Chapter 2. Alternatives

This chapter describes the two alternatives—the No Action Alternative and the Proposed Action. Section 2.3 describes alternatives that were considered but eliminated from further detailed analysis. The potential environmental effects of the two alternatives are summarized in Section 2.4. The Proposed Action is Reclamation's Preferred Alternative.

2.1 No Action Alternative

The No Action Alternative represents a projection of current conditions to the most reasonable future responses or conditions that could occur during the life of the project without any action alternatives being implemented. Because reasonably foreseeable future actions may be implemented regardless of which alternative is chosen, the No Action Alternative is not considered to be the same as the existing condition of the affected environment. Therefore, the No Action Alternative is often described as "the future without the long-term miscellaneous purposes contract" (Reclamation 2000).

For FEIS analysis purposes, it is assumed in the No Action Alternative that Reclamation would neither renew the existing short-term miscellaneous purposes contract when it expires in 2009, nor enter into a long-term miscellaneous purposes contract (Table 2). The agencies considered renewing the existing short-term contract multiple times as an alternative to the Proposed Action (see Section 2.3.1).

Under the No Action Alternative, the NMISC would continue using the existing short-term miscellaneous purposes contract for delivery of Project water either leased or allotted to NMISC-owned lands to the state line until it expires in 2009. CID would not release Project water to the state line after the existing short-term contract expires in 2009.

When the FEIS analysis began, the NMISC owned 164 acres in CID, and had the right to use 713 acre-feet of water in a full allotment year (3.697 acre-feet/acre with 1.176 factor for off-farm delivery losses not incurred). NMISC is acquiring land and associated water rights in the CID as part of the Settlement Agreement. For purposes of analysis, it

Table 2. Summary of the No Action Alternative and Proposed Action.

Component	No Action Alternative	Proposed Action (Most Likely)	Proposed Action (Possible Range)
Miscellaneous Purposes Contract	Short-term contract through 2009; no contract after 2009	New long-term contract beginning in 2006 for 40 years	—
Opportunity for NMISC to lease water and fallow land in CID	No water leases Fallowing of 164 acres owned by NMISC	Leasing water and fallowing of 3,416[1] acres and 164 acres owned by NMISC	Leasing water and fallowing of 0 to 11,336 acres and 164 acres owned by NMISC
Project water (acre-feet)	None	5,170[2] acre-feet (with transmission loss adjustments, total release would be 6,080 acre-feet)	0 to 50,000 acre-feet, less any leased water allotted to land subsequently fallowed
Avalon Dam releases	No releases for state line deliveries; water would be stored or used for irrigating 164 acres	Up to 21,600[3] acre-feet per year in full allotment years.	0 to 50,000 acre-feet per year
Likelihood of priority call	Considerably higher risk	Considerably lower risk	Considerably lower risk

[1]Average land fallowed associated with NMISC's water leases from 1992 to 2004

[2]Average undelivered allotment leases from 1992 to 2003

[3]Water appurtenant to 3,580 acres of fallowed land plus other leased water, in years with full allotment

is assumed that the NMISC currently owns 164 acres in the CID. The effects of acquiring additional land and water rights as part of the Settlement Agreement are discussed under cumulative effects in Chapter 4.

If Project water appurtenant to land owned by NMISC is not released for state line delivery, it may be left in storage, where it might contribute to future conservation or flood control spills. (A conservation spill is a release of Project water from Avalon Dam to the Pecos River when total Carlsbad Project storage is exceeded.) The likelihood of such a small volume of water being solely responsible for a conservation spill would be low. Without an ability to effectively deliver water to the state line, the NMISC would likely cease all water leasing from CID members. In all irrigated areas within the CID, some water returns to the river via return flows from irrigated fields or via ground water replenishment and discharge to the river. With current CID irrigation practices, return flow to the river from irrigation is about half the same amount of water if directly released from Avalon Dam.

In attempting to comply with the Compact without a long-term miscellaneous purposes contract, the New Mexico State Engineer is more likely to be forced to issue a priority call. The priority call would be issued to avoid an imminent shortfall, or to correct a net shortfall in accordance with the Pecos River Master's approved plan. The New Mexico State Engineer, not the NMISC, has the direct authority to issue a priority call. The likelihood of a priority call would be considerably greater with the No Action Alternative than with the Proposed Action (Table 2).

2.2 Proposed Action

The Proposed Action (also Reclamation's Preferred Alternative) analyzed in this FEIS is Reclamation's execution of a long-term miscellaneous purposes contract with the CID, and review of any related separate third-party contracts between the CID and the NMISC. The long-term miscellaneous purposes contract would allow the NMISC to use Project water for purposes other than irrigation for a period of 40 years. Water allotted to land within the CID boundaries either leased from other CID members or allotted to NMISC-owned lands would be used for state line delivery (Table 2). In addition to using Project water appurtenant to NMISC-owned lands for state line deliveries, at least two types of water might be leased by NMISC for the same purpose: "fallowed land water," which is allotted to lands fallowed by other CID members in an irrigation season, and "undelivered allotment water," which is Project water allotted to lands within CID, but not delivered to farms by October 31 of a given year. Undelivered allotment water is determined near the end of the irrigation season and is based on total project supply.

The long-term miscellaneous purposes contract would replace an existing short-term miscellaneous purposes contract (which allows the same uses of Project water under a 5-year term). The proposed long-term miscellaneous purposes contract would be executed in 2006, have a term of 40 years, and would limit NMISC to the use of no more than 50,000 acre-feet per year of Project water. Any related third-party contracts that Reclamation would review would be executed throughout the term of the long-term miscellaneous purposes contract, not to exceed the term of the long-term miscellaneous purposes contract.

The Proposed Action would allow for the continued release from Avalon Dam of water allotted to NMISC's currently owned lands within the CID (164 acres) and any new lands within the CID acquired by NMISC, as well as any annual leases of water in the CID. For analysis purposes, it is assumed that 3,580 acres of CID lands would be fallowed as a result of water leases or water right ownership over the next 40 years (164 acres currently owned by NMISC, plus the average of 3,416 acres fallowed as a result of water being leased from other CID members). Total fallowed land, 3,580 acres, is the amount of land fallowed by NMISC water leasing in 1999, and representative of past land fallowing (Table 3).

Based on the average of leases from 1992 to 2004, it is assumed that an additional 5,170 acre-feet of Project water would be leased for delivery to the state line (5,170 acre-feet of leased Project water plus adjustments for unrealized transmission losses would result in releases of 6,080 acre-feet). In years with a full allotment, state line delivery of Project water either from water leases or water allotted to NMISC-owned lands would total about 21,600 acre-feet per year. Actual leases and water releases would continue to vary from year to year. For example, total amounts of Project water leases have varied from 5,600 acre-feet in 2003 to 44,800 acre-feet in 1997. Similarly, the amount of land fallowed due to leasing or water right ownership has varied from 0 acres in 2004 to 5,133 acres in 1993. Such variation would continue with the Proposed Action.

Maintenance of the fallowed land would be the responsibility of the lessee from whom water is leased. The ability for NMISC to enter into lease agreements would continue to depend on a CID Board decision that determines whether supplies are sufficient to allow for water leases, followed by willing lessors entering into an agreement to participate in NMISC's leasing program.

Table 3. NMISC's leases and land fallowing.

Year	Land Fallowed in CID (acres)	Fallowed Land Water Leased (acre-feet)	Undelivered Allotment Water Leased (acre-feet)	Excess Allotment Water Leased (acre-feet) †	Total Project Water Leased (acre-feet)
1992	3,370	11,800	3,300	0	15,100
1993	5,133	18,000	0	0	18,000
1994	4,332	17,800	0	0	17,800
1995	4,026	16,600	0	0	16,600
1996	4,233	14,900	0	8,300	23,200
1997	2,867	11,800	21,800	11,200	44,800
1998	2,524	10,400	10,700	0	21,100
1999	3,580	14,700	0	700	15,400
2000	4,038	14,700	0	0	14,700
2001	0	0	6,900	0	6,900
2002	1,690	2,600	4,200	0	6,800
2003	0	0	5,600	0	5,600
2004	0	0	25,900	0	25,900

Source: On file with the NMISC.
Water volumes rounded to the nearest 100 acre-feet.
†Excess allotment leases are unlikely to occur in the future.

The long-term miscellaneous purposes contract would allow release of up to 50,000 acre-feet of water per year from Avalon Dam to the Pecos River. Such releases would be limited to 600 cfs, as are current releases, due to a low-flow culvert downstream of Avalon Dam. Use of up to 50,000 acre-feet of water for miscellaneous purposes would require NMISC to enter into either fallowed land water leases or undelivered allotment water leases. If all 50,000 acre-feet were comprised of fallowed land water leases, NMISC would need to fallow 11,336 acres in addition to the 164 acres they own (at a full allotment of 3.697 acre-feet per acre) to get 50,000 acre-feet for state line delivery. Although fallowing of 11,500 acres is the maximum amount possible, it is unlikely that 11,336 acres would be available to meet the NMISC's need. Since leasing began in 1992, the maximum amount of land fallowed by NMISC as a result of water leases was 5,133 acres. The possible range of NMISC leases shown in the "Proposed Action—Possible Range" column of Table 2 is discussed qualitatively in the effects section of Chapter 3.

As discussed in the *No Action Alternative* section, the New Mexico State Engineer is more likely to be forced to issue a priority call. The priority call would be issued to correct a net shortfall in accordance with a Pecos River Master's approved plan or in response to a valid call by a senior water right owner. The likelihood of a priority call would be considerably less with the Proposed Action than with the No Action Alternative (Table 2).

2.3 Alternatives Considered but Eliminated from Detailed Analysis

Based on comments and suggestions received during scoping, the lead agencies considered several alternatives to a long-term miscellaneous purposes contract, but eliminated them from detailed analysis. The alternatives considered but eliminated and the reasons for their elimination are described below.

2.3.1 A Series of Short-term Miscellaneous Purposes Contracts

The proposed long-term miscellaneous purposes contract would have a term of 40 years. The lead agencies considered using a series of short-term miscellaneous purposes contracts in a series instead of one long-term miscellaneous purposes contract. The existing short-term miscellaneous purposes contract was renewed for another 5-year period in 2004. It will expire in 2009.

The lead agencies eliminated the alternative of a series of a series of short-term miscellaneous purposes contracts from detailed analysis because it would not fulfill the project purpose and need of long-term Compact compliance. Each contract renewal would be limited to a 5-year term, with no assurance of future renewal. A 5-year miscellaneous purposes contract would not provide the NMISC with adequate assurance that it could meet state line delivery requirements over time for the State's goal of maintaining long-term Compact compliance. In addition, a series of short-term miscellaneous purposes contracts would have the same environmental effects as a long-term miscellaneous purposes contract if a short-term miscellaneous purposes contract is renewed every 5 years for a total of 40 years.

2.3.2 25-Year Contract Term Length

The proposed long-term miscellaneous purposes contract would have a term of 40 years. The lead agencies considered a contract term of 25 years instead of 40 years. The lead agencies eliminated this from detailed analysis because it would not fulfill the project purpose and need of long-term Compact compliance. Like a series of 5-year miscellaneous purposes contracts, a 25-year contract would not provide the NMISC with adequate assurance that it could meet state line delivery requirements over time for the State's goal of maintaining long-term Compact compliance. In addition, a 25-year contract would have the same environmental effects as a 40-year contract but for a shorter period.

2.3.3 Priority Call

During scoping, the alternative of issuing a priority call of junior water rights was suggested. A priority call would not meet the purpose and need for the FEIS. A priority call would be a New Mexico State Engineer action, not a Federal action, and therefore would not be an alternative to the proposed Federal action–Reclamation's execution of a long-term miscellaneous purposes contract and review of any related third-party contracts. Reclamation has no authority to implement a priority call. Therefore, a priority call is not a reasonable alternative to the Proposed Action of this FEIS and was eliminated from further analysis.

2.4 Comparison of Effects of Alternatives

2.4.1 Direct and Indirect Effects

A comparison of direct and indirect effects for the two alternatives for all resources and resource indicators is presented in Table 4. Additional

details of the affected environment and effects are in Chapter 3.

2.4.2 Cumulative Effects

Cumulative effects of eight reasonably foreseeable independent actions were analyzed. Reasonably foreseeable actions analyzed in this FEIS are those future actions and activities independent of the Proposed Action that could result in cumulative effects when combined with the effects of the Proposed Action. These activities are anticipated to occur regardless of which alternative is selected. The reasonably foreseeable actions evaluated in this FEIS are: the Pecos River Settlement Agreement, NMOSE's Active Water Resource Management, actions analyzed in the Carlsbad Project Water Operations and Water Supply Conservation EIS, Vegetation Management Projects, Brantley and Avalon Reservoirs Resource Management Plan, the Malaga Bend Salinity Alleviation Project, NMISC's Water Resources Conservation Project, and the Calloway Culvert Reconstruction. None of these actions would result in cumulative impacts to cultural resources. Other cumulative impacts are summarized in Table 5, and additional details are provided in Chapter 4.

Table 4. Comparison of direct and indirect effects.

Resource and Indicator	Existing Conditions	No Action Alternative		Proposed Action
		Until 2009	After 2009	
Hydrology				
Pecos River flows below Avalon Dam	No flow about 88 percent of the time (321 days/year)	Same as existing conditions	Decrease from existing conditions by up to 21,600 acre-feet per year in full allotment years; flow of 600 cfs exceeded up to 18 fewer days each year	After 2009, an increase of up to 21,600 acre-feet per year in full allotment years; Flows of 600 cfs exceeded up to 18 more days than the No Action Alternative; potential for increase to 50,000 acre-feet
Pecos River flows at Red Bluff gauge	River is rarely, if ever, dry due to base inflows from Carlsbad Basin aquifers. Flows are 200 cfs or more 10% of the time.	Same as existing conditions	Decrease from existing conditions; flow of 600 cfs exceeded up to 18 fewer days each year	After 2009, flow of 600 cfs exceeded up to 18 more days than the No Action Alternative
Flows in CID Main Canal and changes to Project efficiency	Diversions based on allotment and delivery to about 18,000 irrigated acres. CID assumes average transmission losses from Avalon Dam to farm headgate is 35% of farm delivery.	Same as existing conditions	Slight increase in CID Main Canal flows and slight increase in Project efficiency, as currently fallowed lands are returned to irrigation	After 2009, slightly lower CID Main Canal flows and Project efficiency compared to the No Action Alternative
Base inflows to the Pecos River	Average base inflows of about 26,500 acre-feet/yr. Base inflows are affected by irrigation return flows, which are in turn a function of allotment, crop type, precipitation.	Same as existing conditions	Increase in Pecos River base inflows (about 5,000 acre-feet per year), due to fallowed lands being returned to irrigation	After 2009, less Pecos River base inflows (about 5,000 acre-feet per year) compared to the No Action Alternative
Water Quality	Salinity in Pecos River range from 3,900 µS/cm below Dark Canyon to 9,200 µS/cm at Pierce Canyon Crossing.	Same as existing conditions	• Pecos River below Dark Canyon, reduction in salinity (-1,000 µS/cm) • Pecos River near Malaga, increase in salinity (+1,200 µS/cm), • Near Pierce Canyon Crossing, increase in salinity (+3,400 µS/cm) • Red Bluff gauge, increase in salinity (+4,600 µS/cm)	• Pecos River below Dark Canyon, slight increase in salinity (+100 µS/cm) • Pecos River near Malaga, decrease in salinity (-100 µS/cm) • Near Pierce Canyon Crossing, decrease in salinity (-100 µS/cm) • Red Bluff gauge, not enough data to estimate changes. • With a potential maximum 50,000 acre-feet annual release, salinity would decrease by up to 800 µS/cm.

Table 4. Comparison of direct and indirect effects (cont'd).

Resource and Indicator	Existing Conditions	No Action Alternative		Proposed Action
		Until 2009	After 2009	
Geomorphology	Stable river channel, typically armored by thick stands of salt cedar. Channel degradation due primarily to downcutting	Same as existing conditions	Reduction in capacity for sediment transport, particularly below Avalon Dam	No change in existing conditions. Compared to the No Action Alternative after 2009, slightly higher capacity for sediment transport.
Wetlands	Three types of wetlands exist within the analysis area, primarily within the Pecos River floodplain	No change from existing conditions; maximum possible release may support additional wetlands	Increased irrigation return flows may increase wetlands within and along the Pecos River channel below CID; wetlands directly below Avalon Dam may decrease slightly.	No change from existing conditions. Compared to the No Action Alternative after 2009, wetlands within and along the Pecos River channel below CID may be less; wetlands directly below Avalon Dam may be more; maximum possible release may support additional wetlands.
Vegetation	Three vegetation communities exist within the analysis area with riparian scrubland along the Pecos River corridor	No change from existing conditions; maximum possible release may support additional riparian vegetation	Emergent annual vegetation in riparian areas below CID may increase with increased irrigation return flow; riparian vegetation directly below Avalon Dam may decrease slightly.	No change from existing conditions. Compared to the No Action Alternative after 2009, emergent annual vegetation in riparian areas below CID would be less; riparian vegetation directly below Avalon Dam would be more; maximum possible release may support additional riparian vegetation.
Wildlife	Different types and densities of wildlife exist within the three vegetation communities within the analysis area	No effect	No effect	No effect
Threatened and Endangered Species	Various listed species exist within Eddy County. Table 11 in Section 3.8 lists the species potentially in the analysis area	No effect	No effect	No effect
Cultural Resources	Portions of the Carlsbad Project are designated as the Carlsbad Irrigation District National Historic Landmark	No effect	No effect	No effect

Table 4. Comparison of direct and indirect effects (cont'd).

Resource and Indicator	Existing Conditions	No Action Alternative		Proposed Action
		Until 2009	After 2009	
Socioeconomic				
Crop Production	Irrigated crops in Eddy county total 45,489 acres; for Chaves county total 69,789 acres. CID average cropped acres is 18,044	No change from existing conditions	Net increase in irrigated crops (3,416 acres) and increase in annual crop revenue of $492,000	$492,000 less annual crop revenue compared to the No Action Alternative after 2009; potential for decrease in irrigated crops
Regional Economy	Total annual earnings (1999) for Chaves and Eddy County of about $771 and $699 million respectively; average per capita 2001 income of $22,637 in Eddy County and $20,769 in Chaves County. Water lease revenue is $1.4 million. 2003 unemployment rate in Eddy and Chaves County 7 to 8%	No change from existing conditions	Decrease in total value added of up to $3.3 million over a 20-year period; decrease in gross value of up to $5.8 million Considerably higher risk of priority call and associated adverse economic impacts ($59.6 million in single-year costs); lower employment, income, taxes and value added	Compared to the No Action Alternative after 2009, considerably lower risk of priority call; similar to existing conditions and the No Action Alternative through 2009 in years without a priority call
Social Effects	Total population of Chaves and Eddy county is 111,316 people (2002). Population is concentrated in urban areas. Ethnic diversity is about 74% white and 26% non-white/Hispanic	No change from existing conditions	In years where a priority call would be necessary, agricultural community resources would be adversely affected No significant change in other years	Compared to the No Action Alternative, agricultural community resources are considerably less likely to be affected by priority call; similar to existing conditions and the No Action Alternative through 2009 in years without a priority call
Recreation	River recreation below Avalon Dam occurs at low levels; reservoir recreation occurs at Tansill Lake, which supports seasonal recreation levels of up to 15,000 people	No change from existing conditions	Recreational opportunity in Pecos River channel below Avalon Dam and at Tansill Lake slightly reduced	No change from existing conditions; after 2009, slightly more recreational opportunity in Pecos River channel below Avalon Dam and at Tansill Lake compared to the No Action Alternative
Land Use	Agriculture, recreation, wildlife habitat, mineral/oil and gas extraction are existing land uses	No change from existing conditions	Increase in irrigated land (3,416 acres) and decrease in fallowed land	No change from existing conditions; less irrigated land and potential for additional fallowed land compared to the No Action Alternative
Soils	Existing fallowed land (3,416 acres on average) subject to higher erosion and weed invasions	No change in prime farmland, erosion or weeds	Increase in prime farmland (up to 3,416 acres); decrease in water and wind erosion and noxious weeds	No change in prime farmland, erosion or weeds; less prime farmland and greater potential for increased erosion and weeds compared to the No Action Alternative

Table 5. Summary of cumulative effects.

Resource/Resource Indicator	Reasonably Foreseeable Action	Impact in Conjunction with Proposed Action
Hydrology		
Pecos River flows below Avalon Dam	Pecos River Settlement Agreement	Net increase in Pecos River flow
	Calloway Culvert Reconstruction	Net increase in release volume (culvert capacity to double); net decrease in number of days of releases from Avalon Dam
	Active Water Resource Management	No net change when in conjunction with Settlement Agreement
Pecos River flows at Red Bluff gauge	Pecos River Settlement Agreement	Net increase in Pecos River flow volume
	Calloway Culvert Reconstruction	Net increase in release volume (culvert capacity to double); net decrease in number of days of releases from Avalon Dam
	Active Water Resource Management	No net change when in conjunction with Settlement Agreement
Flows in CID Main Canal and changes to Project efficiency	Pecos River Settlement Agreement	Net increase in CID allotment
Base inflows to the Pecos River	Pecos River Settlement Agreement	Net increase in base inflows over the long-term, but inter-annual variability depending on land retirement, CID allotment, and Compact obligations
Water Quality	Pecos River Settlement Agreement	Net benefit to water quality
	Malaga Bend salinity alleviation project	Net benefit to water quality
Geomorphology	Calloway Culvert Reconstruction	Increased flow results in 26 percent more sediment transport at Red Bluff gauge
Wetlands	Pecos River Settlement Agreement	Increased river flow may promote wetland expansion
	Calloway Culvert Reconstruction	Potential increase in bank saturation at higher releases may promote wetland expansion
Vegetation	Pecos River Settlement Agreement	Increased river flow may promote riparian area expansion
	Calloway Culvert Reconstruction	Potential increase in bank saturation at higher releases may promote riparian area expansion
Wildlife	Pecos River Settlement Agreement	Increased river flow may increase riparian habitat volume and quality
	Calloway Culvert Reconstruction	Potential increase in bank saturation at higher releases may increase riparian habitat volume and quality
Threatened and Endangered Species	Pecos River Settlement Agreement	Increased river flow may increase riparian and aquatic habitat volume and quality
	Calloway Culvert Reconstruction	No effect

Table 5. Summary of cumulative effects (cont'd).

Resource/Resource Indicator	Reasonably Foreseeable Action	Impact in Conjunction with Proposed Action
Socioeconomic		
Crop Production	Pecos River Settlement Agreement	Reduction in cropland of up to 2,584 acres in CID and up to 11,000 acres in RAB
	Carlsbad Project Operations EIS	Potential for 5,000 to 16,400 acre reduction in cropland
Regional Economy	Pecos River Settlement Agreement	*Employment* would increase in the short term (103 jobs) and decrease in the long term (loss of 16 to 17 jobs) *Income* would increase in short term (by $8.0 million per year for years 1-2 and by $5.9 million per year for years 3, 4, and 5) and decrease about $0.6 million in years 6 to 20 *Indirect business taxes* would increase by $260,000 per year for years 1-2, $130,000 per year for years 3, 4, and 5, and about $9,000 per year for years 6 to 20 *Value added* for the Settlement Agreement would result in a net increase over a 20-year period of about $24 million *Gross output* for the Settlement Agreement would result in a net increase over a 20-year period of about $59 million
	Carlsbad Project Operations EIS	*Employment* would follow the same pattern as Settlement Agreement (short-term gain of up to 52 jobs and long-term loss of 1 to 69) *Income* would increase up to $1 million per year initially and decrease about $20,000 to $2.1 million per year in long-term *Indirect business taxes;* small net tax revenue increases are expected *Value added* the Carlsbad Project Operations would likely result in a small net increase in value added over a 20-year period *Gross output* the Carlsbad Project Operations would likely result in a small net increase in gross output
Priority Call	Settlement Agreement	Reduction in risk of priority call
Social Effects	All Reasonably Foreseeable Actions	No significant change in social conditions
Recreation	All Reasonably Foreseeable Actions	No cumulative impacts
Land Use	Pecos River Settlement Agreement	Reduction in cropland of up to 2,584 acres in CID and up to 11,000 acres in RAB
	Carlsbad Project Operations EIS	Potential for 5,000 to 16,400 acre reduction in cropland
Soils	Pecos River Settlement Agreement	Increased potential for wind and water erosion and weeds on fallowed lands; land management program would mitigate impacts
	Vegetation Management Projects	Net benefit to floodplain soils due to salt cedar removal
	Carlsbad Project Operations EIS	Increased potential for wind and water erosion and weeds on fallowed lands; land management program would mitigate impacts