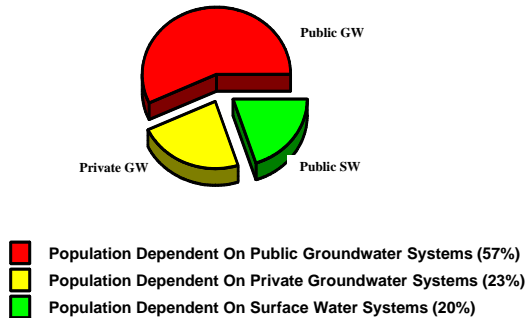


WYOMING GROUND WATER CONDITIONS

Ground Water Importance and Use: Groundwater is an important resource vital to the livelihoods of Wyoming's residents and industries. The state has a population of approximately 480,000 and a surface area of 97,914 square miles. Ground water provides roughly 80% of the population with their only source of drinking water; in rural areas nearly all residents rely upon ground water for domestic uses. USGS (1995) estimates that approximately 317 million gallons (Mgal) of ground water are used in state each day, as follows: Irrigation (181); Mining (89); Public supply (38); Livestock (13); Private supply (9.7); Industrial (1.6); Thermo-electric (1). Groundwater also supplies fresh water to streams, rivers, and lakes, and in many areas is the only source of water available.

Drinking Water Systems & Usage



Availability: Ground water is located throughout Wyoming in depths ranging from near-surface to many thousands of feet. The geologic units that occur in the State are divided into four principal aquifer systems: unconsolidated valley-fill deposits, principally found along or adjacent to major rivers and drainages; semi-consolidated to locally consolidated sedimentary rocks in the High Plains aquifer system; and consolidated sedimentary rocks (including carbonates) found within or flanking eight different structural basins.

Quality: High quality ground water is available throughout much of the state, with total dissolved solids concentrations well below 500 mg/l. Quality varies in many areas depending upon aquifer depth, distance from recharge areas, and proximity to mineral deposits. While bedrock aquifers are present in most areas, many are not suitable for drinking or irrigation use, but do provide ground water suitable for industrial and livestock use. In localized areas, residents sometimes resort to treating or storing water because

Progress in Protecting Ground Water Quality: Recent advances toward protection of ground water resources in Wyoming have focused primarily upon

high quality ground water is only accessible at great depth, and expense. Certain aquifers in some areas of the state are known to have elevated levels of naturally occurring elements (arsenic, fluoride, selenium, radon, radionuclides) in ground water that make it unsuitable for most uses.

Contamination Issues: Sources of ground water contamination in Wyoming are discussed in Chapter 3 of the report and are typical of those commonly found in other states, including residential, commercial, agricultural, industrial, mineral development, government, and military related activities. Frequently, the number and variety of known groundwater contamination sites is highest in urban commercial and industrial areas.

Once contaminated it's difficult, if not impossible, to completely restore ground water quality. Typically, the cost in terms of time and money to clean up or treat contaminated groundwater is tremendous, and may far outweigh the financial capabilities of those responsible for cleanup. The benefits realized by working through effective groundwater protection programs to avoid such problems and related costs is immeasurable.

Wyoming is fortunate in that few public drinking water supply wells have been affected by contaminants, however, two communities currently must treat part of their water supply to remove contaminants. One community has been impacted by nitrates, the other by trichloroethylene (TCE), possibly from a former defense site. A small number of public water supply wells associated with commercial business operations have also been impacted by contamination from failed, or poorly sited septic systems. In rural areas, private drinking water wells have been impacted by nitrates, bacteria, and other contaminants.

Although Wyoming has established a cleanup fund for leaking underground storage tanks, there are no similar assistance programs available to deal with groundwater contamination resulting from other types of sources, be they residential, commercial, or industrial. (Wyoming is currently working toward development of a 'Brownfields' program to assist businesses and communities with cleanup and redevelopment of properties left dormant due to contamination problems.)

drinking water supplies. In 1997 Wyoming became the 46th state to have an EPA-approved Wellhead Protection Program to assist communities in planning

for protection of drinking water supplies. Wyoming has also taken advantage of funding opportunities providing under the Safe Drinking Water Act (SDWA) to develop Source Water Assessments that will help public water systems better understand the aquifers used to supply those systems, and activities that may impair the quality of ground water. The Wyoming Assoc. of Rural Water Systems continues to assist many water supply systems with development of local drinking water protection plans.

Most recently, the state adopted legislation to begin certification of water well drillers and pump installers to help ensure that new water wells are properly constructed to protect ground water from contaminants, and to prevent cross-connection of high quality ground water with aquifers holding poorer quality ground water. New legislation and regulations have also been adopted to evaluate new subdivision water supplies in order to ensure that there will be a safe and adequate source and supply of water available upon development.

In partnership with the University of Wyoming and the Wyoming State Geological Survey, state agencies have recently characterized and mapped shallow groundwater 'significance' in terms of quality, use, and vulnerability to pollution. This effort built upon previous protection efforts that led to development of GIS-based maps illustrating areas where ground water is vulnerable to contamination. These 'tools' are available to, and being used by some Wyoming communities to plan for future growth and development with an eye toward protecting ground water resources used by the community and area residents. State and federal agencies have also worked cooperatively to develop guidelines for siting off-channel produced water pits associated with coalbed methane gas development in order to protect ground water uses and quality in the Powder River Basin.

What is Needed:

Maintaining and advancing state groundwater protection efforts are limited, in large part, due to the amount of funding (Section 106, Clean Water Act) EPA recommends for state groundwater protection programs. For FY '03, Wyoming ranked 48th in terms of the amount of funding received by states, and

received fewer funds than some U.S. Territories. We suggest the funding formula used to allocate funds to state water programs unfairly penalizes states like Wyoming that have vast areas and abundant, high quality groundwater supplies. Additional funds could assist Wyoming to:

- More effectively prioritize and protect important water resources through better planning and coordination with other state and federal agencies.
- Implement a statewide monitoring program to establish ambient, or baseline, conditions from which to measure progress in protecting ground water quality.
- Expand education, training, and technical assistance to local governments, organizations, and citizens on pollution prevention and ground water protection issues and concerns.
- Funding is also recommended in the following areas:
- Continue SDWA set-aside funding for implementation of drinking water protection plans, and expand to include assessments for 'potential' drinking water supplies.
- Increased funding (through Cheyenne's USGS' Water Resources Division Office) for state water resource programs/centers and the STATEMAP program will enable the University of Wyoming, the Wyoming State Geological Survey, and USGS to continue efforts in addressing state challenges in groundwater protection and to better characterizing ground water resources.
- Financial assistance to individuals for replacement of contaminated, private drinking water wells.