

May 11, 2009

**APPENDIX 1
TO
PLAN OF WATER MANAGEMENT
FOR
SPECIAL IMPROVEMENT DISTRICT NO. 1 OF THE RIO GRANDE
WATER CONSERVATION DISTRICT
ANNUAL REPLACEMENT PLAN**

1. The "Plan Year."
 - A. The Plan Year for the Annual Replacement Plan under the Plan of Water Management will be from May 1 to April 30.
2. Information to be collected by Subdistrict for the Annual Replacement Plan and reported to the State Engineer and Division Engineer by April 15 of each year:
 - A. The April 1st forecast of the NRCS for April through September flows of all forecasted streams in Division 3.
 - B. The Division Engineer's April 1st estimate of the annual flow of the Rio Grande at the index gauging station near Del Norte.
 - C. The Division Engineer's April 1st estimate of the annual flow of the Conejos River and its tributaries at the index gauging station near Mogote plus the April through October flows of the Los Pinos and San Antonio Rivers at the index gauging station near Ortiz.
 - D. Total diversions by ditches diverting water into the Subdistrict for the prior water year.
 - E. Groundwater levels in the Subdistrict (as collected by the Rio Grande Water Conservation District, the Subdistrict, and the USGS during the previous 12 months).
 - F. The amount of annual recharge credit estimated during the Plan Year from the exercise of the decrees in Cases No. W-3979 (Rio Grande Canal), W-3980 (as amended) (San Luis Valley Irrigation District), 79CW91 (Rio Grande Water Users Association), 01CW20 (Rio Grande Water Users Association), 96CW45 (Prairie Ditch Company), 96CW46 (San Luis Valley Canal Company), and any decrees subsequently entered granting recharge credit for water diverted from the Rio Grande into the Subdistrict (collectively the "recharge decrees").
 - G. An estimate of total annual Closed Basin Project production for the Plan Year and the portion thereof allocated to the Rio Grande and/or the Subdistrict and available for replacement of injurious well depletions.

- H. The amount and sources of replacement water available to the Subdistrict for the Plan Year including direct flow and storage water rights.
 - I. A list of all active Subdistrict wells as defined by the Plan of Water Management containing the well ID number, permit number, and/or decree number. The Subdistrict Well Database Appendix attached to the Plan of Water Management will be updated by April 1 of each year by the Subdistrict.
 - J. Total groundwater withdrawals from Subdistrict Wells during the prior Plan Year.
 - K. The location of all previously irrigated lands that have been fallowed as part of the Plan of Water Management through CREP or Subdistrict programs. The list of fallowed land within the Subdistrict will be updated to reflect any changes from the prior Plan Year.
 - L. Farm Unit Data including the number of irrigated acres within the Subdistrict, cropping patterns, irrigation method, surface water source and amount (including ditch company and number of shares and where share is allocated), groundwater source and amount (including well ID number, permit number and/or decree number), and Surface Water Credit exchange, trade, lease or sale information.
3. Procedure to estimate anticipated stream depletions for the current Plan Year.
- A. Response Functions derived from the current version of Rio Grande Decision Support System Ground Water Model, as revised and updated (unless and until superseded) will be used to calculate estimated stream depletions.
 - B. Quantification of Subdistrict Well Pumping:
 - i. Estimate pumping by Subdistrict Wells based upon anticipated hydrologic conditions for the current Plan Year using historical data from well meter records or other reasonable methods.
 - ii. Estimate total groundwater consumption as:
 - a) Consumption for Sprinklers = Total Pumping x 0.83
 - b) Consumption for Flood Irrigation = Total Pumping x 0.60
 - c) Consumption for other uses, e.g. M&I = fact specific determination for each such user that contracts with the Subdistrict to provide well replacement.
 - d) These presumptive consumption factors may be revised by amendment to this Appendix, and with the approval of the State Engineer.

- C. Estimate recharge that offsets groundwater consumption based upon anticipated hydrologic conditions for the Plan Year using historical diversion records and terms of recharge decrees.
 - D. Estimate Net Groundwater Consumption by Subdistrict Wells during the Plan Year as the total estimated groundwater consumption from Subdistrict Well pumping minus estimated decreed recharge that offsets groundwater consumption.
 - E. Lag Net Groundwater Consumption (Depletions) to surface streams using Response Functions to determine stream depletions on a monthly basis.
 - F. Add to current Plan Year's calculated stream depletions, all lagged stream depletions from prior Plan Years' pumping under the Plan of Water Management that will result in stream depletions during the current Plan Year.
4. Use of RGDSS Groundwater Model to Derive Response Functions
- A. Determination of stream depletions for purposes of deriving Response Functions
 - i. Run the RGDSS groundwater model with historical groundwater pumping and quantify stream/groundwater interaction by stream reach.
 - ii. Run the RGDSS groundwater model simulating the quantity of groundwater pumping (consumption) equal to the annual recharge available pursuant to the recharge decrees, and determine stream/groundwater interaction by stream reach.
 - iii. The difference between these two runs (in 4.A.i and 4.A.ii above) is the amount of stream depletion.
 - B. Derivation of Response Functions
 - i. Repeat the process described in 4.A. above for each year 1988 to present for which data is available and derive annual Subdistrict-wide Response Functions.
 - ii. Examine variability in Subdistrict-wide Response Functions and determine the variation in Response Functions for different hydrologic conditions.
 - iii. If there is a material difference in Response Functions for different hydrologic conditions, then select Response Functions that will accurately estimate stream depletions for:
 - a) Very dry hydrologic conditions
 - b) Dry hydrologic conditions

- c) Average hydrologic conditions
 - d) Wet hydrologic conditions
 - iv. After the 3rd and 6th and 10th Plan Years, and every fifth Plan Year thereafter, rerun the RGDSS groundwater model using measured data to check continued reliability of selected Subdistrict-wide Response Functions, and substitute new Response Functions if warranted by the data. The new Response Functions will apply prospectively, and will be used to calculate all future stream depletions resulting from the Subdistrict Well pumping included under this Plan.
5. Procedure and timelines to replace injurious stream depletions.
- A. The monthly depletions by stream reach calculated by the Response Functions shall be replaced in a manner that prevents injury, unless the owner of the injured vested water right has either waived any claim of injury, or agreed to accept compensation for the injury in a form other than water. As described below, replacement may also involve deliveries to Compact gages in order to reduce a Compact curtailment resulting in making water available to vested water rights in priority.
 - B. Replacement to the Rio Grande and Conejos.
 - i. During months when there is a compact curtailment on the Rio Grande or Conejos River at a rate of flow (in c.f.s.) equal to or greater than the rate of injurious stream depletions, then the following procedures shall be followed:
 - a) Direct flow replacement water made available by the Subdistrict, including its share of Closed Basin Project production, shall be credited against any then occurring injurious stream depletions.
 - b) The Subdistrict may provide water in storage for release by the Division Engineer. The Division Engineer may direct the release of the stored water on a daily basis, may release water early in the season in slug releases to enable the curtailment to be lowered for the season, or may elect to retain the water in storage and reduce the compact curtailment by an amount equal to the injurious stream depletions resulting from Subdistrict well pumping, and use the water in storage for subsequent compact delivery.
 - c) The Division Engineer shall recognize any over-delivery of replacement water in a given month as a Rio Grande Compact delivery in the month that it occurs and reduce the Compact curtailment in the following month or months in an amount equal to the accrued replacement credit of the Subdistrict.

- d) Transit losses assessed by Division Engineer shall be based upon the best available data on actual transit losses.
 - ii. During any month or part of a month when there is no compact curtailment, or the rate or location of compact curtailment is less than the then occurring injurious stream depletions resulting from Subdistrict Well pumping, the Subdistrict will deliver replacement water to the injuriously affected water rights by delivery to the Rio Grande or Conejos River, at or above the location of the stream depletions, water necessary to replace the then-occurring injurious stream depletions.
 - C. Replacement to other streams.
 - i. The monthly depletions by stream reach calculated by the Response Functions will be replaced in a manner that prevents injury, unless the owner of the injured vested water right has either waived any claim of injury, or agreed to accept compensation for the injury in a form other than water.
- 6. Type of information to be submitted to the State and Division Engineers to demonstrate the Subdistrict's ability to replace injurious stream depletions during the Plan Year.
 - A. Agreements between the Subdistrict and the Division Engineer to administer water that is available to replace injurious stream depletions.
 - B. Agreements between the Subdistrict and the ditch and reservoir companies that will provide water and/or storage space to the Subdistrict.
 - C. Leases, deeds, loans, options, substitute supply plans, decrees, change of water rights, operational plans used to actually make replacements, including estimated costs of activities.
 - D. Documents to prove that funds necessary to accomplish the above are or will be available.
- 7. Data submitted to the State Engineer to demonstrate the annual replacement will occur and that it will prevent injurious stream depletions.
 - A. The Subdistrict will cooperate with the Division Engineer and the Ditch and Reservoir companies to collect:
 - i. Diversion and stream flow records, Water Commissioner Daily Sheets, ditch and reservoir daily accounting sheets, Rio Grande Compact records showing deliveries and curtailment (10-day Reports) and any other records necessary to account for when and where the replacement water was released to the affected stream.

May 11, 2009

- B. The Subdistrict shall tabulate the data and submit it to the Division Engineer monthly during the Plan Year.
8. Data Regarding the Hydraulic Divide
- A. As part of the annual replacement plan the Subdistrict will submit to the Division Engineer a list of wells that it monitored during the prior Plan Year for purposes of determining the existence and location of the Hydraulic Divide. The list will identify the monitoring wells by Well ID Number and location. The Subdistrict will also submit measurement data for each such well from the past Plan Year.
 - B. The consulting engineer for the Subdistrict will submit a summary report analyzing the data and describing the current condition and location of the Hydraulic Divide.
9. Data Regarding Groundwater Storage
- A. As part of the annual replacement plan the Subdistrict will submit to the Division Engineer the tabulation of the five-year running average of Unconfined Aquifer storage levels. The tabulation will be based on Davis Engineering Service's Unconfined Aquifer Storage Study and will incorporate data from the prior five Plan Years.
10. Disclosure of Fallowed Lands Information
- A. As part of its annual replacement plan the Subdistrict will submit a copy of its required annual reporting to the USDA-FSA that includes the number of acres enrolled in CREP, the amount of money allocated to producers and the amount of water retired for those lands enrolled in CREP.
 - B. As part of its annual replacement plan the Subdistrict will provide a tabulation of total acreage within the Subdistrict boundaries that is participating in any fallowing program and a map showing the location of all fallowed lands.
11. Year-End Review of Plan Year Operation
- A. After the end of the irrigation season, and prior to the submission of the next year's annual replacement plan, the Subdistrict will recalculate the stream depletions caused by Subdistrict well pumping in the Plan Year using actual water use data and the appropriate Response Function to determine the adequacy of replacement operations during the Plan Year. The District will submit its report to the Division Engineer in a form approved by the Division Engineer. If the amount of replacement water provided by the Subdistrict was not sufficient to replace the injurious stream depletions during the Plan Year, then prior to the commencement of the next irrigation season the Subdistrict will:
 - i. Deliver to the Rio Grande and the Conejos River the amount of any unreplaced injurious stream depletions from the prior Plan Year, and the

May 11, 2009

Division Engineer will administer that water to the stateline as a Compact delivery for the respective stream system.

- ii. For surface water rights on streams that are not subject to curtailment under the standards of *Alamosa-La Jara Water Users v. Gould*, any unreplaced injurious stream depletions from the prior Plan Year will be added to the replacement requirements for the current next Plan Year.

12. Change of Water Rights.

- A. Any change of water rights necessary to implement this Plan will be obtained in the manner prescribed by law.