Technical and Physical Feasibility Fact Sheet
Alternative 47: Water Quality

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1. Definition of Alternative

A-47: Identify, protect, and monitor areas vulnerable to contamination, and restrict domestic wells in sensitive areas.

2. Summary of the Alternative Analysis

The purpose of this alternative is to assess the potential for contamination to affect the water supply within the Middle Rio Grande (MRG) water planning region and to identify programs that can assist in protection of groundwater within the region. Contamination of water supplies is an issue particularly in areas with a high density of shallow wells, septic systems, leaking storage tanks, or other contaminant sources, and monitoring and protection programs are often focused on addressing these issues. This alternative is technically and physically feasible. However, substantial additional efforts to pursue this alternative are unnecessary as it largely falls under existing regulatory programs.

Much of the work necessary to identify vulnerable areas within the region has already been completed during preparation of the *Albuquerque/Bernalillo County Ground-Water Protection Policy and Action Plan* (Policy Coordinating Committee, 1995). Groundwater vulnerability for Bernalillo County has been assessed through use of the DRASTIC method (Aller et al., 1987), in which a numerical ranking system is applied to several parameters, including depth, recharge, aquifer and soil media, topography, vadose zone impact, and hydraulic conductivity. The results of this analysis, including a map of relative groundwater vulnerability for the county, are presented in the report *Vulnerability of Bernalillo County Ground-Water Resources* (CH2M Hill, 1990, Figure 3-3). The most highly vulnerable areas identified are those overlying the

shallow valley-fill aquifers within the unconsolidated sediments along the Rio Grande and Rio Puerco. Four additional categories of relatively lower vulnerability were identified in this study.

However, detailed analysis of this type has not been performed in Sandoval and Valencia Counties. To date, the best analysis of aquifer vulnerability for these counties was conducted by Lee Wilson and Associates, Inc. (1979), who used a simpler analysis approach based on water depths and vadose zone protection. A map of relative groundwater vulnerability for the entire state is included in their report (Lee Wilson and Associates, Inc., 1979, Plate 2). The results for the Bernalillo County area shown in this map were very similar to those determined with the DRASTIC method, with the most highly vulnerable areas overlying the shallow valley-fill aquifer along the Rio Grande. Three additional categories of relatively lower vulnerability were identified in this study. Given the similarity of this study's Bernalillo County results to those determined from the DRASTIC method, the vulnerability zones defined for Sandoval and Valencia Counties in this study may be adequate for the purpose of pursuing this alternative.

Several existing monitoring programs are conducted under the regulatory jurisdiction of the New Mexico Environment Department (NMED):

- Monitoring of underground storage tank (UST) sites is overseen by the NMED Petroleum Storage Tank Bureau.

- Monitoring of active and closed landfills is overseen by the NMED Solid Waste Bureau.

- Monitoring of hazardous waste generators and hazardous waste treatment, storage, and disposal facilities is overseen by the NMED Hazardous Waste Bureau.

- Monitoring of mining sites and groundwater discharge plans is overseen by the NMED Groundwater Quality Bureau.

- Monitoring of Superfund sites and National Pollutant Discharge Elimination System (NPDES) permits is overseen by the U.S. Environmental Protection Agency (U.S. EPA) in conjunction with the NMED Groundwater Quality Bureau.

Nearly all readily identifiable potential sources of contamination located within identified vulnerable areas fall under the regulatory jurisdiction of one of these programs. Therefore, additional efforts to identify and monitor contaminant sources within vulnerable areas are largely redundant. There may be value, however, in tracking the progress of the existing programs within the region and participating in discussions with regulators regarding program priorities and regional water supply concerns.

The main contaminant sources relevant to the identified vulnerable areas of the planning region that are not completely included under existing regulatory jurisdiction are on-site domestic wastewater treatment systems (i.e., septic tanks). Bernalillo County has recently enacted a strengthened wastewater ordinance (Bernalillo County Municipal Code, 2001) to address this issue. The new ordinance is performance-based in that treatment requirements are determined by on-site physical conditions and an assessment of the potential risk that effluent from the site's system will contaminate groundwater. The risk depends on factors such as the thickness and quality of the soil, depth to water, and the size of the lot. Existing system upgrades are required to be implemented by January 1, 2015 or upon replacement or modification of the system or upon sale of the property, whichever occurs first. Additional requirements include a maintenance contract and operator's permit for each system.

The Bernalillo County wastewater ordinance can be used as a model for similar ordinances in Sandoval and Valencia Counties to address the issue of groundwater contamination from septic tank discharges in vulnerable areas.

The New Mexico Source Water Assessment and Protection Program (SWAPP) can be used to address monitoring and control of potential sources of contamination near public water supplies. This is a federally funded program overseen by the U.S. EPA that assists communities in protecting their drinking water supplies. Specifically, the New Mexico SWAPP will assist local communities in:

- Determining the source water protection area for the water system
- Taking inventory of actual and potential contaminant sources within the source water protection area

- Determining the susceptibility of the source area and water system to contamination

- Reporting the SWAPP findings to the water utility, its customers, and the community

- Working with the community and other stakeholders to implement source water protection measures that safeguard and sustain the water supply into the future

This existing program can thus be utilized to address this issue with minimal additional cost to the local community. Within Bernalillo County, the *Albuquerque/Bernalillo County Ground-Water Protection Policy and Action Plan* (Policy Coordinating Committee, 1995) has already addressed this issue. For Sandoval and Valencia Counties, communities can contact the New Mexico SWAPP (http://www.nmenv.state.nm.us/dwb/swapp.html) to participate in this program.

The issue of restricting wells in sensitive areas is more of a political issue than a technical one. Under New Mexico Water Law, the New Mexico Office of the State Engineer must grant a permit to those wishing to drill a domestic well. Several efforts to change this provision have been advanced in recent years, but all have encountered political opposition.

Furthermore, domestic wells are more of a water rights and aquifer capacity issue than a water quality one. Septic systems, not domestic wells, are the source of groundwater contamination. Restricting wells will limit public exposure to contaminated groundwater, but will not alleviate the regional water contamination issue. As discussed above, enactment in Sandoval and Valencia Counties of strengthened on-site wastewater treatment ordinances modeled after the Bernalillo County ordinance is likely the best approach to address the issue of regional water contamination from septic tanks within the planning region.

If the goal is to protect public health, a program to encourage water testing by domestic well owners, coupled with a public education program that provides information relevant to health hazards associated with contaminated water, would be an effective approach. Bernalillo County formerly offered free water testing for nitrate and coliform bacteria to domestic well owners, but has discontinued this program. A free water testing program would be very helpful in identifying public health problems due to contaminated wells, essentially taking the place of a separate monitoring program.

3. Alternative Evaluation

3.1 Technical Feasibility

Enabling New Technologies and Status

No new technologies are required for this alternative.

Infrastructure Development Requirements

No new infrastructure is required for development of groundwater protection programs. However, three issues related to these programs should be addressed:

- Additional monitoring wells may be needed in some locations. The installation of new wells may be best accomplished through an existing regulatory program.

- The development of source water/wellhead protection plans for Sandoval and Valencia Counties will require hiring or contracting technical personnel to work with the New Mexico SWAPP.

- Administrative efforts are required to develop and implement enhanced on-site wastewater treatment ordinances in Sandoval and Valencia Counties. Using the Bernalillo County ordinance as a model will minimize these efforts.

Total Time to Implement

Estimated time frames required to implement the various components of this alternative are:

- Development of source water/wellhead protection plans for Sandoval and Valencia Counties could be completed in less than one year.

- Development and implementation of enhanced on-site wastewater treatment ordinances in Sandoval and Valencia Counties could occur within approximately a one-year time frame, although possible political resistance by the public could affect this timetable.

- Regulatory programs addressing landfills, Superfund sites, USTs, and other sources of contamination are already in place.

3.1.1 Physical and Hydrological Impacts

Effect on Water Demand

This alternative has no effect on water demand.

Effect on Water Supply (surface and groundwater)

Although this alternative does not create any new water supply, it can preserve the practical usability of the existing water supply.

Water Saved/Lost (consumption and depletions)

This alternative has no effect on the saving or losing of water.

Impacts to Water Quality (and mitigations)

Adoption of new on-site wastewater treatment ordinances in Sandoval and Valencia Counties and continued implementation and enforcement of the Bernalillo County ordinance will eventually improve water quality by limiting contamination from septic system discharges. Continued operation of other existing regulatory programs will be beneficial to the water quality in the region.

Watershed/Geologic Impacts

Water quality improvements resulting from implementation of on-site wastewater treatment ordinances will have a positive environmental impact.

3.1.2 Environmental Impacts

Impact to Ecosystems

This alternative will not impact ecosystems unless additional monitor well installations in identified vulnerable areas are considered.

Implications to Endangered Species

This alternative will not impact endangered species.

3.2 Financial Feasibility

3.2.1 Initial Cost to Implement

Costs for developing the Sandoval and Valencia County wastewater ordinances are minimal. Existing government employees in Sandoval and Valencia Counties can work with the New Mexico SWAPP to develop source water/wellhead protection plans and to develop and implement enhanced on-site wastewater treatment ordinances. Using the Bernalillo County ordinance as a model will minimize these efforts.

Costs for upgrading existing septic systems can be on the order of $5,000 to $20,000, depending on site conditions and system configuration (UNM Water Resources Program, 2001). Individual homeowners are responsible for paying for system upgrades; however, financial assistance may be available for low income families in Bernalillo County (UNM Water Resources Program, 2001). To effectively reduce potential septic contamination, additional financial support for homeowners may be necessary.

The associated costs for additional monitoring of groundwater quality in identified vulnerable areas, should it be desired, are high. Unit costs for recent New Mexico installations of 2-inch schedule 40 polyvinyl chloride (PVC) monitor wells in hollow stem auger borings up to 100 feet deep range from $12.50 to $16.00 per foot. Deeper monitor wells in the 100- to 200-foot range require rotary drilling and generally require 4-inch schedule 40 PVC wells; recent installation costs for such wells in New Mexico have typically been about $38.50 per foot. At greater depths, schedule 80 PVC is required, and a unit cost of about $52.50 per foot was recently incurred for a well of this type in Sandoval County.

3.2.2 Potential Funding Source

Sources of funding for this alternative vary by the component:

- The existing ordinance in Bernalillo County requires that the affected property owner cover all system upgrade expenses. Property tax increases could be used to aid homeowners affected by these enhanced wastewater ordinance upgrade requirements.

- Contaminant monitoring in vulnerable areas is under the jurisdiction of existing regulatory programs, and costs for the monitoring should be covered by the appropriate regulatory program or the responsible party.

- The prevention of contamination from septic tanks could be considered for Clean Water Section 319 nonpoint source grants, which are administered by the EPA.

3.2.3 Ongoing Cost for Operation and Maintenance

Once on-site wastewater ordinances have been established, homeowner assistance and enforcement will be needed to ensure that septic upgrades are completed and that required maintenance occurs. Costs for homeowners to maintain improved on-site wastewater systems range from $10 to $25 per month (UNM Water Resources Program, 2001). Additionally, once monitoring programs are established and monitor wells are installed, periodic sampling and water quality analyses will be needed. Costs for these analyses may range from approximately $200 to $1,000 per sample, depending on the required analyses.

References/Bibliography

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