Carnuel Mutual Domestic
Water and Wastewater Consumers Association

Water System Improvements
Final Environmental Report

September 2009

TABLES

APPENDICES

1.0 INTRODUCTION

This Environmental Report evaluates potential impacts associated with the proposed Carnuel Water System Improvement project and has been prepared on behalf of the Carnuel Mutual Domestic Water and Wastewater Consumers Association (MDW&WWCA) and the Albuquerque Bernalillo County Water Utility Authority (ABCWUA), a New Mexico political subdivision, in coordination with the U.S. Department of Agriculture Rural Development (RD), New Mexico Environment Department (NMED) and the New Mexico Finance Authority (NMFA). Carnuel MDW&WWCA has secured a combination of grant and loan funding for the proposed project from State of New Mexico legislative appropriations, the U.S. Environmental Protection Agency (EPA), the New Mexico Water Trust Board, and the U.S. Department of Agriculture. Additional federal funding is also anticipated for this project through the American Recovery and Reinvestment Act of 2009. The proposed project is located in the Carnuel area including Echo Canyon and Monticello, east of Albuquerque in Bernalillo County, New Mexico (see Figures 1 and 2–Appendix A).

In compliance with the National Environmental Policy Act (NEPA), project planning includes the preparation of an Environmental Report. The draft Environmental Report was made available for public review and the contents of the Report were summarized and presented at a public hearing held on August 11, 2009 (see Section 6.3). Modifications to the draft report based on public input are presented in bold text in this final version of the Environmental Report dated August 2009.

Important components of the NEPA process include the analysis of potential environmental impacts, the development and consideration of alternatives, and the solicitation of public involvement. This Environmental Report also documents the need to prepare an environmental impact statement (EIS) if significant environmental impacts are identified. This environmental document has been prepared in accordance with the U.S. Department of Agriculture RD Bulletin 1794A-602 (2008) and other applicable guidelines and regulations including the New Mexico State Environmental Review Process utilized by the NMED and NMFA. The lead agency for this process is the RD with the NMED and NMFA acting as cooperating agencies in the review process.

The infrastructure requirements for supplying water to the entire project planning area have been examined in the Preliminary Engineering Report (PER) (Bohannan Huston, Inc. 2009); however, the current available funding would only allow construction of a portion of the needed infrastructure. Future construction projects would be needed to complete the entire infrastructure system to supply water to the entire project planning area. This Environmental Report seeks to obtain clearance for the portions of the project for which funding is currently available. The portion of the project that would be completed is identified as Phases 1 and 2, Alternate 1A (Option 2), and is described in more detail in Section 3.2.1.

Modifications in response to public comments: After receiving numerous public comments regarding the proposed construction of water storage tanks in the Echo Canyon area, the ABCWUA and Carnuel MDW&WWCA agreed to complete a tank siting study that will consider three potential tank site locations. Construction of any tanks will be postponed until a later phase of construction. Current funding allocated for this project would be used for construction of distribution lines.

2.0 PURPOSE AND NEED OF PROPOSAL

2.1 Project Description

The proposed project involves the construction of infrastructure needed to deliver a safe, reliable drinking water supply as well as water for fire protection to the communities of Carnuel, Monticello, and Echo Canyon in the project planning area (see Figure 2–Appendix A). These communities are located east of Albuquerque, New Mexico along Interstate 40 (I-40) in Tijeras Canyon. Water would be supplied through a connection to the existing public water system owned and operated by the ABCWUA, a joint

city/county agency that owns and maintains the water and wastewater utility in Albuquerque and Bernalillo County. The proposed project would include a connection to the existing ABCWUA public water system and the necessary infrastructure, including fire hydrants, to supply water to a portion of the project planning area. Current funding is not available to supply water to the entire project planning area, but project planning is underway, and future projects are anticipated that would complete water service to residences throughout the project planning area. The Proposed Action is described in more detail in Section 3 of this document.

The communities of Carnuel, Monticello, and Echo Canyon do not have a central water system and community members obtain their water from private wells. A small community water system serves 12 residences from a single well. Numerous domestic wells in the area have historically had elevated levels of nitrate contamination that poses a health risk to residents. The Carnuel MDW&WWCA was established in 2001 under the laws of the New Mexico Sanitary Projects Act as a nonprofit organization with the purpose of providing safe, reliable drinking water and wastewater disposal to its members in the Carnuel, Monticello, and Echo Canyon areas. The ABCWUA executed an agreement with the Carnuel MDW&WWCA to utilize water produced by the ABCWUA system. Once distribution lines are constructed in the project planning area, residents would have the opportunity to connect to the distribution system to obtain drinking water. Existing private wells could continue to be used for outdoor irrigation purposes. The ABCWUA would operate and maintain the drinking water facilities in the project area.

2.2 Purpose and Need of the Proposal

The purpose of the proposed Carnuel Water System Improvements project is to provide a safe, reliable supply of drinking water and provide water for fire protection to the project planning area. This project would address potential health concerns related to drinking water quality in the project planning area. Currently, residents within Carnuel, Echo Canyon and Monticello areas rely on private wells. There is no central water system in the project planning area nor is there a central wastewater disposal system. Therefore, poorly functioning aging septic systems often coexist in the same area with private wells. Wells in the area have been analyzed for constituents regulated by the Safe Drinking Water Act (. Some wells exceed the Safe Drinking Water Act standard of 10 milligrams per liter (mg/L) for nitrate levels. Levels above 10 mg/L are considered unsafe and pose the greatest risk to children less than six years of age. In 2002, 24 samples were analyzed from Carnuel MDW&WWCA members in various locations within the community. Of these samples, 48 percent exceeded the 10 mg/L nitrate standard established by the Safe Drinking Water Act (Bohannan Huston, Inc. 2009).

The nitrate contamination is thought to result from a combination of several factors. Numerous wells in the Carnuel area are shallow and many of these shallow wells are located in fractured rock formations that are conducive to pollutant transport. On some of the lots, the septic tanks do not meet liquid waste regulations; they merely function as holding tanks that infiltrate directly into the ground. The septic tanks are often located either too close to the wells or the wells are located downgrade from the septic tank. Additionally, in some areas, populations density per lot is high, leading to a high density of septic tank drain fields (Bohannan Huston, Inc. 2009).

The other main concern is the limited ability to provide fire protection in the project planning area. Since the Carnuel MDW&WWCA does not currently have a central water system, the only fire hydrant near the project planning area is located near a business on an existing ABCWUA distribution line located along NM 333 (Old Route 66) near the entrance to the Four Hills subdivision. This fire hydrant is approximately one mile from the western boundary of the project planning area. During a firefighting event, the distance from homes to the fire hydrant limits the capability to protect structures and residences since water must be hauled from the hydrant to the site. The extension of a central water system into the project planning area would allow the Bernalillo County Fire Department to provide a quicker response to fire fighting events (Bohannan Huston, Inc. 2009).

3.0 ALTERNATIVES TO THE PROPOSED ACTION

In evaluating the potential for future water system improvements in the project planning area, two alternatives were identified in addition to the No-Build Alternative. Identification of the recommended build alternative or Proposed Action was based on results from an evaluation criteria matrix developed in the PER (Bohannan Huston, Inc. 2009).

Based on available funding for the project, it is assumed that the provision of water service in the project planning area would need to occur in several phases over a period of time. There is not sufficient funding in place at the current time to construct the needed infrastructure to supply the entire project planning area.

3.1 No-Build Alternative

In accordance with NEPA and RD Bulletin 1794A-602, the No-Build Alternative was considered as a baseline for comparison with other alternatives. Under the No-Build Alternative, no infrastructure would be constructed to connect the ABCWUA public water system to the project planning area. This alternative would not be expected to impact natural or physical resources. However, the No-Build Alternative would not address the water supply and water quality issues in the project planning area. Consequently, the No-Build Alternative does not meet the purpose and need for the project.

3.2 Alternate 1 – Providing Supply and Distribution to Zone 8E

Alternate 1 was established as the initial phase of the project to extend the ABCWUA system to the project planning area. The project planning area was divided into several pressure zones according to land elevation and criteria established by the ABCWUA (see Figure 3–Appendix A). The pressure zones were established using the criteria of providing a minimum service pressure of 50 pounds per square inch (psi) and a maximum service pressure of 100 psi. The currently available funding identified for this project would allow for completion of the preferred Alternate 1 alternative.

For Alternate 1, three alternative potential connection points to the ABCWUA system were identified that would allow Zone 8E within the project planning area to be served either by gravity from existing Zone 8E ABCWUA reservoirs or with a booster pump from the ABCWUA Zone 6ER system. As shown on Figure 3–Appendix A, Zone 8E is the lowest elevation zone in the project planning area and includes most of the Carnuel community adjacent to NM 333 (Old Route 66). The Tijeras Canyon/Carnuel Plan (2007) prioritized areas for potential water and wastewater service. The Carnuel community was identified as the first priority for receiving utility service. The alternatives considered under Alternate 1 are shown on Figure 4–Appendix A.

3.2.1 Alternate 1A

This alternative considers two potential options for connection points to the existing ABCWUA system which would allow pressure Zone 8E to be supplied by gravity. Both of these options would include construction of two new 200,000-gallon capacity above ground water storage tanks (reservoirs) in Echo Canyon. The storage tank site would be located on private property. The two options examined for this alternative include:

Modifications in response to public comments: After receiving numerous public comments regarding the proposed construction of water storage tanks in the Echo Canyon area, the ABCWUA and Carnuel MDW&WWCA agreed to complete a tank siting study that will consider three potential tank site locations. Construction of any tanks will be postponed until a later phase of construction. Current funding allocated for this project would be used for construction of distribution lines.

Option 1 – Connection to Escondido Reservoir. The existing Escondido Reservoir is located in the Manzano/Four Hills Open Space (City of Albuquerque) near the western boundary of the Four Hills subdivision. This option would require construction of approximately 18,000 linear feet of 12-inch water line. With an estimated 40-foot wide disturbance area for construction activities, construction-related disturbance associated with the pipeline would occur within an area of 16.5 acres. In addition, approximately one acre would be disturbed by construction of the new tanks in the Echo Canyon area.

Option 2 – Connection to Zone 8E System north of I-40 fed by Sandia Manor Reservoir (Proposed Action). The existing Sandia Manor Reservoir is located north of I-40 and east of Tramway Boulevard. This option would require construction of approximately 17,800 linear feet of 12-inch water line. With an estimated 40-foot wide disturbance area for construction activities, construction-related disturbance associated with the pipeline would occur within an area of 16.3 acres. In addition, approximately one acre would be disturbed by construction of the new tanks in the Echo Canyon area.

3.2.2 Alternate 1B

This alternative examined a connection to an existing 10-inch water main on the south side of I-40 near Tramway Boulevard. This line is a Zone 6ER line connecting to the existing waterline that crosses I-40 and also to the Four Hills system. Since this line is two pressure zones lower than the lowest service area in Carnuel, a booster pump would be required to send water from Zone 6ER to Zone 8E in the project planning area. This option would require construction of approximately 12,800 linear feet of 12-inch water line. With an estimated 40-foot wide disturbance area for construction activities, construction-related disturbance associated with the pipeline would occur within an area of 11.8 acres. In addition, approximately one acre would be disturbed by construction of the new tanks in the Echo Canyon area.

3.3 Alternate 2 – Providing Supply and Distribution to the remainder of the Project Planning Area

Alternate 2 evaluated the infrastructure needs to provide service to the remainder of the project planning area including Monticello, the remainder of Echo Canyon, and the portion of the Carnuel community south of I-40. The Monticello and Echo Canyon areas were identified as the second priority for receiving utility service in the Tijeras Canyon/Carnuel Plan (Bernalillo County 2007). The current available funding would not be sufficient to construct the Alternate 2 improvements. The Alternate 2 alternatives have been identified, but construction of Alternate 2 would occur at a future time after funding is obtained. The alternatives considered under Alternate 2 are shown on Figure 5–Appendix A.

3.3.1 Alternate 2A – Zone 12E tanks located on the south side of I-40

Under this alternative, a new 460,000-gallon Zone 12E reservoir would be located south of I-40 to serve Zones 9E through 12E in the project planning area. The water would be pumped up to the reservoir from Zone 8E via a proposed booster station. The booster station is proposed to be located along NM 333 (Old Route 66) between Echo Canyon and Monticello. The booster station would deliver water to the reservoir and also to Zone 12E in Monticello. Customers in Carnuel and Monticello in Zones 11E, 10E and 9E would be served via pressure reducing valves from the Zone 12E distribution line. A small booster station would be required for customers in Echo Canyon whose residences lie within Zones 9E and 10E.

This option would require construction of approximately 76,850 linear feet of water line varying from 6 inches to 16 inches in diameter. With an estimated 40-foot wide disturbance area for construction activities, construction-related disturbance associated with the pipeline would occur within an area of 70.6 acres. In addition, approximately one acre would be disturbed by construction of the new tanks south of I-40.

3.3.2 Alternate 2B – New tanks located on north side of I-40

Under this alternative, a new 460,000-gallon water storage reservoir would be located north of I-40, north of Monticello, on Cibola National Forest land. A booster station would be needed at a location along NM 333 (Old Route 66) between Echo Canyon and Monticello to pump water up to the reservoir. Water from the new reservoir would be delivered to the lower zones through a series of pressure reducing valves. An additional small booster station would be required for customer service in Echo Canyon.

This option would require construction of approximately 70,100 linear feet of water line varying from 6 inches to 12 inches in diameter. With an estimated 40-foot wide disturbance area for construction activities, construction-related disturbance associated with the pipeline would occur within an area of 64.4 acres. In addition, approximately one acre would be disturbed by construction of the new tanks on the north side of I-40.

3.3.3 Alternate 2C – Zone 10E tanks located on north side of I-40 along with closed loop booster pump station for Zones 11E and 12E

Under this alternative, a new 460,000-gallon reservoir would be located north of I-40 within the Monticello area. Water would be pumped up to this reservoir via a proposed booster station that would be located along NM 333 (Old Route 66) between Echo Canyon and Monticello. Water from the new reservoir would be delivered to the lower zones through a series of pressure reducing valves. Two small booster stations would serve users in Monticello and Echo Canyon. Due to elevation issues, fire flow pumps would be needed to provide adequate fire flows to higher areas in Monticello and Echo Canyon.

This option would require construction of approximately 67,700 linear feet of water line varying from 6 inches to 18 inches in diameter. With an estimated 40-foot wide disturbance area for construction activities, construction-related disturbance associated with the pipeline would occur within an area of 62.2 acres. In addition, approximately one acre would be disturbed by construction of the new tank on the north side of I-40.

3.4 Comparison of Alternatives

The PER (Bohannan Huston, Inc. 2009) presents an evaluation of all the alternatives considered. The alternatives were ranked in a matrix ranking system based on the following factors: capital cost, operations and maintenance, schedule, number of permits required from public agencies, and need for private property acquisition. Based on this evaluation, Alternate 1A (Option 2) and Alternate 2C were identified as the preferred action for water system improvements. Current available funding would allow for the construction of Alterative 1A (Option 2) only. Alternate 2C would be constructed in the future after funding is secured. Additional environmental analyses may be required prior to approval of Alternate 2C.

3.5 Alternative Eliminated From Further Consideration

In a study completed for the project planning area (Souder, Miller and Associates 2005), an alternative to construct an additional water supply well near the Village of Tijeras was considered. An exploratory test well was drilled; however, due to the low-production capability of this test well, the option of using the well to serve as a long-term water supply for the Carnuel MDW&WWCA was not considered viable.

3.6 Proposed Project Phasing

As noted previously, based on available funding for the project, it is assumed that the provision of water service in the project planning area would occur in several phases over a period of time. There is currently not sufficient funding to construct all of the needed infrastructure to supply the entire project planning area.

In the PER (Bohannan Huston, Inc. 2009), proposed phasing for the project was examined, and the recommended phases are described below. The phasing was established to provide service first to the areas identified as Priority Area 1 in the Tijeras/Carnuel Plan (Bernalillo County 2007). This area consists primarily of Carnuel where the concern with ground water quality from individual water supply wells is the greatest. Phases 1 and 2 include the majority of Alternate 1A (Option 2), but also include a portion of Alternate 2C (such as providing water supply to areas of Carnuel that can be gravity fed from the tank in Echo Canyon). Phases 3-7 include the remainder of Alternate 2C. Current available funding would allow construction of Phases 1 and 2.

Phase 1 shall connect to the existing ABCWUA system in Camino de la Sierra and provide distribution to customers within Zone 8E of Carnuel along NM 333. The phase includes the following items:

- Connection to existing 14-inch Zone 8E piping in Camino de la Sierra, north of I-40,
- Jack and bore across I-40 to south side of I-40 frontage road,
- Jack and bore to north side of I-40 frontage road, and
- 12-inch piping along I-40 frontage road and NM 333 (Old Route 66).

Phase 2 continues to complete the water system infrastructure improvements for Zone 8E and provides redundancy in the system with the construction of Zone 8E tank. This phase also provides service to Zone 8E residences within Echo Canyon and increases fire protection capabilities. This phase includes the following:

- Construct Zone 8E tanks, and
- Construct 12-inch piping to Zone 8E tank.

Modifications in response to public comments: After receiving numerous public comments regarding the proposed construction of water storage tanks in the Echo Canyon area, the ABCWUA and Carnuel MDW&WWCA agreed to complete a tank siting study that will consider three potential tank site locations. Construction of any tanks will be postponed until a later phase of construction. Current funding allocated for this project would be used for construction of distribution lines.

The tank site study will be conducted to evaluate land use and visual impacts to nearby residences. The tank siting study will reevaluate the alternative tank sites, consider additional tank sites, and develop tank design options that minimize the visual impact of the tanks. After the tank siting study is completed and funding for tank construction is identified, a supplemental environmental report would be prepared in coordination with agencies funding that portion of the construction activities. The environmental document would discuss the proposed tank project and environmental consequences of tank construction.

Funding is not currently available for construction of Phases 3, 4, 5, 6 and 7. However, initial planning has been completed and the PER (Bohannan Huston, Inc. 2009) includes analysis of the required infrastructure design to complete Phases 3 through 7. As funding becomes available, future construction projects would be undertaken. Additional environmental analyses may be required for future construction activities.

Phase 3 continues to extend the Zone 8E system to the remainder of Carnuel (south of I-40). This phase includes the following:

- Construct additional Zone 8E distribution system to residences south of I-40, and
- Construct bridge crossing of I-40 by connecting pipeline to existing bridge.

Modifications in response to public comments: Since Phase 2 construction activities have been removed from the scope of work for construction activities, Phase 3 construction may occur prior to the completion of Phase 2.

Phase 4 begins to extend the distribution system to Monticello and provide service to customers within Zone 10E of Monticello. This phase includes the following:

- Zone 8E to Zone 10E booster station,
- Zone 10E tank, and
- Zone 10E distribution piping.

Phase 5 extends the distribution system to the customers within Zone 9E of the Monticello and Carnuel area. This phase includes the following:

- Zone 9E distribution system and pressure reducing valves.

Phase 6 provides service to customers within upper zones of Echo Canyon (Zone 9E and 10E) with the construction of a closed loop booster pump station from the Zone 8E tanks located in Echo Canyon. This phase includes the following:

- Echo Canyon Zone 8E to 10E booster pump station,
- pressure reducing valves, and
- Zone 9E and 10E distribution piping.

Phase 7 is the final phase of the proposed project and provides service to customers within the upper zones of Monticello (Zone 11E and 12E) with the construction of a closed loop booster pump station from the Zone 10E tank in Monticello. This phase includes the following:

- Monticello Zones 11E and 12E booster pump station,
- pressure reducing valves, and
- Zone 11E and 12E piping.

4.0 AFFECTED ENVIRONMENT / ENVIRONMENTAL CONSEQUENCES

4.1 Land Use/Important Farmland/Formally Classified Lands

4.1.1 Affected Environment

The *Tijeras Canyon/Carnuel Plan* (Bernalillo County 2007) serves as a community-scale plan providing Bernalillo County with guidance in the planning for the Carnuel area. As noted in this plan, the primary land use in the area is residential. The existing residential zoning is A-1, A-2, M-H, and R-1. The zoning definitions are identified in Table 1. Most of the western portion of Tijeras Canyon and some parcels directly north of Echo Canyon are zoned A-1. In most of the Carnuel community, the zoning is designated as M-H. In the Echo Canyon area, zoning is designated as M-H and A-1. In the Monticello area, zoning is designated as A-2 and R-1. Figure 6–Appendix A shows the zoning in the project planning area. Some lots in the area are smaller than the minimum required by the zoning designation, and because they existed as such prior to the establishment of the Bernalillo County Zoning Ordinance, they have been "grandfathered" in. Commercial land use is limited to a few small businesses located primarily along NM 333 (Old Route 66). There is an existing water tank adjacent to a residence in the Echo Canyon area.

Table 1. Zoning designations in the project planning area

A-1	Single family dwelling unit of a HUD zone code II manufactured home on a minimum lot size of one acre
A-2	Single family dwelling unit, a HUD zone code II manufactured home, or mobile home on a minimum lot size of two acres
C-1	Neighborhood commercial
M-H	Mobile home at least 40 feet in length, HUD zone code II manufactured mobile home, or single-family dwelling unit on a minimum lot size of ¾ acre
R-1	Single-family dwelling unit or a HUD zone code II manufactured home on a minimum lot size of ¾ acre

Population projections provided by the University of New Mexico Bureau of Business and Economic Research (BBER) indicate that the population growth rate in Bernalillo County varies over time but is expected to increase at a rate between 1.54 to 2.97 percent per year through 2035 with an overall expected rate of 1.5 percent per year. For the purpose of predicting population trends, the PER (Bohannan Huston, Inc. 2009) assumes that under existing conditions in the year 2010, the population in the project planning area is 2,230 people (903 residences) and under future development conditions in 2060, the population is expected to be 4,688 (1,890 residences).

The USDA Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2005) was reviewed for soil and prime farmland information. The three primary soil map units occurring within the proposed project area are shown on Figure 7–Appendix A and listed below:

- Rock outcrop-Othids complex: These soils are found on moderately steep to very steep ridges (30 to 80 percent slope). Runoff is very rapid, and the hazard of water erosion is moderate.
- Tesajo-Millet stony sandy loam: These well-drained soils are found on alluvial fans, terraces, and floodplains with 3 to 15 percent slopes. Runoff is medium and the hazard of water erosion is moderate.
- Salas complex: These soils are found on moderately steep to very steep mountain slopes and hills (20 to 80 percent slope). Runoff is rapid and the hazard of water erosion is moderate. The extremely stony soils have stones and boulders on 25 to 75 percent of the surface.

The soil map units in the vicinity of the project area have been rated by the NRCS as "not prime farmland." Correspondence from the NRCS dated April 27, 2009 (see Appendix B) also confirms that

there is no prime or unique farmland in the project area. Therefore, no prime farmland will be affected by the proposed project.

The project planning area is bordered to the north by the Cibola National Forest. The western face of the Sandia Mountains is managed by the Cibola National Forest as the Sandia Mountain Wilderness. There is a Forest Service trailhead near the project planning area. In order to access the Three Guns Spring trailhead, trail users must travel through the Monticello neighborhood. The Kirtland Air Force Base boundary lies to the south, a portion of which is Cibola National Forest land withdrawn from public use for military purposes and known as the "withdrawal area." In addition, there are tracts of designated Open Space in the vicinity owned by the City of Albuquerque including as the Four Hills/Manzano Open Space. The existing Escondido Reservoir is located within this Open Space area. Figure 8–Appendix A shows land ownership in the vicinity of the project planning area.

One of the main transportation routes in the project planning area is NM 333, also known as Old Route 66. Old Route 66 has been designated by the New Mexico Department of Transportation (NMDOT) and Federal Highway Administration (FWHA) as a Scenic Byway under the National Scenic Byways Program. The road is also part of the National Park Service's Route 66 Corridor Preservation Program.

There are no national parks, wildlife refuges, wild and scenic rivers, grassland, state parks or Native American owned lands within or adjacent to the project planning area. In response to a request for comments regarding this project, the National Park Service indicated that the proposed project would not affect any parks and no comments were offered (see letter in Appendix B).
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4.1.2 Environmental Consequences

The alternatives considered share some common consequences in terms of land use. For the distribution line alignment, ABCWUA would require a 40-foot-wide wide disturbance area for construction activities A 20 to 25-foot-wide permanent easement and an additional 15 to 20-foot-wide temporary easement during construction is required when the distribution line is placed in private property. The additional space would allow equipment and crews to access work areas. Table 2 lists the estimated disturbed acreage associated with construction activities with each of the alternates considered. Temporary water storage tank construction activities and the permanent tanks site would impact approximately one acre.

Table 2. Estimated disturbed area for distribution lines

Alternate	Estimated disturbed area assuming 40-foot width (acres)
1A (Option 1)	16.5
1A (Option 2) *	**16.3**
1B	11.8
2A	70.6
2B	64.4
2C *	**62.2**
* Proposed Action alternates	

The ABCWUA has executed a permanent easement with the Echo Canyon Corporation for the construction and maintenance of water and wastewater facilities along the existing roadways in the Echo Canyon subdivision. The permanent easement includes the site selected for the location of the Alternative 1A water storage tanks.

Portions of the distribution line alignment may occur within publicly owned right-of-way adjacent to roads. No easements would be needed in public rights-of-way. Impacts within public road rights-of-way would include temporary traffic control during construction. Impacts to private property would remain within specified easements, and the effects would include soil excavation and possible temporary fence cuts for waterline construction. Rural land use in adjoining areas would not be expected to be disturbed by the water distribution lines. None of the alternatives would impact prime or unique farmland since none exists within the project area.

The alternatives differ in the degree of impact on private property versus publicly owned right-of-way and impacts to formally classified lands including a designated open space parcel and the Cibola National Forest.

Alternate 1A (Option 1)
Acquisition of private property for a segment of the pipeline easement would be required for Alternate 1A Option 1. Also, a portion of the distribution line would be located within the Manzano/Four Hills Albuquerque Open Space parcel to connect to the existing Escondido Reservoir, also located within the Open Space parcel.

Alternate 1A (Option 2) – Proposed Action
For Alternate 1A Option 2, the pipeline alignment would be placed within publicly owned right-of-way owned by the City of Albuquerque or the New Mexico Department of Transportation (NMDOT); no private property would be affected by the pipeline. Private property may be acquired for the construction of the proposed two 200,000-gallon water storage tanks. A tank siting study will be completed prior to final selection of a proposed tank site. The selected tank site would require a Special Use Permit from Bernalillo County.

Alternative 1B
No private property would need to be acquired for distribution pipeline alignment for Alternate 1B. The distribution pipeline would be placed within publicly owned right-of-way along NM 333 (Old Route 66). Private property would be acquired for the construction of the two proposed 200,000-gallon water storage tanks in the Echo Canyon area.

Alternate 2A
Private property would be acquired for the construction of the proposed Zone 12E tank as well as the supply line serving the reservoir. An easement for the distribution lines would need to be obtained for the area south of I-40 and Carnuel. The distribution pipeline would cross through NMDOT right-of-way along NM 333 and I-40.

Alternate 2B
The proposed site for the Zone 12E tank would be located within the Cibola National Forest which would require permit approval for this land use from the U.S. Forest Service. The distribution pipeline would cross through NMDOT right-of-way along NM 333 and I-40.

Alternate 2C – Proposed Action for future construction
For Alternate 2C, private property would be acquired for the proposed Zone 10E tank and booster pump as well as some of the distribution lines. The distribution pipeline would cross through NMDOT right-of-way along NM 333 and I-40.

4.1.3 Mitigation

All necessary permits would be acquired for utility construction within publicly owned right-of-way including a permit from the NMDOT for construction within I-40 and NM 333 right-of-way. Private

property owners may be compensated for easements across private property and for the acquisition of property for tanks or booster pump station sites.

4.2 Floodplains

4.2.1 Affected Environment

As shown on Federal Emergency Management Agency maps (FEMA 2008), a majority of the project planning area is located within Zone X which consists of areas outside the 100-year floodplain, or areas within the 100-year floodplain where sheet flow depths were less than one foot, the contributing drainage area is less than one square mile, or the area is protected by levees.

In the southern part of the planning area, Tijeras Creek is designated as Zone AE indicating an area within the 100-year floodplain with a 25 percent chance of flooding over the life of a 30-year mortgage. Several tributaries to Tijeras Creek are designated as Zone AO, indicating river or stream flood hazard areas, or areas within the 100-year floodplain with sheet flow depths from 1 to 3 feet (see Figure 9–Appendix A).

In response to a request for comments, the Bernalillo Floodplain Administrator reviewed the project information and provided comments relating to Section 404 permitting and preparation of a Storm Water Pollution Prevention Plan. Both of those subjects are further addressed in Section 4.6 (Water Quality) of this document. The Floodplain Administrator's comments (dated June 30, 2009) are included in Appendix B.

4.2.2 Environmental Consequences

For all alternatives considered, proposed water tank sites and/or booster pump stations would be located outside the 100-year floodplain. However, in some cases, proposed distribution lines may cross through designated floodplains.

Alternate 1A (Option 1)

Alternate 1A (Option 1) would include a proposed distribution line that would cross the 100-year Tijeras Creek floodplain (Zone AE).

Alternative 1A (Option 2) – Proposed Action

Alternate 1A (Option 2) does not include any distribution lines located within floodplains; therefore, the Proposed Action would avoid impacts to designated floodplains.

Alternative 1B

Alternative 1B would avoid impacts within floodplains.

Alternate 2A, Alternate 2B, Alternate 2C (Proposed Action for future construction)

Many of the distribution lines associated with Alternates 2A, 2B and 2C share the same alignments. Each of these alternates would involve construction of distribution lines that cross flood zones identified as Zone AO or Zone AE on the FEMA floodplain map.

4.2.3 Mitigation

In accordance with Executive Order 11988, the Proposed Action would not cause adverse changes in the flood hazard potential in the project area nor have any adverse effects on floodplains. Project planning will ensure that the proposed construction is compatible with the floodplain areas. Water storage tanks and booster pump station sites will create additional impervious surfaces in the area that would create minor amounts of additional storm water runoff in the area. These structures, located outside of designated floodplains, would not be expected to create additional flood hazards.

The Proposed Action (Alternate 1A (Option 2)) does not involve any floodplain impacts and therefore, for the currently funded construction activities, no mitigation of floodplain impacts would be needed. For future construction activities association with Alternate 2C, at any location where the proposed distribution line crosses a designated 100-year floodplain, the streambed would be restored to its original condition after construction of the distribution line within the floodplain is completed.

4.3 Wetlands

4.3.1 Affected Environment

Wetlands are lowland areas that are inundated or saturated with water for a sufficient time to allow a prevalence of hydrophytic vegetation to develop. Jurisdictional wetlands, those protected from unauthorized dredge-and-fill activities under Section 404 of the Clean Water Act and Executive Order 11990, have three essential characteristics: dominance by hydrophytic vegetation, hydric soils, and wetland hydrology. Hydrophytic vegetation requires inundated or soil saturation for its existence. Hydric soils are ponded or flooded for a sufficient time during the growing season to develop anaerobic conditions. Wetland hydrology is the availability of surface water or ground water to create the wetland environment.

According to information from the National Wetlands Inventory (USFWS 1980), Tijeras Creek is classified as "riverine intermittent streambed" indicating it has intermittent flowing water. During the biological survey of the project area completed in April 2009 (see Appendix G), potential wetlands were identified at three locations adjacent to Tijeras Creek where distribution lines may intersect the streambed. At these locations, water flows or pools for sufficient periods to allow development of potential wetland conditions.

4.3.2 Environmental Consequences

Alternate 1A (Option 1)

Alternate 1A (Option 1) would include a proposed distribution line that would cross a potential wetland site. The potential wetland site is located along the banks of Tijeras Creek.

Alternative 1A (Option 2) – Proposed Action

Alternate 1A (Option 2) would avoid impacts to any potential wetlands.

Alternative 1B

Alternative 1B would have no impacts on potential wetland sites.

Alternate 2A, Alternate 2B, Alternate 2C (Proposed Action for future construction)

Many of the distribution lines associated with Alternates 2A, 2B and 2C share the same alignments. Each of these alternates would involve construction of distribution lines that would cross Tijeras Creek at two locations where potential jurisdictional wetlands were identified. Impacts to any wetlands due to construction of distribution lines would be expected to cause temporary impacts to wetlands and would not result in a permanent loss of any wetlands.

4.3.3 Mitigation

The Proposed Action (Alternate 1A (Option 2)) would avoid impacts to any potential wetlands; therefore, no mitigation would be required during the initial two phases of construction activities.

Alternate 2C may impact two potential wetland sites. Because funding is not yet available, construction of Alternate 2C is anticipated to occur at future time. Prior to construction of Alternate 2C, the potential wetland sites would be re-evaluated. Construction activities will avoid wetlands where practicable, or minimize the extent of wetlands crossed. The ABCWUA would consult with the USACE regarding

permitting requirements for construction activities within potential wetlands adjacent to Tijeras Creek if they cannot be avoided. Any impacts to wetlands are anticipated to be temporary and would not involve the permanent take of wetlands.

4.4 Cultural Resources

Under Section 106 of the National Historic Preservation Act, a federal agency is required to consult with the State Historic Preservation Officer (SHPO) on a proposed undertaking. As part of the project planning process, an inventory is conducted for cultural resources within the Area of Potential Effect (APE) and a determination is made regarding the effect of the Proposed Action on cultural resources. The SHPO then concurs or makes recommendations to the federal agency (in this case, the RD) regarding the Proposed Action.

4.4.1 Affected Environment

Cultural resources within the project area were inventoried (Marron and Associates, Inc. 2009). During May and June of 2009, an intensive, 100-percent coverage cultural resource survey was completed on both sides of the affected roads where construction of distribution water lines is anticipated. One five-meter-wide archaeological survey transect was completed along each road side. See Figure 10 for a map of the areas surveyed. A summary of the cultural resource survey is included in Appendix H.

A total of 48 historic buildings were located and documented during the cultural resource survey. Each building was evaluated for potential eligibility to the National Register of Historic Places (NRHP).

4.4.2 Environmental Consequences

Alternate 1A (Option 1)

The proposed distribution line alignment from Escondido Reservoir to I-40 was not surveyed because this alternative was not identified as the Proposed Action. However, several past surveys are documented in the Archaeological Resource Management Section (ARMS) of the Museum of New Mexico Laboratory of Anthropology. According to that database, a high density of archaeological sites exists in the area. Since the route from Escondido Reservoir is relatively undeveloped, it is likely that any survey of the alignment would have revealed the presence of previously identified sites as well as new sites.

Within the project area associated with Alternate 1A (Option 1), twelve buildings were recommended as eligible for inclusion to the NRHP. Subject to consultation and comment by the RD, NMDOT and the New Mexico State Historic Preservation Officer (SHPO), management consideration for these buildings may include avoidance of direct impacts and the use of low vibration equipment during construction activities to avoid any damage to these buildings.

Alternate 1A (Option 2) – Proposed Action

No archaeological sites were identified within the Area of Potential Effect (APE) for this alternate. Within the project area associated with Alternate 1A (Option 2), twelve buildings were recommended as eligible for inclusion to the NRHP. Management consideration for these buildings may include avoidance of direct impacts and the use of low vibration equipment during construction activities to avoid any damage to these buildings. Vibration monitoring will be used to verify the level of vibration impact on historic buildings.

After review of the cultural resource investigations, RD made a determination of “no effect” for the project. Though there are adobe buildings within the project area, the project may be completed by avoiding these structures and using low vibration equipment. The New Mexico State Historic Preservation Officer (SHPO) provided concurrence with the determination of RD stating that the

proposed undertaking will not have an adverse effect on registered or eligible properties (see Appendix B for SHPO concurrence letter signed on July 24, 2009).

Alternate 1B

No archaeological sites were identified within the APE for this alternate. Within the project area associated with Alternate 1B, twelve buildings were recommended as eligible for inclusion to the NRHP. Subject to consultation and comment by the RD, NMDOT and the New Mexico State Historic Preservation Officer (SHPO), management consideration for these buildings may include avoidance of direct impacts and the use of low vibration equipment during construction activities to avoid any damage to these buildings.

Alternate 2A, Alternate 2B, Alternate 2C (Proposed Action for future construction)

Alternates 2A, 2B, and 2C share similar distribution line alignments. No archaeological sites were identified within the APE for these alternates. A total of 10 historic buildings were recommended as eligible for inclusion to the NRHP. Subject to consultation and comment by the RD, NMDOT and the New Mexico State Historic Preservation Officer (SHPO), management consideration for these buildings may include avoidance of direct impacts and the use of low vibration equipment during construction activities to avoid any damage to these buildings.

4.4.3 Mitigation

The cultural resource inventory received the concurrence of the SHPO with the inclusion of the following mitigation measures:

- Low-vibration equipment for compaction and excavation will be used within 100 feet of NRHP-eligible historic buildings to avoid the possibility of damage due to vibration. Vibration monitoring will be used to verify the level of vibration impact on historic buildings.
- If buried cultural deposits are discovered during project activities, the contractor will halt work at the site of the discovery and immediately notify the RD, the NMDOT where applicable, and the New Mexico State Historic Preservation Officer. The contractor will not resume work in the affected area until clearance has been received.
- If additional areas are identified for construction activities that have not been surveyed, a cultural resource survey will be completed to identify and evaluate cultural resources.
- Additional cultural resource investigations and SHPO consultation will be conducted if the tank siting study identifies a new tank site and pipeline route that has not been surveyed for cultural resources.

4.5 Biological Resources

4.5.1 Affected Environment

The project area was surveyed by qualified biologists in April 2009 to document vegetation (including noxious weeds), wildlife, and to determine the possible impact to endangered, threatened and sensitive species (Marron and Associates 2009). A copy of the survey report is included in Appendix G.

<u>Vegetation</u>

The project area historically supported Montane Scrub and Coniferous and Mixed Woodland vegetation on uplands and Arroyo Riparian or Montane Riparian vegetation along drainages (Dick-Peddie 1993). No rare plant communities occur within the project area. Much of the project area currently supports weedy vegetation. Dominant plant species present in disturbed areas include tree of heaven, Siberian elm, poplar, and saltcedar. Riparian areas along Tijeras Creek support native species such as box elder, Rio Grande cottonwood, and coyote willow.

The class C New Mexico noxious weed species, Siberian Elm, saltcedar, field bindweed, and Russian olive were observed within the project area. No treatment action is recommended for class C weeds.

Wildlife

The following mammals or their sign were observed during surveys: mule deer, black bear, raccoon, striped skunk, coyote, desert cottontail, black tailed jackrabbit, Botta's pocket gopher, grey fox, rock squirrel, and Gunnison's prairie dog. Prairie dogs occur at the western half of the project area along the north NM 333 right-of-way approximately 150 yards east of Tramway Boulevard. They are not currently protected federally or by the State of New Mexico. However, prairie dog burrows provide habitat for other animals, such as the protected western burrowing owl. Prairie dogs would be relocated prior to construction.

Birds observed within the project area included: American crow, American robin, sharp-shinned hawk, canyon towhee, northern flicker, American kestrel, Eurasian collared dove, white-winged dove, mourning dove, rock dove, black-chinned hummingbird, broad-tailed hummingbird, Cassin's finch, scrub jay, chipping sparrow, house sparrow, house finch, Say's phoebe, western kingbird, barn swallow, and Townsend's solitaire.

Threatened and Endangered Species

The Endangered Species Act of 1973 (ESA) requires the evaluation of potential impacts on federally listed species and their critical habitat. Prior to the biological field survey, a list of federal and state endangered, threatened, and species of concern was obtained for Bernalillo County (New Mexico Department of Game and Fish 2009; U.S. Fish and Wildlife Service 2009).

No target species or their sign were observed during the biological survey of the project area. An evaluation of plants and wildlife with agency status by the USFWS and the State of New Mexico in Bernalillo County indicate that 17 protected or monitored species could occur within or near to the project area (see Table 3). No suitable habitat for other species is present. Protected birds in Bernalillo County that may pass through or over the project area include bald eagle, Mexican spotted owl, Baird's sparrow, northern goshawk, mountain plover, white-eared hummingbird, and black tern. However, these species would be unlikely to remain within most of the project planning area as it does not provide suitable habitat for nesting.

Migratory Birds

The Migratory Bird Treaty Act protects against the 'taking' of migratory birds, their nests, and their eggs, except as permitted by the USFWS. Western burrowing owl is a federal species of concern and is protected under the Migratory Bird Treaty Act. This species is found throughout the mid and lower elevations of New Mexico. It usually inhabits bare ground ranging from desert to grassland-juniper habitat. It is common in the Albuquerque area and populations occur near the lower portions of Tijeras Arroyo near the Albuquerque airport.

The project area supports burrowing rodents which provide nesting habitat for western burrowing owl. No owls were observed during the biological survey of the project area. However, they could occur there in the future.

In addition, trees and shrubs located within the project area, particularly those associated with Tijeras Creek and arroyos, as well as culverts and bridges provide nesting habitat for other migratory birds. One unoccupied nest was observed within the project area during surveys.

4.5.2 Environmental Consequences

Alternate 1A (Option 1)
Alternate 1A (Option 1) would temporarily disturb approximately 16.5 acres of habitat with construction activities including trenching and equipment use for distribution line construction. An additional one acre would be disturbed for water storage tank construction. The distribution line from Escondido Reservoir would cross Tijeras Creek and its associated riparian area. Since southwestern willow flycatcher and yellow-billed cuckoo are associated with riparian areas, these species may be impacted if construction occurred during the nesting season.

Alternative 1A (Option 2) – Proposed Action
Alternate 1A (Option 2) would disturb approximately 16.3 acres of habitat with construction activities including trenching and equipment use for distribution line construction. An additional one acre would be disturbed for water storage tank construction. The Proposed Action avoids impacts to Tijeras Creek and its riparian zone. With the implementation of avoidance measures, the Proposed Action is expected to have minimal effects to protected species, vegetation and wildlife in the project planning area.

Table 3. Protected species which could occur within the project area

Species	Federal Status	State Status	
Birds			
Western burrowing owl (*Athene cunicularia hypugaea*)	SOC, MBTA		The project area supports burrowing rodents which provide nesting habitat for western burrowing owl. No owls were observed during the biological survey of the project area. However, they could occur there in the future.
Peregrine falcon (*Falco peregrinus anatum / tundris*)	SOC	T	No suitable nesting habitat was observed within the project planning area. Peregrine falcons could fly over the project planning area and hunt along Tijeras Creek, but proposed project activities are unlikely to affect this species.
Southwestern willow flycatcher *(Empidonax traillii extimus*)	E	E	Portions of the riparian zone along Tijeras Creek provide migration habitat for southwestern willow flycatcher. However, proposed segments surveyed along the creek do not provide suitable habitat for this species. The project is unlikely to affect southwestern willow flycatcher.
Yellow-billed cuckoo (*Coccyzus americanus*)	C		Potentially suitable habitat for this species occurs along Tijeras Creek adjacent to and within the project area. If construction is scheduled during the nesting season (March 15-August 30), surveys for this species should be completed.
Gray vireo (*Vireo vicinior)*	MBTA	T	The lower Coniferous/Mixed Woodland and Juniper Savanna habitats south of Tijeras Creek provide suitable habitat for this species. Although potentially suitable habitat also occurs north of NM 333, the density of housing in these areas is likely to preclude the use of these areas by gray vireo. It is recommended that protocol surveys for this species be conducted prior to constructing within or adjacent to suitable habitat if construction coincides with the migratory bird season (April 1 – September 15).
Bell's vireo (*Vireo bellii arizonae*)	MBTA	T	Although this species is very rare in central New Mexico, it could occur in dense vegetation along Tijeras Creek. If construction along Tijeras Creek is scheduled during the breeding season (April 15-August 30) surveys for this species would be recommended.
Mammals			
Spotted bat		T	Though bats could utilize bridge and culvert structures near to

(*Euderma maculatum)* Townsend's big-eared bat (*Corynorhinus townsendii*)	SOC		the proposed waterline installation routes, the project would not impact these structures under current design. These species could utilize the project area for forage or hunting activities, but would not remain there and would not be active during installation, which would occur during daylight hours.
Black-footed ferret (*Mustela nigripes*)	E		Due to the developing urban location of the project area and the relatively small numbers of prairie dogs present for a prey base, the presence of this species in the project area would not be likely.
New Mexico meadow jumping mouse (*Zapus hudsonius luteus)*	C	T	No suitable habitat for this species was observed within the project area.

A – absent, P – present, C – candidate, E – endangered, T – threatened, SOC – species of concern, MBTA – Migratory Bird Treaty Act

Alternative 1B

Alternative 1B would impact approximately 11.8 acres of habitat with construction of distribution lines as well as additional areas for water storage tank and booster pump station construction. All construction activities would avoid Tijeras Creek and its riparian zone.

Alternate 2A, Alternate 2B, Alternate 2C (Proposed Action for future construction)

Alternates 2A, 2B, and 2C would temporarily disturb 70.6 acres, 64.4 acres, and 62.2 acres, respectively, for construction of distribution lines. For each of the alternates, construction-related disturbance would result from the construction of a storage tank as well as two booster pump stations. Each of these alternates would require construction of distribution lines that cross Tijeras Creek and the riparian habitat associated with it. Southwestern willow flycatcher and yellow-billed cuckoo may be impacted by construction activities if construction occurred during the nesting season.

4.5.3 Mitigation

The following measures would reduce effects to biological resources:

- In vegetated areas, construct outside of the migratory bird nesting season (March 15 – August 30), and grey vireo nesting season (April 1 – September 15) or complete surveys prior to constructing;
- Avoid removing trees present within the project area;
- Replant disturbed soils with certified weed-free native vegetation;
- Install and bury pipe trenches concurrently to reduce trapping of small mammals and reptiles;
- Prairie dogs would be relocated prior to construction;
- Re-evaluate potential impacts to natural resources if additional project segments are identified or if project segments are constructed more than two years after this evaluation.
- Additional biological surveys will be conducted if the tank siting study identifies a new tank site and pipeline route that has not been surveyed for biological resources.

4.6 Water Quality Issues

4.6.1 Affected Environment

The primary purpose of the proposed project is to address drinking water quality issues in the project planning area. Currently, residents within the project planning area rely on private wells. Wells in the area have been analyzed for constituents regulated by the Safe Drinking Water Act. The analysis results indicate that many private wells are contaminated with nitrates in excess of Safe Drinking Water Act standards. Numerous wells in the Carnuel area are shallow and many of these shallow wells are located

in fractured rock formations that are conducive to pollutant transport. The area does not have a central sewer system and the presence of septic tanks located in close proximity to shallow wells has led to nitrate contamination in wells. Groundwater levels in the area vary depending on topography. Private wells located near Tijeras Creek may be only 60 feet deep while wells at higher elevations may be nearly 400 feet deep.

Upper Tijeras Creek, in eastern Bernalillo County, is a tributary to the Rio Grande. The Rio Grande is located approximately 12 miles to the west of the project area. The waters of the creek originate from springs and seeps in the Sandia and Manzanita Mountains and Tijeras Canyon (which separates the Sandias and Manzanitas), and flow west into the Albuquerque basin. Tijeras Creek is an interrupted stream; that is, it contains perennial reaches with intervening intermittent reaches through the length of Tijeras Canyon.

Tijeras Creek, from the Rio Grande to the headwaters, is listed in Appendix A of the *2008-2010 State of New Mexico CWA Section 303(d) / 305(b) Integrated Report* (NMED 2008). Current designated uses for aquatic life and warmwater aquatic life are listed under the category of "not supporting". The probable sources of impairment are channelization, drought-related impacts, on-site treatment systems (septic systems and similar decentralized systems), rangeland grazing, and pet waste.

4.6.2 Environmental Consequences

All alternatives considered would provide a water distribution system in the Carnuel connected to and using the same water supply used throughout the ABCWUA water system. The ABCWUA water source is a blended mixture of ground water pumped from the regional aquifer and San Juan-Chama surface water from the Rio Grande. The ABCWUA water supply meets federal and state drinking water quality standards. In addition to providing a safe reliable water supply to the project planning area, the proposed project would also decrease the amount of ground water pumping in the project planning area as individual residents connected to the distribution system rather than depending on private wells for a domestic water supply. Existing private wells may continue to be used for outdoor irrigation; however, it is anticipated that overall ground water pumping from private wells in the project planning area would decrease.

The proposed project is unlikely to have an adverse effect on ground water quality. Project-related construction activities will likely involve the use of heavy equipment, thereby leading to the possibility of contaminant releases (e.g. fuel, hydraulic fluid, etc.) associated with equipment malfunctions. The NMED Ground Water Quality Bureau advises all parties involved in construction projects to be aware of discharge notification requirements contained in 20.6.2.1203 NMAC.

The completed water system would have no discharges to surface water and therefore would have no environmental consequences for surface water in the area. A temporary environmental consequence of construction is sedimentation of arroyos during site preparation for the tank construction and trenching for water lines. The U.S. Environmental Protection Agency (EPA) requires National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) coverage for storm water discharges from construction projects that will result in the disturbance of one or more acres of total land area. Because the proposed project will disturb more than one acre, appropriate NPDES permit coverage would be required prior to beginning construction. A Storm Water Pollution Prevention Plan (SWPPP) must be prepared for the site and appropriate Best Management Practices (BMPs) must be implemented and maintained both during and after construction to prevent, to the extent practicable, pollutants (primarily sediment, oil and grease, and construction materials) in storm water runoff from entering waters of the United States.

Preliminary consultation was held with the U.S. Army Corps of Engineers (USACE) during the early planning phase of the proposed project. In a letter dated May 7, 2009, the USACE states that "a

Department of the Army permit is required under Section 404 of the Clean Water Act for the placement of dredged or fill materials into waters of the United States. If the Carnuel MDW&WWCA or any of its contractors work, or plan to work in a river, stream, arroyo or wetland, a Department of the Army permit may be required. Tijeras Arroyo and its tributaries appear to be jurisdictional waters of the United States". When the horizontal alignment for the distribution lines is established, the project engineer will submit the permit application to the USACE to allow the processing of a Section 404 permit for the project.

4.6.3 Mitigation

The temporary construction-related impacts to surface water quality would be avoided or minimized by complying with the NPDES permit requirements and implementing a SWPPP. The SWPPP would identify measures and techniques to prevent sedimentation of arroyos during storm events. The SWPPP would be provided to Bernalillo County Public Works Division prior to construction activities for review and approval.

All conditions and requirements of the Section 404 permit for arroyo crossings will be complied with during the final design and construction of the proposed project.

4.7 Coastal Resources

No coastal resources exist in New Mexico.

4.8 Socioeconomic and Environmental Justice

4.8.1 Affected Environment

Impacts to minority and low-income communities are given special consideration under Executive Order 12898, Environmental Justice (EJ), and Title VI of the Civil Rights Act. These seek to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations, and ensure the full and fair participation by all potentially affected communities in the decision-making process.

According to data collected during the 2000 Census (U.S. Census Bureau), Carnuel is a census designated place with a population of 872. The Hispanic population within the Carnuel area makes up approximately 51 percent of the population. Both on a statewide basis and in Bernalillo County, Hispanic representation is lower at approximately 42 percent of the total population. The poverty level for both Carnuel and Bernalillo County is lower than the overall state average (Table 4).

Appendix C includes Potential EJ Index information for the proposed project area as supplied by the EPA. The Potential EJ Index is a composite index incorporating population density and income. The potential EJ index for the study area was ranked at 2.0, which is considered to be a low to moderate ranking.

4.8.2 Environmental Consequences

Although the alternatives considered differ in terms of distribution line alignments and other infrastructure requirements, the impacts of these alternatives would be similar in terms of socioeconomic and environmental justice issues. No residents or businesses would be relocated as a result of the proposed project regardless of the alternative. Private property owners may be fairly compensated for utility easements across their property or the acquisition of property for other infrastructure including tank sites or booster pump stations. ABCWUA has executed a permanent easement with the Echo Canyon Corporation for construction and operation of water and wastewater lines. The proposed project would allow for the provision of a safe and reliable drinking water supply to all members of the community,

without favoritism or discrimination. The proposed project is considered to be consistent with environmental justice policies. The project is not expected to disproportionately impact low-income or minority populations.

Table 4. Population and economic characteristics

	New Mexico	Bernalillo County	Carnuel CDP
2000 Population	1,819,046		872
2000 Minority Representation			
- White	66.8%	70.8%	69.3%
- Black or African American	1.9%	2.8%	0.3%
- American Indian	9.5%	4.2%	1.7%
- Asian	1.1%	1.9%	0.0%
- Pacific Islander	0.1%	0.1%	0.0%
- Some other race	17.0%	16.1%	27.1%
- Two or more races	3.6%	4.2%	1.6%
- Hispanic or Latino (also included in race categories above)	42.1%	42.0%	51.1%
2000 Age Characteristics			
- Median age	34.6 years	35.0 years	42.5 years
- Percent under 18 years of age	28.0%	25.3%	20.9%
- Percent over 64 years of age	11.7%	11.5%	15.5%
1999 Economic Characteristics			
- Median household income	$34,133	$38,788	$37,813
- Per capita income	$17,261	$20,790	$18,553
- Poverty rate for individuals	18.4%	13.7%	12.3%

CDP – census designated place
Source: U.S. Census Bureau, 2000 Census Data.

The ABCWUA Water and Sewer Rate Ordinance (2007) lists Utility Expansion Charges (UEC) that vary depending on the water meter size for a water service connection. The majority of the water service connections in the project planning area are anticipated to be $^{5}/_{8}$-inch or $^{3}/_{4}$-inch water meters for residential service. The ordinance lists a $2,489 Utility Expansion Charge (UEC) for a $^{5}/_{8}$-inch or $^{3}/_{4}$-inch water service connection. Larger meter sizes would have larger UEC rates.

As noted in the PER (Bohannan Huston, Inc. 2009), the UEC rate may be financially burdensome for some of the users in the project planning area; therefore, the ABCWUA would allow users to pay this charge over a period of 10 years at an interest rate of 7% per annum with a 5% down payment. If this financing option is selected by the customer, a down payment of $419 ($124 UEC and $295 meter set) is required for a $^{5}/_{8}$-inch or $^{3}/_{4}$-inch connection with a monthly payment of $27.46 in addition to the rate for the monthly metered usage.

The rate schedule for the water users within the project planning area would conform to the standard rate schedule as stated in the ABCWUA Water and Sewer Rate Ordinance (2007). With an estimated average daily demand of 180 gallons per day for a service connection, the average monthly rate for a $^{5}/_{8}$-inch or $^{3}/_{4}$-inch residential service connection is estimated to be approximately $21.41 per month. If the UEC financing option is selected, the monthly charge would also include the $27.46 monthly UEC payment for a total monthly charge of $48.87.

4.8.3 Mitigation

The project is expected to benefit the community within the project planning area. No mitigation is needed for socioeconomic or environmental justice issues.

4.9 Climate and Air Quality

4.9.1 Affected Environment

The project planning area has an arid to semiarid climate typical of the southwestern United States. The climate is characterized by abundant sunshine, low relative humidity, light precipitation, and wide diurnal temperature fluctuations. Based on information for Albuquerque, the average maximum temperature is 69.8 degrees Fahrenheit (F) and average minimum temperature is 43.2 degrees F. The average annual precipitation is 8.75 inches (Western Regional Climate Center 2007). Winters are generally dry, and snow rarely remains on the ground at low elevations for more than 24 hours. Summer precipitation supplies almost half of the annual moisture from July through October. Most of the rain falls in brief, though sometimes intense, convective thunderstorms.

Under the Clean Air Act, the EPA established National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants considered harmful to public health and the environment above certain concentrations. The six criteria pollutants are carbon monoxide (CO), lead, nitrogen oxides (NOx), particulate matter (PM), ozone, and sulfur oxides (SOx). Bernalillo County is in attainment of federal ambient air quality standards; however, the County is still designated as a limited maintenance area for carbon monoxide (CO).

4.9.2 Environmental Consequences

Alternate 1A (Option 1)

Construction of the proposed facilities would disturb approximately 16.5 acres for construction of distribution lines and an additional one acre for construction of the water storage tanks. Construction activities would temporarily create an increase in airborne particulates by removing vegetation and disturbing soils. Some temporary localized impacts on air quality would be expected from dust during construction.

Alternative 1A (Option 2) – Proposed Action

Alternate 1A (Option 2) would disturb approximately 15.4 acres for distribution line construction and an additional one acre would be disturbed for water storage tank construction. Temporary increases in dust would be expected during construction. The Proposed Action avoids impacts to Tijeras Creek and its riparian zone. With the implementation of avoidance measures, the Proposed Action is expected to have minimal effects on air quality. No long-term adverse impacts to air quality are expected following completion of the proposed water system improvements.

Alternative 1B

Alternative 1B would impact approximately 11.8 acres with construction of distribution lines as well as additional areas for water storage tank and booster pump station construction. Temporary construction-related dust would be expected.

Alternate 2A, Alternate 2B, Alternate 2C (Proposed Action for future construction)

Alternates 2A, 2B, and 2C would temporarily disturb 70.6 acres, 64.4 acres, and 62.5 acres, respectively, for construction of distribution lines. For each of the alternates, construction-related disturbance would result from the construction of a storage tank as well as a booster pump station.

4.9.3 Mitigation

To minimize fugitive dust, the construction contractor would submit a Dust Control Plan and a Site Disturbance Permit application to the Albuquerque Environmental Health Department Air Quality

Division at least ten days prior to construction as per the Albuquerque–Bernalillo County Air Quality Control Board Regulation 20.11.20 New Mexico Administrative Code (NMAC). The contractor would be responsible for compliance with all air quality regulations. Measures to reduce wind erosion may include wetting the construction site, limiting truck speeds on dirt access roads to the construction site, covering loads, and other suitable dust suppression techniques.

Similarly, operation of gasoline- or diesel-powered construction equipment would result in temporary and minor increases in SOx, NOx, VOCs, and CO. All construction equipment would be required to use approved emission control devices and limit unnecessary idling. In addition, all vehicles involved in transporting materials to or from the site would be required to pass a current New Mexico emission

4.10 Noise

4.10.1 Affected Environment

Noise is defined herein as unwanted or unwelcome sound. Most of the sounds heard in the environment are not composed of a single frequency, but are a band of frequencies, each with a different intensity or level. Levels of noise are measured in units called decibels. Since the human ear cannot perceive all pitches or frequencies equally, these measures are adjusted or weighted to correspond to human hearing. This adjusted unit is known as the A-weighted decibel, or dBA.

Since dBA describes a noise level at just one instant and since ambient noise levels are constantly varying, other ways of describing noise levels, especially over extended periods, are used. The day-night sound level, Ldn, is a noise rating developed by the EPA for specification of community noise from all sources. The Ldn includes a weighting penalty of 10 dBA added to sound levels occurring between 10:00 pm and 7:00 am. Several federal agencies use 65 Ldn as the dividing line between acceptable and unacceptable noise environments.

Noise conditions in the project planning area vary depending primarily on proximity to transportation routes. I-40 carries a daily traffic volume of 53,000 vehicles with 35 percent heavy truck traffic and is the major noise producer in the area. NM 333 (Old Route 66) is commonly used by local residents for access to Albuquerque to the west and to Tijeras and other East Mountain areas to the east. A quiet residential area has an estimated background noise level of 40 dBA while areas near heavy traffic would have an estimated noise level of 85 dBA (League for the Hard of Hearing 2008).

Noise-sensitive areas include residences, schools and day care facilities, hospitals, long-term care facilities, places of worship, libraries, and parks and recreational areas specifically known for their solitude and tranquility such as wilderness areas. Noise-sensitive receptors in the project planning area are primarily residences.

4.10.2 Environmental Consequences

All of the alternatives considered would include construction activities. During construction, noise levels would be higher than normal due to the operation of construction equipment. Construction-related noise is expected to be a temporary impact ending when the construction is completed.

During construction, noise levels could substantially, but temporarily, increase. The projected maximum intermittent noise level is estimated to range from 72 to 98 dBA at 50 feet from the equipment (see Table 5). The highest noise impacts would occur at residences immediately adjacent to construction areas. Residential structures would absorb and reflect the noise, thus reducing the impact at residences that are not immediately adjacent to the construction activity.

Noise levels from a point source such as a piece of construction equipment would decrease 6 dBA per doubling of distance over a hard surface such as a parking lot. Over a “soft” or vegetated surface, noise levels would decrease at a rate of 9 dBA per doubling of distance. Thus, if a piece of construction equipment generates 98 dBA at 50 feet, the noise level at 100 feet (assuming a “soft” or vegetated

surface) would be 89 dBA. This level would lead to noise levels of approximately 80 dBA at 200 feet, 71 dBA at 400 feet, and 62 dBA at 800 feet.

Table 5. Typical noise levels of principal construction equipment

Excavation and Earthmoving	
Equipment	Noise Level (dBA) at 50 feet
Bulldozer	80
Backhoe	72-93
Front-end loader	72-84
Dump truck	81-98
Scraper	80-93

Source: U.S. Environmental Protection Agency (EPA) 1971.

Alternate 1A (Option 1)
Alternate 1A (Option 1) has been designed as a gravity flow system. No booster pump station would be needed to supply water to the target Zone 8E area that would be served by this alternative. In terms of long-term impacts, no additional noise is expected to be generated through operation of the distribution lines or the water storage tanks.

Alternative 1A (Option 2) – Proposed Action
Alternate 1A (Option 2) has been designed as a gravity flow system. No booster pump station would be needed to supply water to the target Zone 8E area that would be served by this alternative. In terms of long-term impacts, no additional noise is expected to be generated by the operation of distribution lines or by the water storage tanks.

Alternative 1B
Alternative 1B would include construction of a booster pump station. The pump station may have noise or vibration impacts on adjacent properties.

Alternate 2A, Alternate 2B, Alternate 2C (Proposed Action for future construction)
The infrastructure requirements for the Alternate 2 alternatives each include two booster pump stations. The pumps will be housed within a building to reduce noise impacts to the surrounding area.

4.10.3 Mitigation

To reduce noise impacts to residences in the vicinity, construction would typically occur during weekdays and daylight hours except when, with the approval of residents, construction activities may extend beyond daylight hours to allow completion of an activity, such as backfilling an open trench, which could be a safety issue if not completed. Construction equipment would typically not operate within 500 feet of a residential zone between the hours of 10 p.m. to 7 a.m., but if extended construction hours are needed, prior approval would be obtained from local residents.

By limiting construction activities to weekdays and daylight hours, noise impacts would be reduced during the peak times when outdoor activities take place by residents (weekends) and limited to hours when noise levels are typically louder (daytime versus nighttime), but this would depend on the preferences of residences. Residents will be contacted to obtain their input regarding construction scheduling.

The booster pumps will be housed within a building to reduce noise impacts to surrounding areas. Although the project area is located outside the incorporated limits of the City of Albuquerque, and therefore is not subject to compliance with city regulations, the booster pump stations will be designed using the City of Albuquerque Noise Control Ordinance as guidance. This ordinance sets a maximum

noise level of 50 dB at a residential property boundary or no greater than a 10 dB increase at the property boundary if ambient noise is greater than 50 dB.

4.11 Visual Impacts

4.11.1 Affected Environment

Located in Tijeras Canyon with the Sandia Mountains to the north and the Manzanita Mountains to the south, the project planning area has unique visual resources. Terrain is steep and rugged on higher slopes with rock outcrops. The bottom of the canyon along Tijeras Creek is lined with riparian or arroyo riparian vegetation. The existing visual quality of the area is influenced by historical and current land uses including commercial and residential development, power lines, and roads (I-40 and NM 333). An existing water tank is located near a residence in the Echo Canyon area.

4.11.2 Environmental Consequences

All alternatives considered would include construction of distribution lines. Due to construction activities, the proposed action would result in two types of potential impacts on visual resources: short-term impacts resulting from construction activities and related materials and equipment staging, and long-term impacts due to vegetation removal. In addition, new aboveground facilities would also be constructed including two water storage tanks and booster pump stations.

Alternate 1A (Options 1 and 2) includes the proposed construction of two 200,000 gallon above ground water storage tanks or reservoirs. These proposed tanks would be approximately 24 feet tall with a diameter of 36 feet and would be similar in appearance to other water storage tanks in the ABCWUA water distribution system. The tanks would be located in the Echo Canyon area north of I-40.

Alternatives 2A, 2B, and 2C include construction of a 460,000-gallon water storage tanks as well as booster pump stations. This proposed tank would be approximately 24 feet tall with a diameter of 55 feet and would be similar in appearance to other water storage tanks in the ABCWUA water distribution system.

Alternate 1A (Option 1), Alternative 1A (Option 2) – Proposed Action

Alternate 1A (Options 1 and 2) each include the proposed construction of two 200,000 gallon above ground water storage tanks or reservoirs. This proposed tank would be approximately 24 feet tall with a diameter of 42 feet and would be similar in appearance to other water storage tanks in the ABCWUA water distribution system. The tank would be located in the Echo Canyon area north of I-40.

Modifications in response to public comments: After receiving numerous public comments regarding the proposed construction of water storage tanks in the Echo Canyon area, the ABCWUA and Carnuel MDW&WWCA agreed to complete a tank siting study that will consider three potential tank site locations. Construction of any tanks will be postponed until a later phase of construction. Current funding allocated for this project would be used for construction of distribution lines.

The tank site study will be conducted to evaluate land use and visual impacts to nearby residences. The tank siting study will reevaluate the alternative tank sites, consider additional tank sites, and develop tank design options that minimize the visual impact of the tanks. After the tank siting study is completed and funding for tank construction is identified, a supplemental environmental report would be prepared in coordination with agencies funding that portion of the construction activities. The environmental document would discuss the proposed tank project and environmental consequences of tank construction.

Alternative 1B
Alternative 1B also includes the construction of two 200,000-gallon water tanks as described above for Alternate 1A. In addition, Alternate 1B would also include construction of a booster pump station.

Alternate 2A, Alternate 2B, Alternate 2C (Proposed Action for future construction)
Alternatives 2A, 2B, and 2C include construction of a 460,00-gallon water storage tank. This proposed tank would be approximately 24 feet tall with a diameter of 55 feet and would be similar in appearance to other water storage tanks in the ABCWUA water distribution system.

4.11.3 Mitigation

To minimize potential visual impacts due to construction of distribution lines, grading during restoration would be conducted in manner that minimizes erosion and conforms to natural topography. Disturbed areas would be re-seeded with a certified weed-free native seed mix (except in residential areas where landscaping would be restored, if necessary), and soils and rock excavated but not used to backfill or restore contour would be evenly spread within the construction disturbance area.

Water storage tanks will be screened from view to the greatest extent possible using a combination of grading, fencing, landscaping, walls, and tank color. Colors selected would be generally neutral (such as earth tones) that will allow the facility to blend in with the visual character of the neighborhood. The future booster pump station (Alternate 2C) would also be designed to blend into the existing landscape to the extent possible through the use of grading, fencing, walls, and neutral color choice.

4.12 Other Resources

4.12.1 Public Health and Safety

If present in the environment, hazardous substances are a serious concern because of health and safety risks for the public and construction workers as well as potential cleanup liability. Section 101(10) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) takes a wide interpretation of hazardous substances to include all of the following:

- Substances designated under Sections 307(a) and 311(b)(4) of the Clean Water Act;
- Hazardous air pollutants listed under Section 112 of the Clean Air Act;
- Resource Conservation and Recovery Act (RCRA) hazardous wastes; and
- Chemical mixtures for which the EPA has taken action under Section 7 of the Toxic Substances Control Act.

A CERCLA release to the environment includes any method of allowing a hazardous substance to enter environmental media (air, water, soil, or geologic material) that is not contained within a building or facility.

No National Priority List (NPL or Superfund) or other sites listed on the Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) database are known to occur in this part of Bernalillo County. No permitted hazardous waste treatment, storage, or disposal facilities are located near the project area. No clandestine drug labs have been found in the general area of the project. One conditionally exempt small quantity hazardous waste generator is located within ½ mile of the project area based on EPA records; no environmental issues were identified with this location.

The New Mexico Environment Department (NMED) lists two leaking underground storage tank (LUST) site in Carnuel:

- Carnue / Deadmans (RID 34 / FID 27249), Highway 66 Carnuel Exit, referred to Ground Water Bureau, NMED contact James Mullaney; and
- Snodgrass Well (RID 30 / FID 27249), Highway 66 Carnuel Exit, cleanup, NMED contact James Mullaney.

The NMED Ground Water Quality Bureau also lists two sites in Carnuel:

- Active site – Carnuel No. 3, Old Route 66, Carnuel, 30 acres, 20-60 foot depth to groundwater, nitrates (NO3) contamination, probable source is a septic tank / drain field; and
- Closed site – Carnuel – Dead Man's Curve (Hertlzer Well), 37 Atencio Road Carnuel, several contaminants (gas, methyl tertiary butyl ether [MTBE], nitroaromatics, and nitrates), site closed in 1996.

These sites have impacted groundwater. NMED should be contacted to obtain precise location information to ensure that project excavation activities do not come in contact with contaminated soil or groundwater.

Based on field observations and available information, there are no hazardous materials issues within most the project area with the exception of the four NMED sites. Two NMED LUST sites, an active ground water remediation site, and a closed ground water remediation site are located in the Carnuel area. Prior to initiating construction the local Albuquerque NMED Petroleum Storage Tank Bureau office should be contacted (telephone number 505-222-9558) and the NMED Ground Water Quality Bureau office in Santa Fe (telephone number 505-827-2900) to ensure that construction activities avoid areas with known soil and groundwater contamination. No other environmental sites are located near the project area.

The construction contractor will ensure that no hazardous materials are released during construction activities. Any hazardous materials will be properly monitored, maintained, and stored while present at the construction site. If contaminated soil or groundwater is encountered during construction, actions will be taken immediately to protect workers and residents from exposures. The NMED will be contacted for guidance and any contaminated materials will be properly handled.

4.12.2 Energy

Irreversibly and irretrievably committed resources associated with the facility are primarily the materials needed for the construction, and the fossil fuels and energy resources needed to operate and maintain the facility. In general, short-term energy demands will increase during the construction phase, including fuel use for construction equipment. These impacts are considered to be minor. The operation of the public water system requires energy, but no long-term energy impacts are expected in association with the proposed project. No mitigation is required.

4.12.3 Transportation

Other than short-term construction-related disruptions of traffic during waterline construction, local roadway capacities and the level of service at intersections would not be affected by the proposed waterline project. Direct impacts would be localized traffic disruptions, of a temporary nature, while the path of construction crosses traffic corridors or temporarily disrupts rights-of-way. An increase in traffic related to construction activity could temporarily impact local traffic patterns; however, overall traffic disruption is expected to be minimal. Impacts to the project area are expected to be short term. The construction contractor will be required to install any necessary signs, barricades, and utilize appropriate traffic safety measures where appropriate.

4.13 Cumulative Impacts

Cumulative impacts are defined as the impacts that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts also can result from individually minor but collectively significant actions taking place over a period of time.

Another foreseeable future project in the Carnuel area is the provision of a central wastewater system with service to individual homes. Although in past planning discussions, the provision of both water and

wastewater utility service was discussed as concurrent activities, funding is not currently available for connecting the project planning area to the existing force main in Tijeras Canyon. Land disturbance due to construction of wastewater lines would be similar to the disturbance associated with the water lines since many of the wastewater collection lines would parallel water lines. Although it would be preferable to complete both the water and wastewater service lines simultaneously to reduce construction impacts, funding is not currently available for the sewer collection system. When funding becomes available, planning, engineering and design for the wastewater system would be completed. Any required environmental clearances would be completed in compliance with NEPA and other applicable rules and regulations.

At present, the Carnuel area has no central water system for the distribution of water to residents. All residents obtain water from private wells. The proposed project would provide the connection to the ABCWUA existing system and the necessary infrastructure to distribute water in the Carnuel area. The new water source would be the same water used throughout the ABCWUA system: a blended mixture of ground water pumped from the aquifer and San Juan-Chama surface water pumped from the Rio Grande. The switch from ground water to a blended mixture of ground and surface water would decrease ground water pumping in the project planning area.

The provision of central water service to individual homes may have the cumulative effect of promoting population growth in the area and increasing property values.

5.0 SUMMARY OF MITIGATION

5.1 Physical Resource Measures

Land Use

- All necessary permits would be acquired for utility construction within public owned right-of-way including a permit from the NMDOT for construction within I-40 and/or NM 333 right-of-way.
- Private property owners may be compensated for easements across private property and for the acquisition of property for tank or booster pump station sites.

Water Quality

- The temporary construction-related impacts to surface water quality would be avoided or minimized by complying with the NPDES permit requirements and implementing a SWPPP. The SWPPP would identify measures and techniques to prevent sedimentation of arroyos during storm events.
- All conditions and requirements of the Section 404 permit for arroyo crossings will be complied with during the final design and construction of the proposed project.
- Avoid locating any equipment staging or construction storage yards within a floodplain.
- Avoid groundwater contamination through proper handling and storage of petroleum products, chemicals, toxic substances, and hazardous materials.

Air Quality

- To minimize fugitive dust, the construction contractor would submit a Dust Control Plan and a Site Disturbance Permit application to the Albuquerque Environmental Health Department Air Quality Division at least ten days prior to construction as per the Albuquerque–Bernalillo County Air Quality Control Board Regulation 20.11.20 New Mexico Administrative Code (NMAC).
- Measures to reduce wind erosion may include wetting the construction site, limiting truck speeds on dirt access roads to the construction site, covering loads, and other suitable dust suppression techniques.
- All construction equipment would be required to use approved emission control devices and limit unnecessary idling. In addition, all vehicles involved in transporting materials to or from the site would be required to pass a current New Mexico emissions test.

5.2 Biological Resource Measures

- Avoid removing trees present within the project area;
- Replant disturbed soils with certified weed-free native vegetation;
- Install and bury pipe trenches concurrently to reduce trapping of small mammals and reptiles;
- Prairie dogs would be relocated prior to construction;
- Re-evaluate potential impacts to natural resources if additional project segments are identified or if project segments are constructed more than two years after this evaluation.
- Additional biological surveys will be conducted if the tank siting study identifies a new tank site and pipeline route that has not been surveyed for biological resources.

5.3 Threatened, Endangered, and Other Protected Species Measures

- In vegetated areas, construct outside of the migratory bird nesting season (March 15 – August 30), and grey vireo nesting season (April 1 – September 15) or complete surveys prior to constructing.

5.4 Socioeconomic/Environmental Justice Measures

- No mitigation measures are required since no adverse effects to socioeconomic or environmental justice issues are anticipated.

5.5 Archaeological, Cultural and Historic Resources Measures

- Low-vibration equipment and practices for compaction and excavation will be used within 100 feet of NRHP-eligible historic buildings to avoid the possibility of damage due to vibration. Vibration monitoring will be used to verify the level of vibration impact on historic buildings.
- If buried cultural deposits are discovered during project activities, the contractor will halt work at the site of the discovery and immediately notify the RD, the NMDOT where applicable, and the New Mexico State Historic Preservation Officer. The contractor will not resume work in the affected area until clearance has been received.
- If additional areas are identified for construction activities that have not been surveyed, a cultural resource survey will be completed to identify and evaluate cultural resources.
- Additional cultural resource investigations and SHPO consultation will be conducted if the tank siting study identifies a new tank site and pipeline route that has not been surveyed for cultural resources.

5.6 Environmentally Sensitive Areas

Floodplains

- Locate structures, including booster pump stations and water storage tanks, outside of designated floodplains.
- At any location where a proposed distribution line crosses a designated 100-year floodplain, the streambed would be restored to its original condition after construction of the distribution line within the floodplain is completed.

Wetlands

- Prior to construction of Alternate 2C in future construction phases, the potential wetland sites that may be impacted by Alternate 2C would be re-evaluated.
- Construction activities will avoid wetlands where practicable, or minimize the extent of wetlands crossed. The ABCWUA would consult with the USACE regarding permitting requirements for construction activities within potential wetlands adjacent to Tijeras Creek if they cannot be avoided. It is anticipated that any impacts due to construction of distribution lines across wetlands adjacent to Tijeras Creek would be temporary construction-related impacts that could be mitigated.

5.7 Other Resources

Noise

- To reduce noise impacts to residences in the vicinity, construction would typically occur during weekdays and daylight hours, but with the approval of local residents, construction activities may extend beyond daylight hours to allow completion of an activity, such as backfilling an open trench, which could be a safety issue if not completed. Residents will be contacted to obtain their input regarding construction scheduling.
- Construction equipment would typically not operate within 500 feet of a residential zone between the hours of 10 p.m. to 7 a.m., but if extended construction hours are needed, prior approval would be obtained from local residents.
- The booster pumps will be housed within a building to reduce noise impacts to surrounding areas. Although the project area is outside the city limits and not subject to City of Albuquerque regulations, the booster pump stations will be designed with reference to the City of Albuquerque Noise Control Ordinance. The following standard would be used: maximum noise level of 50 dB at a residential property boundary or no greater than a 10 dB increase at the property boundary if ambient noise is greater than 50 dB.

Visual Impacts

- To minimize potential visual impacts, grading during restoration would be conducted in manner that minimizes erosion and conforms to natural topography.

- Disturbed areas would be re-seeded with a certified weed-free native seed mix (except in residential areas where landscaping would be restored, if necessary).
- Soils and rock excavated but not used to backfill or restore contour would be evenly spread within the construction disturbance area.
- Water storage tanks will be screened from view to the greatest extent possible using a combination of grading, fencing, landscaping, walls, and tank color. Colors selected would be generally neutral that will allow the facility to blend in with the visual character of the neighborhood.
- The future booster pump stations (Alternate 2C) would also be designed to blend into the existing landscape to the extent possible through the use of grading, fencing, walls, and neutral color choice.
- **After receiving numerous public comments regarding the proposed construction of water storage tanks in the Echo Canyon area, the ABCWUA and Carnuel MDW&WWCA agreed to complete a tank siting study that will consider three potential tank site locations. Construction of any tanks will be postponed until a later phase of construction. Current funding allocated for this project would be used for construction of distribution lines. The tank siting study will be conducted to evaluate land use and visual impacts to nearby residences. The tank siting study will reevaluate the alternative tank sites, consider additional tank sites, and develop tank design options that minimize the visual impact of the tanks. After the tank siting study is completed and funding for tank construction is identified, a supplemental environmental report would be prepared in coordination with agencies funding that portion of the construction activities. The environmental document would discuss the proposed tank project and environmental consequences of tank construction.**

Transportation

- The construction contractor will be required to install any necessary signs, barricades, and utilize appropriate traffic safety measures where appropriate.

6.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

6.1 Agency Coordination

Agency coordination letters were mailed to public and regulatory agencies at the initiation of the environmental review process to solicit input on potential impacts and concerns. Agency comments are briefly summarized in Table 6. Copies of written responses received are included in Appendix B. Copies of the letters that were sent to the agencies are also provided in Appendix B.

Table 6. Agency coordination

Agency Consulted	Consultation Letter Sent	Response Date	Agency Comments
Bernalillo County Floodplain Administrator	April 21, 2009	June 30, 2009	As a portion of the project may cross arroyos considered Waters of the US, the Army Corps of Engineers should be contacted regarding any 404 permitting requirements As the project will disturb more than one acre of land a Storm Water Pollution Prevention Plan for construction activities is required. Please submit a copy to Bernalillo County Public Works Division for review and approval prior to construction activities.
New Mexico Office of Cultural Affairs, State Historic Preservation Division	April 21, 2009	July 24, 2009	The proposed undertaking will not have an adverse effect on registered or eligible properties.
Albuquerque Bernalillo County Air Quality Division	June 30, 2009 (letter sent) July 7, 2009 (phone message).	----------	*No response to the scoping letter or to a follow-up telephone message.*
New Mexico Energy, Minerals, and Natural Resources Department	April 21, 2009	July 6, 2009	No comment.
New Mexico Environment Department	April 21, 2009	May 27, 2009	Ground Water Quality Bureau. The GWQB supports this effort to get households off of septic systems and onto a municipal wastewater collection system. Collection and treatment (including reduction of nitrogen concentrations) of wastewater is often more protective of ground water quality than the widespread use of septic systems. Surface Water Quality Bureau. Because this project appears to exceed one acre, it will require appropriate NPDES permit coverage prior to beginning construction.

New Mexico Department of Transportation	April 21, 2009	May 19, 2009	To obtain environmental and cultural resource clearance for a permit to access NMDOT right of way please send a copy of the environmental report along with the NMDOT environmental clearance checklist to the address and contact below. *In addition to the written response noted above, a meeting was held on May 27, 2009 with the NMDOT, ABCWUA and project engineers to discuss right-of-way use permits for utility lines within NMDOT right-of-way. It was determined that the right-of-way use permit application would be submitted after details about the horizontal distribution line alignment are established. The environmental review process will be finalized and copies of the environmental report will be provided to the NMDOT when the permit application is submitted to the NMDOT.*
New Mexico Office of the State Engineer	April 21, 2009	July 7, 2009	The Office of the State Engineer has continued jurisdiction over appropriation of water from all domestic wells in the Carnuel area. There are no special OSE requirements regarding these wells as residents of the Carnuel area connect to water provided by the ABCWUA. The OSE has continued jurisdiction over permits obtained by the ABCWUA through the OSE. Any changes in these permits in regard to points of diversion, place of use, new appropriation of water, etc. may require a permit wit the OSE.
New Mexico Department of Game and Fish	April 21, 2009	May 22, 2009	The Department does not anticipate significant impacts to wildlife or sensitive habitats. Provided are the following recommendations to minimize or eliminate impacts to wildlife. Open trenches and ditches can trap small mammals, amphibians and reptiles and can cause injury to large mammals. Periods of highest activity for many of these species include night time, summer months and wet weather. To minimize the amount of open trenches at any given time, keep trenching and backfilling crews close together. Trench during cooler months (October-March). Avoid leaving trenches open overnight. With implementation of these recommendations during construction, the Department believes that this project as proposed is unlikely to adversely affect wildlife or wildlife habitats.
Federal Emergency Management Agency	April 21, 2009	----------	No response.
Natural Resources Conservation Service	April 21, 2009	April 27, 2009	There is no prime or unique farmland in the project area. The NRCS has no objections to the proposed action.

U.S. Army Corps of Engineers	April 21, 2009	May 7, 2009	If the Carnuel Mutual Domestic Water and Wastewater Consumers Association or any of its contractors work, or plan to work, in a river, stream, arroyo or wetland, a Department of the Army permit may be required. Tijeras Arroyo and it tributaries appear to be jurisdictional waters of the United States.
U.S. Department of Interior - National Park Service	April 21, 2009	May 18, 2009	The National Park Service reviewed this project, and determined that no parks will be affected; therefore, we have no comments.
U.S. EPA – Office of Planning and Coordination	April 21, 2009	----------	No response.
U.S. EPA – Air Planning Section	April 21, 2009 (letter sent) July 7, 2009 (phone message)	----------	*No response to the scoping letter or to a follow-up telephone message.*
U.S. EPA – Sole Source Aquifer Program	April 21, 2009	April 30, 2009	Based on information provided, we have concluded that the project does not lie within the boundaries of a designated sole source aquifer and is thus not eligible for review under the SSA program.
U.S. Fish and Wildlife Service	April 21, 2009	April 28, 2009	Section 7 consultation is not required in those instances when the direct and indirect effects of an action pose no effect to listed species or critical habitat.
U.S. Forest Service – Cibola National Forest	April 21, 2009	August 25, 2009	It appears that only alternative 2B would involve direct activities on the Cibola National Forest. Should this alternative be selected, the construction of a water storage tank and associated pipeline on Forest Service lands would require additional NEPA and permitting through the Forest Service process.

As the lead federal agency for the Carnuel Water System Improvements project, Rural Development coordinated written tribal consultation directly with the following tribes in conformance with the requirements of Section 106 of the National Historic Preservation Act: Hopi Tribe, Ysleta del Sur Pueblo, White Mountain Apache, Sandia Pueblo, Ohkay Owingeh, Navajo Nation, Laguna Pueblo, and Isleta Pueblo. Responses were received from the Laguna Pueblo and Isleta Pueblo. No concerns about traditional cultural properties were identified by either of these groups responding to the Section 106 consultation. Copies of the consultation letters and responses are included in Appendix B.

6.2 Public Scoping Meeting

A public meeting was held on April 18, 2009 at the Cañon de Carnue Land Grant Hall to present information about the proposed water system improvements and solicit public comments and opinions. The meeting was advertised in advance in local newspapers including the *Mountain View Telegraph* and the *East Mountain Independent*. In addition, the Carnuel MDW&WWCA mailed meeting fliers to its members. The meeting began with a 30-minute open house followed by a presentation regarding the project alternatives and a question-and-answer period. A summary of the meeting is provided in Appendix D. Questions or issues brought up during the discussion period included: provision of additional fire protection, water service for the Monticello area, project time line, sanitary sewer service,

"priority" areas for service, availability of economic stimulus funding, project phasing, easement requirements, condemnation of property, and cost of service.
A written comment form was provided at the meeting and attendees were encouraged to take the forms and submit comments. No written comments were received.

Modifications in response to public comments: The ABCWUA also met with residents in the Echo Canyon area to further discuss the proposed water tank site. Property owners expressed concerns about the visual impact of a tank on the neighborhood. In response to these concerns, the ABCWUA agreed to complete a tank siting study in order to consider other potential sites where the tank may be located.

6.3 Public Review of Environmental Report and Public Hearing

After the Environmental Report was approved for public review by the lead and cooperating agencies, a formal notice of the availability of the Environmental Report and notification of the public hearing were published in the *Albuquerque Journal* on June 27. 2009 (45 days prior to the public hearing). A copy of the text for the legal notice as well as the affidavit of publication are provided in Appendix E. Additional display advertisements with information about the public hearing and availability of the Environmental Report appeared in the *Mountainview Telegraph* on July 30 and August 6, 2009 and in the *East Mountain Independent* on July 29 and August 5, 2009. Notifications were also mailed to agencies as well as attendees of the previous public meeting.

Fifty-nine people signed in on the public hearing sign-in sheet on August 11, 2009 at the Cañon de Carnue Land Grant Hall. A transcript of the meeting is provided in Appendix E. During the public hearing, summaries of the alternatives considered and the environmental review process were presented before opening the floor to comments. In addition to the verbal comments, thirteen written comments were also received. Copies of the written comments are included in Appendix E.

6.4 Responsiveness Summary

The following table provides a summary of the comments received with regard to the proposed project and also lists the response from the ABCWUA as well as any modifications made to the Environmental Report.

Table 7. Responsiveness summary

Public Comment	Agency Response	Modifications in response to public comment
Visual Impacts of Water Storage Tank: A water tank in the proposed Echo Canyon location will have a visual impact on the community. Other potential tank sites should be considered.	ABCWUA has initiated a tank siting study to consider three potential sites for locating a water tank. The results of the tank siting study will be presented at a public meeting at the conclusion of the 30-day tank siting study.	The Environmental Report notes that a tank siting study will be completed prior to selection of a recommended location for a water storage tank.
Eliminating Tank from Proposed Scope of Work: Can you progress with pipe routing with current money allocated for project without the tank? • Can we eliminate tank from process and get clean water for Carnuel?	The proposed tank construction can be delayed until a later phase of construction activities allowing time to complete the tank siting study before selecting a site. The funds currently allocated for construction of the water system would not be used for construction of a water tank at this time. Funding obtained in the future may be used for a water tank.	In response to public comments and concerns regarding the water storage tank, tank construction will be delayed until a future phase of construction. Current funding for construction activities will be used for distribution lines.

Tank Siting Study: Will we have a hearing on the tank siting study? • Will you look for input again?	A public meeting will be held October to present the results of the tank siting study. Additional information about siting criteria will be provided. Public comments will be accepted at the public meeting.	The Environmental Report notes that a tank siting study will be completed prior to selection of a recommended location for a water storage tank. After funding for tank construction is obtained, an environmental assessment will be prepared in coordination with the funding agencies.
Tank Sites: Availability of tank sites is an issue. Are there other sites that will be considered? • What if the proposed tank site is not for sale? • The Echo Canyon tank site should be eliminated from consideration.	Three sites will be considered in the tank siting study. One site alternative is on open space, and the second site alternative is owned by the Echo Canyon Corporation. The third site alternative is on private property.	The Environmental Report notes that a tank siting study will be completed prior to selection of a recommended location for a water storage tank.
Land Grant Tank Site: The Canon de Carnue Land Grant has a site that may be offered for a tank location.	Further investigation of the Land Grant site would be needed.	
Fire Protection: Is the tank only for fire protection? • The tank size seems large. • Will booster pump provide fire flow protection? • I share concern on visual impacts of tanks, but we need tank for fire protection. We need your support for the tank. Think about the long-term.	The tank is for both drinking water and fire protection. The proposed tank size is based on the Bernalillo County Fire Marshall's requirements for fire protection. Without a tank, a water supply for fire fighting cannot be guaranteed. Without a tank, the water system would lack a degree of reliability and redundancy in water supply. For example, in the event of waterline break, there would be no backup water supply for the area.	None.
Noise: Regarding noise from tanks – what is the recommended distance from pump?	During the day, water is fed by gravity. During the evening, pump houses are used, but residents should not be impacted at all. The pump house keeps the noise inside. There is no noise from the tanks. The legal requirement is 50 decibels at the property line.	None.
Sewer System: The sewer system will have to be studied. • The sewer system costs less than the water system. • Use money on the sewer instead.	The funds currently allocated are specifically for construction of a water system.	None.
Clean Drinking Water: We need this water system because we need safe drinking water. Our private wells are going dry. • I think it's important for the community of Carnuel to get water as soon as possible.	Comments noted.	None.
Administrative: When will Carnuel get drinking water? • What are the next steps?	After approval of reviewing agencies, bids will be accepted for construction of Phase 1 of proposed construction. Construction of Phase 1 may be completed in approximately 6 months.	None.

7.0 LIST OF PREPARERS

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References

Albuquerque Bernalillo County Water Utility Authority (ABCWUA) 2007. *Water and Sewer Rate Ordinance*. Website: www.abcwua.org/pdfs/waterrate.pdf

Bureau of Business and Economic Research (BBER) 2008. Projected Population New Mexico Counties July1, 2005 to July 1, 2035.

Bernalillo County 2007. *Tijeras Canyon/Carnuel Plan*. Adopted by the Board of County Commissioners on August 28, 2007. Website: www.bernco.gov/live/departments.asp?dept=7346&submenuid=24042

Bohannan Huston, Inc. 2009. *Carnuel Mutual Domestic Water and Wastewater Consumers Association Water System Improvements Preliminary Engineering Report*. Prepared for Albuquerque Bernalillo County Water Utility Authority. April 27, 2009.

Dick-Peddie 1993. *New Mexico Vegetation Past, Present, and Future*. Albuquerque, NM: University of New Mexico Press.

EPA 1971. *Noise from Construction Equipment and Operations, Building Equipment and Home Appliances*. NJID 300.1, December 31, 1971.

Federal Emergency Management Agency (FEMA) 2008. *National Flood Insurance Program Flood Insurance Rate Map Bernalillo County, New Mexico and Incorporated Areas*. Map Numbers 35001C0378G, 35001C0379G, 35001C0387G, and 35001C0935G. Revised September 26, 2008.

League for the Hard of Hearing. 2008. *Noise Levels in our Environment* Fact Sheet. www.lhh.org/noise/facts/evironment.html

Marron and Associates. 2009a. *Biological Survey Report, Carnuel Water System Improvements*. May 2009.

Marron and Associates. 2009b. *Cultural Resource Survey Report, Carnuel Water System Improvements, Bernalillo County, New Mexico*. May 2009.

Natural Resources Conservation Service (NRCS) 2009. Web soil survey. Website: websoilsurvey.nrcs.usda.gov/app/.

New Mexico Department of Game and Fish. 2009. Bison-M Database. Santa Fe, NM: NMDGF. Web site: www.cmiweb.org/states/.

New Mexico Native Plant Protection Advisory Committee. 2004. *New Mexico Rare Plants*. Website: http://nmrareplants.unm.edu.

New Mexico Water Quality Control Commission. 2008. *2008-2010 State of New Mexico Integrated Clean Water Act 303(d)/305(b) Report*. Website: www.nmenv.state.nm.us/swqb/303d-305b/2008-2010/

Souder, Miller and Associates 2005. *Carnuel Mutual Domestic Water and Wastewater Consumers Association Preliminary Engineering Report*. March 2005.

US Census Bureau 2008. American Factfinder. Website: http://www.factfinder.census.gov/

U.S. Fish and Wildlife Service. 2009. List of Federal Endangered, Threatened, Proposed, and Candidate Species and Species of Concern in New Mexico. Ecological Services Field Office. Albuquerque, New Mexico.

Western Regional Climate Center. 2007. *Historical Climate Summaries*. Web site: http://www.wrcc.dri.edu/summary/Climsmnm.htm