
RETURN-FLOW PLAN CITY OF LAS CRUCES NEW MEXICO

submitted by
City of Las Cruces

prepared by
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Albuquerque, New Mexico 87107

from information furnished by
City of Las Cruces

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INTRODUCTION

The City of Las Cruces holds water rights and State Engineer permits, and has applied for other permits, that carry with them a variety of conditions, including requirements for discharge of certain amounts of water to the natural system after use. In addition, the City of Las Cruces owns, and has entered into leases of, surface-water allotments for future municipal and industrial (M & I) uses. The purposes of this Return-Flow Plan are to compile the various requirements for return flows, and to present the City's plan for meeting them.

SOURCES OF WATER

The Las Cruces water system diverts water from wells in the Mesilla Sub-Basin and wells in the Jornada del Muerto Sub-Basin under Lower Rio Grande Underground Water Basin ground-water rights, and in the future will divert surface water under existing Rio Grande rights already owned by the City, and also under leases from allottees served by the Elephant Butte Irrigation District (EBID). The amounts of water that the City of Las Cruces must return to the surface-water or ground-water system depend on the terms of the several water-right permits the City holds, and the adjudication order in LRG-430 et al. The City currently returns these required amounts to the stream system through the discharge of effluent from wastewater treatment. Water rights owned by the City are listed below, along with descriptions of their respective return-flow requirements.

Ground Water

File No. LRG-430 et al.: This declared Lower Rio Grande Underground Water Basin right, established by the City prior to the declaration of the Basin by the State Engineer in 1980 and confirmed by Court Order, represents the ability to divert (that is, to pump from wells) a combined amount up to 21,869 ac-ft/yr from wells in the Mesilla Sub-Basin.

The right is the subject of a Subfile Order in the adjudication of the Lower Rio Grande, Northern Mesilla Valley Section.¹ The Order establishes no requirement for return flow, so that the entire amount diverted may be consumed, except that “...during periods of drought which, for purposes of this Offer of Judgment, are defined as years when the annual *pro rata* share of Rio Grande Project water available to acreage supplied with such water within Elephant Butte Irrigation District falls below two (2.0) acre-feet per acre, the Defendant [i.e., the City] shall not consumptively use the treated effluent derived from LRG-430 wells ..., but shall return the effluent derived from these wells to the stream system. If the preceding year ended with an annual *pro rata* share of less than two (2.0) acre-feet per acre, the system remains in drought until the annual *pro rata* share is greater or equal to (2.0) acre-feet per acre.”

Two wells in the Jornada del Muerto Basin are also enumerated in the Subfile Order, LRG-430-S-26 (Well 40) and LRG-430-S-28 (Well 41), but “upon completion of infrastructure and notice to the State Engineer,” they will no longer serve as supplemental wells under File No. LRG-430 et al., and will be designated LRG-3289 and LRG-3288 respectively. They will be pumped under State Engineer Permit LRG-3283 through LRG-3296 (issued in 2002), which requires that depletions of Rio Grande flows be offset, by acquisition and transfer of existing valid water rights or by discharge of treated effluent, according to a schedule that reaches 644 ac-ft/yr after 100 years, as described in a following section. Wells LRG-430-S-29 and -S-30 are intended by the City to also become supplemental points of diversion under the East Mesa permits upon adjudication of those permits. A State Engineer permit will be applied for.

Permits LRG-389 and LRG-399: Las Cruces has State Engineer permits to drill two wells and divert up to 4,250 ac-ft/yr from them (2,550 ac-ft/yr from LRG-389 and 1,700 ac-ft/yr from LRG-399), with a requirement that effects on the Rio Grande flows be offset by transfer of existing rights. The wells have not been drilled, because of water-quality considerations at the locations described in the permits, but the City is applying for a supplemental point of diversion, Well LRG-430-S-44, for the rights represented by these permits. The application was not protested, and is awaiting action from the Office of the State Engineer.

Diversions from Well LRG-430-S-44 under LRG-389 and LRG-399 will be reported to the State Engineer separately from diversions from the well under Declaration LRG-430 et al. State Engineer records indicate that 435.5 ac-ft/yr may be diverted from Well LRG-399 under

¹ State of New Mexico vs. Elephant Butte Irrigation District et al., Third Judicial District Court No. CV 96-888, Subfile No. LRN-28-011-0078-A.

existing water rights other than LRG-430. An additional transfer of 21.0 ac-ft/yr was applied for, but the permit has been denied by the State Engineer. The City is aggrieved by the denial, and has responded formally.² The consumptive-use amounts available under the already-transferred rights (LRG-5933, LRG-3530, and LRG-4455-B) currently total 297.55 ac-ft/yr. These rights would be available to offset depletion due to pumping from the supplemental well.

Permit LRG-3283 through LRG-3296: The Las Cruces East Mesa wells in the Jornada del Muerto Sub-Basin are governed by this permit, issued in 2002, which provides for diversion of up to 10,200 ac-ft/yr according to a limiting schedule, and requires that depletions of Rio Grande flows due to pumping be offset, by acquisition and transfer of existing valid water rights or by discharge of treated effluent, according to another schedule. That schedule of required offsets is reproduced in Table 1 and is expanded by interpolation in Table 2, simply as a convenience to provide a value for each year to be used in the return-flow calculations described in later sections of this Plan. No diversions under the permit have occurred.

Interpolated annual required offsets, the amount that would be required in each year based on the schedule in the permit, are presented in Table 2. For the first 20 years, the values are linear interpolations between the values for 1, 5, 10, and 20 years. For later years, the interpolation is from a polynomial fit through all of the values in the schedule.

Table 1. Schedule of required offsets of Rio Grande depletion under Permit No. LRG 3283 through LRG-3296, Jornada del Muerto Sub-Basin (East Mesa) wells

time after start of pumping (years)	required depletion offsets (ac-ft/yr)	time after start of pumping (years)	required depletion offsets (ac-ft/yr)
1	0.0	30	50
5	0.3	40	100
10	2.8	100	644
20	18		

ac-ft/yr - acre-feet per year

² The diversion amounts are as follows: LRG-3530 and LRG-3530-S into LRG-399, 19.0 ac-ft/yr; LRG-4455-B into LRG-399, 109.0 ac-ft/yr; and LRG-5933 and LRG-399, 307.5 ac-ft/yr, for a total of 435.5 ac-ft/yr. The transfer that had been applied for, but which was denied, is LRG-449 into LRG-389 and LRG-399. The LRG-4455-B application had requested a diversion of 285.24 ac-ft/yr from Well LRG-399, which would have led to a total diversion of 611.7 ac-ft/yr, but the Conditions of Approval indicate a maximum diversion of 109.0 ac-ft/yr. This amount is based on a State Engineer analysis of the quantity available for transfer (see OSE Memorandum dated October 15, 2002, from E.H. Fuchs to Calvin Chaves, File No. LRG-399).

Table 2. Annual offsets of Rio Grande depletion required under Permit No. LRG-3283 through LRG-3296, the East Mesa (Jornada del Muerto Sub-Basin) wells, interpolated from values in Table 1

time after start of pumping (years)	offset required (acre-feet)	time after start of pumping (years)	offset required (acre-feet)
1	0.00	51	161
2	0.06	52	167
3	0.15	53	174
4	0.23	54	181
5	0.30	55	188
6	0.80	56	195
7	1.3	57	203
8	1.8	58	210
9	2.3	59	218
10	2.8	60	225
11	4.3	61	233
12	5.8	62	241
13	7.3	63	249
14	8.8	64	258
15	10	65	266
16	12	66	275
17	13	67	283
18	15	68	292
19	16	69	301
20	18	70	310
21	23	71	319
22	26	72	329
23	29	73	338
24	32	74	348
25	35	75	357

Table 2. Annual offsets of Rio Grande depletion required under Permit No. LRG-3283 through LRG-3296, the East Mesa (Jornada del Muerto Sub-Basin) wells, interpolated from values in Table 1 (concluded)

time after start of pumping (years)	offset required (acre-feet)	time after start of pumping (years)	offset required (acre-feet)
26	38	76	367
27	41	77	377
28	45	78	387
29	48	79	398
30	50	80	408
31	56	81	419
32	60	82	429
33	64	83	440
34	68	84	451
35	73	85	462
36	77	86	473
37	82	87	485
38	86	88	496
39	91	89	508
40	100	90	520
41	102	91	531
42	107	92	543
43	112	93	556
44	118	94	568
45	124	95	580
46	130	96	593
47	135	97	605
48	142	98	618
49	148	99	631
50	154	100	644

Wastewater collected by the Las Cruces system is presently conveyed to the Jacob A. Hands Wastewater Treatment Facility, treated, and then discharged to the Rio Grande. Las Cruces plans to build a water-reclamation plant on the East Mesa to collect wastewater from interceptors serving, in particular, the Las Colinas, Mars, High Range, and Sonoma Ranch areas, and will have the ability to serve the recently-annexed Vistas at Presidio development.³ Flows collected from these systems will be treated to produce a very-high-quality reclaimed water intended for sale to customers with high landscape-irrigation needs and for use to irrigate city parks east of Interstate 25. A potential customer is the Sonoma Ranch Golf Course, but it is not included in any current plan. The wastewater would primarily be derived from the East Mesa wells. The plant is expected to be in service by about 2010, and have a capacity of 500,000 gallons per day. The annual capacity at full operation would be about 560 ac-ft, but the irrigation use is likely to be seasonal, and the annual treatment volume less than 560 ac-ft. The remaining wastewater would be transferred to the Jacob A. Hands Wastewater Treatment Facility, treated, and then discharged to the Rio Grande.

Application, File No. LRG-3275 through LRG-3282 (West Mesa Applications):

Las Cruces applied to the State Engineer in 1981 for an appropriation of 8,000 ac-ft/yr, to be pumped from wells on the West Mesa. Although the permit has not yet been approved, it is very likely to be conditioned to require that depletion of flows of the Rio Grande be offset by a combination of acquisition of existing rights to surface water or ground water, and return flows. Las Cruces expects to use return flows from various sources, in accordance with the LRG-430 et al. Subfile Order and subject to the conditions of other permits as described elsewhere in this Return-Flow Plan, to offset depletion. All of the effluent that results from pumping of the group of West Mesa wells plus up to 4,480 ac-ft/yr of other effluent (assuming that 44 percent of pumping will appear as return flow) will be used to offset the entire amounts diverted from the wells.

File No. LRG-5818 et al., Jornada Water Company: Las Cruces has preliminarily acquired the wells, State Engineer permits, and declared pre-basin water right of Jornada Water Company. The total permitted diversion is 792.0 ac-ft/yr. Diversions in excess of the pre-basin right, 42.46 ac-ft/yr, must be matched by offsetting water rights or return flow. Although the amount of water that may be diverted shall not exceed 42.46 ac-ft/yr without submission, and approval by the State Engineer, of a schedule for the acquisition of

³ City of Las Cruces 40-Year Water Development Plan, November 2008, p. 57.

replacement surface water to prevent impairment of senior surface water rights, the permit also includes a provision to the effect that “upon submission of an effluent return-flow plan acceptable to the State Engineer, permittee’s discharge of treated effluent to the Rio Grande stream system may reduce the amount of replacement surface water otherwise required, but shall not be a basis for requesting an increase in the maximum annual diversion of up to 792.0 acre-feet.”⁴ This Return-Flow Plan is intended to serve as that submission, and the return-flow accounting in this Plan includes a provision for increasing diversions under LRG-5818 et al. by discharging treated effluent in sufficient amounts to offset the increased effects on the flow of the Rio Grande.

Rio Grande Project (Elephant Butte Irrigation District) Surface Water

Las Cruces is planning a surface-water diversion project and a water-treatment facility for potable water uses. A comprehensive feasibility study is currently underway, including determination of a plant site. Water will be diverted under rights and other arrangements as described below, treated, and conveyed to the distribution system. The following discussion of the City’s potential surface-water supply is included in this Return-Flow Plan, even though specifics as to the supply are lacking at present, because return-flow requirements are expected and would be included in the accounting under this Plan.

Surface-Water Rights Owned or Leased from EBID: Las Cruces owns or has lease-purchase agreements for surface-water rights appurtenant to some 1,138.48 acres of irrigated land.⁵ These rights are represented by Offers of Judgment in the adjudication of the Lower Rio Grande Basin. The amount of consumptive use available under these rights remains to be determined in the adjudication; the City expects that the proportion of return flow of water diverted under these rights by the City would be required to be the same as if the rights were exercised in irrigation.

Leases to Las Cruces Special Water Users Association: Legislation enacted in 2003⁶ allows municipalities, such as Las Cruces, and certain other kinds of entities, to form Special Water Users’ Associations (SWUAs) which may lease Rio Grande Project irrigation water for their respective uses. State Engineer regulations governing these leases, and the associated return-flow requirements, are expected to be promulgated.

⁴ Permits for Supplemental Wells, Nos. LRG-5818-S-7 through –S-10, Conditions of Approval 1 and 7.

⁵ Information from City of Las Cruces, January 2008.

⁶ NMSA 1978, §§73-10-48, 73-10-49, and 73-10-50 (2003).

Las Cruces formed the Las Cruces Special Water Users' Association in 2005, for the purposes of entering into 40-year leases of the annual allotments of Rio Grande Project water from the owners of tracts of land within the boundaries of the Elephant Butte Irrigation District, acting in a fiduciary capacity on behalf of the City as a municipal water utility, and acquiring annual water allotments on behalf of the City.⁷

SOURCES OF WASTEWATER

Municipal Wastewater System

The principal source of wastewater to be treated and discharged is the municipal sewer system. As of this writing, an amount equivalent to about 44 percent of the City's total water diversion is discharged to the Rio Grande as treated wastewater.⁸ The actual future amounts will be determined monthly as a part of this plan. At present, most of this effluent is derived from pumping of the City's wells under File No. LRG-430 et al.

Some wastewater derived from LRG-430 wells west of the Rio Grande (Wells 36, 46, and 63, and four other permitted wells either not yet in service or as-yet undrilled), and wastewater from the airport, the prison, and the industrial park, is treated in a small wastewater reclamation plant west of the river. Water from this plant is not discharged to the Rio Grande, and no return flow is claimed. In the future, water produced from the West Mesa wells drilled under the applied-for permit, File Nos. LRG-3275 through LRG-3282, will result in additional wastewater. At present there is no wastewater connection across the river, but it is planned that some water from these sources will be treated in the Jacob A. Hands plant and discharged to the Rio Grande.

The municipal wastewater system serves some individual customers that are supplied water by other water utilities which have no wastewater systems, and the wastewater is therefore derived from non-City sources. These individual residential customers (Code 1431 accounts) are distinguished in the City's utility accounting, and the discharge volume from each is estimated based on similar residential routes. It is therefore possible to determine the amounts of wastewater from City customers that are derived from non-City supply sources only. As of October 30, 2007, there were about 165 such accounts.

⁷ Second Amended Certificate of Organization for the Las Cruces Special Water Users' Association, 2005

⁸ City of Las Cruces 40-Year Water Development Plan, November 2008, p. 16.

Other Sources of Wastewater

State Engineer practice, in the absence of any agreement to the contrary, is to recognize return-flow credit as belonging to the entity that physically discharges water to the original source, which in the case of Las Cruces is the Rio Grande.

New Mexico State University: The City owns and treats wastewater, originally derived from University wells under its water rights, received from the University. The wastewater flows are metered. The governing contract, signed in 1991, does not explicitly assign the return-flow credit. Las Cruces will account for the wastewater as part of its return flow to the Rio Grande in compensation for handling and treating the wastewater.

Las Cruces entered into an agreement in 2007 that provides for purchase of water from the University for peaking and emergency supply. That agreement provides that the City owns all return-flow credits that would arise from discharge of wastewater derived from that source.

Town of Mesilla: Las Cruces owns and treats wastewater, originally derived from Town of Mesilla wells under its water rights, received from the town. The lift station that conveys the Mesilla wastewater to the City wastewater system also receives some wastewater from Las Cruces customers. The wastewater flows from Mesilla, not metered at present, will be metered as part of this Plan. The contract with Mesilla, signed in 1991, does not assign the return-flow credit. Las Cruces will include the wastewater as part of its return flow to the Rio Grande, in compensation for handling and treating the wastewater.

San Pablo Mutual Domestic Water Consumers' Association: The City owns and treats wastewater from the San Pablo Association under a contract that does not assign return-flow credits. The wastewater flows are metered. The water is derived from wells of the Jornada Water Co., pumped by Jornada under State Engineer permits other than Declaration LRG-5818 et al., which now belong to Las Cruces. Las Cruces will include the wastewater as part of its return flow to the Rio Grande, in compensation for handling and treating the wastewater.

Doña Ana County, on behalf of the Community of Doña Ana: Las Cruces accepts wastewater from Doña Ana under a 1998 contract that does not mention return-flow credits. The water supplier in this case is the Doña Ana Mutual Domestic Water Consumers' Association. Pursuant to a settlement agreement with the Association,⁹ the Association has the right to all

⁹ Agreement of Compromise, Settlement and Release, Doña Ana Mutual Domestic Water Consumers' Association vs. City of Las Cruces, U.S. District Court for N.M., Case No. CIV-02-122 BB/KMB.

return-flow credits, if any, associated with water provided to its water customers that is treated as wastewater by the City. The Association may construct its own wastewater-treatment facilities in the future, and the potential return-flow credits may be reduced accordingly. The wastewater received by the City from the Community of Doña Ana is metered.

Winterhaven Mobile Home Subdivision: Las Cruces owns and treats wastewater from Winterhaven MDWC&SWA, which provides water service to its customers, and will include the wastewater as part of its return flow to the Rio Grande, in compensation for handling and treating the wastewater. The wastewater flows are not metered at present, but will be metered as part of this Plan.

Some City wastewater customers within the city limits have their own wells, or purchase water from other suppliers. Las Cruces owns, treats, and discharges wastewater received from these customers.

DISPOSITION OF WATER: DEPLETIONS AND RETURN FLOWS

According to the City's 40-Year Water Development Plan,¹⁰ "about 44 percent of the City's total water diversion is discharged as treated waste water effluent to the Rio Grande. The remainder is consumptively used through evapotranspiration or returned to the aquifer through deep percolation." A large percentage of that remainder is depleted in various uses. The following sections describe the disposition of the portion of the total diversion that is either discharged as treated wastewater, or otherwise returns to the aquifer system.

Direct Return to the Rio Grande

Jacob A. Hands Wastewater Treatment Facility: Wastewater collected by the City is treated at the Jacob A. Hands plant, and discharged to the Rio Grande. The discharge is metered. Return flows described in this Plan will appear in the Rio Grande at that point, which is located just north of Interstate 10, and just east of the river. The plant treats 7.3 to 8.3 MGD (equivalent to about 9,300 ac-ft/yr for the period 2000 through 2005). The City is currently upgrading this plant to accept 13.5 MGD of wastewater.

¹⁰ City of Las Cruces 40-Year Water Development Plan, November 2008, p. 16.

Estimated Return Flow to Shallow Ground Water

Although this Return-Flow Plan contemplates that only metered flow returned directly to the Rio Grande will be considered “return flow” in the context of water-rights administration, there are other flows of water, diverted under City water rights, that go back to “the ground water system or surface water system (see definition of ‘return flow’ in the proposed State Engineer Rules and Regulations).”¹¹ Although these other physical return flows are not claimed by the City as components of the return flow required under various rights, they are discussed here to provide a description of all of the categories of disposition of water that is diverted and not consumed. These indirect return flows do have the effects of ensuring, first, that the City’s obligations in terms of physical returns of water are met, and also of providing a buffer in case of short-term under-delivery of return flow. The current total of such physical return flows is estimated at something close to 3,450 ac-ft/yr, as described in the following paragraphs.

Septic-Tank Returns from City Water Customers: The City has identified, through a study by CDM, an estimated 1,880 parcels within the current City service area that are on septic-tank systems and not served by the City’s wastewater collection and treatment system.¹² Not all of these parcels are occupied; on the other hand, a number of parcels have several mobile homes on each parcel. In recent years, State Engineer policy has recognized physical return flows only in areas of shallow ground water, generally defined as those in which the water table is 100 ft or less below land surface.

For the purpose of estimating the return flow that might be occurring under present conditions, only the potential septic tanks west of Interstate 25, where the depth to the water table is generally less than 100 ft, are considered. These lie in City Council Districts 1 through 4, and certain subdivisions in Districts 5 and 6. The number of parcels estimated in the CDM report is 767. If each potential tank is assumed to receive water at an “inside use” rate equivalent to the winter residential water use of about 5 percent of the annual use (169 gallons per capita per day) per winter month, and the number of individuals using each

¹¹ §19.25.16.7VV NMAC

¹² CDM, 2006, City of Las Cruces, New Mexico, septic tank identification and prioritization plan: CDM, consultant’s report to City of Las Cruces, p. 1.

septic tank is 2.46,¹³ then the total flow to these septic tanks is on the order of 200 ac-ft/yr. This amount is expected to decline over time as presently unsewered lots are connected to the system. The City understands that the septic-tank flows are not recognized for return-flow credit by the State Engineer.

Return Flow from Irrigation of Parks and Other Lands: Las Cruces supplies irrigation water to parks, golf courses, athletic fields, and landscaping owned by the City. The average deliveries for these purposes during the period 2000-2005 was 1,101 ac-ft/yr (about 8 percent of all metered delivery).¹⁴ Most of these lands are in the valley, where the water table is relatively close to land surface, and some return flow can be expected. If the average return flow from irrigation of these lands is about one-half of the amount applied, then a return flow under current conditions of about 550 ac-ft/yr would be occurring. The City understands that the irrigation returns described in this paragraph are not recognized for return-flow credit by the State Engineer.

Non-Revenue Water: Some components of the City's water audit accounting described in a following section, CURRENT WATER REPORTING, are flows that are likely to reach the Rio Grande through storm sewers, or to reach shallow ground water, and thus provide physical return flow. These components include fire-fighting and training, street cleaning, new water-main flushing, line breaks and spills, and system leaks. The total of all components, including both the real physical losses listed, and apparent losses related to theft and vandalism, meter inaccuracy, and data-management errors, would have led to an estimated average amount of about 2,700 ac-ft/yr during the period 2003-2007; a large part of that is likely to be appearing physically as return flow.

Although the total non-revenue water, as a percentage of annual diversion, is expected to decline, the annual diversions themselves are expected to increase over time. The City's goal is to reduce non-revenue water to about 10 percent of diversions. The City understands that the flows described in the preceding paragraph are not recognized for return-flow credit by the State Engineer.

¹³ City of Las Cruces 40-Year Water Development Plan, November 2008, Appendix O, p. O-1.

¹⁴ City of Las Cruces 40-Year Water Development Plan, November 2008, Appendix O, Table O1.

CURRENT WATER REPORTING

The City of Las Cruces maintains a system-wide water audit to track and record water production, water use, and “non-revenue” (formerly referred to as “unaccounted”) water. Each month, the following supply and demand statistics are compiled and reported:

- metered supply: ground-water pumping, by basin.
- metered demands:
 - ◆ non-potable water: well flushing and irrigation water,
 - ◆ account demand: water delivered and billed to permanent accounts, and
 - ◆ non-account demand: bulk water sales, and water for main flushing and sewer cleaning.

The difference between metered supply and metered demand is the “non-revenue” or “unaccounted” water, which includes certain authorized uses (such as fire fighting and training), unauthorized uses (such as theft and vandalism), accidental uses (such as line breaks and leaks), and meter and data errors.

For the 5-year period from 2003 through 2007, the water audit shows the following:

- Total metered supply was 98,306 ac-ft.
- Total metered demand was 84,650 ac-ft.
- “Non-revenue” or “unaccounted” water was 13,656 ac-ft.

The reporting will be augmented with the following additional information:

- monthly well-by-well pumping,
- monthly meter readings reflecting amounts of water received from other individual sources,
- monthly meter readings for each new well as it is added to the City system,
- monthly meter readings for Well LRG-430-S-44 assigned to Permits LRG-389 and LRG-399 rather than to LRG-430,
- monthly amounts of surface diversion, once the surface-water treatment facility is in operation, and,
- monthly amounts of wastewater received by the Las Cruces system from each non-City system, including New Mexico State University, the Town of Mesilla, the San Pablo MDWCA, Doña Ana County, and Winterhaven MDWC&SWA.

RETURN-FLOW ACCOUNTING

Las Cruces proposes the following return-flow plan, based on its understanding that metered flow delivered to the Rio Grande will be accounted for as return flow in terms of water-right administration.

Accounting Period and Reporting Date

It is proposed that reporting to the State Engineer of diversions, and of metered discharge of treated effluent to the Rio Grande, be monthly, as required by Permit LRG-3283 through LRG-3296 for the East Mesa wells, and that year-to-date totals be brought forward and reported on a calendar-year basis. That permit requires that reports be submitted to the State Engineer on or before the 10th day of each month for the preceding calendar month, and that schedule is proposed in this Return-Flow Plan for all reporting.

Although the draft Proposed Rules and Regulations define the accounting period for the Water Master District as the water year, beginning each November 1, the proposed return-flow reporting would be monthly, with a calendar-year annual accounting requirement, following the City's historical reporting practice, and because of the diversity of reporting dates and anniversary dates of permits. For example, Permit LRG-3283 through LRG-3296 requires a report on conservation efforts each January 1, and has an anniversary date of February 28. The anniversary date of Permit LRG-399 is January 31.

Amount of Physical Return Flow Required

The minimum discharge to the Rio Grande each year is made up of several components, relating to various State Engineer permits, as described in the section SOURCES OF WATER, above. Return-flow requirements depend on the source of water supply to the system. Water supplied to some parts of the water-distribution system may come from more than one source, and the wastewater generated in that part of the service area may not come entirely from water sources within it.

The water sources included in this calculation at present are the LRG-430 et al. (valley) wells, and the LRG-5818 et al. (Jornada Water Co.) wells. In the future, other water sources that may supply the same service area, such as the applied-for West Mesa wells, and the water-supply and wastewater derived from them will be included in the calculation. This requires that other wastewater flows be metered separately, and deducted from the total effluent.

Calculation of Effluent Attributable to LRG-430 et al.: It is necessary to distinguish between effluent attributable to LRG-430 et al. and effluent derived from other sources because of the provision in the Subfile Order that associates the disposition of the return flow derived from pumping under LRG-430 with the annual EBID allotment.

Water from the several supply sources described above may be commingled in the distribution system, and wastewater derived from them, and from other sources, may be commingled in the wastewater system. The amount of effluent attributable to pumping under LRG-430 et al. will be calculated by determining the net amount of effluent attributable to the combined sources of water diverted for use in the City system (that is, the quantity remaining after subtraction of wastewater amounts derived from non-City sources), excluding the effluent attributable to pumping from the East Mesa and West Mesa wells, and finding the ratio relating the effluent from the combined sources to the total of the diversions, then applying that ratio to the diversions from wells under LRG-430.

Effluent from the west side of the Rio Grande is not presently discharged to the river, and no direct return flow is derived from it, but water pumped from wells under File No. LRG-430 et al. on the West Mesa is included in the calculation of the ratio of effluent to diversion. If some wastewater from the West Mesa is later conveyed to the Jacob A. Hands facility for treatment and discharge, it is likely to be derived from a combination of LRG-430 et al. wells and wells drilled and pumped under the currently pending West Mesa applications LRG-3275 through LRG-3282. The amount of the wastewater to be attributed to LRG-430 et al. pumping on the West Mesa will be determined according to the proportion of total pumping on the West Mesa that comes from LRG-430 et al. wells. The calculation is summarized in Table 3, below. All flow amounts will be converted to acre-feet for the calculation. Table 3 will be amended as necessary if regulations change, or if other relevant changes occur.

Return Flows Required by Other Rights and Permits: Other required return flows are summarized in Table 4, below.

Calculation of Physical Return Flow Required: Table 4 represents the set of monthly calculations for determining the amount of effluent discharge required to meet State Engineer permit conditions for all of the City's water rights. Table 4 will be amended as necessary if regulations change, or if other relevant changes occur.

Table 3. Calculation of effluent attributable to File No. LRG-430 et al.

component	monthly amount, ac-ft
net effluent attributable to pumping under City water rights (excluding East Mesa and West Mesa non-LRG-430 wells)	
1. enter total monthly effluent discharged to the Rio Grande	
2. subtract total estimated discharge volume, residential customers not served by City water (Code 1431 accounts)	
3. subtract metered wastewater received from Doña Ana MDWCA	
4. subtract metered wastewater received from New Mexico State University	
5. subtract metered wastewater received from San Pablo MDWCA	
6. subtract metered wastewater received from Town of Mesilla	
7. subtract metered wastewater received from Winterhaven MDWCA	
8. subtract metered wastewater from west of river conveyed to Jacob A. Hands facility that is derived from non-LRG-430 et al. wells, based on proportion of non-LRG-430 pumping to total West Mesa pumping	
9. subtract metered wastewater from East Mesa, derived from wells LRG-3283 through LRG-3296	
10. Subtotal: net effluent attributable to City water rights (excluding East Mesa and West Mesa non-LRG-430 wells)	
total diversion under City water rights (excluding East Mesa and West Mesa non-LRG-430 wells)	
11. enter combined monthly diversion from all LRG-430 et al. wells	
12. add combined monthly diversion from LRG-5818 et al. (Jornada Water Co.) wells	
13. add monthly surface-water diversion	
14. Subtotal: diversion attributable to City water rights (excluding East Mesa and West Mesa non-LRG-430 wells)	
find overall ratio of wastewater to diversion	
15. Divide net effluent (Line 10) by diversion (Line 14)	
find return flow attributable to LRG-430 et al.	
16. Enter monthly pumping from all LRG-430 et al. wells, including LRG-430-S-44 (assigned to Permits LRG-389 and LRG-399)	
17. Subtract pumping from LRG-430-S-44 under Permits LRG-389 and LRG-399. Any pumping from this well in excess of 435.5 ac-ft/yr is assigned to Permit LRG-430-et al.*	
18. Subtotal: net pumping from LRG-430 et al. wells under LRG-430 Permit	
19. Apply ratio to net pumping from LRG-430 wells to find return flow attributable to LRG-430 et al.: Line 18 times Line 15.	

* This item will be amended if and as additional consumptive-use rights are transferred to offset depletion due to pumping under this permit.

Table 4. Minimum monthly discharge to the Rio Grande to satisfy requirements for return flow, City of Las Cruces

component of return-flow requirement	monthly amount (ac-ft)
1. Doña Ana MDWCA. Add an amount equal to the metered amount of wastewater received from Doña Ana MDWCA during the preceding month.	
2. Permit LRG-3283 through LRG-3296. A scheduled offset of Rio Grande depletion is required under Permit No. LRG-3283 through LRG-3296, Jornada del Muerto Sub-Basin (East Mesa) wells (see Table 2): add an amount equal to one-twelfth of the scheduled annual amount for the current year.	
3a. File No. LRG-430 et al. If the prior-year Elephant Butte Irrigation District (EBID) allotment was 2.0 ac-ft/ac or more and the current-year allotment has not been set: no return flow is required.	
3b. File No. LRG-430 et al. If the prior-year EBID allotment was 2.0 ac-ft/ac or more and the current-year allotment has been set at 2.0 ac-ft/ac or more: no return flow is required.	
3c. File No. LRG-430 et al. If the prior-year EBID allotment was 2.0 ac-ft/ac or more and the current-year allotment has been set at less than 2.0 ac-ft/ac: add an amount equal to the return flow attributable to LRG-430 wells for the previous month determined as described in Table 3, Line 19.	
3d. File No. LRG-430 et al. If the prior-year EBID allotment was less than 2.0 ac-ft/ac and the current-year allotment has not been set: add an amount equal to the return flow attributable to LRG-430 wells for the previous month determined as described in Table 3, Line 19.	
3e. File No. LRG-430 et al. If the prior-year EBID allotment was less than 2.0 ac-ft/ac and the current-year allotment has been set at less than 2.0 ac-ft/ac: add an amount equal to the return flow attributable to LRG-430 wells for the previous month determined as described in Table 3, Line 19.	
3f. File No. LRG-430 et al. If the prior-year EBID allotment was less than 2.0 ac-ft/ac and the current-year allotment has been set at 2.0 ac-ft/ac or more: no return flow is required.	
3g. File No. LRG-430 et al. If the current-year EBID allotment has been less than 2.0 ac-ft/ac and effluent has been discharged under Item 3c, 3d, or 3e as return flow assigned to Declaration No. LRG-430 et al. during the current year, but the EBID allotment has since been increased to 2.0 ac-ft/ac or more, <u>deduct</u> an amount equal to the total amount of return flow assigned for the current year under Items 3c, 3d, and 3e.	
4. Surface Water: Rio Grande Water Rights: [tentative*]: add an amount as required by regulations.	
5. Surface Water: Leased EBID Allotments: [tentative*]: add an amount as required by regulations.	
6. West Mesa wells (LRG-3275 through LRG-3282): [tentative, pending permit conditions]: add an amount as required by permit conditions. This is expected to be a combination of West Mesa effluent flow and effluent from other sources such that the total is equal to the total diversion from the West Mesa wells. Add an amount equal to sum of the previous month's diversions from West Mesa wells.	
7. Jornada Water Co. (LRG-5818 et al.): Depletions in excess of 42.46 ac-ft/yr must be offset. If year-to-date pumping under this permit is less than 42.46 ac-ft divided by the ratio of wastewater to diversion (Table 3, Line 15), no return flow is required. If year-to-date pumping through the previous month is greater than 42.46 ac-ft divided by the ratio of wastewater to diversion, add an amount equal to the total year-to-date pumping through the previous month, less 42.46 ac-ft divided by the ratio of wastewater to diversion, less any return flow assigned in earlier months.**	
8. Permits LRG-389 and LRG-399: [tentative, pending permit conditions]: add an amount as required by permit conditions. This is expected to be an amount equal to the diversion from Well LRG-430-S-44 under Permits LRG-389 and LRG-399, less the combined consumptive-use amounts of existing rights transferred into LRG-430-S-44 under these permits. At present the consumptive-use total is 297.55 ac-ft/yr. If year-to-date pumping through the previous month is greater than 297.55 ac-ft, add an amount equal to the total year-to-date pumping through the previous month, less 297.55 ac-ft divided by the ratio of wastewater to diversion (Table 3, Line 15), less any return flow assigned in earlier months.**	
Subtotal: return flow required for current month: sum of the items above.	
Sum of previous months' required return flow for current year	
Year-to-date effluent discharged to Rio Grande	
Net return flow required for current month	

* tentative, pending regulations

** This item will be amended if and as additional consumptive-use rights are transferred to offset depletion due to pumping under this permit.