STATEMENT OF BASIS AND PURPOSE FOR THE AUGUST 20, 2010 RULEMAKING TO AMEND 5.2.7.1 AND 5.2.7.2 OF THE RULES AND REGULATIONS FOR THE MANAGEMENT AND CONTROL OF DESIGNATED GROUND WATER, RULE 2 C.C.R. 410-1

I. STATEMENT OF BASIS

Data demonstrates that the alluvial aquifer of the Upper Big Sandy Designated Basin should be identified as set forth in the changed Rule 5.2.7.1.

Data demonstrates that the net average annual rate of depletion of ground water in the alluvial aquifer of the Upper Big Sandy Designated Basin is in excess of the allowable net average annual depletion rate. Therefore the conditions of the aquifer warrant a designation of an overapproprated aquifer.

A. Specific Statutory Authority

The Commission's Rules and any amendments thereto are promulgated pursuant to section 37-90-111 (1)(h), C.R.S. to carry out the authority and responsibilities of the Commission to supervise and control the exercise and administration of rights acquired to the use of designated ground water. The proceedings were conducted pursuant to the Commission's Rules for Procedure for All Hearings before the Colorado Ground Water Commission, 2 CCR 402-3, as modified herein.

The Commission published the required Section 24-4-103 notice and invited public comment and participation during the adoption process. The proposed rule, and the Statement of Basis, Purpose and Specific Statutory Authority were made available to the public at least five (5) days prior to the hearing as required by Section 24-4-103 (4), C.R.S.

The Commission complied with the Sections 24-4-103 (3) and 103.5, C.R.S. notice requirements by providing a notice to the Office of the Secretary of State and publication thereof in the Colorado Register. Any written comments from the public concerning or resulting from the Notice of Rulemaking are included as an exhibit in the Rule hearing record.

The Hearing Officer for the Commission received reports and information on the proposal. No requests for formal Party Status were received. The petitioner, Upper Big Sandy Ground Water Management District ("District") submitted a motion for a summary ruling from the Hearing Officer, and Commission Staff agreed to have a summary ruling issued by the Hearing Officer. On June 18, 2010 the Hearing Officer found that that no Fact Finding Hearing was necessary and issued a Findings of Fact. On August 20, 2010, the Commission held a public hearing concerning the proposed amendment. Parties to the fact finding hearing as well as the general public were invited to make written and oral

statements. All comments, both in oral testimony at the hearing and by exhibits which were made part of the rulemaking record, were considered and responded to by the Commission. The specific reasons for the Commissions action is described in the record testimony and exhibits. All rule provisions resulting from these proceedings will be based upon the record of the August 20, 2010 public hearing.

The Commission states that each of the five standards required by Section 24-4-103 (4) (b), C.R.S. has been met. The record of this proceeding demonstrates the need for and the benefit to be derived from the adoption of the amendment to the Rule, and demonstrates that the amendment to the Rule needs to be adopted as directed by Colorado statutes pursuant to Section 37-90-111 (1)(h), C.R.S. To the extent practicable, the amendment is clearly and simply stated. The amendment to the Rule does not conflict with other provisions of law.

II. PURPOSE

The purpose of the amendment to the Rule 5.2.7.1 is to better define the extent of the alluvial aquifer of the Upper Big Sandy Designated Basin. The purpose of the amendment to the Rule 5.2.7.2 is to designate the alluvial aquifer of the Upper Big Sandy Designated Basin as overappropriated, and to require replacement plans for new large capacity wells in that aquifer.

III. ANALYTICAL EVALUATION OF THE RATIONAL JUSTIFYING THE RULE

Rule 4.J.6 of the Rules for Procedure for All Hearings before the Colorado Ground Water Commission requires that after considering the relevant data presented at the public hearing, the Commission shall include as part of a rule or incorporate by reference in the rule adopted, a detailed, analytical evaluation of the scientific or technological rationale justifying the rule, if the proposed rule involves scientific or technological issues. Because the data supporting the amendment involves scientific and/or technological issues, the analytical evaluation is set forth below.

1. Martin and Wood Water Consultants, Inc. conducted an analysis of the Basin and developed a Water Balance Report in June 2009.[1] The analysis consisted of field investigations, geologic and hydrologic literature review, probe hole drillings, soil analysis, etc., to develop an interpolation and understanding of the saturated alluvial extent of the basin.

2. As of June 2008, the basin has approximately 1,600 permitted wells. Approximately 45 percent of the wells can produce water from the alluvial aquifer. Ninety-eight wells have a final permit (FP) designation in the DWR

[1] The report is entitled "Upper Big Sandy Designated Ground Water Basin Phase 2 Water Balance Report, June 2009," Martin and Wood Water Consultants

database and twenty-four wells have a conditional (F) designation. The remaining 55 percent of the wells are permitted for household or domestic use.

3. Sedimentary bedrock (the Denver Basin) underlies the alluvial unconsolidated deposits at issue herein. These unconsolidated deposits consist of sand and gravel containing thin beds of silt and clay.

4. The mapped alluvial deposits are confined to the bottoms of the alluvial valleys within the District.

5. The District estimates an average hydraulic conductivity value of 1,586 gpd/ft^2. This estimate appears to be reasonable.

6. The District estimates the specific yield (Sy) values to be 20 to 25 percent for the Big Sand Creek mainstem area east of Matheson, 30 to 35 percent for the Big Sandy Creek mainstem area west of Matheson, and 23 percent for the Big Sandy tributaries. These values appear to be reasonable estimates for the basin.

7. The major component of inflow to the alluvial aquifer is natural recharge from precipitation, accounting for more than 90 percent of aquifer recharge. Minor components of recharge include return flows from irrigation and municipal wastewater return flows. The majority of outflow from the basin is irrigation pumping and phreatophyte consumptive use. Minor outflow occurs through municipal pumping, underflow leaving the basin and stock watering.

8. The District estimates a total saturated alluvial volume of between approximately 385,000 and 454,000 acre-feet. These estimates appear to be reasonable.

9. The average year water balance in depicted on the District's Table 4 (attached). This indicates a total inflow of 16,677 acre-feet (af) per year and a total outflow of 18,767 af per year. The annual change in storage is negative 2,090 af per year. Using this water balance estimate at the current average rate of use it is estimated there will be 92 to 150 years of additional useable life of the aquifer (based on an estimate of 50 to 70 percent of the total water in storage in the alluvium as being recoverable).

10. The dry year annual change in storage is negative 5,990 af per year, with a wet year change in storage equaling 7,510 af per year.

11. The District also conducted a "Permitted Pumping Water Balance" analysis (see Table 9, attached). Relevant permitted wells within the basin are allowed to withdraw 13,860 acre-feet on an annual basis. This analysis indicates outflow exceeding inflow by approximately 10,060 acre-feet on an

annual basis. Using this analysis and the fully permitted and allowed for use in the basin it is estimated there will only be 19 to 32 years of useable aquifer life (based on an estimate of 50 to 70 percent of the total water in storage in the alluvium as being recoverable).

12. Staff reviewed the analysis as provided by the District and concluded that the description of the alluvial aquifer should be expanded slightly to include all unconsolidated material above bedrock within the basin outside of the area as identified in the District's Figure 3 (attached) that is hydraulically connected to the Big Sandy Creek alluvium. The District concurs with Staff's recommendations, and this recommendation appears to be reasonable.

13. The analysis indicates that the increase in stored water in the alluvial aquifer during wet years has not been sufficient to offset the depletions occurring during dry and normal years resulting in a corresponding reduction in the alluvial water table and that water levels "are likely to generally decrease unless there is an extended period of wet years or multiple wet years" and the basin is over-appropriated .[2]

[2] Phase 2 Water Balance, Martin and Wood Water Consultants, p. 62

Table 4
Average Year Water Balance
Upper Big Sandy Designated Ground Water Basin
Phase 2 Water Balance Report

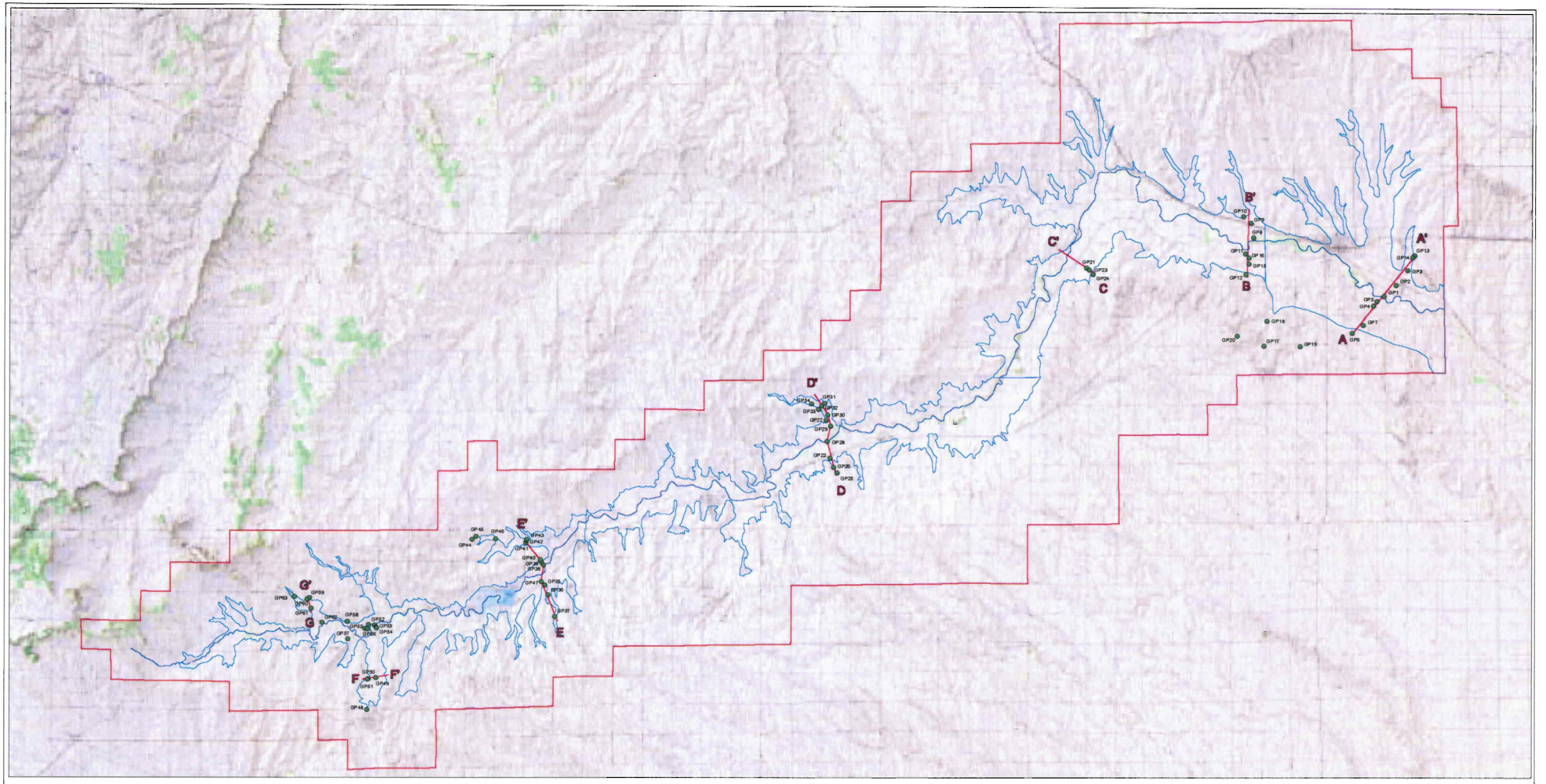
AVERAGE YEAR WATER BALANCE	
Inflows	
Precipitation Recharge (acre-feet)	15,400
Irrigation Return Flows (from all irrigation) (acre-feet)	680
Municipal Wastewater Return Flow (acre-feet)	597
Total Inflow	**16,677**
Outflows	
Irrigation Pumping from Alluvial Aquifer (acre-feet)	4,500
Phreatophyte Consumptive Use (acre-feet)	10,780
Municipal Pumping from Alluvial Aquifer (acre-feet)	1,017
Underflow Leaving the Basin (acre-feet)	2,300
Stock Watering (acre-feet)	170
Total Outflow	**18,767**
Annual Change in Storage (Balance)	**-2,090**

All values based on estimates developed for the water balance analysis.

Table 9
Water Balance Based on Permitted Pumping
Upper Big Sandy Designated Ground Water Basin
Phase 2 Water Balance Report

PERMITTED PUMPING WATER BALANCE	
Inflows	
Precipitation Recharge (acre-feet)	15,400
Irrigation Return Flows (from all irrigation) (acre-feet)	1,650
Municipal Wastewater Return Flow (acre-feet)	0
Total Inflow	**17,050**
Outflows	
Irrigation Pumping from Alluvial Aquifer (acre-feet)	11,000
Phreatophyte Consumptive Use (acre-feet)	10,780
Municipal Pumping from Alluvial Aquifer (acre-feet)	2,860
Underflow Leaving the Basin (acre-feet)	2,300
Stock Watering (acre-feet)	170
Total Outflow	**27,110**
Annual Change in Storage (Balance)	**-10,060**

All values based on estimates developed for the water balance analysis.



Legend

- Test Hole Locations
- Big Sandy Creek
- Cross Section Locations
- Interpolated Saturated Alluvial Extent
- Upper Big Sandy Basin Boundary

N W E S

0 2.5 5 10 Miles

Job No.:	694.4
Date:	4-8-2009
Drawn:	WRB
Checked:	PLM

Upper Big Sandy
Phase 2 Water Balance

Interpolated Saturated Alluvial Extent,
Cross Section Locations, and Test Hole Locations
Figure 3

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S:\694 - Upper Big Sandy Mgmt Dist\694.4 - Severance Tax\GIS\Saturated Alluvial Extent and Cross Section Locations.mxd

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