

**SOURCE WATER ASSESSMENT
EXECUTIVE SUMMARY
FOR
Alpine**

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PROJECT: 424-001

ASSESSMENT COMPLETED BY: TRIHYDRO CORPORATION

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SOURCE WATER ASSESSMENT SUMMARY FOR Alpine

PWS Source Water Assessment Summary

Alpine is a community groundwater system located in Lincoln County. The system serves approximately 550 people through 246 service connections. Facilities include two wells, one spring, and one distribution system. Alpine's two wells scored medium with respect to the combined integrity and source sensitivity ratings. Alpine's spring scored high with respect to the combined integrity and source sensitivity ratings. The spring also scored high with respect to land use and point source susceptibility and medium with respect to transportation corridor susceptibility. Alpine's other water sources generally scored high for land use susceptibility and low for point source contaminant susceptibility.

Delineation Methods

This water system is a non-community system that draws water from a spring and porous sedimentary formation. Hydrogeologic mapping methods and WhAEM methods were implemented to estimate the 2-year and 5-year time of travel zones 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.

U.S. EPA's Wellhead Analytic Element Model or WhAEM method was used for community water systems that derive their sources from alluvial or shallow bedrock aquifers. The WhAEM model uses well and limited hydrogeologic data to estimate time-of-travel capture zones in relatively simple hydrogeologic settings for either confined or unconfined aquifers. For the source water assessment, the WhAEM model was used to develop two year and five year groundwater capture zones. Due to this methodology, the delineated source water areas may be larger than the true capture zones for each well. However, use of this method typically results in source water protection areas that can be used to more reliably protect the water supply.

Groundwater Sources

Alpine uses one spring and two wells to supply water. The spring draws water from the Teewinot Formation. Recharge to the spring originates as infiltrating precipitation and surface water from the surrounding drainage basin, and reaches the well through porous flow. The wells

draw water from the alluvium in the Greys River Valley. Recharge to the alluvial aquifer comes from the Greys River and reaches the well through porous media flow generally from southeast to northwest. Additional information on the spring and wells is included on the attached Spring Information Sheet and Well Information Sheet. As shown on the enclosed source water area delineation map, contaminant inventory zones 2 and 3 were delineated by hydrogeologic mapping methods and WhAEM methods. The spring's Zone 2 encompasses the immediate unnamed drainage that contributes water to the spring. Zone 3 for the spring encompasses the outcrop of the Teewinot, terminating on the east at an unnamed fault. WhAEM zones 2 and 3 represent 2-year and 5-year groundwater travel times, respectively. These capture zones extend southeast from the wellheads.

Integrity Summary

Alpine supplies water from two wells and one spring. The wells are approximately 243 feet and 275 feet deep. As shown on the Integrity Summary Table, Well #1 and Well #2 received integrity scores of 5 and 4, respectively. Well #1 received a slightly higher integrity score primarily because the well was constructed prior to 1983, when less stringent construction standards were required by the State of Wyoming. The spring received an integrity score of 7 primarily because the spring was constructed prior to 1983, when less stringent construction standards were required by the State of Wyoming and because the spring lacks a screen to protect against potential infiltration of contaminants.

Water Source Sensitivity Summary

As shown on the Source Sensitivity Summary Table, the wells each received a sensitivity score of 9 and the spring received a sensitivity score of 10. The wells received a score of 4 for aquifer sensitivity due to drawing water through porous media flow in an unconfined aquifer that is known to be vulnerable to contamination. The wells scored 5 for chemical sensitivity due to documented chemical detections in the groundwater. The spring received a sensitivity score of 10 for two reasons. The first reason is that springs are more vulnerable to contamination due to unpredictable flow pathways and their proximity to the ground surface. The second reason is that there is documented chemical detections in the 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, Alpine 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. The spring scored high for point source susceptibility due to the presence of five underground storage tanks within Zone 3. The spring also received a medium score for transportation corridor susceptibility due a state highway in the proximity of Zone 3.

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 Alpine
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
Underground Tank	N/A	N/A	5

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