

**Revision History:** Memorandum to File from Patricia Turney dated May 19, 2005  
- Subject: *2004 San Juan River Basin Acreage Inventory*

October 6, 2005. Table 2 was revised to include Westwater acres in Farmers Mutual Ditch acreage.

# M E M O R A N D U M

May 19, 2005

**TO:** File  
**FROM:** Patricia Turney, NMISC Staff Engineer  
**SUBJECT:** 2004 San Juan River Basin Acreage Inventory

This memorandum summarizes the subject inventory's methodology, collected field data, and analysis. NMISC gratefully acknowledges the assistance of the Navajo and Jicarilla Apache Nations in the field data collection efforts on their respective lands.

## **Inventory Methodology:**

NMISC staff developed cultivated field delineations from U.S. Geological Survey DOQQs from the most recent National Aerial Photography Program photography available, the majority of which was flown in 1996-97. NMISC contractors Garda Stock and Thelma Yazzie collected crop type and irrigation method information for each parcel and indicated boundary changes where appropriate. NMISC staff input all field-collected data into an ArcInfo database. The ArcInfo database and its associated metadata are available from the author. Because no U.S. Geological Survey DOQQs were available showing the 2004 configuration of the NIIP area, NIIP acreage is not included in the ArcInfo database. NIIP acreage data was provided to NMISC staff by BIA consultant, Ron Bliesner.

## **Inventory Acreage Status:**

NMISC contractors and staff identified the following irrigated crops and other acreage in the Basin during the summer of 2004. The aforementioned NIIP acreage data is also included in the following lists. The inventory generally does not include small residential gardens or yards and does not reflect double cropping if any.

Alfalfa	High density single grass
New alfalfa	Low density mixed grass
Lawn/turf	Trees, fruit
Grapes	Trees, other
Corn	Graze out
Sorghum	Wheat, oats, barley, triticale
Garden	Fallow
Dry beans	Plowed
Potatoes	Conservation Reserve Program
Pumpkins	Wild native vegetation
Onions	

NMISC staff aggregated the acres found irrigated and as reported for NIIP as follows for purposes of comparing 2004 data with earlier years of inventory level data.

2004 Crop	Aggregated Crop
Alfalfa	Alfalfa
New alfalfa	Alfalfa
Lawn/turf	Sod
Sod	Sod
Corn	Corn/Sorghum
Sorghum	Corn/Sorghum
Garden	Misc. Vegetables
Dry beans	Misc. Vegetables
Potatoes	Misc. Vegetables
Pumpkins	Misc. Vegetables
Onions	Misc. Vegetables
High-density single grass	Pasture
Low-density mixed grass	Pasture
Trees, fruit	Orchard
Grapes	Orchard
Trees, other	Orchard
Grazed out	Small Grains
Wheat, oats, barley, triticale	Small Grains
Fallow/irrigated	Distributed across irrigated small grains, pasture, alfalfa
Plowed/irrigated	Distributed across irrigated small grains, pasture, alfalfa
Not marked or No access	Blank (Distributed across all categories, including not irrigated)

For analysis purposes, all irrigated plowed parcels and all irrigated fallow parcels were distributed across the irrigated crop categories of small grains, pasture and alfalfa based on the overall cropping pattern for these categories in each irrigation area.

Of the approximately 32,000 acres targeted for field data collection, 470 acres were not field-checked (approximately 1.5 % of the total). For analysis purposes, NMISC staff distributed these 470 acres across all acreage categories, including not irrigated acreage, based on the overall cropping pattern for each irrigation area. However, acres found not irrigated and categorized as “wild native vegetation” or “grass, mixed varieties, low density (including native grasses)” were not included in this distribution and are not included in the Table 2 tabulated columns *Acreage Not Irrigated* and *Total Acreage*. These categories in a non-irrigated state represent natural vegetation that may include both native and introduced species, which grows without benefit of intentional cultivation. Most of this acreage occurs in the Dulce area.

### **Inventory Analysis**

Data analysis is contained in the following tables and figure.

- Table 1 lists and describes the hydrologic units and the irrigation areas within each unit.
- Table 2 lists the acreage distribution for the 2004 inventory.
- Figure 1 shows the mapped extent of the San Juan River Basin 2004 inventory.

**TABLE 1. IRRIGATION AREAS IN THE SAN JUAN RIVER BASIN IN NEW MEXICO BY HYDROLOGIC UNIT - 2004**

UNIT	DESCRIPTION OF HYDROLOGIC DRAINAGE	IRRIGATION AREAS IN UNIT
1	NAVAJO RIVER, PINE RIVER, AND SAN JUAN RIVER ABOVE NAVAJO DAM	ABOVE NAVAJO DAM
2	ANIMAS RIVER ABOVE THE ANIMAS RIVER AT FARMINGTON GAGE	ANIMAS RIVER
3	SAN JUAN RIVER BELOW NAVAJO DAM AND ABOVE THE SAN JUAN RIVER AT FARMINGTON GAGE (EXCLUDING UNIT 2)	ABOVE ARCHULETA, CITIZEN'S DITCH, ARCHULETA DITCH, TURLEY DITCH, HAMMOND AREA (1), NIIP BLOCKS 1, 4, 5, & 8 (5%), ECHO (2)
4	LA PLATA RIVER ABOVE LA PLATA RIVER NEAR FARMINGTON GAGE	UPPER LA PLATA (3), LA PLATA RIVER
5	CHACO RIVER ABOVE MOUTH	CHACO RIVER, NIIP BLOCKS 3 (89%), 7 (26%) & 8 (84%)
6	SAN JUAN RIVER BELOW THE SAN JUAN RIVER AT FARMINGTON GAGE AND ABOVE THE SAN JUAN RIVER AT SHIPROCK GAGE (EXCLUDING UNITS 4 AND 5)	FARMINGTON GLADE (4), FARMERS MUTUAL DITCH (5), JEWETT VALLEY, WESTWATER, FRUITLAND, HOGBACK-EAST (6), CAMBRIDGE, NIIP BLOCKS 2, 6, 3 (11%), 7 (74%) & 8 (11%)
7	SAN JUAN RIVER BELOW THE SAN JUAN RIVER AT SHIPROCK GAGE (EXCLUDING UNIT 8)	HOGBACK-WEST (7), CUDEI
8	WHISKEY CREEK DRAINAGE, RED WASH	WHISKEY CREEK

NOTES:

- (1) INCLUDES HAMMOND PROJECT AND ACREAGE WITH PRIVATE WATER RIGHTS EXCLUSIVE FROM THE HAMMOND PROJECT.
- (2) INCLUDES ONLY THAT PORTION OF ACREAGE SERVED BY ANY DITCH DIVERSION FROM ANIMAS RIVER FOR WHICH RETURN FLOW OCCURS BELOW THE ANIMAS RIVER AT FARMINGTON GAGE OR TO THE SAN JUAN RIVER ABOVE THE MOUTH OF THE ANIMAS RIVER
- (3) INCLUDES ONLY ACREAGE SERVED BY DIVERSIONS FROM THE LA PLATA RIVER ABOVE THE LA PLATA RIVER AT STATELINE GAGE. THE ENTERPRISE DITCH SERVES LANDS IN THIS AREA AND IN COLORADO.
- (4) INCLUDES ONLY ACREAGE SERVED BY DIVERSION FROM ANIMAS RIVER FOR WHICH RETURN FLOW OCCURS TO THE SAN JUAN RIVER BELOW THE SAN JUAN RIVER AT FARMINGTON GAGE.
- (5) DIVERSION SERVING THIS AREA IS FROM ANIMAS RIVER BELOW THE ANIMAS RIVER AT FARMINGTON GAGE AND IS SUPPLEMENTED BY DIVERSION FROM THE SAN JUAN RIVER BELOW THE SAN JUAN RIVER AT FARMINGTON GAGE.
- (6) INCLUDES ONLY THAT PORTION OF THE HOGBACK PROJECT ABOVE SHIPROCK.
- (7) INCLUDES ONLY THAT PORTION OF THE HOGBACK PROJECT BELOW SHIPROCK, INCLUDING THE HOGBACK EXTENSION, WHICH IS SERVED BY DIVERSION FROM THE SAN JUAN RIVER ABOVE THE SAN JUAN RIVER AT SHIPROCK GAGE.
- (8) THE WHISKEY CREEK DRAINAGE INCLUDES THE CRYSTAL, NEW MEXICO AREA THAT DRAINS TO CHINLE WASH. ITS CONFLUENCE WITH THE SAN JUAN RIVER IS LOCATED BELOW BLUFF, UTAH. THE RED WASH CONFLUENCE WITH THE SAN JUAN RIVER IS LOCATED IN NEW MEXICO JUST EAST OF THE ARIZONA-NEW MEXICO STATE LINE.

**TABLE 2. 2004 CROP ACREAGE DATA FOR THE SAN JUAN RIVER BASIN IN NEW MEXICO BY AREA**

HYDROLOGIC UNIT	IRRIGATION AREA	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE		
			ALFALFA	CORN/ SORGHUM	MISC. VEGET.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	IRRIGATED	ACREAGE					
1	ABOVE NAVAJO DAM	TOTAL ACRES	81	0	1	0	325	0	0	0	0	0	0	0	406	0	406
		% DISTRIB.	20	0	0	0	80	0	0	0	0	0	0	0			
		Flood-irrigated	38	0	0	0	307	0	0	0	0	0	0	0	344		
		Sprinkler-irrigated	43	0	0	0	18	0	0	0	0	0	0	0	61		
		Drip-irrigated	0	0	1	0	0	0	0	0	0	0	0	1			
1	DULCE	TOTAL ACRES	0	0	0	0	0	0	0	0	0	0	0	0	157	157	157
		% DISTRIB.															
		Flood-irrigated	0	0	0	0	0	0	0	0	0	0	0	0			
		Sprinkler-irrigated	0	0	0	0	0	0	0	0	0	0	0	0			
		Drip-irrigated	0	0	0	0	0	0	0	0	0	0	0	0			
2	ANIMAS RIVER	TOTAL ACRES	1,203	2	63	76	3,162	42	188	4,737	768	5,505					
		% DISTRIB.	25	0	1	2	67	1	4								
		Flood-irrigated	997	2	47	56	2,219	35	2	3,359							
		Sprinkler-irrigated	206	0	12	19	943	8	186	1,373							
		Drip-irrigated	0	0	5	1	0	0	0	0	6						
3	ECHO	TOTAL ACRES	153	15	25	36	158	10	25	421	147	569					
		% DISTRIB.	36	3	6	9	37	2	6								
		Flood-irrigated	27	15	25	36	129	10	0	241							
		Sprinkler-irrigated	126	0	0	0	29	0	25	181							
		Drip-irrigated	0	0	0	0	0	0	0								
3	ARCHULETA DITCH	TOTAL ACRES	0	0	0	0	17	0	0	17	32	50					
		% DISTRIB.	0	0	0	0	100	0	0								
		Flood-irrigated	0	0	0	0	0	0	0	0	0						
		Sprinkler-irrigated	0	0	0	0	17	0	0	17							
		Drip-irrigated	0	0	0	0	0	0	0								

TABLE 2. 2004 CROP ACREAGE DATA FOR THE SAN JUAN RIVER BASIN IN NEW MEXICO BY AREA

HYDROLOGIC UNIT	IRRIGATION AREA	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE
			ALFALFA	CORN/ SORGHUM	MISC. VEGET.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	IRRIGATED	ACREAGE			
3	CITIZENS DITCH	TOTAL ACRES	799	0	22	24	1,737	0	79	0	0	0	2,660	260	2,920
		% DISTRIB.	30	0	1	1	65	0	3	0	0	0	0	0	0
		Flood-irrigated	263	0	9	1	1,058	0	0	0	0	0	1,331	0	1,331
		Sprinkler-irrigated	537	0	9	21	679	0	79	0	0	0	1,324	0	1,324
		Drip-irrigated	0	0	4	2	0	0	0	0	0	5	0	5	
3	TURLEY DITCH	TOTAL ACRES	0	0	0	6	136	0	1	0	0	143	25	167	
		% DISTRIB.	0	0	0	4	95	0	0	0	0	0	0	0	
		Flood-irrigated	0	0	0	0	109	0	0	0	0	109	0	109	
		Sprinkler-irrigated	0	0	0	0	27	0	1	0	0	27	0	27	
		Drip-irrigated	0	0	0	6	0	0	0	0	6	0	6		
3	HAMMOND	TOTAL ACRES	2,070	0	5	10	1,056	47	16	0	0	3,204	351	3,555	
		% DISTRIB.	65	0	0	0	33	1	0	0	0	0	0	0	
		Flood-irrigated	53	0	0	4	46	2	0	0	0	105	0	105	
		Sprinkler-irrigated	2,017	0	5	6	1,010	45	16	0	0	3,099	0	3,099	
		Drip-irrigated	0	0	0	0	0	0	0	0	0	0	0		
3	NMP	TOTAL ACRES	5,522	6,686	2,145	107	0	6,664	392	21,517	2,809	24,326			
		% DISTRIB.	26	31	10	0	0	31	2	0	0	0			
		Flood-irrigated	8	0	0	0	24	0	0	0	32	0	32		
		Sprinkler-irrigated	78	0	0	0	0	0	2	80	0	80			
		Drip-irrigated	0	0	0	0	0	0	0	0	0	0			
4	UPPER LA PLATA	TOTAL ACRES	86	0	0	0	24	0	2	112	38	150			
		% DISTRIB.	77	0	0	0	21	0	1	0	0	0			
		Flood-irrigated	8	0	0	0	24	0	0	32	0	32			
		Sprinkler-irrigated	78	0	0	0	0	0	2	80	0	80			
		Drip-irrigated	0	0	0	0	0	0	0	0	0				
4	LA PLATA RIVER	TOTAL ACRES	1,313	21	3	1	675	50	3	2,066	1,015	3,081			
		% DISTRIB.	64	1	0	0	33	2	0	0	0	0			
		Flood-irrigated	1,134	21	3	1	566	38	2	1,765	0	1,765			
		Sprinkler-irrigated	179	0	0	0	109	12	2	301	0	301			
		Drip-irrigated	0	0	0	0	0	0	0	0	0				

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HYDROLOGIC UNIT	IRRIGATION AREA	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE			
			ALFALFA	CORN/ SORGHUM	MISC. VEGET.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	NOT IRRIGATED	TOTAL						
5	CHACO RIVER	TOTAL ACRES																
		% DISTRIB.																
		Flood-irrigated																
		Sprinkler-irrigated																
		Drip-irrigated																
5	NIMP	TOTAL ACRES	480	7,463	4,155	0	0	0	2,584	0	14,682	832	15,514					
		% DISTRIB.	3	51	28	0	0	18	0									
		Flood-irrigated																
		Sprinkler-irrigated																
		Drip-irrigated																
6	FARMERS MUTUAL DITCH	TOTAL ACRES	1,134	55	19	15	575	0	6	1,794								
		% DISTRIB.	62	3	1	1	31	0	2									
		Flood-irrigated	1,124	55	19	15	575	0	6	1,794								
		Sprinkler-irrigated	10	0	0	0	1	0	28	39								
		Drip-irrigated	0	0	0	0	0	0	0	0								
6	JEWETT VALLEY DITCH	TOTAL ACRES	523	24	2	1	199	0	125	874	116	991						
		% DISTRIB.	60	3	0	0	23	0	14									
		Flood-irrigated	514	24	2	1	198	0	9	747								
		Sprinkler-irrigated	9	0	0	0	2	0	116	127								
		Drip-irrigated	0	0	0	0	0	0	0	0								
6	WESTWATER	TOTAL ACRES																
		% DISTRIB.																
		Flood-irrigated																
		Sprinkler-irrigated																
		Drip-irrigated																
WESTWATER ACRES INCLUDED IN FARMERS MUTUAL DITCH																		
6	CAMBRIDGE	TOTAL ACRES	20	27	6	0	10	0	0	64	0	64						
		% DISTRIB.	32	43	9	0	16	0	0									
		Flood-irrigated	20	27	6	0	10	0	0	64								
		Sprinkler-irrigated	0	0	0	0	0	0	0	0								
		Drip-irrigated	0	0	0	0	0	0	0	0								

Not field-checked 2004

TABLE 2. 2004 CROP ACREAGE DATA FOR THE SAN JUAN RIVER BASIN IN NEW MEXICO BY AREA

HYDROLOGIC UNIT	IRRIGATION AREA	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE
			ALFALFA	CORN/ SORGHUM	MISC. VEGT.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	IRRIGATED	ACREAGE			
6	FRUITLAND	TOTAL ACRES	1,190	508	54	3	171	15	0	0	0	0	1,941	699	2,640
		% DISTRIB.	61	26	3	0	9	1	0	0	0	0			
		Flood-irrigated	1,190	508	54	3	171	15	0	0	0	0	1,941	699	2,640
		Sprinkler-irrigated	0	0	0	0	0	0	0	0	0	0	0	0	0
		Drip-irrigated	0	0	0	0	0	0	0	0	0	0	0	0	0
6	HOGBACK-EAST	TOTAL ACRES	405	374	42	3	155	0	6	984	453	1,437			
		% DISTRIB.	41	38	4	0	16	0	1						
		Flood-irrigated	405	374	42	3	155	0	6	984	453	1,437			
		Sprinkler-irrigated	0	0	0	0	0	0	5	0	0				
		Drip-irrigated	0	0	0	0	0	0	0	0	0				
6	FARMINGTON GLADE	TOTAL ACRES	3	0	0	15	65	0	43	126	15	141			
		% DISTRIB.	2	0	0	12	51	0	34						
		Flood-irrigated	0	0	0	13	59	0	0	72	0	72			
		Sprinkler-irrigated	3	0	0	2	6	0	43	54	0				
		Drip-irrigated	0	0	0	0	0	0	0	0	0				
6	NIIP	TOTAL ACRES	6,448	8,149	4,510	224	0	1,922	0	21,253	1,244	22,497			
		% DISTRIB.	30	38	21	1	0	9	0						
		Flood-irrigated	756	538	62	1	220	2	0	1,580	0	1,580			
		Sprinkler-irrigated	0	0	0	0	0	0	8	8	0				
		Drip-irrigated	0	0	0	7	0	0	7	0	7				
7	HOGBACK-WEST	TOTAL ACRES	756	538	62	8	220	2	8	1,594	828	2,423			
		% DISTRIB.	47	34	4	0	14	0	1						
		Flood-irrigated	756	538	62	1	220	2	0	1,580	0	1,580			
		Sprinkler-irrigated	0	0	0	0	0	0	8	8	0				
		Drip-irrigated	0	0	0	7	0	0	7	0	7				
7	CUDEI	TOTAL ACRES	138	74	0	1	82	4	0	298	69	367			
		% DISTRIB.	46	25	0	0	27	1	0						
		Flood-irrigated	138	74	0	1	82	4	0	298	69	367			
		Sprinkler-irrigated	0	0	0	0	0	0	0	0	0				
		Drip-irrigated	0	0	0	0	0	0	0	0	0				

TABLE 2. 2004 CROP ACREAGE DATA FOR THE SAN JUAN RIVER BASIN IN NEW MEXICO BY AREA

HYDROLOGIC UNIT	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE		
		ALFALFA	CORN/ SORGHUM	MISC. VEGET.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	IRRIGATED	ACREAGE					
8	WHISKEY CREEK															
	TOTAL ACRES															
	% DISTRIB.															
	Flood-irrigated															
	Sprinkler-irrigated															
	Drip-irrigated															
	ARCHULETA DITCH, CITIZENS DITCH	4,527	79	48	56	3,721	47	254	8,732	1,317	10,048					
	TURLEY DITCH, HAMMOND	52	1	1	1	43	1	3								
	FARMERS MUTUAL DITCH															
	JEWETT VALLEY AND WESTWATER COMBINED	1,954	79	31	21	1,986	2	15	4,087							
	Sprinkler-irrigated	2,573	0	14	27	1,735	45	239	4,634							
	Drip-irrigated	0	0	4	8	0	0	0	11							
	ANIMAS RIVER, BCHO, AND FARMINGTON GLADE COMBINED	1,359	16	89	128	3,385	52	256	5,285	930	6,215					
	% DISTRIB.	26	0	2	2	64	1	5								
	Flood-irrigated	1,024	16	72	105	2,407	44	2	3,671							
	Sprinkler-irrigated	335	0	12	21	978	8	254	1,607							
	Drip-irrigated	0	0	5	1	0	0	0	6							
	UPPER LA PLATA AND LA PLATA RIVER COMBINED	1,399	21	3	1	699	50	5	2,178	1,053	3,231					
	% DISTRIB.	64	1	0	0	32	2	0								
	Flood-irrigated	1,142	21	3	1	590	38	2	1,797							
	Sprinkler-irrigated	257	0	0	0	109	12	3	381							
	Drip-irrigated	0	0	0	0	0	0	0	0							
	FRUITLAND, CAMBRIDGE AND HOGBACK-EAST COMBINED	1,616	909	102	6	337	15	6	2,989	1,152	4,141					
	% DISTRIB.	54	30	3	0	11	1	0								
	Flood-irrigated	1,616	909	102	6	337	15	1	2,985							
	Sprinkler-irrigated	0	0	0	0	0	0	5	5							
	Drip-irrigated	0	0	0	0	0	0	0	0							

Not field-checked 2004

TABLE 2. 2004 CROP ACREAGE DATA FOR THE SAN JUAN RIVER BASIN IN NEW MEXICO BY AREA

HYDROLOGIC UNIT	IRRIGATION AREA	ITEM	CROP CATEGORY										TOTAL ACREAGE IRRIGATED	ACREAGE NOT IRRIGATED	TOTAL ACREAGE
			ALFALFA	CORN/ SORGHUM	MISC. VEGET.	ORCHARD	PASTURE	SMALL GRAINS	SOD	IRRIGATED	IRRIGATED	IRRIGATED			
HOGBACK-WEST AND CUDEI COMBINED		TOTAL ACRES	893	613	62	8	302	6	0	8	1,893	897	2,790		
		% DISTRIB.	47	32	3	0	16	0	0	0					
			Flood-irrigated	893	613	62	2	302	6	0	0	1,878	8	7	
		Sprinkler-irrigated	0	0	0	0	0	0	0	8	8				
		Drip-irrigated	0	0	0	7	0	0	0	7					
NAVAJO INDIAN IRRIGATION PROJECT		ACRES	12,450	22,299	10,810	332	0	11,169	392	57,452	4,886	62,337			
		% DISTRIB.	22	39	19	1	0	19	1	100					
			Sprinkler-irrigated	12,450	22,299	10,810	332	0	11,169	392	57,452	4,886			