

WYOMING WATER ASSESSMENT AND PROTECTION PROGRAM (SWAP)



SOURCE WATER ASSESSMENT PROGRAM EXECUTIVE SUMMARY

Source Water Assessment Prepared For:
Flying J

Assessment Completed By:
Lidstone and Associates, Inc.
Engineering, Geology & Water Resource Consultants
4025 Automation Way, Building E
Fort Collins, CO 80525



June 30, 2004

SOURCE WATER ASSESSMENT SUMMARY FOR Flying J

PWS Source Water Assessment Summary

The Flying J Travel Plaza is classified as a non-transient non-community groundwater system, and is located just west of Rawlins along I-80. The facility, comprised of a restaurant and a convenience store, provides water for 85 employees and an average daily patronage of 893, through two connections year round. Source water is obtained from four wells that are located about a quarter mile north of the Plaza. Water from the wells is collectively pumped to two 16,000 gallon steel storage tanks located on a hillside and is gravity fed to the Plaza where it is filtered through the single stage cartridge filters and then through the softeners. From here the system supplies water to the restaurant, toilet rooms, showers, and lawn irrigation on demand.

In general, the Flying J water sources rated low for land use susceptibility. The overall point source contaminant susceptibility rating is also low due to the lack of contamination sources being present within the delineated zones.

Delineation Methods

Because the Flying J Travel Plaza 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 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 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 Flying J Travel Plaza obtains its source water from four wells that are completed in Miocene Rocks to depths ranging from 100 to 200 feet. Recharge to the Miocene Rocks occurs through the direct infiltration of precipitation and possibly from hydraulic communication with the underlying Tensleep Sandstone. Groundwater reaches the wells through porous media flow. Additional information on these four wells is included on the attached Well Information Sheets.

As shown on the enclosed source water area map, the contaminant inventory zones for these wells are centered around the wellheads and overlap due to their proximity. Zone 2 extends approximately 380 feet radially from the wellheads, while Zone 3 extends approximately 672 feet radially around the wells.

Integrity Summary

The Flying J Travel Plaza uses four wells to supply water to its water system. While Gay Johnson Well Nos. 1 and 3 were constructed after 1993 when stringent construction standards were required by the State of Wyoming, Gay Johnson Well Nos. 2 and 4 were completed prior to 1983 when less stringent standards were used. The available records indicated that the wells were all properly sealed to protect against surface infiltration of potential contaminants and flooding around the wellhead. As shown on the Integrity Summary Table, Gay Johnson Well Nos. 1 and 3 both received a score of 1, while Gay Johnson Well Nos. 2 and 4 both received scores of 3. These scores are a direct reflection of the well completion date for each respective well.

Water Source Sensitivity Summary

The travel plaza uses four wells that obtain groundwater from a confined aquifer. As shown on the Source Sensitivity Summary Table, each of the wells received a sensitivity score of 6.

These wells received an intermediate sensitivity score for two reasons. The first reason is that confined aquifers are the least vulnerable to contamination. The second reason is that laboratory analysis of water samples from the facility within the last five years detected several contaminants that are listed on EPA's primary and secondary drinking water standards. These include sodium, sulfate, nitrate, and total coliform. While sulfate was detected at concentrations that exceeded the EPA's secondary maximum contaminant levels, the other contaminants were detected at concentrations below their respective 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, Flying J scores low for land use susceptibility. The overall point source contaminant susceptibility rating is also low due to the lack of contamination sources being present 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 Flying J
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