Draft GAM Task 10-005

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EXECUTIVE SUMMARY

This report presents results of a GAM Task that was requested at the May 10, 2010 Groundwater Management Area 9 meeting in Kerrville. This task represents an expansion of the GAM run requested by Groundwater Management Area 9 (Chowdhury, 2010) and the supplement of that GAM run request (Hutchison, 2010), both of which were discussed at the May 10, 2010 Groundwater Management Area 9 meeting.

The simulations completed as part of this task include seven pumping scenarios of the Trinity Aquifer that range from zero pumping to about twice current pumping. Each scenario included running 387 50-year simulations. The 387 50-year simulations were developed based on tree-ring precipitation estimates from 1537 to 1972 for the Edwards Plateau (Cleaveland, 2006). The results were used to evaluate the relationships between pumping versus drawdown, spring and base flow and outflow across the Balcones Fault Zone.

Results from the Task were summarized Groundwater Management Area-wide, by county, and by three areas designated by Mr. Ron Fieseler, General Manager of the Blanco-Pedernales Groundwater Conservation District. Because each scenario consisted of 387 50-year simulations, the results can also be expressed in terms of minimum, average, and maximum, as well as values that are exceeded 5 percent of the time and values that are exceeded 95 percent of the time.

ORIGIN OF TASK:

During the course of the May 10, 2010 Groundwater Management Area 9 meeting, there was consensus to complete these 50-year simulations to provide additional information to the groundwater conservation districts in Groundwater Management Area 9

DESCRIPTION OF TASK:

The simulations completed as part of this task include seven pumping scenarios of the Trinity Aquifer that range from zero pumping to about twice current pumping. Each scenario included running 387 50-year simulations. The 387 50-year simulations were developed based on tree-ring precipitation estimates from 1537 to 1972 for the Edwards Plateau (Cleaveland, 2006). The results were used to evaluate the relationships between pumping versus drawdown, spring and base flow and outflow across the Balcones Fault Zone.

METHODS:

The original request (Chowdhury, 2010) included model runs that included predictive simulations using the Hill Country portion of the Trinity Aquifer model to assess the effects of drought and increased pumping on water levels, baseflow, and flow across the Balcones Fault Zone. The requested runs consisted of 50-year simulations, some with 50

years of average recharge, and some with 43 years of average recharge followed by 7 years of drought-of-record conditions. The runs also included various combinations of pumping at 2008 levels, one and a half times the 2008 pumping levels, and one and a half times 2008 pumping levels which were reduced to 2008 pumping levels during droughts.

The supplement (Hutchison, 2010) included seven separate scenarios. Three of the scenarios assumed constant pumping (i.e. no drought reduction), and four scenarios assumed a 33 percent pumping reduction during drought years. Each scenario included 430 7-year simulations based on tree-ring precipitation estimates from 1537 to 1972 for the Edwards Plateau (Cleaveland, 2006).

These simulations involve varying recharge based on the Cleaveland (2006) tree-ring dataset, but include 387 50-years simulations, as detailed below.

Precipitation and Recharge

The 50-year running average of the tree-ring precipitation is presented in Figure 1. Note that the precipitation for the 50-year period ending in 1593 is about 96 percent of average, and represents the driest 50 year period in the record. Aside from the generally dry conditions in the late 1500s and early 1600s, there are three other relatively dry periods in the early 1800s, the early 1900s, and the most recent period that ended in 1972 (at the end of the record).

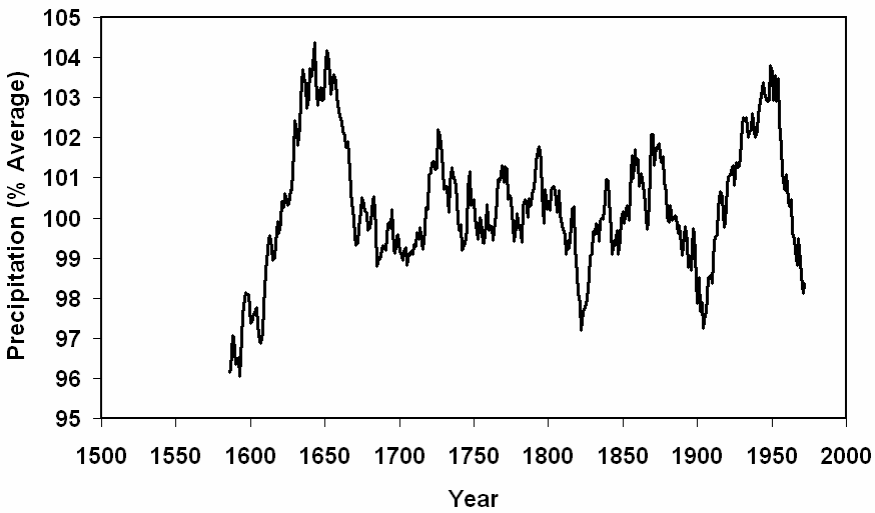

Figure 1. 50-year running average precipitation in the Edwards Plateau region of Texas based on tree-ring data (data from Cleaveland, 2006).

These tree-ring precipitation data were used to develop 387 separate recharge input files based on the relationship between precipitation and recharge during the model calibration period as shown in Figure 2.

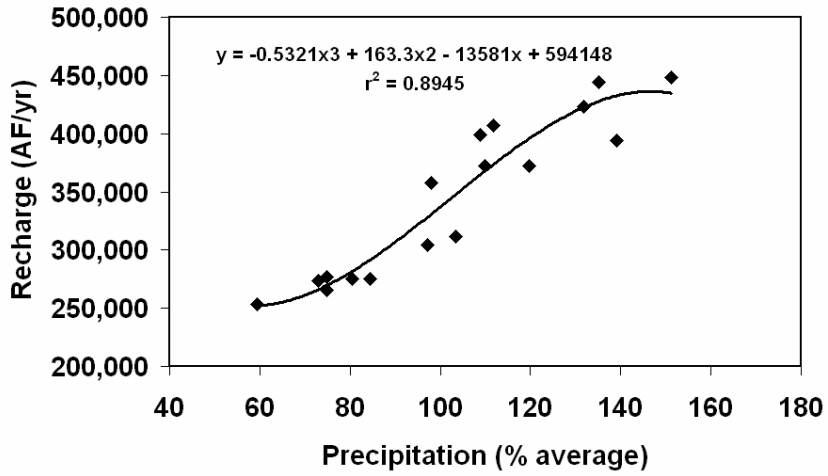

Figure 2. Precipitation versus recharge in Hill Country model from 1981 to 1997

Pumping

Pumping in the original request was based on 2008 pumping, and in some runs, was increased to one-and-a-half times the 2008 pumping. As reported in the main report (Chowdhury, 2010) 2008 pumping totaled 61,248 acre-feet per year. One-and-a-half times 2008 pumping totaled 89,921 acre-feet per year. Pumping scenarios in the supplemental runs (Hutchison, 2010) were based on an analysis of 2008 pumping and 2007 State Water Plan groundwater availability estimates. Pumping ranged from about 64,000 acre-feet per year to about 119,000 acre-feet per year.

For this Task, seven pumping scenarios were developed. The groundwater districts in Groundwater Management Area 9 updated their estimates of 2008 pumping, as detailed in Table 1. Total 2008 pumping is about 60,000 acre-feet per year.

The seven scenarios were based on varying the 2008 pumping as follows (all pumping amounts are from the Trinity Aquifer and are approximate):

- Scenario 1 = 0 acre-feet per year
- Scenario 2 = 20,000 acre-feet per year
- Scenario 3 = 40,000 acre-feet per year
- Scenario 4 = 60,000 acre-feet per year (2008 conditions)
- Scenario 5 = 80,000 acre-feet per year
- Scenario 6 = 100,000 acre-feet per year
- Scenario 7 = 120,000 acre-feet per year

Table 2. Estimated 2008 Pumping as Provided by Groundwater Conservation Districts in Groundwater Management Area 9

County	Edwards Group of the Edwards-Trinity (Plateau) Aquifer	Upper Trinity Aquifer	Middle Trinity Aquifer	Lower Trinity Aquifer	Total Pumping (County)
Bandera	631	288	3567	515	**5,000**
Bexar	0	693	14110	197	**15,000**
Blanco	0	77	1,477	0	**1,554**
Comal	0	398	5,788	0	**6,186**
Hays	0	416	4,800	449	**5,665**
Kendall	315	300	6,060	325	**7,000**
Kerr	1,035	213	6,263	5,534	**13,045**
Medina	0	0	500	1000	**1,500**
Travis	0	551	4,967	0	**5,518**
Total pumping (aquifer)	**1,981**	**2,936**	**47,532**	**8,020**	**60,468**

PARAMETERS AND ASSUMPTIONS:

- As in the requested runs and the supplemental runs, the recently updated groundwater availability model (version 2.01) for the Hill Country portion of the Trinity Aquifer developed by Jones and others (2009) was used for these simulations (see Mace and others (2000) and Jones and others (2009) for details on model construction, recharge, discharge, assumptions, and limitations of the model).

- The model has four layers: layer 1 represents the Edwards Group of the Edwards-Trinity (Plateau) Aquifer, layer 2 represents the Upper Trinity Aquifer, layer 3 represents the Middle Trinity Aquifer, and layer 4 represents the Lower Trinity Aquifer.

- The rivers, streams, and springs were simulated in the model using MODFLOW's Drain package. MODFLOW's Drain package was also used to simulate spring discharge along bedding contacts of the Edwards Group (Plateau) and the Upper

Trinity Aquifer in the northwestern parts of the model area. This resulted in the assignment of numerous drain cells along this outcrop contact.

- Seven different pumping scenarios were used as described above
- 387 recharge input files were developed as described above.
- Each simulation consisted of 50 stress periods. Initial conditions were assumed to be equivalent to 2008 conditions.
- The model was run with MODFLOW-96 (Harbaugh and McDonald, 1996)

RESULTS:

Similar to the supplemental runs (Hutchison, 2010), results from this Task focused on drawdown impacts, impacts to spring and base flow, and impacts to outflow across the Balcones Fault Zone. Results are summarized Groundwater Management Area-wide and by county. In addition, results are presented for three areas within Groundwater Management Area 9 as designated by Mr. Ron Fieseler, General Manager of the Blanco-Pedernales Groundwater Conservation District. These areas are defined as follows:

- Area 1 – Comal, Hays and Travis Counties
- Area 2 – Bexar and Medina Counties
- Area 3 – Bandera, Blanco, Kendall and Kerr Counties

Because each scenario consisted of 387 50-year simulations, the results can also be expressed in terms of minimum, average, and maximum, as well as values that are exceeded 5 percent of the time and values that are exceeded 95 percent of the time.

All drawdown results are expressed as drawdown from 2008 initial conditions at the end of the simulation (50 years). All flow data (spring flow, baseflow, outflow across the Balcones Fault Zone) are calculated using the results from each year of the 387 50-year simulations.

Summary tables of all results (for all of Groundwater Management Area 9, by the portions of the counties located within the model, and by area) are presented in Appendix A.

Figure 3 summarizes the relationship between Groundwater Management Area 9 pumping and overall Trinity Aquifer drawdown after 50 years (averaged over the entire Groundwater Management Area) for all seven pumping scenarios. For purposes of this analysis, overall Trinity Aquifer drawdown includes the Trinity Aquifer and the Trinity portion of the Edwards-Trinity (Plateau) Aquifer.

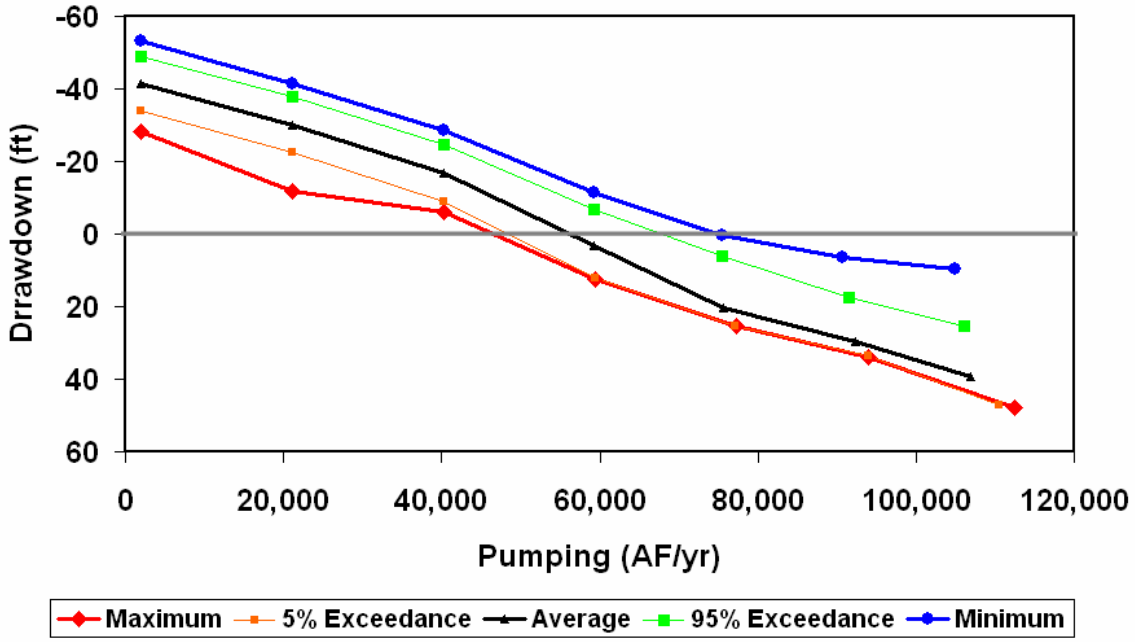

Figure 3. Pumping versus overall Trinity Aquifer drawdown after 50 years for all scenarios for Groundwater Management Area 9

Note that, as expected, increases in pumping result in increases in drawdown. The nature of these simulations provides an opportunity to evaluate drawdown in terms of the minimum value (out of all 387 simulations), 95 percent exceedance value (drawdown that is exceeded 95 percent of the time based on the 387 simulations), the average drawdown (out of all 387 simulations), 5 percent exceedance value (drawdown that is exceeded 5 percent of the time based on the 387 simulations), and the maximum value (out of all 387 simulations).

When pumping is about 60,000 acre-feet per year (the estimated 2008 pumping), average drawdown is near zero, which is expected since this pumping represents no change from 2008 conditions. However, it ranges from 12 feet of drawdown (representative of when a 50-year period ends in dry conditions) to about 12 feet of recovery (representative of when a 50-year period ends in wet conditions).

When pumping is about 1.5 times current pumping (92,000 acre-feet per year), average drawdown is about 29 feet after 50 years, with a range of between 6 to 33 feet depending on conditions at the end of the 50-year period.

Figure 4 summarizes the relationship between pumping and spring and base flow (averaged over the entire Groundwater Management Area) for all seven scenarios.

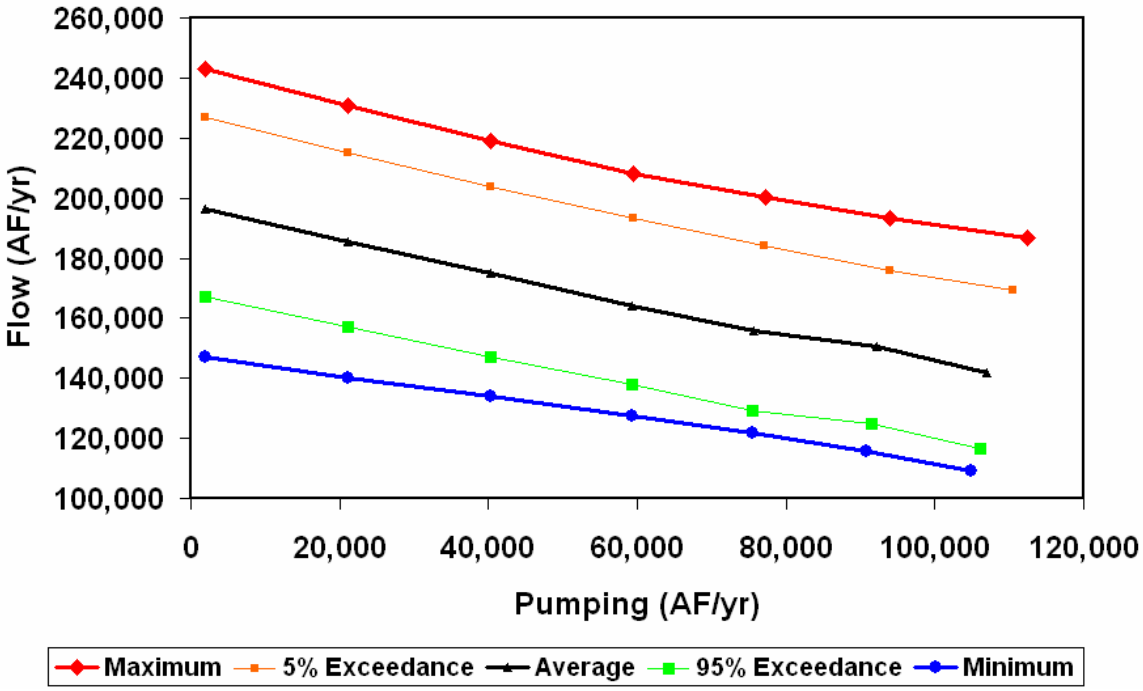

Figure 4. Pumping versus spring and base flow for all scenarios for Groundwater Management Area 9

As expected, pumping increases result in reductions in spring and base flow as the pumping captures this water prior to its discharge. It can be seen that, based on average values, 2008 pumping rates (approximately 60,000 acre-feet per year) result in an average spring and base flow of about 164,000 acre-feet per year. Zero pumping would result in a spring and base flow of about 197,000 acre-feet per year. Thus the impact of pumping 60,000 acre-feet per year includes a reduction in spring and base flow of about 33,000 acre-feet per year. If pumping were increased to 92,000 acre-feet per year (about 1.5 times the 2008 pumping rate), spring and base flow would be reduced, on average, to about 150,000 acre-feet per year. Thus an increase in pumping from 2008 levels of about 32,000 acre-feet per year would result in a reduction of 14,000 acre-feet per year in spring and base flow.

Figure 5 summarizes the relationship between pumping and outflow across the Balcones Fault Zone (averaged over the entire Groundwater Management Area) for all seven scenarios. As expected, pumping increases result in reductions in outflow across the Balcones Fault Zone as the pumping captures this water prior to its discharge. It can be seen that, based on average values, 2008 pumping rates result in an average outflow of 62,000 acre-feet per year. Zero pumping would result in a spring and base flow of about 81,000 acre-feet per year. Thus, the impact of pumping 60,000 acre-feet per year includes a reduction in Balcones Fault Zone outflow of about 19,000 acre-feet per year. If pumping were increased to 92,000 acre-feet per year (about 1.5 times the 2008 pumping rate), Balcones Fault Zone outflow would be reduced, on average, to about

50,000 acre-feet per year. Thus an increase in pumping from 2008 levels of about 32,000 acre-feet would result in a reduction of about 12,000 acre-feet per year in Balcones Fault Zone outflow.

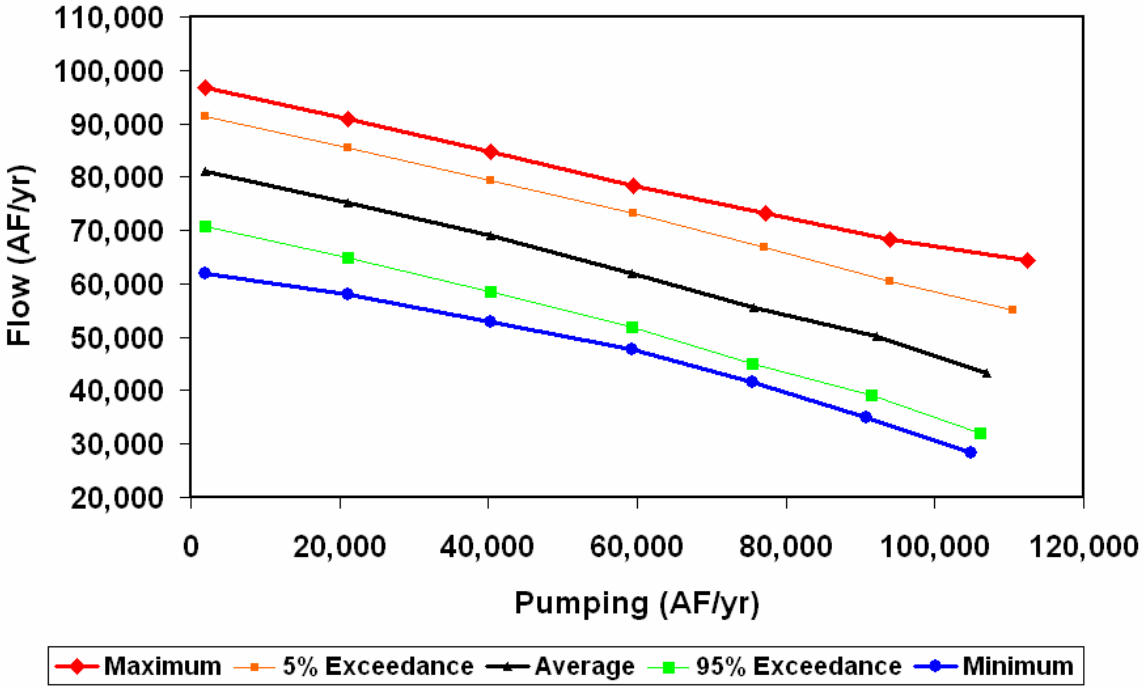

Figure 5. Pumping versus outflow across the Balcones Fault Zone for all scenarios for Groundwater Management Area 9

Figures 6, 7 and 8 summarize pumping versus the average Groundwater Management Area 9 drawdown in the upper, middle and lower Trinity Aquifer, respectively. Note that increases in pumping have less impact in the Upper Trinity Aquifer drawdown, presumably due to the buffering effect of surface water and the smaller amount of pumping in this aquifer compared with the Middle and Lower Trinity units.

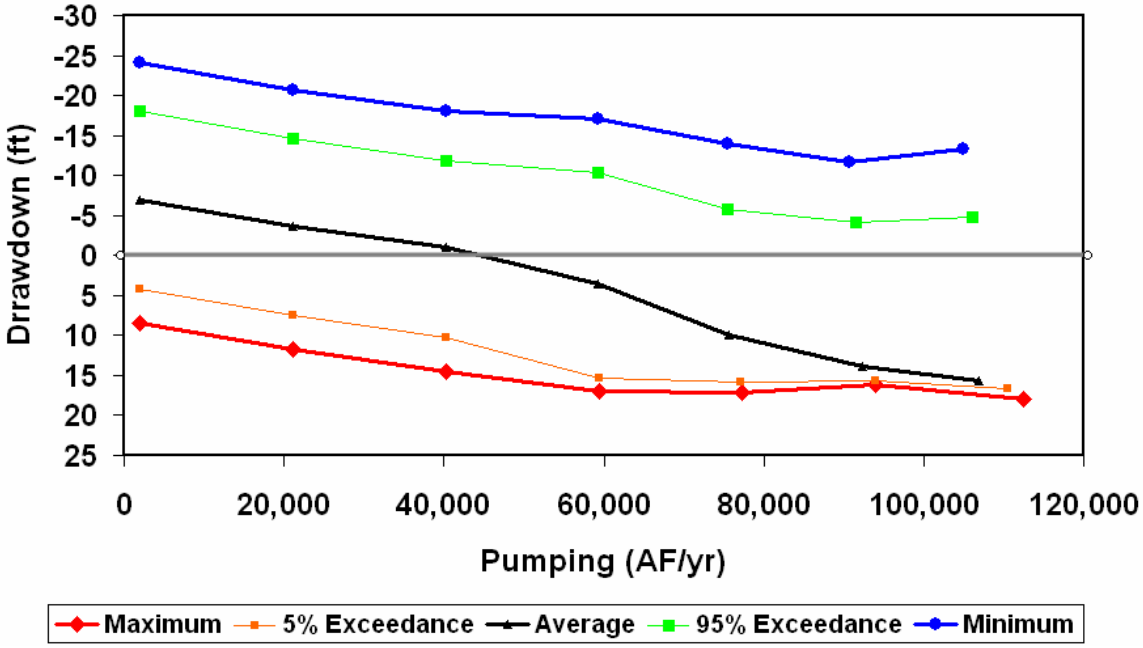

Figure 6. Pumping versus drawdown after 50 years in the Upper Trinity Aquifer for all scenarios for Groundwater Management Area 9

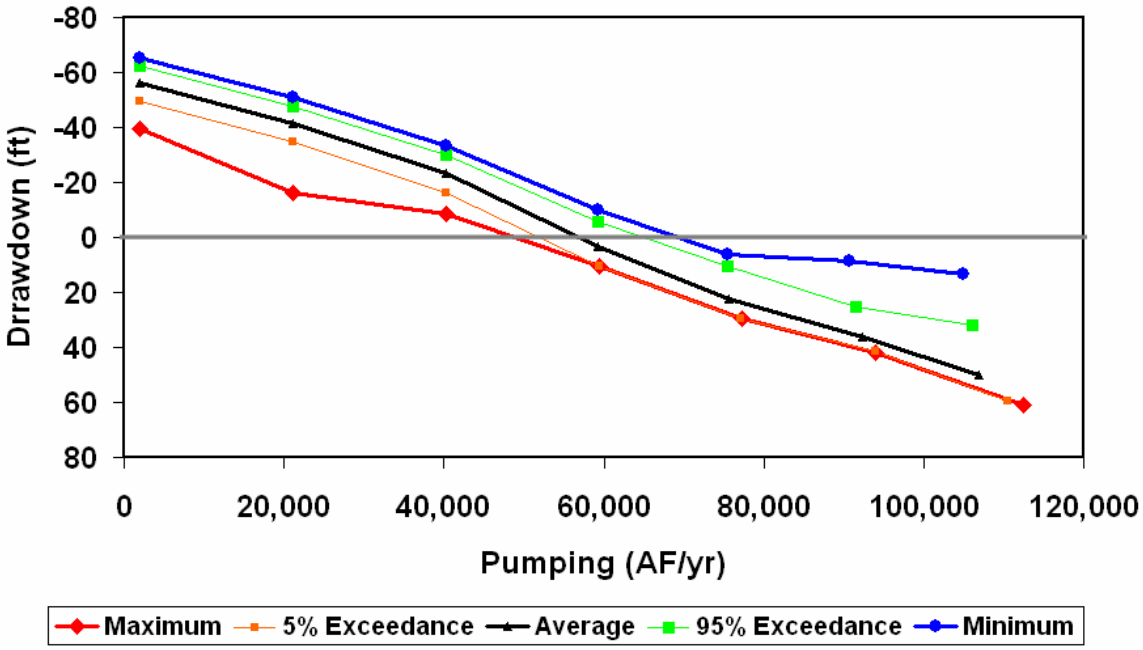

Figure 7. Pumping versus drawdown after 50 years in the Middle Trinity Aquifer for all scenarios for Groundwater Management Area 9

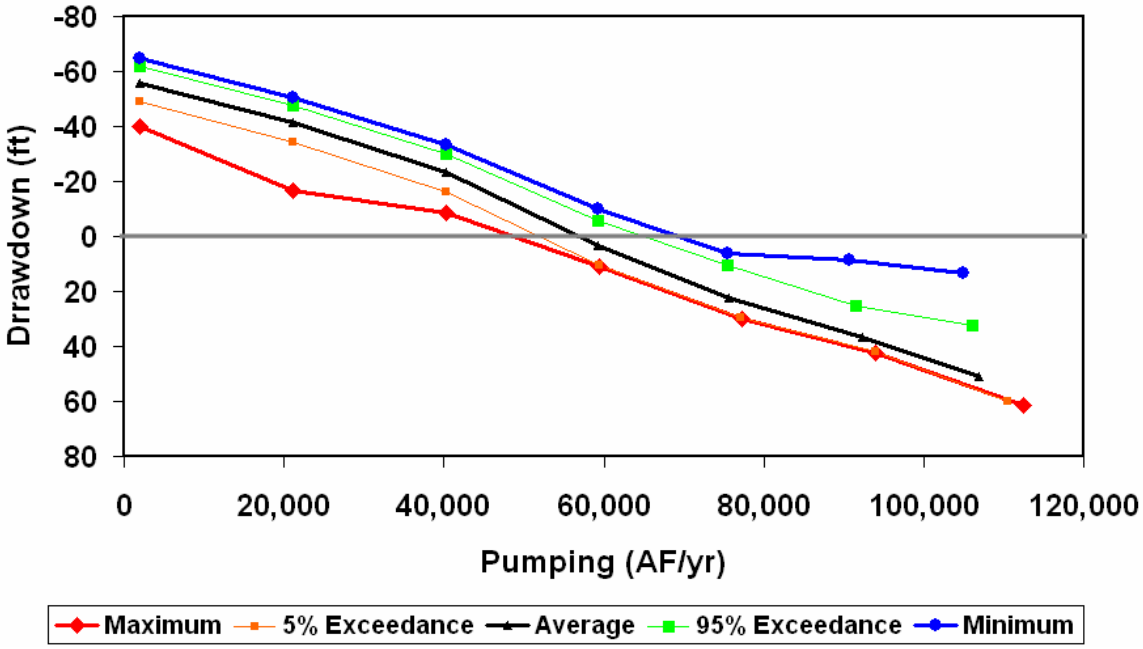

Figure 10. Pumping versus drawdown after 50 years in the Lower Trinity Aquifer for all scenarios for Groundwater Management Area 9

REFERENCES:

Chowdhury, Ali H., 2010. Draft GAM Runs 09-011, 09-012, and 09-24. Texas Water Development Board unpublished report.

Cleaveland, Malcolm K., 2006. Extended Chronology of Drought in the San Antonio Area. Report to the Guadalupe-Blanco River Authority.

Harbaugh, A.W. and McDonald, M.G., 1996, User's documentation for the U.S. Geological Survey modular finite-difference ground-water flow model: U.S. Geological Survey Open-File Report 96-485

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Jones, I.C., Anaya, R. and Wade, S., 2009, Groundwater Availability Model for the Hill Country portion of the Trinity Aquifer System, Texas, Texas Water Development Board unpublished report,193 p.

Mace, R.E., Chowdhury, A.H., Anaya, R., and Way, S-C., 2000, Groundwater availability of the Trinity Aquifer, Hill Country Area, Texas—Numerical simulations through 2050: Texas Water Development Board Report 353, 119 p.

Appendix A
Results Summary:
GMA 9
Bandera County
Bexar County
Blanco County
Comal County
Hays County
Kendall County
Kerr County
Medina County
Travis County
Area 1 (Comal, Hays, Travis Counties)
Area 2 (Bexar and Medina Counties)
Area 3 (Bandera, Blanco, Kendall and Kerr Counties)

GMA 9

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	1,969	21,117	40,270	59,344	75,424	90,727	104,940
	Exceeded 95% of years	1,969	21,117	40,270	59,344	75,524	91,479	106,022
	Average	1,969	21,117	40,270	59,344	75,624	92,261	106,982
	Exceeded 5% of years	1,969	21,117	40,270	59,418	77,094	94,042	110,485
	Maximum	1,969	21,117	40,270	59,418	77,193	94,042	112,454
Spring and River Base Flow (AF/yr)	Minimum	147,208	140,310	133,845	127,663	121,697	115,641	109,250
	Exceeded 95% of years	166,965	156,950	147,187	137,975	129,301	125,017	116,465
	Average	196,565	185,496	174,835	164,295	155,854	150,359	141,829
	Exceeded 5% of years	226,855	215,184	203,683	193,362	184,292	175,822	169,517
	Maximum	242,887	230,903	218,873	208,311	200,390	193,276	186,668
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	61,911	58,009	52,906	47,691	41,702	34,904	28,372
	Exceeded 95% of years	70,712	64,824	58,595	51,782	45,097	39,036	32,054
	Average	81,036	75,275	69,101	62,023	55,633	50,163	43,208
	Exceeded 5% of years	91,297	85,499	79,377	73,150	66,955	60,524	54,981
	Maximum	96,699	90,900	84,783	78,421	73,289	68,380	64,497
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-53.1	-41.6	-28.6	-11.6	0.4	6.4	9.8
	Exceeded 95% of years	-49.1	-37.8	-24.5	-6.9	6.0	17.6	25.4
	Average	-41.6	-30.1	-16.9	3.2	20.2	29.8	39.4
	Exceeded 5% of years	-33.8	-22.4	-8.8	12.0	25.4	33.7	47.0
	Maximum	-28.1	-11.8	-6.1	12.5	25.5	34.0	48.0
Edwards Group Drawdown after 50 Years (ft)	Minimum	-8.1	-8.1	-8.1	-8.1	-6.5	-6.1	-6.5
	Exceeded 95% of years	-6.2	-6.1	-6.1	-5.9	-4.8	-4.4	-4.7
	Average	-3.0	-3.0	-3.1	-2.1	0.2	0.5	0.2
	Exceeded 5% of years	0.2	0.2	0.2	0.7	3.5	2.5	3.4
	Maximum	1.7	1.3	1.7	3.3	3.9	3.4	3.9
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-24.1	-20.7	-18.0	-17.0	-14.0	-11.6	-13.3
	Exceeded 95% of years	-18.0	-14.6	-11.8	-10.4	-5.7	-4.1	-4.8
	Average	-7.0	-3.7	-1.0	3.6	9.9	13.9	15.6
	Exceeded 5% of years	4.2	7.5	10.2	15.4	15.8	15.6	16.6
	Maximum	8.4	11.8	14.5	16.9	17.2	16.2	18.0
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-65.1	-50.8	-33.4	-9.9	6.3	8.5	13.2
	Exceeded 95% of years	-62.2	-47.7	-29.9	-5.9	10.5	25.0	31.9
	Average	-56.0	-41.3	-23.4	3.1	22.4	36.4	50.2
	Exceeded 5% of years	-49.5	-34.6	-16.4	10.5	29.4	41.6	59.5
	Maximum	-39.5	-16.3	-8.6	10.7	29.6	42.0	60.9
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-64.8	-50.6	-33.4	-10.0	6.3	8.7	13.5
	Exceeded 95% of years	-61.9	-47.5	-29.9	-5.9	10.6	25.4	32.5
	Average	-55.7	-41.2	-23.4	3.1	22.6	36.7	50.8
	Exceeded 5% of years	-49.2	-34.4	-16.4	10.6	29.5	42.0	60.0
	Maximum	-40.0	-16.6	-8.8	10.8	29.8	42.3	61.5

Bandera County

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	625	2,082	3,540	4,996	6,452	7,910	9,349
	Exceeded 95% of years	625	2,082	3,540	4,996	6,452	7,910	9,361
	Average	625	2,082	3,540	4,996	6,452	7,910	9,367
	Exceeded 5% of years	625	2,082	3,540	4,996	6,452	7,910	9,367
	Maximum	625	2,082	3,540	4,996	6,452	7,910	9,367
Spring and River Base Flow (AF/yr)	Minimum	30,247	29,115	28,013	26,929	25,691	24,868	23,201
	Exceeded 95% of years	35,570	33,352	31,201	28,948	27,337	26,502	25,120
	Average	40,975	38,469	35,883	33,402	31,735	30,620	29,204
	Exceeded 5% of years	46,187	43,494	40,716	38,187	36,489	34,773	33,648
	Maximum	48,851	46,055	43,093	40,337	39,037	37,946	36,910
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	1,217	1,081	887	673	323	5	-445
	Exceeded 95% of years	1,763	1,505	1,197	819	499	165	-225
	Average	2,148	1,856	1,531	1,122	823	535	169
	Exceeded 5% of years	2,457	2,168	1,838	1,443	1,154	924	681
	Maximum	2,622	2,336	2,006	1,611	1,413	1,259	1,125
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-48.9	-39.2	-26.7	-8.0	5.5	4.5	6.7
	Exceeded 95% of years	-46.5	-36.4	-23.6	-4.2	8.8	18.6	21.6
	Average	-41.2	-31.1	-18.2	3.2	18.7	29.3	42.7
	Exceeded 5% of years	-35.9	-25.5	-12.3	9.7	24.4	34.6	51.1
	Maximum	-25.0	-8.0	-3.9	9.9	24.6	35.0	52.7
Edwards Group Drawdown after 50 Years (ft)	Minimum	-7.1	-7.1	-7.1	-7.1	-5.9	-5.4	-5.9
	Exceeded 95% of years	-5.5	-5.4	-5.4	-5.2	-4.2	-3.7	-3.9
	Average	-2.5	-2.5	-2.5	-1.5	0.6	0.8	0.6
	Exceeded 5% of years	0.5	0.5	0.5	0.9	3.1	2.4	3.0
	Maximum	1.8	1.4	1.8	3.1	3.3	3.1	3.3
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-20.7	-18.2	-15.9	-15.3	-12.6	-10.6	-12.1
	Exceeded 95% of years	-15.3	-12.7	-10.4	-9.1	-5.2	-3.8	-4.5
	Average	-5.5	-3.0	-0.8	3.5	13.7	12.6	14.2
	Exceeded 5% of years	4.6	7.1	9.6	14.2	14.5	14.1	15.1
	Maximum	8.3	11.0	13.5	15.6	15.8	14.7	16.3
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-62.2	-49.3	-32.2	-5.3	11.0	6.2	9.2
	Exceeded 95% of years	-60.8	-47.4	-29.9	-2.5	13.9	21.2	25.6
	Average	-57.6	-43.9	-26.1	3.3	21.3	37.8	58.3
	Exceeded 5% of years	-54.1	-40.2	-21.8	7.7	29.1	44.6	67.6
	Maximum	-36.8	-11.6	-5.9	8.9	29.5	45.1	70.1
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-62.2	-49.3	-32.2	-5.3	11.0	6.2	9.2
	Exceeded 95% of years	-60.8	-47.4	-29.9	-2.5	13.9	21.2	25.6
	Average	-57.6	-43.9	-26.1	3.3	21.3	37.8	58.3
	Exceeded 5% of years	-54.2	-40.2	-21.8	7.7	29.1	44.6	67.7
	Maximum	-36.8	-11.6	-5.9	8.9	29.5	45.1	70.1

Bexar County

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	0	4,970	9,943	14,913	19,884	24,856	29,246
	Exceeded 95% of years	0	4,970	9,943	14,913	19,884	24,856	29,358
	Average	0	4,970	9,943	14,913	19,884	24,856	29,589
	Exceeded 5% of years	0	4,970	9,943	14,913	19,884	24,856	29,827
	Maximum	0	4,970	9,943	14,913	19,884	24,856	29,827
Spring and River Base Flow (AF/yr)	Minimum	9,527	9,466	9,405	9,344	9,284	9,225	9,167
	Exceeded 95% of years	9,790	9,730	9,671	9,596	9,519	9,455	9,392
	Average	10,647	10,581	10,515	10,444	10,340	10,319	10,233
	Exceeded 5% of years	11,492	11,424	11,365	11,301	11,224	11,104	11,092
	Maximum	11,867	11,798	11,730	11,665	11,600	11,536	11,471
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	33,298	31,221	28,595	25,917	23,139	20,183	17,228
	Exceeded 95% of years	36,683	34,038	31,225	28,227	25,103	22,220	19,009
	Average	42,130	39,459	36,714	33,626	30,583	28,131	24,650
	Exceeded 5% of years	47,585	44,946	42,210	39,560	36,613	33,455	30,948
	Maximum	50,232	47,632	44,964	42,271	39,633	37,091	34,721
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-69.2	-56.9	-44.3	-31.0	-13.3	4.7	14.6
	Exceeded 95% of years	-59.9	-47.5	-34.5	-20.2	0.1	16.3	29.2
	Average	-43.7	-31.2	-18.2	1.5	33.7	46.0	62.9
	Exceeded 5% of years	-27.0	-13.9	-0.4	20.6	35.2	49.4	64.2
	Maximum	-20.8	-7.6	6.1	22.8	36.1	49.4	64.4
Edwards Group Drawdown after 50 Years (ft)	Minimum	NA	NA	NA	NA	NA	NA	NA
	Exceeded 95% of years	NA	NA	NA	NA	NA	NA	NA
	Average	NA	NA	NA	NA	NA	NA	NA
	Exceeded 5% of years	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-24.5	-23.7	-22.9	-22.1	-17.7	-15.9	-16.1
	Exceeded 95% of years	-17.9	-16.5	-15.7	-14.0	-9.2	-6.2	-6.9
	Average	-4.2	-3.4	-2.7	3.4	16.0	15.1	17.4
	Exceeded 5% of years	10.7	11.5	12.3	17.2	18.0	17.5	19.5
	Maximum	14.8	15.6	16.4	17.6	18.3	17.7	19.8
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-87.6	-70.6	-53.0	-34.7	-11.6	13.1	27.1
	Exceeded 95% of years	-77.0	-60.0	-42.4	-21.9	3.9	25.6	44.5
	Average	-60.1	-43.0	-24.6	0.7	40.6	58.6	81.1
	Exceeded 5% of years	-42.3	-24.3	-5.5	22.1	42.3	62.5	82.6
	Maximum	-35.4	-17.1	1.9	24.9	43.4	62.6	82.8
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-87.5	-70.5	-53.0	-34.7	-11.6	13.1	27.1
	Exceeded 95% of years	-76.9	-59.9	-42.3	-21.9	3.9	25.5	44.5
	Average	-60.0	-42.9	-24.6	0.7	40.6	58.6	81.5
	Exceeded 5% of years	-42.3	-24.3	-5.5	22.1	42.3	62.5	83.0
	Maximum	-35.3	-17.1	1.9	24.9	43.4	62.6	83.2

Blanco County

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	0	515	1,029	1,544	2,059	2,573	3,088
	Exceeded 95% of years	0	515	1,029	1,544	2,059	2,573	3,088
	Average	0	515	1,029	1,544	2,059	2,573	3,088
	Exceeded 5% of years	0	515	1,029	1,544	2,059	2,573	3,088
	Maximum	0	515	1,029	1,544	2,059	2,573	3,088
Spring and River Base Flow (AF/yr)	Minimum	13,690	13,313	12,942	12,594	12,221	11,845	11,411
	Exceeded 95% of years	15,263	14,849	14,353	13,847	13,187	12,913	12,310
	Average	18,762	18,259	17,710	17,092	16,489	16,312	15,606
	Exceeded 5% of years	22,508	21,879	21,285	20,783	20,208	19,556	19,181
	Maximum	24,353	23,748	23,128	22,617	22,122	21,702	21,319
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	NA	NA	NA	NA	NA	NA	NA
	Exceeded 95% of years	NA	NA	NA	NA	NA	NA	NA
	Average	NA	NA	NA	NA	NA	NA	NA
	Exceeded 5% of years	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-23.0	-19.9	-16.6	-13.1	-7.9	-1.4	-0.4
	Exceeded 95% of years	-18.1	-14.9	-11.6	-7.4	-0.2	4.1	7.4
	Average	-9.4	-6.1	-2.7	4.0	16.7	19.2	23.6
	Exceeded 5% of years	-0.1	3.0	6.7	13.3	18.5	21.0	27.1
	Maximum	2.9	6.2	9.6	14.8	18.5	22.1	27.2
Edwards Group Drawdown after 50 Years (ft)	Minimum	NA	NA	NA	NA	NA	NA	NA
	Exceeded 95% of years	NA	NA	NA	NA	NA	NA	NA
	Average	NA	NA	NA	NA	NA	NA	NA
	Exceeded 5% of years	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-19.7	-19.1	-18.6	-18.1	-14.3	-12.6	-13.5
	Exceeded 95% of years	-13.2	-12.5	-11.9	-10.5	-6.2	-4.0	-5.4
	Average	-1.0	-0.5	-0.1	4.9	16.0	14.8	16.2
	Exceeded 5% of years	12.1	12.6	13.0	17.3	17.6	16.7	18.1
	Maximum	16.0	16.5	16.9	17.8	18.0	16.9	18.4
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-24.1	-20.1	-15.9	-11.3	-5.6	2.7	4.4
	Exceeded 95% of years	-20.1	-16.0	-11.7	-6.4	1.5	7.0	11.6
	Average	-12.6	-8.2	-3.6	3.5	16.7	20.6	26.0
	Exceeded 5% of years	-4.3	0.2	5.0	11.8	19.6	23.4	31.4
	Maximum	-1.8	2.7	7.5	13.7	19.7	24.5	31.4
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-24.4	-20.3	-16.0	-11.4	-5.5	2.9	4.6
	Exceeded 95% of years	-20.4	-16.1	-11.8	-6.4	1.6	7.2	11.8
	Average	-12.7	-8.3	-3.6	3.6	16.8	20.7	26.2
	Exceeded 5% of years	-4.5	0.1	4.9	11.8	19.6	23.4	31.3
	Maximum	-2.0	2.6	7.4	13.7	19.6	24.4	31.3

Comal County

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	0	2,042	4,086	6,128	8,170	10,214	11,924
	Exceeded 95% of years	0	2,042	4,086	6,128	8,170	10,214	12,068
	Average	0	2,042	4,086	6,128	8,170	10,214	12,225
	Exceeded 5% of years	0	2,042	4,086	6,128	8,170	10,214	12,256
	Maximum	0	2,042	4,086	6,128	8,170	10,214	12,256
Spring and River Base Flow (AF/yr)	Minimum	5,309	3,693	1,918	124	-1,730	-3,623	-5,496
	Exceeded 95% of years	8,017	5,663	3,509	1,592	-576	-2,387	-4,498
	Average	12,794	10,322	7,883	5,319	3,114	1,477	-823
	Exceeded 5% of years	17,638	15,165	12,669	10,228	7,669	5,079	3,287
	Maximum	19,973	17,503	15,001	12,558	10,192	8,010	6,277
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	33,808	32,833	31,781	30,711	29,604	28,442	27,279
	Exceeded 95% of years	35,331	34,298	33,261	32,094	30,871	29,689	28,480
	Average	39,283	38,316	37,292	36,131	34,913	33,948	32,577
	Exceeded 5% of years	43,101	42,124	41,128	40,215	39,082	37,888	36,897
	Maximum	44,814	43,864	42,898	41,927	40,960	40,011	39,046
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-27.8	-23.6	-19.4	-15.0	-7.9	-1.3	2.3
	Exceeded 95% of years	-22.8	-18.6	-14.3	-9.2	-0.7	5.9	10.8
	Average	-14.2	-10.1	-5.3	2.9	19.2	23.9	31.1
	Exceeded 5% of years	-4.9	-0.3	4.6	14.4	20.3	25.7	31.9
	Maximum	-1.7	3.1	8.5	15.2	20.7	25.7	32.0
Edwards Group Drawdown after 50 Years (ft)	Minimum	NA	NA	NA	NA	NA	NA	NA
	Exceeded 95% of years	NA	NA	NA	NA	NA	NA	NA
	Average	NA	NA	NA	NA	NA	NA	NA
	Exceeded 5% of years	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-21.8	-21.1	-20.5	-19.9	-16.0	-14.3	-14.8
	Exceeded 95% of years	-14.8	-14.0	-13.5	-11.9	-7.5	-4.2	-5.2
	Average	-1.4	-0.9	-0.3	5.4	16.4	15.4	17.5
	Exceeded 5% of years	12.6	13.1	13.7	17.9	18.5	17.9	19.6
	Maximum	16.3	16.8	17.4	17.9	18.5	17.9	19.6
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-29.1	-24.2	-19.1	-13.9	-6.3	1.6	5.9
	Exceeded 95% of years	-24.6	-19.6	-14.6	-8.7	0.6	8.4	14.3
	Average	-17.0	-11.9	-6.4	2.4	19.8	25.5	33.7
	Exceeded 5% of years	-8.9	-3.2	2.8	13.6	20.7	27.5	34.3
	Maximum	-5.7	0.1	6.6	14.7	21.2	27.5	34.4
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-29.1	-24.2	-19.1	-13.9	-6.3	1.6	6.0
	Exceeded 95% of years	-24.7	-19.7	-14.6	-8.7	0.6	8.4	14.4
	Average	-17.0	-11.9	-6.4	2.4	19.7	25.5	34.3
	Exceeded 5% of years	-9.0	-3.2	2.8	13.6	20.7	27.5	35.1
	Maximum	-5.7	0.1	6.5	14.7	21.2	27.5	35.3

Hays County

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	0	1,826	3,652	5,478	7,304	9,115	10,486
	Exceeded 95% of years	0	1,826	3,652	5,478	7,304	9,115	10,492
	Average	0	1,826	3,652	5,478	7,304	9,115	10,938
	Exceeded 5% of years	0	1,826	3,652	5,478	7,304	9,130	10,956
	Maximum	0	1,826	3,652	5,478	7,304	9,130	10,956
Spring and River Base Flow (AF/yr)	Minimum	17,976	17,239	16,474	15,709	14,913	14,104	13,345
	Exceeded 95% of years	18,900	18,203	17,417	16,552	15,690	14,938	14,154
	Average	21,917	21,133	20,364	19,599	18,694	18,025	17,140
	Exceeded 5% of years	25,016	24,230	23,451	22,686	21,850	20,971	20,286
	Maximum	26,427	25,620	24,832	24,080	23,346	22,630	21,854
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	5,832	5,290	4,623	3,894	3,046	2,155	1,418
	Exceeded 95% of years	6,889	6,029	5,235	4,355	3,371	2,600	1,838
	Average	8,252	7,409	6,557	5,668	4,774	3,995	3,179
	Exceeded 5% of years	9,628	8,772	7,907	7,105	6,214	5,335	4,665
	Maximum	10,263	9,405	8,542	7,743	7,039	6,509	5,978
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-21.5	-16.8	-12.1	-7.3	-1.3	5.4	6.6
	Exceeded 95% of years	-18.3	-13.6	-8.8	-3.5	3.9	9.2	12.2
	Average	-12.5	-7.7	-3.0	4.0	15.1	19.2	23.5
	Exceeded 5% of years	-6.6	-1.9	3.2	10.2	15.9	20.3	24.5
	Maximum	-4.7	0.2	5.2	10.9	15.9	20.8	24.6
Edwards Group Drawdown after 50 Years (ft)	Minimum	NA	NA	NA	NA	NA	NA	NA
	Exceeded 95% of years	NA	NA	NA	NA	NA	NA	NA
	Average	NA	NA	NA	NA	NA	NA	NA
	Exceeded 5% of years	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-12.0	-11.7	-11.3	-11.0	-8.2	-7.3	-7.8
	Exceeded 95% of years	-8.0	-7.1	-6.7	-5.8	-2.9	-1.1	-2.2
	Average	0.5	0.9	1.2	4.8	12.2	11.4	12.7
	Exceeded 5% of years	9.4	9.7	10.1	13.0	13.4	12.9	14.0
	Maximum	12.0	12.3	12.7	13.1	13.5	13.0	14.1
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-25.4	-19.0	-12.6	-6.0	1.5	8.2	11.8
	Exceeded 95% of years	-22.8	-16.3	-9.7	-2.9	6.2	13.5	17.4
	Average	-17.9	-11.4	-4.7	3.7	16.0	22.4	27.5
	Exceeded 5% of years	-12.7	-6.1	0.9	9.1	17.6	23.8	29.2
	Maximum	-11.1	-4.3	2.6	10.0	17.6	24.3	29.4
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-25.4	-19.0	-12.6	-6.0	1.5	8.2	11.8
	Exceeded 95% of years	-22.8	-16.3	-9.7	-2.9	6.2	13.5	17.5
	Average	-17.9	-11.4	-4.7	3.7	16.0	22.4	27.7
	Exceeded 5% of years	-12.7	-6.1	0.9	9.1	17.6	23.8	29.5
	Maximum	-11.1	-4.4	2.6	10.0	17.6	24.4	29.6

Kendall County

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	310	2,539	4,766	6,994	9,223	11,450	13,678
	Exceeded 95% of years	310	2,539	4,766	6,994	9,223	11,450	13,678
	Average	310	2,539	4,766	6,994	9,223	11,450	13,678
	Exceeded 5% of years	310	2,539	4,766	6,994	9,223	11,450	13,678
	Maximum	310	2,539	4,766	6,994	9,223	11,450	13,678
Spring and River Base Flow (AF/yr)	Minimum	25,159	23,558	22,071	20,736	19,214	17,848	15,899
	Exceeded 95% of years	29,988	27,651	25,150	22,814	20,790	19,421	17,739
	Average	36,424	33,737	31,034	28,183	26,184	24,753	22,688
	Exceeded 5% of years	43,318	40,422	37,390	34,466	32,253	30,160	28,629
	Maximum	47,156	44,178	40,989	38,030	36,010	34,442	32,978
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	NA	NA	NA	NA	NA	NA	NA
	Exceeded 95% of years	NA	NA	NA	NA	NA	NA	NA
	Average	NA	NA	NA	NA	NA	NA	NA
	Exceeded 5% of years	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-41.3	-35.0	-28.0	-20.0	-11.5	-0.2	2.7
	Exceeded 95% of years	-34.5	-27.9	-21.1	-12.9	-0.9	7.7	13.5
	Average	-22.0	-15.7	-8.6	3.4	23.5	28.6	36.8
	Exceeded 5% of years	-9.1	-2.8	4.4	17.1	26.6	31.7	41.9
	Maximum	-5.0	1.5	8.6	19.6	26.6	32.5	42.0
Edwards Group Drawdown after 50 Years (ft)	Minimum	-3.5	-3.5	-3.5	-3.5	-3.1	-2.3	-3.1
	Exceeded 95% of years	-2.3	-2.3	-2.3	-2.3	-1.4	-1.1	-1.2
	Average	-0.3	-0.4	-0.3	0.2	2.1	2.0	2.0
	Exceeded 5% of years	1.7	1.7	1.7	2.1	2.7	2.3	2.7
	Maximum	2.3	2.3	2.3	2.7	2.7	2.7	2.7
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-45.0	-42.8	-41.0	-39.5	-32.9	-27.1	-31.4
	Exceeded 95% of years	-30.6	-28.3	-26.5	-24.3	-14.9	-11.5	-12.6
	Average	-7.1	-5.2	-3.7	5.2	29.1	26.3	30.3
	Exceeded 5% of years	17.9	19.4	21.0	30.4	31.1	30.3	32.4
	Maximum	26.1	28.0	29.4	33.3	33.9	31.0	34.9
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-40.2	-32.3	-23.9	-14.1	-4.3	7.4	11.1
	Exceeded 95% of years	-35.6	-27.8	-19.2	-8.8	3.7	13.6	22.5
	Average	-27.0	-19.1	-10.4	3.1	21.3	29.3	38.8
	Exceeded 5% of years	-18.2	-10.0	-0.8	12.5	25.6	32.8	45.7
	Maximum	-15.3	-7.0	2.2	14.9	25.6	33.3	45.8
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-40.1	-32.3	-23.9	-14.2	-4.3	7.4	11.2
	Exceeded 95% of years	-35.5	-27.8	-19.3	-8.8	3.7	13.7	22.5
	Average	-26.9	-19.0	-10.4	3.0	21.3	29.4	39.0
	Exceeded 5% of years	-18.1	-9.9	-0.8	12.6	25.6	32.9	45.8
	Maximum	-15.2	-6.9	2.2	15.0	25.6	33.4	45.9

Kerr County

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	1,033	5,030	9,029	13,026	14,180	14,594	15,656
	Exceeded 95% of years	1,033	5,030	9,029	13,026	14,180	15,170	16,614
	Average	1,033	5,030	9,029	13,026	14,180	15,952	16,614
	Exceeded 5% of years	1,033	5,030	9,029	13,026	15,650	17,468	18,935
	Maximum	1,033	5,030	9,029	13,026	15,650	17,468	20,755
Spring and River Base Flow (AF/yr)	Minimum	31,354	31,284	31,168	31,102	31,097	31,127	31,040
	Exceeded 95% of years	34,569	33,772	33,361	33,242	33,121	33,421	33,125
	Average	39,213	38,159	37,582	37,349	37,351	37,559	37,294
	Exceeded 5% of years	44,116	42,936	42,155	42,132	41,972	41,641	41,844
	Maximum	46,635	45,388	44,438	44,272	44,256	44,225	44,193
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	NA	NA	NA	NA	NA	NA	NA
	Exceeded 95% of years	NA	NA	NA	NA	NA	NA	NA
	Average	NA	NA	NA	NA	NA	NA	NA
	Exceeded 5% of years	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-103.0	-78.8	-49.0	-9.0	11.6	5.6	9.8
	Exceeded 95% of years	-100.1	-75.4	-45.2	-5.2	13.4	21.0	25.1
	Average	-94.7	-70.2	-40.1	2.7	21.3	39.2	58.5
	Exceeded 5% of years	-89.1	-64.4	-33.8	7.9	33.1	46.6	69.2
	Maximum	-57.2	-18.5	-9.8	11.5	33.6	47.5	72.0
Edwards Group Drawdown after 50 Years (ft)	Minimum	-9.0	-9.0	-9.0	-9.0	-7.1	-6.9	-7.1
	Exceeded 95% of years	-7.0	-6.9	-6.9	-6.6	-5.4	-5.2	-5.3
	Average	-3.5	-3.5	-3.6	-2.5	-0.2	0.2	-0.2
	Exceeded 5% of years	0.1	0.1	0.1	0.4	3.7	2.6	3.5
	Maximum	1.6	1.1	1.6	3.4	4.2	3.6	4.2
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-27.3	-19.0	-12.5	-10.5	-9.1	-7.2	-8.7
	Exceeded 95% of years	-23.7	-15.4	-9.1	-6.9	-4.6	-3.7	-3.8
	Average	-17.0	-9.0	-2.8	0.7	6.9	6.7	7.1
	Exceeded 5% of years	-10.3	-2.2	3.7	6.9	9.4	8.3	9.6
	Maximum	-3.1	-0.1	5.9	9.4	9.7	9.5	10.1
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-142.2	-109.5	-67.6	-8.1	13.2	8.3	14.4
	Exceeded 95% of years	-139.9	-106.3	-64.5	-4.8	21.0	27.6	34.1
	Average	-135.1	-101.8	-59.4	3.6	29.1	56.8	86.6
	Exceeded 5% of years	-130.1	-96.1	-52.1	9.5	45.1	66.4	99.8
	Maximum	-84.1	-27.0	-14.1	16.9	45.8	68.1	103.5
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-142.7	-110.4	-68.5	-8.2	13.8	8.6	15.0
	Exceeded 95% of years	-140.2	-107.2	-65.4	-4.8	21.3	28.5	35.5
	Average	-135.6	-102.8	-60.2	3.8	29.7	58.2	88.8
	Exceeded 5% of years	-130.7	-97.1	-53.0	9.7	46.0	68.0	102.4
	Maximum	-86.7	-28.3	-14.8	17.2	46.7	69.8	106.3

Medina County

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	0	500	1,000	1,500	2,000	2,500	3,000
	Exceeded 95% of years	0	500	1,000	1,500	2,000	2,500	3,000
	Average	0	500	1,000	1,500	2,000	2,500	3,000
	Exceeded 5% of years	0	500	1,000	1,500	2,000	2,500	3,000
	Maximum	0	500	1,000	1,500	2,000	2,500	3,000
Spring and River Base Flow (AF/yr)	Minimum	4,991	4,985	4,978	4,971	4,965	4,955	4,943
	Exceeded 95% of years	5,112	5,096	5,083	5,070	5,056	5,049	5,037
	Average	5,463	5,443	5,428	5,413	5,398	5,395	5,378
	Exceeded 5% of years	5,810	5,789	5,773	5,776	5,750	5,734	5,729
	Maximum	5,961	5,940	5,922	5,911	5,904	5,896	5,889
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	10,930	9,947	8,705	7,361	5,365	3,375	915
	Exceeded 95% of years	14,040	12,286	10,422	8,214	6,305	4,318	2,065
	Average	16,304	14,499	12,538	10,236	8,380	6,647	4,483
	Exceeded 5% of years	18,400	16,589	14,611	12,344	10,570	8,903	7,233
	Maximum	19,533	17,731	15,726	13,475	12,099	10,924	9,948
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-24.2	-18.9	-12.7	-4.9	1.6	5.0	7.4
	Exceeded 95% of years	-22.4	-17.0	-10.9	-2.9	4.3	10.7	15.4
	Average	-18.9	-13.6	-7.4	1.6	10.8	16.1	22.1
	Exceeded 5% of years	-15.3	-9.9	-3.8	5.7	12.4	17.9	25.0
	Maximum	-13.7	-6.8	-2.5	5.8	12.4	17.9	25.4
Edwards Group Drawdown after 50 Years (ft)	Minimum	NA	NA	NA	NA	NA	NA	NA
	Exceeded 95% of years	NA	NA	NA	NA	NA	NA	NA
	Average	NA	NA	NA	NA	NA	NA	NA
	Exceeded 5% of years	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-8.2	-8.0	-7.8	-7.5	-6.0	-5.3	-5.7
	Exceeded 95% of years	-5.5	-5.2	-4.9	-4.4	-2.6	-1.7	-2.2
	Average	-0.5	-0.3	-0.1	2.0	6.8	6.4	7.0
	Exceeded 5% of years	5.0	5.2	5.4	7.3	7.5	7.2	7.9
	Maximum	6.6	6.9	7.1	7.6	7.7	7.2	7.9
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-32.5	-24.6	-15.7	-4.1	5.4	7.3	10.9
	Exceeded 95% of years	-31.1	-23.2	-14.1	-2.4	7.5	16.0	20.8
	Average	-28.4	-20.4	-11.3	1.5	12.8	21.0	30.3
	Exceeded 5% of years	-25.5	-17.5	-8.3	4.8	15.3	23.5	34.2
	Maximum	-21.4	-10.4	-5.4	4.9	15.4	23.8	34.8
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-32.6	-24.7	-15.7	-4.1	5.5	7.3	10.9
	Exceeded 95% of years	-31.2	-23.3	-14.2	-2.4	7.5	16.1	20.9
	Average	-28.5	-20.5	-11.3	1.5	12.8	21.1	30.4
	Exceeded 5% of years	-25.6	-17.5	-8.3	4.8	15.4	23.6	34.3
	Maximum	-21.4	-10.5	-5.4	4.9	15.4	23.9	34.9

Travis County

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	0	1,814	3,629	5,368	6,958	8,521	9,405
	Exceeded 95% of years	0	1,814	3,629	5,368	7,058	8,521	9,561
	Average	0	1,814	3,629	5,368	7,158	8,697	9,692
	Exceeded 5% of years	0	1,814	3,629	5,443	7,158	8,947	10,437
	Maximum	0	1,814	3,629	5,443	7,257	8,947	10,736
Spring and River Base Flow (AF/yr)	Minimum	13,039	12,019	10,762	9,511	8,171	6,895	5,915
	Exceeded 95% of years	14,452	12,938	11,495	10,032	8,549	7,343	6,337
	Average	16,216	14,699	13,180	11,666	10,197	9,050	7,959
	Exceeded 5% of years	18,024	16,480	14,936	13,469	12,022	10,687	9,792
	Maximum	18,883	17,348	15,798	14,389	13,230	12,312	11,359
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	1,565	1,377	1,132	855	521	171	-147
	Exceeded 95% of years	1,966	1,643	1,314	973	613	290	-28
	Average	2,341	2,006	1,672	1,321	980	670	341
	Exceeded 5% of years	2,717	2,377	2,034	1,700	1,384	1,057	777
	Maximum	2,914	2,571	2,226	1,917	1,695	1,510	1,324
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-24.8	-18.4	-11.7	-5.1	2.9	11.1	12.5
	Exceeded 95% of years	-21.3	-14.8	-8.1	-1.0	8.9	16.6	19.1
	Average	-15.2	-8.6	-1.9	6.9	20.7	27.6	31.5
	Exceeded 5% of years	-9.0	-2.6	4.4	13.4	22.0	28.8	32.9
	Maximum	-7.1	-0.6	6.3	13.9	22.0	29.4	33.4
Edwards Group Drawdown after 50 Years (ft)	Minimum	NA	NA	NA	NA	NA	NA	NA
	Exceeded 95% of years	NA	NA	NA	NA	NA	NA	NA
	Average	NA	NA	NA	NA	NA	NA	NA
	Exceeded 5% of years	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-14.2	-12.6	-11.0	-9.5	-4.3	-0.1	-3.8
	Exceeded 95% of years	-6.6	-5.0	-3.4	-1.3	4.9	8.0	6.4
	Average	5.9	7.4	8.9	14.8	28.0	28.2	29.4
	Exceeded 5% of years	18.7	20.3	21.8	28.1	29.3	29.7	31.0
	Maximum	23.5	25.1	26.7	28.3	29.6	30.8	32.9
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-28.7	-20.6	-12.2	-3.8	5.7	11.3	16.1
	Exceeded 95% of years	-26.6	-18.3	-9.8	-1.1	9.7	19.8	23.3
	Average	-22.8	-14.5	-5.9	4.1	17.8	27.6	31.5
	Exceeded 5% of years	-18.9	-10.6	-1.8	8.1	19.8	29.0	33.5
	Maximum	-17.8	-9.4	-0.6	8.7	19.8	29.5	33.8
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-28.9	-20.7	-12.3	-3.9	5.4	11.4	16.1
	Exceeded 95% of years	-26.8	-18.5	-9.9	-1.3	9.6	19.4	23.3
	Average	-23.0	-14.6	-5.9	4.0	17.8	27.6	32.5
	Exceeded 5% of years	-19.0	-10.6	-1.7	8.2	19.9	29.0	34.8
	Maximum	-17.9	-9.4	-0.5	8.8	19.9	29.5	35.3

Area 1 (Comal, Hays and Travis Counties)

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	0	5,682	11,367	16,974	22,432	27,850	31,828
	Exceeded 95% of years	0	5,682	11,367	16,974	22,532	27,850	32,131
	Average	0	5,682	11,367	16,974	22,632	28,026	32,855
	Exceeded 5% of years	0	5,682	11,367	17,049	22,632	28,291	33,649
	Maximum	0	5,682	11,367	17,049	22,731	28,291	33,948
Spring and River Base Flow (AF/yr)	Minimum	36,382	33,020	29,161	25,397	21,452	17,392	13,798
	Exceeded 95% of years	41,415	36,777	32,250	28,088	23,579	19,904	15,872
	Average	50,919	46,177	41,514	36,563	32,043	28,588	24,313
	Exceeded 5% of years	60,615	55,827	51,004	46,460	41,599	36,704	33,352
	Maximum	65,283	60,471	55,624	51,000	46,618	42,766	39,484
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	41,232	39,579	37,536	35,479	33,228	30,775	28,578
	Exceeded 95% of years	44,158	41,949	39,692	37,286	34,837	32,611	30,270
	Average	49,847	47,750	45,517	43,107	40,642	38,643	36,144
	Exceeded 5% of years	55,375	53,220	51,036	48,980	46,694	44,199	42,358
	Maximum	57,991	55,840	53,666	51,582	49,641	47,778	46,271
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-24.5	-19.6	-14.5	-9.4	-2.6	4.8	6.5
	Exceeded 95% of years	-20.4	-15.4	-10.4	-4.7	3.6	10.0	13.4
	Average	-13.6	-8.8	-3.6	4.3	18.0	23.0	28.1
	Exceeded 5% of years	-6.7	-1.4	4.1	12.5	18.6	24.3	29.0
	Maximum	-4.3	1.0	6.6	13.1	18.6	24.5	29.3
Edwards Group Drawdown after 50 Years (ft)	Minimum	NA	NA	NA	NA	NA	NA	NA
	Exceeded 95% of years	NA	NA	NA	NA	NA	NA	NA
	Average	NA	NA	NA	NA	NA	NA	NA
	Exceeded 5% of years	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-15.1	-14.4	-13.6	-12.9	-9.0	-7.2	-8.3
	Exceeded 95% of years	-9.7	-8.3	-7.5	-6.0	-1.9	0.7	-0.8
	Average	1.4	2.1	2.9	7.7	17.6	17.0	18.6
	Exceeded 5% of years	12.8	13.5	14.2	18.4	19.0	18.7	20.0
	Maximum	16.2	16.9	17.7	18.5	19.2	19.0	20.6
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-27.5	-21.2	-14.8	-8.3	-0.4	8.7	11.4
	Exceeded 95% of years	-24.4	-18.0	-11.5	-4.6	5.1	13.1	18.0
	Average	-18.7	-12.3	-5.6	3.3	17.9	24.7	30.8
	Exceeded 5% of years	-12.8	-6.2	0.8	10.5	19.0	26.1	32.1
	Maximum	-10.9	-4.2	3.0	11.4	19.0	26.7	32.1
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-27.6	-21.3	-14.8	-8.3	-0.5	8.6	11.4
	Exceeded 95% of years	-24.5	-18.1	-11.6	-4.6	5.1	13.0	18.2
	Average	-18.8	-12.4	-5.7	3.3	18.0	24.8	31.4
	Exceeded 5% of years	-12.9	-6.3	0.8	10.5	19.0	26.1	32.7
	Maximum	-11.0	-4.2	3.0	11.4	19.0	26.7	32.8

Area 2 (Medina and Bexar Counties)

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	0	5,470	10,943	16,413	21,884	27,356	32,246
	Exceeded 95% of years	0	5,470	10,943	16,413	21,884	27,356	32,358
	Average	0	5,470	10,943	16,413	21,884	27,356	32,589
	Exceeded 5% of years	0	5,470	10,943	16,413	21,884	27,356	32,827
	Maximum	0	5,470	10,943	16,413	21,884	27,356	32,827
Spring and River Base Flow (AF/yr)	Minimum	14,518	14,451	14,383	14,315	14,249	14,183	14,119
	Exceeded 95% of years	14,893	14,824	14,752	14,649	14,574	14,501	14,429
	Average	16,113	16,027	15,946	15,865	15,737	15,718	15,612
	Exceeded 5% of years	17,305	17,216	17,134	17,078	16,977	16,841	16,825
	Maximum	17,828	17,738	17,652	17,576	17,504	17,432	17,360
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	44,228	41,198	37,300	33,278	28,805	23,593	18,313
	Exceeded 95% of years	50,933	46,428	41,743	36,416	31,309	26,651	21,169
	Average	58,350	53,918	49,236	43,765	38,878	34,722	29,275
	Exceeded 5% of years	65,785	61,372	56,704	51,861	47,188	42,165	37,851
	Maximum	69,765	65,363	60,690	55,746	51,732	47,886	44,669
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-54.3	-44.3	-33.8	-22.4	-8.4	6.1	14.5
	Exceeded 95% of years	-47.5	-37.2	-26.6	-14.1	1.5	14.4	25.1
	Average	-35.6	-25.4	-14.6	1.6	26.2	36.3	49.2
	Exceeded 5% of years	-23.1	-12.6	-1.6	15.6	27.4	38.9	50.8
	Maximum	-18.6	-8.0	3.2	17.1	27.4	39.0	51.1
Edwards Group Drawdown after 50 Years (ft)	Minimum	NA	NA	NA	NA	NA	NA	NA
	Exceeded 95% of years	NA	NA	NA	NA	NA	NA	NA
	Average	NA	NA	NA	NA	NA	NA	NA
	Exceeded 5% of years	NA	NA	NA	NA	NA	NA	NA
	Maximum	NA	NA	NA	NA	NA	NA	NA
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-18.6	-18.0	-17.4	-16.8	-13.3	-12.0	-12.2
	Exceeded 95% of years	-13.4	-12.4	-11.8	-10.4	-6.8	-4.5	-5.2
	Average	-2.9	-2.3	-1.8	2.9	12.6	11.9	13.7
	Exceeded 5% of years	8.6	9.2	9.8	13.6	14.2	13.7	15.2
	Maximum	11.8	12.4	13.0	13.9	14.4	13.9	15.5
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-70.2	-56.0	-41.1	-24.8	-6.2	14.0	26.3
	Exceeded 95% of years	-62.6	-48.3	-33.5	-15.8	5.2	23.1	38.9
	Average	-50.2	-35.8	-20.5	0.9	31.9	46.9	64.4
	Exceeded 5% of years	-37.1	-22.4	-6.4	16.5	33.4	50.1	67.0
	Maximum	-32.1	-17.1	-1.1	18.6	33.5	50.2	67.3
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-70.1	-56.0	-41.1	-24.8	-6.2	14.0	26.4
	Exceeded 95% of years	-62.6	-48.3	-33.4	-15.8	5.2	23.1	39.0
	Average	-50.2	-35.8	-20.5	0.9	31.9	46.9	65.0
	Exceeded 5% of years	-37.1	-22.3	-6.4	16.5	33.4	50.1	67.6
	Maximum	-32.0	-17.1	-1.1	18.6	33.5	50.2	67.8

Area 3 (Bandera, Blanco, Kendall and Kerr Counties)

Component	Case	Scenario						
		1	2	3	4	5	6	7
Pumping (AF/yr)	Minimum	1,968	10,166	18,364	26,560	31,914	36,527	41,771
	Exceeded 95% of years	1,968	10,166	18,364	26,560	31,914	37,103	42,741
	Average	1,968	10,166	18,364	26,560	31,914	37,885	42,747
	Exceeded 5% of years	1,968	10,166	18,364	26,560	33,384	39,401	45,068
	Maximum	1,968	10,166	18,364	26,560	33,384	39,401	46,888
Spring and River Base Flow (AF/yr)	Minimum	100,461	97,270	94,255	91,435	88,684	86,241	82,052
	Exceeded 95% of years	115,607	109,855	104,205	98,851	94,460	92,528	88,258
	Average	135,508	128,712	122,144	116,054	111,785	109,241	104,792
	Exceeded 5% of years	155,874	148,542	141,290	135,155	130,583	126,108	122,824
	Maximum	166,200	158,564	150,900	144,514	140,649	137,187	134,241
Outflow Across the Balcones Fault Zone (AF/yr)	Minimum	1,217	1,081	887	673	323	5	-445
	Exceeded 95% of years	1,763	1,505	1,197	819	499	165	-225
	Average	2,148	1,856	1,531	1,122	823	535	169
	Exceeded 5% of years	2,457	2,168	1,838	1,443	1,154	924	681
	Maximum	2,622	2,336	2,006	1,611	1,413	1,259	1,125
Overall Trinity Drawdown after 50 Years (ft)	Minimum	-62.3	-49.1	-33.1	-11.4	2.5	5.0	7.9
	Exceeded 95% of years	-58.8	-45.4	-29.0	-6.8	7.1	19.6	24.6
	Average	-51.5	-38.0	-21.7	3.2	20.0	31.1	42.6
	Exceeded 5% of years	-43.9	-30.4	-13.8	11.2	27.3	36.3	52.2
	Maximum	-32.7	-11.9	-6.3	11.6	27.5	36.6	53.7
Edwards Group Drawdown after 50 Years (ft)	Minimum	-8.1	-8.1	-8.1	-8.1	-6.5	-6.1	-6.5
	Exceeded 95% of years	-6.2	-6.1	-6.1	-5.9	-4.8	-4.4	-4.7
	Average	-3.0	-3.0	-3.1	-2.1	0.2	0.5	0.2
	Exceeded 5% of years	0.2	0.2	0.2	0.7	3.5	2.5	3.4
	Maximum	1.7	1.3	1.7	3.3	3.9	3.4	3.9
Upper Trinity Drawdown after 50 Years(ft)	Minimum	-27.3	-22.8	-19.3	-18.2	-15.5	-12.8	-14.8
	Exceeded 95% of years	-21.3	-16.8	-13.2	-10.9	-6.9	-5.2	-5.9
	Average	-9.8	-5.5	-2.1	2.8	14.4	13.2	15.0
	Exceeded 5% of years	1.8	5.9	9.8	14.9	15.5	15.1	16.0
	Maximum	5.8	10.4	13.9	16.9	17.2	15.8	17.7
Middle Trinity Drawdown after 50 Years(ft)	Minimum	-77.6	-60.7	-39.3	-9.1	9.7	7.0	11.1
	Exceeded 95% of years	-74.9	-57.6	-35.9	-4.9	13.0	24.4	29.1
	Average	-69.4	-51.8	-29.9	3.2	22.5	38.9	56.7
	Exceeded 5% of years	-63.6	-45.7	-23.5	9.6	32.2	45.8	67.3
	Maximum	-46.0	-16.4	-8.6	10.6	32.6	46.3	69.5
Lower Trinity Drawdown after 50 Years (ft)	Minimum	-78.1	-61.2	-39.8	-9.1	10.0	7.2	11.4
	Exceeded 95% of years	-75.4	-58.2	-36.4	-4.9	13.2	24.8	29.8
	Average	-69.9	-52.4	-30.4	3.3	22.8	39.6	57.9
	Exceeded 5% of years	-64.2	-46.3	-24.0	9.7	32.6	46.7	68.7
	Maximum	-47.1	-16.9	-8.9	10.7	33.0	47.1	70.9