

**SOURCE WATER ASSESSMENT
EXECUTIVE SUMMARY
FOR
Osage Water District**

June 30, 2004

PROJECT: 424-001

ASSESSMENT COMPLETED BY: TRIHYDRO CORPORATION

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SOURCE WATER ASSESSMENT SUMMARY FOR Osage Water District

PWS Source Water Assessment Summary

The Osage Water District is a community groundwater supply system located in Weston County. The system serves 350 people through 125 service connections year-round. The system is supplied by two wells that draw water from limestone of the Madison Formation. Facilities also include a water treatment unit for disinfection, a storage tank, a storage tower, and the interconnecting transmission system. The water sources scored medium with respect to the combined integrity and aquifer sensitivity ratings. The district scored high with respect to land use susceptibility and medium for point source susceptibility. The system also scored low for transportation corridor susceptibility.

Delineation Methods

This water system is a community system that draws water from fractured limestone. Hydrogeologic mapping methods were implemented to estimate the 2-year and 5-year time of travel for the groundwater flow system.

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

The Osage Water District draws water from the Madison Aquifer. Recharge for the wells originates from limestone outcrops northeast of the wells, and reaches the wells through conduit flow. Additional information on these wells is included on the attached Well Information Sheets. As shown on the enclosed source water area delineation map, contaminant inventory zones 2 and 3 are combined and delineated by hydrogeologic mapping methods. Zone 2 encompasses the outcrop of limestone formations that makes up the Madison Aquifer, and all surface drainage into the outcrops northeast of the wells along the South Dakota border.

Integrity Summary

The Osage Water District uses two wells, approximately 3000 to 3100 feet deep, to supply water. The wells were constructed prior to 1983 when less stringent construction standards were required by the State of Wyoming. However, records show that the wells were properly sealed to protect against surface infiltration of potential contaminants and flooding around the wellhead. As shown on the Integrity Summary Table, Osage Plant Well #2 received a score of 3 due primarily to the well completion date. Osage Well #4 received a score of 4 due to the well completion date and its long conveyance structure length.

Water Source Sensitivity Summary

As shown on the Source Sensitivity Summary Table, the wells received a sensitivity score of 10. The wells received the score for two reasons. First, the wells are completed in an aquifer that is known to be vulnerable to contamination because of the high velocities associated with conduit flow. Second, the wells scored 5 for chemical sensitivity due to documented detections in groundwater.

Water System Susceptibility Rating

Susceptibility is defined as the potential for a public water supply to draw contaminated water at concentrations that would pose a threat or concern to human health. In general, the Osage Water District scores high for land use susceptibility because much of the land surrounding the water sources is forested. Forested areas were included to evaluate the potential risks of increased runoff and water quality problems following forest fires. However, the recharge area for the Madison Aquifer is approximately 16 miles northeast of the wells. Therefore, infiltration of contaminants is unlikely due to the depth of the wells and their distance from the recharge area. The overall point source contaminant susceptibility rating is medium due to the presence of contamination sources present within the delineated zones. The water sources were assigned a low transportation corridor susceptibility.

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 Osage Water District
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
Sol/Haz Waste Site	N/A	6	N/A

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