

# **Condon Work Center**

## **Source Water Delineation and Assessment Report (SWDAR)**

### **Condon Work Center United States Forest Service Public Water Supply**

**State of Montana Public Water Supply ID# MT0062279**

**Flathead National Forest**  
1935 3<sup>rd</sup>. Ave E.  
Kalispell, Mt 59901

**Phone:** (406) 728-5200

**System Address**  
Condon Work Center  
Star Route 3000  
Condon, MT 59826

**Phone:** (406) 837-7500



**September 2004**

# Table of Contents

**1.0 – Introduction**

**2.0 – Background and Delineation**

**3.0 – Inventory**

**4.0 – Susceptibility Assessment**

**5.0 – References**

## **Figures**

[Figure 1 – Condon Work Center Location](#)

[Figure 2 – Condon Work Center Watershed and Well Location](#)

[Figure 3 – Condon Work Center Area Geology](#)

[Figure 4 – Condon Work Center Source Water Management Zones](#)

[Figure 5 – Condon Land Cover Classification](#)

[Figure 6 – Condon Work Center Area Septic System Density](#)

## **Tables**

Table 1 – Well information summary

Table 2 – Susceptibility Assessment of Significant Contaminant Sources

## **Appendices**

Appendix A – Sanitary Survey

Appendix B – Preliminary Assessment, Well Log, and Water Quality Data

Appendix C – Well logs for PWS area well from MBMG-GWIC

## 1.0 INTRODUCTION

The Safe Drinking Water Act (SDWA) Amendments of 1996 require states to develop and implement Source Water Assessment Programs (SWAP) to analyze existing and potential threats to the quality of the public drinking water supplies throughout the state. The US Environmental Protection Agency (EPA) formally approved the Montana SWAP, prepared and administered by the Montana Department of Environmental Quality (MDEQ), in November 1999. The Montana SWAP was developed from the former Wellhead Protection Program, but includes surface water sources and requires a more rigorous inventory of potential contaminant sources.

SWAP addresses only public water systems (PWS) regulated according to the Federal Safe Drinking Water Act. A public water supply system is defined, according to Federal and Montana regulations, as a system that supplies water for human consumption. A public water supply system has at least 15 service connections or regularly provides water to at least 25 persons daily for a minimum of 60 days in a calendar year. There are three types of public water supply systems:

- Community water systems provide water on a year-round basis, and have a minimum of 15 service connections or regularly serve at least 25 residents. In addition to incorporated towns, community systems may serve smaller areas such as housing subdivisions or trailer courts.
- Non-transient non-community systems do not serve communities, but provide water regularly to a minimum of 25 of the same people for at least 6 months of a year. These systems serve public buildings such as schools and hospitals, where people are employed but do not reside.
- Transient non-community systems do not serve communities, and do not regularly serve a minimum of 25 of the same people for at least 6 months of the year. These systems are usually seasonal, and are located in areas such as Ranger Stations and parks. *The Condon Work Center PWS is a transient non-community system.*

The Montana Source Water Protection Program is intended to be a practical and cost-effective approach to help public drinking water supplies protect their water source from contamination. The United States Forest Service (USFS) works with the Montana DEQ to complete delineation and assessment reports for USFS managed public water supplies in Montana. The Source Water Delineation and Assessment Report (SWDAR) compiles the appropriate data and other technical information about an area to allow the USFS to develop source water protection plans for potable water supplies. 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. Geologic and hydrologic conditions are evaluated in order to delineate source water protection areas. Assessment involves identifying potential contaminant sources in delineated source water protection areas, and evaluating the potential for contamination of drinking water from these sources under "worst-case" conditions such as a flood, fire or human error.

### Scope and Purpose

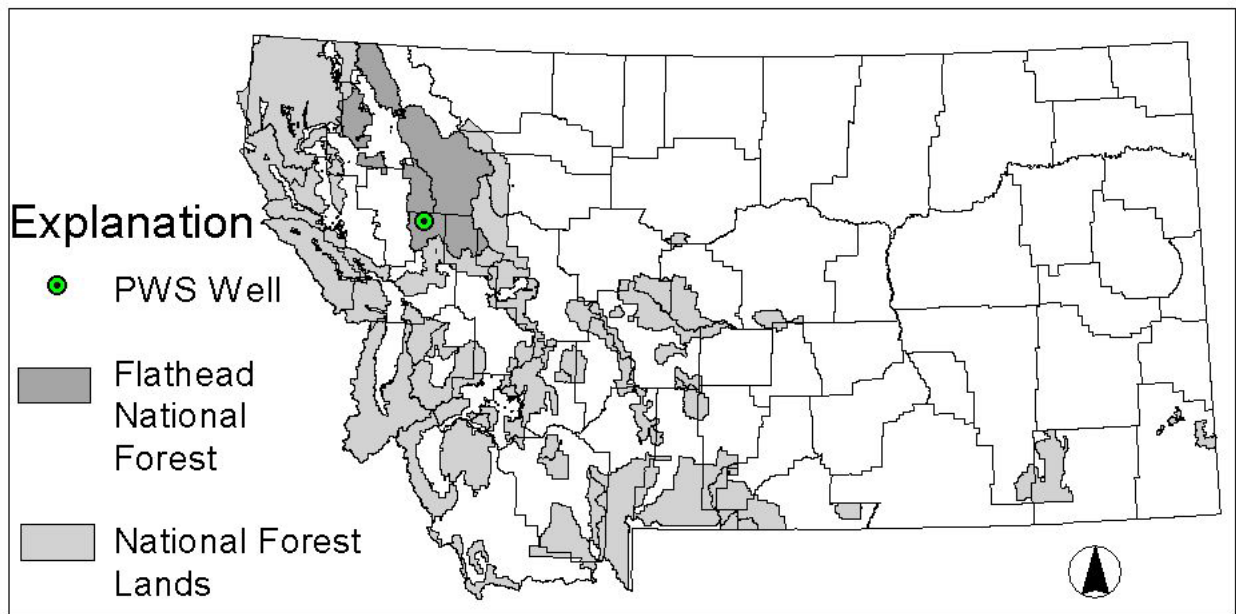
This report presents the source water delineation and assessments for the public water supply for the Condon Work Center located southeast of Kalispell in Missoula County, Montana. This report is intended to meet the technical requirements for the completion of the delineation and assessment report for this PWS, as required by the Montana Source Water Protection Program (DEQ, 1999) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996 (P.L. 104-182).

### Acknowledgements

This report was prepared by James Swierc, hydrogeologist and Brian Story, Environmental Engineering Trainee, both with the USFS Region 1 office, as part of a cooperative agreement with the United States Environmental Protection Agency.

### Limitations

This report was prepared to assess threats to the Condon Work Center public water supply and is based on published information. The terms "drinking water supply" or "drinking water source" refer specifically to sources for regulated public water supplies, and not any other type of water supply. The inventory of potential contaminant sources focuses on the management areas delineated for the public water supply in this report. As a result, other potential sources of contamination to surface and ground water in the area may not be identified.



*Figure 1 – Condon Work Center Location*

## 2.0 BACKGROUND AND DELINEATION

The Condon Work Center is located within the Flathead National Forest, approximately one-half mile north of Condon, Montana. The Condon Work Center is part of a Forest Service facility including an airstrip. The Condon Work Center is located along MT Highway 83, which runs Northwest-southeast through the Swan River Valley. The Condon Work Center is classified as a transient, non-community public water supply; however, the facility houses a few seasonal residents and other transient workers and visitors. The Condon Work Center is located at approximately 47.54° North latitude and 113.72° West longitude, in Section 36 of Township 21 North, Range 17 West. The location of the facility in the Flathead National Forest is shown in [Figure 1](#), with the location of the well shown in [Figure 2](#) with the general setting of the facility. The Condon Work Center well provides water for workers at the facility, both resident and non-resident. The sanitary survey for the system (Appendix A) indicates that the PWS serves a variable number of users.

The public water supply uses one well. Information on the well is listed in Table 1. Water from the well is pumped with a vertical turbine pump into a 1500 gallon pressure tank before flowing to the distribution system. There is no treatment of the water prior to use.

*Table 1. Well information summary.*

Well	Well 1
Source ID	002
MBMG-GWIC ID#	75768
DNRC Water Right #	--
Location	47.5359°N Lat 113.7187°W Long T21N, R17W, Section 36 ACCD
Total Depth	283 feet, backfilled to 196 ft
Completion Date	May 9, 1961
Perforated Interval	64 to 78 feet
Static Water Level	53 feet
Pumping Water Level	--
Pump Test Rate	50 gpm
Drawdown/Yield	--

### Hydrogeologic Assessment

There are no readily available references specific to the hydrogeology of Condon and the Swan River drainage in this area. Ground water for the well occurs in a confined aquifer in glacial sediments. A geologic map of the region is shown in [Figure 3](#). The well log for the PWS well indicates that the well is installed through clay-rich layers present to a depth of 283 feet. Since no significant water bearing interval was found with depth, the well was backfilled to 196 feet, and the casing was perforated from 64 to 78 feet over a gravel layer. The presence of fine-

grained material at the base of the valley is interpreted to reflect glacial deposits from the glacial activity that formed the major features in the area.

Recharge to the aquifer occurs from infiltration of precipitation and surface water discharge to ground water at locations where the aquifer is exposed at the surface in the watershed upgradient from the Condon Work Center. The surface infiltration path through glacial sediments is discontinuous, reflecting the widely variable hydrogeologic properties of glacial strata.

Ground water is interpreted to flow in a direction that generally follows topography. The aquifer is classified as a confined aquifer in unconsolidated glacial sediments. This type of aquifer is classified as having a *high* source water sensitivity to contamination according to the Montana SWAP Program (DEQ, 1999).

### **Source Water Protection Management Zones**

The source water protection areas for the Condon Work Center PWS are identified based on the criteria for a transient non-community PWS as defined in the Montana SWAP Program (DEQ, 1999). For the PWS sources, two primary management areas are identified within the source water protection area; the control zone and the inventory region. The control zone, also known as the exclusion zone, is an area at least 100-foot radius around each well. The inventory region for the well is delineated as the area within a 1000-foot radius around the well. The inventory zone for the well and the surrounding area is depicted in [Figure 4](#).

Since the aquifer may be in communication with surface water, a surface water buffer zone is delineated as a secondary management zone. The surface water buffer zone represents the area of one-half mile on each side of a stream, within a four-hour time of travel distance not to exceed ten miles upstream from the inventory zone. The surface water buffer is delineated around the Swan River and Glacier Creek as shown in [Figure 4](#).

### **Condon Work Center Sampling Results and Water Quality**

Every PWS is required to perform monitoring for contamination to their water supply. The monitoring parameters for transient non-community systems typically include coliforms (as an indicator of pathogenic organisms), and nitrates as an acute health risk. A review of DEQ and USFS databases of monitoring results for the Condon Work Center PWS indicates one positive test for total coliform in the last 15 years. The detected level of nitrates has been significantly less than the drinking water standard of 10 mg/L.

## 3.0 INVENTORY

An inventory of potential sources of acute health hazards was conducted for the Condon Work Center PWS source within the control and inventory zones. The contaminants in this category represent nitrates and pathogens, as required by the Montana Source Water Protection Program (DEQ, 1999). Potential sources include areas with septic systems and agricultural areas where nitrogen fertilizers may be used. These are shown in [Figure 4](#) and [Figure 5](#). While additional sources of contamination may be present, this assessment only focuses on the above listed potential contaminants.

### **Inventory Results/Control Zone**

The control zone represents the most critical point to protecting the integrity of a wellhead for ground water sources. The land around the control zone for the well includes State Highway 83. The control zone around the wellhead is not fenced or otherwise protected from access.

### **Inventory Results/Inventory Region**

The inventory region represents the area near the source well where any contamination spilled onto the ground or subsurface has the potential to migrate directly into the PWS source aquifer. Roads, including US Highway 83, Forest Service Route 901, and Forest Service Route 1146 are all potential contaminant sources. Septic tanks for the Condon Work Center represent another potential contaminant source identified within the inventory zone. Agriculture, practiced within the region, serves as the final potential contaminant.

### **Inventory Results/Surface Water Buffer Zone**

Land use within the inventory region is classified as primarily forest as shown in [Figure 5](#). The small town of Condon lies within the Surface Water Buffer zone. Condon has septic tanks, which pose concern (see [Figure 6](#)). Finally, some agriculture is practiced within the surface water buffer zone.

## 4.0 SUSCEPTIBILITY ASSESSMENT

Susceptibility is the potential for a public water supply to draw water contaminated by inventoried sources at concentrations that would pose concern. Susceptibility is assessed in order to prioritize potential pollutant sources for management actions by the Flathead National Forest, in this case the Condon Work Center PWS.

The goal of Source Water Management is to protect the source water by controlling activities in the control zones and managing significant potential contaminant sources in the Inventory Regions. Management priorities in the Inventory Regions are determined by ranking the significant potential contaminant sources identified in the previous chapter according to susceptibility. Any alternative management approaches, which could be used to reduce susceptibility, are recommended.

Susceptibility is determined by considering the hazard rating for each potential contaminant source and the existence of barriers that decrease the likelihood that contaminated water will flow to the Condon Work Center PWS source. Hazards are assigned based on the percent of land in the inventory zone for non-point sources, and the location for point sources. Susceptibility ratings are presented individually for each potential contaminant source.

After the relative hazard of a potential contaminant source is assigned, the relative susceptibility is determined based on the presence of barriers that may mitigate the potential for a contaminant source to impact a water source. Barriers may represent natural conditions, engineered barriers or management actions. Natural barriers include anything that can be demonstrated as effective in slowing the migration of any chemicals released at the surface. Engineered barriers represent man-made structures to contain chemicals if they are released. Management barriers are plans that prohibit or control potentially polluting activities, but only if there is a plan or approach that has been formally implemented. For the Condon Work Center PWS source, a natural barrier is noted for the clay-rich soils. A management barrier is noted for the septic tanks, representing the proper maintenance of the facilities.

### **Susceptibility Assessment Results**

The results of the susceptibility assessment for the Condon Work Center PWS are listed in Table 2. The primary threats identified are roads in and near the work center as well as septic tanks within the center. The summary information in Table 2 reviews the relative hazard, barriers and susceptibility ranking of each potential source. Management alternatives are recommended that can help reduce the relative susceptibility of each identified potential contaminant source to the PWS sources.

**Table 2. Susceptibility assessment of significant potential contaminant sources.**

Source	Contaminant	Hazard	Hazard Rating	Barriers	Susceptibility	Management
<b><i>Control Zone</i></b>						
State Highway 83	Various Chemicals	Spills	High	Clay Rich Soils	High	Develop emergency response plan
<b><i>Inventory Zone</i></b>						
Work Center Septic Tanks and Drainfield	Nitrates and Pathogens	Infiltration and Runoff	High	Management, Clay-rich soils	Moderate	Maintain proper operation and maintenance protocols
State Highway 83 and Forest 901 and 1146	Various Chemicals	Spills	High	Clay-rich soils	High	Develop emergency response plan
Agriculture	Various Chemicals and Nitrates	Spills and infiltration	Low	Clay-rich soils	Low	Develop emergency response plan
<b><i>Surface Water Buffer Zone</i></b>						
Condon Septic Tanks	Nitrates and Pathogens	Infiltration and Runoff	Moderate	Management, Clay rich soils	Low	Maintain proper operation and maintenance protocols

## 5.0 REFERENCES

- Alden, W.C., 1953. Physiography and Glacial Geology of Western Montana and Adjacent Areas; U.S. Geological Survey Professional Paper 231.
- Fetter, C.W., 1994. Applied Hydrogeology, Macmillan College Publishing Co., New York, NY.
- Heath, R., 1982. Basic Ground Water Hydrology, U.S. Geological Survey Water Supply Paper 2220.
- Montana Department of Environmental Quality (DEQ), 1999. Montana Source Water Protection Program.
- Ross, C.P., Andrews, D.A., and I.J. Witkind, 1955. Geologic Map of Montana; United States Geological Survey, in cooperation with the Montana Bureau of Mines and Geology.
- Todd, D.K., 1980, Ground Water Hydrology, John Wiley and Sons, New York, NY.
- United States Environmental Protection Agency (EPA), 1993. Seminar Publication – Wellhead Protection: A Guide for Small Communities, EPA/625/R-93/002.
- United States Geological Survey, 2000. Preliminary land use classification data for Montana