

Completing a PWS-6 Report for a Multi-User Water Supply

(Updated: October 2024)

The PWS-6 report for a Multi-User Water Supply (MUWS) provides the initial groundwork needed for the delineation and assessment for a water supply as defined in the 1996 Federal Safe Drinking Water Act. A MUWS is a system that serves, or is intended to serve, more than two living units or commercial units or a combination of both and that is not a public water supply system as defined in 75-6-102, MCA. In estimating the population that will be served by a proposed residential system, the reviewing authority shall multiply the number of living units by 2.5. The report must include the information found in the sections below to adequately describe the water supply, the aquifer or surface water source, and potential sources of regulated contaminants in the inventory region. Regulated contaminants for a MUWS include microbiological contaminants (coliform bacteria and *E. coli*) and nitrate. In addition to the text, include a map showing the distribution system and a site layout map identifying the control zone and inventory region. On the inventory region map, be sure to show information laid out in the inventory section below. The report must include the required appendices. For more guidance on completing a PWS-6 Report for a MUWS, please contact the Source Water Protection Program at (406) 444-5546. Please know that when clicking a link below, a PDF will be generated and downloaded from your internet browser, or you will be directed to a website on the internet.

INTRODUCTION AND PURPOSE

Keep in mind when preparing a report that delineation and assessment are the foundation water systems use to protect their drinking water sources. Describe the purpose and potential benefits of delineation and assessment. Include the MUWS name, address, primary contact person, telephone number, and date of report. Identify who completed the report and include their contact information.

WATER SYSTEM INFORMATION

Describe the location, latitude and longitude (decimal degrees), and nature of the water supply (i.e. daycare, elder care facility, bed and breakfast, small food manufacturer, etc.). If this is a new source at an existing MUWS, describe why it is needed. Identify how many individuals the MUWS will serve, the number of service connections, and the anticipated water demand in gallons per day. Use values from pages 27-28, Tables 3.1.1 & 2, column 4 of Circular DEQ 4 to estimate typical flow rates used by the MUWS. A link to access Circular DEQ 4 can be found below. Discuss water treatment measures in use or proposed for the MUWS if applicable. Describe water quality for regulated contaminants at the site if analytics are available and include applicable lab report(s) as an appendix. If the well has not been drilled, include a water quality report from an adjacent well. For wells, list the depth, perforated interval, static water level, pumping water level, yield, and lithology of nearby wells. Attach the well log, or nearby well logs as an appendix. Use the Montana Bureau of Mines and Geology (MBMG) Ground Water Information Center's (GWICs) website to locate nearby wells and their well logs. A link to the Montana Ground Water Information Center's GWIC's website be found below. Attach neighboring well logs as an appendix. Please provide the well log(s) to the Source Water Protection Program after the system is installed. Describe the aquifer or surface water source sufficiently and use Table 1 to assign a sensitivity rank to the water supply.

- [Link to Circular DEQ 4 \(PDF\)](#)
- [Link to Montana Ground Water Information Center \(Website\)](#)

DELINEATION

A 100-foot radius control zone and a 500-foot radius inventory region around the proposed/existing well are the minimum appropriate buffers to delineate the source water protection areas for a MUWS. Show the boundaries of the control zone and inventory region on an aerial map. Describe whether the aquifer is unconfined, semiconfined, or confined based on neighboring well log information for the MUWS. Refer to DEQ Circular PWS-5 to determine if the MUWS will use ground water under direct influence of surface water (GWUDISW). Include the preliminary assessment result page from Circular PWS-5 in the report as an appendix. A link to Circular PWS-5 can be found below.

- [Link to Circular PWS 5 \(PDF\)](#)

Table 1. Source Water Aquifer Sensitivity Table

High Source Water Sensitivity	Moderate Source Water Sensitivity	Low Source Water Sensitivity
<ul style="list-style-type: none">• Surface water and GWUDISW• Unconfined Alluvium• Fluvial-Glacial Gravel• Terrace and Pediment Gravel• Shallow Fractured or Carbonate Bedrock	<ul style="list-style-type: none">• Semi-confined Valley Fill Alluvium	<ul style="list-style-type: none">• Confined Sandstone Bedrock• Deep Fractured or Carbonate Bedrock

INVENTORY

Use the Source Water Protection Program's potential contaminant source web-based mapping application to create a 500-ft inventory region map or to download the most current data for contaminant sources statewide. If you are using your own mapping software to create the inventory, note that the DEQ shapefile data is updated nightly, and it is important to download the most up to date information for making your own maps. The link to the inventorying application and most up to date data download can be found below. For detailed video instructions on how to use the Source Water Protection Program's potential contaminant source web-based mapping application, follow the link below.

- [Link to the Source Water Protection Map Viewer and Data Download \(Website\)](#)
- [Link to the Source Water Protection Map Viewer Guidance Video \(Website\)](#)

Land Use

Describe the general land uses within the inventory region. On an aerial map, indicate the general land uses within the control zone and inventory region. Table 2 lists land use types and map codes that should be used on the map. Put a table like Table 3 in the report with percentages of each land use type within the inventory region. These percentages must add up to 100% of the inventory region.

Table 2. Land Use, Map Codes, and Percent Cover

Land Use Type	Map Code	Percent Cover
Irrigated crop/pasture	ICP	
Dryland crop/pasture	DCP	
Forest	F	
Residential	R	
Municipal	M	
Industrial	I	

Point Sources

Describe the location of the well(s) with respect to sewer mains, sewage treatment systems, and other potential point sources of microbiological and nitrate contaminants within the inventory region. On the aerial map, indicate point sources of microbiological and nitrate contamination. Table 4 lists the point source type and map codes that can be used on the map. Show the exact location of the on-site sewage treatment system for this property and, if possible, for neighboring areas on a site layout map. Other potential sources of non-regulated contaminants such as leaking underground storage tanks, petroleum spills, or superfund sites should be identified and discussed in the report text.

Table 3. Point Sources of Contaminants

Point Source Type	Map Code
Animal Feeding Operation	AFO
Wastewater Treatment Sites	WTS
Sludge Handling Sites	SHS
Land Application Areas	LAA
Septic Systems	SS
Sewer Mains	SM

Septic Density

Describe the septic and municipal sewer density in the inventory region. Include a map showing the septic density and include a table like Table 4 below to indicate percent coverage of each density type. The mapping application will provide square footage of each density, which can be converted to percentage. These percentages must add up to 100% of the inventory region.

Table 4. Septic and Sewer Density

Septic Density	Percent of Inventory Region
High	
Moderate	
Low	
Municipal	

Site Layout

Show on a site layout map the exact location of the well(s), control zone(s), buildings, water distribution system(s), sewage disposal system(s), and roads within the parcel boundaries for the property where the MUWS will operate.

SUSCEPTIBILITY

Susceptibility of the PWS to specific contaminant sources, or classes of contaminant sources identified in the inventory region, is determined by the hazard associated with potential contaminant sources and the existence of natural, management (i.e. ordinances), or engineered barriers. For point sources, hazard is determined by proximity to the water intake. Density is the measure used for assessing hazards associated with contaminant sources such as septic systems that have been grouped into classes. The results should be presented to the DEQ as a table, listing sources, source classes and their associated susceptibility rating along with a narrative describing the analysis. Use the following procedure for the susceptibility analysis, or you can request DEQ's Source Water Protection Staff complete the susceptibility analysis. Include a table like Table 5 below to list each potential contaminant source.

Table 5. Example Susceptibility Table for Potential Sources of Contaminants for a Water Supply

Source	Contaminants	Description (Location and nature of hazard)	Hazard Rating	Barriers	Susceptibility
Septic Systems	Pathogens and Nitrates				
Sewer Mains	Pathogens and Nitrates				
Irrigated Agricultural Land	Pathogens and Nitrates				
Waste Water Treatment, Handling, Disposal Sites	Pathogens and Nitrates				
Animal Feeding Operations	Pathogens and Nitrates				
Landfills, Dumps	Pathogens and Nitrates				

Use Table 6a-b to assign a hazard rating for each potential contaminant source listed in Table 5 based on the aquifer or surface water characteristics.

Table 6a. Hazard rankings for potential contaminant sources at surface water intakes or GWUDISW

Potential Contaminant Source	High Hazard	Moderate Hazard	Low Hazard
Point Sources	Potential for direct discharge to Source Water	Potential for discharge to GW that is hydraulically connected to SW	Potential contaminant sources present within the watershed
Septic Systems	More than 50% of inventory region with greater than 300 per sq. mi. (high density)	20 to 50% of inventory region with greater than 300 per sq. mi. (high density)	Less than 20 % of inventory region with greater than 300 per sq. mi. (high density)
Municipal Sanitary Sewer	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region
Cropped Agricultural Land	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region
EPA Regulated Facilities		All	
MPDES Wastewater Discharges	All		
Storm Water Discharges		All	
Highway or Railroad Crossings	All		
Pipeline Crossings	All		
Animal Feeding Operations	All		
Wastewater Treatment/Spray Irrigation/Lagoons	All		

Table 6b. Hazard rankings for potential contaminant sources at a well

Potential Contaminant Source	High Hazard	Moderate Hazard	Low Hazard
Point Sources	Within 100 feet of well	Between 100 feet and 250 feet	Between 250 feet and 500 feet
Septic Systems	More than 50% of inventory region with greater than 300 per sq. mi.	20 to 50% of inventory region with greater than 300 per sq. mi. (high density)	Less than 20 % of inventory region with greater than 300 per sq. mi. (high density)
Municipal Sanitary Sewer	More than 50% of region	20 to 50% of region	Less than 20% of region
Irrigated Pasture + Agricultural Land	More than 50% of region	20 to 50% of region	Less than 20% of region

Use Table 7 to help you identify natural or man-made barriers for each source listed in Table 5. Only barriers in Table 7 should be used in the susceptibility assessment.

Table 7. Natural and man-made barriers

Well Construction Related Barriers: <ul style="list-style-type: none"> • Intake depth of >50 feet below static waterlevel. • Well seal (grout) extends into confining layer above aquifer • Meets Board of Water Well Contractor Requirements 	Engineering Related Barriers: <ul style="list-style-type: none"> • Existing program to replace/repair sewer lines • Stormwater control structures in place • Leak detection and monitoring for pipelines • Secondary containment in place (fuel and chemical storage tanks)
Location and size of Potential Contaminant Source Related Barriers: <ul style="list-style-type: none"> • Cross or down-gradient location for the contaminant source • Distance from the PWS well(s) • Small non-commercial facility 	Permit Related Barriers: <ul style="list-style-type: none"> • Permitted facility in compliance with permit requirements • Animal feeding Operation plant is operating within its regulatory permit • Groundwater monitoring program in place and active • On-going remediation and monitoring or completion of remediation • Documented removal of contaminant source (fuel and chemical storage tanks, soils etc.)
Soil and Aquifer Related Barriers: <ul style="list-style-type: none"> • Thick unsaturated zone above the aquifer, greater than 100 feet • Continuous clay layer(s) overlie the aquifer • Clay rich surface soils • Upward ground-water gradient (ground-water discharge area) 	Disaster and Emergency Response Related: <ul style="list-style-type: none"> • Emergency Response Plan in Place • Local and County Emergency Response Capacity

Use Table 8 to assign susceptibility ratings for each contaminant listed in Table 5.

Table 8. Susceptibility to contaminant sourced determined by the hazard and presence of barriers

Presence Of Barriers	High Hazard	Moderate Hazard	Low Hazard
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

LIMITATIONS

Include the following text in the report: Identification of potential contaminant sources is limited to nitrates and microbial contaminants and is generally based on readily available information and reports. Unreported activities and contaminant releases will likely be missed and not 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.

REFERENCES

Include a list of references used to prepare the report. See Table 9 below for the suggested format.

Table 9. Suggested Format for Listing References

Author Name, Date of Publication, Title of Report or Document: Publication Source and Report or Volume Number, page number.

Example:

- Kendy, E., and R.E. Tresch, 1996, Geographic, Geologic, and Hydrologic Summaries of Intermontane Basins of the Northern Rocky Mountains, Montana: U.S. Geological Survey Water Resources Investigations Report 96- 4025, 233 p.
- Morrison – Maierle, Inc., 1980, Flower Creek Basin Flower Creek Dam Libby, Montana, MT-1458, 23 p.