GAM Run 09-34 Addendum: Additional Information for Predictive Scenario Run in the Carrizo-Wilcox, Queen City, and Sparta Aquifers for Groundwater Management Area 13

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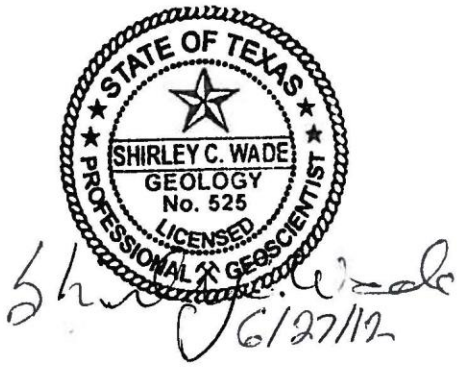
June 27, 2012



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GAM RUN 09-34 ADDENDUM: ADDITIONAL INFORMATION FOR PREDICTIVE SCENARIO RUN IN THE CARRIZO-WILCOX, QUEEN CITY, AND SPARTA AQUIFERS FOR GROUNDWATER MANAGEMENT AREA 13

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EXECUTIVE SUMMARY:

We summarized average drawdown per groundwater district based on the updated district boundaries for Plum Creek Conservation District and Gonzales County Underground Water Conservation District in order to be consistent with the boundaries used to summarize the modeled available groundwater (MAG) amounts in GAM Run 10-012 MAG. The average drawdown in Plum Creek Conservation District is about 10 percent greater (109 feet versus 97 feet) in the Carrizo Aquifer and somewhat less in the other units as compared with scenario 4 drawdown averages in GAM Run 09-034. For all other groundwater conservation districts the drawdown averages are the same as reported in GAM Run 09-34.

REQUESTOR:

This report is supplemental information for a run requested by Mr. Mike Mahoney from the Evergreen Underground Water Conservation District acting on behalf of Groundwater Management Area 13.

DESCRIPTION:

Tables of average drawdown per groundwater conservation district shown in GAM Run 09-34 (Wade and Jigmond, 2010) were based on groundwater district boundaries from September 2009. In early 2012, the boundaries for Plum Creek Conservation District and Gonzales County Underground Water Conservation District were revised and draft modeled available groundwater amounts (Wade, 2012) were released based on the new boundaries. This addendum presents groundwater district average drawdown for

scenario 4 based on the same groundwater district boundaries that the modeled available groundwater amounts were based on.

PARAMETERS AND ASSUMPTIONS:

Details on the parameters and assumptions are provided in the report for GAM Run 09-034 (Wade and Jigmond, 2010).

METHODS AND RESULTS:

We extracted water level drawdown relative to 1999, the final year of the calibration period, from the scenario 4 model results and summarized average drawdown per groundwater conservation district at the end of the 61-year simulation period (Table 1). The average drawdown in Plum Creek Conservation District is about 10 percent greater (109 feet versus 97 feet) in the Carrizo Aquifer and somewhat less in the other units as compared with scenario 4 drawdown in GAM Run 09-034 (Wade and Jigmond, 2010). However, for all other groundwater conservation districts the drawdown averages are the same as reported in GAM Run 09-34 (Wade and Jigmond, 2010).

TABLE 1. AVERAGE 2060 DRAWDOWN IN FEET PER GROUNDWATER CONSERVATION DISTRICT FOR GAM RUN 09-034 (WADE AND JIGMOND, 2010) SCENARIO 4.

Groundwater Conservation District	Groundwater Management Area 13 drawdown (feet) – GR 09-034 scenario 4								
	Sparta	Weches	Queen City	Reklaw	Carrizo	Layer 6	Layer 7	Layer 8	Wilcox Overall
Evergreen UWCD	9	12	9	35	63	62	64	107	78
Gonzales County UWCD	21	25	30	57	97	97	90	85	91
Guadalupe County GCD	0	0	-11	5	54	52	20	31	30
McMullen GCD	25	29	32	39	45	44	12	9	22
Medina County GCD	0	0	0	-1	29	29	28	28	28
Plum Creek CD	0	0	0	18	109	108	35	69	57
Uvalde County UWCD	0	0	0	0	1	0	12	30	22
Wintergarden GCD	5	6	0	-4	0	0	-9	-10	-7

LIMITATIONS:

The groundwater model used in completing this analysis is the best available scientific tool that can be used to meet the stated objective(s). To the extent that this analysis will be used for planning purposes and/or regulatory purposes related to pumping in the past and into the future, it is important to recognize the assumptions and limitations associated with the use of the results. In reviewing the use of models in environmental regulatory decision making, the National Research Council (2007) noted:

> "Models will always be constrained by computational limitations, assumptions, and knowledge gaps. They can best be viewed as tools to help inform decisions rather than as machines to generate truth or make decisions. Scientific advances will never make it possible to build a perfect model that accounts for every aspect of reality or to prove that a given model is correct in all respects for a particular regulatory application. These characteristics make evaluation of a regulatory model more complex than solely a comparison of measurement data with model results."

A key aspect of using the groundwater model to evaluate historic groundwater flow conditions includes the assumptions about the location in the aquifer where historic pumping was placed. Understanding the amount and location of historic pumping is as important as evaluating the volume of groundwater flow into and out of the district, between aquifers within the district (as applicable), interactions with surface water (as applicable), recharge to the aquifer system (as applicable), and other metrics that describe the impacts of that pumping. In addition, assumptions regarding precipitation, recharge, and streamflow are specific to a particular historic time period.

Because the application of the groundwater model was designed to address regional scale questions, the results are most effective on a regional scale. The TWDB makes no warranties or representations relating to the actual conditions of any aquifer at a particular location or at a particular time.

It is important for groundwater conservation districts to monitor groundwater pumping and overall conditions of the aquifer. Because of the limitations of the groundwater model and the assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine this analysis in the future given the reality of how the aquifer responds to the actual amount and location of pumping now and in the future. Historic precipitation patterns also need

to be placed in context as future climatic conditions, such as dry and wet year precipitation patterns, may differ and affect groundwater flow conditions.

REFERENCES:

National Research Council, 2007, Models in Environmental Regulatory Decision Making. Committee on Models in the Regulatory Decision Process, National Academies Press, Washington D.C., 287 p.

Wade S., 2012 Draft GAM Run 10-012 MAG: Modeled Available Groundwater for the Carrizo-Wilcox, Queen City, and Sparta Aquifers in Groundwater Management Area 13, Texas Water Development Board GAM Run Report, 19 p.

Wade S.C. and Jigmond, M., 2010, GAM Run 09-034, Texas Water Development Board GAM Run Report, 146 p.