Memorandum

REVISED DRAFT

Date: August 8, 2003

To: File

From: ISC Staff - Pat Turney, and John Whipple

Subject: Historic Depletions from the San Juan River in New Mexico for Power Generation

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This memorandum analyzes historic diversions, return flows, and depletions associated with the operation of power generation facilities in the San Juan River Basin in New Mexico. Monthly diversions, estimated return flows and calculated depletions for power generation facilities in the basin were determined using data compiled from New Mexico Office of the State Engineer (OSE) water use records, and US Geological Survey (USGS) streamflow records.

BACKGROUND

Within the San Juan River Basin in New Mexico are located two thermal electric power plants (the Four Corners Power Plant and the San Juan Generating Station), two hydroelectric facilities (the Farmington Hydroelectric Plant and the Navajo Reservoir Hydroelectric Plant), and one natural gas-fired facility (the Animas Power Plant). The facilities are permitted by the OSE to divert water from the San Juan or Animas Rivers to use for power production purposes. By conditions of their permits, both thermal electric power plants are required to report monthly the quantity of water

diverted and the amount of water returned to the San Juan River or its tributaries. The Farmington Hydroelectric Plant and Navajo Dam Hydroelectric Plant are gravity fed and consume no water, and the Animas Power Plant diverts water from the Animas River via the City of Farmington water system.

For purposes of hydrologic modeling, the Bureau of Reclamation has divided the San Juan River Basin in New Mexico into eight hydrologic units based on locations of USGS streamflow gauges on the San Juan, Animas and La Plata rivers. A description of Reclamation's hydrologic units is provided in Table 1 attached hereto. The analysis presented herein is to provide historic monthly diversion, return flow and depletion data by both facility and hydrologic unit for use by Reclamation in its water supply and operations models for the Basin.

FARMINGTON HYDROELECTRIC PLANT

The Farmington Hydroelectric Plant is located on the Animas River in Farmington and uses direct flow from the Animas River via the Willet Ditch. The plant is owned by the City of Farmington and has been in operation since its construction in 1928. It was refurbished in 1981. Farmington has rights to divert up to 205 cubic feet per second (cfs) direct flow from the Animas River for use at the plant. The point of diversion and the point of return for the Farmington Hydroelectric Plant are both on the Animas River in Reclamation's hydrologic unit 2. The most recent OSE permit requires measurement of all waters diverted and returned; however, the OSE files contain no documentation of any meter readings. Because this is a pass-through facility, it is

assumed that the facility has not depleted the streamflow of the Animas River at Farmington.

ANIMAS POWER PLANT

The Animas Power Plant is a natural gas-fired facility located near the Farmington Hydroelectric Plant along the Animas River in Reclamation's hydrologic unit 2, and was completed in 1959. A combined cycle turbine was added in 1994. Animas Power Plant personnel describe use by the facility of from 50 to possibly 780 acre-feet of water per year, but that the process used for cooling at the plant produces little if any discharge due to cycling of the water. The plant receives water from the City of Farmington water system and there is no separate OSE permit for diversion of water by the plant. New Mexico Environment Department personnel indicate that discharges from the facility have not been constant and are reported sporadically. The plant operates under a National Pollutant Discharge Elimination System (NPDES) Permit.

The power plant draws cooling water from the city water system where it is accounted under the City's municipal and industrial diversions. Therefore, the depletion from the Basin by this facility is included under municipal uses. The Interstate Stream Commission in past water use reporting included a depletion of 14.08 acre-feet per year for the power plant under the power use category; however, to eliminate double counting of depletions, this amount will not be included or accounted in the power depletions in this memorandum. Return flows from the power plant also are not considered in this memorandum due to the lack of discharge data.

NAVAJO DAM HYDROELECTRIC POWER PLANT

A penstock installed in the outlet works of Navajo Dam permitted the development of a downstream power plant during the late 1980's. OSE Permit No. 3845 was approved August 27, 1986, to appropriate 1,320 cfs (non-consumptive) from the San Juan River for power production purposes. Diversion and return flow via the penstock occurs at Navajo Dam in Reclamation's hydrologic unit 1, and the water use by the facility is non-consumptive and is included in the release from Navajo Dam.

FOUR CORNERS POWER PLANT

Owned by BHP-Navajo Coal Company, the Four Corners Power Plant (FCPP) is a mine-mouth, coal-fired, electric production facility. Construction of Four Corners Units 1 and 2 (each rated at 170 megawatts) began in 1961. They went into commercial operation in 1963. Unit 3 (220 megawatts) began producing electricity in 1964, and Units 4 and 5 (rated at 740 megawatts each) began commercial operation in 1969 and 1970, respectively. Cooling water for all five units comes from the San Juan River diversion at the Arizona Public Service Company's FCPP weir to Morgan Lake, which is adjacent to the plant. Initial filling of Morgan Lake began in 1962. The FCPP, under OSE Permit No. 2838 dated October 10, 1958, may divert up to 51,600 acre-feet in any calendar year and may consume at the site of use 39,000 acre-feet in any calendar year. The diversions may be supplemented by pumping drainage or seepage collected at the Navajo Mine in addition to the diversion from the San Juan River. FCPP has measured and reported to the OSE, monthly volumes of water associated with its operations from 1962 to the present.

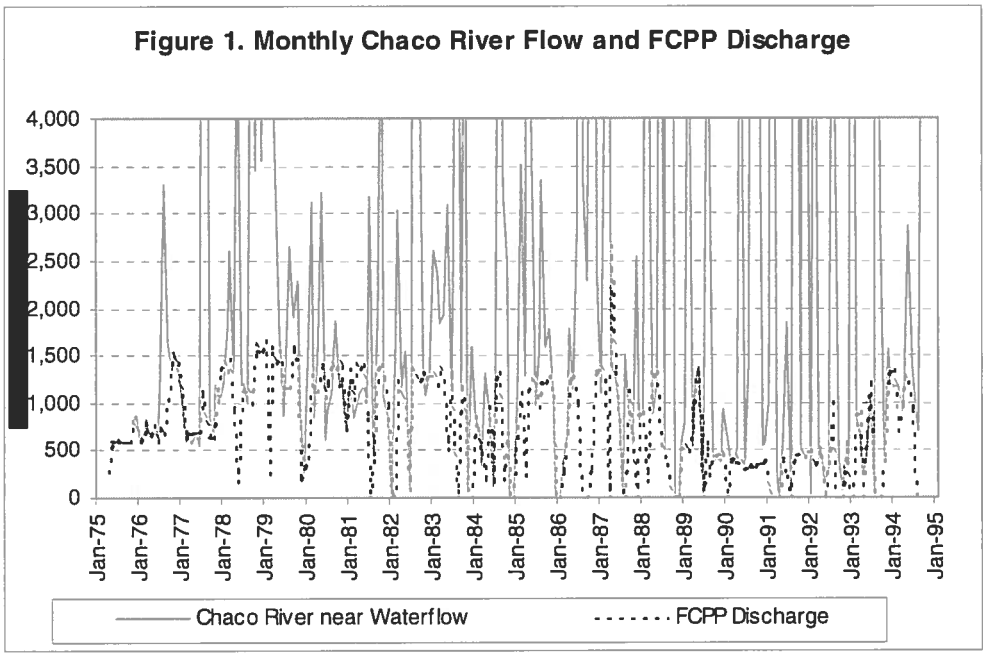
Water diverted from the San Juan River is measured at the river and pumped to Morgan Lake. Pumps at the plant divert water from Morgan Lake, mainly for cooling, and heated water returns to the lake. Water in Morgan Lake is lost to evaporation and lake seepage and FCPP makes periodic releases (also called blowdown) from the lake to maintain a suitable concentration of dissolved solids. Ash sluice water conveys bottom ash from the plant to collection bins or to a backup decant cell. Bottom ash is decanted off and treated water returns to Morgan Lake. Several ash ponds at the plant receive scrubber slurry and handle occasional blow-down from the scrubber system. Seep water from the ash ponds is captured in French drains, collected and then pumped to plastic lined evaporative ponds from which there is no discharge. However, prior to 1980, a portion of the decanted water from the scrubber slurry was discharged to Chaco Wash after being collected in the ash ponds.

Morgan Lake discharge is NPDES permitted, with a maximum release of 14.7 million–gallons–per-day (mgd), or approximately 22.7 cfs. Discharge from Morgan Lake is to an unnamed arroyo that is tributary to the Chaco River. In past computations of consumptive use and return flow, the OSE/ISC assumed that all releases to tributary channels returned undiminished to the San Juan River. However, a portion of the release is lost, in part, to dense stands of tamarisk along the banks of the unnamed discharge arroyo and into the sands of the Chaco River bed. The maximum release rate is consistent with the baseflow measured at the USGS gauging station on the Chaco River near Waterflow, New Mexico, approximately 8.9 miles downstream from the dam forming Morgan Lake. The gauge has a continuous record from November 1975 through

September 1994. Figure 1 shows monthly volumes released from FCPP compared to monthly discharge at the USGS gauge.

FCPP informs ISC staff that Morgan Lake discharge is set to approximately 14 mgd or 21.6 cfs, but notes that the discharge is variable and sometimes halted in the summer to comply with NPDES permit limitation on water temperature. This ongoing operation plus ash pond discharges to the Chaco River prior to 1980 are reflected in the Chaco River near Waterflow gauge record as shown in Figure 1.

Figure 1. Monthly Chaco River Flow and FCPP Discharge



The release from Morgan Lake drains into an unnamed arroyo, where it then travels to the Chaco River, and then to the San Juan River. Analysis of the USGS gauge record for the Chaco River near Waterflow shows a relationship between the monthly Lake Morgan release and the level of base flow in the Chaco River near Waterflow gauge. The Lake Morgan release is reported only as a monthly volume, which makes determining the lag-time and channel loss for the release difficult. For most of the USGS gauge record, the monthly flow at the gauge is greater than the monthly release due to

natural flows or runoff in the river. However, during some periods, the monthly release was greater than the monthly flow in the Chaco River near Waterflow, thus giving an indication of loss within the reach. Aerial photographs of the FCPP site indicate that Morgan Lake release supports substantial phreatic vegetation lining the channel banks of the unnamed arroyo between the Morgan Lake dam and its confluence with the Chaco River, a distance of 2.6 miles. In the 6.3 miles between the confluence of the unnamed arroyo and the Chaco River near Waterflow gauge, the bed of the Chaco River is wide with shallow flows, exposed wetted sands and moderate vegetation along its banks.

For those months when the Morgan Lake release volume was reported as being greater than the monthly discharge of the Chaco River near Waterflow gauge, the average difference in flows in the 8.9-mile stretch was approximately 16%, which suggests a net loss to seepage and evapotranspiration of about 16% of the release volume. Seasonally, the indicated difference in flows averaged about 16% for the summer months of April to October and 13% in the winter months of November to March, but the data set is not large. Also, there are uncertainties as to how much of the river channel seepage loss eventually returns to the San Juan River. It is assumed for the purpose of the analysis that 15% of the Morgan Lake release is lost above the Chaco River near Waterflow gauge each month. It is also assumed that this loss rate can be prorated to the 7.6 mile reach downstream of the Chaco River near Waterflow gauge to the confluence of the Chaco River and the San Juan River, which suggests an additional loss of up to 14% of the release. Therefore, it is assumed that 30% of the monthly blowdown volume is lost before reaching the San Juan River, and that return flow from the FCPP to the San Juan River amounts to about 70% of the blowdown release. Ash pond discharge to the Chaco

River prior to 1980 is assumed to have the same loss as the Morgan Lake releases previously described.

For comparison, a rough estimate was made of the evaporative loss along the channels of the unnamed discharge arroyo and the Chaco River. Aerial photography indicates that the width of open channel or wetted sand in the Chaco River below its confluence with the unnamed discharge arroyo averages about 50 feet and the width of moderate to dense bank vegetation averages about 70 feet wide on both sides of the channel. Additional native vegetation exists throughout the floodplain. The unnamed arroyo that receives Morgan Lake releases has very dense bank vegetation averaging about 100 feet wide on both sides. The width of its open channel and wetted sand is approximately 20 feet. The release travels approximately 2.6 miles in the unnamed arroyo and 13.9 miles in the Chaco River before reaching the San Juan River. Evaporation from the stream channels was computed using a pan evaporation rate of 70 inches, a pan coefficient of 0.80, and average precipitation of 7.75 inches (New Mexico State Engineer Technical Report No. 31, 1965). Consumptive use by bank vegetation was assumed 3.0 acre-feet per acre (Final Report of the Engineering Advisory Committee to the Upper Colorado River Basin Compact Commission, 1948). The resulting estimate of evapotranspiration losses from the reach is 2,400 acre-feet per year.

Under OSE Permit No. 2838, as amended, BHP Minerals International may consumptively use a maximum of 39,000 acre-feet of water in any one calendar year. The method for computing said consumptive use set forth in the conditions of approval for the permit adjusts diversions from the San Juan River for return flows to its tributaries

and underground water sources, changes in off-stream storage in Morgan Lake and other at-site storage facilities, and diversions of water collected at the mine.

The quantity of seepage losses from Morgan Lake has not been determined, nor has the extent to which seepage losses may return to the San Juan River as groundwater flow, may be collected at the mine, or may support depletions by riparian vegetation. It also has not been determined whether water collected at the mine from local storm drainage, which is not a large amount, would have otherwise reached the San Juan River. Return discharges from the ash sluicing ponds to another arroyo tributary to the Chaco River would be factored into the net loss determined above the Chaco River gauge near Waterflow. It is assumed for purposes of this analysis that these additional factors offset one another. In any event, the at-site consumptive uses determined in accordance with the permit does not correspond with depletions of San Juan River flows as needed for hydrologic modeling of the river or consumptive use accounting of streamflow depletions under Upper Colorado River Basin Compact.

The measured diversions from the San Juan River, estimated return flows to the river, and depletions to the river by the FCPP for each month of the 1961-2001 period are provided in Table 2 attached hereto. Annual amounts are provided in Table 3 attached.

SAN JUAN GENERATING STATION

The San Juan Generating Station (SJGS) is a coal-fired power production facility operated by Public Services Company of New Mexico (PNM). The SJGS receives water diverted from the San Juan River to an on-site reservoir in the Westwater

Arroyo drainage. The SJGS reservoir was constructed from 1971-1973, and diversions to the SJGS began in 1973. Evaporation ponds at the SJGS were added in 1982 for wastewater (brine) disposal. The SJGS, under OSE Permit No. #3258 approved Dec. 27, 1972, may divert up to 20,200 acre-feet in any calendar year and consume up to 16,200 acre-feet in any calendar year. Water to supply the consumptive use under permit No. 3258 is supplied by the Secretary of the Interior pursuant to Contract No. #14-06-400-4821 for Navajo Reservoir Supply, dated October 9, 1981. In addition, PNM currently leases water from BHP under OSE Permit No. 2838, approved October 9, 1981. Pursuant to said lease and permit, PNM may divert up to an additional 10,585 acre-feet in any calendar year from the San Juan River and consume at the SJGS site an additional 8,000 acre-feet in any year. In total, SJGS has permits for the total diversion of 30,785 acre-feet in any year with a consumptive use of up to 24,200 acre-feet in any year. Records of the monthly diversions from the San Juan River and at-site uses are reported by PNM to the OSE Water Rights Division.

The SJGS diversion weir on the San Juan River is located in Reclamation's hydrologic unit 6. Water diverted from the San Juan River is measured at the pump and delivered to the SJGS reservoir. Water from the reservoir is used for power generation and supportive mining purposes. Return flow from the SJGS historically occurred from reservoir seepage to Westwater Arroyo that then traveled to the San Juan River via Shumway Arroyo. The point of return is within Reclamation's hydrologic unit 6. However, in 1983, sump pumps were installed near the toe of the dam forming SJGS reservoir to collect and recycle seepage from the dam. In addition, brine concentrators and evaporation ponds were installed and the process discharge under NPDES permit was

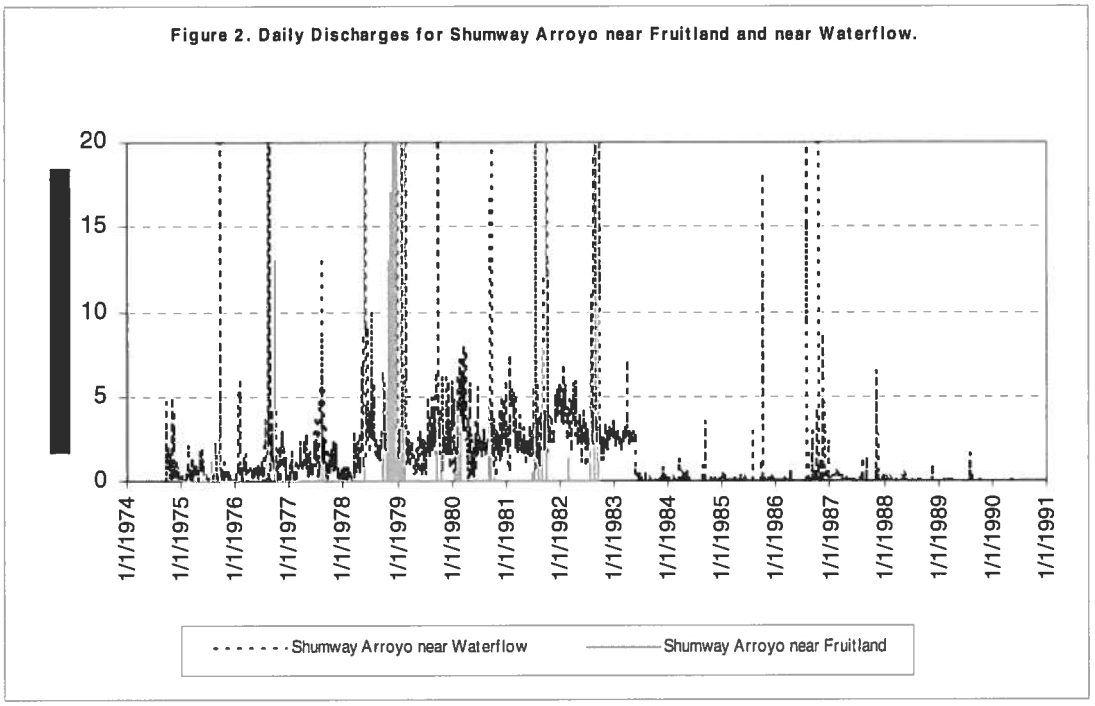
terminated. The SJGS is now a "zero discharge" facility. USGS discharge records for Shumway Arroyo may be used to estimate historic return flows from the SJGS to the San Juan River.

Mike Farley, Environmental Supervisor at the SJGS, informs ISC staff that the increased baseflow at the USGS gauge on Shumway Arroyo near Waterflow during the 1973-1983 period was due to a process discharge at the facility under an NPDES Permit. This discharge stopped in 1983 when evaporation ponds and new brine concentrators came on-line. There are no records available of quantities for the process discharge, but Mr. Farley estimated that the discharge was approximately 1.5 cfs. This amount is consistent with the baseflow measured in Shumway Arroyo at the near Waterflow gauge during that period.

Two USGS gauges were located on the Shumway Arroyo. Discharge records for the Shumway Arroyo near Fruitland gauge, which was located above the SJGS and the confluence of the Shumway and Westwater arroyos, are available for the period January 1975 to September 1982. Discharge records for the Shumway Arroyo near Waterflow gauge, below the SJGS and Westwater Arroyo, are available for the period September 1974 to May 1990. Contributions to the discharge of the Shumway Arroyo near Waterflow include the process discharge from the SJGS, seepage losses from the SJGS not collected and pumped back for recycling use, and runoff from the drainage. The discharge of the Shumway Arroyo near Fruitland includes only natural flows from the contributing drainage area. Figure 2 gives a comparison of the discharge records for the two gauges and shows that some reservoir seepage and process discharge reached the Shumway Arroyo near Waterflow gauge prior to 1984. Beginning June 1983, the

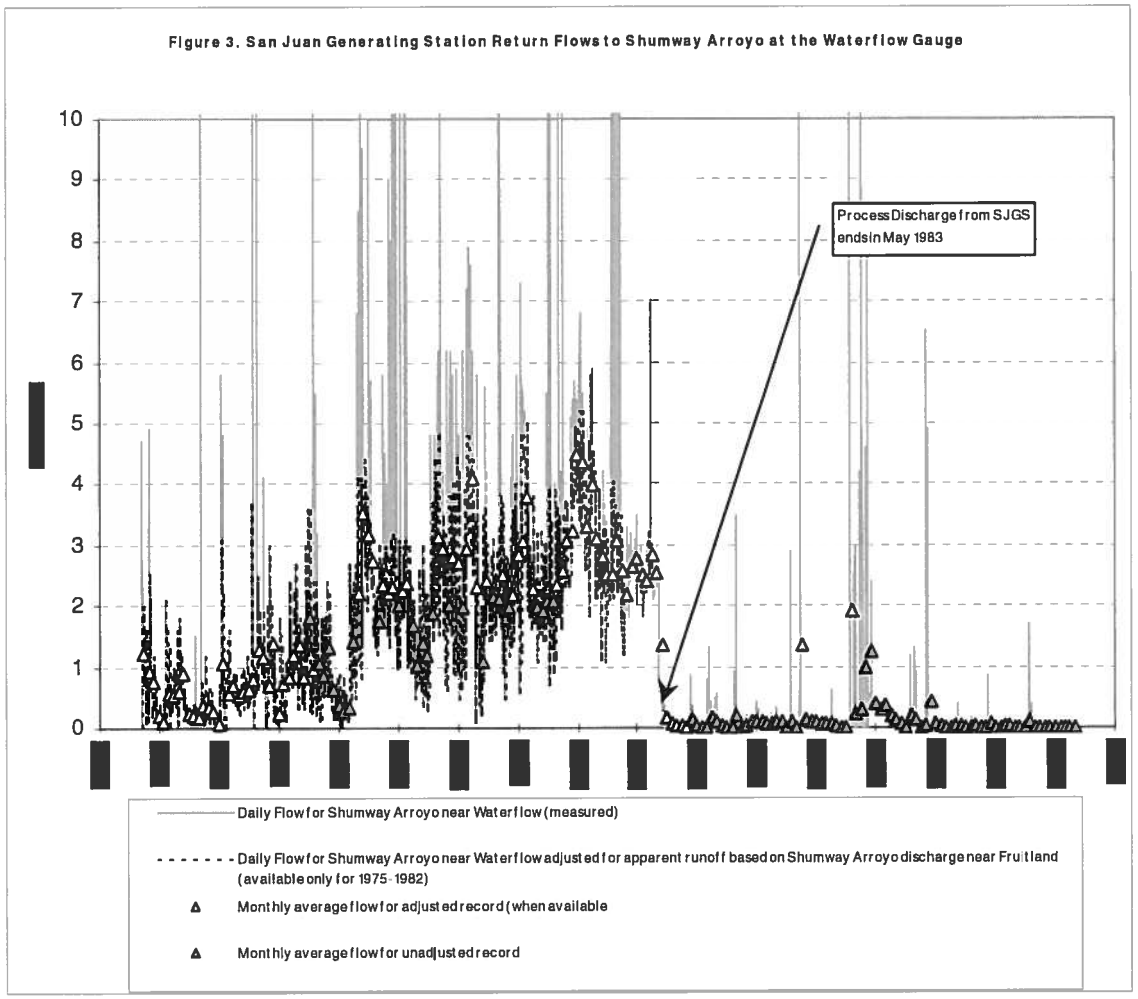
hydrograph for the Waterflow gauge is indicative of natural flow conditions with occasional runoff events interrupting extended periods of little or no flow.

Based on the discharge records for both gauges, the daily hydrograph for the Shumway Arroyo near Waterflow for the period of concurrent data was adjusted by separating apparent natural runoff from the drainage above the gauge. The resulting adjusted hydrograph for the gauge near Waterflow gives an indication of the amount of



reservoir seepage and process discharge flowing past the gauge. Figure 3 shows the adjusted hydrograph of daily flows for the Shumway Arroyo near Waterflow for the period of concurrent data. Also shown in Figure 3 are the resulting monthly average flows for the Shumway Arroyo near Waterflow that might be considered supported by return flow from the SJGS. Relatively large monthly average flows near Waterflow after May 1983, however, are unadjusted and reflect natural runoff.

The distance between the Shumway Arroyo near Waterflow gauge and the confluence of the arroyo with the San Juan River is about 3.8 miles. Because the lower portion of Shumway Arroyo is located near and has similar physical characteristics to the lower portion of the Chaco River, it is assumed that the channel loss on Shumway Arroyo between the Waterflow gauge and the San Juan River averages about 1.5% per mile, or the same loss rate as estimated for the Chaco River. This assumption yields a channel



loss of 6% of the estimated SJGS discharge measured at the Shumway Arroyo near Waterflow gauge. In addition to uncertainties in data and assumptions, there are uncertainties regarding how much seepage from Shumway Arroyo may get back to the

San Juan River and whether wasteway discharge from Farmers Mutual Ditch to the lower reach of the Arroyo may affect losses.

It is assumed for the purpose of this memorandum that for the period September 1974 to May 1983, the monthly return flow from the SJGS to the San Juan River amounted to 95% of the monthly average flow of the Shumway Arroyo near Waterflow, as adjusted for natural runoff. Due to the lack of gauge records on Shumway Arroyo for the period April 1973 to August 1974, the return flow from the SJGS to the river during this period was assumed to be 0.5 cfs based on the process discharge measured in the mid-1970s.

It is assumed that there is no return flow from the SJGS to the San Juan River for the period June 1983 to December 2001. Seepage from the SJGS reservoir now is measured below the dam on Westwater Arroyo and is reported occasionally to the OSE Dam Safety Bureau. The seepage currently is approximately 0.1-0.2 cfs, or 70-140 acre-feet year. It is assumed that none of this surface flow returns to the San Juan River via Shumway Arroyo because PNM collects most of it for reuse by pumping it back into the reservoir with sump pumps. The gauge record for Shumway Arroyo near Waterflow shows no measurable base flow after May 1983.

The measured diversions from the San Juan River, estimated return flows to the river, and depletions from the river by the SJGS for each month of the 1973-2001 period are provided in Table 2 attached hereto. Annual amounts are provided in Table 3 attached.

SAN JUAN AND LA PLATA MINES

Water for the San Juan and La Plata mines is diverted from the San Juan River through PM's SJGS diversion facilities and is accounted under OSE Permit No. 2838. The mines began using water in 1982, and records of diversions have been submitted monthly to the OSE. The water use at the mines is fully depleted and is included in the diversion and depletion amounts for the SJGS. Water use at the mines was not segregated out from other uses under Permit No. 2838. Rather, water use at the mines is accounted under the power usage category due to the ultimate use of the mined coal for power production at the SJGS.

Table 1. U.S. Bureau of Reclamation Hydrologic Unit Descriptions for the San Juan River Basin in New Mexico

Hydrologic Unit	Description of Drainage Area
1	San Juan River above Archuleta gauge
2	Animas River above Farmington gauge
3	San Juan River from Archuleta gauge to Farmington gauge
4	La Plata River above Farmington gauge
5	Chaco River above mouth
6	San Juan River from Farmington gauge to Shiprock gauge
7	San Juan River from Shiprock gauge to four Corners gauge
8	Whiskey Creek drainage

Table 2. Summary of Monthly Depletions for Power Uses in the San Juan River Basin in New Mexico

(units: acre-feet)

	Four Corners Power Plant					San Juan Generating Station				Total Power Depletions		
Month	Diversion	Ash Pond Discharge	Morgan Lake Blowdown	Return Flow1	Depletion	Diversion	Returns to Shumway Arroyo	Return Flow to San Juan River [2]	Depletion	Basin in New Mexico	Hydrologic Unit 6[3]	Hydrologic Unit 5[4]
Jan-07	1804		384	269	1536	2101			2101	3637	3905	-269
Feb-07	1751		347	243	1508	1967			1967	3475	3718	-243
Mar-07	1330		384	269	1062	2327			2327	3389	3658	-269
Apr-07	2430		371	260	2170	2218			2218	4388	4648	-260
May-07	1723		384	269	1454	2321			2321	3775	4043	-269
Jun-07	2217		153	107	2109	2204			2204	4313	4420	-107
Jul-07	2561		0	0	2561	2239			2239	4799	4799	0
Aug-07	2825		0	0	2825	1877			1877	4702	4702	0
Sep-07	2616		0	0	2616	1877			1877	4493	4493	0
Oct-07	1903		398	279	1624	1899			1899	3523	3802	-279
Nov-07	3074		310	217	2856	2001			2001	4857	5075	-217
Dec-07	1094		291	204	890	1478			1478	2368	2572	-204
	25327		**3022**	**2115**	**23211**	**24508**			**24508**	**47720**	**49835**	**-2115**
Jan-08	1226		15	10	1216	1320			1320	2536	2547	-10
Feb-08	1818		185	129	1689	655			655	2345	2474	-129
Mar-08	1812		439	307	1504	1533			1533	3037	3344	-307
Apr-08	1621		440	308	1313	2008			2008	3321	3629	-308
May-08	1877		412	288	1589	2091			2091	3680	3969	-288
Jun-08	2898		388	272	2626	1873			1873	4499	4771	-272
Jul-08	2218		92	65	2153	1857			1857	4010	4074	-65
Aug-08	3316		0	0	3316	2044			2044	5360	5360	0
Sep-08	3316		0	0	3316	2021			2021	5337	5337	0
Oct-08	2593		404	283	2310	2069			2069	4379	4662	-283
Nov-08	1993		482	338	1655	1951			1951	3606	3944	-338
Dec-08	2877		387	271	2606	2075			2075	4681	4952	-271
	27566		**3245**	**2271**	**25295**	**21497**			**21497**	**46792**	**49063**	**-2271**
Jan-09	1690		213	149	1541	2065			2065	3605	3754	-149
Feb-09	1963		542	379	1583	1919			1919	3502	3882	-379
Mar-09	2357		618	433	1924	2093			2093	4017	4450	-433
Apr-09	2073		598	419	1654	1971			1971	3625	4044	-419
May-09	2774		611	428	2346	2162			2162	4508	4936	-428
Jun-09	2944		433	303	2641	2199			2199	4840	5143	-303
Jul-09	2095		0	0	2095	2075			2075	4169	4169	0
Aug-09	2656		0	0	2656	2299			2299	4955	4955	0
Sep-09	2266		0	0	2266	2224			2224	4491	4491	0
Oct-09	2835		407	285	2550	2284			2284	4833	5118	-285
Nov-09	1935		500	350	1585	2114			2114	3699	4049	-350
Dec-09	1979		609	426	1553	1882			1882	3434	3861	-426
	27567		**4532**	**3173**	**24395**	**25285**			**25285**	**49680**	**52852**	**-3173**

1 Four Corners Power Plant Return Flow equals zero for 12/1961 - 3/1963; and equals 70% of discharge thereafter

2 San Juan Generating Station Return equals 0.5 cfs for 4/1973 - 8/1974; equals 95% of returns to Shumway Arroyo for 9/1974 - 5/1983; and equals zero after 5/1983

3 Net Power Depletion for Hydrologic Unit 6 equals (FCPP Diversion + SJGS Depletion)

4 Net Power Depletion for Hydrologic Unit 5 equals -(FCPP Return Flow)

Table 3. Summary of Annual Depletions for Power Uses in the San Juan River Basin in New Mexico

(units: acre-feet)

	Four Corners Power Plant					San Juan Generating Station				Total Power Depletions		
Month	Diversion	Ash Pond Discharge	Morgan Lake Blowdown	Return Flow1	Depletion	Diversion	Returns to Shumway Arroyo	Return Flow to San Juan River [2]	Depletion	Basin in New Mexico	Hydrologic Unit 6[3]	Hydrologic Unit 5[4]
1961	1845			0	1845					1845	1845	
1962	31842			0	31842					31842	31842	
1963	22581	1616		1131	21450					21450	22581	
1964	14035	4168		2918	11117					11117	14035	
1965	15216	4934		3454	11762					11762	15216	
1966	13134	4484		3139	9995					9995	13134	
1967	17170	4757		3330	13840					13840	17170	
1968	14226	3685		2580	11647					11647	14226	
1969	18674	3363		2354	16320					16320	18674	
1970	21478	4053		2837	18641					18641	21478	
1971	19054	3884	772	3260	15795					15795	19054	-3260
1972	18667	1840		1288	17379					17379	18667	
1973	25950	2677		1874	24076	2198		218	1980	26056	27930	
1974	21002	2009		1406	19596	4223		375	3848	23443	24850	
1975	25284	1773	5014	4751	20533	4961	230	219	4742	25275	30026	-4751
1976	31539	1080	9697	7544	23995	4597	516	490	4106	28101	35645	-7544
1977	30759	1026	8949	6982	23777	6436	643	611	5825	29602	36583	-6982
1978	31488	1823	12476	10010	21478	7304	1310	1244	6059	27538	37547	-10010
1979	34024	2265	11081	9342	24682	9969	1367	1299	8670	33352	42694	-9342
1980	35704	105	13826	9751	25953	10134	1543	1465	8668	34621	44373	-9751
1981	29446	24	12730	8928	20518	12687	1779	1690	10997	31515	40443	-8928
1982	29744	0	11125	7787	21957	21473	1936	1840	19633	41590	49377	-7787
1983	26487	0	9471	6630	19858	21234	632	601	20634	40491	47121	-6630
1984	29110	0	6572	4601	24509	19571	0	0	19571	44080	48681	-4601
1985	29119	0	11331	7931	21188	21965	0	0	21965	43153	51084	-7931
1986	28043	0	7418	5193	22850	16712	0	0	16712	39562	44754	-5193
1987	36246	0	9729	6810	29436	13894	0	0	13894	43329	50140	-6810
1988	31913	0	6769	4738	27174	15198	0	0	15198	42373	47111	-4738
1989	33884	0	6812	4768	29115	17261	0	0	17261	46377	51145	-4768
1990	27813	0	3933	2753	25059	16777	0	0	16777	41836	44589	-2753
1991	26899	0	2854	1998	24901	14876	0	0	14876	39777	41774	-1998
1992	27458	0	3536	2475	24983	15210	0	0	15210	40193	42668	-2475
1993	32719	0	6693	4685	28035	19806	0	0	19806	47841	52526	-4685
1994	34039	3	7813	5471	28567	18992	0	0	18992	47559	53031	-5471
1995	32745	0	8755	6129	26617	19148	0	0	19148	45765	51894	-6129
1996	25636	0	4613	3229	22407	21068	0	0	21068	43475	46704	-3229
1997	26717	0	4510	3157	23560	22297	0	0	22297	45857	49014	-3157
1998	29222	0	6047	4233	24989	17622	0	0	17622	42611	46844	-4233
1999	27742	0	5424	3797	23945	21009	0	0	21009	44954	48751	-3797
2000	29519		6210	4347	25172	19264	0	0	19264	44436	48782	-4347
2001	28982		6714	4700	24282	24034	0	0	24034	48316	53016	-4700
2002	29035		9002	6302	22734	22887	0	0	22887	45620	51922	-6302
2003	28453		5861	4102	24351	22640	0	0	22640	46990	51093	-4102
2004	27014		2600	1820	25194	23780	0	0	23780	48974	50794	-1820
2005	27627		94	66	27561	23624	0	0	23624	51185	51251	-66
2006	27868		2733	1913	25954	24483	0	0	24483	50437	52350	-1913
2007	25327		3022	2115	23211	24508	0	0	24508	47720	49835	-2115
2008	27566		3245	2271	25295	21497	0	0	21497	46792	49063	-2271
2009	27567		4532	3173	24395	25285	0	0	25285	49680	52852	-3173

1 Four Corners Power Plant Return Flow equals zero for 12/1961 - 3/1963; and equals 70% of discharge thereafter.

2 San Juan Generating Station Return equals 0.5 cfs for 4/1973 - 8/1974; equals 95% of returns to Shumway Arroyo for 9/1974 - 5/1983; and equals zero after 5/1983

3 Net Power Depletion for Hydrologic Unit 6 equals (FCPP Diversion + SJGS Depletion)

4 Net Power Depletion for Hydrologic Unit 5 equals -(FCPP Return Flow)