RECLAMATION

Managing Water in the West

Record of Decision for the Arkansas Valley Conduit and Long-term Excess Capacity Master Contract Final Environmental Impact Statement

Approved:

Michael J. Ryan, Regional Director
Great Plains Region
Bureau of Reclamation
Department of the Interior

FEB 27, 2014
Date

United States Department of the Interior
Bureau of Reclamation
Great Plains Region
Eastern Colorado Area Office

Mission Statements

U.S. Department of the Interior

Protecting America's Great Outdoors and Powering Our Future

The U.S. Department of the Interior protects America's natural resources and heritage, honors our cultures and tribal communities, and supplies the energy to power our future.

Bureau of Reclamation

To manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Abbreviations and Acronyms

Acre-feet	ac-ft
AVC	Arkansas Valley Conduit
Corps	U.S. Army Corps of Engineers
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
Fry-Ark	Fryingpan-Arkansas
Interconnect	Pueblo Dam north-south outlet works interconnect
ITA	Indian Trust Asset
JUP	Joint Use Pipeline
Master Contract	Long-term excess capacity master contract
NEPA	National Environmental Policy Act
OM&R	Operation, Maintenance, and Replacement
P&G	*Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies*
P&R	*Principles and Requirements for Federal Investments in Water Resources*
Reclamation	Bureau of Reclamation
Southeastern	Southeastern Colorado Water Conservancy District

Introduction and Decision to be Made

Introduction

"It's kind of hard to argue against clean drinking water and frankly, it's something that should have gotten done a long time ago. My general theory is a bill that was passed authorizing a project when I was born should be finished by now."
-- President Barack Obama, speaking of the proposed Arkansas Valley Conduit in Pueblo, Colo. on August 9, 2012.

The President's August 2012 visit to the community of Pueblo, Colorado and the Lower Arkansas River Valley coincided with the 50th anniversary of the federal Fryingpan-Arkansas Project (Fry-Ark), a water delivery system designed and built to provide clean water for agricultural, municipal and industrial use across southeastern Colorado. Although the project was authorized in 1962, one major component, the Arkansas Valley Conduit (AVC), has yet to be constructed. As a result, the people of the agricultural communities in the southeast corner of the state have been waiting more than 70 years for safe drinking water.

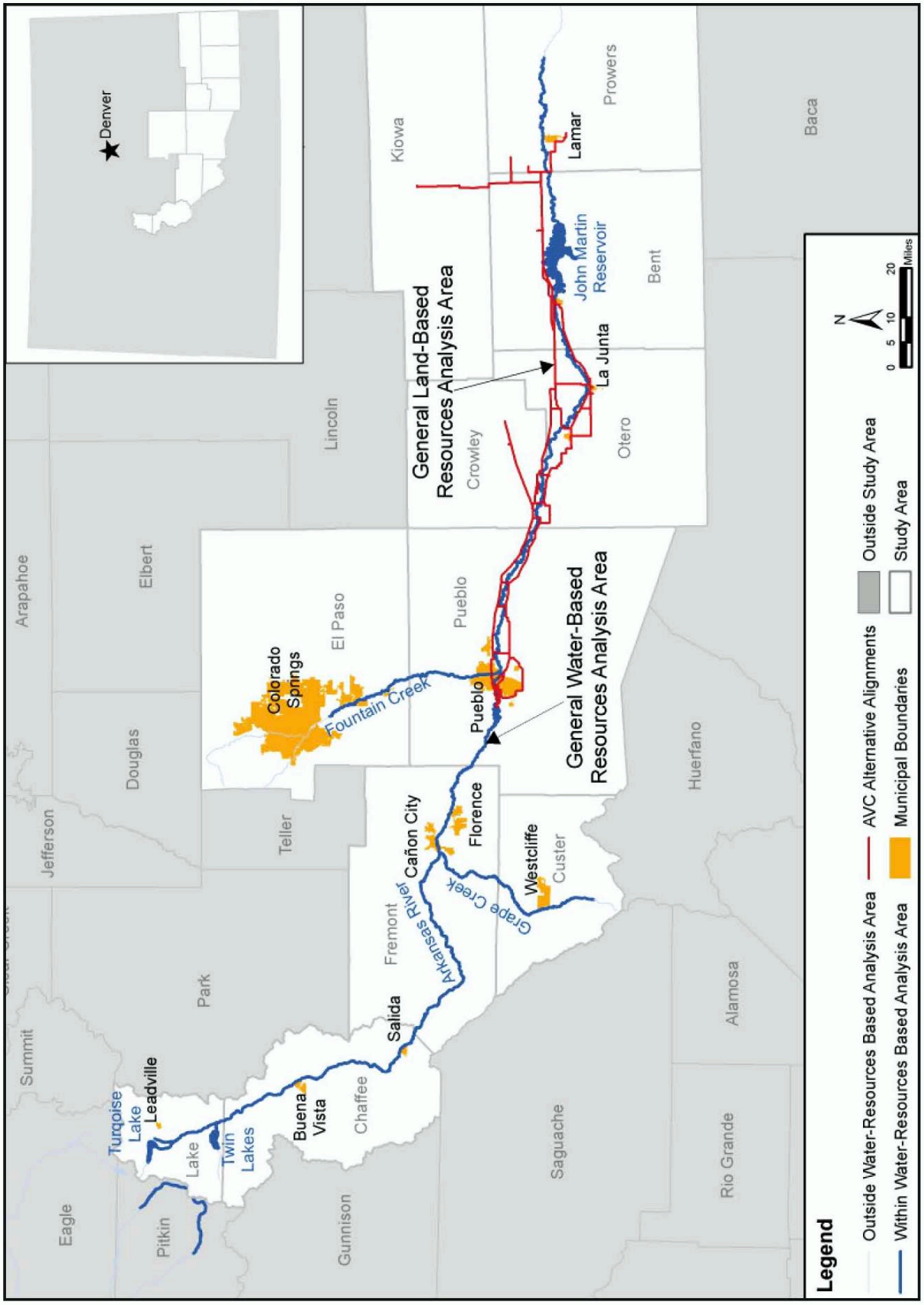
The U.S. Department of the Interior, Bureau of Reclamation (Reclamation) is issuing this Record of Decision selecting the AVC for construction using the Comanche North Alternative, consistent with the policies and programs of the President.

The Lower Arkansas Valley

"The Lower Arkansas Valley water systems are failing and with the water quality standards changing at a rapid rate, they need this project for the future of their communities."
--Dwight Gardner, resident of Ordway, Colorado

Currently, the Lower Arkansas River Basin communities in southeastern Colorado use groundwater wells to supply most of their drinking water. Now, that supply is in question. More and more towns are finding their groundwater contains cancer-causing radioactive contaminants including naturally occurring radium and uranium. Twelve water providers are currently under orders by the Colorado Department of Public Health and Environment to remove the radioactivity using expensive treatment technology, or to find a better quality water source.

To address these issues, Reclamation prepared the *Arkansas Valley Conduit and Long-Term Excess Capacity Master Contract Final Environmental Impact Statement* (Final EIS) in August 2013 that discloses potential environmental consequences associated with constructing and operating the proposed AVC, entering into a conveyance contract for the Pueblo Dam north-south outlet works interconnect (Interconnect), and entering into a long-term excess capacity master contract (Master Contract). These facilities and contracts are needed in the Arkansas River Basin precisely because they would deliver water that meets federal and state drinking water standards, provide for existing and future water demands, and provide system redundancy for water deliveries. The study area in the Final EIS covers much of southeastern Colorado (see map on page 2).


Denver
Kiowa
Prowers
Lamar
Baca
John Martin Reservoir
Bent
La Junta
General Land-Based Resources Analysis Area
Lincoln
Crowley
Otero
Arapahoe
Elbert
El Paso
Pueblo
Colorado Springs
Fountain Creek
Pueblo
General Water-Based Resources Analysis Area
Douglas
Huerfano
Jefferson
Teller
Cañon City
Florence
Westcliffe
Custer
Grape Creek
Fremont
Arkansas River
Park
Salida
Alamosa
Summit
Leadville
Turquoise Lake
Buena Vista
Chaffee
Lake
Twin Lakes
Saguache
Rio Grande
Eagle
Pitkin
Gunnison
Legend
Outside Water-Resources Based Analysis Area
Within Water-Resources Based Analysis Area
AVC Alternative Alignments
Municipal Boundaries
Outside Study Area
Study Area
N
0 5 10 20
Miles

Fryingpan-Arkansas Project

"The Arkansas Valley Conduit, I believe, is essential to the future of all the communities east of Pueblo, and it has been for decades. And it's an essential part of the original Fry-Ark Project Authorization."

--Joe Kelley, Utilities Director, City of La Junta

A multipurpose, trans-basin water diversion and delivery project in Colorado, Reclamation constructed the Fry-Ark project between 1964 and the mid-1980s. It diverts water from Colorado's Fryingpan River on the West Slope, underneath the Continental Divide, to Colorado's East Slope. West Slope imports are stored on the East Slope in Turquoise Reservoir, Twin Lakes, and Pueblo Reservoir. Fry-Ark Project reservoirs also store Arkansas River Basin water that is primarily available during wet years, and other non-Fry-Ark water supplies, through contracts with water users. Project yield is a supplemental water supply for municipal, industrial, and irrigation use in the Arkansas River Basin of Colorado. Over the course of its 50-year operating history, the Fry-Ark has an annual average diversion of 48,500 acre-feet (ac-ft) of water. Over the last ten years, the annual average has been closer to 54,000 ac-ft of water, yet people of southeastern Colorado are still relegated to using contaminated well water for municipal and domestic needs.

1 acre-foot (ac-ft) equals 325,851 gallons. 1 ac-ft is approximately the size of a football field filled with water 1 foot deep, and meets the needs of a family of 4 for about 1 year.

Yield is water available from untreated water collection systems, expressed primarily in acre-feet per year (ac-ft/yr). Yield can vary depending on demands in the service area and on the level of service.

AVC was authorized by Congress in the original Fry-Ark legislation in 1962 (Public Law 87-590). It would not increase Fry-Ark Project water diversions from the West Slope; rather it was intended to improve drinking water quality. However, AVC was not constructed with the original project, primarily because of the beneficiaries' inability to repay the construction costs. In 2009, Congress amended the original Fry-Ark legislation in Public Law 111-11, which authorized annual federal funding, as necessary, for constructing AVC, and included a cost-sharing plan with 65 percent federal and 35 percent local funding. The legislation provides that the locally funded portion of AVC will be repaid within 50 years from the time the works are first available for the delivery of water from revenues generated by payments pursuant to a repayment contract and revenue that may be derived from contracts for the use of Fry-Ark project excess capacity or exchange contracts using Fry-Ark project facilities.

In testimony during public hearings for the AVC Environmental Impact Statement, Keith Goodwin, Otero County Commissioner said, *"We don't have that kind of money lying around. So (AVC) is built on being funded then paid back over a 50-year period. And we're okay with paying back; we just need the funding up front to get the project done."*

Decision To Be Made

The Final EIS, dated August 2013, and this Record of Decision have been prepared pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended, the Council on Environmental Quality's regulations that implement NEPA (40 Code of Federal Regulation 1500), and Reclamation's NEPA Handbook (Reclamation 2012b).

Reclamation is the lead federal agency responsible for preparing the Final EIS and this Record of Decision. All proposed actions will be part of, or use features of, the Fry-Ark Project, which is owned and operated by Reclamation. Several federal, state, and local agencies participated in the Draft and Final EIS process as cooperating agencies. The Southeastern Colorado Water Conservancy District (Southeastern) is a cooperating agency and has an administrative role that will include being the local contracting agency responsible for repayment of locally funded construction costs of AVC and Interconnect and working with Fry-Ark beneficiaries.

This Record of Decision documents Reclamation's decision on selection of an alternative for the AVC, Interconnect, and Master Contract. The Regional Director for Reclamation's Great Plains Region is the responsible official for the decision made in this Record of Decision.

Cooperating Agencies
Bent County
Board of Water Works of Pueblo
Colorado Department of Natural Resources
Colorado Department of Transportation
Colorado Division of Water Resources
Colorado Division of Parks and Wildlife
Fountain Creek Watershed and Flood Control District
Kansas Division of Water Resources
Lower Arkansas Valley Water Conservancy District
Otero County
Prowers County
Pueblo County
City of Pueblo
Southeastern Colorado Water Conservancy District
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

Summary of Proposed Actions

Three proposed federal actions by Reclamation are analyzed in the Final EIS: (1) constructing and operating AVC, (2) entering into a conveyance contract with various water providers for use of the Interconnect between Pueblo Dam's north and south outlet works, which could be constructed as part of AVC, and (3) entering into a Master Contract with Southeastern to store water in Pueblo Reservoir (Table 1).

Table 1. Proposed Federal Actions

Proposed Action	Purpose	Water Providers	Reclamation Contract
AVC construction and operation	Bulk water supply pipeline and related facilities for municipal and industrial water delivery	Forty AVC water providers within Southeastern's boundaries	AVC Repayment and Conveyance Contract, Term: 50 years
Issuance of a Pueblo Dam North and South Outlet Works Interconnect Long-Term Conveyance Contract to water providers	Construction of a pipeline connection as part of AVC to allow flexibility in delivery of water between the north or south outlets, if either outlet is temporarily shut down	AVC water providers, Board of Water Works of Pueblo, Pueblo West, Southern Delivery System water providers, and Fountain Valley Authority within Southeastern's boundaries	Pueblo Dam North-South Outlet Works Interconnect Conveyance Contract, Term: 40 years
Issuance of a Long-Term Excess Capacity Master Contract to Southeastern	Long-term excess capacity storage in Pueblo Reservoir to improve water supply	Twenty-five AVC water providers and twelve other water providers within Southeastern's boundaries	Long-Term Excess Capacity Master Contract, Term: 40 years

Arkansas Valley Conduit

AVC will be a water supply pipeline that will help meet existing and future municipal and industrial water demands of water providers in the Arkansas River Basin. Physical features will include constructing about 227 miles of buried pipeline, water treatment, and other related facilities. Forty towns and rural domestic water supply systems within Southeastern boundaries located in Pueblo, Crowley, Otero, Bent, Prowers, and Kiowa counties (projected 2070 population 74,255) will participate in AVC. Water providers are requesting water deliveries of 10,256 ac-ft to help meet 2070 water demands (Table 2). AVC water treatment will include filtering, which will require the water provider to add disinfectant, or filtering and disinfection. AVC water will not be used for agricultural irrigation because such use is not a congressionally authorized purpose for AVC.

Pueblo Dam North-South Outlet Works Interconnect Conveyance Contract

During occasional maintenance and emergency situations, the Interconnect will move water between the north and south outlet works at Pueblo Reservoir. The Interconnect will be a short section of pipeline to be constructed as part of AVC between the two outlet works. Interconnect operations will require a long-term (40-year) contract between Reclamation and the Interconnect water providers for use during those maintenance or emergencies activities. The Interconnect contract will also support partial deliveries of water to existing and future water connections at Pueblo Reservoir for the AVC, Pueblo Fish Hatchery, Board of Water Works of Pueblo, Pueblo West Metropolitan District, Southern Delivery System (Colorado Springs), and Fountain Valley Authority.

Table 2. AVC Water Providers and Requested Water Deliveries in 2070

AVC Water Provider	Annual AVC Deliveries (ac-ft)	AVC Water Provider	Annual AVC Deliveries (ac-ft)
Pueblo County		**Otero County (continued)**	
Avondale	164	Bents Fort Water Company	81
Boone	94	Cheraw	30
St. Charles Mesa Water District	2,651	East End Water Association	13
Crowley County		Eureka Water Company	86
96 Pipeline Company	27	Fayette Water Association	14
Crowley County Water Association	617	Fowler	220
Crowley	51	Hancock, Inc.	18
Olney Springs	59	Hilltop Water Company	40
Ordway	366	Holbrook Center Soft Water	22
Sugar City	127	Homestead Improvement Association	9
Bent County		La Junta	2,299
Hasty Water Company	33	Manzanola	50
Las Animas	602	Newdale-Grand Valley Water Company	60
McClave Water Association	59	North Holbrook Water	8
Prowers County		Patterson Valley	17
Lamar	1,241	Rocky Ford	576
May Valley Water Association	222	South Side Water Association	5
Wiley	28	South Swink Water Company	92
Kiowa County		Swink	49
Eads	116	Valley Water Company	39
Otero County		Vroman	37
Beehive Water Association	10	West Grand Valley Water, Inc.	15
		West Holbrook Water	9
			Total: 10,256 ac-ft

Master Contract

Reclamation intends to execute a Master Contract with Southeastern for excess capacity storage. The charges associated with this contract will be the responsibility of Southeastern. The Master Contract will allow use of extra storage space in Pueblo Reservoir when this space is not filled with Fry-Ark water. Storage of non-Fry-Ark water in Pueblo Reservoir will be subject to the existing Reclamation contract rules. Southeastern may subcontract with participating water providers to divide the requested storage space, as shown in Table 3, and to obtain the revenues needed to cover these charges from the actual water users. The water providers in the Master Contract are all located within Southeastern boundaries. Some AVC water providers are also participating in the Master Contract and will store non-Fry-Ark water for delivery through AVC. Non AVC water providers will use existing water systems or the Arkansas River to receive their Master Contract water deliveries.

The Master Contract will allow storage of non-Fry-Ark water within available storage space in Pueblo Reservoir.

Table 3. Master Contract Water Providers and Requested Storage

Water Provider [1]	Storage Request (ac-ft)	Water Provider [1]	Storage Request (ac-ft)
Chaffee County		**Otero County**	
Poncha Springs	200	*Beehive Water Association*	*18*
Salida	2,000	*Bents Fort Water Company*	*10*
Upper Arkansas Water Conservancy District	1,000	*Fayette Water Association*	*16*
Fremont County		*Fowler*	*50*
Cañon City	1,000	*Hilltop Water Company*	*35*
Florence	2,250	*Holbrook Center Soft Water*	*12*
Penrose	900	*Homestead Improvement Association*	*6*
El Paso County		*La Junta*	*2,000*
Fountain	1,000	Lower Arkansas Valley Water Conservancy District	5,000
Security	1,500	*Manzanola*	*60*
Stratmoor Hills	200	*Newdale-Grand Valley Water Company*	*50*
Widefield	650	*Patterson Valley*	*40*
Pueblo County		*Rocky Ford*	*1,200*
Pueblo West	6,000	*South Side Water Association*	*8*
St. Charles Mesa Water District	*2,000*	*South Swink Water Company*	*80*
Crowley County		*Valley Water Company*	*47*
96 Pipeline Company	*25*	*Vroman*	*41*
Crowley County Water Association	*1,000*	*West Grand Valley Water, Inc.*	*15*
Olney Springs	*125*	**Bent County**	
Ordway	*750*	*Las Animas*	*300*
Kiowa County		**Prowers County**	
Eads	*50*	*May Valley Water Association*	*300*
			Total: 29,938 ac-ft

Notes:
[1] Water providers in *blue italics* are participating in both AVC and Master Contract.

Purpose and Need

Each proposed federal action has a specific purpose and need:

- The purpose of AVC is to deliver water for municipal and industrial water use within Southeastern's boundaries (Figure 1–2). There are two general needs for AVC: 1) needs associated with drinking water quality and 2) the need to meet existing and future water demands. These needs were quantified by a U.S. Environmental Protection Agency (EPA)-funded study that obtained information from each AVC participant (Black & Veatch 2010). Additional information was gathered from AVC participants during the NEPA process.

- The purpose of the Interconnect is to provide redundancy in water delivery to Interconnect participants. The Interconnect contract is needed through 2060 to convey water during short-term disruptions of service from either the north or south outlet works at Pueblo Reservoir by transferring water to the other working outlet.

- The purpose of the Master Contract is to provide excess capacity storage in Pueblo Reservoir for Master Contract participants within Southeastern's boundaries. A long-term storage contract provides surety and convenience not found in a short-term contract. The Master Contract secures a reliable water supply for participants to help meet projected demand through 2060.

Alternatives Considered in Final Environmental Impact Statement

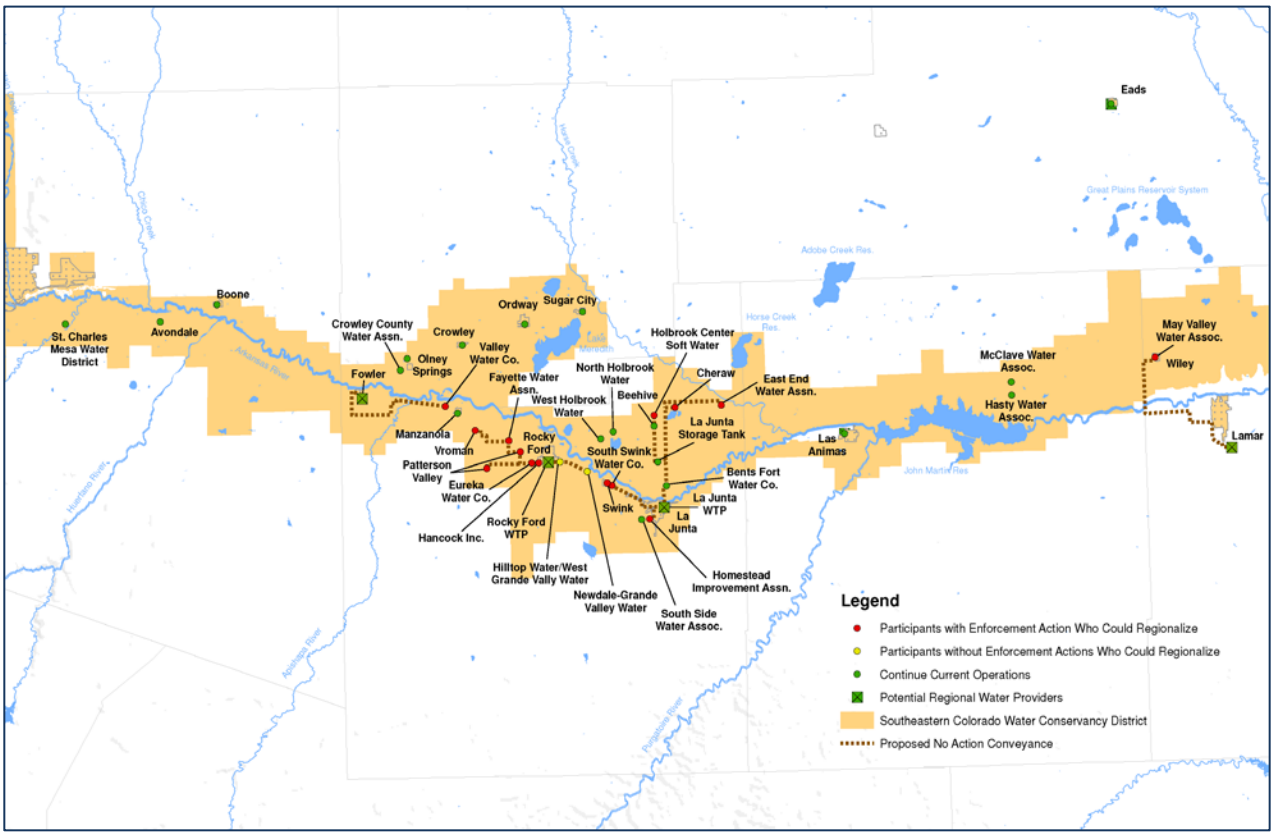
Alternatives were developed using a structured alternative development and screening process. The goal of this process was to identify a range of reasonable alternatives to meet the purpose and needs of the AVC, Interconnect contract, and Master Contract. NEPA regulations require analysis of a No Action Alternative (the future without the proposed actions) to serve as a basis of comparison to other action alternatives.

In response to public comments and recommendations on the Draft EIS, the alternatives were reexamined to see if mixing pipeline routes, water treatment options, and other engineering features would reduce costs and minimize adverse infrastructure effects from construction through Pueblo. The resulting hybrid alternative is Comanche North.

No Action Alternative

If AVC is not built, water providers would likely meet water quality and water supply needs with a combination of regional and local independent water treatment systems. Regional systems are combinations of smaller water providers who would be served by a larger neighboring provider's water treatment plant, share existing and possible new water rights, and construct new pipelines connecting these systems. Local independent systems would include water providers with the ability to meet primary drinking water standards and who are not regional system providers. The No Action Alternative was developed to meet primary drinking water standards, address enforcement actions using surface and groundwater supplies, and meet full 2070 demands. The No Action Alternative would not meet secondary drinking water standards.

Most Interconnect water providers would use existing systems; no new infrastructure would be built to provide a system backup under No Action. Master Contract water providers would continue current operations without storage or continue applying for temporary excess capacity (If-When storage) contracts with Reclamation to store non-Fry-Ark water in Pueblo Reservoir. The No Action Alternative assumes that no new infrastructure would be built to store water because new reservoirs are speculative at this point.



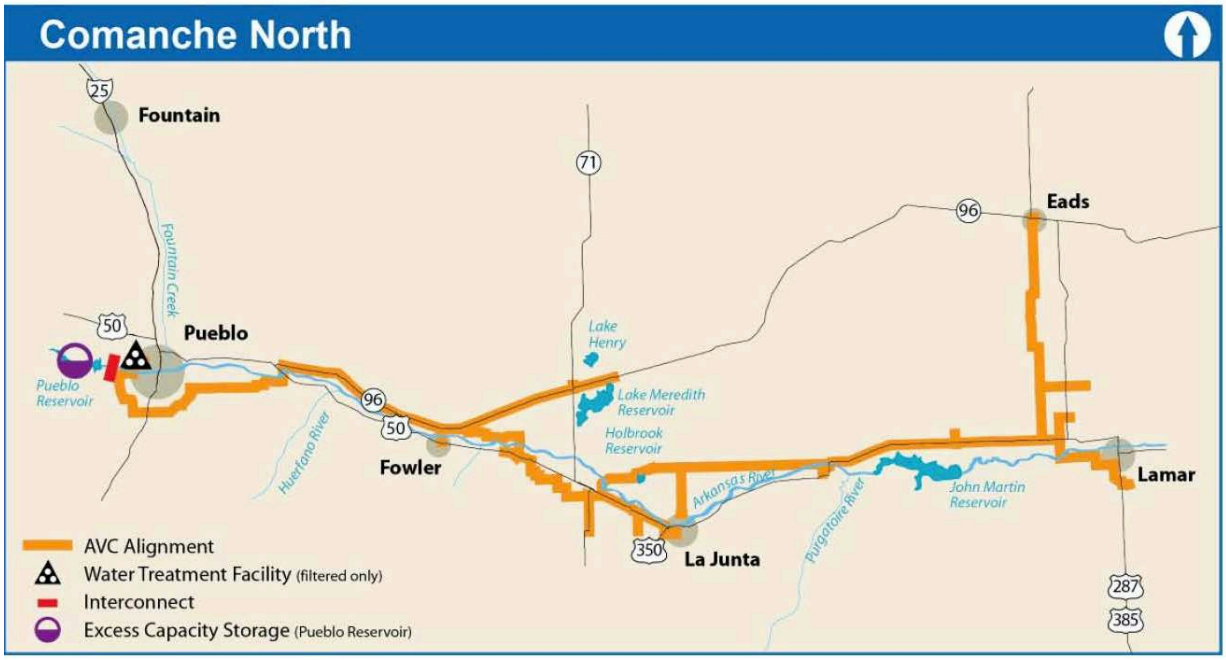
No Action Alternative

Comanche North Alternative

The Comanche North Alternative includes constructing the AVC and Interconnect, and issuing the Master Contract to store water in Pueblo Reservoir. Water will be diverted from Pueblo Reservoir through the south outlet works and delivered via an existing Joint Use Pipeline (JUP) to the wye (a three-way pipeline connection). A new pipeline will be constructed from the wye to the existing Board of Water Works of Pueblo Whitlock Water Treatment Plant in Pueblo. From the Whitlock Water Treatment Plant site, new pipeline will be constructed south of Pueblo and then east of Pueblo along the north side of the Arkansas River to Lamar; then north to Eads. The pipeline for the Comanche North Alternative, including spurs, will be about 227 miles long. Shorter spur pipelines will deliver water to AVC water providers located near the main pipeline, including communities south of the pipeline. Spurs crossing the Arkansas River and perennial streams will be bored under the river. Pipeline sizes will range from 36 inches in diameter at the JUP wye to 4 inches at some water provider tie-ins.

New water treatment plant components will be integrated into the existing Whitlock Water Treatment Plant. The integrated water treatment plant will filter water; disinfection will be the responsibility of AVC water providers at their point of delivery. Under this alternative, the St. Charles Mesa Water District will receive filtered water. Pumping stations will be built at the

Whitlock Water Treatment Plant and on the south end of the pipeline spur to Eads. A surge tank (to manage pipeline pressure) will be built near Fowler and La Junta.



Pueblo Dam South Alternative

The Pueblo Dam South Alternative includes constructing AVC without building the Interconnect, but issuing the Master Contract. Water would be diverted from the existing Pueblo Reservoir south outlet works. A new pipeline would be constructed from Pueblo Dam, generally following Bessemer Ditch through Pueblo. East of the city, the pipeline would be built generally parallel to U.S. Highway 50 south of the Arkansas River to Lamar. The pipeline for the Pueblo Dam South Alternative would be about 230 miles long. Pipeline sizes would range from 48 inches in diameter at the dam intake to 4 inches at some AVC participant tie-in locations. One pumping station would be installed on the south end of the pipeline spur to Eads. Except for the spur to Eads, the Pueblo Dam South Alternative is the only alternative that would move water in the pipeline via gravity and would not require extra pumping. Storage tanks would be built near Fowler and La Junta.

A new water treatment plant would be constructed in the St. Charles Mesa area. The water treatment plant would filter AVC water; water providers would disinfect the supply at their delivery points. Under this alternative, the St. Charles Mesa Water District would receive unfiltered water.

JUP North Alternative

The JUP North Alternative would include constructing the AVC and Interconnect, without the Master Contract. Water would be diverted at Pueblo Reservoir and delivered through the

existing JUP. A new pipeline would be built through Pueblo, and east of Pueblo, the pipeline would be located north of the Arkansas River. The pipeline for the JUP North Alternative would be about 233 miles long. Pipeline sizes would range from 42 inches in diameter at the intake to 4 inches at some AVC participant tie-in locations. Two pumping stations would be constructed; one would be located just downstream from the water treatment plant and another on the south end of the pipeline spur to Eads. Storage tanks would be located near Fowler and La Junta.

A new water treatment plant would be constructed adjacent to the existing Whitlock Water Treatment Plant. The water treatment plant would filter water from AVC; disinfection would be provided by the water providers at their delivery points. Under this alternative, the St. Charles Mesa Water District would receive filtered water.

Pueblo Dam North Alternative

The Pueblo Dam North Alternative would include constructing the AVC and Interconnect, and issuing the Master Contract. AVC would generally follow a route through Pueblo and north of the Arkansas River. Water would be diverted from the Pueblo Reservoir south outlet works. The pipeline for the Pueblo Dam North Alternative would be about 236 miles long. Pipeline sizes and spurs would be similar to the JUP North Alternative. Pumping stations would be built at the foot of Pueblo Dam, at the water treatment plant, and on the south end of the pipeline spur to Eads. Storage tanks would be located near Fowler and La Junta.

A new water treatment plant would be constructed below Pueblo Reservoir on Reclamation property, immediately south of the Pueblo Fish Hatchery. The new water treatment plant would filter water; AVC water providers would be responsible for adding disinfection at their delivery point. Under this alternative, the St. Charles Mesa Water District would receive filtered water.

River South Alternative

The River South Alternative includes constructing AVC and issuing the Master Contract, but not constructing the Interconnect. AVC would divert water from the Arkansas River just upstream from the river's confluence with Fountain Creek near the existing St. Charles Mesa diversion structure and pump station. A new pipeline would be constructed from the Arkansas River east through Pueblo and then along a route south of the Arkansas River. The pipeline for the River South Alternative would be about 216 miles long. Pipeline spurs would be as described for the Pueblo Dam South Alternative. Pipeline sizes would range from 42 inches in diameter at the intake to 4 inches at some AVC participant tie-in locations. Three pumping stations would be built; one would be located near the intake to pump water to the water treatment plant, the second would be located just downstream from the new water treatment plant, and the third would be located on the south end of the pipeline spur to Eads. Storage tanks would be located near Fowler and La Junta.

A new water treatment plant would be constructed adjacent to the existing St. Charles Mesa Water Treatment Plant. The new water treatment plant would both filter and disinfect water for

the water provider delivery points. Under this alternative, the St. Charles Mesa Water District would be delivered unfiltered water.

Master Contract Only Alternative

To provide a range of reasonable and practicable alternatives for evaluation in the Final EIS, the Master Contract Only Alternative does not include federal actions to build the AVC or Interconnect. The Master Contract would include up to 29,938 ac-ft of excess capacity storage in Pueblo Reservoir. Each water provider would request that Reclamation release water from Pueblo Reservoir to either the Arkansas River to an existing or future water delivery system, or exchange water to an upstream location. Water could be stored and released if and when space is available after other Fry-Ark commitments have been met. Contract terms and costs for using Pueblo Reservoir excess capacity would be determined during contract negotiations.

Without the AVC or Interconnect, AVC and Interconnect water providers would pursue actions similar to those previously described in the No Action Alternative to meet water supply and water quality needs.

Decision and Rationale for Decision

"This valley's towns need the quality water from the Pueblo Reservoir to remain in a growth situation rather than the opposite effect of dealing with individual treatment plants and poorer quality water as individuals."

--Nancy Moore, resident of Otero County

Decision

Reclamation has taken a hard look at the impacts of constructing the AVC in the Final EIS, as well as the consequences of not constructing the AVC (No Action). Reclamation has also listened to the comments of people in the lower Arkansas Valley, cooperating agencies, community leaders, state and federal political leaders, and the President. With all this in mind, Reclamation has selected the Comanche North Alternative for implementation.

Rational for Decision

Decision Not to Select No Action

> *"We believe that the No Action Alternative is not a reasonable alternative for water providers in the Arkansas Valley, especially those of us under an enforcement order from the Colorado Department of Public Health & Environment for not meeting drinking water standards with the radionuclide rule...The waste disposal of radionuclides is simply too expensive."*

> *"A No Action Alternative leaves South Swink Water Company and many others without drinking water that meets standards."*
>
> --John Hostetler, President, South Swink Water Company

Reclamation found that the costs of the No Action Alternative exceed its benefits. Simply put, families and communities across the Lower Arkansas Valley face the insurmountable problem of rising water treatment costs in a declining local economy. Without a realistic option for coming decades, these same communities will soon spend themselves out of sustainable water treatment.

Reclamation did not select the No Action Alternative for implementation for the following reasons:

- *The No Action Alternative Would Not Meet National Secondary Drinking Water Regulations.* Not meeting secondary water quality regulations will result in increased OM&R costs exacerbating the economic disadvantages of the area. The Environmental Protection Agency (EPA) has established National Secondary Drinking Water Regulations for 15 contaminants. These guidelines assist public water systems in managing contaminants in drinking water that do not risk human health but do have economic consequences because of objectionable color, odor, and taste and detrimental effects on equipment. EPA states these contaminants "may cause a great number of people to stop using water from their public water system even though the water is actually safe to drink (2013)."

- *The No Action Alternative Could Have Significant Economic Implications.* No Action Alternative water sources are particularly high in two contaminants - sulfates and total dissolved solids. Sulfates are associated with undesirable aesthetic effects on water, while total dissolved solids have corrosion and scaling effects that lead to premature deterioration of distribution pipes, water treatment equipment, and household appliances. Many of the No Action Alternative water supplies exceed the total dissolved solids standard, some by more than 500%. EPA (2013) states corrosion caused by high total dissolved solids can, "have significant economic implications" due to impacts on pipes. EPA describes scaling impacts as "mineral deposit which builds up on the insides of hot water pipes, boilers and heat exchangers, restricting or even blocking water flow." Total dissolved solids cannot be removed by conventional water treatment, requiring "fairly expensive technologies and may be impractical for smaller systems."

- *The No Action Alternative Would Have Negative Net Benefits.* Economic analysis estimates benefits of No Action range from $194.78 to $239.88 million, while the costs of No Action range from $307.31 to $308.43 million (construction cost of $192 million, present value of annual costs of $112.17 million, and short-term excess capacity storage costs of $3.14 million to $4.26 million), resulting in estimated net benefits of -$113.65 million to -$67.43 million. <u>The net benefits of No Action are negative under all benefit and cost scenarios.</u>

- *The No Action Alternative Would Cost $33 Million More in OM&R than Comanche North.* The water treatment facilities under the No Action Alternative are expected to cost significantly more to operate, maintain, and replace than treatment of AVC water by

Comanche North. Many of the communities being served are economically disadvantaged; this would be an additional economic burden. The estimated cost per month of No Action would more than double the cost of water, which could be interpreted as evidence of financial hardship and rate shock.

- *The No Action Alternative Would Lack the Water Delivery Reliability of Comanche North.* Without the Interconnect there would be no operational redundancy for entities taking water deliveries from Pueblo Reservoir, such as the Southern Delivery System (Colorado Springs) and the Fountain Valley Conduit, in the event that either of Pueblo Dam's two outlets is not operational.

Economic Benefits of Action vs. No Action

> *"One of the things that I don't think you did address in your costs was the savings that's going to be realized by folks right here. Ask Pat Palmer what it costs him to soften enough water to wash cars or run his sub shop or anybody else in town that serves food."*
> --Bill Rich, Hasty Water Company

Benefits

This decision takes into account a final economic analysis based on the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies entitled *Arkansas Valley Conduit and Long-Term Excess Capacity Master Contract, Evaluation of the Economic Feasibility of Appraisal Level Alternatives* (Principles and Guidelines Study). The study quantified the benefits of additional water supplies, water quality improvements, avoided transit losses, avoided maintenance and monitoring losses with the Interconnect, reductions in greenhouse gas emissions and meeting drinking water standards. Values were derived from previous economic studies for domestic and commercial water supplies, net farm revenue from irrigated agriculture, health-related benefits from meeting primary drinking water standards, and future carbon dioxide prices.

Table 4. Comparison of the Benefits of the No Action Alternative to the Comanche North Alternative

Benefit	No Action Alternative	Comanche North Alternative
Improved Water Quality (excludes radionuclide improvement)	●	○
Improved Radionuclide Water Quality	=	=
Excess Capacity Water Supply (excludes rotational fallowing contract)	●	○
Excess Capacity Water Supply (rotational fallowing contract only)	○	●
Reduced Greenhouse Gas Emission	●	○
Reduced Transit Losses	●	○
System Redundancy (Interconnect)	●	○

Key:
○ – more beneficial ● – less or not beneficial = – benefits are equal

Costs

In conjunction with the AVC EIS, Reclamation conducted appraisal studies for the EIS alternatives (Reclamation 2012a, 2013). The Appraisal Design Reports prepared construction and operating, maintenance, and replacement cost estimates for planning, evaluating, and comparing alternatives and features (Table 5). Comanche North is the least expensive of the AVC water supply action alternatives.

Table 5. Estimated Costs of Alternatives

COST DESCRIPTION	COSTS ($ MILLION) [1][2]						
	NO ACTION	COMANCHE NORTH	PUEBLO DAM SOUTH	JUP NORTH	PUEBLO DAM NORTH	RIVER SOUTH	MASTER CONTRACT ONLY
Construction [3]	192	400	495	495	505	475	192
Annual OM&R [3]	5.0	3.5	3.4	3.8	3.8	4.2	5.0
Annual Master Contract [4]	0.1 - 0.2	0.8 - 1.1	0.8 - 1.1	0.1 - 0.2	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1

Notes:
(1) These cost estimates are not suitable for construction funding appropriations from Congress.
(2) Costs are in 2011 dollars.
(3) Construction and OM&R costs for Comanche North, Pueblo Dam South, JUP North, Pueblo Dam North, and River South costs from appraisal design reports (Reclamation 2012a, 2013a). Construction and Operation, Maintenance, and Replacement (OM&R) costs for No Action and Master Contract Only alternatives from Appendix B.3.
(4) Master Contract costs presents range of costs.

Benefit-Cost Analysis

In the Principles and Guidelines Study Reclamation compared the benefits of the action alternatives to the costs of those alternatives (Table 6). Although most Principles and Guidelines analyses are based on feasibility-level alternatives, this analysis is based on appraisal engineering design and would be considered appraisal level.

Based on that study, Comanche North would be the least expensive action alternative to construct at $400 million, as compared to other action alternatives that would cost $475-505 million. Present value of OM&R is $78.85 million for Comanche North, in comparison to No Action and Master Contract Only at $112.17 million. The other AVC alternatives present value of OM&R ranges from $76.48 – $98.53 million.

The preliminary benefit-cost ratio of Comanche North ranges from .78 to 1.02. The other AVC alternatives benefit-cost ratios are lower with a high end range from .56 to .86. A range of net benefits and benefit-cost ratios are estimated which reflects a level of uncertainty that is expected at the appraisal level of analysis. A benefit-cost ratio greater than 1.0 indicates benefits exceed costs.

Table 6. Comparison of Benefits-Costs of the No Action Alternative to the Comanche North Alternative

Action Alternative	Benefits (millions$)	Costs (millions$)	Net Benefits (millions$)	Benefit-Cost Ratio
Comanche North	427.21 to 549.66	539.27 to 545.33	- 118.12 to + 10.39	.78 to 1.02
No Action	194.78 to 239.88	307.31 to 308.43	- 113.65 to - 67.43	.63 to .78

Although the *Principles and Requirements for Federal Investments in Water Resources* (P&R) were established in March 2013, the P&R will not be in effect until 180 days after publication of final Interagency Guidelines. The exact form of a P&R analysis is not yet known because the final Interagency Guidelines have not been completed. However, the P&R consider environmental and social goals in addition to economic goals. This means that there would likely be some additional benefits recognized under the P&R for Comanche North that were not included in the P&G analysis. These benefits would likely not be realized or would be substantially less under the No Action Alternative.

Reclamation compared all alternatives in the Final EIS in terms of how well each addressed purpose and need, relevant environmental and non-environmental issues identified by Reclamation during the EIS process, and estimated costs (Table 7). The Comanche North Alternative ranked number one.

Table 6. Alternatives Ranking Used to Identify the Preferred Alternative

Alternative	Criteria Ranking					Overall Sum	Overall Rank
	Purpose and Need: Water Quality	Purpose and Need: Quantity, Redundancy, and Reliability	Financial	Engineering and Realty	Environ -mental Effects		
Comanche North	1	1	1	3	4	10	1
No Action	6	7	2	1	1	17	2
Pueblo Dam South	1	3	4	5	5	18	3
Pueblo Dam North	1	1	7	4	5	18	3
Master Contract	6	6	4	1	2	19	5
JUP North	1	5	3	6	7	22	6
River South	5	3	6	7	3	24	7

Note: Standard competitive ranking methodology was used to rank alternatives. An alternative was assigned its relative rank (for example, the sixth best alternative would be ranked 6, even if the first five alternatives tie and are each ranked 1).

Agency Mission Considerations

The decision to construct the AVC is consistent with Reclamation's mission "to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public." Testimonials during Reclamation's NEPA public proceedings for the AVC were no different than those Reclamation heard across various rural water public processes. Like the others, those commenting on the AVC expressed many of the same concerns for safe and clean drinking water and also expectations of good governance from federal agencies like Reclamation.

Reclamation has witnessed the benefits of "managing, developing, and protecting" clean water in the course of construction of rural water projects like the Southwest Pipeline; Lewis & Clark Regional Water System; Mid-Dakota Rural Water System; Mni Wiconi; and Perkins County Rural Water Systems. All of these projects cited good quality water that meets secondary drinking water standards as an important purpose and/or need of the project. Our observation is when clean water is a reality, businesses can turn their attention to new opportunities, communities can gain stability, and people have one less thing to worry about.

"This is very exciting for Mercer County. The people getting this water are ecstatic to be able to turn on their faucets and have good tasting water, instead of the brown, icky water they had before."

--Marie Johnson, Director, Southwest Water Authority, North Dakota

Comanche North Alternative Selection Summary

Based on the above and the following reasons, the Comanche North Alternative was selected for implementation:

- The Comanche North Alternative will complete the action; will best meet the purpose and need for the action; has the consensus of the affected community; is reasonable and practicable; and is within Reclamation's statutory authority to implement (Reclamation 2012b).

- Regarding purpose and need, the Comanche North Alternative will deliver water that meets both primary and secondary drinking water standards. The preferred alternative will also meet future annual participant demands, assuming base levels of conservation; includes the Interconnect as a back-up system that will minimize water delivery disruptions from Pueblo Reservoir; and the Master Contract that will increase supply reliability and drought protection.

- The Comanche North Alternative is less expensive than other alternatives that would fully meet purpose and need.

- The Comanche North Alternative will integrate new water treatment plant components into the existing Whitlock Water Treatment Plant, which will minimize water treatment plant construction costs and terrestrial effects.

- The Comanche North Alternative's alignment south of Pueblo will have less construction risk, urban construction disturbance, and real estate constraints than other alternatives that will fully meet purpose and need. East of Pueblo, aligning the AVC pipeline north of the river avoids most of the U.S. Highway 50 corridor.

- When coupled with proposed mitigation measures described in Appendix A, the Comanche North Alternative will have similar or fewer environmental effects compared to other alternatives that meet purpose and need.

This decision would have no impacts on Indian Trust Assets (ITAs). The Final EIS documents that no ITAs were identified in the study area and, as such, no impacts to ITAs will occur.

Southeastern, who represents the communities to be served by the AVC, supports selection of the Comanche North Alternative. Southeastern, in particular, was involved in developing this alternative, including identifying key measures to reduce project costs.

Environmentally Preferable Alternative

Council on Environmental Quality regulations require the Record of Decision to identify one or more environmentally preferable alternatives (40 C.F.R. § 1505.2(b)). Ordinarily, an environmentally preferable alternative is one that causes the least damage to the biological and physical environment and that best protects, preserves, and enhances historic, cultural, and natural resources. After considering and balancing the full range of adverse and beneficial environmental effects of all alternatives examined in the Final EIS, Reclamation concludes that the No Action Alternative is environmentally preferable. However, the No Action Alternative has a number of impacts and disadvantages outlined in the *Decision Not to Select No Action* section, including not meeting the project purpose need, especially water quality and reliability. Although the No Action Alternative would have the least environmental effects because of fewer ground disturbing activities, the Comanche North Alternative will have the fewest environmental effects of action alternatives that meet the purpose and need.

Summary of Substantive Comments on the Final Environmental Impact Statement

"We support this project's examination of means to improve public health protection by reducing dependence on poor quality drinking water sources for 14 of the AVC participants that have been or currently are under enforcement order from the Colorado Department of Public Health and Environment."
--Suzanne J. Bohan, Director, NEPA Compliance and Review Program,
Office of Ecosystems Protection and Remediation, EPA, September 23, 2013

The mandatory 30-day waiting period before signing a Record of Decision that follows EPA's publication of the Final EIS notice of availability ended on September 23, 2013. During the

waiting period Reclamation received two letters. The first was from Colorado Springs Utilities, and the second was from EPA. This section summarizes substantive comments and Reclamation's response to each.

In their letter of September 20, 2013, Colorado Springs Utilities expressed support for the AVC and anticipates discussions with Reclamation regarding AVC's use of Colorado Spring Utilities' capacity in the JUP. In addition, Colorado Springs Utilities requested assistance from Reclamation and Southeastern in facilitating future water exchanges during operation of the AVC. As stated in the Final EIS, Reclamation will provide coordination assistance with participants in managing storage and water releases from Pueblo Reservoir but will not modify operations that would impact Fry-Ark Project yield. Regarding the JUP, Reclamation anticipates that Southeastern will work with the Board of Water Works of Pueblo, who own the JUP, to develop an agreement for AVC use of the JUP. It is Reclamation's understanding that the Board of Water Works will need to reconcile the terms of any agreement with AVC against the requirements of the Board of Water Works' other third-party agreements, including the August 15, 2000, Intergovernmental Agreement with Colorado Springs Utilities for use of the JUP.

In their letter of September 23, 2013, EPA made four recommendations: 1) develop detailed measures to evaluate the success of mitigation measures; 2) conduct post-project evaluation of mitigation effectiveness; 3) consider additional mitigation of impacts to aquatic life in Holbrook and Pueblo reservoirs; and 4) extend the duration of the Environmental Review Team.

First, EPA recommended that Reclamation work with the Environmental Review Team to develop sufficient detail for proposed mitigation to assure that effects to aquatic resources associated with reduced flows in the Arkansas River below Pueblo Reservoir be offset. The negligible to minor adverse effects of AVC on aquatic resources and water quality would be too small to be detected by a monitoring program. There are so many other variables in the basin that affect water resources from other diversions, reservoir operations, variations in water years, wastewater discharges, and agricultural runoff that it is unlikely that any AVC impacts would show a cause and effect relationship. Any potential effects to a resource would be cumulative, and AVC's contribution would be very small. Given the above information and that effects to aquatic habitat would be negligible to minor (less than 10% for most species), Reclamation does not believe the effort to develop and implement detailed measures and associated monitoring and adaptive management is warranted or would be meaningful.

Second, EPA expressed uncertainty whether the aquatic life mitigation measures would offset predicted impacts, and recommended post-project evaluation. They also requested that Reclamation consider designating a minimum flow trigger above 50 cubic feet per second to mitigate adverse effects to water quality and aquatic life. The 50 cubic feet per second target is consistent with the Arkansas River Low Flow Program. The surface water best management practice in Appendix A of this Record of Decision requires participants to comply with Southeastern's commitments in the Pueblo Flow Management Program, which has a100 cubic feet per second trigger. As disclosed in the Final EIS, the subject water quality effects would have limited intensity with no significant adverse effects to water quality or to aquatic life. Given this, Reclamation believes that additional mitigation measures beyond that in Appendix A is not warranted. However, Reclamation will seek assistance from the Environmental Review

Team to review any proposed project changes. This is explained in the Environmental Commitments section (below).

Third, EPA suggested that the Environmental Review Team evaluate the adequacy of mitigation of project effects to aquatic life in Holbrook and Pueblo reservoirs. Holbrook Reservoir is owned by Holbrook Mutual Irrigating Company, which recently modified the outlet structure to facilitate draining the reservoir dry for irrigation needs. There is no agreement between the company and the State of Colorado or Reclamation to maintain a minimum pool. Therefore, investing in aquatic habitat in Holbrook Reservoir would be less effective than the mitigation listed in Appendix A. The effects of Comanche North on aquatic life in Pueblo Reservoir would be negligible; therefore, no mitigation is necessary for that reservoir.

Fourth, EPA recommended that the Environmental Review Team continue to function for five years after the project commences, rather than for one year. Because AVC is a federal-owned project, Reclamation will be available to address concerns and issues for the life of the project and could reinstate the Environmental Review Team at any time if it is deemed necessary or worthwhile.

Environmental Commitments

Reclamation has committed to implement several best management practices and mitigation measures involving avoidance, minimization, reduction, compensation, and/or review of construction activities and operations (Appendix A). These commitments will be fully incorporated into all final design and project implementation activities including, but not limited to, construction contracts, management agreements with resource agencies, long-term storage and conveyance contracts, and management plans, where appropriate to implement the preferred alternative. All practicable means to avoid or minimize adverse environmental effects from the selected alternative have been considered and adopted. The environmental commitments in this Record of Decision are intended to avoid, minimize, and/or offset or compensate for adverse environmental effects.

Reclamation will establish and coordinate an Environmental Review Team to ensure that project activities are completed concurrently and in full compliance with all environmental commitments specified in this Record of Decision. Team members will advise Reclamation regarding implementation and compliance of best management practices and mitigation measures identified for the preferred alternative. The Environmental Review Team will also review any future proposed project changes (for example, pipeline routing, new participants, new water supplies, or changes in water rights administration), and make recommendations regarding warranted additional NEPA or Arkansas River Compact compliance review, adaptive management, mitigation, or other environmental compliance. The Environmental Review Team will function during final design through one year after AVC and/or Master Contract operations begin. The Environmental Review Team could include technical representatives of the following agencies:

- Bureau of Reclamation
- U.S. Army Corps of Engineers (Corps)

- U.S. Fish and Wildlife Service
- Southeastern Colorado Water Conservancy District
- Colorado Department of Transportation
- Colorado Parks and Wildlife
- Colorado State Historic Preservation Office
- Kansas Division of Water Resources
- City of Pueblo
- Pueblo, Otero, Bent, Kiowa, and Prowers counties
- Other entities as deemed important to the process

Implementing the Decision

Comanche North, the selected alternative, includes all three federal actions. The following actions will be implemented:

- Construction and operation of the AVC and issuance of a 50-year AVC repayment, operation and maintenance contract to Southeastern (or a duly authorized Enterprise);
- Issuance of an Interconnect long-term conveyance contract to Southeastern for AVC, Colorado Parks and Wildlife for the Pueblo Fish Hatchery, Board of Water Works of Pueblo for the City of Pueblo, Pueblo West Metropolitan District for Pueblo West, Colorado Springs Utilities for Southern Delivery System, and Fountain Valley Authority for the Fountain Valley Conduit; and
- Issuance of a 40-year Master Contract to Southeastern to allow use of extra storage space in Pueblo Reservoir when this space is not filled with Fry-Ark water. Southeastern could then subcontract with the participating water providers listed in the Final AVC EIS.

Water Contracts

To protect the interests of the United States, general Reclamation law requires contracts for the delivery and storage of project and nonproject water, for the use of Federal facilities, and for the recovery of reimbursable project costs. Contracts are always required, unless a superseding Federal authority dictates otherwise, and must be executed pursuant to appropriate authority, whether found in general Reclamation law, project-specific legislation, or other congressional authorization.

Regarding the AVC repayment contract, Public Law 111-11 specifies “payment in an amount equal to 35 percent of the cost of the conduit that is comprised of revenue generated by payments pursuant to a repayment contract and revenue that may be derived from contracts for the use of Fryingpan-Arkansas project excess capacity or exchange contracts using Fryingpan-Arkansas project facilities’’ (43 USC 616 Section 9115(a)). The law goes on to state:

"Notwithstanding the reclamation laws, until the date on which the payments for the Arkansas Valley Conduit under paragraph (3) begin, any revenue that may be derived from contracts for the use of Fryingpan-Arkansas project excess capacity or exchange contracts using Fryingpan-Arkansas project facilities shall be credited towards payment of the actual cost of Ruedi Dam and Reservoir, the Fountain Valley Pipeline, and the South Outlet Works at Pueblo Dam and Reservoir plus interest in an amount determined in accordance with this section (43 USC 616 Section 9115(b)(2)(A)).

''Nothing in the Federal reclamation law (the Act of June 17, 1902 (32 Stat. 388, chapter 1093), and Acts supplemental to and amendatory of that Act (43 U.S.C. 371 et seq.) prohibits the concurrent crediting of revenue (with interest as provided under this section) towards payment of the Arkansas Valley Conduit as provided under this paragraph (43 USC 616 Section 9115(b)(2)(B)).

''Notwithstanding the reclamation laws, any revenue derived from contracts for the use of Fryingpan-Arkansas project excess capacity or exchange contracts using Fryingpan-Arkansas project facilities shall be credited towards payment of the actual cost of the Arkansas Valley Conduit plus interest in an amount determined in accordance with this section. ''(B) Any rates charged under this section for water for municipal, domestic, or industrial use or for the use of facilities for the storage or delivery of water shall be adjusted to reflect the estimated revenue derived from contracts for the use of Fryingpan-Arkansas project excess capacity or exchange contracts using Fryingpan-Arkansas project facilities'' (43 USC 616 Section 9115(b)(3)(B)).

Funding Implementation of the AVC

"In a bipartisan, bicameral letter to the Department of Interior, the members of Colorado's congressional delegation outlined the importance of supporting the conduit, which will bring clean drinking water to up to dozens of municipalities, towns, and water providers in the lower Arkansas valley. Recognizing the project's importance to residents of southern Colorado, the Obama administration has signed legislation committing to supporting a substantial share of the project, but the amount budgeted for fiscal year 2014 is far less than the project's cost."
--*Summit Business Journal*, August 12, 2013

Congress approved the AVC as part of the original authorizing legislation for the Fry-Ark Project in 1962. However, it was not constructed with the original project, primarily because AVC beneficiaries were unable to repay all construction costs as required in the original authorizing legislation. Congress amended the original Fry-Ark legislation in 2009 through Public Law 111-11, which authorized annual federal funding, as necessary, for construction of AVC, and included a cost-sharing plan with 65 percent federal funding and 35 percent reimbursement from other non-federal funding sources within 50 years. Federal funds cannot be used for the OM&R of the AVC and would be Southeastern's responsibility.

AVC shares many of the characteristics of Reclamation's rural water projects. In fact, some have suggested the rural water program as a potential funding source for AVC. While in the near term this program may not be a likely funding source given limited program funds and current demands, Reclamation's rural water project experience has taught the agency to design and build these projects in phases or increments to take advantage of funding as it becomes available. Reclamation recognized early in the rural water program that receiving full funding at the onset of project design and construction was unrealistic. Reclamation adapted to the incremental project funding by designing and building these projects in commensurate increments or phases. A similar approach could be used to complete construction of the AVC.

Reclamation recognizes the importance of this project to the communities it would serve, but cannot guarantee when federal funding will become available for construction of this project. Current constrained budgets, along with competing water infrastructure needs across the West, have made it difficult to fund new large-scale projects. However, Reclamation believes it is prudent to be in a position to take advantage of funding opportunities when they arise and acknowledges that potential funding opportunities can result from further coordination with other federal agencies, the State, and Southeastern. The exact nature of future funding possibilities for construction of the AVC cannot be predicted. In fact, Reclamation believes no federal agency forecasted the funding that became available under the American Recovery and Reinvestment Act of 2009, but those agencies with "shovel-ready" projects could capitalize on that opportunity to stimulate the economy by investing in the Nation's infrastructure. This Record of Decision helps make it possible for the AVC to make the most of any funding opportunities that become available, whether at the federal, State, or local level.

Summary

As has been the case for decades, surface and groundwater in Southeastern Colorado contains naturally occurring radium and uranium, as well as high salinity, selenium, sulfate, hardness, and manganese that exceeds water quality standards year-round. If communities improved water treatment to meet primary drinking water standards without federal funding, families could face paying $92 per month for water, tripling the current cost of drinking water. Adding to that burden, AVC-area communities are already in economically disadvantaged counties.

Right now, these same twelve communities are currently under Colorado Department of Health and Environment enforcement orders to remove cancer-causing radioactive contaminants from their drinking water or to find a better quality source of water.

By building the AVC project, Reclamation not only helps these communities implement a solution they have long worked together to achieve, but fulfills a commitment the federal government made decades ago. The AVC Comanche North Alternative is a sound solution. It is the most cost effective alternative, providing water quality solutions now and well into the future.

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Appendix A – Best Management Practices and Mitigation Measures

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Best Management Practices

Best management practices, as outlined in the Final EIS, are intended to avoid or reduce general construction-related effects while the preferred alternative is being implemented. Best management practices will be implemented either by construction contract documents between Reclamation and construction contractors, or by Reclamation contracts directly with participants.

Table A.1. Best Management Practices

Resource	Best Management Practices	Implementation Mechanism [(1)]
General	Construction activities will comply with all applicable laws and regulations.	Construction Contract Documents
	To the extent practicable, construction will avoid wetlands; federal, state, and local wildlife areas and refuges; designated critical habitats; migratory bird habitat during nesting brood-rearing season; known historic properties; hazardous material sites; and other resource sensitive areas noted below.	Construction Contract Documents
	Construction limits will be clearly marked with stakes or fencing before beginning ground disturbing activities. No disturbance will occur beyond these limits other than non-destructive protection measures for erosion/sediment control.	Construction Contract Documents
	Construction will typically occur during daylight hours, although these hours may be extended if needed for certain work aspects.	Construction Contract Documents
	Material and equipment storage will be only within well-defined, designated staging areas placed outside of wetlands and other sensitive areas.	Construction Contract Documents
	Structures affected by pipeline construction, including utilities, roads, highways, rivers, canals, railroads, agricultural irrigation facilities, fences, and other structures, will be replaced, repaired, or restored to current condition or better after construction.	Construction Contract Documents
	Construction debris will be hauled from the work site to a disposal location approved by the Contracting Officer or his/her representative.	Construction Contract Documents
Surface Water	Participants will continue voluntary commitment to operations of the Fry-Ark Project and other non-Fry-Ark water supplies in accordance with the Upper Arkansas Voluntary Flow Management Program.	Reclamation Contracting Process
	Participants will participate and comply with Southeastern's commitments in the Pueblo Flow Management Program, as outlined in the Six Party Intergovernmental Agreement.	Reclamation Contracting Process
Groundwater	Established groundwater monitoring wells will be avoided. However, if any monitoring wells will be inadvertently damaged or affected during construction they will be repaired and the Colorado Division of Water Resources, U.S. Geological Survey or other agency responsible for the well will be contacted.	Construction Contract Documents

Table A.1. Best Management Practices (continued)

Resource	Best Management Practices	Implementation Mechanism [1]
Water Quality	As part of the National Pollution Discharge Elimination System permitting requirement, a stormwater pollution prevention plan will be developed and approved by Reclamation and submitted to the Colorado Water Quality Control Division before commencing construction activities.	Construction Contract Documents
	The stormwater pollution prevention plan will include erosion control measures to prevent or reduce erosion, soil loss, and nonpoint source pollution. These practices may include, but are not limited to, silt fencing, filter fabric, sediment logs, hay bales, temporary sediment ponds, check dams, and/or immediate mulching of exposed areas to minimize sedimentation and turbidity effects as a result of construction activities. The placement and specific measures used will be dictated by site specific conditions. Erosion control measures will be inspected regularly and repaired as needed.	Construction Contract Documents
	In-stream flows will be maintained during stream crossing construction. Spoil, debris piling, construction materials, and any other obstructions will be removed from stream crossings to preserve normal water flow.	Construction Contract Documents
	Stream crossings will be routed, as practicable, to minimize disturbance.	Construction Contract Documents
	Intermittent streams will be crossed only during low-flow periods and preferably when streambeds are dry.	Construction Contract Documents
	Disturbed portions of stream banks and beds of rivers, streams, and other waterways will be protected by rock riprap of adequate size and type to minimize erosion and scour. Any slopes greater than 3:1 will be protected with erosion-control blankets after seeding.	Construction Contract Documents
Aquatic Life	To minimize effects on fisheries and stream habitat, any stream identified as a fishery, based on recommendations from the Division of Parks and Wildlife, that cannot be constructed as a trenchless crossing will be avoided during spawning periods and during high flow and crossed when flows are low.	Construction Contract Documents
	Identified potential habitat for state threatened, endangered, and special concern species will be avoided if feasible, especially for Arkansas darters in tributary streams.	Construction Contract Documents
	In-stream flows will be maintained during stream crossing construction. Water will be allowed to flow around or past stream crossings to preserve normal water flow downstream from construction.	Construction Contract Documents
Recreation	Construction will be timed to minimize effects and disruption to parks and trails during the peak recreation season (May through September) where feasible.	Construction Contract Documents

Table A.1. Best Management Practices (continued)

Resource	Best Management Practices	Implementation Mechanism [1]
Wetlands and Riparian Areas	Permanent and temporary effects on jurisdictional wetlands will be avoided to the extent practicable in compliance with Section 404 of the Clean Water Act.	Construction Contract Documents
	Identified perennial river or stream crossings will be performed by trenchless construction operations, which will not disturb the stream channel or the adjacent wetlands.	Construction Contract Documents
	Erosion control measures will be employed as appropriate and at stream crossings before construction activities. In addition: • Preserve, if feasible, existing trees along the stream bank • Stabilize, control erosion, restore, and re-vegetate streambeds and embankments as soon as a stream crossing is completed, following vegetation best management practices, and maintain until stable • Replant riparian, as necessary, woody shrubs and trees appropriate to ecological characteristics of the site to preserve watercourse shading characteristics and the aesthetic nature of the stream bank	Construction Contract Documents
	Any equipment used previously in a water body or wetland will be disinfected to prevent the spread of invasive aquatic species. Disinfection methods will follow the Corps Section 404 requirements.	Construction Contract Documents
	Where open trench crossing of stream is required, the stream channel will be reestablished following pipe installation.	Construction Contract Documents
	All temporarily disturbed jurisdictional and non-jurisdictional wetlands and riparian areas will be reestablished following construction by doing the following: • Restore contours to previous elevations • Compact trenches sufficiently to prevent drainage along the trench or via bottom seepage • Salvage and replace topsoil • Backfill in such a manner as to not drain wetland or stream • Reestablish wetlands to similar type of wetland and wetland function • Monitor for success of reestablishment annually for a period of 3 years and take remedial actions as necessary until successful	Construction Contract Documents
	Permanent and temporary effects on wetlands and riparian areas will be avoided to the extent practicable in compliance with Section 404 of the Clean Water Act.	Construction Contract Documents

Table A.1. Best Management Practices (continued)

Resource	Best Management Practices	Implementation Mechanism [1]
Vegetation	Sensitive vegetation communities, native prairie, or areas with sensitive plant species will be avoided to the extent possible. However, if these areas are disturbed during pipeline construction, topsoil will be replaced and re-vegetation plans will be specifically designed to reestablish a similar type and quality of native vegetation. Monitor for success of reestablishment annually for a period of 3 years and take remedial actions as necessary until successful.	Construction Contract Documents
	Vegetated areas temporarily disturbed by construction (except cropland) will be revegetated with species appropriate to the surrounding area's ecological conditions of, and in a manner that prevents erosion and noxious weed invasion. Revegetation will occur as soon as practicable after construction and will follow all pertinent local and state regulations. Temporary seeding may be required when areas remain disturbed for more than 30 days.	Construction Contract Documents
	All areas with existing landscape cover or mulch will be replaced with similar size and type of cover materials. A turf seed mix will be used for established lawns.	Construction Contract Documents
	Topsoil will be removed and stockpiled separately from surface soils for reapplication following construction.	Construction Contract Documents
	Topsoil, soil amendments, fertilizers, and mulches will be reapplied selectively, as appropriate, before revegetation during favorable plant establishment climate conditions to match site conditions and revegetation goals.	Construction Contract Documents
	Revegetation will be found to be successful with a cover of local native species obtains 90% cover and will be monitored for a minimum of 3 years following reseeding. Areas will be reseeded as necessary.	Construction Contract Documents

	To prevent introducing, and minimizing spread of, nonnative vegetation and noxious weeds, the following measures will be implemented during construction: • Survey noxious weed within a year before construction to establish type, size, and location of noxious weed populations. • Minimize soil disturbance. • Pressure wash and/or steam clean construction equipment before entering construction zones from off-site locations and before moving from an infested site to a non-infested site within the construction zone. • Cover haul trucks bringing fill materials to prevent seed transport. • Park vehicles and equipment only in construction sites or approved staging areas. • Survey staging areas for noxious weeds and treat appropriately before use. • Use fill, rock, and topsoil that is weed-free. • Minimize fertilizer in seeded areas. • Use certified weed-free seed and mulch. • Use weed-free straw bales for erosion control. • Monitor and follow-up on treatment of exotic vegetation after construction. • Follow Colorado Department of Agriculture and US Department of Agriculture Noxious Weed Management Guidelines as well as applicable local regulations. • A weed management and control plan will be drafted and approved by Reclamation prior to disturbance of vegetation.	Construction Contract Documents

Table A.1. Best Management Practices (continued)

Resource	Best Management Practices	Implementation Mechanism [(1)]
Wildlife	Identified potential habitat for federal or state threatened, endangered, and sensitive species will be avoided if feasible.	Construction Contract Documents
	Construction will be prohibited within ½ mile of designated piping plover or Interior least tern breeding areas during the breeding season (April 15 through August 31) when these species are present.	Construction Contract Documents
	If threatened or endangered species are identified and encountered during construction, all ground-disturbing activities in the immediate area will be stopped to consult with the U.S. Fish and Wildlife Service and determine appropriate steps to avoid affecting the species.	Construction Contract Documents
	Effects on migratory birds will be avoided and minimized by implementing a Migratory Bird Management Plan. The management plan will include a number of measures, including removal of vegetation before migratory bird breeding season (which is typically between April 1 and August 15 in Colorado) or conducting clearance surveys immediately before construction. A Migratory Bird Management Plan will be developed.	Construction Contract Documents
	Seasonal Restrictions and Buffer Zones for Raptors. Avoidance and mitigation options for nesting raptors sites consists of: 1) conducting nest surveys before construction, 2) establishing reasonable site-specific buffers and seasonal restrictions, 3) implementing seasonal restrictions to avoid and minimize disturbance, and 4) removing inactive nests from the construction footprints or other areas of long-term effects.	Construction Contract Documents
Noise and Vibration	Construction and operation activities will comply with state and local noise ordinances.	Construction Contract Documents
	Night construction will be avoided near residential and populated areas.	Construction Contract Documents
Visual Resources	As noted for vegetation, short-term disturbances associated with constructing facilities will be revegetated and/or landscaped with Colorado native species.	Construction Contract Documents
	Existing topographic grades will be restored following pipeline excavation.	Construction Contract Documents
	Constructed structures, facilities, and features will be designed to blend with the architectural characteristics of surrounding structures. Local agencies will be invited to participate in the Environmental Review Team to coordinate design of aboveground structures, facilities, and features.	Construction Contract Documents
	Valve boxes will be left above grade in a cultivated field if agreeable to the landowner, or moved to the nearest fence or right-of-way. Valves will not be located adjacent to or in close proximity to a paved or graveled road and will be painted a neutral color that blends with the background, reduces visibility, and maintains the viewshed.	Construction Contract Documents
	Construction lighting during night work will be directed downward onto the construction activity to minimize effects near occupied homes and businesses, and to the night sky.	Construction Contract Documents

Table A.1. Best Management Practices (continued)

Resource	Best Management Practices	Implementation Mechanism [(1)]
Traffic	Residents and business will be notified in advance of planned interruptions to utility services; any utility disruptions will typically be limited to less than 1 day or less	Construction Contract Documents
	Crossings of interstate or divided highways and railroads will be performed by trenchless construction methods, which will not disturb or interrupt traffic.	Construction Contract Documents
	Night work will be considered at select locations to minimize traffic effects, where work could be performed without affecting nearby residences;	Construction Contract Documents
	Boring under highways and major collector streets; or construction within existing rights-of-way or easements part of or adjacent to roadways will also be used to reduce effects on traffic.	Construction Contract Documents
	No more than two city blocks will be unavailable for general traffic at any time.	Construction Contract Documents
	Construction contractors will coordinate with the Colorado Department of Transportation, county, and local jurisdictions on traffic plans, lane closures, and detours.	Construction Contract Documents
Socio-economics	Landowners will be compensated for crop damage and hay loss caused by construction activities.	Reclamation Contracting Process
	Structures damaged or disturbed during construction will be repaired, replaced, or the landowners compensated.	Construction Contract Documents
Cultural Resources	Direct disturbance to historical properties will be avoided to the extent feasible and in accordance with the Section 106 programmatic agreement.	Construction Contract Documents
	Previously disturbed utility rights-of-way will be used for placement of pipelines and facilities, where feasible, to diminish the probability of encountering any undisturbed historical properties.	Construction Contract Documents
	All known burials or cemeteries will be avoided to the extent possible. If a burial or cemetery cannot be avoided or is encountered during construction, Reclamation will comply with the Native American Graves Protection and Repatriation Act if graves are discovered on Federal or trust lands or within reservation boundaries. If on state or private land, Reclamation will comply with the State unmarked burial law and the Section 106 programmatic agreement.	Construction Contract Documents
	If unrecorded cultural resources or traditional cultural properties are encountered during construction, all ground disturbance activity within the area will be stopped, Reclamation and appropriate authorities will be notified, and all applicable stipulations of the Section 106 programmatic agreement will be followed. Activities in the area will resume only when compliance has been completed.	Construction Contract Documents
	All appropriate cultural resource compliance activities will be completed in accordance with the Section 106 programmatic agreement.	Construction Contract Documents

Table A.1. Best Management Practices (continued)

Resource	Best Management Practices	Implementation Mechanism [(1)]
Air Quality	A fugitive dust control plan will be developed and implemented to minimize particulate and dust emissions from the construction site.	Construction Contract Documents
	Construction equipment/vehicles will not be allowed to idle longer than 15 minutes when not in use.	Construction Contract Documents
	All construction equipment will be maintained in proper working order.	Construction Contract Documents
Floodplains	No structures will be constructed that will raise flood water surface elevations.	Construction Contract Documents
Hazardous Materials	A Hazardous Spill Plan or Spill Prevention, Control and Countermeasures Plan, whichever is appropriate, will be in place, stating what actions will be taken in the event of a spill, notification measures, and preventive measures to be implemented, such as the placement of refueling facilities, storage, and handling of hazardous materials.	Construction Contract Documents
	All equipment will be maintained in a clean and well-functioning operating condition to avoid or minimize contamination from automotive fluids. All equipment will be checked daily and any leaks will be immediately repaired on discovery. Oil, hydraulic fluids, antifreeze or other chemicals will not be drained to the ground.	Construction Contract Documents
	Before construction, a more detailed hazardous materials assessment in conformance with the scope and limitations of American Society for Testing Materials (ASTM) 1527-05: "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" will be conducted to identify sites with soil and/or groundwater contamination not documented in readily ascertainable agency files.	Construction Contract Documents
	Any known solid waste disposal areas identified in the construction sites will be avoided or removed and properly disposed at a permitted solid waste disposal facility	Construction Contract Documents
	Equipment or vehicles will not be refueled within 100 feet of rivers, streams, or identified wetlands. If on-site fuel tanks are used, approved containment devices will be required.	Construction Contract Documents
	Identified evidence of hazardous materials, petroleum product spills, or other contamination will be avoided or excavated and properly disposed at a permitted waste disposal facility.	Construction Contract Documents
	If soil and/or groundwater contamination is encountered during construction, mitigation procedures will be implemented to minimize the risk to construction workers and to future operations.	Construction Contract Documents
Unique and Prime Farmland/ Agricultural Lands	To the extent feasible, construction activities on irrigated lands will be avoided during the growing season.	Construction Contract Documents
	Cropland disturbed by construction will be restored with topsoil to the depth, quality, grade, and relative density, as the original surface. Pipelines crossing agricultural fields will be backfilled and compacted to prevent settling when the field is irrigated.	Construction Contract Documents

	Long-term effects on prime and unique farmland will be avoided to the extent feasible. If avoidance is not possible, Reclamation will complete and submit a Farmland Conversion Form (AD-1006) to the Natural Resources Conservation Service in compliance with the Farmland Protection Policy Act for any long-term change in land use.	Construction Contract Documents

Notes:
(1) Construction Contract Documents include design drawings and construction specifications that will be implemented by the contractor. The Reclamation Contracting Process includes measures that Reclamation will address directly.

Mitigation Measures

Mitigation measures are methods or plans to reduce, offset, or eliminate adverse effects. Mitigation could include one or more of the following:

- Avoiding effects.
- Minimizing effects by limiting the degree or magnitude of an action.
- Rectifying effects by restoration, rehabilitation, or repair of the affected environment.
- Reducing or eliminating effects over time.
- Compensating for the effect by replacing or providing substitute resources or environments to offset the loss.

Reclamation will be responsible for implementing the following mitigation commitments as part of the Comanche North Alternative. Other participants or agencies may also have a role in accomplishing these commitments.

- Reclamation will limit excess capacity contract operations when streamflow is less than 50 cfs, as measured by adding streamflow at the Arkansas River above Pueblo gage to fish hatchery return flows from the current hatchery discharge point, to mitigate moderate effects of occasional low streamflow immediately below Pueblo Reservoir, and the effects of this low streamflow on water quality and aquatic life.
- Reclamation will provide coordination assistance with participants in managing storage and water releases in a manner that will assist in augmenting occasional moderate low streamflow effects in the Arkansas River downstream from Pueblo Reservoir to the Fountain Creek confluence. Reclamation will not modify operations that would impact Fry-Ark Project yield.
- Reclamation will provide $50,000 for habitat improvements downstream from Pueblo Reservoir to mitigate moderate streamflow effects and minor aquatic life effects of the Comanche North Alternative during low-flow periods in the Arkansas River. Design and location of improvements will be coordinated between Reclamation and Colorado Parks and Wildlife, including site-specific NEPA compliance.
- To mitigate moderate reservoir effects in the Lower Arkansas River Basin on aquatic life, Reclamation will support expansion of the Pueblo Fish Hatchery near the existing Pueblo Fish Hatchery, if requested and deemed feasible by Colorado Parks and Wildlife, in conjunction with mitigation requirements set forth in the Southern Delivery System EIS and Fish and Wildlife Mitigation Plan. Hatchery expansion will occur through a

mutually acceptable agreement between Colorado Parks and Wildlife and Reclamation, and the location of the expansion and site-specific NEPA compliance will be coordinated between Reclamation and Colorado Parks and Wildlife. The State will be responsible for construction, operation, and maintenance of fish production ponds and associated facilities. This includes providing all water necessary for these ponds, including, but not limited to, water for filling the ponds, and augmenting evaporation from the ponds, in accordance with Colorado state law.

- Effects on jurisdictional wetlands and waters of the U.S. will require authorization from the Corps. A compensatory mitigation plan may be required for the loss of any wetlands and will include methods to replace specific functions of affected wetlands. Any permanent loss of non-jurisdictional wetlands will be replaced.
- Before construction, rare plant surveys will be conducted during the appropriate flowering period in areas with potential habitat for state plant species of concern. If a plant species of concern population is found, construction activities may be shifted slightly, where practicable, to avoid plant species of concern. If not practicable, a plan detailing measures and methods to restore habitat or transplant species will be implemented. This plan will include measures appropriate for specific rare plant species and site conditions based on methods developed by the Rare Plant Initiative, Colorado Natural Heritage Program, and other experts.
- A Fish and Wildlife Coordination Act Report will be prepared in coordination with the U.S. Fish and Wildlife Service and Colorado Parks and Wildlife before implementing the Comanche North Alternative.
- Preconstruction surveys by trained observers will identify sensitive habitats and wildlife use before construction to allow implementing best management practices, temporal and spatial restrictions, and implementation of a migratory bird management plan. Pipelines, water treatment plants, and pump station facilities will be realigned during final design, where feasible, to avoid sensitive wildlife habitat.
- Open space areas and parks affected by construction activities will remain open to the extent feasible with consideration for public safety. Safe, reasonable, and short-term detours around construction areas will be created to minimize effects on park or trail users. Limitations in public access will be restored as quickly as possible.
- Planned construction or maintenance activities will be advertised in advance to minimize inconvenience to land owners and recreation activities.
- Traffic delays or detours from construction activities will be announced in advance of work to minimize disruption in traffic patterns. Residential, business, and emergency vehicles access will be maintained at all times. Incentives and disincentives will be offered to construction contractors to expedite completion in areas where traffic effects will be greatest.
- Construction traffic will be routed away from noise-sensitive streets, where feasible. Noisy operations will be conducted during the same time period, since combined noise levels will not be significantly greater than the level produced if the operations were performed separately.
- Construction methods with the minimum vibratory disturbance will be used near sensitive structures. Vibration monitors will be placed near sensitive structures to monitor and correct potential effects.

- When final engineering is complete, Reclamation will meet with Pueblo County to enter into an agreement to address specific construction effects in accordance with best management practices and mitigation measures in this Record of Decision.
- Compliance with Section 106 of the National Historic Preservation Act will be completed in accordance with the programmatic agreement.