

Memorandum
August 9, 2004, ~~Draft~~ JW

To: San Juan Agricultural Water Users Association Board
From: John Whipple, Staff Engineer, New Mexico Interstate Stream Commission
Subject: Concerns of the San Juan Agricultural Water Users Association regarding the Proposed San Juan River Basin in New Mexico Navajo Nation Water Rights Settlement Agreement, Dated July 9, 2004

The San Juan Agricultural Water Users Association seeks clarity as to whether or how some of its concerns regarding the proposed San Juan River Basin in New Mexico Navajo Nation Water Rights Settlement Agreement were addressed.

1. The Association desires protection of water rights adjudicated by the Echo Ditch Decree, with waivers from the Navajo Nation that the Nation would not challenge the decreed rights except on the basis of forfeiture for non-use after entry of the Decree.

The requested waivers were included in the revised proposed Settlement Agreement dated July 9, 2004. Specifically, the Navajo Nation would agree to waive objections to the priority dates and to the quantifications of irrigation rights adjudicated by the Echo Ditch Decree; except, that the Nation may raise objections in the San Juan River Adjudication relating to whether water rights acreage has been forfeited or abandoned for non-use or other lawful cause since the time the rights were decreed.

2. The Association desires that the Hogback Irrigation Project diversion right have a split priority: a 115 cfs diversion rate with a priority date of 1868, plus a 110 cfs diversion rate with a priority date of 1909.

The priority date for the Hogback Project diversion remains 1868 in the revised proposed Settlement Agreement. The Hogback Project rights are federal reserved rights, and as such are not subject to historic use standards. The Project acreage of 8,830 acres included in the Settlement Agreement is all land reserved by the United States in trust for the Navajo Nation in 1868, and the priority date for the rights to irrigate the lands ties back to the date lands were reserved by the United States to create a Navajo homeland. All the proposed water right acreage for the Project lies within the existing service area of the Project canal system, is currently allotted to members of the Navajo Nation for farming purposes, and is likely to be determined to be practicably irrigable.

Non-Navajo municipal, industrial and irrigation users all expressed concerns over risks of curtailment due to priority calls being implemented to satisfy the rights for the Fruitland and Hogback irrigation projects at such times that the direct flow is not sufficient to meet the demands of the direct-flow water rights. Further, both Navajo and non-Navajo ditches on the San Juan River expressed a desire to receive benefits

from Navajo Reservoir storage. However, avoiding administration of direct-flow and stored water rights, or obtaining new contracts for water from the Navajo Reservoir water supply over and above the proposed contract for the Navajo-Gallup Water Supply Project, are not viable options.

A substantial solution to the concerns expressed is that the Navajo Nation under the proposed Settlement Agreement would agree to use in any year up to 15,000 acre-feet of its Navajo Indian Irrigation Project contract water from Navajo Reservoir to supply uses under the Fruitland and Hogback irrigation projects as necessary to prevent or delay priority calls. The amount of alternate water supply to be provided by the Navajo Nation would be reduced in years that contract deliveries to the Navajo Indian Irrigation Project are shorted because of shortage sharing between contractors. The Navajo Nation would not request a priority call in any year to meet current demands of the Fruitland and Hogback projects until the contract water is exhausted. For purposes of water rights administration, this solution much of the time effectively subordinates the senior 1868 priority rights for the Fruitland and Hogback irrigation projects to the 1955 contract rights of the Navajo Indian Irrigation Project.

The Interstate Stream Commission staff estimates based on historic hydrology that without the alternate water source provisions for the Fruitland and Hogback irrigation projects, the administration of direct-flow rights and contract rights for stored water in the San Juan River Basin in New Mexico would result in priority calls against junior direct-flow uses for weeks to months at a time during approximately 46 years out of every 100 years. The State Engineer has committed to such administration to protect water rights. With the alternate water source provisions provided by the Settlement Agreement, the risk of occurrence of shortages to direct-flow users would be substantially reduced to about 4 years every 100 years. A summary of the Commission's evaluation of risk is attached. Those who benefit most from the Navajo Nation's agreement to supply Navajo Indian Irrigation Project water to the Fruitland and Hogback projects in accordance with this agreement are those who have the more junior rights on the San Juan River stream system because they are the ones more vulnerable to the occurrence of curtailments in priority.

This solution provides non-Navajo direct-flow users on the San Juan and Animas rivers with substantial protection against priority calls for the Fruitland and Hogback projects, and provides them the benefits of stored water in Navajo Reservoir without a contract and at no cost. By reducing potential priority calls that could ripple up the San Juan, Animas and La Plata rivers, this solution also allows water supply management issues on the three streams to more often be addressed locally.

Also, the Navajo Nation under the Settlement Agreement would agree that the annual consumptive irrigation requirements and diversion requirements for the Fruitland and Hogback irrigation projects would be limited to being determined on the same basis as the non-Navajo irrigation rights adjudicated by the Echo Ditch Decree. The maximum diversion rate for the Hogback Project was reduced to 221 cfs total to be consistent with the one cfs per 40 acres diversion rates adjudicated to non-Navajo

irrigation ditches in the San Juan River Basin by the Echo Ditch Decree. The annual diversion requirement for the Project was changed to reflect consistency with the determinations of annual diversion requirements for non-Navajo irrigation ditches in the report of Hydrographic Survey approved by the Echo Ditch Decree. These agreements help protect direct-flow water rights in the San Juan River Basin. But, if irrigation rights in the San Juan River Adjudication are determined using a methodology that results in per-acre consumptive irrigation requirements and diversion requirements that are different than those determined in the report of hydrographic Survey approved by the Echo Ditch Decree, the diversion and depletion rights of the Navajo Nation for the Fruitland and Hogback irrigation projects would be increased accordingly for reasons of equity. Further, because a basin-wide increase in irrigation water rights senior to the Secretary of the Interior's right to store water in Navajo Reservoir would add risk to the Navajo Reservoir water supply contractors, including for uses under the Navajo Indian Irrigation Project contract rights, the agreement of the Navajo Nation to use some of its Navajo Indian Irrigation Project water on the Fruitland and Hogback projects as alternate water supply would be nullified. The conditions for the alternate water source provisions for the Fruitland and Hogback projects simply mirror the waivers that non-Navajo irrigation users in the Basin sought to be included as part of the proposed Settlement Agreement.

The Navajo Nation under the proposed Settlement Agreement further would agree to limit its water rights acreage under the Fruitland and Hogback irrigation projects to existing farm acreage under the project service area, which totals 12,165 acres. Without settlement, the Navajo Nation may claim additional acreage as part of a practicably irrigable acreage claim. Subsection 11(c) of Public Law 87-483 makes reference to expansion of the Fruitland and Hogback irrigation projects in an aggregate amount of up to 11,000 acres, and the Congressional record refers to a total acreage under both projects combined of 26,000 acres with expansion. Public Law 87-483 makes clear that the Navajo Nation did not waive its claims to waters originating either above or below Navajo Dam for water to irrigate expanded projects. Acreage under expanded projects would have reserved senior water rights, and as such Public Law 87-483 exempts the water required to irrigate the expanded projects from the requirement that water users must have a contract for the delivery of water to which the United States is entitled that originates above Navajo Dam. A consultant to the Navajo Nation more recently prepared an evaluation of potentially irrigable lands within the Navajo Nation in the area near and between Shiprock and Four Corners, and reportedly found about 37,000 acres of potentially irrigable land in New Mexico over and above the 12,165 acres under the current service area of the Fruitland and Hogback projects. It is not clear how many acres might be determined by the Court in the San Juan River Adjudication to be practicably irrigable.

3. The Association desires that a 1955 priority date be provided for the uses under the Navajo-Gallup Water Supply Project, as opposed to a priority date of 1868 subordinated to 1955.

The priority date for the Navajo Nation uses in New Mexico under the Navajo-Gallup Water Supply Project remains 1868 in the revised proposed Settlement Agreement. The Navajo Nation's rights under the Project for uses in New Mexico are being treated as federal reserved rights because the Nation must have domestic water supplies if the reservation is fulfill the purpose of being a permanent homeland for the Navajo people. Still, the senior 1868 reserved priority for these uses would be subordinated to the priority dates of permits held by the Secretary of the Interior for water development in New Mexico consistent with Public Law 87-483, which from a practical perspective addresses the concerns of non-Navajo users regarding possible impacts that otherwise could result from quantifying large senior rights. Similarly, the uses under the Navajo-Gallup Water Supply Project by the Jicarilla Apache Nation, including a proposed lease of its Navajo Reservoir water supply contract water to the City of Gallup, would be subordinated to the priority dates of the permits held by the Secretary.

For purposes of water rights administration, the portion of the Navajo-Gallup Water Supply Project demand that is served by diversions through the Navajo Indian Irrigation Project facilities would be supplied out of Navajo Reservoir under State Engineer File No. 2849 with a priority date of 1955. The Project demand that is served by diversions from the San Juan River at the Public Service Company of New Mexico diversion weir near Kirtland, including also the diversions for delivery to Navajo Nation uses under the Project in Arizona, would be supplied first from inflow to the San Juan River arising below Navajo Dam under State Engineer File No. 3215 with a priority date of 1968 to the extent inflow is available in priority, and would be supplied second from water originating above Navajo Dam under File No. 2849 with a priority date of 1955.

Under the Settlement Agreement, the Project uses in Arizona would be administered as junior to water uses in New Mexico so as to not cause detriment to contractors in New Mexico. The demand on the Navajo Reservoir water supply of the Arizona portion of the Project would be shorted in its entirety in any year before allocating shortages among the New Mexico uses of water from that supply.

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Study of the Effects of the Provisions of Subparagraphs 9.1 and 9.2 of the Proposed Settlement Agreement Assuming Historic Hydrology for the Available Period of Record 1956-2003

Annual Summary of Amounts of Water Released from Navajo Reservoir Storage to Meet the Minimum Direct Flow Determination as per Subparagraph 9.1 of the Agreement and the Alternate Water Source Provisions for Navajo Nation San Juan River Diversions, including the Fruitland and Hogback Irrigation Projects, as per Subparagraph 9.2 of the Agreement

Year	Modeled May 31 Navajo Reservoir Storage (1) (af)	Release from Storage to Maintain Minimum Direct Flow (af)	Release from Storage for Alternate Water Source Demands for Fruitland and Hogback (2) (af)	Ten-year Running Average of Releases per Alternate Water Source Provisions (af)	Depletion of Release from Alternate Water Source Demands for Fruitland and Hogback Projects (3) (af)	Ten-year Running Average of Depletions per Alternate Water Source Provisions (af)	Shortage to Direct-Flow by Alternate Water Source Provisions (af)	Period of Shortage to Direct-Flow Uses (dates)	Shortage to Direct-Flow Uses Not Met if Endangered Fish Habitat Releases Provide Carriage Water (5) (af)
1956	944,200	0	15,000	6,480	6,480	1,831	16,864	9/16-10/31	8,344
1957	891,700	0	0	0	0	0	0		0
1958	1,685,700	0	222	96	96	1,212	0		0
1959	1,388,300	690	15,000	6,480	6,480	1,212	4,109	9/17-9/30	0
1960	1,377,700	0	4,979	2,151	2,151	1,203	0		0
1961	1,289,600	0	212	92	92	555	0		0
1962	1,440,500	0	3,855	1,665	1,665	388	0		0
1963	1,424,400	0	2,383	1,029	1,029	611	0		0
1964	1,173,100	0	726	314	314	508	0		0
1965	1,145,600	0	0	4,238	4,238	917	0		0
1966	1,670,900	0	683	2,806	2,806	887	0		0
1967	1,360,200	0	0	2,785	2,785	1,328	0		0
1968	1,281,300	0	10	1,285	1,285	1,654	0		0
1969	1,393,300	0	0	798	798	1,649	0		0
1970	1,481,900	0	113	898	898	345	0		0
1971	1,506,000	0	1,210	523	523	388	0		0
1972	1,372,200	0	9,025	3,899	3,899	611	0		0
1973	1,374,000	0	0	1,177	1,177	508	0		0
1974	1,591,500	0	10,179	2,122	2,122	917	0		0
1975	1,325,300	0	0	2,122	2,122	887	0		0
1976	1,530,600	0	0	2,954	2,954	1,328	0		0
1977	1,188,900	216	10,203	3,074	4,408	1,654	0		0
1978	1,085,000	0	7,560	3,829	3,266	1,654	0		0
1979	1,204,500	0	0	3,829	0	1,649	0		0
1980	1,451,900	0	0	3,818	0	281	0		0
1981	1,432,300	0	651	3,762	281	1,625	0		0
1982	1,502,800	0	0	2,859	0	81	0		0
1983	1,468,100	0	0	2,859	0	81	0		0
1984	1,654,300	0	0	2,859	0	53	0		0
1985	1,567,400	0	0	1,841	0	53	0		0
1986	1,429,500	0	0	1,841	0	53	0		0
1987	1,571,400	0	0	821	0	53	0		0
1988	1,543,400	0	0	65	0	253	0		0
1989	1,511,800	0	1,229	188	531	253	0		0
1990	1,278,400	0	0	188	0	253	0		0
1991	1,523,100	0	0	123	0	200	0		0
1992	1,542,500	0	0	123	0	678	0		0
1993	1,616,900	0	0	124	4	683	0		0
1994		0	9	124	4	1,007	62,258	6/27-10/25	57,998
1995		0	0	124	0	1,331	7,042	multiple (4)	2,782
1996		0	4,622	586	1,997	1,331	1,881		1,440
1997		0	0	586	0	1,026	0		0
1998		0	0	586	0	0	0		0
1999		0	0	463	0	0	0		0
2000		0	11,059	1,569	4,777	0	0		0
2001		0	121	1,561	52	0	0		0
2002		0	7,500	2,331	3,240	1,007	62,258	6/27-10/25	57,998
2003		0	7,500	3,081	3,240	1,331	7,042	multiple (4)	2,782
Average		19	2,376	1,026	1,026	1,881	1,881		1,440

Notes:

- (1) Modeled storage is from the draft Navajo Reservoir operations EIS. Navajo Reservoir gaged inflow records are available daily beginning 1956, and the modeling period used in the EIS ended 1993. The total depletion in New Mexico used in the model was 610,600 acre-feet, as compared to 609,800 acre-feet projected in New Mexico's Upper Basin depletion schedule. The total depletion served from the Navajo Reservoir water supply is also similar between documents. It is assumed that May 31 storage in 2002 and 2003 would be modeled under full development conditions to be less than 1 million acre-feet due to the severity of the recent drought, and in particular, the 10% of average runoff that occurred in 2002.
- (2) Model results showed no shortages to the amount of depletions modeled while operating Navajo Dam to make contract deliveries and to meet flows for endangered fish habitat in the San Juan River recommended by the San Juan River Basin Recovery Implementation Program. Under full development, shortages may have occurred during 2002 and 2003, and a 10% shortage to the Navajo Indian Irrigation Project diversion demand is assumed for both years.
- (3) The depletion of the releases from storage for delivery to the Fruitland and Hogback projects is computed assuming an incremental river channel loss of 2%, a project efficiency of 38% (38% of the diversion satisfies the consumptive irrigation use after accounting for canal and irrigation efficiencies), and incidental depletions equal to 16% of the consumptive use. Possible re-division and re-use at Hogback of incremental return flows from the Fruitland project resulting from diversion of alternate source water at Fruitland is not included in this calculation.
- (4) Periods of shortage to direct-flow users include August 8-14, August 20-23, and September 27-October 31. Based on provisional flow data for 2003.
- (5) Assumes return flows from diversions by the Fruitland and Hogback projects under the alternate water source provisions are credited towards meeting the habitat flow needs of endangered fish in the San Juan River and would be released from Navajo Dam to maintain such habitat flows without the alternate water source provisions. The amount of release chargeable to the NIP contract right may vary depending on the recommended flows for endangered fish habitat, Navajo Dam operations to meet such flows, whether any portions of the return flows bypass gages used to measure performance under the flow recommendations, and the extent to which dam releases for endangered fish habitat may be considered as carriage water. To the extent that Navajo Dam releases made to meet the flow recommendations can be considered as carriage water and not as a delivery chargeable against the NIP contract diversion right, the depletions associated with alternate water sourcing for 1956, 1959, 2002 and 2003 chargeable to the NIP contract right would exceed those shown, and the releases from storage specifically for use at Fruitland and Hogback for other years would be less than those shown. The flow recommendations for endangered fish habitat are subject to change through adaptive management.

Summary of findings:

- (1) The minimum direct flow determination provisions of subparagraph 9.1 of the Settlement Agreement do not affect contract deliveries from runoff above Navajo Dam.
- (2) Under the alternate water source provisions of subparagraph 9.2 of the Settlement Agreement, the years of shortage experienced by the direct-flow users below Navajo Dam are reduced from 46% of the years (22 years out of 48, excluding total shortages of 10 acre-feet or less in 1968 and 1994) to 8% of the years (4 years out of 48) for the period of record. If historic hydrology patterns repeated, about two years of shortage would occur every 45 years or so, or in about 4% of years, pursuant to subparagraph 9.2. If releases made from Navajo Dam to benefit endangered fish species in the San Juan River can be used as carriage water to and through the Fruitland and Hogback projects, the releases from Navajo Dam made pursuant to subparagraph 9.2 can provide greater coverage against the occurrence or extent of priority calls. Actual accounting of alternate water source deliveries would be determined based on conditions at the times of delivery.

Assumptions generally used in study:

- (1) Analysis considers only water rights in New Mexico.
- (2) Hogback and Fruitland projects combined divert 324 cfs every day during April through October (includes municipal and domestic use diversions at Shiprock pursuant to subparagraph 3(d) of the proposed Partial Final Decree).
- (3) Rate of daily average direct flow needed to satisfy all demands of direct flow users during April-September:
 - (a) combined direct flow of the Animas River near Cedar Hill and the San Juan River at Archuleta of 700 cfs, with direct flow of the San Juan River at Archuleta of 250 cfs; or
 - (b) direct flow of the San Juan River at Archuleta of 450 cfs, with direct flow of the Animas River near Cedar Hill of 250 cfs or less.
- (4) Rate of daily average direct flow needed to satisfy all demands of direct flow users during October:
 - (a) combined direct flow of the Animas River near Cedar Hill and the San Juan River at Archuleta of 500 cfs, with direct flow of the San Juan River at Archuleta of 250 cfs; or
 - (b) direct flow of the San Juan River at Archuleta of 250 cfs, with direct flow of the Animas River near Cedar Hill of 250 cfs or less.
- (5) Direct flow of the San Juan River at Archuleta equals the maximum of:
 - (a) the inflow to Navajo Reservoir computed using a water budget computation for the reservoir, averaged over three consecutive days; and
 - (b) the sum of the gaged inflows to Navajo Reservoir at four gaging stations (San Juan River at Carracas, Piedra River near Arboles, Los Pinos River at La Boca, and Spring Creek at La Boca), plus 20 cfs for intervening inflow between the gages and Navajo Dam under pre-dam conditions, averaged over three consecutive days.Provided, that the direct flow, if computed pursuant to (a) and (b) to be less than 225 cfs, will be determined for the purpose of water rights administration as a minimum of 225 cfs if Navajo Reservoir storage exceeds 1 million acre-feet at the end of May.

Sensitivity of results to study factors:

Factor:

- (a) Peak irrigation consumptive use and river loss conditions apply during April-September
- (b) Irrigation, including at Fruitland and Hogback, is at maximum cfs rates with no annual volume limits
- (c) No re-division and re-use occurs at Hogback of returns from alternate source water used at Fruitland
- (d) No inflows occur below Cedar Hill and Navajo Dam, including from the La Plata River, except return flows
- (e) Historic flows repeat on the Animas River near Cedar Hill and in the drainage above Navajo Dam

Impact on estimated amount of release pursuant to alternate water source provisions:

- tends to over-estimate
- tends to over-estimate
- tends to over-estimate
- tends to over-estimate
- impact depends on future hydrology and uses in Colorado

Other remarks:

State Engineer administration of the rights to divert from the direct-flow and from stored water is expected to follow approval of statewide rules and regulations for active water resource management. It is anticipated that a draft water resources administration manual for the San Juan River Basin may be released for public review and comment in the fall of 2004. The assumptions made in the study regarding the determination of the direct flow at Navajo Dam and administration of the direct flow should not be viewed to pre-determine the outcome of the public review process on basin-specific administrative criteria. Regardless of minor differences that may occur between study assumptions and actual administration conditions, it can be concluded from the study that the alternate water source provisions provide significant protection to direct-flow users in the San Juan River Basin in New Mexico against the occurrence of curtailment by priority call when the direct flow is insufficient to meet all the demands under the rights to divert and use direct flow in New Mexico. The Navajo Nation and non-Navajo water users in the Basin may still need to come together to cooperatively address severe conditions from time to time in the future.