

SPECIAL IMPROVEMENT DISTRICT #1 OF THE
RIO GRANDE WATER CONSERVATION DISTRICT

ANNUAL REPORT FOR THE
2016 PLAN YEAR

Prepared

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by

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Executive Summary

The Rio Grande Water Conservation District (RGWCD) established Special Improvement District #1 (Subdistrict #1) in 2006. After extensive litigation and appeals over the Plan of Water Management (Plan), and decisions by both the District and the Colorado Supreme Courts in 2010 and 2011, respectively, the Plan was approved. The approved Plan guided the implementation of Subdistrict #1. In spring 2012, the State Engineer's Office (SEO) provided additional guidance regarding the Annual Replacement Plan (ARP).

After SEO approval of the 2012 Annual Replacement Plan for Subdistrict #1, objectors initiated litigation over the ARP's suitability. On October 29th and 30th, 2012, a Court trial was held to address the Subdistrict #1 augmentation plans and subject wells' description and whether Closed Basin Project (CBP) production could be used as a replacement water source. The District Court issued its ruling on the objections on April 10, 2013 approving the ARP, including the use of the CBP production as a replacement water source. Some of the objectors appealed the Court's ruling to the Colorado Supreme Court and arguments in the case were heard on September 30, 2014.

On June 29th, 2015, the Colorado Supreme Court ruled in a unanimous opinion that the 2012 ARP's inclusion of Closed Basin Project water as a source of replacement water for depletions caused by Subdistrict well pumping was adequate and suitable to prevent injury to senior surface water rights and the inclusion of augmentation plan wells as Subdistrict wells for the purpose of calculating total groundwater depletions did not render the ARP invalid.

On April 12, 2016, the 2016 ARP was finalized and provided to the SEO, the District Court and the public. On April 29, 2016, the SEO approved the 2016 ARP, enabling Subdistrict #1 staff to move forward making replacements in the manner approved. The Plan and the Court require a detailed Annual Report (AR) to document Subdistrict #1's compliance with the decrees and the approved 2016 ARP. The AR is due March 1, 2017.

The SEO and the Colorado Division of Water Resources (CDWR) generate much of the data required to be included in the AR. The data describes the various aspects of water use throughout the 2016 ARP year related to Subdistrict #1, including streamflow records, diversion records and Subdistrict #1 well pumping records.

Although the ARP year is not yet complete, Subdistrict #1 has accomplished a majority of the ARP's goals. This AR details how Subdistrict #1 has remedied all injurious depletions at the time the injury occurred, in the place the injury occurred and for the total amount of injury for the 2016 ARP year. This AR complies with the terms and conditions of the court decrees by permitting public access to data related to projections in the 2016 ARP and to Subdistrict #1's actual operations. It also details the outcomes of Subdistrict #1's actions during the 2016 ARP year.

Subdistrict #1 proceeded with proactive and conservative practices during the 2016 ARP Year to insure senior water rights were not injured by groundwater withdrawals from Subdistrict #1 Wells. The 2016 AR describes the data, methodology and calculations that verify injurious depletions were remedied as required.

This AR confirms that Subdistrict #1 provided more replacement water to the Rio Grande than was necessary for the Plan Year to properly make the river “whole.” The AR also describes Subdistrict #1’s attempts to reduce pumping through use of the Conservation Reserve Enhancement Program (CREP).

The AR data is accurate as of March 1st, 2017, but will not be complete until the end of the 2016 ARP year, April 30th, 2017.

1.0 CALCULATIONS OF ACTUAL PLAN YEAR 2016 RIO GRANDE DEPLETIONS FROM SUBDISTRICT WELLS

This section of the 2016 AR presents data showing both projected and actual calculated depletions to the Rio Grande caused by groundwater withdrawals from Subdistrict #1 Wells. Depletions are calculated by a CDWR supplied Response Function spreadsheet that outputs total depletions for the ARP year and a breakdown of monthly depletions for three reaches of the Rio Grande.

Projected depletions were presented in the 2016 ARP completed on April 14, 2016. Forecasted calendar year flow through the Rio Grande near Del Norte gage (index gage) was the primary bench mark used to make projections. From this forecast, estimates of total well pumping, canal diversions and annual recharge credit were prepared and utilized in the depletion spreadsheet. In the following subsections, actual river depletions have been calculated for 2016 using recorded values for well pumping, canal diversions and resulting recharge credit.

Full definitions of terms and the processes used in this section are included in the ARP and the Plan. As the AR is a summary report of the success of the ARP, definitions and extensive explanations are not repeated herein.

1.1 STREAM FLOW FORECASTS COMPARED TO ACTUAL FLOWS

1.1.1 2016 Stream Flow Forecasts

The Division Engineer for Water Division 3 elected to use a hybrid of both the NRCS Forecast and the National Weather Service Forecast for the Rio Grande gage near Del Norte (index gage) as well as the Conejos River system in 2016. Data collected from the Division 3 Engineer's Preliminary Rio Grande Compact Ten Day Report on April 7, 2016 estimated the flow for the period April – September 2016 for the index gage to be 540,000 ac-ft. Also from the data contained in the report, 105,000 ac-ft. is added to the April – September hybrid forecast for the index gage to obtain the projected annual flow. Therefore, using the Division Engineer's April 7, 2016 hybrid forecast and the additional 105,000 acre feet, the projected annual flow of the Rio Grande at the index gage was 645,000 ac-ft.

1.1.2 2016 Actual Stream Flow

Based on the Division 3 Engineer's Rio Grande Compact Ten Day Report for the end of 2016, see Appendix H of the Appendices, the actual annual flow of the Rio Grande through the index gage was 667,300.0 ac-ft. This increase above the projected flows resulted in a decrease in calculated stream depletions for the Subdistrict. See Table 1.7 below. The actual annual flow of the Conejos River through the index gage was 280,100.0 ac-ft. also included in Appendix H.

1.2 TOTAL PUMPING

Based on information obtained from the Division of Water Resources in February of 2017, the actual metered pumping from Subdistrict #1 Wells included in the 2016 ARP was

236,641.0 ac-ft. for Irrigation Year 2016. Projected pumping for 2016, as contained in the 2016 ARP, was 238,000 ac-ft. Therefore, actual well pumping was lower than projected pumping by less than 1%. All Subdistrict #1 metered well pumping in 2016 was used for irrigation with the vast majority through center pivot sprinklers and only a small amount applied to flood irrigation.

1.3 ANNUAL RECHARGE CREDIT

Recharge credit is available to four canals/ditches that divert from the Rio Grande into Subdistrict #1 in accordance with their respective decrees. This recharge credit is used as an offset to groundwater consumption in accordance with the respective decrees and the method used to calculate depletions. The canals/ditches and their decrees are listed in the following tabulation:

<u>Canal/Ditch</u>	<u>Decree</u>
Rio Grande Canal	Case No. W-3979
San Luis Valley Irrigation District	Case No. W-3980
Prairie Ditch	Case No. 96CW45
San Luis Valley Canal	Case No. 96CW46

The actual 2016 annual calculated recharge credits for these four canals/ditches within Subdistrict #1 were prepared using end of irrigation year 2016 canal diversion records obtained from Division of Water Resources and information obtained directly from canal companies and irrigators. The actual recharge credit for each canal is adjusted through the following steps, which results in total consumable credit.

Information used in calculating total consumable credit for each canal/ditch was prepared using the entire irrigated service areas of each canal/ditch. Then, the totals were reduced based on the best estimated percentages of total pro rata ditch shares located within the Subdistrict # 1 boundary provided by each ditch company. The following percentages were used:

- Rio Grande Canal = 91.68%
- San Luis Valley Irrigation District = 100%
- Prairie Ditch = 99.20%
- San Luis Valley Canal = 78.82%

Further, it was necessary to reduce the totals by the actual consumptive use attributable to surface water used directly through sprinklers and for flood irrigation. This data was obtained from irrigators during 2016 and is listed below:

- 1) Rio Grande Canal: Surface water through sprinklers = 5,182.91 ac-ft. and surface water applied to flood irrigation = 160.40 ac-ft.
- 2) San Luis Valley Irrigation District: Surface water through sprinklers = 129.12 ac-ft. and surface water applied to flood irrigation = 10.0 ac-ft.
- 3) Prairie Ditch: Surface water through sprinklers = 318.64ac-ft. and surface water applied to flood irrigation = 0.0 ac-ft.
- 4) San Luis Valley Canal: Surface water through sprinklers = 484.41 ac-ft. and surface water applied to flood irrigation = 6.0 ac-ft.

Using the total consumable water derived from each of the four canals/ditches in accordance with the procedure described in the Court’s ruling in Case Numbers 06CV64 & 07CW52 and reducing those totals using the above information and the approved estimated consumption for sprinkler (83%) and flood irrigation (60%), the following tabulation shows the actual resulting total of individual canal/ditch consumable credits and the total for all of the systems.

Table 1.1
Calculated Recharge Decree Credits for Subdistrict #1 During 2016
Prepared February 16, 2017
 (All units in ac-ft)

	Rio Grande Canal	San Luis Valley I.D.	Prairie Ditch	SLV Canal	Totals
Total Consumable	141,668.22	32,176.75	13,243.00	18,778.84	205,866.81
% Within Subdistrict #1	91.68%	100%	99.20%	78.82%	
Total Consumable Within Subdistrict #1	129,881.43	32,176.75	13,137.06	14,801.48	189,996.71
Surface Water Through Sprinklers @83%	-4,301.82	-107.17	-264.47	-402.06	-5,075.51
Surface Water Used for Flood @60%	-96.24	-6.00	0	-3.60	-105.84
Totals	125,483.37	32,063.58	12,872.58	14,395.82	184,815.35

Therefore, the calculated consumable credit under the four recharge decrees for 2016 is 184, 815.35 ac-ft.

1.4 CLASSIFICATION AS “WET,” “AVERAGE,” OR “DRY” YEAR

Response Functions generated from the RGDSS Groundwater Model Phase 6P98 were used in determining stream depletions as described in this section based on three types of weather conditions during the ARP year. These conditions are “Wet,” “Average,” or “Dry.” A year is classified as being “Wet,” “Average,” or “Dry” based on the amount of Net Groundwater Consumptive Use for Subdistrict wells using the following criteria⁽¹⁾:

Table 1.2
Definition of “Wet,” “Average,” or “Dry” Year

Year Type	Net Groundwater Consumptive Use (ac-ft./yr)
Wet	Less than 10,000
Average	Between 10,000 and 180,000
Dry	Greater than 180,000

Reference: Updated information obtained March 20, 2012 from James R. Heath, P.E., Division of Water Resources Lead Modeler.

The Net Groundwater Consumptive Use for the 2016 ARP year was 11,597.0 ac-ft. as shown in Table 1.3. Referencing the ranges in Table 1.2, the 2016 ARP year is classified as an “average” year.

1.5 2016 STREAM DEPLETIONS

Stream depletions attributable to the groundwater withdrawals from Subdistrict #1 Wells have been calculated using the Response Function spreadsheet produced by the RGDSS Groundwater Model Phase 6P98 (RGDSS Model) as operated by DWR. The first step in calculating depletions is to update Table 1.3 to derive annual Net Groundwater Consumptive Use. For reference, values for previous years 2011, 2012, 2013, 2014, and 2015 are included in the table along with the values for 2016. Notes are included at the bottom of the table to provide a description of the calculations. For 2016, the values in columns 5 through 9 are obtained from Table 1.1 above. The Net Groundwater Consumption Use data for 2016 is applied to the Response Function spreadsheet contained in Table 1.4 to calculate stream depletions for the 2016 Plan Year and lagged depletions into the future.

The Net Groundwater Consumptive Use derived in Table 1.3 is input into Column 3 of Table 1.4 for year 2016. The annual stream depletions resulting from Subdistrict #1 well pumping for the respective reaches of the Rio Grande and the total are shown in columns 4 through 7 of Table 1.4.

Table 1.5 is an output from the Response Function spreadsheet that divides the annual total depletions into monthly replacement obligations for the three impacted reaches of the Rio Grande. This table lists the 2016 Plan Year stream depletions as required under the Plan and Decree.

Table 1.3
Estimated Net Groundwater Consumptive Use
(Units in ac-ft.)

Year	Subdistrict #1 Total				Recharge that Offsets Groundwater Pumping					Net Groundwater Consumptive Use
	Irrigation Pumping to Center Pivots	Irrigation Pumping to Flood Irrigation	Other Pumping	Groundwater Consumption	Rio Grande Canal	San Luis Valley Irrigation District	Prairie Ditch	San Luis Valley Canal	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2011	328,043	0	0	272,275	86,569	9,981	8,325	7,310	112,185	160,090
2012	260,672	0	0	216,358	56,721	6,748	4,795	3,136	71,400	144,958
2013	229,413	0	0	190,413	85,975	5,477	4,227	4,844	100,523	89,890
2014	237,787	0	0	197,363	110,972	28,560	14,133	13,244	166,909	30,454
2015	205,941	0	0	170,931	122,901	34,685	15,139	15,608	188,333	-17,402
2016	236,641	0	0	196,412	125,483	32,064	12,873	14,396	184,815	11,597
Avg.	249,749	0	0	207,292	98,104	19,586	9,915	9,756	137,361	69,931

Explanation of Columns

- (1) Calendar Year
- (2) Determined from metered groundwater pumping
- (3) Determined from metered groundwater pumping

- (4) Determined from metered groundwater pumping
(5) Calculated as $0.83 \times \text{Col2} + 0.60 \times \text{Col3}$
(0.83 and 0.60 are the consumptive use ratios of total pumping associated with sprinkler irrigation practices, respectively)
(6) – (9) Determined by Davis Engineering from analysis of historical diversions and recharge decrees (W-3979, W-3980, 96CW0045, and 96CW0046)
(10) Calculated as $\text{Col5} + \text{Col6} + \text{Col7} + \text{Col8}$
(11) Calculated as $\text{Col4} - \text{Col9}$

Table 1.4
Estimated Historical and Projected Net Stream Depletions from Groundwater
Pumping in Subdistrict #1
(Units in ac-ft.)

Annual Net Stream Depletions (May-Apr) ^{a)}						
Year	Rio Grande near Del Norte Stream Gage (Apr-Sep)	Net Groundwater Consumptive Use (Jan-Dec)	Rio Grande Del Norte-Excelsior	Rio Grande Excelsior-Chicago	Rio Grande Chicago-State Line	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1970	561,150	101,275	225	341	-116	450
1971	389,397	135,541	420	714	-169	965
1972	373,031	169,393	619	1,069	-223	1,465
1973	755,509	38,851	479	878	-91	1,266
1974	270,942	220,567	2,366	1,325	-285	3,406
1975	730,848	23,753	2,294	1,028	-137	3,185
1976	512,997	65,760	2,016	938	-164	2,790
1977	163,635	240,127	3,825	1,513	-347	4,991
1978	340,660	155,492	3,828	1,627	-328	5,127
1979	886,617	11,835	3,093	1,222	-153	4,162
1980	672,668	63,873	2,726	1,100	-189	3,637
1981	310,945	170,010	2,681	1,423	-300	3,804
1982	572,474	36,314	2,286	1,211	-156	3,341
1983	578,510	32,273	2,031	994	-138	2,887
1984	652,637	40,219	1,869	902	-137	2,634
1985	864,564	2,568	1,648	717	-87	2,278
1986	865,371	-37,341	-90	669	16	595
1987	907,650	109,992	43	858	-115	786
1988	346,087	177,158	593	1,246	-226	1,613
1989	407,389	169,478	883	1,485	-243	2,125
1990	424,033	88,971	886	1,371	-166	2,091
1991	529,567	46,509	826	1,117	-117	1,826
1992	415,482	67,128	861	1,040	-136	1,765
1993	577,831	-21,380	-193	847	-6	648
1994	444,629	100,660	-115	924	-117	692
1995	734,492	-68,610	-2,899	893	140	-1,866
1996	313,441	205,238	-960	1,265	-111	194
1997	781,596	-1,949	-462	906	9	453
1998	466,821	112,457	-70	1,003	-122	811
1999	799,489	-50,972	-2,204	916	110	-1,178
2000	312,094	213,180	-208	1,325	-142	975
2001	655,233	65,822	415	1,184	-91	1,508
2002	96,717	322,490	3,276	1,932	-378	4,830
2003	261,300	234,308	5,234	2,191	-388	7,037
2004	431,675	126,966	4,837	1,967	-322	6,482
2005	682,540	70,356	4,059	1,661	-234	5,486
2006	411,656	119,657	3,660	1,626	-273	5,013
2007	593,239	23,116	3,064	1,311	-155	4,220
2008	623,333	49,201	2,700	1,148	-166	3,682
2009	513,058	-4,448	2,119	911	-90	2,940

2010	453,063	76,286	2,013	968	-166	2,815
2011	415,182	160,090	2,113	1,310	-264	3,159
2012	328,382	144,958	2,096	1,499	-260	3,335
2013	344,435	89,890	1,975	1,394	-203	3,166
2014	518,599	30,454	1,785	1,121	-133	2,773
2015	555,700	-17,402	921	884	-48	1,757
2016	667,300	11,597	707	711	-53	1,365
2017			760	545	-43	1,262
2018			786	438	-42	1,182
2019			804	335	-41	1,098
2020			649	249	-33	865
2021			533	197	-27	703
2022			283	159	-17	425
2023			140	129	-10	259
2024			114	109	-8	215
2025			92	92	-6	178
2026			70	77	-5	142
2027			61	55	-4	112
2028			55	31	-3	83
2029			55	13	-2	66
2030			30	3	-1	32
2031			-4	1	1	-2
2032			-30	1	2	-27
2033			-41	0	2	-39
2034			-30	0	1	-29
2035			2	0	0	2
2036			0	0	0	0
2037			0	0	0	0
2038			0	0	0	0
2039			0	0	0	0
2040			0	0	0	0
Avg. 2001-2016	471,963	93,959	2,561	1,364	-201	3,723
Avg. 2001- 2010	472,181	108,375	3,138	1,490	-226	4,401
Post Plan Depletion			4,332	2,433	-235	6,527

- a) Estimated net stream depletions shown in this table are greater than the stream depletions that potentially cause injury to surface water rights.

Explanation of Columns

- (1) Year
- (2) Rio Grande near Del Norte Gage streamflow in acre-feet for the NRCS streamflow forecast period of April through September
- (3) Net Groundwater Consumptive Use (Net GWCU) for January through December. Net GWCU values for 2001 through 2010 were taken from the RGDS Groundwater Model output. Net GWCU values for 2011 through 2014 were calculated using well meter data, diversion data, and irrigated acreage information
- (4) Net Stream Depletions in the Rio Grande Del Norte to Excelsior Ditch reach for the plan year (May through April) in acre-feet
- (5) Net Stream Depletions in the Rio Grande Excelsior Ditch to Chicago Ditch reach for the plan year (May through April) in acre-feet
- (6) Net Stream Depletions in the Rio Grande Chicago Ditch to the State Line reach for the plan year (May through April) in acre-feet
- (7) Total Net Stream Depletions columns (4+5+6) in acre-feet.

Table 1.5
Subdistrict #1 Monthly Net Stream Depletions for Plan Year
Calculated February 17th, 2017
 (Units in ac-ft.)

Stream Reach	Subdistrict #1 Total												
	2016								2017				Total
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Rio Grande Del Norte-Excelsior	55	60	66	63	59	61	59	60	54	51	53	65	706
Rio Grande Excelsior-Chicago	84	52	58	46	48	49	47	58	65	65	76	63	711
Rio Grande Chicago-State Line	-1	-29	0	5	2	3	3	6	-2	-7	-12	-21	-53
Total	138	83	124	114	109	113	109	124	117	109	117	107	1,364

As indicated in lower right hand corner of Table 1.5, the calculated total depletions that will impact the Rio Grande during the 2016 ARP year, due to both past pumping and the 2016 pumping, using the RGDSS Groundwater Model Phase 6P98 Response Function is 1,364.0 ac-ft. The locations of the depletions and monthly quantities are also tabulated in Table 1.5.

If wells that were pumping in 2016 were shut off today, there would be a continuing impact to the river for approximately 19 years according to the RGDSS Groundwater Model Phase 6P98. This is the calculated time required to recover to conditions that existed before well pumping started. The volume of water required to replace depletions during this recovery period is called Post-Plan Stream Depletions. Table 1.6 shows that the total post-plan stream depletions are calculated to be 6,527.0 ac-ft. The portion of the total depletions impacting each of the three designated reaches of the river is also included in Table 1.6.

Table 1.6
Subdistrict #1 Post-Plan Stream Depletions
 (Units in ac-ft.)

Years (May-Apr)	Rio Grande - Del Norte to Excelsior Ditch Headgate	Rio Grande - Excelsior Ditch Headgate to Chicago Ditch Headgate	Rio Grande - Chicago Ditch Headgate to Stateline	Total
2017-2036	4,329	2,434	-236	6,527

Table 1.7 lists both the April 2016 projected obligations and the February 2017 final calculated obligations to compare projected versus actual calculated depletions for the 2016 ARP Year.

Table 1.7
Subdistrict # 1 Monthly Stream Replacement Obligation for 2016 ARP year
 (Units in ac-ft.)

Month	Reach #1				Reach # 2				Reach # 3				Projected Totals	Calculated Totals
	4/14/2015 Projection	2/29/2016 Calculation	4/12/2016 Projection	2/17/2017 Calculation	4/14/2015 Projection	2/29/2016 Calculation	4/12/2016 Projection	2/17/2017 Calculation	4/14/2015 Projection	2/29/2016 Calculation	4/12/2016 Projection	2/17/2017 Calculation		
16-Mar	245	37			39	32			30	26			314	95
16-Apr	235	38			30	28			19	21			284	87
16-May			55	55			84	84			-1	-1	138	138
16-Jun			61	60			52	52			-30	-29	83	83
16-Jul			68	66			58	58			-2	0	124	124
16-Aug			65	63			46	46			3	5	114	114
16-Sep			62	59			49	48			1	2	112	109
16-Oct			63	61			51	49			1	3	115	113
16-Nov			61	59			52	47			3	3	116	109
16-Dec			61	60			63	58			6	6	130	124
17-Jan			56	54			70	65			-2	-2	124	117
17-Feb			53	51			69	65			-7	-7	115	109
17-Mar			54	53			80	76			-12	-12	122	117
17-Apr			67	65			67	63			-22	-21	112	107
Total 2015 Plan Year Projected	480				69				49				598	
Total 2015 Plan Year Calculated 2/29/2016		75				60				47				182
Total 2016 Plan Year Projected 4/12/2016			726				741				-62		1,405	
Total 2016 Plan Year Calculated 2/17 /2017				706				711				-53		1,364.0

* Total depletions entered in Table 1.7 have been rounded off to the nearest whole number.

April 12th, 2016 calculations projected 1,405.0 ac-ft. of stream depletions during the 2016 ARP year. The actual quantity of calculated depletions based on DWR’s end-of-year records for 2016 groundwater use and surface water diversions is 1,364.0 ac-ft. Based on actual data, Subdistrict #1 overpaid a minimal amount of injurious depletions to the Rio Grande during the 2016 Plan Year and will adjust the remaining period of the ARP to minimize any additional overpayment.

2.0 TOTAL DIVERSION BY DITCHES

Table 2.1 shows the ditch service areas that have diversions in Subdistrict #1. The diversions shown are total irrigation water for the ditch for the 2016 irrigation year, but only a portion is delivered within Subdistrict #1.

**Table 2.1
Ditch Service Areas with Diversions in Subdistrict #1
Total Ditch Diversions for the 2016 Irrigation Year**

WDID	DITCH NAME	Diversions In Ac.-ft	Subdistrict Year
2000546	Billings Ditch	5,417.10	2016
2000556	Butler Ditch	1,680.60	2016
2000627	Excelsior Ditch	23,137.50	2016
2000631	Farmers Union Canal	45,883.00	2016
2000699	Kane Callan Ditch	2,518.40	2016
2000736	Mc Donald Ditch	6,048.50	2016
2000798	Prairie Ditch	18,539.00	2016
2000812	Rio Grande Canal	167,204.00	2016
2000814	Rio Grande Ditch #2	1,451.50	2016
2000829	San Luis Valley Canal	22,467.00	2016
2700518	Green D #1	2,029.83	2016
2700523	Johnnie Smith D 1	1,080.25	2016
2700533	McLeod No 3	60.16	2016
2700714	McLeod No 4 & 5	565.58	2016

Notes:

New Structure (2700714) replaced (2700534) McLeod No. 4 and (2700535) McLeod No. 5

3.0 TOTAL IRRIGATED ACRES

Each irrigation season, the RGWCD conducts a field survey of the irrigated acreage on the Valley floor to record crop types grown. Table 3.1 is the summary of “irrigated acres, cropping patterns and irrigation methods” on parcels that are part of 2016 Subdistrict #1 Farm Units. The data was derived from the irrigated agriculture field survey by spatially “capturing” any fields that lie within any of the landowner parcels that are part of the 2016 Subdistrict #1 Farm Units. Only those fields that had entries updated during the 2016 crop survey were used in this analysis. The crop information and acreage from the irrigated agriculture shapefile attribute tables was compiled and is shown in Table 3.1.

**Table 3.1
Cropping Patterns within Subdistrict #1 for 2016**

Crop Type	Total Acres	Sprinkler	LEPA	Flood
Alfalfa	31,519	31,292	31	197
Canola	1,853	1,853	0	0
Carrots	1,175	1,175	0	0
Corn	82	82	0	0
Fallowed	4,781	4,781	0	0
Grain	50,324	50,254	60	10
Grass hay/pasture	1,498	1,026		472
Green manure	9,819	9,819	0	0
Lettuce	1,457	1,457	0	0
Oats	1,470	1,370	0	100
Pasture	1,185	518	59	607
Potatoes	48,900	48,864	29	6
Sudan grass hay	3,381	3,381	0	0
Triticale	604	604	0	0
Vegetables	1,339	1,339	0	0
CREP	5,958	5,958	0	0
Quinoa	200	200	0	0
Totals	165,545	163,973	179	1,392

Information collected for 2016 Subdistrict #1 Farm Units included identification of the wells and surface rights allocated to the irrigated fields on the lands comprising each Farm Unit. A summary of the ditches and pro rata shares of surface water allocated to fields on Subdistrict #1 2016 Farm Units is included in Appendix B and represents the “surface water source” for Subdistrict #1.

The Plan timeline requires Subdistrict #1 to request well meter readings prior to the end of the irrigation season and, therefore, the meter readings were requested as of September 7th, 2016. The diversion amounts for the Subdistrict #1 Wells is for the portion of the 2016 irrigation season through November 1st, 2016. The pumping covered by augmentation plans during 2016 was not included in the total pumping used to calculate Recharge Credit in Section 4, below.

4.0 SURFACE WATER CREDIT

The amount of Surface Water Credit (SWC) exchanged both 2015 and 2016, between Farm Units and applied against the 2016 Variable Fees was 13,330.87 ac-ft.

At the time of submission of this AR, the estimated amount of 2015 carry over SWC carried forward into 2016 that was not utilized and therefore extinguished by rule was 3,684.59 ac-ft. This number may change during the appeal process in 2017.

5.0 CLOSED BASIN PROJECT PRODUCTION-PROJECTED AND ACTUAL

According to accounting from the Bureau of Reclamation (BOR) Alamosa Field Division, Closed Basin Division, San Luis Valley Project, Colorado, the production of the CBP delivered to the Rio Grande was 8,469 ac-ft. during the calendar year 2016. The 2016 ARP projected the production of the CBP to be 10,000 ac-ft. This difference is attributable to a reduction in project pumping because Colorado's delivery obligation under the Rio Grande Compact was met before the end of 2016.

6.0 AMOUNTS AND SOURCES OF REPLACEMENT WATER

The remaining amounts and sources of water available for the remainder of the 2016 ARP year and 2017 ARP is: 27,534.55 ac-ft.

Table 6.1
Remaining Balances of Replacement Water Acquired by
Subdistrict #1 for 2016

Water Right(s) Name	Quantity (Acre Feet)	Water Previously Controlled By:	Decree(s)	Current Location
Williams Creek Squaw Pass	1,698.0	Navajo Development	CA73, CA308, W-1869-78	Rio Grande Reservoir
Williams Creek Squaw Pass	48.0	TJ Brown, Private Owner	CA73, CA308, W-1869-78	Rio Grande Reservoir
Williams Creek Squaw Pass	56.49	San Luis Valley Irrigation District	CA73, CA308, W-1869-78	Rio Grande Reservoir
Tabor Ditch # 2, Tabor Ditch # 2 Enlargement	105.3	San Luis Valley Irrigation District	W-3549	Rio Grande Reservoir
Tabor Ditch # 2, Tabor Ditch # 2 Enlargement	272.5	Colorado Parks and Wildlife	W-3549	Rio Grande Reservoir
Piedra River TM, Piedra Water Rights	500.0	Colorado Parks and Wildlife	W-3549	Rio Grande Reservoir
Pine River Weminuche Pass	1000.0	SLV Water Conservancy District	CA 1248-B, 84CW62, 94CW62	Rio Grande Reservoir
Treasure Pass Trans- basin Diversion	730.76	Evelyn Underwood and Patti Cook	CA 0308	Rio Grande Reservoir
Treasure Pass Trans- basin Diversion	100.0	Sid Klecker	CA 0308	Rio Grande Reservoir
SMRC 2012 Leases of 3270.8 shares in RG Canal @ 0.944 af/share	1,705.9	Santa Maria Reservoir Co.		Santa Maria & Continental Reservoirs

SMRC 2013 Leases of 3235.8 shares in RG Canal @ 0.72 af/share	2,328.8	Santa Maria Reservoir Co.		Santa Maria & Continental Reservoirs
SMRC 2014 Leases of 3320.8 shares in RG Canal @ 1.288 af/share	4,137.0	Santa Maria Reservoir Co.		Santa Maria & Continental Reservoirs
SMRC 2015 Leases of 3095.8 shares in RG Canal @ 1.86 af/share	5,568.2	Santa Maria Reservoir Co.		Santa Maria & Continental Reservoirs
SMRC 2016 Leases of 1645.0 shares in RG Canal @ 0.968 af/share	1,556.2	Santa Maria Reservoir Co.		Santa Maria & Continental Reservoirs
SMRC Leases DWR Credit for Overpayment in 2015	200.0	Santa Maria Reservoir Co.		Santa Maria & Continental Reservoirs
Rio Grande Canal Forbearance	2000.0			
Prairie Ditch Forbearance	100.0			
Farmers Union Canal Forbearance	1000.0			
Monte Vista Canal Forbearance	300.0			
San Luis Valley Canal Forbearance	400.0			
Empire Canal Forbearance	500.0			
Centennial Ditch Forbearance	100.0			
Excelsior Ditch Forbearance	1000.0			
Rio Grande Lariat Ditch Forbearance	100.0			
Closed Basin Project Allocation as of March 1, 2017	2,027.4	RGWCD		Closed Basin Project
Total Water Available	27,534.55			

Notes:

* 2016 releases of replacement water in storage were released from the vintage Williams Creek Squaw Pass Transmountain account held at Rio Grande Reservoir.

* 146.7 acre feet of Non Consumable Use water from both the 2014 and 2015 leased share accounts was released for SMRC accretion obligations to the river during the 2016 irrigation season of the 2015 Plan Year.

* 36.15 acre feet of Non Consumable Use water from the 2016 leased share accounts was released for SMRC accretion obligations to the river during the 2016 irrigation season of the 2016 Plan Year.

Subdistrict #1 had negotiated an agreement with the Colorado Division of Parks and Wildlife (CPW) to establish a small 50 acre-foot regulating pool in Beaver Park Reservoir to enable a

more timely release of replacement water to the river in the past. Due to repairs being completed at Beaver Park Reservoir, this agreement was not continued in 2016. When repairs are completed at this facility, Subdistrict #1 will possibly renegotiate the agreement with CPW to establish the small pool if found necessary.

6.1 2016 Plan Year Forbearance Agreements

Pursuant to § 37-92-501(4)(b)(I)(B), C.R.S., Subdistrict #1 reached an agreement with the Centennial Ditch, Empire Canal, Excelsior Ditch, Farmers Union Canal, Lariat Ditch, Monte Vista Canal, Prairie Ditch, Rio Grande Canal, and San Luis Valley Canal whereby these canals accept that, subject to the specific provisions of the forbearance agreement, injury to its water rights resulting from the use of groundwater by Subdistrict #1 Wells can be remedied by means other than providing water to replace stream depletions when one of these canals are the calling right on the Rio Grande. Based upon climate projections and historical diversion patterns, the agreements with these canals are predicted to result in a reduction of 1,200 to 1,800 acre-feet of the amount of water Subdistrict #1 would otherwise have to supply to the Rio Grande-Del Norte to Excelsior Ditch headgate reach. During the 2016 Plan Year, the Board of Managers of Subdistrict #1 chose not to exercise any forbearance with any canal for projected well depletions from May 1st through November 1st due to abundant replacement water in storage located in the Rio Grande and Santa Maria Reservoir facilities. All projected well depletions on the Rio Grande from Subdistrict #1 wells during that time frame were remedied by replacement water releases to the Rio Grande from those facilities.

7.0 OPERATION OF THE SUBDISTRICT #1 WATER REPLACEMENT PLAN

Subdistrict #1 replacement water was released from the Rio Grande Reservoir in the Upper Rio Grande at the direction of the Division Engineer and based on output from the RGDSS Model to offset injurious stream depletions. All injurious depletions shown to occur in the accepted model run were replaced in the time, place and amount that they occurred, beginning May 1, 2016 through February 28, 2017, the date of completion of this report. The remaining 2016 ARP year depletions will be replaced by Closed Basin Project releases to the river and water in storage. The reaches, amounts and time that these depletions occurred are described in Appendix A. These releases of water were performed under the provisions contained in §37-87-103, C.R.S.

The most current RGDSS Groundwater Model runs and Response Functions do not predict depletions in amounts above the minimum threshold established by the Water Court, Water Division No. 3 in Case Nos. 2006CV64 and 2007CW52 caused by the withdrawal of groundwater by Subdistrict #1 Wells to streams other than the Rio Grande. Therefore, Subdistrict #1 did not make replacements to any stream other than the Rio Grande.

7.1 Description of Monthly Operations

February

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing stream reach depletions on the Rio Grande for the month of February on a daily basis pursuant to the approved 2015 ARP. On February 1st, the Subdistrict's Replacement Water Plan resumed with Closed Basin Project (CBP) allocation releases to the Rio Grande replacing all three Subdistrict #1 projected stream reach depletion obligations. Bureau of Reclamation staff attempted to keep the release rate from the CBP canal into the Rio Grande to at least the minimum of 9.62 ac-ft./day to meet the daily obligation for the Subdistrict and were successful in doing so for the entire month of February. There were no releases made of replacement water from any storage account in control by the Subdistrict from any of the upstream reservoirs at any time during the month. The balance of the Subdistrict #1 CBP allocation available for replacement water as of the end of February, 2016: 1,174.7 acre feet.

March

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing stream reach depletions on the Rio Grande for the month of March on a daily basis pursuant to the approved 2015 ARP. On March 1st, the Subdistrict's Replacement Water Plan resumed with Closed Basin Project (CBP) allocation releases to the Rio Grande replacing all three Subdistrict #1 projected stream reach depletion obligations. On March 7th, the Division 3 Division Engineer, Craig Cotten, contacted Subdistrict staff and granted permission to utilize the depletions owed for March and April 2016 to the Rio Grande under the new amount presented in the 2015 Annual Report rather than the 2015 ARP estimate. That amount for March is 95.0 acre feet. He then proposed that Subdistrict #1 pay depletions to the Rio Grande at the same daily rate that had been delivered for the month to date, but continue only until the total amount owed for March is paid and demonstrated to reach the river. Subdistrict staff agreed with his proposal and the release rate of 10.13 ac-ft. /day from the project canal into the Rio Grande replacing injurious depletions in all three stream reaches resumed until the end of the day on March 10, 2016. There were no releases made of replacement water from any storage account in control by the Subdistrict from any of the upstream reservoirs at any time during the month. The balance of the Subdistrict #1 CBP allocation available for replacement water as of the end of March, 2016: 1,079.7 acre feet.

April

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing stream reach depletions on the Rio Grande for the month of April on a daily basis pursuant to the new amounts presented and approved by the Division Engineer in the Subdistrict's 2015 Annual Report rather than the 2015 ARP estimate. Subdistrict #1's Replacement Water Plan began with a release from the approved Williams Creek Squaw Pass TM replacement water pool held at Rio Grande Reservoir on March 31st, 2016, in the amount including transit loss of 2.51 ac-ft. /day for injurious depletion obligations in Stream Reach 1 and 2 on the Rio Grande. The release from Rio Grande Reservoir to the river

continued each day for the entire month of April replacing depletion obligations in Stream Reach 1 and 2 for the Subdistrict. Total Stream Reach 3 depletion obligations for Subdistrict #1 in April was 21.0 ac-ft. and they were replaced entirely by Subdistrict #1's Closed Basin Project allocation releases to the Rio Grande on a daily basis.

May

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing projected stream reach depletions on the Rio Grande for the month of May on a daily basis pursuant to the amounts presented in the Subdistrict's 2016 Annual Replacement Plan. Subdistrict #1's Replacement Water Plan began with a release from the approved Williams Creek Squaw Pass TM replacement water pool held at Rio Grande Reservoir on April 30th, 2016, in the amount including transit loss of 5.16 ac-ft./day for injurious depletion obligations in Stream Reach 1 and 2 on the Rio Grande. The release from Rio Grande Reservoir to the river continued each day for the entire month of May replacing projected depletion obligations in Stream Reach 1 and 2 for the Subdistrict. There were no projected depletion obligations for Subdistrict #1 in Stream Reach No. 3 of the Rio Grande for the month of May, 2016.

June

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing projected stream reach depletions on the Rio Grande for the month of June on a daily basis pursuant to the amounts presented in the Subdistrict's 2016 Annual Replacement Plan. Subdistrict #1's Replacement Water Plan began with a release from the approved Williams Creek Squaw Pass TM replacement water pool held at Rio Grande Reservoir on May 31st in the amount including transit loss of 4.30 ac-ft./day to replace projected depletion obligations in Stream Reach 1 and 2 on the Rio Grande. Subdistrict staff was then notified June 1st by the Division 3 Division Engineer's Office (DEO) regarding the negative amount of projected depletion obligations for Stream Reach 3 identified in Table 2.6, Subdistrict #1 Monthly Net Stream Depletions for Plan Year of the 2016 ARP, in the amount of 1.0 ac-ft./day. The staff was directed by the DEO that if the calling water right on the Rio Grande receiving the replacement water obligation was located above Stream Reach 2 on any given day, then an amount equal to the negative, daily depletion identified in Stream Reach 3 will be deducted from the Stream Reach 2 daily obligation. The release from Rio Grande Reservoir to the river was then recalculated June 1st to an amount of 3.12 ac-ft./day, including transit loss, which took into account the 1.0 ac-ft./day offset from Stream Reach 3. This release continued each day for the entire month of June replacing projected depletion obligations in Stream Reach 1 and 2 for the Subdistrict. There was one day during the month when the calling water right fell within Stream Reach 2 of the Rio Grande being the Costilla Ditch. A Compact substitution amount of 1.0 acre foot was included with the replacement water release to fulfill the Subdistrict's depletion obligation to the Costilla Ditch that day and an equal amount of water was exchanged from the Subdistrict replacement water pool to the Compact storage account all held at Rio Grande Reservoir.

July

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing projected stream reach depletions on the Rio Grande for the month of July on a daily basis pursuant to the amounts presented in the Subdistrict's 2016 Annual Replacement Plan. Subdistrict #1's Replacement Water Plan began with a release to the river from the approved Williams Creek Squaw Pass TM replacement water pool held at Rio Grande Reservoir on June 30th in the amount, including transit loss, of 4.64 ac-ft. /day to replace projected depletion obligations in Stream Reach 1 and 2 of the Rio Grande beginning July 1st. This release to the river continued each day for the entire month of July replacing projected depletion obligations in Stream Reach 1 and 2 for the Subdistrict. There were no Subdistrict #1 projected depletion obligations in Stream Reach 3 for the month of July, 2016.

August

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing projected stream reach depletions on the Rio Grande for the month of August on a daily basis pursuant to the amounts presented in the Subdistrict's 2016 Annual Replacement Plan. Subdistrict #1's Replacement Water Plan began with a release to the river from the approved Williams Creek Squaw Pass TM replacement water pool held at Rio Grande Reservoir on July 31st in the amount, including transit loss, of 4.08 ac-ft. /day to replace projected depletion obligations in Stream Reach 1 and 2 of the Rio Grande beginning August 1st. This release to the river continued each day for the entire month of August replacing projected depletion obligations in Stream Reach 1 and 2 for the Subdistrict. Total Stream Reach 3 depletion obligations for Subdistrict #1 in August was 3.0 ac-ft. and they were replaced entirely by Subdistrict #1's Closed Basin Project allocation releases to the Rio Grande on a daily basis.

September

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing projected stream reach depletions on the Rio Grande for the month of September on a daily basis pursuant to the amounts presented in the Subdistrict's 2016 Annual Replacement Plan. Subdistrict #1's Replacement Water Plan began with a release to the river from the approved Williams Creek Squaw Pass TM replacement water pool held at Rio Grande Reservoir on August 31st in the amount, including transit loss, of 4.22 ac-ft. /day to replace projected depletion obligations in Stream Reach 1 and 2 of the Rio Grande beginning September 1st. This release to the river continued each day for the entire month replacing projected depletion obligations in Stream Reach 1 and 2 for the Subdistrict. Total Stream Reach 3 depletion obligations for Subdistrict #1 in September was 1.0 ac-ft. and it was replaced entirely by Subdistrict #1's Closed Basin Project allocation releases to the Rio Grande on a daily basis.

October

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing projected stream reach depletions on the Rio Grande for the month of October on a daily basis pursuant to the amounts presented in the Subdistrict's 2016 Annual Replacement Plan. Subdistrict #1's Replacement Water Plan began with a release to the river from the approved Williams Creek Squaw Pass TM replacement water pool held at Rio Grande Reservoir on September 30th in the amount, including transit loss, of 4.19 ac-ft. /day to replace projected depletion obligations in Stream Reach 1 and 2 of the Rio Grande beginning October 1st. This release to the river continued each day for the entire month replacing projected depletion obligations in Stream Reach 1 and 2 for the Subdistrict. Total Stream Reach 3 projected depletion obligations for Subdistrict #1 in October was 1.0 ac-ft. and it was replaced entirely by Subdistrict #1's Closed Basin Project allocation releases to the Rio Grande on a daily basis.

November

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing projected stream reach depletions on the Rio Grande for the month of November on a daily basis pursuant to the amounts presented in the Subdistrict's 2016 Annual Replacement Plan. Subdistrict #1's Replacement Water Plan began with a release to the river from the approved Williams Creek Squaw Pass TM replacement water pool held at Rio Grande Reservoir on October 31st in the amount, including transit loss, of 4.30 ac-ft. /day to replace projected depletion obligations in Stream Reach 1 and 2 of the Rio Grande beginning November 1st. Subdistrict #1 Closed Basin Project allocation releases to the river continued replacing projected depletion obligations for Stream Reach 3. The release of reservoir water to the river continued through November 6th to replace projected depletions in Stream Reach 1 and 2 on November 7th. On November 8th, the Subdistrict staff was given permission from the Division Engineer to begin replacing projected depletion obligations for all three stream reaches on the Rio Grande to the Rio Grande Compact. On that day, Subdistrict No. 1 Closed Basin Project Allocation releases to the river increased to the amount of 3.86 ac-ft. /day replacing projected depletion obligations for all three stream reaches on the Rio Grande and continued for the rest of the month.

December

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing projected stream reach depletions on the Rio Grande for the month of December on a daily basis pursuant to the amounts presented in the Subdistrict's 2016 Annual Replacement Plan. On December 1st, the Subdistrict's Replacement Water Plan resumed with Closed Basin Project (CBP) allocation releases to the Rio Grande replacing all three projected stream reach depletion obligations. Bureau of Reclamation staff attempted to keep the release rate from the CBP canal into the Rio Grande to at least the minimum of 4.19 ac-ft. /day to meet the daily obligation for the Subdistrict and were successful in doing so for the entire month of December. There were no releases made of replacement water from any storage account in control by the Subdistrict from any of the upstream reservoirs at any

time during the month of December. The balance of the Subdistrict #1 CBP allocation available for replacement water for the 2016 Annual Replacement Plan as of the end of December is 2,275.4 acre feet.

January

Under the direction of the Division 3 Division Engineer and the District 20 Water Commissioner, Subdistrict #1 continued replacing projected stream reach depletions on the Rio Grande for the month of January on a daily basis pursuant to the amounts presented in the Subdistrict's 2016 Annual Replacement Plan. On January 1st, the Subdistrict's Replacement Water Plan resumed with Closed Basin Project (CBP) allocation releases to the Rio Grande replacing all three projected stream reach depletion obligations. Bureau of Reclamation staff attempted to keep the release rate from the CBP canal into the Rio Grande to at least the minimum of 4.06 ac-ft. /day to meet the daily obligation for the Subdistrict and were successful in doing so for the entire month of January. There were no releases made of replacement water from any storage account in control by the Subdistrict from any of the upstream reservoirs at any time during the month of January. The balance of the Subdistrict #1 CBP allocation available for replacement water for the 2016 Annual Replacement Plan as of the end of January is 2,149.37 acre feet.

Remaining 2016 ARP Year

Because of the timing of this report, Subdistrict #1 will continue the same protocol to replace stream reach depletions for all three stream reaches of the Rio Grande on a monthly basis with CBP allocation for the months of February and March of 2017 or until the start of the next irrigation season. Subdistrict #1 will follow the direction of the Division #3 Division Engineer when the irrigation season begins for replacing stream reach depletions on the Rio Grande with trans-mountain reservoir releases and CBP allocation that Subdistrict #1 is in control of for the remaining period of the 2016 ARP year through April 30th, 2017.

Table 7.1 illustrates the replacement water accounting for Subdistrict #1 during the 2016 ARP year on a monthly basis.

**Table 7.1
Subdistrict #1 Monthly Stream Replacement Obligation for the 2016 ARP Year with
Replacement Source to Fulfill Obligation. (Units in acre feet)**

Stream Reach Obligation	March 2016	April 2016	May 2016	June 2016	July 2016	August 2016	September 2016	October 2016	November 2016	December 2016	January 2017	February 2017	March 2017	April 2017
SR-1	37	38	55	61	68	65	62	63	61	61	56	53	53	65
SR-2	32	28	84	52	58	46	49	51	52	63	70	69	76	63
SR-3	26	21	-1	-30	-2	3	1	1	3	6	-2	-7	-12	-21
Total	95	87	138	83	124	114	112	115	116	130	124	115		
Replacement														
SR-1 RGR TM Water Forbearance Compact Subst. SMRC Water CBP Allocation		38	55	61	68	65	62	63	14.23					65
SR-2 RGR TM Water Forbearance Compact Subst. SMRC Water CBP Allocation	37								46.77	61	56	53	53	
SR-3 RGR TM Water Forbearance Compact Subst. SMRC Water CBP Allocation		28	84	21	58	46	49	51	12.13					63
SR-3 RGR TM Water Forbearance Compact Subst. SMRC Water CBP Allocation	32			1.0					39.87	63	70	69	76	
SR-3 RGR TM Water Forbearance Compact Subst. SMRC Water CBP Allocation	26	21	-1.0	-30	-2	3.0	1.0	1.0	3.0	6	-2	-7	-12	-21
Creditable CBP Production at Rio Grande	317	899	910	932	626	382	304	351	826	922	924			

Explanation of Abbreviations:

- *RGR TM Water: Rio Grande Reservoir Pool Trans-mountain Water
- *Forbearance: Forbearance with one of the 9 Ditches in agreement with SD #1 for the 2016 Plan Year
- *SMRC Water: SD #1 Santa Maria Reservoir Company (SMRC) Reservoir Water
- *Compact Subst.: SD #1 SMRC Reservoir Water Exchange with Rio Grande Compact Storage
- *CBP Allocation: Closed Basin Project Allocation for SD #1

Notes:

March and April stream depletions have not yet been delivered, but are calculated by the response function using final 2016 DWR data

Summary

Pursuant to the 2016 ARP for Special Improvement District #1 of the RGWCD and by the direction of the SEO, Subdistrict #1 has met and will continue to meet the requirements for replacing injurious depletions to the Rio Grande attributable to Subdistrict #1 Wells for the 2016 ARP year. The projected depletions on the Rio Grande for all three stream reaches in the 2016 ARP for Subdistrict #1 approved by the SEO for the 2016 Plan Year was 1,405.0 acre feet. The actual amount of depletions for all three stream reaches on the Rio Grande is 1,364.0 acre feet. Subdistrict #1 will have over paid in replacement water for actual stream depletions on the Rio Grande during the 2016 Plan Year in the amount of 41.0 acre feet.

Beginning May 1, 2016, Subdistrict #1 has met stream depletion obligations for all 3 stream reaches of the Rio Grande with replacement water releases from Rio Grande Reservoir and the Closed Basin Project on a daily basis. As documented with supporting data from the Colorado Division of Water Resources Division 3 Office, Subdistrict #1 staff did not identify any day

during the term of the 2016 ARP year that the daily and monthly stream depletion obligation for any of the stream reaches was not met.

8.0 CENTENNIAL DITCH COMPANY AGREEMENT

After the last three years of operation, Subdistrict #1 did not feel it necessary to continue the Centennial Ditch Agreement to carry replacement water to calling water rights below the Excelsior Ditch diversion dam during the 2016 Plan Year. Even with below average river flows experienced on the Rio Grande the last 5 years, the river below the Excelsior Ditch diversion dam has been a live stream servicing calling water rights in Stream Reaches 2 and 3. Subdistrict #1 will monitor the lower stream reaches in the future and reinstate this agreement if necessary.

9.0 FOLLOWING OF SUBDISTRICT #1 LANDS - TEMPORARY AND PERMANENT

9.1 Conservation Reserve Enhancement Program (CREP)

Subdistrict #1 continued to sign up contractors into the CREP Program in an attempt to fallow up to 40,000 acres of previously irrigated lands on a long-term or permanent basis during the 2016 Plan Year. Sign-up into CREP in Subdistrict No. 1 is ongoing now with the approval of the new Farm Bill in 2014. As of the time of this report, Subdistrict #1 has a total of 49 CREP contracts that include 5,975.0 acres and 110 irrigation wells that have approximately 10,000.0 acre feet of recent groundwater pumping use annually in Subdistrict #1. Of the total acres enrolled, 2,763.0 acres are enrolled into a permanent CREP contract term while 3,212.0 acres are enrolled into a temporary CREP contract term. The USDA FSA found all existing 2014, 2015 and 2016 fiscal year CREP contracts in Subdistrict #1 to be in cropping and water use compliance at the end of the 2016 fiscal year, September 30th, 2016, and all were paid their annual rental payments as well as any additional incentives provided by the Subdistrict. The Subdistrict's incentive and annual payments alone were approximately \$1,700,000.0. A map of the locations of these CREP parcels is included in Appendix F.

9.2 Permanent Land Purchases

Subdistrict No. 1 is still actively pursuing opportunities to acquire water rights, however, there were no land or water right purchases completed by the District on behalf of the Subdistrict in 2016. Based on total head-gate diversions for the Rio Grande Canal during the irrigation season netting 21.0 acre-feet/share in 2016, the Subdistrict with their 59.5 shares of surface water diverted approximately 1250.0 acre-feet towards recharge to the aquifer on the White, McConnell and Lacy properties during the irrigation season. Subdistrict #1 did not use the wells located on these parcels for any purpose in 2016. The District staff will continue experimenting with different aquifer recharge strategies within DWR regulation on these properties to increase surface water recharge efficiencies. A map identifying the locations of the permanent land purchases acquired by the Rio Grande Water Conservation District for Subdistrict #1 is included in Appendix G.

10.0 AUGMENTATION PLANS

The Subdistrict #1 Well list includes some wells that are involved in a decreed plan for augmentation. The augmentation plans vary in their conditions, but they coordinate surface rights and other wells in administration of their respective plan. They are included in the list for fee determination, and if any pre-existing groundwater right portion of their pumping is not covered by their augmentation plans, such pumping is subject to Subdistrict #1 fees and Subdistrict #1 will, and in fact, did replace injurious depletions due to this pumping. See Appendix I for the augmentation plan well list as classified for Subdistrict #1 purposes and a location map of the parcels involved in the plans listed below.

10.1 Description of Court Approved Augmentation Plans

Case No. 81CW69, Application of Alan and Dorothy Beard (related case 02CW65, In the Matter of the Application of John Slane)

The decrees in Cases No. 81CW69 and 02CW65 are actually changes of water rights, not plans for augmentation. The wells operated pursuant thereto have been classified as Augmentation Plan Wells by Subdistrict #1 for accounting purposes with the Division 3 Engineer.

The decree in Case No. 81CW69 specifically finds that the applicants sought to change their method of irrigation whereby the water diverted by the San Luis Valley Irrigation District and attributable to the applicants' land that was historically directly applied by flood irrigation, may be first used to recharge the unconfined aquifer and then withdrawn by a well for the irrigation by center pivot sprinkler of crops in the NE¹/₄ and the SE¹/₄ of Section 19, T41N, R10E, N.M.P.M. The decree authorized the applicants to construct two wells, Beard Irrigation Wells No. 2 and 3, into the unconfined aquifer to withdraw the water recharged for the irrigation of the described lands.

Because this decree is a change in method of irrigation, not a plan for augmentation, the wells are not Augmentation Plan Wells and may be properly included within the Amended Plan and the ARP. Because the wells' withdrawals are limited by the quantity of water recharged, there is no net depletion to the aquifer system and no resulting stream depletions the Amended Plan is required to replace.

The decree in Case No. 02CW65 changed the point of diversion of Well Permit # 9343-F, decreed as Well No. 2 in Case No. W-1505, WDID 2705546, to Beard Irrigation Well No. 3, Permit # 44595-F WDID 2905547 decreed in Case No. 81CW69. The total quantity of water changed is a long term average of 32 ac-ft. per year of historical consumptive use. The water right decreed to Well No. 2 in Case No. W-1505 is a decreed right to the use of groundwater, the injurious depletions from which are replaced pursuant to the Amended Plan and ARP. Because neither Case No. 81CW69 nor Case No. 02CW65 is an augmentation plan, Beard Irrigation Wells No. 2 and 3 are Subdistrict Wells and the lands irrigated by these wells are Subdistrict Lands within the ambit of the Amended Plan.

<http://www.dwr.state.co.us/SharedUtils/WaterCourtDocs.aspx?div=3&caseNum=81CW0069>

Case No. 81CW72, Application of Ray and Sally Slane

Case No. 81CW72, like Case No. 81CW69, involved an application for a change in the manner of application of irrigation water allocated to lands located within the San Luis Valley Canal service area from direct flood irrigation to recharge and subsequent irrigation by means of a center pivot sprinkler. The decree specifically finds that the application seeks a change of water rights to change the method of irrigation. Accordingly, this is not an augmentation plan and the well authorized by this decree is not an Augmentation Plan Well. However, the Division Engineer and Subdistrict #1 consider it as such for accounting purposes.

The decree in Case No. 81CW72 authorized the construction of Slane Irrigation Well No. 3, Well Permit # 47246-F, WDID 2006662, to be located in the center of the NE $\frac{1}{4}$ of Section 2, T40N, R10E, N.M.P.M. Withdrawals by that well, like the wells authorized under the decree in Case No. 81CW69, are limited by the amount of recharge credit accrued in accordance with the terms of the decree. Well WDID 2014257, Well Permit # 58972-F is an alternate point of diversion for Slane Irrigation Well No. 3 and is subject to the same limitations as Slane Irrigation Well No. 3 and is also a Subdistrict Well. Because these are not Augmentation Plan Wells, the lands irrigated by these wells are Subdistrict Lands within the ambit of the Amended Plan.

In 2016, the provisions of this case were not invoked and the owner instead elected to receive surface water credit which was used to offset pumping that occurred within the Subdistrict #1 Farm Unit. The owner notified Subdistrict #1 staff to not invoke the provisions of the case during the early part of the 2016 irrigation season. The owner received surface water credit for all 200.0 shares dedicated to the augmentation plan in the amount of 238.0 acre feet to offset pumping that occurred within the Subdistrict #1 Farm Unit for 2016.

<http://www.dwr.state.co.us/SharedUtils/WaterCourtDocs.aspx?div=3&caseNum=81CW0072>

Case No. 99CW09, Application of Off Ranches, Inc.

The application in this case sought an alternate point of diversion for Well #1, Case W-914, Permit #1970-R, WDID 2009876, and sought to increase the number of acres that could be irrigated by Well #1 and its alternate point of diversion. The original well, in combination with water available from applicant's shares in the Rio Grande Canal Water Users' Association and the Santa Maria Reservoir Company (SMRC), historically had been used to flood irrigate the SW $\frac{1}{4}$ of Section 30, T40N, R7E, N.M.P.M. The decree granted the alternate point of diversion well and limited the combined annual withdrawal from the original well and the alternate point of diversion well WDID 2013756 to 132.2 ac-ft. per year for irrigation of the SW $\frac{1}{4}$ of Section 30.

The augmentation plan portion of the decree authorizes the withdrawal of additional water beyond 132.2 ac-ft. through these two wells for purposes of irrigation on the SW $\frac{1}{4}$ of Section 30, based upon recharge of applicant's surface water rights. The "augmentation credits" allowed under the decree are limited to the applicant's historical consumptive use from its *first use* of Rio Grande Canal (as opposed to reuse and successive use recognized by the Rio Grande Canal's recharge decree) and Santa Maria Reservoir Company water for irrigation of this land. Because

the diversion of 132.2 ac-ft. by Wells #1 and #1A is considered in the decree to be the existing groundwater right of Well #1 and is not included in the augmentation plan, the injurious depletions from that use are remedied pursuant to the Amended Plan. Accordingly, these wells are Subdistrict Wells and the irrigated lands are Subdistrict Lands.

In 2016, a Variable Fee was assessed to the first 132.2 ac-ft. of pumping that was not covered by the augmentation plan, and no Surface Water Credit was given for the surface water consumed under the plan for augmentation. These wells are also part of a larger Farm Unit and therefore must be included in the Amended Plan and ARP to correctly compute the Surface Water Credit available to offset the Variable Fee assessed against the Farm Unit.

<http://www.dwr.state.co.us/SharedUtils/WaterCourtDocs.aspx?div=3&caseNum=99CW0009>

Case No. 99CW25, Application of James Bradley

This case involved a change of water right to obtain an alternate point of diversion well and a plan for augmentation to increase the amount of water that could be withdrawn through both wells to irrigate the NW¼ of Section 31, T40N, R7E, N.M.P.M. The wells involved are Well No. 2, Case No. W-1153, Permit # 727-R, WDID 2010235, and its alternate point of diversion, Well No. 2A, WDID 2013884. The decree limits the annual withdrawals from Wells No. 2 and 2A to 150 ac-ft. annually under the existing groundwater right of Well No. 2. The decree allows these wells to withdraw no more than 150 ac-ft. annually, or 510 ac-ft. in any 10 consecutive years pursuant to the plan for augmentation.

The plan for augmentation portion of the decree authorizes the applicant to recharge the water available to its shares in the Rio Grande Canal and Santa Maria Reservoir Company. The decree allows the applicant to increase the total annual withdrawals from the well for irrigation of the NW¼ of Section 31 to the extent of the Allowable Pumping Credit calculated under the terms of the decree. The annual pumping credit is based upon the historical irrigation consumptive use that resulted from the *first use* of the surface water.

Because Well Nos. 2 and 2A had an existing groundwater right limited to 150 acre feet annually and not included in the plan for augmentation, the injurious stream depletions from that pumping use are remedied pursuant to the Amended Plan. This means that Well No. 2 and 2A are Subdistrict Wells, and the irrigated land is Subdistrict Land within the ambit of the Amended Plan.

The unconsumed portion of any recharge of the surface water rights can be used as a surface water credit to offset the calculation of any Variable Fee assessed against pumping of up to 150 ac-ft. under the existing groundwater right for Well Nos. 2 and 2A. Accordingly, Well Nos. 2 and 2A and their associated surface water right also must be included in the Amended Plan for purposes of correctly calculating the surface water credit and Variable Fees for the Farm Unit.

<http://www.dwr.state.co.us/SharedUtils/WaterCourtDocs.aspx?div=3&caseNum=99CW0025>

Case No. 00CW19, Application of Roger and Julia Ensz

This plan for augmentation involves Well No. 2, Case No. W-2058, Permit #1843-R, WDID 2005728; Well No. 2-A, Case No. 82CW119, Permit # 21996-F, WDID 2005729; and Well No. 3, Case No. W-2058, Permit # 9503-F, WDID 2011878. Wells No. 2 and 3 were historically used for the irrigation of the SW $\frac{1}{4}$ of Section 8, T40N, R7E, N.M.P.M. The decree found that the applicants' 25 shares in the Rio Grande Canal and 45 shares in the Santa Maria Reservoir Company historically had been used to irrigate up to 300 acres in the E $\frac{1}{2}$ of Section 7, T40N, R7E, N.M.P.M. The application sought to increase withdrawals through Wells No. 2 and 3 in order to use the wells to irrigate the E $\frac{1}{2}$ of Section 7. The decree authorized that use based on recharging of the water available from the applicants' shares in the Rio Grande Canal and the Santa Maria Reservoir Company. The increased amount of water that can be withdrawn through the wells for irrigation in the E $\frac{1}{2}$ of Section 7 is based upon the quantity of water recharged as calculated by procedures set forth in the decree.

The decree states that it does not limit the use of the wells for the irrigation of the SW $\frac{1}{4}$ of Section 8, and authorizes the use of the wells for irrigation of the E $\frac{1}{2}$ of Section 7 under the plan for augmentation when augmentation credit is available. Wells No. 2 and 3 divert water under their own decreed groundwater rights for irrigation of the SW $\frac{1}{4}$ of Section 8, the injurious depletions from which are remedied pursuant to the Amended Plan. Accordingly, the wells are Subdistrict Wells and the SW $\frac{1}{4}$ of Section 8 is Subdistrict Land. The E $\frac{1}{2}$ of Section 7 is treated as Non-Benefitted Subdistrict Land and is assessed no Subdistrict fees. These wells also are part of a Farm Unit, and therefore it is necessary to include these wells in the Amended Plan and the ARP to correctly calculate surface water credits available to offset the Farm Unit's Variable Fees.

<http://cdss.state.co.us/onlineTools/Pages/WaterRights.aspx>

Case No. 00CW42, Application of James and Donna Cooley

This case was an application for a change of water rights and plan for augmentation. The applicants sought to use water from one share in the Prairie Ditch Company associated with the W $\frac{1}{2}$ of the SE $\frac{1}{4}$ of Section 8, T39N, R10E, N.M.P.M. for direct irrigation and/or as a source of augmentation for two existing irrigation wells. The two existing irrigation wells are Well #1, Case No. W-245, Permit #12178-R, WDID 2008692; and Permit # 57923-F, WDID 2014243. Those two wells were permitted only for use on the E $\frac{1}{2}$ SE $\frac{1}{4}$ of Section 8.

The plan for augmentation allows the wells to irrigate the W $\frac{1}{2}$ SE $\frac{1}{4}$ of Section 8 by pumping against credits accumulated from surface water recharge from one share in the Prairie Ditch. The decree contains the manner for quantification of the recharge credits and limits pumping by the wells for irrigation of the W $\frac{1}{2}$ SE $\frac{1}{4}$ of Section 8 to the amount of accumulated augmentation credit. Nothing in the decree limits the exercise of the decreed water rights for the wells for the irrigation of the E $\frac{1}{2}$ SE $\frac{1}{4}$ of Section 8.

The E $\frac{1}{2}$ SE $\frac{1}{4}$ of Section 8 is Subdistrict Land, and the use of these wells to irrigate that land makes them Subdistrict Wells. The injurious stream depletions from the irrigation of the E $\frac{1}{2}$

SE $\frac{1}{4}$ of Section 8 are remedied pursuant to the Amended Plan as implemented by the ARP. The W $\frac{1}{2}$ SW $\frac{1}{4}$ of Section 8 is treated as Non-Benefitted Subdistrict Land and is not assessed Subdistrict fees. In addition, the SE $\frac{1}{4}$ of section 8 is part of a larger Farm Unit, so it is necessary to include the entire SE $\frac{1}{4}$ in the Amended Plan and ARP for purposes of determining surface water credit available to offset the Farm Unit's Variable Fees.

<http://www.dwr.state.co.us/SharedUtils/WaterCourtDocs.aspx?div=3&caseNum=00CW0042>

Case No. 07CW64, Application of JDS Farms, LLC and Allen Entz

This case involves Well No. 2, Case No. W-635 WDID 2009403, Permit #1534-F; Well No. 4, Case No. W-635 WDID 2009405, Registration #1297-R; and Well #1, Case No. W-485 WDID 2009165, Registration #19606-R. The decree finds that Wells No. 2 and 4 in Case No. W-635 were historically used in conjunction with one share of Prairie Ditch for the irrigation of the E $\frac{1}{2}$ SE $\frac{1}{4}$ of Section 7, T39N, R9E, N.M.P.M. Well #1, Case No. W-485 was historically used in conjunction with two shares of the Prairie Ditch for the irrigation of the W $\frac{1}{2}$ SE $\frac{1}{4}$ of Section 7. The plan for augmentation sought authorization for the three wells to irrigate the entire SE $\frac{1}{4}$ of Section 7 and to divert more groundwater than the historical use by these wells.

The decree quantifies the combined historical groundwater use of the three wells for irrigation under their own priorities as approximately 160 ac-ft. The decree authorizes pumping of more than 160 ac-ft. based on surface water recharge to the unconfined aquifer and a calculation of a recharge credit pursuant to a formula set forth in the decree. The recharge credit is based on the historical consumptive use from the *first use* of the surface water.

These wells are Subdistrict Wells, and the SE $\frac{1}{4}$ of Section 7 irrigated by these wells is Subdistrict Land because the wells withdraw groundwater under their decreed water rights, the injurious depletions from which are remedied pursuant to the Amended Plan. The owners of these wells have not exercised their rights under the plan for augmentation, and therefore the wells have been treated solely as Subdistrict Wells. No Variable Fee will be assessed for pumping under the augmentation plan, and no surface water credit will be given for surface water consumed by the augmentation plan. Because these wells are part of two separately owned Farm Units, it is also necessary to include the land and wells in the Amended Plan and the ARP for purposes of calculation of surface water credits available to offset the Farm Units' Variable Fees.

<http://www.dwr.state.co.us/SharedUtils/WaterCourtDocs.aspx?div=3&caseNum=07CW0064>

Case No. 82CW17, Application of SRS Ranch, Inc.

This case involves an application for change of water rights and a plan for augmentation. The applicant owned approximately 946 acres comprised of Section 23 and the S $\frac{1}{2}$ of Section 22 and the north portion of Section 27, T40N, R6E, N.M.P.M. The land was historically served with water from the Rio Grande Canal, the Midland Ditch, and irrigation Wells No. 2, 4, and 5, Case No. W-713. The application proposed to plug the three existing wells and to construct five replacement wells, one each in the center of the NE $\frac{1}{4}$, NW $\frac{1}{4}$, SE $\frac{1}{4}$, and SW $\frac{1}{4}$ of Section 23 and

the center of the SE¼ of Section 22 all in T40N, R6E, N.M.P.M. At the time the application was filed, the applicant used the three original wells to operate five center pivots irrigating all of Section 23, the S½ of Section 22, and a portion of Section 27 using both groundwater and surface water rights. The decree granted the proposed change of water rights allowing the construction of the five wells as replacement wells and new points of diversion for the water rights decreed to the original three wells on the ranch. The court approved the plan for augmentation conditioned upon the applicant's continued ownership and recharge of the surface water available to its shares in the Rio Grande Canal and the Midland Ditch. All groundwater pumping from the 5 wells is to be fully augmented by the recharge of the surface water shares identified in the decreed plan of augmentation and should not create net depletions from their operations.

The replacement wells are Well #1R, Permit # 37045-F, WDID 2008188; Well No. 2R, Permit # 30339-F, WDID 2008189; Well No. 3R, Permit # 41845-F, WDID 2008190; Well # 4R, Permit # 37047-F, WDID 2008191; and Well No. 5R, Permit # 3032-F, WDID 2008192. These wells and the lands they irrigate are in three separate ownerships.

The quarter section served by Well #1R is separately owned and was treated as Non-Benefitted Subdistrict Land with no Subdistrict fees assessed in 2016. This quarter section is part of a larger Farm Unit.

Well No. 3R and the quarter section it irrigates are also separately owned and are included in a larger Farm Unit. In 2016 this land was treated as Non-Benefitted Subdistrict Land, and no Subdistrict fees were assessed on this land.

Well Nos. 2R, 4R, and 5R, and the lands irrigated thereby are separately owned. These wells and the lands irrigated are not part of a larger Farm Unit. This land is treated as Non-Benefitted Subdistrict Lands, and no Subdistrict fees are assessed on this land.

<http://www.dwr.state.co.us/SharedUtils/WaterCourtDocs.aspx?div=3&caseNum=82CW0017>

Case No. 89CW45, Application of Monte Vista PCA

This case is a change of water rights and plan for augmentation that changed surface water rights in the Excelsior Ditch and the San Luis Valley Canal historically used, along with groundwater, to irrigate 140 acres in the SE¼ of Section 34, T39N, R9E, N.M.P.M. The application sought to use the surface water to recharge the unconfined aquifer and then withdraw that water and apply it by center pivot sprinkler to the historically irrigated land. The well historically used on this land is Well No. 5, Case No. W-1181, Permit # R13476-RF, WDID 2006555, located in the center of the SE¼ of Section 34. The decree authorizes the applicant to divert additional groundwater through the supplemental well and to recharge to the aquifer an amount equal to the consumptive use of the water diverted by the supplemental well. The supplemental well was constructed pursuant to Well Permit # 38425-F, WDID 2006633. Both Well No. 5 and the supplemental well supply water to the same sprinkler system for the irrigation of the SE¼ of Section 34.

The supplemental well's use of groundwater is offset by the quantity of water recharged by the applicant under the decree in 89CW45. Accordingly, the augmented portion per decree of the water diverted by the supplemental well, WDID 2006633, was not assessed a Variable Fee for 2016 and was not given surface water credit for the recharged surface water consumed by this practice. Because Well No. 5 had a pre-existing groundwater right that is not included in the plan of augmentation, it is a Subdistrict Well and the injurious stream depletions occurring from the original use are being remedied pursuant to the Amended Plan. Because a Subdistrict Well irrigates this land, the land is Subdistrict Land within the ambit of the Amended Plan.

<http://www.dwr.state.co.us/SharedUtils/WaterCourtDocs.aspx?div=3&caseNum=89CW0045>

Case No. 96CW5, Application of George Kirkpatrick

This case authorizes the construction of "auxiliary wells." The auxiliary wells are permits # 45102-F WDID 2013719, 45103-F WDID 2013721, and WDID's 2013720, 2013722 and 2008241 to be used in conjunction with existing wells for the irrigation of the SE $\frac{1}{4}$ of Section 6 and the SW $\frac{1}{4}$ of Section 5 in T39N, R10E, N.M.P.M. The "auxiliary wells" are intended to supplement the water supply available from Well #1, Permit # 22543-F, WDID 2008240 located in the center of the SW $\frac{1}{4}$ of Section 5, and Well No. 2, Permit # 22542-F, WDID 2008241 located in the center of the SE $\frac{1}{4}$ of Section 6. Shares in the San Luis Valley Canal Company and the Prairie Ditch Company represent the surface water rights involved. The plan for augmentation operates by allowing the "auxiliary wells" to withdraw a portion of the water recharged under the surface water rights. The decree limits the consumptive use credits under the surface water rights to 50% of the amount diverted to recharge, and limits the consumptive use that can be made of water diverted by the auxiliary wells to the consumptive use credit calculated under the decree.

This land is Subdistrict Land because it is irrigated by Wells #1 and 2 under their pre-existing groundwater rights, the injurious depletions from which are remedied by the Subdistrict pursuant to the Amended Plan as implemented by the ARP. Although the auxiliary wells operate pursuant to a decreed plan for augmentation, they irrigate Subdistrict Land that is also irrigated by Subdistrict Wells. While the auxiliary wells were not assessed a Variable Fee and no surface water credit was given for the water consumed by these wells in 2016, it is necessary to account for these wells in the Amended Plan in order to correctly determine the Farm Unit's Variable Fee and surface water credit.

<http://www.dwr.state.co.us/SharedUtils/WaterCourtDocs.aspx?div=3&caseNum=96CW0005>

Case No. 01CW06, Application of Kimothy and DeAnn Cooley

Case No. 01CW06, the application of Kimothy and De Ann Cooley, involves 200 shares of the San Luis Valley Canal that historically have been used for the irrigation of the NE $\frac{1}{4}$ of Section 35, T40N, R10E, N.M.P.M. Prior to 1966, this land was flood irrigated; in 1966 a sprinkler was installed and the San Luis Valley Canal shares were diverted into a holding pond and then used for irrigation through a center pivot sprinkler. The application in Case No. 01CW06 sought to

change the manner of irrigation from direct application to the land through the center pivot sprinkler to recharge of the aquifer and then withdrawal of the recharged water through wells supplying the center pivot sprinkler. The decree permits the applicants to use the 200 shares in the San Luis Valley Canal for direct irrigation and as a source of augmentation for up to 4 wells. WDID Nos. 2014013, 2014014, 2014016 are currently located on the NE¼ of Section 35. The decree authorizes the applicants to recharge the unconfined aquifer and, pursuant to a formula in the decree, to withdraw a portion of the groundwater so recharged through wells for continued irrigation of the NE¼ of Section 35 by center pivot sprinkler.

Because these wells are limited to the pumping of recharge, they create no net depletions from their operations that must be replaced under the Amended Plan. Therefore, they are not considered Subdistrict #1 Wells, and the land irrigated by the wells is treated as Non-Benefitted Subdistrict #1 Lands and assessed no Subdistrict #1 fees. However, the land and wells are part of a larger Farm Unit, and it is necessary to continue to account for the wells and surface water in the Amended Plan in order to properly calculate the Farm Unit's surface water credit and Variable Fees.

<http://www.dwr.state.co.us/SharedUtils/WaterCourtDocs.aspx?div=3&caseNum=01CW0006>

Case No. W-3847, Application of Gary Seger

This case involves an application and decree for Conditional Alternate Points of Diversion and a Plan for Augmentation. The proposed wells in the decree were completed and are being used pursuant to this decree. This operation is not what is commonly described as a Plan for Augmentation but the court has decreed it as such, so it is included.

The two alternate points of diversion (APD) wells are WDID 2005398, Permit # 25360-F, Well number 1A, W-3847 which irrigates the SW¼ S13, T40N, R06E, N.M.P.M. and WDID 2005399, Permit # 25361-F, Well number 2-A, W-3847 which irrigates the NE¼ S13, T40N, R06E, N.M.P.M. both in Rio Grande County, Colorado. These two wells are alternate points to WDID 2005933, Permit # 6885RR, Well Number 1, W-1231, WDID 2005931, Permit # 16941-F, Well Number 1 and WDID 2005932, Permit # 16940-F, Well Number 2 both of W-3325 which also irrigated the SE¼ S13, T40N, R06E, N.M.P.M. and the SW¼ S18, T40N, R07E, N.M.P.M.

All five wells have a combined pumping limitation of 4,480 gpm. The yield of the two wells subject to this decree is to be no more than a maximum of 895 gpm each. Mr. Seger has 45 shares of Rio Grande Canal water and 40 shares of Santa Maria Reservoir Company water to serve the four quarters that are associated with this overall plan. As a condition of the decree in this case, half of the water associated with these shares must be recharged in pits on the quarters in order for this plan to operate according to the decree. The court calculated that the water attributable to half of the total shares would be recharged and thence used for irrigation by means of well pumping. It also required that none of the shares attributable to the subject plan could be used for flood irrigation purposes.

<http://www.dwr.state.co.us/SharedUtils/WaterCourtDocs.aspx?div=3&caseNum=W3847>

11.0 HYDRAULIC DIVIDE

The hydraulic divide (divide) is a shallow groundwater divide, that when present, separates the closed basin in the San Luis Valley from the remainder of the Rio Grande Basin. The divide has been historically mapped generally paralleling and lying northerly of the Rio Grande $\pm\frac{1}{2}$ to ± 2 miles through the reach from near Del Norte to Alamosa. The divide extends northwest of Del Norte to the Continental Divide and from Alamosa northeast to the basin divide along the Sangre de Cristo Mountains. Recent water level measurements in wells along the north side of the Rio Grande indicate that the divide has retreated south to the Rio Grande or very near the river. A goal of the Plan of Water Management is to recover and re-establish the divide northerly of the river which is likely to reduce depletions to the Rio Grande from well pumping within Subdistrict #1.

Appendix C contains maps showing the results of groundwater measurements collected during spring 2016. These maps include interpreted groundwater elevation contours and vectors showing direction of groundwater flow. If a well-defined divide lying northerly of the Rio Grande exists, groundwater flow vectors would indicate a groundwater flow from the divide along the southerly side toward the river and on the northerly side toward the Closed Basin. The groundwater flow vectors do not provide evidence of a well-defined divide with the possible exception of an area between Monte Vista and Alamosa where there is some evidence for a few miles. The interpreted location of the divide is shown on the maps prepared from the 2016 groundwater measurements. The approximate divide location in the area between Del Norte and the 7-Mile Plaza is uncertain due to the perched river condition, so it is shown as a dotted line on the maps included in Appendix C.

12.0 GROUNDWATER LEVELS IN THE UNCONFINED AQUIFER AND UNCONFINED AQUIFER STORAGE LEVELS

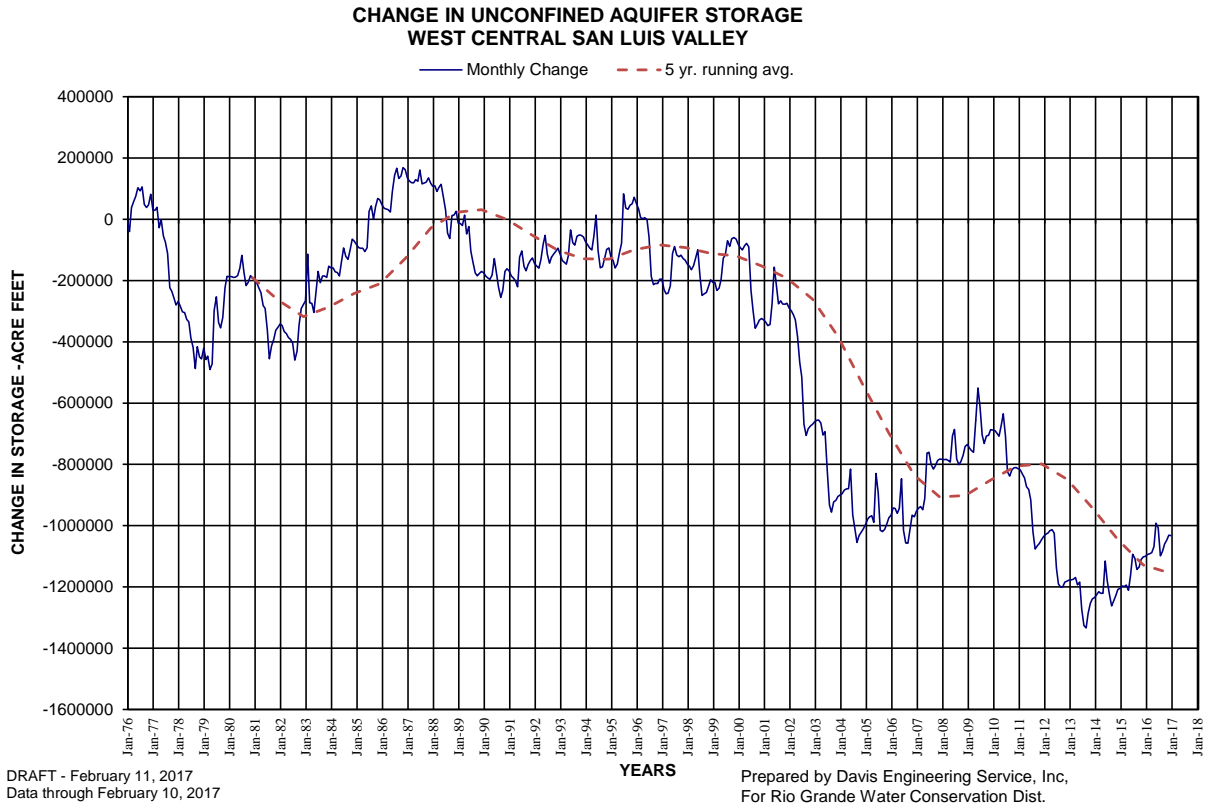
12.1 Groundwater Levels in the Unconfined and Confined Aquifer

A tabulation of groundwater levels measured in unconfined and confined wells both within the boundaries of Subdistrict #1 and the study area for the Change in Unconfined Aquifer Storage – West Central San Luis Valley are provided in Appendix D. This tabulation includes measured values for each of the wells obtained during the previous 12-months. A map showing the location of each well is also included in Appendix D.

12.2 Unconfined Aquifer Change in Storage Volumes

A map showing the study area for the Change in Unconfined Aquifer Storage – West Central San Luis Valley and a tabulation of the data is included in Appendix E. The calculated monthly change in unconfined aquifer storage volumes have been accumulated and plotted on a chart and included as Figure 12.1. The monthly change in storage volumes are plotted on the chart and connected by a line on the chart with the horizontal axis divided into years and the vertical axis divided into change in storage in acre-feet. An additional line is plotted on the chart representing the 5-year running average of the annual average of the monthly change in unconfined storage volume.

Figure 12.1
Chart Showing Change in Unconfined Aquifer Storage



The change in unconfined aquifer storage based on measurements through February 10, 2017 and calculated on February 11, 2017 was -1,025,380 acre-feet on an accumulated monthly basis. The accumulated 5-year running average of the annual average of the monthly change through December 1, 2016 was -1,153,878 acre-feet. As previously noted, the goal in the Plan is to achieve recovery and maintain storage at a level between -200,000 and -400,000 acre-feet. The December 1, 2016 storage value is 753,878 acre-feet below the lowest goal level.