

WYOMING WATER ASSESSMENT AND PROTECTION PROGRAM (SWAP)



SOURCE WATER ASSESSMENT PROGRAM EXECUTIVE SUMMARY

Source Water Assessment Prepared For:
Curt Gowdy SP Crystal Dam Overlook

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June 30, 2004

SOURCE WATER ASSESSMENT SUMMARY FOR Curt Gowdy SP Crystal Dam Overlook

PWS Source Water Assessment Summary

The Curt Gowdy State Park is located on Wyoming Highway 210 about 25 miles west of Cheyenne. The Crystal Dam Overlook water system consists of a well pump, a hydropneumatic tank, a chlorine bleach injection system, a 5-micron cartridge filter, a concrete vault, and a hand hydrant. The system serves a transient population estimated to be 25 people per day between May 1 and October 1. Source water for the facility is obtained from one well that is completed in the White River Formation and Sherman Granite.

In general, the Curt Gowdy State Park Crystal Dam Overlook scores high for land use susceptibility because some of the land surrounding the water sources is forested. The overall point source contaminant susceptibility rating is low due to the lack of contamination sources being present within the delineated zones.

Delineation Methods

Because the Crystal Dam Overlook water system is classified as a transient non-community groundwater system and obtains water from a porous media/fracture flow aquifer, Lidstone delineated the source water area for this system using both calculated fixed radius (CFR) and hydrogeologic mapping methods. The CFR method was used to estimate the two and five year time of travel radii for the groundwater system based on data obtained from the Wyoming SEO, the PWS sanitary survey, the Wyoming Water Research Institute report, and the SWAP guidance document. Hydrogeologic mapping techniques were used to include additional vulnerable areas near the well.

The CFR is an appropriate method to use when groundwater flow to the well, spring or tunnel can be characterized as porous. This process was implemented for small communities that derive water from deeper, confined aquifers, or for non-community water systems. A factor of safety of 1.5 was applied to all systems where portions of the data were suspect. At the ground surface, the radius can be used to delineate an area around the well to be used for wellhead protection. The radius is the distance from the well to a point where groundwater (and contaminant) can reach the well over a specified time period. Input data requirements are limited, consisting of the pumping rate, open area (screened interval) of the well, porosity of the aquifer, and the selected time of travel (2 years and 5 years).

Hydrogeologic mapping techniques use surface observations in combination with subsurface geologic and hydrogeologic data to identify aquifer boundaries and areas that contribute water to the aquifer. These techniques were used when a PWS's source was derived from a spring, fractured bedrock, or from a limestone or dolomite aquifer. Conduit flow aquifers have extremely variable flow patterns and rates, making the calculation of time of travel difficult. In some instances, only one contaminant inventory zone was identified beyond Zone 1 due to the inherent difficulty in attempting to assign a particular time of travel to a given area. Because of this issue, aquifer vulnerability mapping techniques were also used as part of the hydrogeologic mapping effort to identify and delineate vulnerable areas. These areas (faults, fractures, exposed

bedrock, etc.) are anticipated to be more susceptible to the rapid infiltration of contaminants released at the ground surface.

Groundwater Sources

Crystal Dam Overlook obtains its source water from one well that is completed in the White River Formation and Sherman Granite to a depth of 120 feet. Recharge to these rocks occurs through the direct infiltration of precipitation and possibly from stream losses along the South Fork of Crow Creek. Groundwater reaches the well through porous media/fracture flow. Additional information on this well is included on the attached Well Information Sheet.

As shown on the enclosed source water area map, the contaminant inventory zones for this well are centered around the wellhead. Zone 2 extends approximately 290 feet radially from the wellhead, while Zone 3 extends approximately 458 feet. As an added measure of protection, Crystal Lake Reservoir was included in the delineation.

Integrity Summary

The Curt Gowdy State Park Crystal Dam Overlook uses one well to supply water to the system. The well, Crystal #1, was constructed between 1983 and 1993, when more stringent construction standards were not required by the State of Wyoming. Records also show that the well was properly sealed to protect against surface infiltration of potential contaminants and flooding around the wellhead. As shown on the Integrity Summary Table, the well received a low score of 3, which is a direct reflection of the well completion date and wellhead accessibility.

Water Source Sensitivity Summary

The Curt Gowdy State Park Crystal Dam Overlook obtains water from the White River/ Sherman Granite that has unconfined aquifer characteristics. As shown on the Source Sensitivity Summary Table, the well received a sensitivity score of 8.

This well received a sensitivity score of 8 for two reasons. First, the unconfined aquifer is known to be vulnerable to contamination in this area. The second reason is that laboratory analysis of water samples from the Crystal Dam Overlook within the last five years detected nitrate, a contaminant that is listed on EPA's primary and secondary drinking water standards. Despite detection, this contaminant was detected at concentrations below the EPA's maximum contaminant levels.

Water System Susceptibility Rating

Susceptibility is defined as the potential for a public water supply to draw water contaminated at concentrations that would pose a threat or concern to human health. In general, the Curt Gowdy State Park Crystal Dam Overlook scores high for land use susceptibility because some of the land surrounding the water sources is forested. The overall point source contaminant susceptibility rating is low due to the lack of contamination sources within the delineated zones. Susceptibility ratings for each type of potential contaminant source are summarized on the attached

susceptibility tables.

A review of your PWS's routine water analysis results revealed that one or more chemicals that are considered contaminants in drinking water were detected at some time within the last five years. Chemical detections have a large impact on your PWS's sensitivity score because it may indicate that there is a pathway for contaminants to reach the water supply. However, it is likely that these chemicals are present only in small amounts and are not a danger to your health. Some of these chemicals may also occur naturally in water.

For more information about which chemicals were detected, please contact the PWS for a copy of the most recent Consumer Confidence Report or water analysis results. Chemical detections at levels that are a concern to human health are reported on the EPA's website: http://www.epa.gov/enviro/html/sdwis/sdwis_query.html. To see if your PWS has exceeded the federal primary or secondary drinking water standards, just click on the State of Wyoming and then type in the name of your PWS. Consumer Confidence Reports are prepared by the PWS on a yearly basis. The reports should include information about any chemicals found in the water, even those found at very low levels. Please contact Kim Parker at DEQ, 307-777-7781, or WARWS for assistance. You may also contact EPA to find out what contaminants were detected. You may have to fill out a Freedom of Information Act request to obtain the water test results for your PWS. Please call EPA's Safe Drinking Water Hotline at 1-800-426-4791.

**POINT SUSCEPTIBILITY SUMMARY TABLE
FOR Curt Gowdy SP Crystal Dam Overlook
Point Source Susceptibility Summary**

It may appear from the results of this point source susceptibility summary table that your system has too many PSOCs influencing the final ratings. In some cases, a specific PSOC falls within a specific contaminant inventory zone shared by multiple wells or intakes. When this is the case, that PSOC will be scored for each intake. For example, an underground storage tank may appear within a contaminant inventory zone shared by four different wells. This would cause that single storage tank to be entered into the table four times, or once for each well or intake.

Point Source Type	Low	Medium	High
None Identified	N/A	N/A	N/A

- * Illustrates the number of PSOCs in a particular rating class for all water sources
- * N/A - Not Applicable