

## **Protecting Groundwater**

Nevada's mining water pollution control regulations were passed in 1989, but the State's mining history stretches back to the 1860s. Older facilities that were constructed prior to the implementation of Nevada's mining regulations were not built to the strict standards in use today and groundwater contamination may have occurred. This led to the stringent construction requirements in place today for process components at modern mine facilities. For example, process plants are required to have engineered primary and secondary containment structures. Primary containment may be a tank, pipe, or vessel; secondary containment may be a concrete floor with stem walls or a geosynthetic-lined ditch. Pipes installed underground must have a secondary pipe to ensure that any leaks in the primary pipe are captured by the secondary pipe. Heap leach pads and tailings impoundments must have engineered liner systems designed to protect the environment.

In most cases the State's Water Pollution Control Permits (WPCP) for mining facilities include a zero discharge requirement; the operators cannot leak or discharge any process fluid or other contaminants to the environment. If they do they must clean up the release immediately. Some WPCPs for mining facilities do authorize a limited discharge of water (usually groundwater pumped by the operator for the purpose of dewatering the ore body); but even in those cases, no degradation of groundwater (or surface water) quality is permitted. If groundwater is found to have been degraded by the mine facility, the operator is typically required to stop the leakage immediately and then install a groundwater pumpback system of wells. These wells are required to collect the contaminated water and return it to the mine facility for treatment or for use in the process plant. Groundwater contamination is not allowed to exist unchecked; remediation is required.

### Monitoring Wells

Groundwater monitoring wells are commonly located hydrologically downgradient of the process plant, leach pad, solution ponds, rapid infiltration basin, and/or tailings impoundment. In some cases monitoring wells are also located near a pit lake or upgradient of a process component to provide other types of information. The operator is required to sample these wells regularly and submit the samples to a Nevada-certified laboratory for water quality analyses. The groundwater quality in the wells must not exceed drinking water standards, or natural background concentrations if the water quality is naturally elevated above drinking water standards. If there is any indication that groundwater quality has been degraded by the mining process, the operator is required to address the potential contamination immediately. While it is the Division's desire to work with the operator to achieve compliance within a reasonable timeframe, failure by the operator to do so may result in enforcement action taken by the Division with additional requirements for the operator to return to compliance. Enforcement action may also be taken by the Division in the case of any other significant violation of permit requirements or applicable regulations. If groundwater contamination is discovered, a corrective action plan is typically required by the Division to eliminate the source, clean up the contamination, and prevent it from migrating downgradient.