

Table 22. Comparison of Claimed and Adjusted Stock Pond Storage Volumes to Stock Pond Storage Capacities Reported by Federal Agencies

	San Juan County	McKinley County	Rio Arriba County	Sandoval County	San Juan Basin Total
<b><u>A. Stock Water Reservoir Capacities Claimed by the US Survey</u></b>					
Number of Livestock Reservoirs Claimed by the US Survey by Land Ownership Status:					
Stock ponds or reservoirs on Navajo Nation trust lands	851	275	2	10	1,138
Stock ponds or reservoirs on Navajo Nation fee lands	69	189	33	10	301
Stock ponds or reservoirs on Navajo allotments	132	141	0	17	290
Navajo Lands in San Juan River Basin Total	1,052	605	35	37	1,729
Amount of Storage Capacity at Spillway Crest Claimed by the US Survey for Stock Water Reservoirs:					
Capacity of stock ponds or reservoirs on Navajo Nation trust lands (af)	9,293.1	3,261.0	0.3	137.3	12,691.7
Capacity of stock ponds or reservoirs on Navajo Nation fee lands (af)	493.0	1,069.2	177.7	54.3	1,794.2
Capacity of stock ponds or reservoirs on Navajo allotments (af)	4,152.0	2,325.9	0.0	116.5	6,594.4
Navajo Lands in San Juan River Basin Total Capacity (af)	13,938.1	6,656.1	178.0	308.1	21,080.3
Amount of Claimed Storage Capacity for Stock Water Reservoirs, Excluding Certain Lakes: <sup>1</sup>					
Capacity of stock ponds or reservoirs on Navajo Nation trust lands (af)	8,257.8	2,054.4	0.3	137.3	10,449.7
Capacity of stock ponds or reservoirs on Navajo Nation fee lands (af)	323.6	1,069.2	177.7	54.3	1,624.8
Capacity of stock ponds or reservoirs on Navajo allotments (af)	1,246.6	2,325.9	0.0	116.5	3,689.0
Navajo Lands in San Juan River Basin Total Capacity (af)	9,827.9	5,449.5	178.0	308.1	15,763.4
Average Storage Capacity at Spillway Crest Claimed for Stock Water Reservoirs, Excluding Certain Lakes:					
Average capacity of reservoirs on Navajo Nation trust lands (af/pond)	9.77	7.53	0.15	13.73	9.18
Average capacity of reservoirs on Navajo Nation fee lands (af/pond)	4.76	5.66	5.38	5.43	5.40
Average capacity of reservoirs on Navajo allotments (af/pond)	9.52	16.50	—	6.85	12.72
Weighted Average Capacity (af/pond)	9.41	9.04	5.09	8.33	9.12
<b><u>B. Adjusted Stock Pond Maximum Storage Volumes<sup>2</sup></u></b>					
Number of Stock Ponds by the US Survey by Land Ownership Status:					
Stock ponds or reservoirs on Navajo Nation trust lands	845	273	2	10	1,130
Stock ponds or reservoirs on Navajo Nation fee lands	69	189	33	10	301
Stock ponds or reservoirs on Navajo allotments	132	141	0	17	290
Navajo Lands in San Juan River Basin Total	1,046	603	35	37	1,721
Amount of Adjusted Maximum Storage Volume for Stock Ponds:					
Volume of stock ponds or reservoirs on Navajo Nation trust lands (af)	3,693.0	855.6	0.3	85.3	4,634.2
Volume of stock ponds or reservoirs on Navajo Nation fee lands (af)	172.7	447.2	93.0	31.6	744.5
Volume of stock ponds or reservoirs on Navajo allotments (af)	1,217.9	708.5	0.0	60.3	1,986.7
Navajo Lands in San Juan River Basin Total Capacity (af)	5,083.6	2,011.3	93.3	177.2	7,365.4
Amount of Adjusted Maximum Storage Volume for Stock Ponds, Excluding Certain Lakes: <sup>1</sup>					
Volume of stock ponds or reservoirs on Navajo Nation trust lands (af)	3,320.2	855.6	0.3	85.3	4,261.4
Volume of stock ponds or reservoirs on Navajo Nation fee lands (af)	124.4	447.2	93.0	31.6	696.2
Volume of stock ponds or reservoirs on Navajo allotments (af)	480.8	708.5	0.0	60.3	1,249.6
Navajo Lands in San Juan River Basin Total Capacity (af)	3,925.3	2,011.3	93.3	177.2	6,207.1
Adjusted Average Maximum Storage Volume for Stock Ponds, Excluding Certain Lakes:					
Average volume of reservoirs on Navajo Nation trust lands (af/pond)	3.96	3.16	0.15	8.53	3.77
Average volume of reservoirs on Navajo Nation fee lands (af/pond)	1.83	2.37	2.82	3.16	2.31
Average volume of reservoirs on Navajo allotments (af/pond)	3.67	5.02	—	3.55	4.31
Weighted Average Capacity (af/pond)	3.78	3.35	2.67	4.79	3.61

Table 22. Comparison of Claimed and Adjusted Stock Pond Storage Volumes to Stock Pond Storage Capacities Reported by Federal Agencies  
(continued)

	San Juan County	McKinley County	Rio Arriba County	Sandoval County	San Juan Basin Total
<b>C. Average Capacities for Active Stock Ponds Reported by Federal Agencies:<sup>3</sup></b>					
Ave. capacity of stock ponds on Navajo land reported by BIA (af/pond)	2.77	2.77	2.77	2.77	2.77
Ave. capacity of stock ponds on private land reported by SCS (af/pond)	3.00	3.00	3.00	3.00	3.00
Weighted Average Capacity from Federal Agency Reports (af/pond)	2.81	2.90	2.99	2.94	2.85

Notes:

<sup>1</sup> The OSE for water use accounting has included the following livestock reservoirs claimed by the US Survey under the accounting of evaporation from small lakes in the San Juan River Basin in New Mexico, as opposed to under the accounting of stock pond evaporation:

Impoundment	Land Status	Capacity Claimed (acre-feet)	NNDWR Capacity (acre-feet)	Adjusted Volume (acre-feet)
<u>Number</u> <u>Reservoir</u> <u>County</u> <u>Quadrangle</u>				
P-5088 Lost Lake San Juan Crystal	Trust Land	63.21		42.14
P-5092 Berland Lake San Juan Crystal	Trust Land	60.99	7.00	40.66
P-5081 Todacheene Lake San Juan Crystal	Trust Land	32.24	80.00	21.49
P-1092 Little White Cone Lake San Juan Upper Wheatfields	Trust Land	145.13		67.40
P-1108 Black Lake San Juan Sonsela Buttes	Trust Land	483.30		232.42
P-0040 Big Gap Reservoir San Juan Yellow Hill	Trust Land	250.47		36.14
P-1456 Tanner Lake San Juan Tanner Lake	Fee Land	169.44		48.35
P-0017 Juan's Lake San Juan La Vida Mission	Allotment	2,905.40	2,650.00	737.08
P-1823 Bass Lake McKinley Big Rock Hill	Trust Land	6.65		10.74
P-0042 Long Lake McKinley Washington Pass	Trust Land	1,200.00	3,255.00	1,350.00

Navajo Nation Department of Water Resources (NNDWR) reservoir statistics for certain reservoirs are from Draft Water Resource Development Strategy for the Navajo Nation, prepared by the NNDWR, and dated April 6, 2008 (table 3.2).

<sup>2</sup> Adjusted maximum storage volumes for livestock reservoirs on Navajo lands based on adjustments to the capacities claimed by the US Survey as described in Appendix E, table E-2.

<sup>3</sup> Average storage capacities for active (not silted or breached) stock ponds as of June 30, 1963, were reported for Navajo lands by BIA-Gallup and for private lands statewide by the SCS (see OSE Memorandum dated February 27, 1964, from E.F. Sorensen to J.C. Yates on Active Stock Ponds in New Mexico as of June 30, 1963). Excludes the storage capacities for certain lakes identified in note 1. Weighted average areas from federal agency reports assume that BIA data may apply to Navajo Nation trust lands and SCS data might apply to lands now claimed as Navajo Nation fee lands or Navajo allotments.

Table 23. Average Evaporation Rates for Shallow Reservoirs in the San Juan River Basin in New Mexico by Quadrangle

Quadrangle	Gross	Normal	Average Annual Net	
	Annual Lake Evap Rate (in/yr) <sup>1</sup>	Annual Precip Rate (in/yr) <sup>2</sup>	Evaporation Rate (in/yr)	(ft/yr)
Teec Nos Pos	60.0	8.0	52.0	4.3
Sallies Spring	60.0	8.0	52.0	4.3
Canal Creek	60.0	8.0	52.0	4.3
Skinney Rock	58.0	8.0	50.0	4.2
Palmer Mesa	56.0	9.0	47.0	3.9
Beclabito	60.0	10.0	50.0	4.2
Rocky Point	60.0	8.0	52.0	4.3
Rattlesnake	60.0	8.0	52.0	4.3
Shiprock	60.0	8.0	52.0	4.3
Chimney Rock	60.0	8.0	52.0	4.3
Waterflow	57.0	8.0	49.0	4.1
Horse Mesa	57.0	10.0	47.0	3.9
Sand Spring	60.0	8.0	52.0	4.3
Ship Rock	60.0	8.0	52.0	4.3
Sulfur Spring	60.0	8.0	52.0	4.3
The Hogback North	60.0	8.0	52.0	4.3
Fruitland	60.0	8.0	52.0	4.3
Kirtland	60.0	8.0	52.0	4.3
Farmington South	58.0	8.0	50.0	4.2
Horn Canyon	58.0	9.0	49.0	4.1
Bloomfield	58.0	10.0	48.0	4.0
Cutter Canyon	57.0	10.0	47.0	3.9
Red Valley	55.0	11.0	44.0	3.7
Mitten Rock	56.0	9.0	47.0	3.9
Yellow Hill	58.0	8.0	50.0	4.2
Table Mesa	60.0	8.0	52.0	4.3
The Hogback South	60.0	8.0	52.0	4.3
Kirtland SW	59.0	8.0	51.0	4.3
Kirtland SE	57.0	8.0	49.0	4.1
Hugh Lake	54.0	9.0	45.0	3.8
Gallegos Trading Post	55.0	10.0	45.0	3.8
East Fork Kutz Canyon	54.0	10.0	44.0	3.7
Huerfano Peak	53.0	10.0	43.0	3.6
Fresno Canyon	52.0	10.0	42.0	3.5
Roof Butte	45.0	18.0	27.0	2.3
Sanostee West	50.0	13.0	37.0	3.1
Sanostee East	57.0	8.0	49.0	4.1
Little Water	59.0	8.0	51.0	4.3
Newcomb NE	60.0	8.0	52.0	4.3
The Pillar NW	58.0	8.0	50.0	4.2
The Pillar	55.0	9.0	46.0	3.8
Moncisco Wash	53.0	9.0	44.0	3.7
Carson Trading Post	52.0	10.0	42.0	3.5
Huerfano Trading Post NW	51.0	11.0	40.0	3.3
Huerfano Trading Post	49.0	11.0	38.0	3.2
Thompson Mesa	50.0	11.0	39.0	3.3
Smouse Mesa	50.0	11.0	39.0	3.3
Gonzales Mesa	50.0	11.0	39.0	3.3
Tsaile Butte	40.0	18.0	22.0	1.8
Old Pine Spring	45.0	14.0	31.0	2.6
Tsin-nas-kid	55.0	8.0	47.0	3.9
Newcomb	58.0	8.0	50.0	4.2
Newcomb SE	60.0	8.0	52.0	4.3
Bumham Trading Post	59.0	8.0	51.0	4.3
Bisti Trading Post	56.0	8.0	48.0	4.0
Alamo Mesa West	55.0	9.0	46.0	3.8
Alamo Mesa East	52.0	10.0	42.0	3.5
Huerfano Trading Post SW	49.0	10.0	39.0	3.3
Blanco Trading Post	47.0	11.0	36.0	3.0
Crow Mesa West	47.0	12.0	35.0	2.9
Crow Mesa East	47.0	12.0	35.0	2.9
Tafoya Canyon	50.0	12.0	38.0	3.2
Upper Wheatfields	48.0	16.0	32.0	2.7
Toadlena	40.0	18.0	22.0	1.8
Two Grey Hills	50.0	11.0	39.0	3.3
Sheep Springs	57.0	8.0	49.0	4.1
Great Bend	60.0	8.0	52.0	4.3
The Pillar 3 NW	60.0	8.0	52.0	4.3
The Pillar 3 NE	59.0	8.0	51.0	4.3
Tanner Lake	56.0	9.0	47.0	3.9
Pretty Rock	54.0	9.0	45.0	3.8
Pueblo Bonito NW	50.0	10.0	40.0	3.3
Kimбето	48.0	10.0	38.0	3.2
Lybrook NW	45.0	11.0	34.0	2.8
Lybrook	45.0	12.0	33.0	2.8
Counselor	45.0	12.0	33.0	2.8

Table 23. Average Evaporation Rates for Shallow Reservoirs in the San Juan River Basin in New Mexico by Quadrangle (continued)

Quadrangle	Gross	Normal	Average Annual Net	
	Annual Lake Evap Rate (in/yr) <sup>1</sup>	Annual Precip Rate (in/yr) <sup>2</sup>	Evaporation Rate (in/yr)	(ft/yr)
Sonsela Buttes	55.0	16.0	39.0	3.3
Crystal	50.0	18.0	32.0	2.7
Washington Pass	45.0	15.0	30.0	2.5
Naschitti	56.0	8.0	48.0	4.0
Grey Hill Spring	60.0	8.0	52.0	4.3
The Pillar 2 SW	60.0	8.0	52.0	4.3
The Pillar 3 SE	60.0	8.0	52.0	4.3
La Vida Mission	58.0	8.0	50.0	4.2
Kin Kizhin Ruins	55.0	9.0	46.0	3.8
Pueblo Bonito	53.0	9.0	44.0	3.7
Sargent Ranch	52.0	10.0	42.0	3.5
Fire Rock Well	50.0	10.0	40.0	3.3
Lybrook SE	47.0	11.0	36.0	3.0
Mule Dam	45.0	12.0	33.0	2.8
Deer Mesa	42.0	13.0	29.0	2.4
Buell Park	55.0	16.0	39.0	3.3
Toddlito Park	54.0	18.0	36.0	3.0
Chuska Peak	52.0	16.0	36.0	3.0
Coyote Canyon NW	57.0	9.0	48.0	4.0
Ear Rock	60.0	8.0	52.0	4.3
Standing Rock NW	60.0	8.0	52.0	4.3
Red Lake Well	60.0	8.0	52.0	4.3
Milk Lake	59.0	8.0	51.0	4.3
Nose Rock	58.0	8.0	50.0	4.2
Seven Lakes NW	56.0	8.0	48.0	4.0
Seven Lakes NE	54.0	9.0	45.0	3.8
Pueblo Pintado	52.0	10.0	42.0	3.5
Pueblo Alto Trading Post	50.0	10.0	40.0	3.3
Star Lake	46.0	10.0	36.0	3.0
Crevasse Canyon	55.0	16.0	39.0	3.3
Tohatchi	58.0	12.0	46.0	3.8
Chuska Lake	60.0	9.0	51.0	4.3
Coyote Canyon	60.0	9.0	51.0	4.3
Toyee	57.0	9.0	48.0	4.0
Standing Rock	57.0	9.0	48.0	4.0
Antelope Lookout Mesa	58.0	9.0	49.0	4.1
Becenti Lake	57.0	9.0	48.0	4.0
Seven Lakes	56.0	9.0	47.0	3.9
Seven Lakes SE	54.0	9.0	45.0	3.8
Whitehorse	50.0	9.0	41.0	3.4
Whitehorse Rincon	50.0	9.0	41.0	3.4
Rincon Marquez	48.0	10.0	38.0	3.2
Tse Bonita School	55.0	13.0	42.0	3.5
Twin Lakes	55.0	12.0	43.0	3.6
Big Rock Hill	55.0	11.0	44.0	3.7
Hard Ground Flats	55.0	11.0	44.0	3.7
Oak Spring	55.0	11.0	44.0	3.7
Dalton Pass	56.0	11.0	45.0	3.8
Crownpoint	56.0	10.0	46.0	3.8
Heart Rock	56.0	10.0	46.0	3.8
Laguna Castillo	54.0	10.0	44.0	3.7
Orphan Annie Rock	51.0	9.0	42.0	3.5
Gallup East	55.0	12.0	43.0	3.6
Hosia Butte	50.0	13.0	37.0	3.1
Casamero Lake	50.0	12.0	38.0	3.2
Borrogo Pass	50.0	11.0	39.0	3.3
Mesa De Los Toros	50.0	10.0	40.0	3.3

Notes:

<sup>1</sup> Average annual gross lake evaporation rates estimated for each quadrangle from a map showing lines of equal annual gross lake evaporation that was prepared by the SCS and dated April 1972 (see New Mexico Water Resources Assessment for Planning Purposes, US Department of the Interior, Bureau of Reclamation in cooperation with the State of New Mexico, November 1976, supporting maps). The map was developed from available data with adjustments for physiographic factors.

<sup>2</sup> Normal annual precipitation rates estimated for each quadrangle from a map showing lines of equal normal annual precipitation that was prepared by the SCS and dated April 1972 (see New Mexico Water Resources Assessment for Planning Purposes, US Department of the Interior, Bureau of Reclamation in cooperation with the State of New Mexico, November 1976, supporting maps). The map was developed from available data with adjustments for physiographic factors.



Table 24. Estimated Evaporation Depletions for Stock Ponds on Lands Held by the United States in Trust for the Navajo Nation in the San Juan River Basin in New Mexico

Quadrangle	Average Annual Reservoir Evap Ratio (ft/yr)	Surface Water Ditch Reservoirs			Combined Water Source Reservoirs			NIP Reservoirs			All Surface Waters or Combined Source Reservoirs			Ground Water Only Reservoirs			All Stock Reservoirs Combined				
		Maximum Surface Area (acres)	High Water Mark Area (acres)	Low Water Mark Area (acres)	Maximum Surface Area (acres)	High Water Mark Area (acres)	Low Water Mark Area (acres)	Maximum Surface Area (acres)	High Water Mark Area (acres)	Low Water Mark Area (acres)	Maximum Surface Area (acres)	High Water Mark Area (acres)	Low Water Mark Area (acres)	Maximum Surface Area (acres)	High Water Mark Area (acres)	Low Water Mark Area (acres)	Maximum Annual Evaporation (acre-feet)	Average Annual Evaporation (acre-feet)	Total Annual Evaporation (acre-feet)	Percentage of Total Evaporation Imposed from Use Depletion	
<b>San Juan River Drainage above Chaco River</b>																					
<b>San Juan County:</b>																					
Chimney Rock	4.3	13.9	3.7	0.0	0.0	0.0	13.9	60.3	3.7	1.5	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.3	6.5	100%
Fullland	4.3	5.1	2.0	0.0	0.0	0.0	5.1	36.1	3.4	1.4	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.1	6.0	100%
McLard	4.3	17.7	4.2	0.0	0.0	0.0	2.1	20.2	6.7	6.3	2.5	10.9	0.0	0.0	0.0	0.0	0.0	0.0	87.8	10.8	100%
Farmington South	4.2	0.0	0.0	0.0	0.0	0.0	3.4	14.3	3.3	0.5	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	2.2	100%
Horn Canyon	4.1	7.3	3.5	0.0	0.0	0.0	7.3	29.8	3.5	1.4	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.8	5.7	100%
Bloomfield	4.0	2.0	0.8	0.0	0.0	0.0	2.0	7.9	0.8	0.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	1.2	100%
Kilbuck SE	4.1	1.0	0.4	0.0	0.0	0.0	1.0	4.4	1.5	0.8	2.5	0.2	0.2	0.0	0.0	0.0	0.0	0.0	4.4	2.8	79%
Chimney Rock	4.1	1.0	0.4	0.0	0.0	0.0	1.0	4.4	1.5	0.8	2.5	0.2	0.2	0.0	0.0	0.0	0.0	0.0	4.4	2.8	79%
Chimney Rock	3.8	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	187.7	16.3	79%
Chimney Rock	3.7	17.7	4.2	0.0	0.0	0.0	14.2	66.1	11.0	12.5	18										

Table 24. Estimated Evaporation Depletions for Stock Ponds on Lands Held by the United States in Trust for the Navajo Nation in the San Juan River Basin in New Mexico (continued)

Quadrangle	Average Annual Reservoir Evap Rate (DVs)	Surface Water Only Reservoirs*			Combined Surface Reservoirs			NIP Reservoirs*			All Surface Water or Combined Surface Reservoirs			Ground Water Only Reservoirs*			All Stock Reservoirs Combined					
		Maximum Surface Area (acres)	High Water Mark Area (acres)	Low Water Mark Area (acres)	Maximum Surface Area (acres)	High Water Mark Area (acres)	Low Water Mark Area (acres)	Maximum Surface Area (acres)	High Water Mark Area (acres)	Low Water Mark Area (acres)	Maximum Surface Area (acres)	High Water Mark Area (acres)	Low Water Mark Area (acres)	Maximum Surface Area (acres)	High Water Mark Area (acres)	Low Water Mark Area (acres)	Maximum Annual Evaporation (acre-feet)	Average Annual Evaporation (acre-feet)	Total Annual Evaporation (acre-feet)	Total Annual Evaporation (acre-feet)	Percentage of Surface Water Amount (percent)	
Chaco River Drainage (continued)																						
McGhey County:																						
Washington Pass-Long Lk. (P-0042)	2.1	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%	
Nescahili	4.0	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.6	0.0	0.0	0%	
Grey Hill Spring	4.3	1.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.8	0.0	0.0	0%	
The Pillar 2 SW	3.0	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.5	3.8	0.0	0.0	0%	
Toledo Park	3.0	8.5	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.5	3.8	0.0	0.0	0%	
Chuska Peak	3.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	0.0	0.0	0%	
Chuska Canyon NW	4.0	26.4	18.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	108.0	25.7	0.0	0.0	0%	
Chuska Canyon NE	4.0	26.4	18.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	108.0	25.7	0.0	0.0	0%	
Shoshone Rock NW	4.3	28.7	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	179.0	36.8	0.0	0.0	0%	
Shoshone Rock NE	4.3	28.7	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	179.0	36.8	0.0	0.0	0%	
Red Lake Well	4.3	46.9	28.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	214.0	41.9	0.0	0.0	0%	
Milk Lake	4.3	10.4	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.3	0.8	0.0	0.0	0%	
Neese Rock	4.2	5.1	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.5	2.5	0.0	0.0	0%	
Seven Lakes NW	4.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	0.0	0.0	0%	
Seven Lakes NE	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0%	
Pueblo Pinedo	3.6	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0%	
Pueblo Alto Trading Post	3.3	5.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.4	0.0	0.0	0%	
Chuska Canyon	3.6	32.3	13.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	2.3	0.0	0.0	0%	
Tohatchi	3.6	32.3	13.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	1.0	0.0	0.0	0%	
Chuska Lake	4.3	31.1	21.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	143.0	33.9	0.0	0.0	0%	
Coyote Canyon	4.3	14.1	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.8	6.7	0.0	0.0	0%	
Standing Rock	4.0	48.5	29.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	185.2	41.8	0.0	0.0	0%	
Antelope Lookout Mesa	4.1	7.1	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.0	13.2	0.0	0.0	0%	
Beant Lake	4.0	4.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.3	3.1	0.0	0.0	0%	
Yuhimero	3.4	3.5	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.8	2.8	0.0	0.0	0%	
Yuhimero	3.4	3.5	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.8	2.8	0.0	0.0	0%	
Big Rock Hill	3.6	20.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	74.4	10.1	0.0	0.0	0%	
Beas Lake (P-1823)																						
Other	3.7	27.9	21.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	28.3	3.6	1.2	4.8	0%
Hard Ground Flats	3.7	6.2	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Oak Spring	3.7	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Dalton Pass	3.8	14.1	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Chowchort	3.8	1.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
Hairt Rock	3.8	7.4	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%
County Subtotal		405.4	214.9	0.4	0.1	0.0	0.0	405.8	1,629.0	215.1	75.3	303.6	28.8	114.6	12.6	4.5	17.8	1,745.5	321.4	0.0	0.0	0%
San Juan County:																						
Lybrook SE	3.0	1.0	0.4	0.0	0.0	0.0	0.0	1.0	3.0	0.4	0.1	0.3	0.0	0.0	0.0	0.0	0.0	3.0	0.3	0.0	0.0	0%
Mule Dam	2.8	41.7	35.4	0.0	0.0	0.0	41.7	114.3	35.4	10.6	29.2	0.0	0.0	0.0	0.0	0.0	114.8	29.2	0.0	0.0	0%	
County Subtotal		42.7	35.8	0.0	0.0	0.0	42.7	117.7	35.8	10.7	29.8	0.0	0.0	0.0	0.0	0.0	117.7	29.8	0.0	0.0	0%	
Chaco River Drainage Total		1,547.8	882.2	5.4	2.2	33.9	1,587.2	6,248.5	896.8	354.7	1,396.1	48.4	188.0	22.9	6.5	34.0	6,448.5	1,400.1	231.8	0.0	0.0	0%
San Juan River Drainage below Chaco River																						
San Juan County:																						
Trac Noe Pox	4.3	2.1	1.0	0.0	0.0	0.0	2.4	10.4	1.0	0.4	1.6	0.1	0.5	0.1	0.0	0.0	10.9	1.9	0.0	0.0	100%	
Camel Creek	4.3	28.9	8.9	0.0	0.0	0.0	28.9	129.5	9.9	4.0	17.2	0.1	0.8	0.1	0.1	0.2	130.1	17.5	0.0	0.0	100%	
Stoney Rock	4.3	15.0	4.0	0.0	0.0	0.0	15.6	87.7	5.4	2.2	9.4	0.0	0.0	0.0	0.0	0.0	87.7	9.4	0.0	0.0	100%	
Rocky Pass	4.3	1.5	0.6	0.0	0.0	0.0	1.5	6.0	0.6	0.2	2.4	0.0	0.0	0.0	0.0	0.0	6.0	0.6	0.0	0.0	100%	
Rocky Pass	4.3	1.5	0.6	0.0	0.0	0.0	1.5	6.0	0.6	0.2	2.4	0.0	0.0	0.0	0.0	0.0	6.0	0.6	0.0	0.0	100%	
Rollinsdale	4.3	2.7	2.1	0.0	0.0	0.0	3.2	11.9	2.1	0.8	3.6	0.2	0.7	0.2	0.1	0.3	12.5	3.6	0.0	0.0	100%	
Shirook	4.3	3.2	1.6	0.0	0.0	0.0	3.2	13.8	1.8	0.6	2.7	0.0	0.0	0.0	0.0	0.0	13.8	2.7	0.0	0.0	100%	
Chimney Rock	4.3	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	100%	
Horse Mesa	3.9	0.1	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	75%	
Sand Spring	4.3	8.0	4.7	0.0	0.0	0.0	8.0	42.4	4.7	1.9	6.1	1.2	5.4	0.6	0.2	1.0	47.8	8.2	0.0	0.0	75%	
Ship Rock	4.3	8.5	8.5	0.0	0.0	0.0	8.5	41.3	8.5	3.8	16.5	0.0	0.0	0.0	0.0	0.0	41.3	16.5	0.0	0.0	75%	
Red Valley	3.7	13.4	0.9	0.0	0.0	0.0	13.4	62.3	0.9	0.2	0.8	0.2	0.1	0.2	0.1	0.2	62.3	0.9	0.0	0.0	50%	
Red Valley	3.7	13.4	0.9	0.0	0.0	0.0	13.4	62.3	0.9	0.2	0.8	0.2	0.1	0.2	0.1	0.2	62.3	0.9	0.0	0.0	50%	
Red Butte	2.9	0.8	0.4	0.0	0.0	0.0	0.8	1.8	0.4	0.2	0.4	0.0	0.0	0.0	0.0	0.0	1.8	0.4	0.0	0.0	25%	
Drainage below Chaco R. Total		112.0	50.7	0.0	0.0	0.0	112.0	474.8	50.7	20.3	86.1	2.9	12.3	1.6	0.6	2.7	487.2	86.8	72.4	0.0	0.0	0%
Chuska Wash Drainage																						

Table 24. Estimated Evaporation Depletions for Stock Ponds on Lands Held by the United States in Trust for the Navajo Nation in the San Juan River Basin in New Mexico (continued)

- Notes:
- <sup>1</sup> Based on the average annual net evaporation rates for small or shallow reservoirs in each quadrangle shown in table 23, except that the annual net evaporation rates for Lost Lake, Boreland Lake, Totocheene Lake and Long Lake at high elevations (about 8780 feet to 8950 feet) along the crest of the Chuska Mountains are based on the gross annual lake evaporation from figure 2 less the normal precipitation from figure 3 for their specific locations and seasons.
  - <sup>2</sup> Includes reservoirs classified by the US Survey as the following types: diversion, improved spring, in-channel, in-channel/wetling, and off-channel. These types of reservoirs are assumed to have variable supplies from surface water sources, including any spring discharges.
  - <sup>3</sup> Excludes two NIP off-channel livestock reservoirs that are assumed to be supplied water solely from the NIP canal. Also excludes Nascahual Reservoir, Little Whites Cone Lake and Long Lake, which were included in the evaluation of irrigation reservoirs.
  - <sup>4</sup> Includes reservoirs classified by the US Survey as in-channel/wetling reservoirs. This type of reservoir is assumed to be supplied water from combined surface water and ground water sources. Excludes Sheep Dip Reservoir, which was included in the evaluation of irrigation reservoirs.
  - <sup>5</sup> Includes reservoirs classified by the US Survey as NIP in-channel reservoirs. NIP off-channel reservoirs are assumed to be supplied from the San Juan River via the NIP canal, and thus the Navajo Nation's rights for storage and evaporation of water from NIP off-channel reservoirs are assumed to be the same as for NIP in-channel reservoirs. The NIP off-channel reservoirs that are assumed to be supplied from the San Juan River via the NIP canal are identified in Appendix E, table E-1, and are not to be included in the Supplemental Debris. NIP in-channel reservoirs are assumed to be supplied from riparian lands above the reservoirs, though some might also receive water from the NIP supply after either directly or by capture of riparian drainage before it can return to the river.
  - <sup>6</sup> Includes reservoirs classified by the US Survey as being associated with the storage of ground water withdrawn from a well. Excludes Base Lake and the Whites Rock Project reservoir, which were included in the evaluation of irrigation reservoirs.
  - <sup>7</sup> Total maximum surface areas for livestock reservoirs on Navajo Nation trust lands in the drainage within each quadrangle based on adjustments to the total areas claimed by the US Survey as described in Appendix E, table E-2 (see table 19).
  - <sup>8</sup> Total surface areas at high water mark for livestock reservoirs on Navajo Nation trust lands in the drainage within each quadrangle based on adjustments to the total areas claimed by the US Survey as described in Appendix E, table E-4.
  - <sup>9</sup> Assumes that all claimed livestock reservoirs are actively storing water for stock watering and that reservoir storage is full throughout the year to the level of the maximum surface areas.
  - <sup>10</sup> Assumes average lushness factors for stock ponds of 40% for San Juan and Rio Arriba counties, 35% for McKinley County and 30% for Sandoval County based on the lushness factors for stock ponds in these counties in the San Juan River Basin used by the OSE to prepare stock pond evaporation estimates for State Engineer Technical Report 44. Lushness factors were applied to the historic high water mark areas, except that average operating levels for Big Gap Reservoir, Lost Lake, Boreland Lake and Black Lake were based on "Water Surface Elevation for 1980" instead of the historic high water mark. Lushness factors were also applied to the historic high water mark areas for Engineer Technical Report 46, and for Totocheene Lake was assumed equal to the high water mark (the surface area for the lake used by "Water Surface Elevation for 1980" instead of the historic high water mark).
  - <sup>11</sup> Based on average surface areas under normal operating and water supply conditions that are assumed to be reflected by the average lushness factors for stock ponds in each county. Assumes all claimed livestock reservoirs are actively storing water for stock watering.
  - <sup>12</sup> Assumed depletion impact percentages for surface water uses on the flow of the San Juan River were based on ephemerical channel distances between the livestock reservoirs and the river (see figure 1). It was assumed for purposes of this analysis that ground water withdrawals to fill stock ponds do not impact San Juan River flow.

Table 25. Estimated Evaporation Depletions for Stock Ponds on Lands Held in Fee by the Navajo Nation in the San Juan River Basin in New Mexico

Quadrangle	Average Annual Net Evaporation Rate (mm)	Surface Water Only Reservoirs <sup>1</sup>			Combined Surface Reservoirs <sup>2</sup>			NIP Reservoirs <sup>3</sup>			All Surface Water or Combined Storage Reservoirs <sup>4</sup>			Ground Water Only Reservoirs <sup>5</sup>			All Stock Reservoirs Combined					
		Minimum Area (acres)	High Water Area (acres)	Mark Area (acres)	Minimum Surface Area (acres)	High Water Surface Area (acres)	Mark Area (acres)	Minimum Surface Area (acres)	High Water Surface Area (acres)	Mark Area (acres)	Minimum Surface Area (acres)	High Water Surface Area (acres)	Mark Area (acres)	Minimum Surface Area (acres)	High Water Surface Area (acres)	Mark Area (acres)	Minimum Evaporation (acre-feet)	Average Evaporation (acre-feet)	Total Evaporation (acre-feet)	Total Annual Depletion of Stock Ponds (acre-feet)	Total Annual Depletion of Stock Ponds as a Percentage of Surface Water Available (percent)	
<b>San Juan River Drainage above Chaco River</b>																						
<b>San Juan County:</b>																						
Horn Canyon	4.1	1.2	0.5	0.0	1.2	5.0	0.5	0.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.5	100%	
Hugh Lake	3.8	0.7	0.2	0.0	0.7	2.7	0.2	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.3	75%	
Galapago Trading Post	3.7	1.5	0.6	0.0	1.5	5.4	0.6	0.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.8	75%		
East Fork Kutz Canyon	3.6	2.0	0.7	0.0	2.0	7.0	0.7	0.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	1.1	75%		
Huerfano Peak	3.3	0.4	0.2	0.0	0.4	1.4	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.2	50%		
Thompson Mesa	2.9	3.6	1.4	0.0	3.6	10.8	1.4	0.6	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	1.3	50%		
Crow Mesa West																						
County Subtotal		8.7	4.0	0.0	8.7	33.2	4.0	1.8	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.2	5.5		3.8	
<b>Rio Arriba County:</b>																						
Siouxes Mesa	3.3	6.0	2.3	0.0	6.0	18.5	2.3	0.9	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.5	3.0		1.5	
Gonzales Mesa	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Crow Mesa East	2.9	2.6	1.0	0.0	2.6	7.4	1.0	0.4	1.1	1.5	4.3	0.8	0.2	0.1	0.2	0.1	0.2	11.7	1.8		25%	
Taylor Canyon	3.2	12.6	4.8	0.0	12.5	39.8	4.8	1.8	6.0	0.5	1.5	0.2	0.1	0.2	0.1	0.2	0.1	41.0	6.2		25%	
Lynook	2.8	8.9	3.4	0.0	8.9	24.3	3.4	1.3	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.3	3.7		0%	
Counseiler	2.8	13.9	6.5	0.0	13.9	39.2	6.5	2.6	7.1	0.3	0.8	0.1	0.0	0.1	0.0	0.1	0.0	39.1	7.2		0%	
County Subtotal		43.8	17.8	0.0	43.8	128.1	17.8	7.1	20.9	3.1	9.3	1.2	0.5	1.4	1.8	0.4	1.4	138.4	22.3		3.3	
<b>Sandoval County:</b>																						
Counseiler	2.8	15.8	6.0	0.0	15.8	43.5	6.0	1.8	5.0	0.3	0.7	0.1	0.0	0.1	0.0	0.1	0.0	44.2	5.0		0%	
Drainage above Chaco R. Total		88.3	27.8	0.0	88.3	205.7	27.8	10.5	31.3	3.3	10.0	1.3	0.5	1.5	1.6	0.5	1.5	215.7	32.8		7.1	
<b>Chaco River Drainage</b>																						
<b>San Juan County:</b>																						
Tanner Lake	3.9	24.7	9.8	0.0	24.7	69.8	9.8	3.6	10.6	0.4	1.4	0.2	0.1	0.4	0.2	0.1	0.4	88.8	9.8		0%	
Tanner Lake (P-1456)																						
Other	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0%	
The Pilar 3 BE	4.3	0.9	0.4	0.0	0.9	4.0	0.4	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.6		0%	
La Vida Mission	4.2	0.6	0.2	0.0	0.6	2.3	0.2	0.1	0.4	0.3	1.4	0.1	0.0	0.2	0.1	0.0	0.2	3.7	0.5		0%	
Knob Hill Run	3.5	5.1	3.2	0.0	5.1	19.7	3.2	1.3	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.7	4.9		0%	
San Juan River	3.5	3.9	1.9	0.0	3.9	14.3	1.9	0.8	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	2.3		0%	
Samuel Ranch	3.5	37.7	19.8	0.0	37.7	106.8	19.8	7.3	23.8	0.3	1.0	0.1	0.0	0.1	0.0	0.1	0.0	132.8	28.0		0%	
Flw Rock Well	3.3	5.7	2.2	0.0	5.7	18.8	2.2	0.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.8	2.9		0%	
County Subtotal		78.5	52.1	0.0	78.5	287.8	52.1	20.8	77.8	1.0	3.8	0.4	0.2	0.7	0.2	0.7	0.2	291.4	78.3		0%	
<b>McInley County:</b>																						
Red Lake Well	4.3	5.5	4.8	0.0	5.5	23.7	4.8	1.7	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.7	7.5		0%	
McInley Well	4.3	15.3	5.8	0.0	15.3	65.2	5.8	2.0	8.7	3.7	15.8	1.6	0.6	2.4	0.6	2.4	0.6	81.0	11.0		0%	
McInley Well	4.2	3.8	1.2	0.0	3.8	15.4	1.2	0.4	2.3	0.8	3.3	0.3	0.1	0.4	0.1	0.4	0.1	19.7	2.7		0%	
Seven Lakes NW	3.8	18.9	7.2	0.0	18.9	73.5	7.2	2.6	10.6	1.8	7.6	0.7	0.2	2.9	0.7	2.9	0.7	81.3	11.3		0%	
Seven Lakes NE	3.5	4.0	1.5	0.0	4.0	14.0	1.5	0.5	1.9	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	14.3	1.9		0%	
Pueblo Abito Trading Post	3.3	4.7	1.8	0.0	4.7	15.7	1.8	0.8	2.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	16.0	2.1		0%	
Star Lake	3.0	1.8	0.7	0.0	1.8	5.4	0.7	0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.7		0%	
Beardt Lake	4.0	74.2	52.4	0.0	74.2	286.7	52.4	18.3	73.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	286.7	73.3		0%	
Seven Lakes	3.8	20.3	8.8	0.0	20.3	78.7	8.8	3.0	6.9	0.4	1.6	0.2	0.1	0.2	0.1	0.2	0.1	81.3	9.1		0%	
West Lakes BE	3.8	22.7	8.9	0.0	22.7	85.0	8.9	3.0	11.3 <sup>6</sup>	1.8	6.9	0.6	0.2	0.8	0.2	0.8	0.2	90.9	12.1		0%	
McInley Well	3.8	2.4	0.9	0.0	2.4	9.7	0.9	0.3	0.9	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	9.8	0.9		0%	
Heart Rock	3.8	2.4	0.9	0.0	2.4	9.7	0.9	0.3	0.9	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	9.8	0.9		0%	
Orphan Annie Rock	3.5	2.3	1.0	0.0	2.3	8.9	1.0	0.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	1.2		0%	
County Subtotal		218.0	110.9	0.0	218.0	855.8	110.9	38.8	154.8	10.3	41.3	4.1	1.4	6.7	8.0	2.1	6.7	898.8	180.5		0%	
Chaco River Drainage Total		284.5	163.0	0.0	284.5	1,143.2	163.0	58.7	232.4	11.3	45.1	4.5	1.6	8.4	11.8	3.1	8.4	1,188.3	238.8		0%	
San Juan River Basin Total		363.8	190.8	0.0	363.8	1,348.9	190.8	70.2	285.7	14.8	55.1	5.8	2.1	7.8	10.4	2.1	7.8	1,404.0	271.8		7.1	

Notes:  
<sup>1</sup> Based on the average annual net evaporation rates for small or shallow reservoirs in each quadrangle shown in table 23.  
<sup>2</sup> Includes reservoirs classified by the US Survey as the following types: diversion, improved spring, in-channel, in-channel/well reservoirs.  
<sup>3</sup> Includes reservoirs classified by the US Survey as in-channel/well reservoirs. The type of reservoir is assumed to be supplied water from combined surface water and ground water sources.  
<sup>4</sup> Includes reservoirs classified by the US Survey as being associated with the storage of ground water withdrawn from a well.  
<sup>5</sup> Total surface areas of high water mark for livestock reservoirs on Navajo lands as determined by the US Survey as described in Appendix E, table E-4.  
<sup>6</sup> Assumes that all claimed livestock reservoirs are actively storing water for stock watering and that reservoir storage is full throughout the year to the level of the maximum surface area. Assumes average fullness factors for stock ponds of 40% for San Juan and Rio Arriba counties, 35% for McInley County and 30% for Sandoval County based on the fullness factors for stock ponds in these counties in the San Juan River Basin used by the OSE to prepare stock pond evaporation estimates for State Engineer Technical Report 44. Fullness factors were applied to the historic high water mark areas.  
<sup>7</sup> Based on average surface area under normal operating and water supply conditions that are assumed to be reflected by the average fullness factors for stock ponds in each county. Assumes all claimed livestock reservoirs are actively storing water for stock watering.  
<sup>8</sup> Assumed depletion impact percentages for surface water use on the flow of the San Juan River were based on ephemeral channel distances between the livestock reservoirs and the river (see figure 1). It was assumed for purposes of this analysis that ground water withdrawals to fill stock ponds do not impact San Juan River flow.

Table 26. Reservoir Volumes and Evaporation Depletions Associated with Proposed Water Rights for Stock Ponds on Navajo Lands in the San Juan Basin in New Mexico

**A. Stock Water Storage on Navajo Nation Trust Lands under Proposed Federal Reserved Rights:**

<u>Drainage</u>	<u>Number of Reservoirs<sup>1</sup></u>	<u>Total Storage Volume (acre-feet)<sup>2</sup></u>	<u>Total Maximum Surface Area (acres)<sup>3</sup></u>	<u>Total Maximum Annual Evaporation (acre-feet)<sup>4</sup></u>	<u>Average Annual Evaporation (acre-feet)<sup>5</sup></u>	<u>Annual Depletion of San Juan River Flow (acre-feet)<sup>6</sup></u>
<b><u>San Juan River Drainage above Chaco River</u></b>						
Surface Water Reservoirs <sup>7</sup>						
Outside NIIP	129	395.6	175.8			
Within NIIP	58	207.8	70.5			
Subtotal	187	603.4	246.3			
Ground Water Reservoirs <sup>8</sup>	5	17.1	3.2			
Combined Source Reservoirs <sup>9</sup>	1	7.5	3.9			
Drainage above Chaco R. Total	193	628.0	253.4	956	166	126
<b><u>Chaco River Drainage</u></b>						
Surface Water Reservoirs <sup>7</sup>						
Outside NIIP	645	3,167.2	1,547.8			
Within NIIP	19	67.3	33.9			
Subtotal	664	3,234.4	1,581.7			
Ground Water Reservoirs <sup>8</sup>	134	133.2	49.4			
Combined Source Reservoirs <sup>9</sup>	5	10.2	5.4			
Chaco River Drainage Total	803	3,377.8	1,636.5	6,446	1,400	252
<b><u>San Juan River Drainage below Chaco River</u></b>						
Surface Water Reservoirs <sup>7</sup>						
Outside NIIP	87	257.7	112.0			
Within NIIP	0	0.0	0.0			
Subtotal	87	257.7	112.0			
Ground Water Reservoirs <sup>8</sup>	11	5.9	2.9			
Combined Source Reservoirs <sup>9</sup>	0	0.0	0.0			
Drainage below Chaco R. Total	98	263.5	115.0	487	89	72
<b><u>Chinle Wash Drainage</u></b>						
Surface Water Reservoirs <sup>7</sup>						
Outside NIIP	36	364.9	180.2			
Within NIIP	0	0.0	0.0			
Subtotal	36	364.9	180.2			
Ground Water Reservoirs <sup>8</sup>	0	0.0	0.0			
Combined Source Reservoirs <sup>9</sup>	0	0.0	0.0			
Chinle Wash Drainage Total	36	364.9	180.2	556	105	0
<b>San Juan River Basin Total</b>	<b>1,130</b>	<b>4,634.2</b>	<b>2,185.1</b>	<b>8,445</b>	<b>1,760</b>	<b>450</b>

Table 26. Reservoir Volumes and Evaporation Depletions Associated with Proposed Water Rights for Stock Ponds on Navajo Lands in the San Juan Basin in New Mexico  
(continued)

**B. Stock Water Storage on Navajo Nation Fee Lands under Proposed State Law Rights:**

<u>Drainage</u>	<u>Number of Reservoirs<sup>1</sup></u>	<u>Total Storage Volume (acre-feet)<sup>2</sup></u>	<u>Total Maximum Surface Area (acres)<sup>3</sup></u>	<u>Total Maximum Annual Evaporation (acre-feet)<sup>4</sup></u>	<u>Average Annual Evaporation (acre-feet)<sup>5</sup></u>	<u>Annual Depletion of San Juan River Flow (acre-feet)<sup>6</sup></u>
<b><u>San Juan River Drainage above Chaco River</u></b>						
Surface Water Reservoirs <sup>7</sup>						
Outside NIIP	48	135.3	69.3			
Within NIIP	0	0.0	0.0			
Subtotal	48	135.3	69.3			
Ground Water Reservoirs <sup>8</sup>	5	7.8	3.3			
Combined Source Reservoirs <sup>9</sup>	0	0.0	0.0			
<b>Drainage above Chaco R. Total</b>	<b>53</b>	<b>143.1</b>	<b>72.7</b>	<b>216</b>	<b>33</b>	<b>7</b>
<b><u>Chaco River Drainage</u></b>						
Surface Water Reservoirs <sup>7</sup>						
Outside NIIP	194	575.2	294.5			
Within NIIP	0	0.0	0.0			
Subtotal	194	575.2	294.5			
Ground Water Reservoirs <sup>8</sup>	54	26.2	11.3			
Combined Source Reservoirs <sup>9</sup>	0	0.0	0.0			
<b>Chaco River Drainage Total</b>	<b>248</b>	<b>601.4</b>	<b>305.8</b>	<b>1,188</b>	<b>239</b>	<b>0</b>
<b>San Juan River Basin Total</b>	<b>301</b>	<b>744.6</b>	<b>378.4</b>	<b>1,404</b>	<b>272</b>	<b>7</b>

**C. Summary for All Stock Water Storage Reservoirs Combined:**

<u>Drainage</u>	<u>Number of Reservoirs<sup>1</sup></u>	<u>Total Storage Volume (acre-feet)<sup>2</sup></u>	<u>Total Maximum Surface Area (acres)<sup>3</sup></u>	<u>Total Maximum Annual Evaporation (acre-feet)<sup>4</sup></u>	<u>Average Annual Evaporation (acre-feet)<sup>5</sup></u>	<u>Annual Depletion of San Juan River Flow (acre-feet)<sup>6</sup></u>
Drainage above Chaco River	246	771.2	326.1	1,172	199	133
Chaco River Drainage	1,051	3,979.3	1,942.3	7,635	1,639	252
Drainage below Chaco River	98	263.5	115.0	487	89	72
Chinle Wash Drainage	36	364.9	180.2	556	105	0
<b>San Juan River Basin Total</b>	<b>1,431</b>	<b>5,378.8</b>	<b>2,563.6</b>	<b>9,849</b>	<b>2,032</b>	<b>457</b>

**Table 26. Reservoir Volumes and Evaporation Depletions Associated with Proposed Water Rights for Stock Ponds on Navajo Lands in the San Juan Basin in New Mexico  
(continued)**

**Notes:**

- <sup>1</sup> Proposed number of livestock reservoirs for water storage rights of the Navajo Nation based on the US Survey (see tables 16 and 17). Excludes two off-channel livestock reservoirs on the NIIP that are assumed to be supplied solely from diversions from the San Juan River via the NIIP canal (P-5346 and P-5350). Also excludes six claimed livestock reservoirs that are included in the evaluation of irrigation reservoirs. Amounts of evaporation and depletion shown herein exclude livestock water consumption from the reservoirs.
- <sup>2</sup> Combined total storage volumes for stock water reservoirs identified by the US Survey based on adjustments to the reservoir capacities claimed by the US Survey as described in Appendix E, table E-2 (see tables 19 and 20). Excludes two off-channel reservoirs on the NIIP (P-5346 and P-5350).
- <sup>3</sup> Combined total maximum surface areas for stock water reservoirs identified by the US Survey based on adjustments to the reservoir areas claimed by the US Survey as described in Appendix E, table E-2 (see tables 19 and 20). Excludes two off-channel reservoirs on the NIIP (P-5346 and P-5350).
- <sup>4</sup> Maximum annual evaporation from tables 24 and 25. Assumes all claimed reservoirs are actively storing water and are maintained full of water to the level of the maximum surface area at all times throughout the year.
- <sup>5</sup> Average annual evaporation from tables 24 and 25. Assumes all claimed reservoirs are actively storing water as available for livestock watering, with certain assumptions regarding average historic reservoir fullness for active stock ponds to reflect historic water supply available for storage.
- <sup>6</sup> Average annual depletion of San Juan River flow from tables 24 and 25. Assumes all claimed reservoirs are actively storing water as available for livestock watering and historic water supply.
- <sup>7</sup> Reservoirs which store water from surface flows or springs.
- <sup>8</sup> Reservoirs which store water from ground water wells.
- <sup>9</sup> Reservoirs which store water from surface flows or springs and from ground water wells.

Table 27. Summary of Irrigation Reservoirs on Navajo Nation Lands Held in Trust in the San Juan River Basin in New Mexico that are Claimed by the US Survey by Reservoir Type or Source, Drainage and Quadrangle<sup>1</sup>

Quadrangle	Diversion			Improved Spring			In-Channel			In-Channel, Spring			In-Channel, Well			Off-Channel			Well			Total			
	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	
<b>Chaco River Drainage</b>																									
San Juan County:																									
Yellow Hill																									
Sanostee West	2	2.11	5.72																						
Sanostee East	3	3.71	10.32	1	1.23	3.87																			
Old Pine Spring																									
Tain-ris-hid																									
Newcomb																									
Captain Tom Reservoir (P-0036) <sup>2</sup>																									
Other																									
Toadlena																									
Two Grey Hills																									
Washington Pass																									
Nasahli																									
La Vida Mission																									
County Subtotal	5	5.82	16.04	3	1.59	5.01																			
McKinley County:																									
Chuska Peak																									
Whiskey Lake (P-0043) <sup>3</sup>																									
Other																									
Tohatchi																									
Chuska Lake																									
Chuska Lake (P-1182) <sup>4</sup>																									
Other																									
Toyso																									
Standing Rock																									
Twin Lakes																									
Big Rock Hill																									
Crownpoint																									
County Subtotal	0	0.00	0.00	0	0.00	0.00																			
Chaco River Drainage Total	5	5.82	16.04	3	1.59	5.01																			
<b>San Juan River Drainage below Chaco River</b>																									
San Juan County:																									
Rocky Point																									
Rattlesnake																									
Mittan Rock																									
Drainage below Chaco R. Total	0	0.00	0.00	0	0.00	0.00																			
<b>Chinle Wash Drainage</b>																									
San Juan County:																									
Toadlena																									
Sonsela Buttes																									
Crystal																									
Chinle Wash Drainage Total	0	0.00	0.00	0	0.00	0.00																			
San Juan River Basin Total	5	5.82	16.04	3	1.59	5.01																			

Notes:  
<sup>1</sup> Reservoirs on Navajo Nation trust lands identified in table F-3 of Appendix F of the US Survey with irrigation as the primary purpose. Impoundment No. P-1380 on the Hogback Project is omitted from this tabulation because it is supplied water from the project canal via diversions from the San Juan River, and the depletions associated with this reservoir are included in the water rights for the project. Impoundment No. P-1380 is claimed to have an area of 16.53 acres and a capacity of 350.38 acre-feet.  
<sup>2</sup> Navajo Nation Department of Water Resources data for Captain Tom Reservoir indicate a surface area of about 75 acres and a storage capacity of about 1,170 acre-feet for the reservoir. SCS data indicate a reservoir storage capacity of 1,020 acre-feet or less. The reservoir stores water diverted from Captain Tom Wash, and may also store runoff from the natural drainage above the reservoir.  
<sup>3</sup> Navajo Nation Department of Water Resources data for Whiskey Lake indicate a surface area of about 100 acres and a storage capacity of about 7,468 acre-feet for the reservoir. SCS data indicate a reservoir storage capacity of 1,000 acre-feet or less.  
<sup>4</sup> Navajo Nation Department of Water Resources data for Chuska Lake indicate a surface area of about 83 acres and a storage capacity of about 3,345 acre-feet for the reservoir. SCS data indicate a reservoir storage capacity of 1,500 acre-feet or less. The reservoir may store water diverted from Red Willow Wash in addition to runoff from the natural drainage above the reservoir.



Table 28. Summary of Irrigation Reservoirs on Lands Allotted to Members of the Navajo Nation in the San Juan River Basin in New Mexico that are Claimed by the US Survey by Reservoir Type or Source, Drainage and Quadrangle<sup>1</sup>

Quadrangle	Diversion			Improved Spring			In Channel			In Channel Spring			In Channel Well			Off Channel			Well			Total				
	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)	Number	Area (acres)	Capacity (acre-feet)		
<b>Chaco River Drainage</b>																										
San Juan County:																										
La Vida Mission	1	5.87	5.58																			1	5.87	5.58		
McKinley County:																										
Antelope Lookout Mesa	2	6.20	20.75																			2	6.20	20.75		
Becenti Lake	2	88.91	278.13																			2	88.91	278.13		
Whitehorse	1	10.41	57.38																			1	10.41	57.38		
Crownpoint	3	3.16	10.92																			3	3.16	10.92		
Heart Rock							1	0.67	1.03													1	0.67	1.03		
County Subtotal	8	108.68	368.18	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	9	110.35	368.21
Sandoval County:																										
Mule Dam	1	1.09	2.55																			1	1.09	2.55		
Chaco River Drainage Total	0	0.00	0.00	0	0.00	0.00	10	116.44	376.31	0	0.00	0.00	1	0.67	1.03	0	0.00	0.00	0	0.00	0	0.00	0.00	11	117.11	377.34
San Juan River Basin Total	0	0.00	0.00	0	0.00	0.00	10	116.44	376.31	0	0.00	0.00	1	0.67	1.03	0	0.00	0.00	0	0.00	0	0.00	0.00	11	117.11	377.34

Notes:

<sup>1</sup> Reservoirs on Navajo allotments identified in table F-3 of Appendix F of the US Survey with irrigation as the primary purpose.

Table 29. Adjusted Maximum Areas and Storage Volumes for Tributary Irrigation Reservoirs on Lands Held by the United States in Trust for the Navajo Nation in the San Juan River Basin in New Mexico<sup>1</sup>

Quadrangle	Surface Water Reservoirs <sup>2</sup>		Ground Water Reservoirs <sup>3</sup>		Combined Source Reservoirs <sup>4</sup>		All Irrigation Reservoirs	
	Adjusted Surface Area (acres) <sup>5</sup>	Adjusted Storage Volume (acre-feet) <sup>6</sup>	Adjusted Surface Area (acres) <sup>5</sup>	Adjusted Storage Volume (acre-feet) <sup>6</sup>	Adjusted Surface Area (acres) <sup>5</sup>	Adjusted Storage Volume (acre-feet) <sup>6</sup>	Adjusted Surface Area (acres)	Adjusted Storage Volume (acre-feet)
<b>Chaco River Drainage</b>								
San Juan County:								
Yellow Hill	0.9	1.7	0.0	0.0	0.0	0.0	0.9	1.7
Sanostee West	3.0	8.9	0.8	1.9	0.0	0.0	3.8	10.7
Sanostee East	4.7	14.4	1.2	2.8	0.0	0.0	5.9	17.2
Old Pine Spring	15.2	131.4	0.0	0.0	0.0	0.0	15.2	131.4
Tsin-nas-kid								
Sheep Dip Reservoir (P-0039)					30.2	60.4	30.2	60.4
Other	15.5	37.7	1.0	2.4	4.6	9.1	21.2	49.2
Newcomb								
Captain Tom Reservoir (P-0036)	100.0	1,020.0					100.0	1,020.0
Other	2.3	7.7	0.4	0.9	0.0	0.0	2.7	8.6
Toadlena	5.6	34.5	0.0	0.0	0.0	0.0	5.6	34.5
Two Grey Hills	3.9	10.1	0.0	0.0	0.0	0.0	3.9	10.1
Washington Pass	4.4	8.7	0.0	0.0	0.0	0.0	4.4	8.7
Naschitti								
Naschitti Reservoir (P-0257)	90.0	650.0					90.0	650.0
Other	3.4	6.7	0.0	0.0	0.0	0.0	3.4	6.7
The Pillar 3 SE-White Rock Project (P-5072)			0.2	0.6			0.2	0.6
La Vida Mission	0.8	1.6	0.0	0.0	0.0	0.0	0.8	1.6
County Subtotal	249.7	1,933.3	3.7	8.6	34.8	69.4	288.2	2,011.3
McKinley County:								
Washington Pass-Long Lk. (P-0042)	258.4	1,350.0					258.4	1,350.0
Chuska Peak								
Whiskey Lake (P-0043)	138.0	1,200.0					138.0	1,200.0
Other	0.5	0.9	0.0	0.0	0.0	0.0	0.5	0.9
Tohatchi	14.2	27.8	0.0	0.0	0.0	0.0	14.2	27.8
Chuska Lake								
Chuska Lake (P-1162)	115.0	1,500.0					115.0	1,500.0
Other	0.0	0.0	1.8	4.3	0.0	0.0	1.8	4.3
Toyee	2.7	5.2	0.0	0.0	0.0	0.0	2.7	5.2
Standing Rock	6.8	13.4	0.0	0.0	0.0	0.0	6.8	13.4
Twin Lakes	20.9	41.0	0.0	0.0	0.0	0.0	20.9	41.0
Big Rock Hill								
Bass Lake (P-1823)			4.6	10.7			4.6	10.7
Other	5.4	10.5	0.6	1.4	4.9	9.6	10.9	21.5
Crownpoint	5.1	10.0	0.0	0.0	0.0	0.0	5.1	10.0
County Subtotal	566.9	4,158.8	7.0	16.5	4.9	9.6	578.9	4,184.9
Chaco River Drainage Total	816.7	6,092.1	10.7	25.1	39.7	79.0	867.1	6,196.2
<b>San Juan River Drainage below Chaco River</b>								
San Juan County:								
Rocky Point	3.6	7.1	0.0	0.0	0.0	0.0	3.6	7.1
Rattlesnake	1.4	2.7	0.0	0.0	0.0	0.0	1.4	2.7
Mitten Rock	7.5	14.8	0.0	0.0	0.0	0.0	7.5	14.8
Drainage below Chaco R. Total	12.5	24.5	0.0	0.0	0.0	0.0	12.5	24.5
<b>Chinle Wash Drainage</b>								
San Juan County:								
Upper Wheatfields-Little White Cone L. (P-1092)	34.4	67.4					34.4	67.4
Toadlena	0.6	1.2	0.0	0.0	0.0	0.0	0.6	1.2
Sonsela Buttes	5.9	11.6	0.0	0.0	0.0	0.0	5.9	11.6
Crystal	3.2	6.6	0.0	0.0	0.0	0.0	3.2	6.6
Chinle Wash Drainage Total	44.1	86.8	0.0	0.0	0.0	0.0	44.1	86.8
<b>San Juan River Basin Total</b>	<b>873.3</b>	<b>6,203.3</b>	<b>10.7</b>	<b>25.1</b>	<b>39.7</b>	<b>79.0</b>	<b>923.7</b>	<b>6,307.5</b>

Notes:

- <sup>1</sup> The US Survey does not claim any irrigation reservoirs on lands held in fee by the Navajo Nation.
- <sup>2</sup> Includes reservoirs classified by the US Survey as the following types: diversion, improved spring, in-channel, in-channel/spring, and off-channel. These types of reservoirs are assumed to have variable supplies from surface water sources, including any spring discharges.
- <sup>3</sup> Includes reservoirs classified by the US Survey as being associated with the storage of ground water withdrawn from a well.
- <sup>4</sup> Includes reservoirs classified by the US Survey as in-channel/well reservoirs. This type of reservoir is assumed to be supplied water from combined surface water and ground water sources.
- <sup>5</sup> Total maximum surface areas for irrigation reservoirs on Navajo Nation trust lands in the drainage within each quadrangle based on adjustments to the total areas claimed by the US Survey as described in Appendix E, table E-6.
- <sup>6</sup> Total storage volumes for irrigation reservoirs on Navajo Nation trust lands in the drainage within each quadrangle based on adjustments to the total capacities claimed by the US Survey as described in Appendix E, table E-6.



Table 30. Estimated Evaporation Depletions for Tributary Irrigation Reservoirs on Lands Held by the United States in Trust for the Navajo Nation in the San Juan River Basin in New Mexico<sup>1</sup>  
(continued)

Quadrangle	Average Annual Reservoir Net Evap Rate (ft/yr) <sup>2</sup>	Surface Water Only Reservoirs <sup>3</sup>			Combined Water Source Reservoirs <sup>4</sup>			All Surface Water or Combined Source Reservoirs <sup>5</sup>			Ground Water Only Reservoirs <sup>6</sup>			All Irrigation Reservoirs Combined <sup>7</sup>				
		Maximum Surface Area (acres) <sup>8</sup>	High Water Mark Area (acres) <sup>9</sup>	Maximum Surface Area (acres) <sup>10</sup>	Maximum Surface Area (acres) <sup>11</sup>	High Water Mark Area (acres) <sup>12</sup>	Maximum Surface Area (acres) <sup>13</sup>	Maximum Surface Area (acres) <sup>14</sup>	High Water Mark Area (acres) <sup>15</sup>	Maximum Surface Area (acres) <sup>16</sup>	Maximum Surface Area (acres) <sup>17</sup>	High Water Mark Area (acres) <sup>18</sup>	Maximum Surface Area (acres) <sup>19</sup>	Maximum Surface Area (acres) <sup>20</sup>	High Water Mark Area (acres) <sup>21</sup>	Maximum Surface Area (acres) <sup>22</sup>	High Water Mark Area (acres) <sup>23</sup>	Maximum Surface Area (acres) <sup>24</sup>
San Juan County:																		
Upper Wheatfields-LWC Lk. (P-1082)	2.7	34.4	34.4	0.0	0.0	34.4	34.4	20.0	54.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Toediana	1.8	0.6	0.2	0.0	0.0	0.6	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sonsela Buttes	3.3	5.9	2.0	0.0	0.0	5.9	0.8	2.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crystal	2.7	3.2	1.2	0.0	0.0	3.2	0.5	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chinle Wash Drainage Total		44.1	37.8	0.0	0.0	44.1	21.4	58.1	58.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
San Juan River Basin Total		873.3	684.2	39.7	33.8	913.0	239.5	716.6	716.6	10.7	41.1	4.2	2.7	10.1	2,864.1	726.7	56.8	56.8

Notes:

- The US Survey does not claim any irrigation reservoirs on lands held in fee by the Navajo Nation.
- Based on the average annual net evaporation rates for small or shallow reservoirs in each quadrangle shown in table 23; except, that the annual net evaporation rates for more substantial storage reservoirs (Captain Tom Reservoir, Whiskey Lake, Chuska Lake and Long Lake) were based on the gross annual lake evaporation from figure 3 for the specific location of each reservoir. Also, the gross lake evaporation rate for Whiskey Lake was reduced from about 50 inches per year indicated from figure 2 to about 45 inches per year, and the normal annual precipitation at the lake was assumed to be about 20 inches, based on the high elevation of the lake at 8995 feet, and indicated evaporation and precipitation rates for other lakes of similar elevation along the crest of the Chuska Mountains.
- Includes reservoirs classified by the US Survey as the following types: diversion, improved spring, in-channel, in-channel/spring, and off-channel. These types of reservoirs are assumed to have variable supplies from surface water sources, including any spring discharges.
- Includes reservoirs classified by the US Survey as in-channel/well reservoirs. This type of reservoir is assumed to be supplied water from combined surface water and ground water sources.
- Includes reservoirs classified by the US Survey as being associated with the storage of ground water withdrawn from a well.
- Total maximum surface areas for irrigation reservoirs on Navajo Nation trust lands in the drainage within each quadrangle based on adjustments to the total areas claimed by the US Survey as described in Appendix E, table E-4 (see table 27).
- Total surface areas at high water mark for irrigation reservoirs on Navajo Nation trust lands in the drainage within each quadrangle based on adjustments to the total areas claimed by the US Survey as described in Appendix E, table E-8.
- Assumes that all claimed irrigation reservoirs are actively storing water for irrigation or livestock uses and that reservoir storage is full throughout the year to the level of the maximum surface areas.
- Assumes average fullness factors of 40% and 35% for small reservoirs in San Juan and McKinley counties, respectively, based on the fullness factors for stock ponds in these counties in the San Juan River Basin used by the OSE to prepare stock pond evaporation estimates for State Engineer Technical Report 44. Fullness factors were applied to the historic high water mark areas, except, that average operating levels for Captain Tom Reservoir, Whiskey Lake, Chuska Lake, Long Lake and Little White Cone Lake were based on "Water Surface Evaporation for 1985, Small New Mexico Reservoirs, Upper Colorado River Basin" (backup data for New Mexico State Engineer Technical Report 46), and for Bass Lake was assumed equal to the high water mark (the surface area for the lake used by "Water Surface Evaporation for 1965" exceeds the estimated high water mark area for the lake). Most of the irrigation reservoirs claimed by the US Survey are small or shallow reservoirs or ponds used also for livestock watering.
- Based on average surface areas under normal operating and water supply conditions that are assumed to be reflected by the average fullness factors for stock ponds in each county; except, that average surface areas under normal conditions for some reservoirs were based on available data from the BIA or OSE. Assumes all claimed irrigation reservoirs are actively storing and regulating water for irrigation or stock water use.
- Assumed depletion impact percentages for surface water uses on the flow of the San Juan River were based on ephemeral channel distances between the irrigation reservoirs and the river (see figure 1). It was assumed for purposes of this analysis that ground water withdrawals to fill Navajo tributary irrigation reservoirs do not impact San Juan River flow. The tributary irrigation reservoirs generally are small with limited storage capability. For Captain Tom Reservoir, the river depletion impact associated with reservoir evaporation was increased 10% over that assumed based on channel distance because the reservoir is of a larger size and may store several hundred acre-feet in any year via diversions from Captain Tom Wash during periods of spring runoff from the Chuska Mountains when flows are reaching the river.

Table 31. Reservoir Volumes and Evaporation Depletions Associated with Proposed Water Rights for Tributary Irrigation Reservoirs on Lands Held by the United States in Trust for the Navajo Nation in the San Juan River Basin in New Mexico<sup>1</sup>

<u>Drainage</u>	<u>Number of Reservoirs<sup>2</sup></u>	<u>Total Storage Volume (acre-feet)<sup>3</sup></u>	<u>Total Maximum Surface Area (acres)<sup>4</sup></u>	<u>Total Maximum Annual Evaporation (acre-feet)<sup>5</sup></u>	<u>Average Annual Evaporation (acre-feet)<sup>6</sup></u>	<u>Annual Depletion of San Juan River Flow (acre-feet)<sup>7</sup></u>
<b><u>Chaco River Drainage</u></b>						
Surface Water Reservoirs <sup>8</sup>	65	6,092.1	816.7			
Ground Water Reservoirs <sup>9</sup>	10	25.1	10.7			
Combined Source Reservoirs <sup>10</sup>	3	79.0	39.7			
Chaco River Drainage Total	78	6,196.2	867.1	2,691	661	51
<b><u>San Juan River Drainage below Chaco River</u></b>						
Surface Water Reservoirs <sup>8</sup>	4	24.5	12.5	51	8	5
<b><u>Chinle Wash Drainage</u></b>						
Surface Water Reservoirs <sup>8</sup>	7	86.8	44.1	122	58	0
<b>San Juan River Basin Total</b>	<b>89</b>	<b>6,307.5</b>	<b>923.7</b>	<b>2,864</b>	<b>727</b>	<b>57</b>

Notes:

- <sup>1</sup> Irrigation water storage on Navajo Nation trust lands under proposed federal reserved water rights. The US Survey did not claim any irrigation reservoirs on Navajo Nation fee lands. Amounts of evaporation and depletions shown herein exclude depletions of storage water released for irrigation uses and depletions resulting from livestock water consumption from the reservoirs.
- <sup>2</sup> Proposed number of irrigation reservoirs for water storage rights of the Navajo Nation based on the US Survey (see table 27). Excludes Impoundment No. P-1380 which is a diversion re-regulation reservoir that is part of the Hogback Canal system and stores water diverted from the San Juan River.
- <sup>3</sup> Combined total storage volumes for irrigation reservoirs identified by the US Survey based on adjustments to the reservoir capacities claimed by the US Survey as described in Appendix E, table E-6 (see table 29). Excludes Impoundment No. P-1380 on the Hogback Project.
- <sup>4</sup> Combined total maximum surface areas for irrigation reservoirs identified by the US Survey based on adjustments to the reservoir areas claimed by the US Survey as described in Appendix E, table E-6 (see table 29). Excludes Impoundment No. P-1380 on the Hogback Project.
- <sup>5</sup> Maximum annual evaporation from table 30. Assumes all claimed reservoirs are actively storing water and are maintained full of water to the level of the maximum surface area at all times throughout the year.
- <sup>6</sup> Average annual evaporation from table 30. Assumes all claimed reservoirs are actively storing and regulating water as available for irrigation and/or livestock watering uses, with certain assumptions regarding average historic reservoir fullness for active irrigation reservoirs or stock ponds to reflect historic water supply available for storage.
- <sup>7</sup> Average annual depletion of San Juan River flow from table 30. Assumes all claimed reservoirs are actively storing and regulating water as available for irrigation and/or livestock watering uses and historic water supply.
- <sup>8</sup> Reservoirs which store water from surface flows or springs.
- <sup>9</sup> Reservoirs which store water from ground water wells.
- <sup>10</sup> Reservoirs which store water from surface flows or springs and from ground water wells.

Table 32. Estimates of Possible Historic Animal Units and Livestock Water Consumption on Navajo Lands in the San Juan River Basin in New Mexico<sup>1</sup>

San Juan County

Year	Beef Cattle			Sheep			Horses			Water Consumed on Navajo Lands (acre-feet) <sup>2</sup>				
	Total Head of All Cattle in County	Total Head of Milk Cows in County	Total Head of Beef Cattle in San Juan River Basin on Navajo Lands <sup>3</sup>	Total Head of Sheep in County	Total Head of Sheep in San Juan River Basin on Navajo Lands <sup>3</sup>	Total Head of Horses in County	Total Head of Horses in San Juan River Basin on Navajo Lands <sup>3</sup>	Water Consumed on Navajo Lands (acre-feet) <sup>2</sup>						
1930	11,565 *	1,520 †	10,045	10,025	7,318	82	212,972 *	212,546	155,159	348	7,360 *	7,345	5,362	72
1935	17,986 *	1,450 †	16,538	16,503	12,047	135	139,073 *	138,795	101,320	227	7,775 *	7,758	5,664	76
1940	10,505 *	1,950 †	8,555	8,538	6,233	70	131,646 *	131,383	95,908	215	8,688 *	8,669	6,328	85
1945	13,461 *	2,128 †	11,358	11,333	8,273	83	162,878 *	162,353	118,517	266	8,988 *	8,980	6,555	88
1950	15,554 *	2,301 †	13,253	13,228	9,655	108	102,255 *	102,050	74,487	197	8,404 *	8,387	6,123	82
1954	16,878 *	1,742 †	15,138	15,106	11,027	124	91,835 *	91,651	66,905	150	7,290 *	7,275	5,311	71
1959	18,303 *	1,275 †	15,028	14,998	11,488	128	84,368 *	84,199	60,987	137	4,148 *	4,140	3,141	42
1960	18,000	1,850	16,450	16,417	12,003	134	83,000	82,834	61,197	137	4,474 *	4,465	3,259	44
1961	18,000	1,900	16,500	16,467	12,385	139	85,000	84,830	63,747	143	4,474 *	4,465	3,259	44
1962	19,000	1,400	17,600	17,465	12,788	143	90,000	89,820	68,018	141	4,474 *	4,465	3,259	44
1963	19,000	1,400	17,600	17,465	12,859	144	83,000	82,834	60,833	138	4,474 *	4,465	3,259	44
1964	19,000	1,300	17,700	17,565	12,859	144	84,000	83,832	59,740	134	4,474 *	4,465	3,259	44
1965	19,000	1,400	17,600	17,565	12,859	144	80,000	79,840	59,211	135	4,800 †	4,790	3,313	45
1966	19,000	1,300	17,700	17,565	12,859	145	110,000	109,780	91,832	206	4,285 †	4,288	3,129	42
1967	19,000	1,200	17,800	17,664	12,832	145	142,100	141,816	108,176	180	4,285 †	4,288	3,129	42
1968	19,000	1,300	17,700	17,665	13,298	149	78,000	77,844	56,462	128	4,285 †	4,288	3,129	42
1969	20,000	1,200	18,800	18,762	14,087	158	77,000	76,848	55,770	125	4,285 †	4,288	3,129	42
1970	21,000	1,100	19,900	19,860	14,826	168	76,100	75,948	51,398	115	3,782 †	3,782	2,489	34
1971	22,000	1,200	20,800	20,759	16,283	182	65,000	64,870	46,827	104	3,070 †	3,064	2,237	30
1972	25,000	1,100	23,900	23,852	17,521	198	63,000	62,874	46,262	104	3,070 †	3,064	2,237	30
1973	25,000	800	24,200	24,152	19,558	220	64,000	63,872	44,405	98	3,070 †	3,064	2,237	30
1974	30,000	400	29,600	29,541	23,277	261	57,900	57,784	41,865	94	3,070 †	3,064	2,237	27
1975	35,000	700	34,300	34,231	24,260	272	57,000	56,888	41,381	93	2,345 †	2,345	1,582	21
1976	33,000	700	32,300	32,235	20,581	231	56,600	56,487	40,179	90	1,994 †	1,990	1,453	20
1977	25,000	800	24,200	24,152	18,866	189	53,700	53,593	41,053	92	1,994 †	1,990	1,453	20
1978	23,000	900	22,100	22,056	15,336	172	58,800	58,682	41,527	93	1,994 †	1,990	1,453	20
1979	21,000	1,000	20,000	19,960	15,269	171	55,000	54,880	41,891	94	1,838 †	1,835	1,519	18
1980	23,000	1,000	22,000	21,958	15,283	171	60,000	59,880	40,070	90	2,532 †	2,527	1,845	25
1981	21,000	1,100	19,900	19,860	15,862	178	50,000	49,900	36,427	82	2,532 †	2,527	1,845	25
1982	25,000	1,300	23,700	23,653	17,867	198	50,000	49,900	36,427	82	2,532 †	2,527	1,845	25
1983	26,000	1,200	24,800	24,750	18,796	211	50,000	49,900	36,427	82	3,428 †	3,419	2,488	33
1984	28,000	1,200	26,800	26,746	20,326	228	47,000	46,906	33,513	78	3,350 †	3,343	2,441	33
1985	30,000	1,000	29,000	28,942	21,164	237	45,000	44,910	34,606	78	3,350 †	3,343	2,441	33
1986	30,000	800	29,200	29,142	21,565	242	50,000	49,900	37,520	84	3,350 †	3,343	2,441	33
1987	31,000	800	30,200	30,140	21,801	242	53,000	52,884	43,348	97	3,350 †	3,343	2,441	33
1988	30,000	800	29,200	29,142	21,337	238	66,000	65,888	48,178	110	3,274 †	3,267	2,378	32
1989	30,000	800	29,200	29,142	21,346	238	66,000	65,888	48,448	109	3,266 †	3,259	2,379	32
1990	30,000	800	29,200	29,142	21,053	225	64,000	63,872	46,898	103	3,266 †	3,259	2,379	32
1991	26,000	500	25,500	25,469	18,997	213	62,000	61,876	44,441	100	3,266 †	3,259	2,379	32
1992	27,000	400	26,600	26,547	19,088	214	60,000	59,880	42,255	95	3,266 †	3,259	2,378	32
1993	26,000	200	25,800	25,748	18,760	210	56,000	55,888	34,970	78	3,257 †	3,250	2,457	33
1994	26,000	300	25,700	25,646	18,488	218	40,000	39,820	27,885	62	3,488 †	3,481	2,541	34
1995	28,000	200	27,800	27,744	20,591	231	36,000	35,928	24,406	55	3,488 †	3,481	2,541	34
1996	28,000	300	28,000	27,943	19,452	218	31,000	30,938	18,942	42	3,488 †	3,481	2,541	34
1997	25,000	300	24,700	24,651	18,888	243	21,000	20,968	14,571	33	3,488 †	3,481	2,625	35
1998	35,000	162 †	34,838	34,788	26,838	301	19,000	18,962	13,915	31	3,719 †	3,712	2,678	36
1999	38,000	182 †	38,838	38,780	29,024	325	19,200	19,162	14,844	33	3,633 †	3,626	2,647	36
2000	41,000	182 †	40,838	40,768	28,659	321	21,000	20,958	14,207	32	3,633 †	3,626	2,647	36
2001	38,000	162 †	37,838	37,762	25,795	289	18,000	17,864	10,200	23	3,633 †	3,626	2,647	36
2002	33,000	24 †	32,978	32,910	20,022	224	10,000	9,890	6,557	15	3,633 †	3,626	2,615	36
2003	22,000	12 †	21,988	21,944	15,261	171	8,000	7,884	5,464	12	3,547 †	3,540	2,674	36
2004	20,000	12 †	19,988	19,946	14,828	167	7,000	6,968	5,464	12	3,783 †	3,785	2,783	37
2005	21,000	12 †	20,988	20,946	16,383	184	6,000	5,960	4,557	15	3,783 †	3,785	2,783	37
2006	24,000	12 †	23,988	23,940	17,481	198	10,000	9,960	7,285	16	3,793 †	3,785	2,783	37
2007	24,000	0 †	24,000	23,952	16,756	188	10,000	9,960	8,597	18	3,793 †	3,785	2,783	38
2008	22,000	0 †	22,000	21,956	16,028	180	13,600	13,573	9,544	21	4,039 †	4,031	2,943	40
2009	22,000	0 †	22,000	21,956	16,574	186	12,600	12,575	9,180	21	4,039 †	4,031	2,943	40
2010	23,500	0 †	23,500	23,453			12,600	12,575			4,039 †	4,031	2,943	40

Table 32. Estimates of Possible Historic Animal Units and Livestock Water Consumption on Navajo Lands in the San Juan River Basin in New Mexico<sup>1</sup>  
(continued)

Year	McKinley County														
	Beef Cattle					Sheep					Horses				
	Total Head of All Cattle in County	Total Head of Beef Cattle in County <sup>2</sup>	Total Head of Milk Cows in County	Head of Beef Cattle in San Juan River Basin on Navajo Lands <sup>3</sup>	Water Consumed on Navajo Lands (acre-feet) <sup>4</sup>	Total Head of Sheep in County	Head of Sheep in San Juan River Basin on Navajo Lands <sup>3</sup>	Water Consumed on Navajo Lands (acre-feet) <sup>4</sup>	Total Head of Horses in County	Head of Horses in San Juan River Basin on Navajo Lands <sup>3</sup>	Water Consumed on Navajo Lands (acre-feet) <sup>4</sup>				
1930	8,720 *	8,470	250 ?	2,245	1,347	15	148,921 *	60,462	36,277	81	6,210 *	1,105	663	9	
1935	17,167 *	16,867	500 ?	4,417	2,650	30	171,478 *	69,620	41,772	94	7,780 *	1,385	831	11	
1940	7,284 *	6,884	410 ?	1,824	1,095	12	114,954 *	46,871	28,003	63	8,146 *	1,450	870	12	
1945	9,567 *	9,315	282 ?	2,468	1,481	17	132,708 *	53,879	32,328	72	9,315 *	1,658	985	13	
1950	10,253 *	10,089	154 ?	2,676	1,608	18	112,682 *	45,749	27,449	61	8,594 *	1,530	918	12	
1954	10,429 *	10,384	65 ?	2,746	1,648	18	95,114 *	38,916	23,170	52	10,817 *	1,890	1,134	15	
1959	9,148 *	9,112	38 ?	2,415	1,674	19	103,224 *	41,909	25,605	57	3,793 *	675	419	6	
1960	12,000	11,840	60	3,164	1,816	20	107,000	43,442	26,786	60	4,047 <sup>10</sup>	720	432	6	
1961	11,000	10,930	70	2,898	1,974	22	113,000	45,878	27,648	62	4,047 <sup>10</sup>	720	432	6	
1962	14,000	13,800	100	3,694	1,972	22	114,000	46,284	27,040	61	4,047 <sup>10</sup>	720	432	6	
1963	11,000	10,800	100	2,889	1,733	18	108,000	43,848	26,308	59	4,047 <sup>10</sup>	720	432	6	
1964	11,000	10,900	100	2,889	1,813	20	108,000	43,848	26,552	59	4,047 <sup>10</sup>	720	446	6	
1965	12,000	11,900	100	3,154	2,389	27	110,000	44,960	24,360	55	4,300 <sup>12</sup>	765	477	6	
1966	18,000	17,800	100	4,744	2,767	31	90,000	38,540	16,878	42	4,625 <sup>10</sup>	823	484	7	
1967	17,000	16,800	100	4,479	2,767	31	85,000	26,390	13,142	52	4,625 <sup>10</sup>	823	484	7	
1968	18,000	17,900	100	4,744	2,846	32	125,000	26,390	30,328	68	4,625 <sup>10</sup>	823	484	7	
1969	18,000	17,800	100	4,744	2,826	33	124,000	50,344	30,085	67	4,625 <sup>10</sup>	823	511	7	
1970	19,000	18,900	100	5,009	2,926	33	123,000	49,938	28,379	84	4,949 <sup>11</sup>	881	731	10	
1971	18,000	17,900	100	4,744	2,846	32	110,000	44,960	26,167	59	8,734 <sup>10</sup>	1,555	933	13	
1972	18,000	17,900	100	4,744	2,767	31	105,000	42,630	25,822	58	8,734 <sup>10</sup>	1,555	933	13	
1973	17,000	16,800	100	4,479	2,846	32	107,000	43,442	24,811	56	8,734 <sup>10</sup>	1,555	933	13	
1974	19,000	18,900	100	5,009	3,005	34	96,700	38,260	21,644	45	8,734 <sup>10</sup>	1,555	1,135	15	
1975	19,000	18,900	100	5,009	3,085	35	91,000	32,866	20,073	45	12,518 <sup>11</sup>	2,228	1,313	15	
1976	20,000	19,900	100	5,274	3,164	35	83,800	34,023	19,860	45	12,067 <sup>10</sup>	2,148	1,289	17	
1977	20,000	19,900	100	5,274	3,721	42	79,500	32,277	20,402	46	12,067 <sup>10</sup>	2,148	1,289	17	
1978	27,000	26,900	100	7,129	4,118	46	88,000	35,728	21,011	47	12,067 <sup>10</sup>	2,148	1,289	17	
1979	25,000	24,900	100	6,589	4,188	47	84,500	34,307	21,254	48	11,615 <sup>11</sup>	2,087	1,233	17	
1980	28,000	27,800	100	7,384	4,118	46	90,000	38,540	22,553	50	11,471 <sup>10</sup>	2,042	1,225	16	
1981	24,000	23,900	100	6,334	3,884	43	95,000	38,570	23,368	52	11,471 <sup>10</sup>	2,042	1,225	16	
1982	25,000	24,900	100	6,589	3,847	44	97,000	39,382	23,628	53	11,471 <sup>10</sup>	2,042	1,217	16	
1983	24,000	23,950	50	6,347	3,967	44	97,000	39,382	23,507	53	11,327 <sup>11</sup>	2,018	1,094	15	
1984	26,000	25,950	50	6,877	4,126	46	96,000	38,976	22,655	51	9,152 <sup>10</sup>	1,829	977	13	
1985	26,000	25,950	50	6,877	4,126	46	90,000	36,540	21,315	48	9,152 <sup>10</sup>	1,829	977	13	
1986	26,000	25,950	50	6,877	4,126	46	85,000	34,510	20,097	45	9,152 <sup>10</sup>	1,829	977	13	
1987	26,000	25,950	50	6,877	4,047	45	80,000	32,480	20,982	47	9,152 <sup>10</sup>	1,829	861	12	
1988	25,000	24,950	50	6,612	3,967	44	92,100	37,393	22,667	51	6,977 <sup>11</sup>	1,242	731	10	
1989	25,000	24,950	50	6,612	3,967	44	94,000	38,164	22,168	50	6,710 <sup>10</sup>	1,194	717	10	
1990	25,000	24,950	50	6,612	3,768	42	88,000	35,728	20,950	47	6,710 <sup>10</sup>	1,194	717	10	
1991	22,500	22,450	50	5,949	3,608	40	84,000	34,104	21,437	48	6,710 <sup>10</sup>	1,194	717	10	
1992	23,000	22,928	71 <sup>13</sup>	6,076	3,849	41	92,000	37,352	21,193	47	6,710 <sup>10</sup>	1,194	702	9	
1993	23,000	22,965	36 <sup>10</sup>	6,086	3,731	42	82,000	33,292	18,514	41	6,443 <sup>11</sup>	1,147	583	8	
1994	24,000	23,985	36 <sup>10</sup>	6,351	4,208	47	70,000	28,420	16,189	36	4,463 <sup>10</sup>	786	479	6	
1995	29,000	28,965	38 <sup>10</sup>	7,676	4,764	53	63,000	25,578	14,129	32	4,463 <sup>10</sup>	786	479	6	
1996	31,000	30,965	38 <sup>10</sup>	8,206	4,847	54	53,000	21,518	12,180	27	4,463 <sup>10</sup>	786	479	6	
1997	30,000	30,000	0 <sup>13</sup>	7,950	5,845	63	47,000	19,082	10,109	23	4,463 <sup>10</sup>	786	479	6	
1998	41,000	41,000	0 <sup>13</sup>	10,865	6,350	71	36,000	14,616	8,404	19	2,523 <sup>11</sup>	448	232	3	
1999	38,000	38,000	0 <sup>13</sup>	10,335	6,201	68	33,000	13,388	8,528	18	1,827 <sup>10</sup>	325	195	3	
2000	38,000	38,000	0 <sup>13</sup>	10,335	6,604	65	37,000	15,022	7,878	18	1,827 <sup>10</sup>	325	195	3	
2001	34,000	34,000	0 <sup>13</sup>	9,010	5,168	58	26,500	11,571	6,395	14	1,827 <sup>10</sup>	325	185	3	
2002	31,000	31,000	0 <sup>13</sup>	8,215	3,973	45	24,000	9,725	5,481	13	1,827 <sup>10</sup>	325	185	3	
2003	19,000	18,878	21 <sup>10</sup>	5,029	2,898	33	23,000	9,338	5,481	12	1,130 <sup>11</sup>	201	252	2	
2004	18,000	17,878	21 <sup>10</sup>	4,784	3,018	34	22,000	8,932	5,359	12	3,593 <sup>10</sup>	640	384	5	
2005	20,000	19,978	21 <sup>10</sup>	5,284	3,018	34	22,000	8,932	5,359	12	3,593 <sup>10</sup>	640	384	5	
2006	18,000	17,979	21 <sup>10</sup>	4,764	2,777	31	22,000	8,932	4,964	11	3,593 <sup>10</sup>	640	384	5	
2007	17,000	16,958	42 <sup>10</sup>	4,484	2,408	28	18,000	7,714	4,484	17	3,593 <sup>10</sup>	640	384	5	
2008	34,000	33,958	42 <sup>10</sup>	8,989	5,240	59	42,000	17,052	9,927	22	6,056 <sup>11</sup>	1,078	647	9	
2009	32,000	31,958	42 <sup>10</sup>	8,469	5,360	60	39,500	16,037	9,622	22	6,056 <sup>11</sup>	1,078	647	9	
2010	35,500	35,458	42 <sup>10</sup>	9,396	5,360	60	39,500	16,037	9,622	22	6,056 <sup>11</sup>	1,078	647	9	

Table 32. Estimates of Possible Historic Animal Units and Livestock Water Consumption on Navajo Lands in the San Juan River Basin in New Mexico (continued)

Year	Beef Cattle, Sheep and Horses in Basin on Navajo Lands					
	San Juan County		McKinley County		San Juan and McKinley Counties Combined	
	Animal Units on Navajo Lands <sup>a</sup>	Water Consumed on Navajo Lands (acre-feet)	Animal Units on Navajo Lands <sup>a</sup>	Water Consumed on Navajo Lands (acre-feet)	Animal Units on Navajo Lands <sup>a</sup>	Water Consumed on Navajo Lands (acre-feet)
1930	51,470	502	11,079	105	62,549	607
1935	43,042	438	13,924	134	56,968	573
1940	38,538	370	8,965	87	45,503	458
1945	44,458	446	10,558	102	55,018	548
1950	34,402	357	9,386	92	43,788	449
1954	33,085	345	8,574	86	41,659	430
1959	29,849	307	8,484	82	38,343	389
1960	30,562	315	8,948	88	39,511	402
1961	31,581	325	9,318	90	40,900	415
1962	31,800	326	9,164	88	40,964	417
1963	31,328	324	8,742	84	40,069	408
1964	31,172	323	8,898	86	40,068	409
1965	33,475	344	8,936	86	42,410	431
1966	39,019	383	7,980	80	46,999	473
1967	36,105	367	9,046	89	45,151	456
1968	30,540	317	10,922	106	41,462	424
1969	30,985	322	10,958	107	41,943	429
1970	30,174	315	10,751	106	40,925	421
1971	30,176	317	10,326	103	40,502	420
1972	31,324	330	10,185	101	41,478	431
1973	32,935	349	9,982	100	42,917	449
1974	35,715	381	9,551	97	45,268	478
1975	36,188	386	9,418	97	45,604	483
1976	32,079	340	9,425	97	41,504	437
1977	28,582	300	10,110	105	38,691	405
1978	27,040	283	10,835	110	37,878	383
1979	27,291	286	10,744	111	38,035	397
1980	27,125	286	10,976	113	38,101	399
1981	26,834	284	10,951	112	37,785	397
1982	28,044	309	11,008	113	39,852	421
1983	30,098	323	10,937	112	41,036	435
1984	31,145	336	10,787	110	41,912	448
1985	32,258	347	10,432	107	42,688	455
1986	33,385	358	10,128	104	43,513	465
1987	34,851	372	10,148	104	44,999	475
1988	35,813	380	10,365	105	46,278	485
1989	35,637	360	10,228	104	46,063	483
1990	33,907	359	9,722	99	43,629	458
1991	32,488	344	9,693	98	42,169	442
1992	32,028	340	9,846	98	41,877	438
1993	29,859	322	8,943	91	38,802	413
1994	28,851	314	8,736	90	37,867	404
1995	29,224	319	8,775	91	37,999	411
1996	26,729	294	8,370	88	35,099	382
1997	27,956	311	8,546	91	36,502	402
1998	32,995	368	8,693	93	41,688	481
1999	35,331	383	8,528	91	43,859	485
2000	34,858	388	7,993	86	42,851	474
2001	30,892	347	6,961	75	37,853	422
2002	24,276	274	5,562	59	29,839	334
2003	19,330	219	4,561	49	23,891	266
2004	19,056	217	4,741	51	23,797	268
2005	20,788	235	4,741	51	25,527	286
2006	22,065	248	4,410	47	28,475	297
2007	21,759	245	6,421	69	28,179	314
2008	21,356	240	6,369	60	28,725	330
2009	21,812	246	6,412	60	30,224	336
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Table 32. Estimates of Possible Historic Animal Units and Livestock Water Consumption on Navajo Lands in the San Juan River Basin in New Mexico<sup>1</sup>  
(continued)

Notes:

- <sup>1</sup> Includes beef cattle, sheep and horses in San Juan and McKinley counties. Drinking water uses by milk cows, hogs and poultry on Navajo lands in the San Juan River Basin are minimal and not significant for this evaluation. The BIA reported that there were no stock ponds or tanks in service on Navajo lands in Rio Arriba and Sandoval counties as of 1980. For this reason, and because there is relatively little Navajo grazing land in Rio Arriba and Sandoval counties, it was assumed that water consumption by range animals on Navajo lands in these two counties was not significant for inclusion in this evaluation of historic Navajo livestock watering uses. Prior to 1960, inventory data for cattle, milk cows, sheep and horses are from the periodic US Census of Agriculture (prepared by the US Department of Commerce, Bureau of the Census, through 1992 and by the US Department of Agriculture, National Agricultural Statistics Service (NASS), beginning 1967). Beginning 1960, inventory data for cattle, milk cows and sheep are from annual New Mexico Agricultural Statistics reports (prepared by the New Mexico Department of Agriculture (NMDA), New Mexico State University); except, that data on milk cows beginning 1968 for San Juan County and 1962 for McKinley County are from US Census of Agriculture. Because the number of milk cows was not estimated by the NMDA beginning 1962 for counties with less than 200 head, all inventory data for horses are from the US Census of Agriculture.
- <sup>2</sup> Total head of all cattle minus total head of milk cows.
- <sup>3</sup> It was assumed for San Juan County that 99.8% of beef cattle, sheep and horses in the county, on average, were within the San Juan River Basin. For McKinley County, it was assumed that 26.5% of beef cattle, 40.6% of sheep and 17.8% of horses in the county, on average, were within the basin (based on map of "Distribution of Livestock in Counties and River Basins in 1970" - backup data for New Mexico State Engineer Technical Report 44).
- <sup>4</sup> It was assumed for San Juan County that 73% of cattle, sheep and horses in the San Juan River Basin were on Navajo lands. For McKinley County, it was assumed that 60% of cattle, sheep and horses in the basin were on Navajo lands. No attempt was made in this analysis to segregate historic livestock uses between Navajo Nation trust lands, Navajo Nation fee lands or trust on behalf of the Navajo Nation or Navajo allottees. For 1959-2009, the number of head of cattle, sheep and horses on Navajo lands for each year was calculated based on the average of the total number of head in the basin on January 1 of the current and following years.
- <sup>5</sup> It was assumed that water consumption rates for livestock on Navajo lands in the San Juan River Basin average about 10 gallons per head per day (gphd) for beef cattle, 2 gphd for sheep and 12 gphd for horses.
- <sup>6</sup> Based on number of cattle and calves over 3 months old on April 1, 1930 or 1940, and on number of cattle and calves of all ages on January 1, 1935. Based on number of cattle and calves reported for 1945, 1950, 1954 or 1959.
- <sup>7</sup> Based on number of cows and heifers over 2 years old on January 1 kept mainly for milk production as of April 1, 1930 or 1940, and on number of cows and heifers milked in 1929, 1934 and 1938. Based on number of milk cows reported for 1950, 1954 or 1959.
- <sup>8</sup> Based on number of sheep and lambs over 6 months old on April 1, 1930 or 1940, and on number of sheep and lambs of all ages on January 1, 1935. Numbers of goats were not listed in the 1940 Agricultural Census, and were assumed to be included in the head counts for sheep and lambs for 1930, 1935 and 1940. Based on number of sheep and lambs reported in 1945 or 1950, assuming reported numbers of goats and kids for 1945 and 1950 were included in the total numbers of sheep and lambs for these two years. Includes reported number of sheep and lambs plus reported number of goats and kids for 1954 or 1959.
- <sup>9</sup> Based on number of horses and mules, including colts, over 3 months old on April 1, 1930 or 1940, or of all ages on January 1, 1935. Based on number of horses and mules, including ponies and colts, reported in 1945, 1950, 1954 or 1959.
- <sup>10</sup> Assumed based on the average of the data from the preceding census and the following census.
- <sup>11</sup> US Census of Agriculture data for December 31 of previous year (US Department of Agriculture, National Agricultural Statistics Service). Includes horses, ponies, mules, burros and donkeys.
- <sup>12</sup> From OSE Memorandum on Water Requirements for Livestock in New Mexico in 1965, prepared by Earl Sorenson and dated January 1971 (sources data from study by Department of Agricultural Economics and Agricultural Business, NMSU).
- <sup>13</sup> US Census of Agriculture data (US Department of Agriculture, National Agricultural Statistics Service).
- <sup>14</sup> Assumes 1 Animal Unit (AU) for each head of beef cattle and horses, and 0.25 AU for each head of sheep.
- <sup>15</sup> Assumes that incidental livestock use depletions resulting from evaporation and spills at steel tanks and troughs and from pipe leaks at wells, windmills and developed springs averages an amount equivalent to about 14 percent of all livestock water consumption in the basin. Excludes evaporation depletions resulting from storage of water in livestock reservoirs claimed by the US Survey.
- <sup>16</sup> The permitted animal units for Navajo lands within the San Juan River Basin in New Mexico for 2009 was estimated at about 24,872 AU, of which 21,674 AU were permitted for Navajo Nation trust lands and about 3,198 AU were permitted for Navajo Nation fee lands or Navajo allotments (see Navajo San Juan Livestock Water Requirements, prepared by Keller-Blesner Engineering, LLC, and dated January 12, 2012, page 4). Based on the livestock use distribution analysis provided in table 33, it was assumed that the depletion impact on the flow of the San Juan River of livestock watering on Navajo Nation trust lands averaged about 21 percent of the livestock water consumption and that the weighted depletion impact on river flow of livestock watering on Navajo Nation fee lands and Navajo allotments averaged about 5 percent. Assuming that the geographic distribution of Navajo livestock watering uses for 2009 is representative of historic conditions, it was assumed that the weighted average depletion impact on river flow of all livestock watering on Navajo lands in the basin combined is about 19 percent of the total at-site livestock watering depletion. For purposes of this analysis, no adjustments were made for livestock watering uses at the cattle feedlot or sheep feedlot that were supplied from the San Juan River.

Table 33. Assumed Percentage Impact on San Juan River Flow of Livestock Water Consumption on Navajo Lands in New Mexico

**A. Livestock Watering Uses on Lands Held by the United States in Trust on Behalf of the Navajo Nation:**

Navajo Grazing District	Permitted Animal Units	Weighted Average Depletion of San Juan River Flow in Percent of At-Site Depletion	Distribution of Potential Livestock Water Sources within Select Grazing Districts by Quadrangles with Assumed Percentage Depletion Impacts on San Juan River Flow <sup>2</sup>									
			Stock Water Sources	Quadrangles with 100% River Impact	Quadrangles with 75% River Impact	Quadrangles with 50% River Impact	Quadrangles with 25% River Impact	Number of Surface Water or Combined Water Sources Located in Quadrangles within which Uses are Assumed to Impact River	Number of Water Sources with No Assumed River Impact <sup>3</sup>			
9	99	29%	0	2	0	0	0	0	0	0	2	
11	178	0%	0	0	0	0	0	0	0	0	3	
12	9,627	36%	2	2	0	0	0	0	0	0	5	
13	2,724	35%	0	0	0	0	0	0	0	0	0	
14	5,629	1%	82	72	27	27	78	55	12	146	11	
15	1,756	0%	2	1	0	0	0	0	0	0	2	
16	9	0%	6	0	0	0	0	0	0	0	226	
18	847	0%	2	6	0	0	8	0	0	0	10	
19	243	53%	0	0	0	0	0	0	0	0	63	
20	562	0%	92	79	29	29	109	75	73	0	0	
Total	21,674	21%	10	35	37	37	75	0	0	0	0	
			9	9	0	0	0	0	0	0	0	
			Wells	1	2	0	0	0	0	0	0	
			Springs	20	37	37	75	0	0	0	0	
			All Sources	0	0	0	0	0	0	0	0	
14			Stock Ponds	0	0	0	0	0	0	0	0	
			Irrig. Reservoirs	0	0	0	0	0	0	0	0	
			Wells	0	0	0	0	0	0	0	0	
			Springs	0	0	0	0	0	0	0	0	
			Natural Lakes	0	0	0	0	0	0	0	0	
			All Sources	0	0	0	0	0	0	0	0	
19			Stock Ponds	9	143	11	11	0	0	0	0	
			Wells	0	0	0	0	0	0	0	0	
			Springs	0	1	0	0	0	0	0	0	
			All Sources	9	144	11	11	0	0	0	0	

**B. Livestock Watering Uses on Lands Held by the Navajo Nation in Fees:**

Navajo Grazing District	Permitted Animal Units	Weighted Average Depletion of San Juan River Flow in Percent of At-Site Depletion	Distribution of Potential Livestock Water Sources within Select Grazing Districts by Quadrangles with Assumed Percentage Depletion Impacts on San Juan River Flow <sup>2</sup>									
			Stock Water Sources	Quadrangles with 100% River Impact	Quadrangles with 75% River Impact	Quadrangles with 50% River Impact	Quadrangles with 25% River Impact	Number of Surface Water or Combined Water Sources Located in Quadrangles within which Uses are Assumed to Impact River	Number of Water Sources with No Assumed River Impact <sup>3</sup>			
9	0		1	6	5	5	27	80	0	0	0	
11	0		0	0	0	0	0	0	0	0	37	
12	0		0	0	0	0	0	0	0	0	0	
13	0		0	0	0	0	0	0	0	0	0	
14	0	0%	1	6	5	5	28	117	1	1	0	
15	0		0	0	0	0	0	0	0	0	0	
16	0		0	0	0	0	0	0	0	0	0	
18	0		0	0	0	0	0	0	0	0	0	
19	376	10%	0	0	0	0	0	0	0	0	0	
20	1,218	0%	0	0	0	0	0	0	0	0	0	
Total	1,594	2%	1	6	5	5	28	117	1	1	0	

Table 33. Assumed Percentage Impact on San Juan River Flow of Livestock Water Consumption on Navajo Lands in New Mexico (continued)

C. Livestock Watering Uses on Lands Held by the United States in Trust on Behalf of Individual Navajo Allottees:<sup>1</sup>

Navajo Grazing District	Permitted Animal Units	Weighted Average Depletion of San Juan River Flow in Percent of At-Site Depletion	Distribution of Potential Livestock Water Sources within Select Grazing Districts by Quadrangles with Assumed Percentage Depletion Impacts on San Juan River Flow <sup>2</sup>										Number of Water Sources with No Assumed River Impact <sup>3</sup>
			Navajo Grazing District	Stock Water Sources	Quadrangles with 100% River Impact		Quadrangles with 75% River Impact		Quadrangles with 50% River Impact		Quadrangles with 25% River Impact		
					River Impact	River Impact	River Impact	River Impact	River Impact	River Impact			
9	0		19	Stock Ponds	2	29	30	0	0	0	0	69	
11	0			Irri. Reservoirs	0	0	0	0	0	0	0	1	
12	31	36%		Wells	0	0	0	0	0	0	0	38	
13	2	35%		Springs	1	1	1	0	0	0	0	0	
14	5	1%		All Sources	3	30	31	0	0	0	0	108	
15	1	0%											
16	35	0%											
18	0												
19	412	24%											
20	1,119	0%											
<b>Total</b>	<b>1,605</b>	<b>7%</b>											

Notes:

- <sup>1</sup> Animal units for Navajo Nation trust lands in the San Juan River Basin in New Mexico by Navajo grazing district are from Navajo San Juan Livestock Water Requirements, prepared by Keller-Blesner Engineering, LLC, and dated January 12, 2012 (Livestock Report), page 4, table 2.
- <sup>2</sup> A map showing Navajo grazing districts within the San Juan River Basin in New Mexico is provided in the Livestock Report at page 3. For purposes of this analysis, it was assumed that water consumption by cattle, sheep and horses within a grazing district was distributed geographically in proportion to the distribution of potential livestock watering sources in the district, including stock ponds, irrigation reservoirs, stock wells and stock springs claimed by the US Survey and natural lakes or intermittent ponds along the crest of the Chuska Mountains identified from US Geological Survey topographic maps (see US Survey, Appendix B). To determine the average depletion impact on the flow of the San Juan River of livestock watering within each district, the grazing district boundaries were overlain onto figure 1. For districts encompassing quadrangles with varying assumed percentage depletion impacts on San Juan River flow, the assumed depletion impacts were determined based on counts of claimed stock ponds, irrigation reservoirs, stock wells and stock springs within each quadrangle; except, that stock or irrigation wells supplying ground water to claimed livestock or irrigation reservoirs were not included in the tabulations shown in this table to avoid double-counting of water sources, and springs along the Fruitland Canal resulting from NIIP return flows also were not included in these tabulations (see figure 1 attached hereto, and Appendices B, F and M and table D-2 of the US Survey). The analysis shown in this table reflects potential counts of water sources based on the US Survey, without reductions for presently inactive storage reservoirs or wells. Domestic water supply wells claimed by the US Survey were included if stock water was claimed as a secondary use for the well.
- <sup>3</sup> Includes stock and irrigation wells and reservoirs filled with ground water well withdrawals that do not impact San Juan River flow, and stock springs, natural lakes and reservoirs filled with surface water or combined surface and ground water sources that are located in quadrangles within which surface water uses were assumed to not impact San Juan River flow due to distances between the water development or source and the river. Alluvial wells within the San Juan River valley claimed by the US Survey as stock water or irrigation wells are included as having 100 percent impact on river flow.
- <sup>4</sup> Total animal units for lands held by the Navajo Nation in fee, lands held by the United States in trust on behalf of Navajo allottees, and lands held by individual members of the Navajo Nation subject to restraint on alienation imposed pursuant to federal law combined are computed for each Navajo grazing district as the difference between the total AU for Navajo lands in the basin and the AU for Navajo Nation trust lands (see Livestock Report, pages 1 and 4, table 2). For grazing districts 12, 13, 14 and 16, the difference was assumed to reflect AU on lands held by members of the Navajo Nation subject to restraint on alienation (which for purposes of this analysis was treated as if it reflected AU on Navajo allotments), and the associated percentage depletion impacts on San Juan River flow were assumed to be equal to the weighted average depletion impact for livestock watering uses on Navajo Nation trust lands in each district because no information has been provided as to where said lands are located within the districts. For grazing districts 15, 19 and 20, the difference was assumed to be distributed geographically between Navajo Nation fee lands and Navajo allotments within each district in the same proportion as the total numbers of livestock water sources on fee lands and allotments, respectively, within each district (the US Survey claims 4 stock ponds on fee lands and 8 stock ponds on allotments within district 15, the US Survey claims about 157 stock watering sources on fee lands and about 172 stock watering sources on allotments within district 19, and the US Survey claims about 197 stock watering sources on fee lands and about 181 stock watering sources on allotments within district 20). The total stock watering sources for districts 19 and 20 include stock ponds, irrigation reservoirs, wells and springs, and there are no irrigation reservoirs, stock wells or stock springs claimed by the US Survey for Navajo Nation fee lands or Navajo allotments within district 15.

Table 34. Summary of Proposed Water Rights for the Navajo Nation for Historic Tributary Uses in the San Juan River Basin

	<u>Irrigation Uses</u>			<u>Reservoir Storage</u>			<u>Livestock Watering</u>		<u>Other</u>	<u>All Uses</u>		
	Acres with Water Rights	Acres Irrigated in Any Year	Maximum Annual Diversion (acre-feet)	Number of Reservoirs	Maximum Storage Volume (acre-feet)	Maximum Surface Area (acres)	Maximum Annual Animal Units	Maximum Annual Diversion (acre-feet)	Maximum Annual Diversion (acre-feet)	Maximum Annual At-Site Depletion (acre-feet)	Average Annual At-Site Depletion (acre-feet)	Depletion of San Juan River Flows (acre-feet)
<b>Federal Reserved Water Rights</b>												
Tributary Irrigation Uses:												
Irrigation Projects <sup>1</sup>												
Chaco River Drainage	7,337.3	4,816	23,635							9,032	4,516	1,107
San Juan River Drainage below Chaco R.	84.3	74	322							157	78	74
Chinle Wash Drainage	597.6	323	910							477	239	0
Subtotal	8,019.2	5,213	24,867							9,666	4,833	1,181
Non-Project Irrigation Lands <sup>2</sup>												
Chaco River Drainage	1,353.9	511	1,512							906	485	23
Chinle Wash Drainage	30.6	5	11							7	3	0
Subtotal	1,384.5	516	1,523							913	488	23
Irrigation Total	9,403.7	5,729	26,390							10,579	5,321	1,204
Tributary Reservoirs:												
Irrigation Reservoirs <sup>3</sup>												
Chaco River Drainage				78	6,196	867				2,691	661	51
San Juan River Drainage below Chaco R.				4	25	13				51	8	5
Chinle Wash Drainage				7	87	44				122	58	0
Subtotal				89	6,308	924				2,864	727	56
Livestock Reservoirs <sup>4</sup>												
San Juan River Drainage above Chaco R.				193	628	253				956	166	126
Chaco River Drainage				803	3,378	1,837				6,446	1,400	252
San Juan River Drainage below Chaco R.				98	264	115				487	89	72
Chinle Wash Drainage				36	365	180				556	105	0
Subtotal				1,130	4,634	2,185				8,445	1,760	450
Reservoir Storage Total				1,219	10,942	3,109				11,309	2,467	506
Livestock Watering							40,900	482		482	482	101
<b>Federal Reserved Water Rights Total</b>	<b>9,403.7</b>	<b>5,729</b>	<b>26,390</b>	<b>1,219</b>	<b>10,942</b>	<b>3,109</b>	<b>40,900</b>	<b>482</b>	<b>0</b>	<b>22,370</b>	<b>8,290</b>	<b>1,811</b>
<b>State Law Water Rights</b>												
Tributary Irrigation Uses:												
Irrigation Projects <sup>1</sup>												
Chaco River Drainage	756.6	756	2,076							1,250	189	0
Tributary Reservoirs:												
Livestock Reservoirs <sup>4</sup>												
San Juan River Drainage above Chaco R.				53	143	73				216	33	7
Chaco River Drainage				248	601	306				1,188	239	0
Total				301	745	379				1,404	272	7
Livestock Watering							3,000	35		35	35	1
Industrial Uses (Chaco River Drainage)									86	86	86	0
<b>State Law Water Rights Total</b>	<b>756.6</b>	<b>756</b>	<b>2,076</b>	<b>301</b>	<b>745</b>	<b>379</b>	<b>3,000</b>	<b>35</b>	<b>86</b>	<b>2,775</b>	<b>582</b>	<b>8</b>
<b>Total of Reserved and State Law Rights</b>	<b>10,160.3</b>	<b>6,485</b>	<b>28,466</b>	<b>1,520</b>	<b>11,686</b>	<b>3,487</b>	<b>43,900</b>	<b>517</b>	<b>86</b>	<b>25,145</b>	<b>8,872</b>	<b>1,819</b>

## Notes:

<sup>1</sup> From table 13.<sup>2</sup> From table 15.<sup>3</sup> From table 31.<sup>4</sup> From table 26.