

The Alamosa River Irrigation System Western Central San Luis Valley, Colorado



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INTRODUCTION

This paper explains the irrigation system below Terrace Reservoir and its potential to impact La Jara Creek, the Rio Grande River, the Alamosa National Wildlife Refuge, and the Monte Vista National Wildlife Refuge. The irrigation system includes water from Terrace Reservoir via the Alamosa River and numerous diversion ditches; water from the upper Rio Grande River via the Monte Vista Canal and the Empire Canal; water from La Jara Creek; water from irrigation wells; and water from ground water recharge to the Alamosa River, La Jara Creek and various ditches.

For the purpose of this document, "Alamosa River water" refers to water from Terrace Reservoir that has not been diluted by other sources. Water in the Alamosa River from Road 15 east is considered to be significantly diluted by other sources and will be referred to in this document as "Alamosa mixed water." For convenience, Highway 285 (HWY 285) is used to designate areas of the irrigation system. There is no hydrologic or geologic significance to this designation.

DESCRIPTION

The Alamosa River receives heavy metal and acidic constituents from several geologic structures and mines. On the north side of the Upper Alamosa River Basin, Alum Creek, Iron Creek and Bitter Creek contribute waters that contain low pH and high metals as they drain these geologic structures. Water quality from the south side of the basin is generally of better quality.

Wightman Fork drains the Summitville Mine Site on the north and receives additional volume from Cropsy Creek, which drains the south side of the Mine Site. Approximately eleven miles downstream from its confluence with Wightman Fork (nine miles northwest of Centro, Colorado), the Alamosa River flows into Terrace Reservoir. Terrace Reservoir stores irrigation water used in the Western Central San Luis Valley. The Alamosa River only flows below this structure when water is released for irrigation and flood control.

The Alamosa River irrigation system consists of thirty-eight diversion structures. Table 1 presents the diversion structures from Terrace Reservoir east along the Alamosa River and includes approximate size, estimated capacity,

priority¹, decreed amount², and location with respect to the Alamosa River. The owners of El Viejo Ditch hold the number one priority.

Thirty of these diversion structures are located west of Hwy 285, which runs north-south between Antonito and Alamosa (see Figure 1). The size of these ditches ranges from the Terrace Main Canal, a truncated triangular ditch approximately 6 feet wide and 3 feet deep, to the San Jose No. 2, a small channel approximately one foot wide and eight inches deep. The volume of water carried in these ditches varies from a twelve-year average of 33.40 cubic feet per second (cfs) in the Terrace Main Canal to a twelve-year average of 1.47 cfs in the San Jose No. 2 (see Table 2). These diversions direct water north and south of the Alamosa River.

Two surface water bodies in the area that may be impacted by Alamosa River water include Hot Creek and La Jara Creek. Hot Creek is located approximately four miles south of the Alamosa River. The Valdez Ditch flows from the Alamosa River south towards Hot Creek, though it is usually diverted for farming uses prior to its confluence with Hot Creek. Hot Creek joins La Jara Creek just east of Centro. At this confluence La Jara Creek is located approximately one mile south of the Alamosa River. Several diversions connect the Alamosa River and La Jara Creek (see Figure 1). They are listed in Table 3. The implications of these diversions will be discussed under the Nature and Extent Section below.

Other sources of irrigation water in the area are ground water recharge, the Monte Vista Canal and the Empire Canal. The percentage of artesian wells increases in areas near Hwy 285 and the Rio Grande River. The Monte Vista and Empire Canals flow southeast from the Rio Grande River, contain exclusively Rio Grande River water, are unlined, and intersect the Alamosa River channel. It is probable that direct recharge

¹In western water law, water is allocated based on priority or the ranking of the owner based on the water right filing date therefore, the oldest adjudicated water right is highest on the seasonal priority

²The decreed amount is the total volume of water allotted by adjudication to a water right owner.

from ground water to the Alamosa River also occurs. Additional discussion of these intersections follows in Nature and Extent Section. Figure 2 presents a flow chart of all known water sources in the area and direction of flow.

WATER USE

The Alamosa River is used to irrigate approximately 45,000 acres in the San Luis Valley (Erdman et.al, 1995). Water usage is distributed among the thirty-eight diversion ditches based on priority, but the largest flow of the water is conducted along the Terrace Main Canal. Twenty of the thirty-eight ditches have a priority of 38 or lower.

Table 2 presents information on all ditches with priority 38 and lower; these are the ditches that are likely to carry the most water for the longest periods of time. Volume is presented in acre-feet to coincide with the legal record. Where listed in the records, the rate in cubic feet per second is noted. The blank cells in the table indicate that no recorded flow from the Alamosa River occurred during that month in the diversion. The reader should note that runoff from precipitation events may flow through these ditches at any time.

The water rights for Terrace Reservoir were recorded in the late 1890's with adjudication in the early 1900's. The reservoir infrastructure was completed during the 1920's with replacement of the metering valve for irrigation waters during 1982. The existing physical capacity of the reservoir is 15,182 acre-feet when the reservoir is filled to the lip of the emergency spillway. The current 100-year flood event safety limitation water level is seven feet below the emergency spillway. Therefore, the maximum capacity under this restraint is about 13,150 acre-feet. The metered valve for the Alamosa River irrigation system draws water from the bottom of Terrace Reservoir. No sediment/de-silting mechanism is in place to prevent silt or sediments from being transported by the irrigation system to the irrigated fields (MK, 1994/1995). Terrace Main Irrigation Company estimates the remaining economic life of Terrace Reservoir to be in excess of 100 years.

Below the Terrace Reservoir dam, the unlined Alamosa River channel is used as a conduit for all metered irrigation waters, spring runoff excesses, and emergency spillway releases. Terrace Main Irrigation Company and the Colorado Department of Water Resources have tested the Alamosa River channel from the Terrace Reservoir dam down to Gunbarrel Road to determine the loss of water. These tests indicate that an average water loss of 13 to 15 percent due to infiltration through this part of the system.

Each spring the water is released to diversions upon demand by the farmers in the irrigation system. The date of initial yearly release depends on the amount of precipitation received by the potentially irrigated lands during the winter and spring. Water release occurs as early as the first of March and as late as the end of April. Flow continues in certain high priority canals as late as December. This release falls under the responsibility of the Colorado

Division of Water Resources, Division 3, District 21. Water is allowed to flow between sources via intra-division agreements and adjudicated instructions of water rights (MK, 1994/1995).

NATURE AND EXTENT OF ALAMOSA RIVER WATER

Few data are available that document the transport of impacted water throughout the Alamosa River irrigation system³. Based on field observations, the pH appears to remain constant from Terrace Reservoir to the headgates along the Alamosa River west of Road 15 (MK, 1995). Farther downstream, the water chemistry is influenced by runoff, return flow, flowing wells, and Rio Grande River irrigation water.

The irrigated area served by the Alamosa River will be discussed as three categories: the Alamosa River and diversions west of Hwy 285 that do not transfer water to La Jara Creek; diversions west of Hwy 285 that transfer water to La Jara Creek; and the Alamosa River and diversions east of Hwy 285 (See Figure 2).

West of Hwy 285-No Transfer

Thirty diversions exist west of Hwy 285. The majority of these divert water from the Alamosa River to irrigated fields (six of these ditches are discussed in the next section). These diversions flow both north and south of the Alamosa River and end at irrigated fields without intersecting other surface water bodies in the area. The extent of land irrigated by Alamosa River water is depicted in Figure 1. Media that have the potential to be impacted by the Alamosa River include ground water and soil as well as the irrigated crops.

Flood irrigation is used throughout this area of the San Luis Valley and the water table often rises within 2 cm of the ground surface at the beginning of the growing season (Emery et al., 1971). Therefore, the potential exists for contact between infiltrating irrigation water and ground water. However, data collected to date do not indicate an impact to the ground water along the Alamosa River from direct river/ditch recharge to the aquifer or irrigation infiltration (MK, 1994/1995).

The Terrace Main receives the largest quantity of water of all the canals west of Hwy 285 and conducts it to the north. Along its length there are several eastern laterals, but the Terrace Main Canal ends at Tenmile Road with four headgates for two holding ponds and two diversions (north and east). The north diversion is unlined and approximately one mile long. It terminates (is allowed to infiltrate) on the south end of an irrigated field. This field is also irrigated with well water and borders the south bank of the Monte Vista Canal.

There was concern that impacted Alamosa River water

³Water chemistry is measured sporadically at AR-31.0 and along the divisions. See Figure 1 for locations.

might reach the Monte Vista National Wildlife Refuge located approximately 3/4 miles north of the Monte Vista Canal. However, an irrigated field of approximately 80 acres acts as a dilution source to any water that flows north from the Terrace Main lateral, and the Monte Vista Canal acts as a barrier between the wildlife refuge and any potentially impacted Alamosa River water. It is assumed that the Monte Vista Canal would carry any infiltration or runoff downstream to the southeast, though this has not been confirmed (the subsurface gradient near the Monte Vista Canal is not known).

Based on discussions with Colorado Division of Water Resources personnel, all east laterals from Terrace Main terminate and infiltrate in fields prior to meeting the Monte Vista Canal (MK, 1994/1995). Four laterals flow east from Terrace Main, along Tenmile Road, Elevenmile Road, Twelvemile road and between Elevenmile and Twelvemile Roads. (Note: These roads are numbered in successive miles south from Hwy 160.)

The USGS 7.5' topographic quadrangle for Capulin, Colorado indicates that the Monte Vista Canal intersects several irrigation ditches from the Alamosa River. At Road Z the Morganville and Flintham Ditches cross the Monte Vista Canal. The Flintham is conducted through the Monte Vista in a culvert. The cross-over for the Morganville is not evident, but it appears that the Morganville is conducted under the Monte Vista.

About one mile north of the Alamosa River on the Monte Vista Canal, the last of the allocated priorities terminates and reportedly, the flow from the Monte Vista Canal is fully utilized by the system. However, the channel/canal continues southward to Hwy 15, south of the Alamosa River and sometimes during high water/spring runoff, the water from the Alamosa River will backup into the Monte Vista Canal channel (MK, 1994/1995). Thus, there is a potential for the two water sources to commingle at a point about one mile north of the Alamosa River in the Monte Vista Canal channel.

During a reconnaissance in April 1995, it was noted that a large stretch of the Alamosa River was dry. Water was noted where the Gunbarrel Highway (Hwy 15) crosses the Alamosa River north of Centro. However, at Road 9 just east of Capulin, the Alamosa River was dry (see Figure 1). At Road 15 approximately six miles east of Road 9, the Alamosa River again contained water. Water with an approximate pH of 5.7 was present in the Alamosa River just west of Road 9. However, at Road 15 (approximately six miles east of Road 9) water was present in the Alamosa River and had an approximate pH of 6.7. It is probable that the water at Gunbarrel Highway is not chemically similar to the water present at Road 15. It is unknown how often segments of the Alamosa River are dry (MK, 1995).

West of Hwy 285-Transfer to La Jara/Hot Creek

Colorado Division of Water Resources records and maps indicate that six ditches west of Hwy 285 may transfer water from Alamosa River to La Jara Creek. These ditches include Valdez, Gabino-Gallegos, Miller-Alamosa, Ramona, Garcia No. 2, Capulin, and El Viejo. Table 3 presents the volume of flow from Alamosa River into La Jara Creek during the 1982 through 1993 water years. The first-use date and last-use date are included to indicate the length of time water could be flowing in the ditches. This length ranges from one day (see Garcia No. 2 in 1991) to the growing season (numerous examples; see Miller-Alamosa for 1991). These ditches are not used continuously throughout the time between the first-use and last-use dates. Based on the data in Table 3, water flowed from the Alamosa River into La Jara Creek during each of the water years 1982 through 1993. A ratio of Alamosa River water to La Jara Creek water flowing in the La Jara creekbed cannot be made because the gage on La Jara Creek is located upstream near La Jara Reservoir and there is no gage to measure the additional volume from Hot Creek..

East of Hwy 285

The Alamosa River irrigation system becomes more diluted by other water sources near Hwy 285. These influences include the Empire Canal, laterals from the Empire Canal, irrigation wells (some are flowing wells), springs, and runoff/precipitation. Based on a comparison of water rights with available flow in the Alamosa River, the Water Commission considers the Alamosa River to be completely allocated at Hwy 285, though flow may be present at this point. The Empire Canal intersects the Alamosa River at Hwy 285. There are no diversion structures at this confluence and the two water bodies flow together without human control.

Two diversions from the Alamosa River, but east of Hwy 285, route water south into La Jara Creek: Empire Canal-Alamosa and Lowland ditch. The majority of the water diverted via the Empire Canal-Alamosa originated in the Empire Canal; however, it has the opportunity to combine with Alamosa mixed water for approximately 500 feet while the Empire Canal uses the Alamosa streambed before the Empire Canal is diverted south at the Empire-Alamosa Diversion. The Lowland canal also diverts Alamosa mixed water south from the Alamosa River to La Jara Creek.

Spring runoff volumes too large for the Terrace Reservoir to safely contain and too large for irrigation use are released from the reservoir and allowed to flow east of Hwy 285. These flows collect and flood pastures behind a dike segregating the waters of the Alamosa River from the waters of the Rio Grande River. It is not known if this has occurred since 1987 when Summitville Consolidated began operations. It is probable that it occurred at least once in Spring 1993 due to the large snowpack of the 1992-1993 winter (MK, 1994/1995).

Other water movement east of Hwy 285 includes the Twenty-foot Lateral, the San Luis Valley Drain, and the Richfield Canal. The Twenty-foot Lateral diverts the majority of the water received at La Jara Creek from the Empire Canal. It is located approximately one mile downstream (east) from the confluence of the Empire Canal and La Jara Creek. Water from the Twenty-foot Lateral irrigates fields, but does not flow into the Rio Grande River.

The San Luis Valley Ditch diverts irrigation return flows from fields irrigated with Conejos River water and flows into the lower La Jara Creek. The Richfield Canal diverts Conejos River water into La Jara Creek west of both the Twenty-foot Lateral and the San Luis Valley Drain.

SUMMARY

Observations of the Alamosa River irrigation system indicate that inputs to the system increase as water flows east from Terrace Reservoir. By the time water arrives at Hwy 285, there are approximately five influences: Alamosa River, La Jara Creek, Rio Grande River (Empire Canal and Monte Vista Canal), irrigation wells, and return flow from fields. Eight ditches transfer water from the Alamosa River to La Jara Creek between Terrace Reservoir and fields east of Hwy 285. At times, La Jara Creek may be impacted by Alamosa River water, however, it is probable that neither the Rio Grande River, the Alamosa National Wildlife Refuge, nor the Monte Vista National Wildlife Refuge are impacted.

ACKNOWLEDGMENTS

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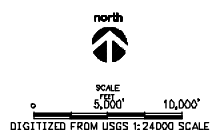
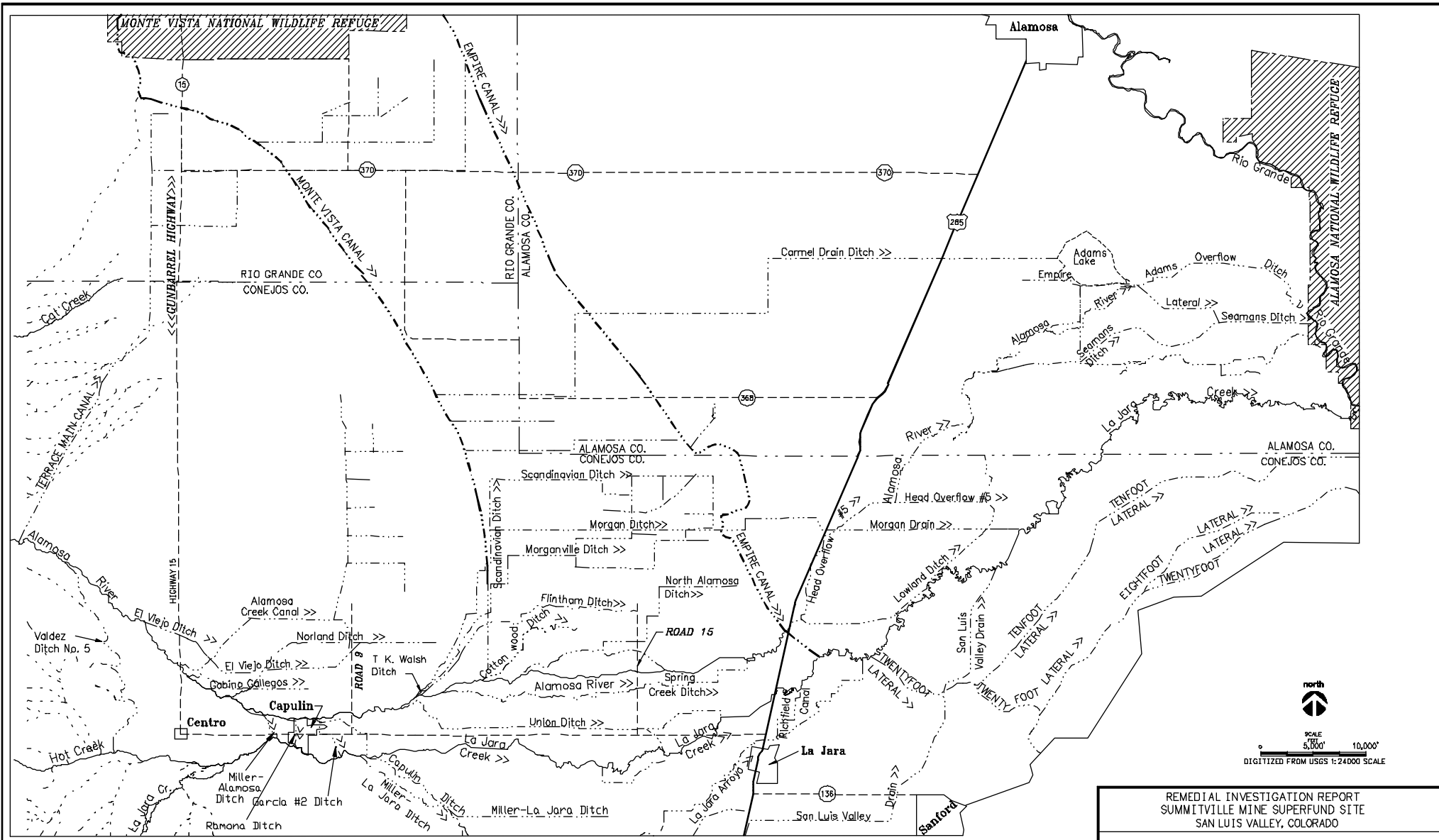
REFERENCES

- Colorado Department of Natural Resources, Division of Water Resources, Water Division Three (1995). Diversion Summaries for the Alamosa River for the water years 1982 through 1993. Dated February 22, 1995.
- Emery, P.A., A.J. Boettcher, R.J. Snipes, & H.J. McIntire, Jr. (1971). Hydrology of the San Luis Valley, South-Central Colorado. USGS Hydrogeographic Investigations Atlas HA-381.
- Erdman, J.A., K.S. Smith, M.A. Dillon, & M. ter Kuile (1995). Impacts of Alamosa River water on alfalfa, southwestern San Luis Valley, Colorado in Proceedings: Summitville Forum '95. Colorado Geological Survey Special Publication 38.
- Morrison Knudsen Corporation (1995). Logbook for sampling

at domestic wells near Capulin, Colorado. Dated April 23-26, 1995.

Morrison Knudsen Corporation (1994/1995). Personal communications with Colorado Division of Water Resources personnel.



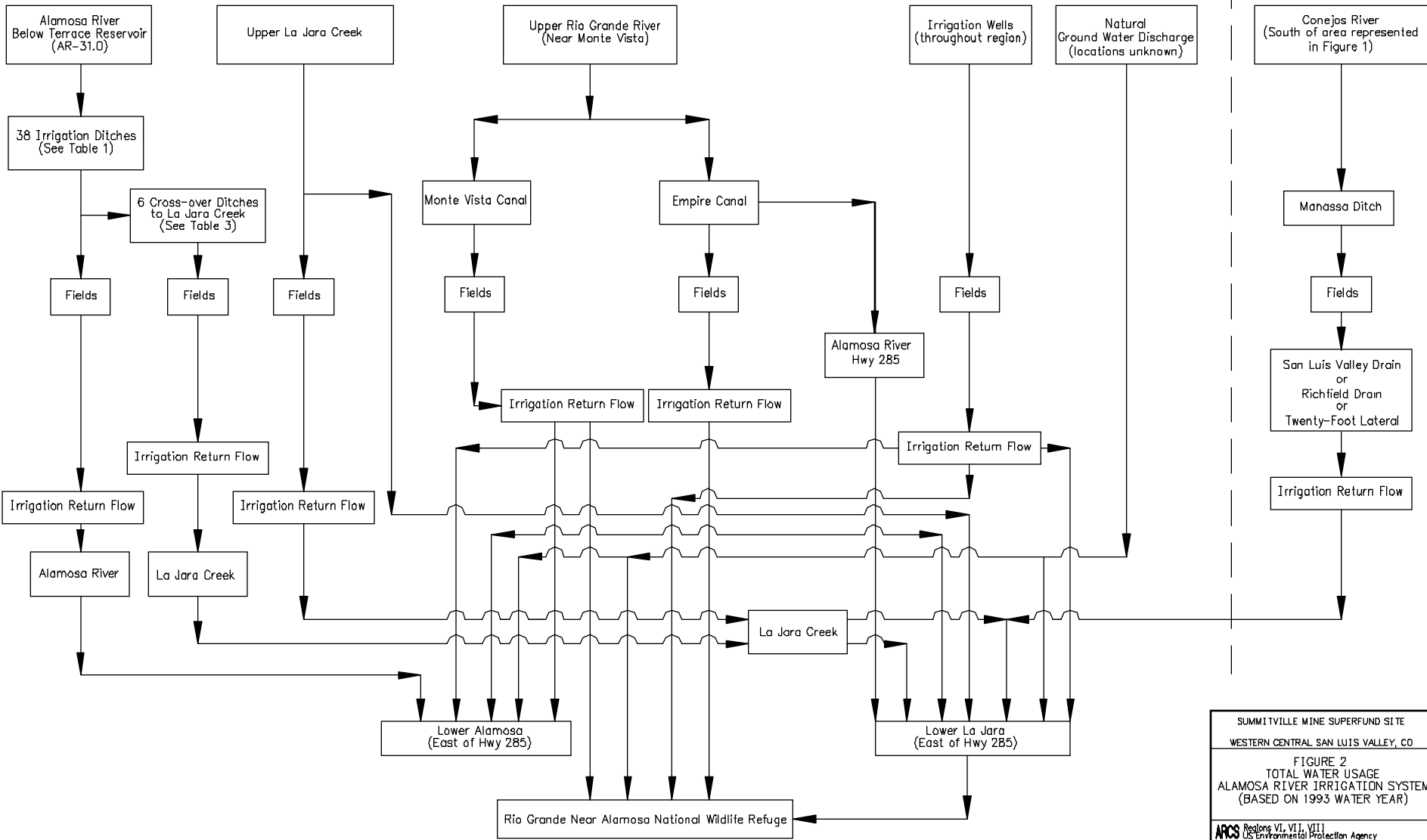


- LEGEND**
- · · · — CANALS/DITCHES
 - - - - COUNTY LINE
 - · · · - INTERMITTENT STREAMS
 - ~~~~~ RIVERS/STREAMS

REMEDIAL INVESTIGATION REPORT SUMMITVILLE MINE SUPERFUND SITE SAN LUIS VALLEY, COLORADO			
Figure 1 CURRENT UNDERSTANDING WESTERN CENTRAL SAN LUIS VALLEY IRRIGATION SYSTEM			
ARCS Regions VI, VII, VIII US Environmental Protection Agency			
MORRISON KNUDSEN CORPORATION			
FILE NAME (GAD) O12HO27A.DWG		DATE: 5/13/96	
WORK ORDER	TASK	DRAWING NUMBER	REV. DRIVE
3780-2718	122H	FIGURE 1	A P:

WATER SOURCES IN WESTERN CENTRAL SAN LUIS VALLEY

MINOR SOURCE



SUMMITVILLE MINE SUPERFUND SITE
 WESTERN CENTRAL SAN LUIS VALLEY, CO
 FIGURE 2
 TOTAL WATER USAGE
 ALAMOSA RIVER IRRIGATION SYSTEM
 (BASED ON 1993 WATER YEAR)

APCS Regions VI, VII, VIII
 US Environmental Protection Agency

MORRISON KNUDSEN CORPORATION

FILE NAME (CWD)	0124-026A.DWG	DATE: 6/16/96
WORK ORDER	378D	TASK
DRAWING NUMBER	FIGURE 2	REV
		DRIVE

Table 1. Alamosa River Irrigation System Diversion Information¹

Diversion Name ²		Appr. Size (width x depth in feet)	Estimated Capacity (cfs)	Priority	Decreed Amount (cfs)	Location of Diversion with respect to the Alamosa River
	Terrace Main Canal	6 x 3	300	2 8 14 37 39 45 112	331.15	North
	Valdez Ditch (also called the No. 5)	3 x 1	30	9.90	92.63	South
	Davies-Chapman NA	³	30	15.76	87.87	NA
	El Viejo (also called the No. 1)	4 x 0.5	25	1	24.96	North
	Alamosa Creek Canal	10 x 1	200	1. 3. 15. 71. 76. 85	216.75	North
	Gabino-Gallegos 5 x 1	30	11	. 113	37.0	South
	Madril	NA	8	89	12.45	NA
	Norland	6 x 2	30 ⁴	68	48.56	North
	Miller-Alamosa	NA	100	17. 24. 70. 75	74.87	South
	Ronaldo Valdez	NA	5	24	6.87	North
	Rivera	NA	15	88	28.80	North
	San Jose No. 1	2 x 1	15	17	16.61	South
	San Jose No. 2	1 x 0.5	6	14. 113A	20.58	South
	Ramona	1 x 0.67	12	26	9.85	South
	Garcia No. 2	2 x 0.67	7	13	5.54	South
	Capulin	6 x 1.5	45	10	31.37	South
	Cristobal-Revera	3 x 1	10	15	13.08	North
	Ortiz	NA	20	32	14.02	NA
	Scandinavian	3 x 2	45	84	43.58	North
	Flintham	3 x 2	40	45. 69	27.13	North
	Union	4 x 1	70	38. 62. 67. 83	455.79	North
	T. K. Walsh	1 x 0.5	4	37	10.93	North
	North Alamosa	NA	50	40. 74. 77	75.66	North
	Morganville	3 x 2	40	73	20.75	North
	Alamosa-Spring Creek 2 x 1	35	29	. 41. 54. 80	62.74	South
	Cottonwood	3 x 1	35	44. 55. 82	35.70	North
	Arova	3 x 1	55	36	53.12	South
	Clark	NA	8	58	6.75	North
	Weist	NA	6	74	3.95	NA
	Gallegos No. 3	NA	15	46	14.94	NA
E. Hwv 285	Empire Canal-Alamosa	15 x 4	300	105	85.00	South
	J. B. Shawcroft No. 2	NA	NA	NA	NA	North
	J. B. Shawcroft No. 3	6 x 3	NA	NA	NA	North
	Head Overflow No. 5	NA	155	66	49.80	North
	Wade Peterson	NA	10.0	71	NA	NA
	Overflow No. 1	NA	80	71	42.0	North
	Lowland	NA	50	57	14.94	South
	J. B. Shawcroft No. 1	6 x 3	NA	NA	NA	North

1. Diversion records from the State of Colorado Department of Natural Resources, Division of Water Resources-Division Three in Alamosa, Colorado. The records include the water years 1982 through 1993.
2. Listed in downstream order. Terrace Main Canal is the farthest west.
3. NA: Information is not available at this time.
4. Estimated capacity may have increased.

Table 2. Alamosa River Irrigation System Diversion Summaries-Water Usage¹ (Displayed by Water Year in Acre-Feet)

Diversion Name		Nov	Mar	Apr	May	June	July	Aug	Sept	Oct	Yearly Average ²
W. of Hwy 285	Terrace Main Canal	26.4	30.1	599	1838	3321	3147	1558	660	523	11703 (33.40 cfs)
	Valdez Ditch	63.3	12.2	344	940	1117	733	523	387	284	4403 (11.53 cfs)
	El Viejo (No. 1)	300	36	388	775	827	832	844	756	737	5307
	Alamosa Creek Canal	34.9	18.6	467	1346	2076	2028	858	359	341	7528 (20.33 cfs)
	Gabino Gallegos	59		155	782	922	579	367	232	196	2913
	Miller-Alamosa			244	1031	1375	624	105	79.3		2925
	Romaldo Valdez			16.1	80.2	92.9	47.4	15.2	1.16	0.7933	254 (1.96 cfs)
	San Jose No. 1			29.2	167	184	49.5	25.8	10.8	5.32	471 (3.54 cfs)
	San Jose No. 2			12.1	48.9	59.8	21.5	3.67	1.16		147 (1.47 cfs)
	Ramona	9.92		105	460	468	275	100	122	243	1343
	Garcia No. 2	33		74	190	191	123	72	50	72	641
	Capulin	235		346	1187	1400	1145	626	189	375	4947
	Cristobal-Revera	37.0		65.4	352	345	163	98.5	32.7	26.8	1120 (5.89 cfs)
	Ortiz			66.7	515	535	160	40.9	24.8	27.4	1370 (9.44 cfs)
	Union			65.4	1284	1133	304	27.6	17.2		2832 (25.08 cfs)
	T. K. Walsh			3.95	47.3	68.0	27.7	8.10			155 (2.54 cfs)
	Alamosa-Spring Creek			21.8	373	401	92.4	3.11	22.8	30.6	945 (9.74 cfs)
Aroya		1.16	92.4	1018	765	237	97.0	52.0	36.5	2300 (18.91 cfs)	
E. Hwy 285	Empire Canal-Alamosa River			1196	6773	9023	4214	2097	1510	3464	23079
	Lowland			1249	3518	4943	793	33.7	283	432	9643

1. Diversion records from the State of Colorado Department of Natural Resources, Division of Water Resources Water-Division Three in Alamosa, Colorado. Records include the water years 1982 through 1993 for priorities 38 and lower.
2. If available, the rate of transfer in cubic feet per second (cfs) is included on the table.

Table 3. Alamosa River Irrigation System Alamosa River-La Jara Creek Transfer Canals¹

ACRE-FEET TRANSFERRED

Diversion Name	Water Year (First Use Date - Last Use Date)											
	1982 ²	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Valdez Ditch	No noted transfers in the record for these water years between Alamosa River and La Jara Creek.											
Gabino-Gallegos	-- ³	? ⁴	No other noted transfers in the record for these water years between Alamosa River and La Jara Creek.									
Miller-Alamosa	--	?	--	?	?	?	--	1,842 (4/9-6/23)	1,179 (5/8-6/27)	2,990 (4/25-8-11)	1,582 (5/2-6/28)	1,133 (4/28-6/9)
Ramona	75 (6/8-8/5)	65 (5/17-7/21)	75 (6/5-7/8)	35 (7/11-7/17)	>24⁵ (5/13-5/18)	139 (6/1-6/26)	24 (5/17-6/15)	107 (5/6-6/21)	121 (5/16-6/19)	67 (5/7-6/10)	43 (5/20-5/29)	57 (7/6-7/18)
Garcia No. 2	24 (7/28-7/31)	8 (7/20-7/21)	67 (6/5-6-21)	12 (7/18-7/19)	--	--	109 (6/2-6/27)	32 (6/12-6/25)	89 (5/25-6/28)	9 (6/14-6/14)	26 (5/15-6/23)	40 (6/24-6/25 & 7/14-7/19)
Capulin	115 (6/9 & 7/2-8/9)	462 (5/5-8/18)	216 (6/1-6/5 & 6/14-6/18)	40 (6/19-7/13)	--	>171 (7/9-8/7)	462 (5/7-7/20)	>521 (4/22-6/30)	>466 (4/18-6/22)	>522 (5/5-8/11)	>395 (5/16-7/26)	>216 (6/24-6/25 & 7/7-7/22)
Empire Canal-Alamosa	18,284 (5/5-9/6)	12,391 (4/28-8/12)	?	14,775 (4/8-8/13)	13,545 (5/5-8/10)	16,602 (5/4-8/30)	9,939 (5/14-7/6)	8,039 (4/19-6/26)	10,236 (5/11-7/13)	16,253 (4/19-7/18)	14,873 (4/21-7/29)	13,315 (4/26-7/20)
Lowland	1,158 (5/3-7/6)	946 (6/1-7/14)	532 (5/17-6/8)	2,112 (4/16-6/23)	776 (4/24-6/4)	778 (5/29-6/19)	91 (5/28-6/12)	67 (4/25-6/3)	137 (5/26-6/14)	917 (4/22-6/23)	691 (5/4-6/15)	1,085 (5/2-7/7)

1. Diversion records from the State of Colorado Department of Natural Resources, Division of Water Resources Water-Division Three in Alamosa, Colorado. The records include the water years 1982 through 1993. Note that the Empire Canal-Alamosa and Lowland are east of Hwy 285.
2. Value displayed is the total volume of water in acre-feet that was transferred from the Alamosa River to La Jara Creek via the diversion in the noted water year, based on available records.
3. No water transfer noted for this water year.
4. Water transfer noted in records, but no volume entered.
5. Two water transfers are noted in the record, but the additional volume of water transferred was not stated in the record.