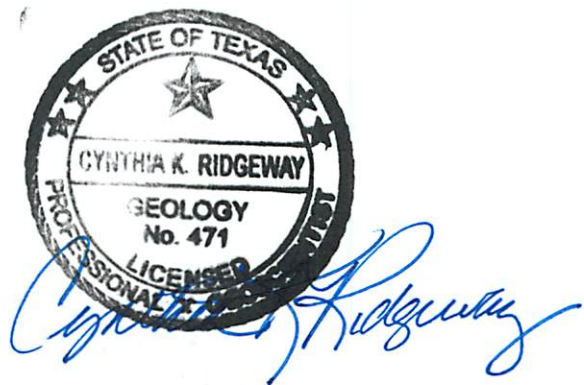


# GAM Run 10-025

by Mr. Wade Oliver

Texas Water Development Board  
Groundwater Availability Modeling Section  
(512) 463-3132  
September 9, 2010



Cynthia K. Ridgeway is the Manager of the Groundwater Availability Modeling Section and is responsible for oversight of work performed by employees under her direct supervision. The seal appearing on this document was authorized by Cynthia K. Ridgeway, P.G. 471, on September 9, 2010.

**EXECUTIVE SUMMARY:**

This report was completed to provide additional information on the estimated drawdown in Polk and Washington counties based on the predictive pumping scenarios described in Groundwater Availability Modeling Task 10-012. The additional results include the estimated average drawdown and corresponding pumping in each unit of the Yegua-Jackson Aquifer for each scenario.

**REQUESTOR:**

Mr. Lloyd Behm of Bluebonnet Groundwater Conservation District on behalf of Groundwater Management Area 14

**DESCRIPTION OF REQUEST:**

Mr. Behm requested we provide estimates of average drawdown for Polk and Washington counties for each of the units comprising the Yegua-Jackson Aquifer based on the predictive simulations presented in Groundwater Availability Modeling Task 10-012 (Oliver, 2010).

**METHODS:**

As described in Oliver (2010), several predictive simulations were run between 2010 and 2060 using the groundwater availability model for the Yegua-Jackson Aquifer. In Oliver (2010), drawdown results for each of the ten scenarios were presented for Groundwater Management Area 14 – including Polk and Washington counties – for the Yegua-Jackson Aquifer as a whole. At the request of Groundwater Management Area 14, we have subdivided the drawdown results for each hydrogeologic unit comprising the Yegua-Jackson Aquifer in these counties. For oldest to youngest these units are the lower Yegua, upper Yegua, lower Jackson, and upper Jackson. In addition we have also subdivided the pumping into each unit for each of the scenarios.

In the groundwater availability model for the Yegua-Jackson Aquifer, the uppermost layer represents the outcrop portions of the aquifer and the overlying Catahoula unit. Each of the lower layers represents the subcrop portion of one of the units of the aquifer. In the results presented here, care was taken to ensure that the proper cells representing each hydrogeologic unit, regardless of layer, were used to calculate the pumping and average drawdown between 2010 and 2060.

See Oliver (2010) for more information on the methods and assumptions used for the model simulations. Notably, each of the simulations was run using average recharge. Also, the model results were extracted from all areas representing the units of the Yegua-Jackson Aquifer in the groundwater availability model. This includes some areas outside the “official” boundary of the aquifer shown in the 2007 State Water Plan (TWDB, 2007). For this reason, the reported drawdowns may reflect water of quality ranging from fresh to brackish and saline. For information on the development, assumptions, and limitations of the groundwater availability model, refer to the model report (Deeds and others, 2010).

**RESULTS:**

Table 1 below shows the pumping and average drawdown in Polk and Washington counties divided by hydrogeologic unit for each of the scenarios described in Oliver (2010). The overall pumping and average drawdown in the Yegua-Jackson Aquifer in each county has also been included for comparison.

Table 1. Pumping and average drawdown between 2010 and 2060 for each hydrogeologic unit of the Yegua-Jackson Aquifer in Polk and Washington counties by scenario. Negative drawdown values indicate a water-level rise.

County	Unit	Drawdown by scenario (feet)									
		0.4	0.6	0.8	Base	1.3	1.6	1.9	2.5	3	4
Polk	Overall	-1	0	1	2	4	6	7	9	12	15
	Upper Jackson	0	1	2	3	5	6	7	10	12	16
	Lower Jackson	1	2	3	4	5	6	7	8	10	13
	Upper Yegua	-2	0	1	2	4	5	6	8	10	13
	Lower Yegua	-4	-2	0	1	4	6	7	11	14	19
Washington	Overall	-2	-2	-2	-2	-1	-1	-1	-1	-1	-1
	Upper Jackson	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Lower Jackson	-2	-2	-2	-1	-1	-1	-1	-1	-1	-1
	Upper Yegua	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1
	Lower Yegua	-2	-2	-2	-2	-2	-2	-2	-2	-2	-1
		Pumping by scenario (acre-feet per year)									
Polk	Overall	144	216	288	360	468	576	684	900	1,080	1,440
	Upper Jackson	143	215	287	358	466	573	681	896	1,075	1,434
	Lower Jackson	1	1	1	2	2	3	3	4	5	6
	Upper Yegua	0	0	0	0	0	0	0	0	0	0
	Lower Yegua	0	0	0	0	0	0	0	0	0	0
Washington	Overall	54	80	107	134	174	214	255	335	402	536
	Upper Jackson	31	47	62	78	98	119	139	180	214	282
	Lower Jackson	22	33	43	54	73	93	112	151	183	247
	Upper Yegua	1	1	1	2	2	3	3	4	5	7
	Lower Yegua	0	0	0	0	0	0	0	0	0	0

**REFERENCES:**

Deeds, N.E., Yan, T., Singh, A., Jones, T.L., Kelley, V.A., Knox, P.R., Young, S.C., 2010, Groundwater availability model for the Yegua-Jackson Aquifer: Final report prepared for the Texas Water Development Board by INTERA, Inc., 582 p.

Oliver, W., 2010, GAM Task 10-012: Texas Water Development Board, GAM Task 10-012 Report, 48 p.

Texas Water Development Board, 2007, Water for Texas – 2007 – Volumes I-III; Texas Water Development Board Document No. GP-8-1, 392 p.