4.10 Environmental Justice

No Action Alternative

Under the No Action Alternative, adverse socioeconomic impacts from diminishing water supplies on the residents of Portales could be considered an environmental justice concern, based on the relatively high incidence of households living below poverty levels in that community.

Proposed Action

Under the Proposed Action, the largest adverse economic effects would not be expected to occur in low-income or minority communities; therefore, these effects are not an environmental justice issue.

4.11 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable resource commitments involve the use of nonrenewable resources and the effects of use on future generations. Irreversible effects primarily result from the use or destruction of specific resources that cannot be replaced within a reasonable time frame, such as energy and minerals. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action, such as extinction of a threatened or endangered species or the disturbance of a cultural resource. Neither the Proposed Action nor the No Action Alternative would result in a large commitment of nonrenewable resources.

Project construction would require the irretrievable commitment of fossil fuels (diesel and gasoline), oils, and lubricants used by construction equipment and vehicles. The Proposed Action would result in unavoidable harm or harassment of some wildlife, including special status species. The Project would not jeopardize the continued existence of any species.

Chapter 5. Cumulative Impacts

Cumulative effects are the direct and indirect effects of a proposed project alternative's incremental effects when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action (40 CFR, Part 1508.7). NEPA recommends that federal agencies identify the temporal and geographic boundaries of the potential cumulative effects of a proposed action (CEQ 1997). For purposes of this EA, the temporal boundary of analysis is from approximately 2010 to 2060, which represents the project planning horizon. However, forecasting potential cumulative effects 50 years in advance is difficult, and most of the cumulative effects analysis is general and qualitative in nature.

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5.1 Reasonably Foreseeable Actions

5.1.1 Ute Lake Ranch and Quay County Entity Water Use

Entities in Quay County, including development of Ute Lake Ranch, have a combined reservation of 7,550 AFY of Ute Reservoir water (see Section 1.2.2 on page 4). Determining the amount of water that may reasonably be used by these entities requires reviewing permitting/platting information, potential population change leading to demand changes, and other factors that are challenging to predict. Rather than predicting an absolute amount of future water use, a "low" and "high" estimate were modeled and analyzed. The entire combined water reservation was used as the "high" estimate, and the demand for Ute Reservoir withdrawals was assumed to be 24,000 AFY for this scenario (Table 22; CE-High). For the "low" estimate, the portion of the reservation that would be needed to meet anticipated demands associated with land development that is permitted/platted was used (Table 22; CE-Low). The Ute Lake Ranch golf course, which has been permitted/platted through Quay County and is partially constructed, would require about 500 AFY of raw water (Garside, pers. comm. 2009). The residential portion of Ute Lake Ranch that is permitted/platted would use existing on-site wells and water pumped from Logan's well fields for potable water.

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Table 22. Simulated Results and Cumulative Effects for Ute Reservoir Conditions.

	Simulated Value				Effects (Magnitude)[2]			Effects (Percentage)[2]		
	NAA	**DE–PA**	**CE–Low**	**CE–High**	**DE-PA**	**CE–Low**	**CE-High**	**DE-PA**	**CE–Low**	**CE-High**
Storage (AF)										
Min	122,040	50,140	47,590	26,410	-71,900	-74,450	-95,630	-59%	-61%	-78%
Ave	174,350	146,130	145,020	129,240	-28,220	-29,330	-45,110	-16%	-17%	-26%
Stage (ft)										
Min	3,772	3,751	3,750	3,738	-21	-22	-34	-1%	-1%	-1%
Ave	3,781	3,775	3,775	3,771	-6	-6	-10	0%	0%	0%
Depth (ft)										
Min	64	43	42	30	-21	-22	-34	-33%	-34%	-53%
Ave	73	67	67	63	-6	-6	-10	-8%	-8%	-14%
Area (ac)										
Min	4,923	2,499	2,401	1,568	-2,424	-2,522	-3,355	-49%	-51%	-68%
Ave	6,289	5,508	5,475	4,996	-781	-814	-1,293	-12%	-13%	-21%
Total Releases[1] (AFY)										
Min	0	0	0	0	0	0	0	0%	0%	0%
Ave	23,910	12,860	12,590	9,011	-11,050	-11,320	-14,899	-46%	-47%	-62%
Max	210,610	148,170	146,300	113,295	-62,440	-64,310	-97,315	-30%	-31%	-46%
# Months Releases/Spills	69	40	38	27	-29	-31	-42	-42%	-45%	-61%

NAA =No Action Alternative; DE-PA = Direct Effects under the Proposed Action; CE-Low = Cumulative Effects-Low; CE-High = Cumulative Effects-High.
[1] Total releases include releases/spills made to meet the Compact requirement of 200,000 AF maximum conservation storage between Conchas and Ute dams, and spills through the Ute Reservoir spillway.
[2] Direct and cumulative effects calculated relative to the No Action Alternative.

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As Table 22 shows, the "low" end of the cumulative effects would be very similar to the impacts from the Proposed Action. The "high" end of the cumulative effects range would be greater than the Proposed Action, as shown in the right-hand column of Table 22. Figure 23 shows the projected changes in Ute Reservoir storage from both the "low" end and "high" end of demands from Quay County and Ute Lake Ranch. Figure 24 represents the simulated reservoir releases/spills during a variety of hydrology conditions—dry, average, and wet years. During average and dry years, the magnitude of change would be less than in wet years.

Figure 23. Cumulative Effects to Ute Reservoir Storage.

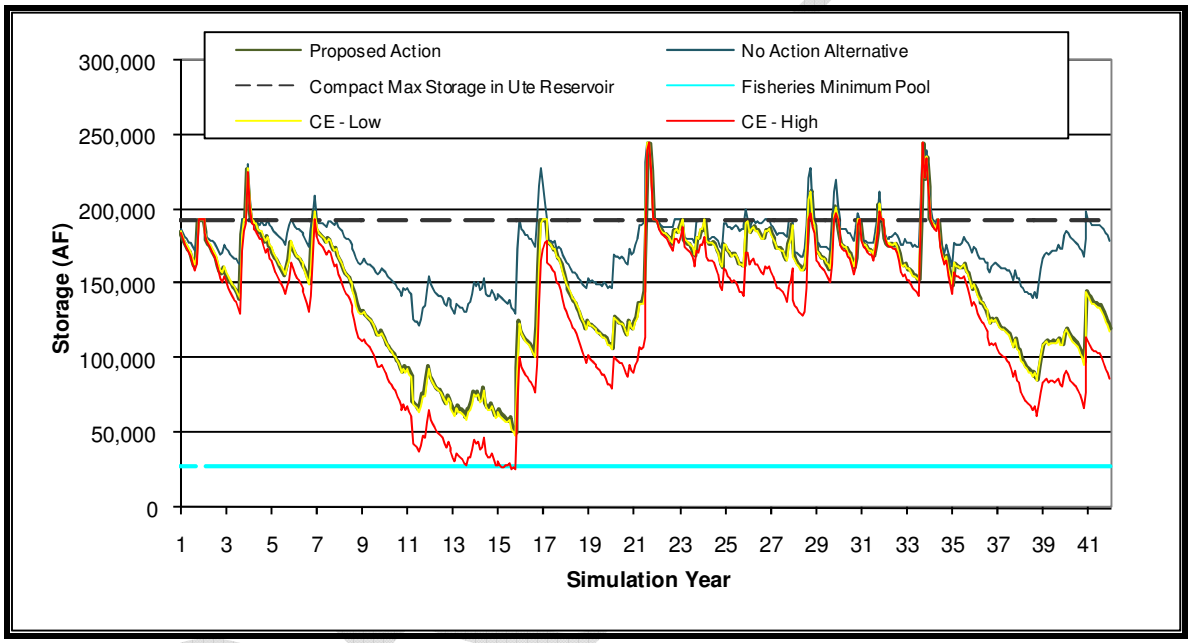
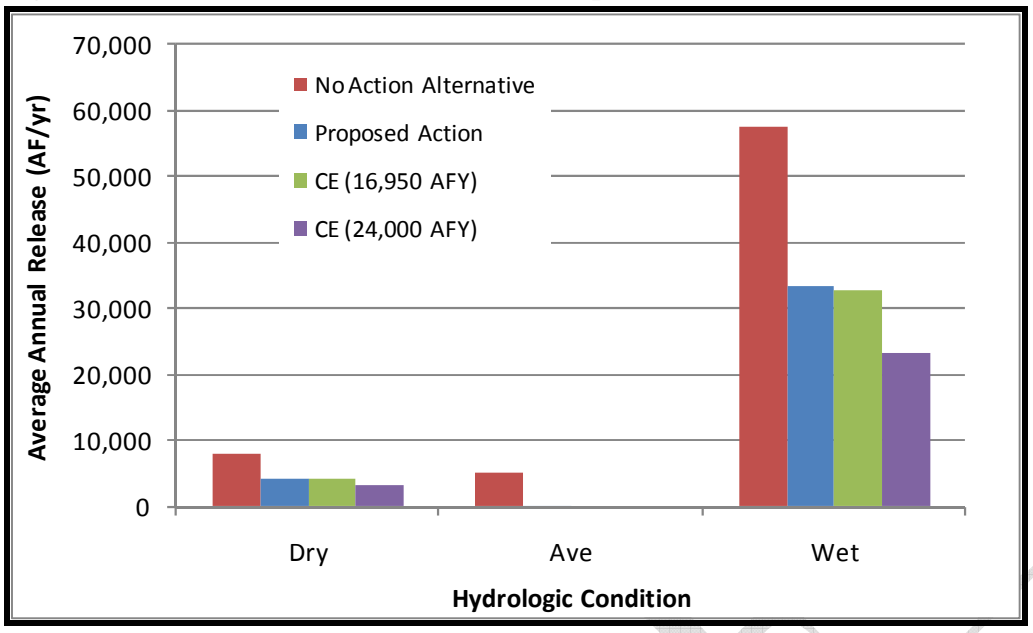


Figure 24. Simulated Ute Reservoir Releases/Spills.



5.1.1.1 Cumulative Effects to Recreation

The cumulative effects hydrologic analysis examined the effects on storage contents, lake elevation, and surface area at Ute Reservoir under both of these future uses (Ute Lake Ranch and Quay County Entity Water Use), in addition to the Proposed Action. Table 23 compares projected annual Ute Reservoir visitation under the two cumulative effects scenarios with projected visitation under the No Action Alternative. The cumulative effects low scenario (CE-Low) anticipates the diversion of 500 AFY for Ute Lake Ranch in addition to the diversions anticipated under the Proposed Action (16,450 AFY). The cumulative effects high scenario (CE-High) anticipates the diversion of the total Ute Reservoir allocation for M&I supply (24,000 AFY)

Table 23. Projected Annual Ute Reservoir Visitation under the Cumulative Effects Scenarios Compared to the No Action Alternative (+/- 50%).

	No Action	CE-Low	CE-High
Percent of years with reduced visitation due to low water conditions	22%	51%	68%
Projected average annual visitation	318,000	298,000	286,000
Percent reduction in visitation compared to the No Action Alternative	NA	-6%	-10%
Minimum visitation in driest year	306,000	227,000	194,000

Projected visitation under the CE-Low scenario is only slightly different from projected visitation under the Proposed Action. Under the CE-High scenario, projected use of the full 24,000 AFY of

M&I supply would be expected to have a substantially greater impact on visitation than the Proposed Action alone.

5.1.1.2 Cumulative Effects to Socioeconomics

As under the Proposed Action, the 6 percent reduction in visitation projected under the CE-Low scenario (500 AFY to serve Ute Lake Ranch, in addition to the Proposed Action) would result in a projected $1 million average annual reduction in the output (gross receipts) for the Quay County economy and an annual difference of about 19 jobs throughout Quay County directly and indirectly supported by recreation at Ute Reservoir.

The 10 percent projected reduction in average annual Ute Reservoir visitation under the CE-High scenario (use of the full 24,000 AF of M&I supply from Ute Reservoir), would result in a projected $1.6 million average annual reduction in the output (gross receipts) for the Quay County economy and an annual difference of about 31 jobs throughout Quay County.

As noted earlier, the Project team believes it is reasonable to consider the estimates to have a level of uncertainty of at least +/- 50 percent from the values stated herein.

5.1.1.3 Cumulative Effects on Lakefront and Lakeview Property Values

Based on the cumulative effects hydrologic analysis, lake levels would be between 3,772 and 3,760 feet about 22 percent of the time under the CE-Low scenario (500 AFY for Ute Lake Ranch in addition to the Proposed Action) and about 26 percent of the time under the CE-High scenario (full use of the 24,000-AF M&I allocation from Ute Reservoir). Lake levels would be below 3,760 feet about 8 percent of the time under the CE-Low scenario and about 15 percent of the time under the CE-High scenario.

Applying the valuation assumptions described in Section 4.3.2 to the projected hydrology and anticipated frequency of low lake levels, lower lake levels under the CE-Low scenario would reduce the premium value for lakefront and lakeview locations by an average of about 10 to 20 percent over the 40-year forecast period compared to the No Action Alternative. Lower lake levels under the CE-High scenario would reduce the premium value for lakefront and lakeview locations by an average of about 14 to 28 percent over the 40-year forecast period compared to the No Action Alternative. These declines in the locational premium values correspond to a projected 5 to 10 percent decrease in total value for lakefront homes and 3 to 6 percent decrease in total value for lakeview homes under the CE-Low scenario. Under the CE-High scenario, lower lake levels are projected to lead to a 7 to 14 percent decrease in total value for lakefront homes and a 5 to 9 percent decrease in total value for lakeview homes.

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5.1.2 Climate Change

Climate changes have the potential to influence precipitation and weather patterns in the Project Area, and may have cumulative effects with the water resources-related impacts of the Project. Localized effects of climate change are difficult to predict. Federal perspectives (Brekke et al. 2009) and New Mexico information (Enquist and Gori 2008) were considered in this evaluation. Increased variability of precipitation (including more extreme events) and increased average temperature are general global climate change trends. In their New Mexico studies, Enquist and Gori (2008) concluded that recent (20-year) trends have been toward warmer and wetter conditions in eastern New Mexico. It is assumed that these trends are indicative of future climate change consequences in the Project Area.

Given the potential effect to water resources from climate change, this assessment addresses climate change from two perspectives: 1) how the Proposed Action may affect global climate change, and 2) how the Proposed Action may be affected by climate change.

A temporary increase in greenhouse gases would result from construction of the Proposed Action. Greenhouse gas emissions would occur over the time period required for construction, and would potentially contribute to incremental climate change. In the context of climate change, there would be no measurable changes in the composition of the atmosphere or in land use associated with the Proposed Action. Therefore, the Proposed Action would have only minor or immeasurable impacts on climate change.

The Proposed Action may be affected by climate change if a warming climate results because a more rapid melt of the snowpack will occur and, therefore, more runoff will occur in the winter and early spring and less during the later spring and early summer.

Increased annual precipitation in the Project Area would tend to moderate the effects of the Proposed Action on Ute Reservoir levels, and increase the volume and frequency of Ute Reservoir spills and Compact releases under the No Action Alternative and Proposed Action. An increase in precipitation extremes could lead to more frequent high flows in Project Area streams, increasing the potential for erosion and sedimentation. Warmer temperatures would potentially increase evaporation from Ute Reservoir and increase the reservoir water level effects. Warmer temperatures also would increase water demand from agricultural and M&I customers in the Participating Communities, exacerbating Ogallala aquifer ground water declines and accelerating the need for a sustainable water source that would be provided by the Proposed Action.

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