WYOMING WATER ASSESSMENT AND PROTECTION PROGRAM (SWAP)

SOURCE WATER ASSESSMENT PROGRAM EXECUTIVE SUMMARY

Source Water Assessment Prepared For:
Holdings Little America

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SOURCE WATER ASSESSMENT SUMMARY
FOR Holdings Little America

PWS Source Water Assessment Summary

The Holdings Little America water facility is a non-transient, non-community groundwater system that is located at the western edge of Cheyenne at 2800 West Lincoln Way. A hotel/restaurant and service station with an adjacent golf course, the facility provides water to about 200 people per day through ten service connections. Source water for the facility is obtained from five wells that are completed in the White River Formation. Produced water is piped to a central location where a sodium hypochlorite solution is injected for disinfection before it enters a 3,800 gallon pressurized storage tank. An air compressor maintains pressure in the tank, which in turn pressurizes the distribution system. Additional water purchased from the Cheyenne Board of Public Utilities (PWS #5600011) supplements the well water during high demand periods, especially during the summer irrigation season.

In general, the Holdings Little America water facility scores low for land use susceptibility for Zone 1 and medium for Zones 2 and 3 because of irrigated lands and urban area within the source water areas for the wells. Little America should also be aware that several potential transportation corridor and point source contaminants lie within the delineation zones.

Delineation Methods

Because the Holdings Little America facility is classified as a non-transient non-community groundwater system and obtains water from a porous sandstone aquifer, Lidstone delineated the source water area for this system using calculated fixed radius (CFR) methods. This 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, and the SWAP guidance document.

The calculated fixed radius (CFR) method is appropriately used when groundwater flow to the well 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. The CFR calculation, $r = [(Qt)/(\pi nH)]1/2$ (FS), requires discharge (Q) during a period of time (t), aquifer porosity (n), and length of the well's open interval (H), to determine the radius (r) of a cylinder containing the volume of water discharged from the well during a chosen time period. A factor of safety (FS) 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 from which groundwater (and contaminants) 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 (two years and five years).

Groundwater Sources

The facility obtains its source water from five wells that are completed in White River Formation to depths ranging from 143 to 200 feet. Recharge to the Formation occurs through the direct

infiltration of precipitation. Groundwater in saturated parts of this formation flows eastward, and reaches the wells through porous media flow. Additional information on these five wells is included on the attached Well Information Sheets.

As shown on the enclosed source water area maps, the contaminant inventory zones for these wells are centered around the wellheads. Zone 2s for the wells extend between 709 and 1,738 feet radially from the wellheads, while Zone 3s range from 1,122 to 2,748 feet radially from the wells. Differences in the size of the contaminant inventory zones are primarily due to differences in the pumping rates of individual wells and local aquifer permeability.

Integrity Summary

The Holdings Little America water facility is a non-transient non-community groundwater system obtained from five wells. The Holding #1, #2, #4 wells were constructed before 1983 when stringent construction standards were not required by the State of Wyoming. The Holding #5 and #6 were completed after 1993 when stringent construction standards were required by the State of Wyoming. Records show that the well was properly sealed from surface infiltration of potential contaminants and flooding around the wellhead. As shown on the Integrity Summary Table, the Holding #1, #2 , #4 wells scored 4, primarily due to the completion date and lack of wellhead protection. The Holding #5 and #6 wells scored 2, primarily due to the completion date and lack of wellhead protection.

Water Source Sensitivity Summary

The Holdings Little America water facility obtains source water for the facility from five wells that are completed in the White River Formation. As shown on the Source Sensitivity Summary Table, a sensitivity score of 6 for all wells was assessed.

The wells received a score of 6 for two reasons. All five wells are completed in a confined aquifer which is insensitive to contamination. The second reason is that laboratory analysis of water samples within the last five years detected several contaminants that are listed on EPA's primary and secondary drinking water standards. These include nitrate, sodium, sulfate, and barium. Despite detection, these contaminants were generally 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 Holdings Little America water facility scores low for land use susceptibility for Zone 1 and medium for Zone 2 because of the irrigated lands and urban area. The presence of underground storage tanks and storage tanks within Zone 3 resulted in a medium point source contaminant susceptibility in general. A pipeline that crosses through Zone 2 resulted in a high susceptibility rating for the transportation corridor contaminants. A pipeline, two interstate highways, state highway, and railroad run through Zone 3. The wells were assigned a low susceptibility for the transportation corridor contaminants for Zone 3. 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 Holdings Little America

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	14	21	N/A
Storage Tank	14	21	N/A

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