect Bacti sample? No Time      Location
11. Field analysis? No Chlorine: Total      Free      pH
12. Is groundwater under the influence of surface water? No
13. List Bacteriological Results for last 10 years:
 

1. <u>1997</u> <u>    </u> P <u>4</u> N	6. <u>1992</u> <u>    </u> P <u>4N, 1</u> HGNC
2. <u>1996</u> <u>    </u> P <u>5</u> N	7. <u>1991</u> <u>    </u> P <u>3N, 1</u> HGNC
3. <u>1995</u> <u>    </u> P <u>5</u> N	8. <u>1990</u> <u>    </u> P <u>3N, 1</u> HGNC
4. <u>1994</u> <u>    </u> P <u>3</u> N	9. <u>1989</u> <u>    </u> <u>1</u> P <u>4</u> N
5. <u>1993</u> <u>    </u> P <u>5</u> N	10. <u>1988</u> <u>    </u> P <u>4</u> N
14. General Comments: Nitrate + Nitrite: 11-3-98 Satisfactory  


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**SANITARY SURVEY FORM - DIAGRAMS**

**Draw brief site plan showing location of well(s), spring(s), water storage, distribution system, pumphouse(s), entry point(s) treatment, etc.**