



# Final Environmental Impact Statement City of Albuquerque Drinking Water Project Executive Summary

**March 5, 2004**

**U.S. Department of the  
Bureau of Reclamation**



**City of Albuquerque  
Public Works Department**

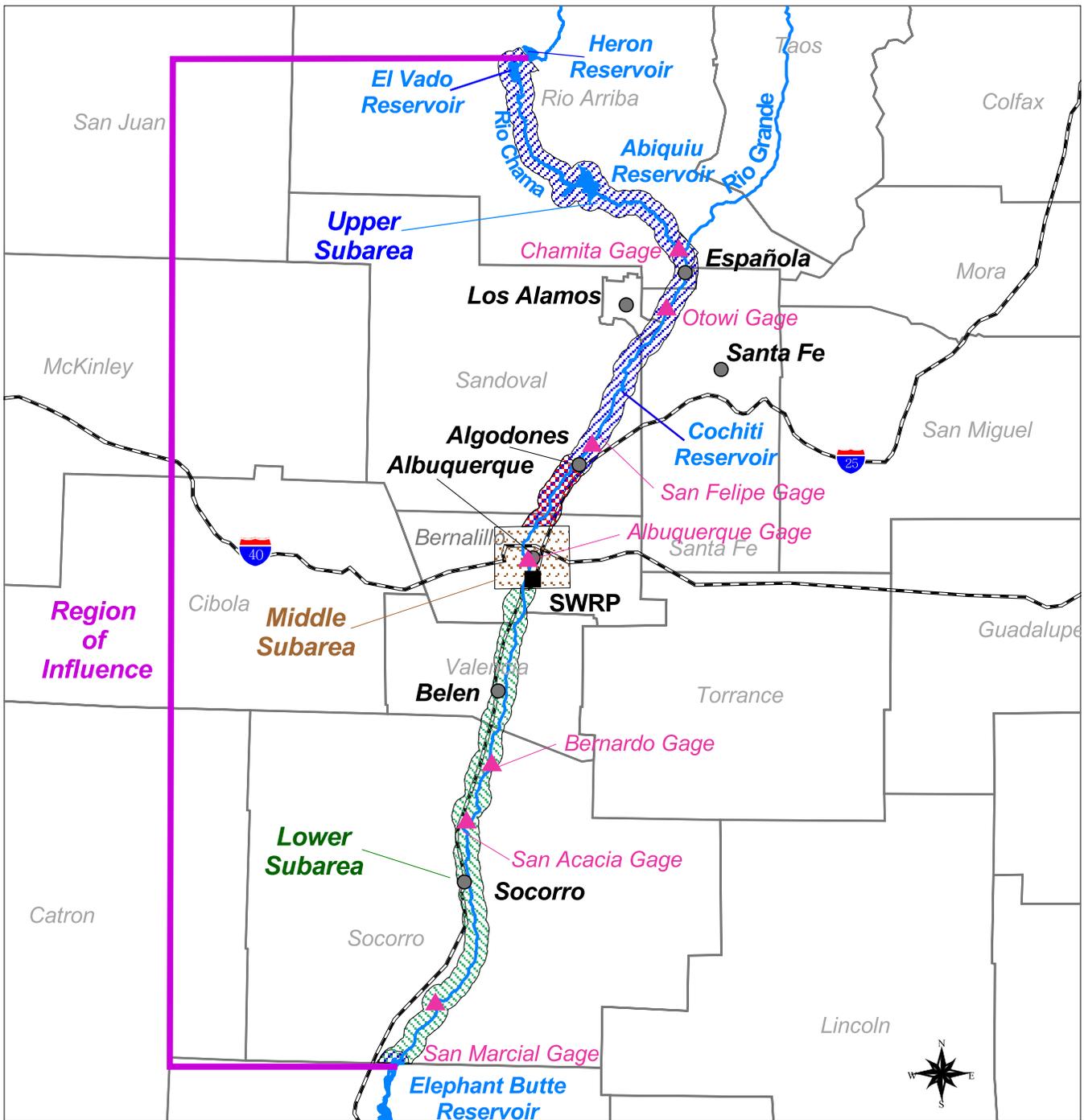


## EXECUTIVE SUMMARY

The City of Albuquerque (City or Albuquerque) proposes to construct and operate a surface water diversion on the Rio Grande, with associated water-treatment and transmission facilities, to fully consumptively use the City's San Juan-Chama (SJC) water to provide a sustainable drinking water supply for its citizens. The proposed project, referred to as the City's Drinking Water Project (DWP), would entail four elements: diverting surface water from the Rio Grande; transporting the raw water to a new water treatment plant (WTP); treating the raw water to drinking-water standards; and distributing the treated, potable water to customers in the City's water service area. The DWP is the most significant aspect of Albuquerque's Water Resources Management Strategy (AWRMS or the Strategy) for purposes of ensuring a sustainable water supply. The AWRMS was adopted by the Albuquerque City Council in 1997.

This Final Environmental Impact Statement (FEIS) is prepared to comply with the requirements of the National Environmental Policy Act (NEPA). The federal actions requiring NEPA compliance are: (1) issuance of a license by the Bureau of Reclamation (Reclamation) to the City for the location of project facilities on Reclamation-owned property or right-of-way, or approval of a license between the City and the Middle Rio Grande Conservancy District for the location of facilities within the Middle Rio Grande Project; (2) execution of a water carriage contract authorizing use of federal irrigation canals to convey non-project water (this action would be required only if there would be diversion of the City's San Juan-Chama Project water at the Angostura Diversion Dam and conveyance of the water through existing facilities of the Middle Rio Grande Project). Special legislation would be needed to authorize carriage of non-project water for municipal and industrial purposes through Middle Rio Grande project facilities; and (3) Clean Water Act Section 404 permitting from the U.S. Army Corps of Engineers in conjunction with construction of project facilities in waters of the United States. The U.S. Fish and Wildlife Service and the Environmental Protection Agency has provided consultation and review pursuant to their respective statutory authority under the Endangered Species Act, Clean Water Act, and NEPA. For purposes of this FEIS, the project's region of influence (ROI) includes portions of the Rio Grande watershed from the outlet works of Heron Reservoir on the Rio Chama, downstream to the headwaters of Elephant Butte Reservoir on the Rio Grande. Figure ES-1 illustrates the ROI with subareas identified. The subareas are identified as follows:

- **Upper Project Subarea** – From the outlet works of Heron Reservoir to the proposed Angostura Diversion (at RM 209.7) (approximately 145 river miles), or from the outlet works of Heron Reservoir to the proposed Paseo del Norte Diversion and Subsurface Diversion facilities (at RM 192) (approximately 165 river miles).
- **Middle Project Subarea** – The approximately 33 river miles from the Angostura Diversion (RM 209.7) to the Albuquerque SWRP outfall (RM 177) or 15 river miles from Paseo del Norte Diversion or Subsurface Diversion (RM 192) to the SWRP outfall (at RM 177).
- **Lower Project Subarea** – The approximately 120 river miles from the SWRP outfall (at RM 177) to the headwaters of Elephant Butte Reservoir (at RM 57).



- Legend**
- Reservoir
  - River
  - County Boundary
  - Interstate Highway
  - City
  - Diversion Dam
  - River Gage
  - Upper Subarea
  - Middle Subarea
  - Lower Subarea
  - Upper Subarea - Paseo del Norte Diversion
  - Middle Subarea - Angostura Diversion
  - Southside Water Reclamation Plant



**Figure ES-1**  
**Region of Influence with Subareas Identified**

Note: Riverine corridor not to scale

Construction of the required diversion and raw-water conveyance facilities would occur within Sandoval and/or Bernalillo Counties; the WTP and new potable water transmission facilities would be constructed entirely in Bernalillo County. The City implemented a water conservation goal of 175 gpcd to be reached by 2005. The 175 gpcd goal has been modified to include an enhanced goal of 150 gpcd by 2014.

## **PURPOSE AND NEED**

The purpose of and need for the proposed project is to provide a sustainable water supply for the City of Albuquerque through direct and full consumptive use of City San Juan-Chama water for potable purposes in accordance with EPA regulations under the Safe Drinking Water Act (SDWA). The project would use the City's allocation of its SJC water (48,200 acre-feet per year [ac-ft/yr]), to be supplied through existing SJC Project facilities. After transit losses to Albuquerque, the amount available for full use would approximate 47,000 ac-ft/yr. A total of approximately 94,000 ac-ft/yr, consisting of 47,000 ac-ft/yr of the City's SJC water and 47,000 ac-ft/yr of the native Rio Grande surface water, would be diverted from the Rio Grande near Albuquerque and conveyed to a new WTP. After the City's SJC water is fully consumed, the native Rio Grande water, about half of the 94,000 ac-ft/yr, would be returned to the Rio Grande following treatment at the City's Southside Water Reclamation Plant (SWRP). The proposed diversion and use would allow the City to fully consume its SJC water and return the native flows to the Rio Grande to 'keep the river whole.'

The Santa Fe Group aquifer, the aquifer underlying the Albuquerque metropolitan area, is currently the City's sole source of water. Continued sole reliance on ground water as the sole source of supply is not sustainable. The proposed project provides a sustainable water supply through full use of renewable surface supplies, reduces the demand on the aquifer, and restores it as a drought reserve. Demand on the aquifer would be reduced by approximately 94,000 ac-ft/yr. The proposed project also includes a conjunctive use component by using SJC water in an Aquifer Storage and Recovery (ASR) project.

Current and projected water demands would not be reliably met without the proposed project. The aquifer would continue to be mined and could not serve as a drought reserve. The long-term effects on the aquifer from ground water extraction would have serious environmental and economic consequences for Albuquerque and other users in the metropolitan area and throughout the Middle Rio Grande. Environmental consequences from continued and increased pumping from the aquifer likely would include large ground water level declines, including some areas of the bosque, land-surface subsidence and water-quality degradation. The proposed project also represents a viable way for the City to satisfy the EPA promulgated arsenic standard under the SDWA. The project would combine treated SJC surface water which is lower in arsenic, with ground water which has higher background levels, resulting in lower arsenic levels. Wells high in arsenic would initially be taken out of service, but would require treatment in the future.

## **PUBLIC AND AGENCY SCOPING**

In April 1997, the Albuquerque City Council adopted the AWRMS. The strategy is based on optimizing the City's use of existing water resources and developing surface-water supplies to transition from unsustainable ground water pumping to renewable sup-

plies. The various elements of the AWRMS are intended to provide a sustainable drinking-water supply for the City by reducing ground water pumping and eliminating the City's sole reliance on ground water resources for potable water supply. The City's DWP is a major feature of the AWRMS. Public process and participation in the selection and ranking of alternatives for the DWP, and ultimately for analysis in this FEIS, has been extensive. Commencing in 1995 and continuing through the present, the City has held over 100 public meetings for purposes of presenting, analyzing, ranking, or selecting alternatives. Pursuant to compliance with NEPA, the identification of environmental issues and concerns, and development of potential mitigation and environmental enhancements, has been a primary focus of the City throughout the course of the development of the DWP and the alternatives for implementation.

Public and agency scoping and involvement continued with agency scoping workshops conducted in December, 1998. Three formal public scoping meetings were held during September, 1999, one each in the cities of Albuquerque, Socorro, and Española. A March 2000 public workshop was held to consider the development of alternatives. Table ES-1 lists the resource categories and associated issues compiled from public scoping meetings (details of these meetings are given in Appendices B – D of the FEIS). Eighteen interagency workgroup meetings have been completed, to solicit input from federal, state, city and Pueblo entities. These meetings consisted of stakeholders from various agencies and non-governmental groups. Numerous public meetings to present status reports and obtain input also have been undertaken to review the WTP-siting and DWP alternatives-selection processes. A town hall meeting was held in April, 2001 to present a preferred alternative.

**TABLE ES-1  
SUMMARY OF ISSUES IDENTIFIED DURING SCOPING**

<b>Resource Category</b>	<b>Related Issues</b>
Human Health and Safety	<ul style="list-style-type: none"> <li>• Opposition to a South Valley water treatment plant location</li> <li>• Taste of water</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>• Effects on downstream uses</li> <li>• Concerns with downstream water quality</li> <li>• Effects on residential wells and agricultural uses</li> <li>• Effects on ground water</li> </ul>
Water Quantity	<ul style="list-style-type: none"> <li>• Drying or alteration of river channel</li> <li>• Effects on reservoirs</li> <li>• River diversion</li> <li>• Selection of diversion method</li> </ul>
Biological Resources	<ul style="list-style-type: none"> <li>• Effects on endangered species</li> <li>• Effects on bosque or riparian areas</li> <li>• Ground water effects on the bosque</li> <li>• Ecosystem approach to cumulative-effects analysis</li> </ul>
Cultural Resources	<ul style="list-style-type: none"> <li>• Identification and consideration of cultural resources</li> </ul>
Indian Trust Assets and Other Tribal Resources	<ul style="list-style-type: none"> <li>• Effects of flow reduction on traditional uses of the river, water quality, water rights, and environment</li> </ul>
Socioeconomics	<ul style="list-style-type: none"> <li>• Effects of population growth</li> <li>• Albuquerque growth effects on neighbors</li> <li>• Water rates</li> </ul>

## ALTERNATIVES CONSIDERED IN DETAIL

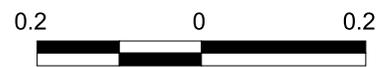
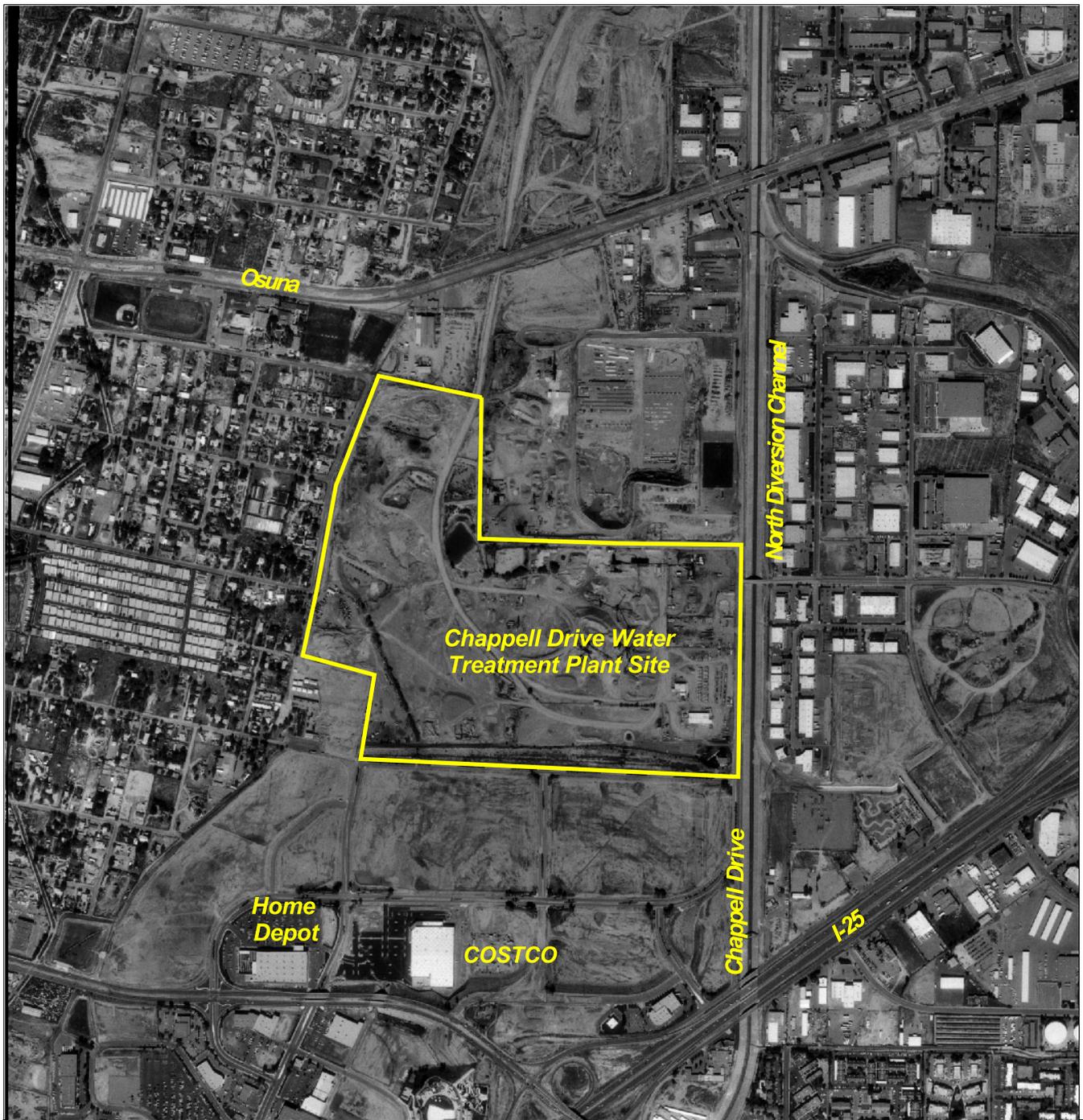
Over the course of six years, the City conducted a comprehensive evaluation process that incorporated public and agency input into the development of the DWP as part of the City's AWRMS. As a result of this extensive public process, three action alternatives and the No Action Alternative were selected for further evaluation of environmental and socioeconomic consequences in this FEIS. The four alternatives retained for detailed analysis are:

- No Action, or continued reliance on ground water resources to meet current and projected drinking-water demand, and continuation of conservation measures;
- The diversion and full consumptive use of the City's SJC water via the existing Angostura Diversion Dam (a Middle Rio Grande Project Facility) on the Rio Grande, with conveyance of raw water to a new WTP via two existing Middle Rio Grande Project conveyance facilities, and distribution of treated, potable water to consumers in the Albuquerque metropolitan area (hereinafter "Angostura Diversion");
- The diversion and full consumptive use of the City's SJC water at a new surface diversion to be constructed on the Rio Grande north of Paseo del Norte in Albuquerque, with conveyance of raw water to a new WTP via a new pipeline, and distribution of treated, potable water to consumers in the Albuquerque metropolitan area (hereinafter "Paseo del Norte Diversion"); and
- The diversion and full consumptive use of the City's SJC water via new subsurface collectors to be constructed in the Rio Grande near Paseo del Norte, with conveyance of raw water to a new WTP via a new pipeline, and distribution of treated, potable water to consumers in the Albuquerque metropolitan area (hereinafter "Sub-surface Diversion").

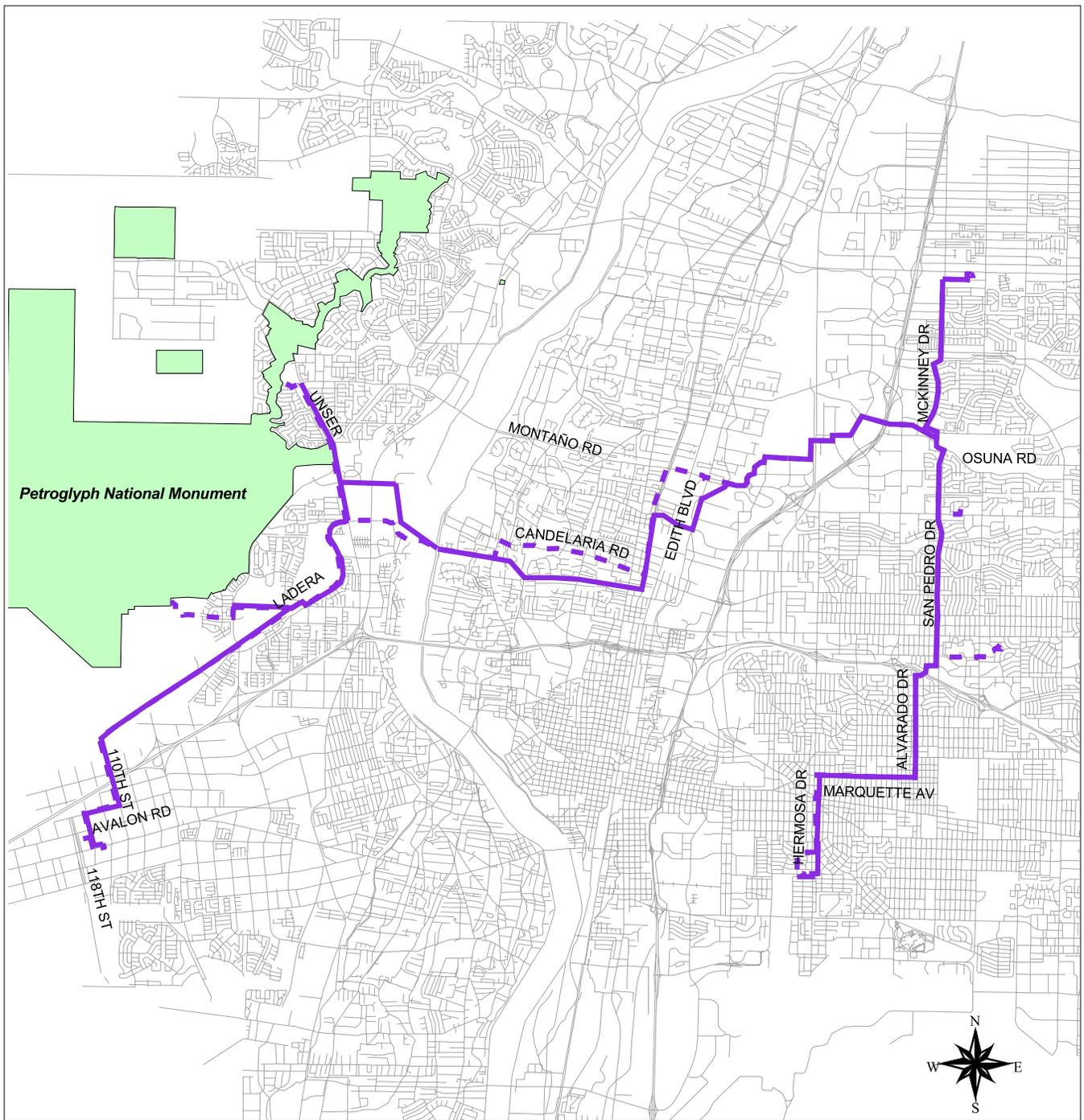
The following project components would be common to each of the action alternatives:

- A new WTP,
- A potable water distribution pipeline system and associated storage facilities,
- Aquifer storage and recovery, and
- All three of the diversion alternatives include the City's conservation strategy that include a 150 gpcd demand by 2014.

The Chappell Drive Water Treatment Plant (WTP) (Figure ES-2) would treat the raw water diverted from the Rio Grande to meet or exceed federal and state standards for municipal drinking water. The proposed WTP would have a treatment capacity of 92 million gallons per day (mgd), or 142 cubic feet per second (cfs). As a result of the WTP site-selection evaluation, and based on input received at public meetings, the Chappell Drive site was selected as the preferred location of the WTP and has been purchased by the City for \$10.8 million. The potable water transmission pipeline alignment (Figure ES-3) would distribute treated water via pipelines from the WTP to the City's customers.



**Figure ES-2**  
**Chappell Drive Water Treatment Plant Site**



- Legend**
-  Potable-Water Transmission Line
  -  Alternate Potable Water Transmission Line
  -  Proposed Reservoir
  -  Street



**Figure ES-3**  
**Potable-Water Transmission Pipeline Alignment**

The selected piping transmission corridors would permit the optimum use of existing hydraulic gradients and existing City water-distribution lines. Aquifer storage and recovery would occur by injection of treated potable water into a number of City wells during low demand periods and later would be recovered by ground water pumping.

## **NO ACTION ALTERNATIVE**

The No Action Alternative is included in this analysis because it provides an understanding of existing conditions, a forecast of probable future conditions if no action is taken, and defines the basis of comparison for the analysis of effects attributable to the proposed action. The City's current sole source of potable water is the Albuquerque aquifer, a deep ground water aquifer. The No Action Alternative assumes continued exclusive reliance on ground water pumping in conjunction with conservation to meet all future City water needs. The No Action Alternative and associated conservation efforts would continue the current trend of aquifer depletion, which would likely result in land subsidence in some areas. The No Action Alternative would require construction of additional wells, replacement wells and ancillary facilities. The City's pumping costs would increase, and water-supply shortages would require acquisition of additional supplies. Assuming current growth trends continue and conservation measures are implemented, ground water pumping requirements are expected to increase from about 108,000 ac-ft/yr in 2006 to approximately 167,000 ac-ft/yr by 2060. Under the No Action Alternative, aquifer water-level declines are projected to exceed 250 feet (the Office of the State Engineer's subsidence threshold) by 2060 in a large area of northeastern Albuquerque. Aquifer drawdowns projected for the proposed action generally are less than 150 feet for the same area potentially offset to some degree by the ASR program under all action alternatives. Water quality in some wells or well fields may deteriorate, and the relatively high concentration of arsenic in City wells would trigger the need for additional treatment to meet the federal arsenic standard for drinking water. Additionally, there are potential associated regional issues related to ground water drawdown because other private and public users draw water from the same aquifer.

The No Action Alternative would result in depletion of surface flows of the Rio Grande system in the Albuquerque reach as a result of continued and increasing ground water pumping. For purposes of comparison to the action alternatives, City SJC water which will be directly used by the City for the purposes of satisfying offset requirements pursuant to New Mexico State Engineer Permit RG-960, that amount of SJC water necessary to satisfy outstanding City contracts (about 2,600 ac/yr through 2011) and the SJC water to the AWRMS Non-potable Surface Water Reclamation project (3,000 acre-feet per year) is included in the No Action Alternative hydrologic baseline. The establishment of a No Action comparative baseline requires determining what future conditions without the project will be, based on what is predictable with some reasonable certainty. The historic use of the City's SJC water cannot reasonably be used to predict a future without the project. Moreover, with the limited amounts described above, possible future uses of SJC water are similarly unpredictable. The amount of SJC water in the comparative baseline is approximately 5,600 acre-feet until 2011, and approximately 3,000 acre-feet thereafter until 2060.

Although only the noted quantities of City SJC water are assumed to be in the Rio Grande below Abiquiu Reservoir, No Action assumes the City's SJC allotment of 48,200 ac-ft/yr is taken from Heron Reservoir each year. Because timing, amount, and destina-

tion of deliveries from Heron, and ultimate uses for most of the City's SJC water (other than the listed quantities) cannot be reasonably predicted, the hydrologic evaluation for the river above and below Abiquiu addresses only the amounts specified above.

### **ANGOSTURA DIVERSION ALTERNATIVE**

The Angostura Diversion Alternative would divert a total of 94,000 ac-ft/yr from the Rio Grande (47,000 ac-ft/yr of SJC water and 47,000 ac-ft/yr of Rio Grande native water) at the existing Middle Rio Grande Project Angostura Diversion Dam. The existing Angostura Diversion Dam would be rehabilitated by making structural repairs, installing new motorized operators and gates, constructing a fish screen and fishway, removing sediment and debris from the concrete-lined settling channel immediately downstream from the diversion gates that lead to the Middle Rio Grande Project irrigation system, and repairing this channel. Figure ES-4 shows the Angostura Diversion Dam site plan and proposed fish screen, return flow bypass pipe, and fishway.

The Angostura Diversion Alternative would use the existing Albuquerque Riverside Drain (also known as the Atrisco Feeder) as the primary raw-water conveyance route, with the Albuquerque Main Canal available for emergency use. The canal and the drain, portions of which traverse San Felipe, Santa Ana and Sandia Pueblos, comprise the dual-conveyance feature of this alternative. Improvements to the Riverside Drain would involve reshaping and enlarging approximately 14.5 miles of the channel, removing vegetation, improving access roads, and improving hydraulic structures. Renovation along the canal and drain would improve conveyance efficiency. From a pump station in the vicinity of the North Diversion Channel, on Sandia Pueblo property, water collected from the Main Canal and Riverside Drain would be conveyed about 5 miles along the North Diversion Channel right-of-way, via a new pipeline (maximum diameter of 72 inches), to the proposed Chappell Drive Water Treatment Plant. After treatment, the potable water is provided for distribution through the same transmission corridors for each alternative.

### **PASEO DEL NORTE DIVERSION ALTERNATIVE (PREFERRED ALTERNATIVE)**

The Paseo del Norte Diversion Alternative is the preferred alternative and the environmentally preferred alternative. A new surface diversion would typically divert a total of 94,000 ac-ft/yr of water from the Rio Grande (47,000 ac-ft/yr of SJC water and 47,000 ac-ft/yr of Rio Grande native water). The new surface diversion facility would consist of a low-head (approximately 2.5 to 3.5 feet in height), adjustable-height dam in the Albuquerque Reach of the Rio Grande, approximately 0.7 miles north of Paseo del Norte. The approximately 600-foot-long dam would consist of inflatable bladder structures mounted on a concrete base across the active river channel. Gates on the east side of the dam would route water to an inlet structure, from which a pump station would pump water into a pipeline for conveyance to the Chappell Drive Water Treatment Plant. The new diversion dam would include fish screen and fishway facilities, as shown on Figure ES-5. The fish passageway facilities may be moved to the east side of the river during final design. This alternative is the environmentally preferred alternative for the following reasons:

- The Angostura Alternative would be required to cross Pueblo lands and additionally, increases the length of the depletion reach of the Rio Grande from the diversion to the SWRP.

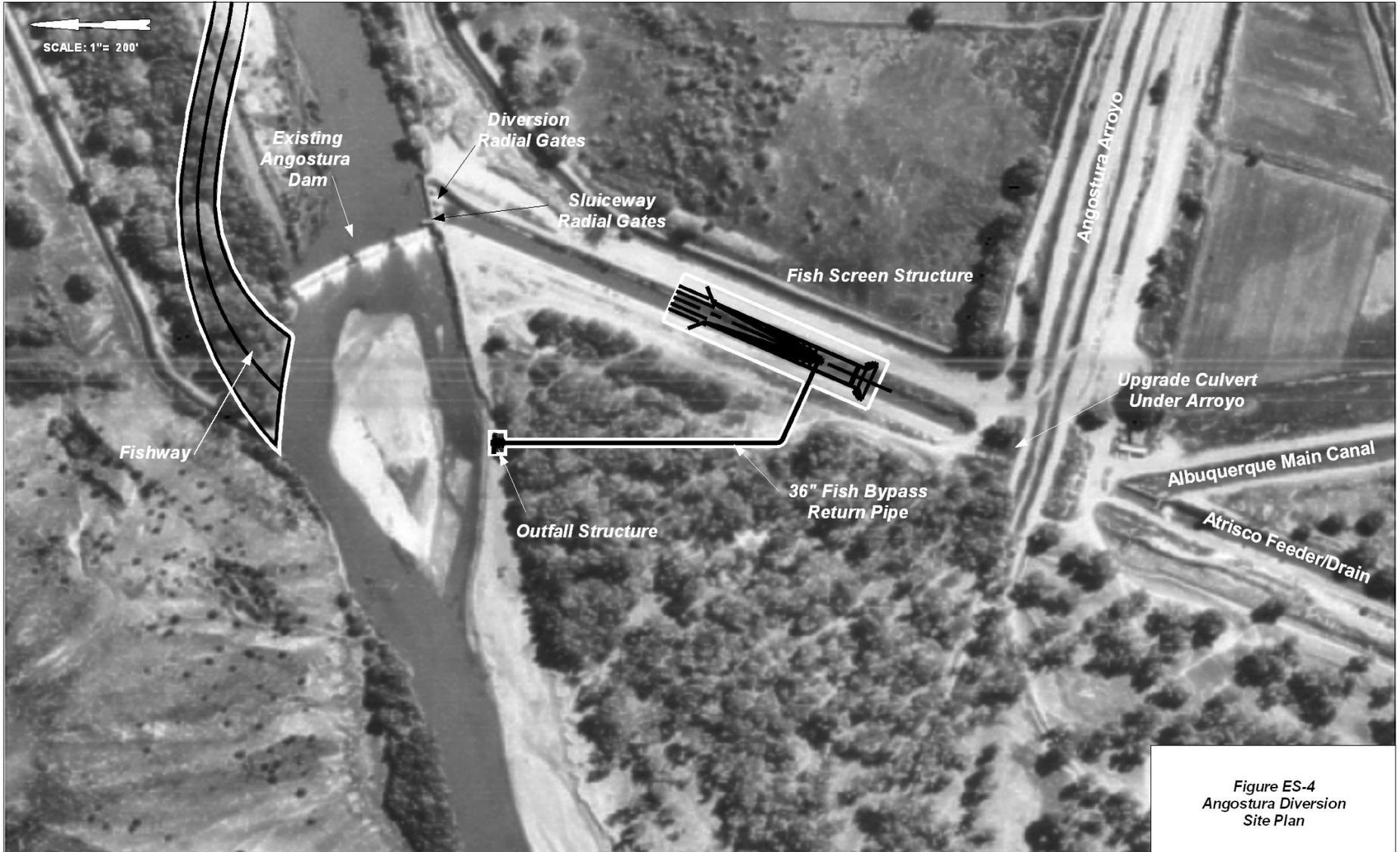
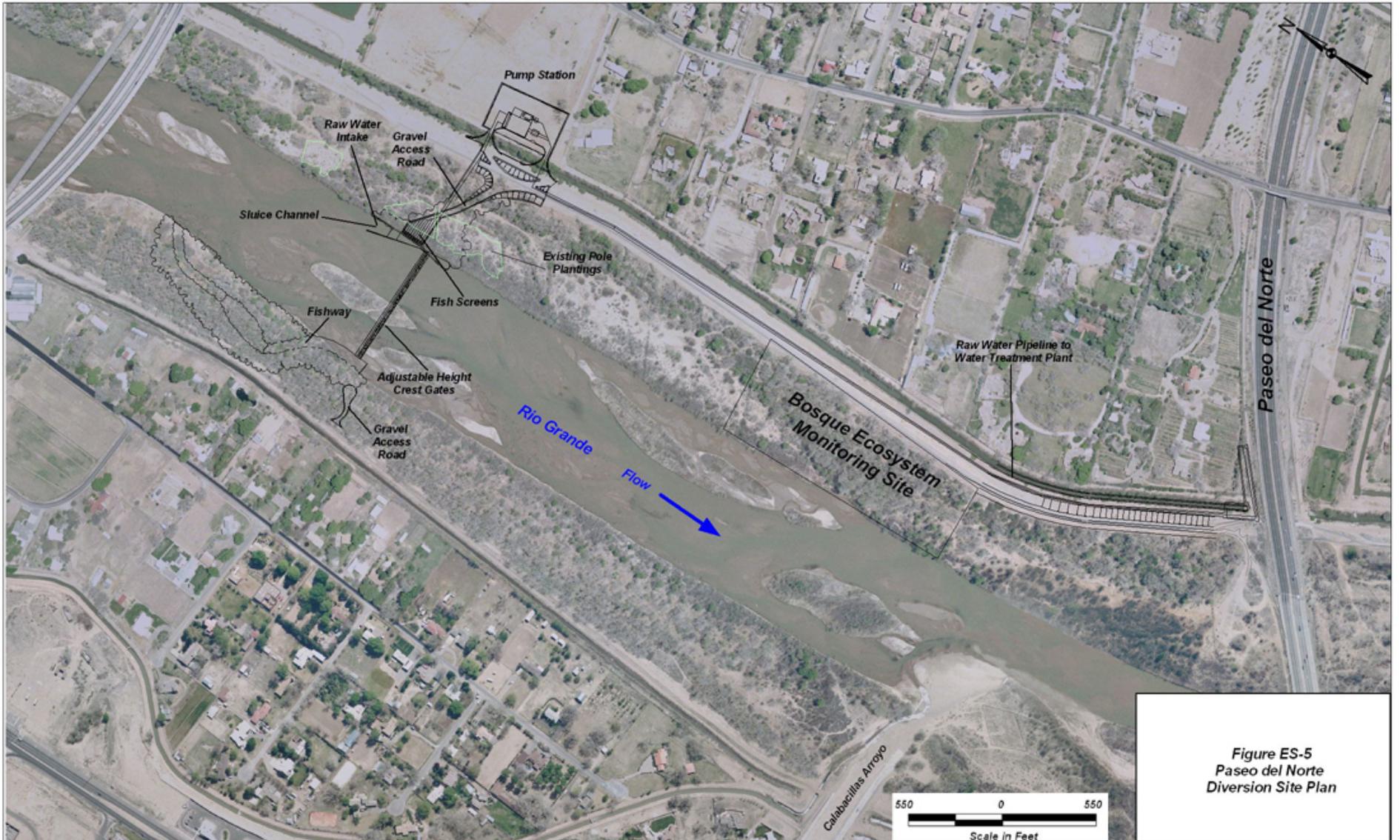


Figure ES-4  
Angostura Diversion  
Site Plan



**Figure ES-5**  
**Paseo del Norte**  
**Diversion Site Plan**

Source: CH2M Hill

- The Subsurface Diversion Alternative would require a substantial amount of riparian vegetation to be altered. It would also require extensive, permanent pipe and pumping facilities in the bosque.

## **SUBSURFACE DIVERSION ALTERNATIVE**

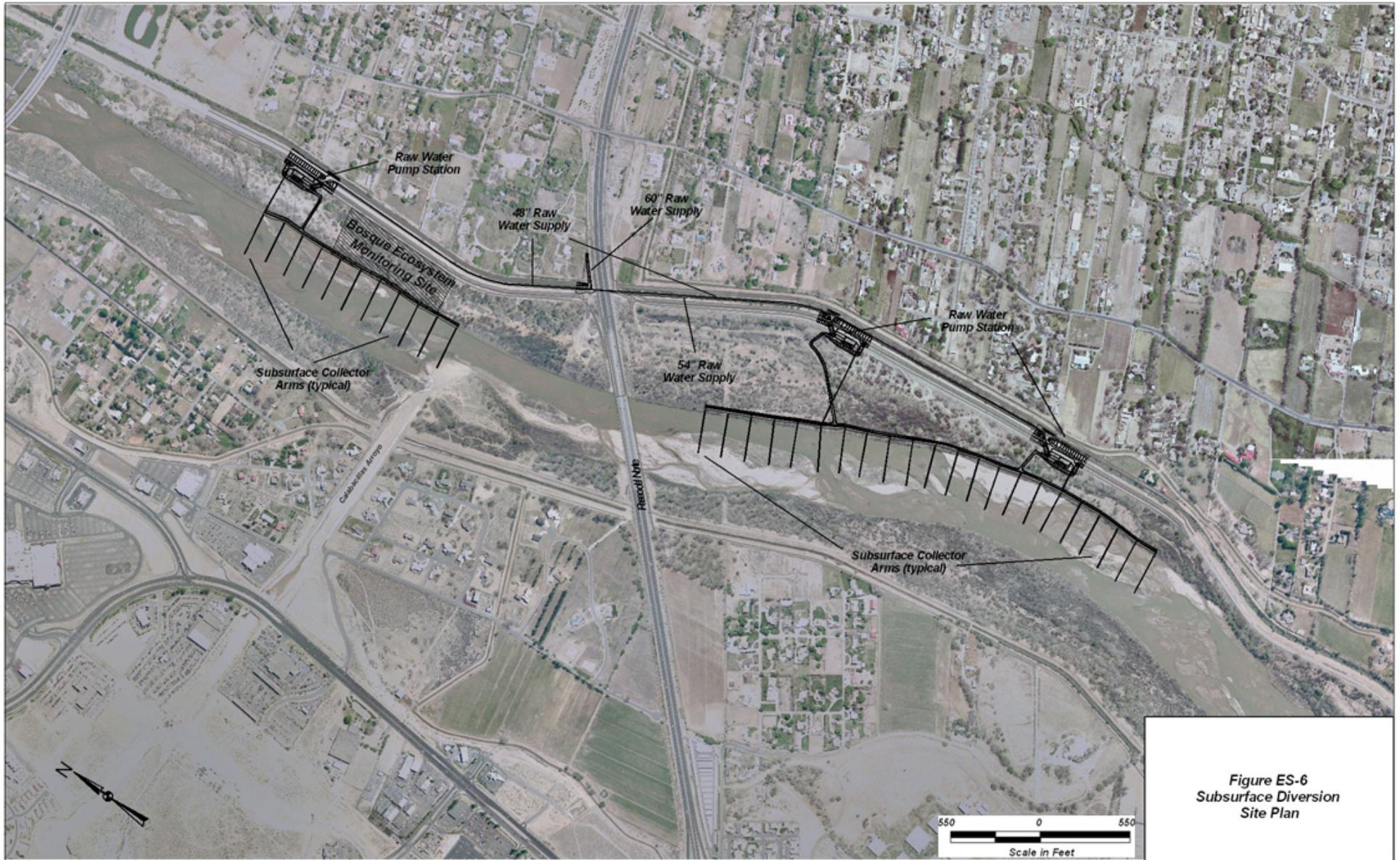
Under the Subsurface Diversion Alternative, subsurface diversion facilities would divert a total of 94,000 ac-ft/yr (47,000 ac-ft/yr of SJC water and 47,000 ac-ft/yr of Rio Grande native water) from the Rio Grande near Paseo del Norte. This alternative would involve construction of underground collector systems adjacent to, and under the river to collect and divert water to pump stations located either in, or adjacent to, the bosque and flood control levees. The alternative would involve the construction of three horizontal collector systems using perforated pipes buried 20 feet beneath the riverbed perpendicular to the riverbank. The pipe trenches would be backfilled with gravel, and would extend about 400 feet into the active river channel. Three collector systems would be constructed along a 1.5-mile reach of the river north and south of the Paseo del Norte Bridge. Each of the three systems would have 11 arms of 20-inch-diameter perforated pipes manifolded to a common header, which would be connected to a pump station for each of the three collector systems. Figure ES-6 shows the site plan of the Subsurface Diversion Alternative at Paseo del Norte.

## **MAJOR CONCLUSIONS**

The No Action Alternative would result in continued depletion of the aquifer, resulting in regional ground water declines, reduced water-table in some areas of the bosque, land-subsidence and deterioration of ground water quality. The No Action Alternative would not provide a drought reserve and would not provide a viable measure for meeting the SDWA standard for arsenic.

The Angostura Diversion Alternative would require construction on, and continuing access to, Native American lands. The Sandia Pueblo objects to the implementation of this alternative and suggests using one of the other two action alternatives. The access to and location of some facilities on Native American lands raise cultural resource concerns. In addition, the Angostura Diversion Alternative has the longest segment of river (from the point of diversion at Angostura to the SWRP outfall) in which native flows would be diminished (33 miles versus 15 miles for the Paseo del Norte Diversion and Subsurface Diversion Alternatives). The surface diversion dam would have fish screens and a fishway, and other operational features (see Figure ES-4) to mitigate effects on the endangered Rio Grande silvery minnow and other aquatic organisms.

The Paseo del Norte Diversion would require construction of a surface diversion in-river and a pump station. The Paseo del Norte Diversion is the preferred alternative for meeting the project purpose and need and includes proposed mitigation and design elements that would mitigate environmental effects. The surface diversion dam would have fish screens and a fishway, and other operational features (see Figure ES-5) to mitigate effects on the endangered Rio Grande silvery minnow and other aquatic organisms. The inflatable dam structure would allow flexible operational configurations to avoid adverse river effects. The Paseo del Norte Diversion would require construction of a pump station.



**Figure ES-6**  
**Subsurface Diversion**  
**Site Plan**

The Subsurface Diversion Alternative would require a large in-river construction effort, likely extending over two low-flow seasons. The Subsurface Diversion Alternative would affect a large area of riparian vegetation, both during construction and operations, and would require construction of three permanent pump stations and considerable piping in the bosque. After construction there would be no effects to aquatic life.

Effects from construction and operation of the Chappell Drive Water Treatment Plant and the potable water delivery system would be the same under all three action alternatives.

## **SUMMARY OF ENVIRONMENTAL CONSEQUENCES**

### **Aesthetics and Visual Resources**

Under the No Action Alternative, new wells could be constructed in existing viewsheds within the Albuquerque area. Under the action alternatives, project facilities would be planned and designed to be compatible with surrounding landscapes. Two public-use areas with unobstructed views would be located within 0.25 miles of any DWP facility.

The Angostura Diversion Alternative would affect existing views. The Paseo del Norte Diversion would be visible from roads and some places in the bosque. The pump station located within the bosque would be visible. The Subsurface Diversion Alternative, would require three pump stations to be constructed within the bosque which would affect views in the area.

### **Cultural Resources**

Under the No Action Alternative, subsidence could be a general “adverse effect” to historic structures. Construction or operation of the Paseo del Norte and Subsurface Alternatives would not affect traditional cultural properties, and would not adversely affect historical structures or historical irrigation and distributions systems. The Angostura Diversion Alternative would affect cultural resources, historical structures and historical irrigation and distribution systems, as the alternative requires crossing Pueblo lands, and would require construction of a pump station on about 5 acres of land within the Sandia Pueblo near the North Diversion Channel. This alternative would also require modifications to historic irrigation and distribution systems, including the Angostura Diversion Dam. The New Mexico State Historic Preservation Officer has concurred with no adverse effect for the preferred alternative and the subsurface diversion alternative.

### **Geology**

Under the No Action Alternative, subsidence risk would increase as a result of increased pumping (and water-table drawdown) to meet City water requirements. There would be no effects on geologic resources or geologic structures within the evaluation area from DWP construction or operations. The reduction of ground water pumping once the DWP is operational would reduce the possibility of land subsidence in the Albuquerque area.

## **Hydrology (Surface Water and Ground Water)**

The No Action Alternative would lead to installation of more wells required to meet an increasing water demand. Degradations of aquifer water quality would likely occur from No Action, and pumping costs would increase. The potential for land-subsidence would increase in northeastern areas of the City, potentially adversely affecting public and private infrastructure and property. There would be less drought reserve capability. There would be wide-spread ground water table declines extending outside the city limits.

As a result of the City's proposed voluntary cooperation on the timing of releases from Heron to Abiquiu Reservoirs to the point of diversion (either at Angostura or near Paseo del Norte), river flows above Albuquerque would increase. Increased flows in this river segment at the San Felipe gage would be approximately 65 cfs relative to the No Action Alternative. From the diversion point to the City's SWRP outfall, there would be a net depletion of 10 to 30 cfs of Rio Grande flows as compared to No Action. The affected reaches would be 33 miles long under the Angostura Diversion Alternative and approximately 15 miles long under the Paseo del Norte and Subsurface Diversion Alternatives. A comparison of severe dry year flows in the Rio Grande below the diversion points for the Paseo del Norte and Subsurface Diversion Alternatives shows that flows during curtailed periods would be up to 32 cfs higher, as compared to the No Action Alternative. This is a result of proposed operating criteria for curtailment of diversions during low flows.

The amount of surface water diverted during project operations would be approximately 94,000 ac-ft/yr (47,000 ac-ft/yr of City SJC water and 47,000 ac-ft/yr of Rio Grande native water). The average annual reduction in Rio Grande flows within the Middle Project Subarea, as measured at the Albuquerque gage, would be 2 percent under all three action alternatives as compared to the No Action Alternative. There would be a range of change of flow from -10 cfs to +22 cfs, attributable to the proposed action in the Rio Grande south of the City SWRP outfall at the I-25 bridge.

If the DWP is implemented, the maximum aquifer drawdown (from pre-development conditions) in the ground water critical-management area would be approximately 100-150 feet below ground surface by 2060, while under the No Action Alternative, the aquifer drawdown would exceed 250 feet from pre-development conditions. The supply of ground water would be improved over time by the reduction in aquifer pumping allowed by the use of the City's SJC water. This increase in ground water supply would be a positive effect of the proposed action. Ground water drawdown in the bosque in the vicinity of the subsurface collectors, under the Subsurface Diversion Alternative, would be 3 to 3.5 feet relative to current conditions.

## **Indian Trust Assets and Other Tribal Resources**

No adverse effects to Indian Trust Assets were identified, although other tribal resources could be affected. The No Action could possibly have an indirect effect on the quantity or quality of ground water pumped from the Santa Fe group aquifer. Operation of the DWP would change river flows through Pueblo lands. Above Paseo del Norte, Rio Grande flows would increase by approximately 65 cfs relative to the No Action Alternative if the Paseo del Norte location is selected. If the Angostura Diversion Alternative is

selected, flows would increase by approximately 65 cfs above Angostura and would be depleted by a maximum of 65 cfs immediately below Angostura, affecting the Pueblos of San Felipe, Santa Ana, and Sandia. Regardless of diversion location, the DWP would result in small flow decreases and small flow increases between the SWRP and the Pueblo of Isleta. These flow changes would occur between 2006 and 2060. None of the flow changes would be adverse and there would be no substantial change in water surface elevation or water quality. The Angostura Diversion Alternative would require approximately 5 acres of land on Sandia Pueblo for the location of a pump station and would involve modification of approximately 14 miles of canals on the Pueblos of San Felipe, Santa Ana, and Sandia. These activities would require a lease, right-of-way, or other suitable agreement with the Pueblos and agreements with the Bureau of Indian Affairs, Reclamation, and MRGCD may be necessary.

### **Environmental Justice**

There were no major or disproportionate impacts from the project identified in minority or economically disadvantaged neighborhoods.

### **Riparian Areas**

The No Action Alternative would have no construction effects upon riparian vegetation but ground water level declines could adversely affect the bosque. Under the action alternatives, there would be disturbance of the riparian areas along the Rio Grande from construction and operation activities. The amounts of riparian vegetation to be temporarily affected during construction of diversion facilities would be 8.2 acres under the Angostura Diversion Alternative, 14.7 acres under the Paseo del Norte Diversion Alternative, and 23.1 acres under the Subsurface Diversion Alternative. Another 2.4 acres of riparian area would be temporarily affected by water pipeline construction under each of the action alternatives. The amounts of riparian area that would be removed due to the construction of new facilities would be 1.8 acres under the Angostura Diversion Alternative, 6.6 acres under the Paseo del Norte Diversion Alternative, and 10.6 acres under Subsurface Diversion Alternative.

Operation of the subsurface collectors under the Subsurface Diversion Alternative would depress local ground water levels, which could result in changes in overall plant community structure in approximately 552 acres of bosque/riparian habitat. The enhancement of riparian areas, and on-going and planned bosque restoration activities in the Albuquerque area, would help offset riparian area effects.

### **Socioeconomics**

The No Action Alternative would require some increase in expenditures for the drilling and operation of new wells. Quality of life was a factor in evaluating alternatives and assessing socioeconomics. A series of increases in water rates, staged over a period of years, to pay for the construction and operations of the DWP have been approved by the City Council. All commercial and private customers of the City are subject to these increased rates. Under the proposed alternatives, an additional 15 to 20 new permanent jobs will be created as well as 380 temporary or seasonal jobs, due to the project.

## **Threatened and Endangered Species**

There would be no effects on threatened or endangered species under the No Action Alternative except during extreme low flow periods the City's pumping effects on the river could also cause the river to recede quicker resulting in longer dry river reaches in the Lower Project Subarea. Three federally listed endangered or threatened species may be affected by the action alternatives. The only known population of the endangered Rio Grande silvery minnow is located in the Rio Grande reaches between Cochiti and Elephant Butte reservoirs. The endangered southwestern willow flycatcher uses riparian habitat along the Rio Grande for nesting and rearing their young. However, the presence of the southwestern willow flycatcher has not been documented within the middle subarea of the project ROI. The flycatcher is known from areas above and below the middle subarea, so it is possible the flycatcher migrates through the middle subarea. The threatened bald eagle has been known to roost near Alameda Boulevard in Albuquerque, and uses the river corridor for feeding and roosting. Habitat enhancement and restoration is proposed to be implemented to minimize project effects on the Rio Grande silvery minnow, southwestern willow flycatcher, and bald eagle. Effects on the Rio Grande silvery minnow could consist of modification and fragmentation of habitat, loss of individuals, disruption of flow requirements, and possible disruption of spawning and fish movement within the Rio Grande. There would be effects of a temporary nature on the minnow population during in-river construction for all action alternatives. Fish screens and fishways would be constructed under both surface-diversion alternatives (Angostura Dam and Paseo del Norte) to minimize effects on fish in the river. Approximately 0.2 acres of critical habitat for the RGSM would be eliminated by construction of the diversion dam for the preferred alternative. River drying in the Albuquerque reach could be lessened under all action alternatives because of the commitment to curtail or shut down diversions during drought. Project effects on the bald eagle, southwestern willow flycatcher, and the yellow-billed cuckoo, if present, would consist of the removal of potential roosting trees or the disruption of feeding behavior during construction. The Service has completed a biological opinion with a concurrence of Reclamation's finding of "may affect, is not likely to adversely affect" for the bald eagle and the flycatcher. In addition, the Service determined that the proposed action "is not likely to jeopardize the continued existence of the silvery minnow, and will not adversely modify its critical habitat." Specific mitigation and conservation measures for the RGSM are detailed within the biological opinion.

## **Water Quality**

The No Action Alternative would result in decreased drinking water quality over time with pumping due to a tendency to pull in deeper, brackish water in the aquifer. The diversion and treatment of river water for consumptive use would not result in any change in taste because the City plans to provide water of comparable taste to all water customers. The finished water quality, after treatment at the WTP, would meet all current and anticipated drinking-water standards. The DWP would provide water to the distribution system that is very low in arsenic. The Rio Grande typically has arsenic concentrations ranging from 2 micrograms per liter ( $\mu\text{g/L}$ ) to 3  $\mu\text{g/L}$ . The DWP water treatment process will remove most arsenic from the Rio Grande. As such, the DWP would significantly improve the arsenic levels in Albuquerque's drinking water and would allow the high arsenic wells to be shut off.

No federal or state water quality criteria would be exceeded downstream from Albuquerque because of project construction or operations. Treated wastewater to be discharged to the Rio Grande at the SWRP would meet all applicable discharge standards and is not expected to negatively affect water quality in the Rio Grande. The operation and discharge from the southside water reclamation plant will not be altered or change as a result of this project.

Table ES-2 is a summary of the environmental effects of the the resource areas discussed above.

## **CONSULTATION AND COORDINATION**

Reclamation has been in consultation with several federal, state, and local agencies, including the U.S. Fish and Wildlife Service, State of New Mexico, Office of Cultural Affairs, City Open Space Division, and Environmental Health Department. Twenty Pueblos, seven tribes, and the Bureau of Indian Affairs have been contacted regarding Reclamation request for government-to-government consultation. There have been numerous public meetings, announcements, and workshops. Agency coordination has been facilitated by a series of interagency workgroup meetings. Specific consultation steps with the U.S. Fish and Wildlife Service to comply with the Endangered Species Act have resulted in a biological opinion which is an appendix to the FEIS. Additional consultation with the U.S. Fish and Wildlife Service has resulted in the completion of the Fish and Wildlife Coordination Act Report which is included in the FEIS as Appendix J. Consultation with the New Mexico State Historic Preservation Officer regarding compliance with the National Historic Preservation Act of 1966 has been completed and is detailed in Appendix G.

## **PROPOSED MITIGATION MEASURES**

The City has initiated several mitigation measures, including fish screens and fishways. The City has been funding recovery efforts and studies for the Rio Grande silvery minnow. There are numerous mitigation steps that would be implemented, including cultural resource recovery plans, best management practices during construction, and operational curtailment when river flows so indicate. The City has an ongoing program for improvement to the Rio Grande Valley State Park. The City has developed locations for habitat restoration mitigation activities that include 160 acres of mixed bosque and 48 acres on the Montaña Oxbow. Channel widening and bank destabilization will be promoted by the removal of 120 jetty jacks. When developing release schedules for its SJC water, the City will work with other agencies such that releases can be made to provide incidental benefits to threatened and endangered species. The mitigation measures are defined and listed in Appendix O of this FEIS.

**TABLE ES-2**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

Evaluation Criteria	No Action	Angostura Diversion	Paseo del Norte Diversion	Subsurface Diversion
<b>Aesthetics and Visual Resources</b>				
Location and size of project facilities that would block most of an existing viewshed	Potential structures, located primarily in urban areas; no disruption of existing viewsheds	An existing diversion dam and new, slightly visible fish screens; no disruption of existing views	A new, low-profile diversion dam, visible from roads and bosque, and one pump station in the bosque	Three pump stations, visible from within the bosque
<b>Air Quality</b>				
Emissions from construction equipment causing violations of standards	Some non-DWP-related construction of pump houses, wells, and other facilities may be required; no violations likely	With mitigation, no air emissions would exceed standards	With mitigation, no air emissions would exceed standards	With mitigation, no air emissions would exceed standards
Emissions that result in non-attainment of NAAQS	Some non-DWP-related construction of pump houses, wells, and other facilities may be required; no violations likely	With mitigation and construction management practices, no non-attainment violations	With mitigation and construction management practices, no non-attainment violations	With mitigation and construction management practices, no non-attainment violations
Generation of dust or other emissions that degrade air quality	Some non-DWP-related construction of pump houses, wells, and other facilities may be required; no violations likely	Dust likely in unpaved areas during construction; amount depends upon climate and moisture conditions; to be controlled by best management practices (BMPs)	Dust likely in unpaved areas during construction; amount depends upon climate and moisture conditions; to be controlled by BMPs	Dust likely in unpaved areas during construction; amount depends upon climate and moisture conditions; to be controlled by BMPs

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
Emission of objectionable odors	Some non-DWP-related construction of pump houses, wells, and other facilities may be required; no violations likely	Off gas from WTP operations would be filtered, and would not pose an odor nuisance	Off gas from WTP operations would be filtered, and would not pose an odor nuisance	Off gas from WTP operations would be filtered, and would not pose an odor nuisance
<b>Aquatic Life</b>				
Reservoir level changes that lead to fish kills	None	No substantive change in historic maximum and minimum reservoir levels as a result of project operations; increase of 65 cfs in flow-through volume in reservoirs of Upper Project Subarea	No substantive change in historic maximum and minimum reservoir levels as a result of project operations; increase of 65 cfs in flow-through volume in reservoirs of Upper Project Subarea	No substantive change in historic maximum and minimum reservoir levels as a result of project operations; increase of 65 cfs in flow-through volume in reservoirs of Upper Project Subarea
Lowered water table that reduces fishery quality	Indirect effect on water table due to ground water pumping of approximately 373 acres of riparian vegetation in Middle Project Area would be affected by lowered water table, which could modify streamside habitats	Increased flows from the City's SJC water would support current water table in Upper Project Subarea; no effect on water table in Middle or Lower Project Subareas	Increased flows from the City's SJC water would support current water table in Upper Project Subarea; no effect on water table in Middle or Lower Project Subareas	Increased flows from the City's SJC water would support current water table in Upper Project Subarea; approximately 552 acres of riparian vegetation in Middle Project Area would be affected by lowered water table, which could modify streamside habitats

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
Habitat modification	None	No substantive changes in flow velocity or river width or depth in any Project Subarea. 0.5 acres of aquatic habitat temporarily lost during in-river construction near the existing dam and ends of fishway to connect to the river. 1.5 acres of aquatic habitat temporarily lost by in-river construction for the potable water transmission line crossing.	No substantive changes in flow velocity or river width or depth in any Project Subarea. 0.2 acres of aquatic habitat lost to dam construction. 1.8 acres temporarily lost due to construction of dam, access roads, backfill areas during in-river construction. 1.5 acres of aquatic habitat temporarily lost by in-river construction for the potable water transmission line crossing.	No substantive changes in flow velocity or river width or depth in any Project Subarea. 1.5 acres of aquatic habitat temporarily lost by in-river construction for the potable water transmission line crossing. 100 acres temporarily lost due to construction of subsurface collectors, access roads, backfill areas, etc. during in-river construction.
<b>Cultural Resources</b>				
NRHP-eligible or –listed resources to be damaged or destroyed	Subsidence could affect historic structures if unabated.	Temporary construction impacts on < 1% of other historic acequias. Adverse effects to the Angostura Dam and the Atrisco Feeder.	Temporary construction impacts on < 1% of historic acequias.	Temporary construction impacts on < 1% of historic acequias.
Traditional Cultural Properties	At Isleta Pueblo Rio Grande flow changes could potentially affect traditional cultural use of the river.	At San Felipe, Santa Ana, Sandia, and Isleta Rio Grande flow changes could potentially affect traditional cultural use of the river by Pueblos.	None	None

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
Known burial sites or human remains to be disturbed	None	None; if human remains are encountered during construction, NAGPRA compliance or New Mexico state burial law compliance would be enforced.	None; if human remains are encountered during construction, NAGPRA compliance or New Mexico state burial law compliance would be enforced.	None; if human remains are encountered during construction, NAGPRA compliance or New Mexico state burial law compliance would be enforced.
<b>Energy</b>				
Energy requirement for diversion-system operations (kWH/Yr)	Not Applicable	13,500,000	12,500,000	13,000,000
Energy requirement for pumping and treatment plant operations (kWH/Yr)	Not Applicable	55,500,000	55,500,000	55,500,000
Energy requirement from wells (kWH/yr)	182,000,000	60,000,000	60,000,000	60,000,000
Total energy requirement of alternatives (kWH/yr)	182,000,000	129,000,000	128,000,000	128,500,000
Additions to power infrastructure or changes in power availability	None	None	None	None
<b>Environmental Justice</b>				
Minority or low-income neighborhoods disproportionately affected by project implementation	None	Construction and flow depletion in the Sandia, San Felipe, and Santa Ana Pueblo areas.	None	None

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
<b>Floodplains</b>				
Increase in the water surface elevation of the 100-year flood between Abiquiu Reservoir and the diversion point (inches)	0	Less than 1	Less than 1	Less than 1
Area within the 100-year floodplain occupied by permanent structures (acres)	0	3.6	6.8	9.3
Increase in the Rio Grande water-surface elevation of the 100-year flood at the location experiencing the largest change in water levels (inches)	0	0	3.5	Less than 0.5

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
<b>Geology</b>				
Loss of unique mineral-recovery operations	None	None	None	None
Project structural facilities located in areas of shallow ground water constraints, or severe (greater than 30-degree) slopes	None	None	None	None
Contribution to land subsidence	Subsidence risk would increase as a result of increased pumping to meet City requirements.	Subsidence risk should decrease as a result of reduced ground water pumping.	Subsidence risk should decrease as a result of reduced ground water pumping.	Subsidence risk should decrease as a result of reduced ground water pumping.
<b>Hazardous Materials</b>				
Number of known hazardous waste sites disturbed by project construction or operation	None	None	None	None

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
Risk of hazardous materials exposure from routine transport and project operations	None	Low	Low	Low
<b>Human Health and Safety</b>				
Number of un-treated/potable water-line cross-connections likely to be implemented during construction activities	None	None	None	None
Primary and secondary drinking-water-quality parameters that would be exceeded in treated water	None	None	None	None
Uncontrollable public safety hazards during project construction	None	None	None	None
Maximum drawdown from pre-development conditions within the critical management area boundary in the year 2040	250-400	100-150	100-150	100-150

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diver- sion</b>	<b>Subsurface Diversion</b>
<b>Hydrology</b>				
Maximum drawdown from pre-development conditions within the critical management area boundary in the year 2060 (feet below ground surface)	200-260	100-130	100-130	100-130
Total ground water pumping (million ac-ft)	7.1	2.3	2.3	2.3
Total length of river channel likely to experience average annual water flow increase of 65 cfs (miles) relative to the No Action Alternative	0	171.3	189	189

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diver- sion</b>	<b>Subsurface Diversion</b>
Total length of river channel where flows would be depleted by project operations (miles)	15	32.7	15	15
Total annual reduction in water from City's SWRP discharged to Rio Grande (ac-ft/yr)	0	0	0	0
Length of river in which future operational reservoir releases would exceed the capacity of the active channel or cause river bank erosion (miles)	0	0	0	0
Average annual flow reduction in Rio Grande in an average water year between the SWRP outfall and Isleta Diversion Dam (percent)	0	0	0	0

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
Average annual reduction in mean annual flow for a typical year midway through the project in the Rio Grande at the Albuquerque gage (percent)	5.0	7.0	7.0	7.0
Reduction in flow in the Rio Grande downstream of the SWRP outfall during low flow periods as a result of diverting surface water (percent)	0	0	0	0
Simulated zero flows (modeled over 2006 at the ABQ gage)	23	16	16	16
Number of modeled years without waivers in which winter minimum fisheries releases could be met (maximum = 54)	54	54	54	54
Number of modeled years without waivers in which rafting releases could be met (maximum = 54)	48	54	54	54

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
Maximum change in shallow water table elevation in the vicinity of the Paseo del Norte Bridge (feet)	1 to 3	0	0	3 to 3.5
<b>Indian Trust Assets and Other Tribal Resources</b>				
Number and location of affected Indian Trust Assets and other tribal resources	Possible indirect effects to ground water supply.	Construction effects of modification of canal and construction of pump station on Sandia Pueblo. Flow depletion through pueblos of Santa Ana, Sandia and a portion of San Felipe.	None	None
<b>Land Use</b>				
Area that would change from private to City ownership (acres)	None	~110 for Chappell Drive WTP.	~110 for Chappell Drive WTP.	~110 for Chappell Drive WTP.
Areas that would require a change in land use designation/ zoning (acres)	None	Lease of ~5 acres of Sandia Pueblo lands for pump station.	None	None
Designated prime or unique farmland to be withdrawn (acres)	None	None	None	None

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
<b>Noise and Vibration</b>				
Number of expected cases when operation of DWP facilities would exceed City noise or vibration standards	None	None	None	None
Number of expected cases when construction of project facilities exceeds City noise or vibration standards	None	None	None	None
<b>Recreation</b>				
Number of reservoir angling days that would be lost because of project operations or construction (Upper Project Subarea)	None	None	None	None
Loss or diminished quality of river-based recreation caused by project construction or operations (all Project Subareas)	None	None; possible positive effect from periodic additions of City's SJC flow below reservoirs.	None; possible positive effect from periodic additions of City's SJC flow below reservoirs.	None; possible positive effect from periodic additions of City's SJC flow below reservoirs.

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
Loss or diminished quality of bosque recreational activity (Middle Project Subarea)	None	Temporary modification of hiking trails and visual/auditory experience during construction; loss of about 8.2 acres of bosque due to construction of permanent facilities.	Temporary modification of hiking trails and diminished visual/auditory experience during construction; loss of 14.7 acres of bosque due to construction of permanent facilities.	Temporary modification of hiking trails and diminished visual/auditory experience during construction; loss of 23.1 acres of bosque due to construction of permanent facilities.
<b>Riparian Vegetation</b>				
Total length of riparian corridor likely to experience substantial changes in existing dominant plant structural composition (miles)	0	0	0.5	1.0
Riparian area temporarily lost due to diversion construction activities (acres)	0	8.2	14.7	23.1
Riparian area temporarily lost due to transmission pipeline construction (acres)	0	2.4	2.4	2.4

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
Riparian area permanently lost due to construction of new facilities (acres)	0	1.8	4.2	10.6
Riparian areas lost due to ground water elevation drawdown of > 3 feet below the existing average ground water depth for at least 1 month each year during the growing season (acres)	373	0	0	27
Riparian areas that would experience substantial changes in overall plant-community structural composition due to a ground water decline of 1 to 3 feet for at least 1 month per year (acres)	607	0	0	552

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diver- sion</b>	<b>Subsurface Diversion</b>
<b>Socioeconomic</b>				
Total number of permanent new jobs gained because of DWP	0	15 to 20	15 to 20	15 to 20
Total number of temporary or seasonal new jobs gained because of DWP	0	420	380	446
Average number of construction jobs gained during the period of DWP construction	0	250	220	263

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
<b>Soils</b>				
Loss or degradation of prime farmland or unique soils (acres)	None	None	None	None
Creation of long-term uncontrolled erosion or unstable soil conditions	Potential for unstable soils due to subsidence related to aquifer depletion.	None	None	None
<b>Threatened and Endangered Species</b>				
Loss of individual members of a population of a listed species	None	No bald eagle or southwestern willow flycatcher would be lost. Individual Rio Grande silvery minnow eggs and larvae would be impinged on or entrained thru fish screens.	No bald eagle or southwestern willow flycatcher would be lost. Individual Rio Grande silvery minnow eggs and larvae would be impinged on or entrained thru fish screens.	None

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
Loss or substantial degradation of supporting habitat	373 acres riparian habitat would be lost; due to ground water elevation drawdown.	1.8 acres of riparian habitat would be lost; no Rio Grande silvery minnow habitat would be lost or substantially degraded.	0.2 acres riparian habitat would be lost; 1 acre of Rio Grande silvery minnow habitat would be lost or substantially degraded.	27 acres riparian habitat would be lost; due to ground water elevation drawdown Rio Grande silvery minnow habitat would be lost or substantially degraded.
Loss or modification of RGSM critical habitat (acres)	0	0	0.2 acres of critical habitat lost or modified	0
<b>Traffic and Circulation</b>				
Number of street/highway/railroad intersection crossings (constructed or bored).	Some possible	19	19	19
Length of pipeline to be installed in 2-lane streets (linear feet).	Some possible	56,600	56,600	56,600
Length of pipeline to be installed in 4+-lane streets (linear feet).	Some possible	37,800	37,800	37,800
<b>Upland Vegetation</b>				
Number of unique upland plant communities affected by construction or operation of the DWP	0	0	0	0

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Di- version</b>	<b>Subsurface Diversion</b>
Number of rare or sensitive upland plant species affected by construction or operation of the DWP	0	0	0	0
Upland vegetated areas to be permanently converted to non-vegetated areas (acres)	0	2	2	2
Total length of unpaved route with upland vegetation to be disturbed by construction (approximate linear feet)	0	26,000	26,000	26,000
Total length of ditch corridor of mixed riparian/upland vegetation disturbed by construction (linear feet)	0	76,600	Minimal	Minimal
<b>Water Quality</b>				
Degradation of water quality in the Rio Grande due to in-river construction	None	Temporary turbidity effects downstream from construction sites.	Temporary turbidity effects downstream from construction sites.	Temporary turbidity effects downstream from construction sites.
Degradation of water quality in the Rio Grande due to DWP operations	None	None	None	None

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
Reduction in the quality or taste of potable water treated at the proposed WTP	--	None	None	None
<b>Wetlands</b>				
Number of jurisdictional wetlands affected by construction or operation of the DWP	0	0	0	0

**TABLE ES-2 (Continued)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diver- sion</b>	<b>Subsurface Diversion</b>
<b>Wildlife</b>				
Number of high-use waterfowl areas that would be lost due to project operations	0	0	0	0
Productive songbird riparian habitat that would be permanently lost due to project construction (acres)	0	1.8	6.6	10.6
Number of active raptor nests that would be lost because of project construction	0	0	1	3
Number of active raptor nests that would be lost because of the close proximity of project structural facilities and associated human presence	0	0	1	3

**TABLE ES-2 (Concluded)**  
**SUMMARY OF DRINKING WATER PROJECT EFFECTS**  
**ON ALL EVALUATED RESOURCE CATEGORIES <sup>a/</sup>**

<b>Evaluation Criteria</b>	<b>No Action</b>	<b>Angostura Diversion</b>	<b>Paseo del Norte Diversion</b>	<b>Subsurface Diversion</b>
Amount of riparian wildlife habitat that would be permanently altered due to project operations (acres)	373	0	0	552
Number of birds protected under the Migratory Bird Treaty Act that would be lost as a direct result of project construction or operations	0	0	0	0

<sup>a/</sup> ac-ft/yr = acre-feet per year; AWRMS = Albuquerque Water Resources Management Strategy; BMP = best management practices; cfs = cubic feet per second; DWP = Drinking Water Project; kWh/yr = kilowatt hours per year; NAAQS = National Ambient Air Quality Standards; NAGPRA = Native American Graves Protection and Repatriation Act; SJC = San Juan-Chama; SWRP = Southside Water Reclamation Plant; WTP = water treatment plant.