LBG-GUYTON ASSOCIATES

TECHNICAL MEMORANDUM

TO: Dirk Aaron, General Manager

FROM: Michael Keester, P.G. and Brant Konetchy

SUBJECT: Results of Northern Trinity / Woodbine Groundwater Availability Model Simulations using a Modified Lower Trinity Transmissivity Distribution

DATE: February 5, 2016

New wells in the Lower Trinity Aquifer have shown the existence of a higher transmissivity zone in eastern Bell County than currently exists in the Texas Water Development Board (TWDB) approved Northern Trinity / Woodbine Groundwater Availability Model (NTWGAM). In particular, the area of higher transmissivity appears to occur to the east of the faulting included in the model. The attached "Lower Trinity Transmissivity" map illustrates the Lower Trinity aquifer transmissivity distribution in the NTWGAM and provides the results from recent pumping tests conducted on wells completed in the aquifer.

On the west side of the District, the pumping test results indicate aquifer transmissivity values higher than, but similar to, the values in the model. However, pumping test results in the deeper portions of the aquifer on the east side of the District indicate transmissivity values several times greater than in the model. Therefore, to evaluate the potential effect on aquifer desired future conditions (DFCs) we used the data from the pumping tests along with additional data obtained from public sources to modify the transmissivity distribution of the Lower Trinity aquifer.

MODIFICATION OF THE NTWGAM LOWER TRINITY TRANSMISSIVITY

The NTWGAM uses a specified value of hydraulic conductivity (K) in each model cell. The K values are related to transmissivity (T) based on the thickness (b) of the aquifer as follows:

$$T = Kb$$

To use the transmissivity values from the pumping tests in the model, we first divided the pumping test transmissivity result at the well location by the model layer (that is, layer 8) thickness at the same location. Using the resulting hydraulic conductivity values, we interpolated the values to the model grid cell locations in and around Bell County. The values were then incorporated into the existing matrix of values that were unchanged outside of the area of investigation.

Creating the Data Set

We compiled five datasets to estimate the hydraulic conductivity within CUWCD. The first dataset was the data points available in NTWGAM conceptual model geodatabase. These data points were used by the model authors to prepare the initial hydraulic conductivity matrix for model layer 8 which represents the Lower Trinity (that is, Hosston aquifer in Bell County). The second dataset was the relatively recent pumping test transmissivity values which were incorporated by calculating the hydraulic conductivity value at the location of the wells. We prepared the third dataset using the TWDB groundwater database to find wells that contain transmissivity values or specific capacity values. The database did not contain any transmissivity values for the area of interest, but did contain many specific capacity values (that is, pumping rate divided by drawdown). The transmissivity (in gallons per day per foot) can be estimated for a confined system by multiplying the specific capacity (in gallons per minute per foot of drawdown) by a factor 2000 (Driscoll, 1986). The fourth data set was transmissivity values identified in scanned images of documents associated with wells in the TWDB groundwater database. The fifth data set included points along the circumference of a circle located about 35 miles from the center of Bell County with hydraulic conductivity values equal to the existing NTWGAM matrix for the Lower Trinity. We used these points to act as control points to ensure a smooth transition to the hydraulic conductivity values in the current model. All point datasets were then combined into one dataset and plotted by location into ArcGIS.

Geostatistical Analysis

Geostatistical analysis is the process by which data are analyzed to determine their spatial relationship so that a reasonable prediction of values can be made in locations where data are unknown. The main concept that drives the analysis is that objects located closer together are more similar. Therefore, when predicting an unknown value at a location, closer known values will exhibit a higher influence in predicting the value than objects farther away. The geostatistical method used for this work was empirical bayesian kriging (EBK), a method that uses classical kriging methods but accounts for the possibility of having multiple semivariograms instead of a single true semivariogram which helps improve the overall model and accounts for any error in using a single semivariogram (Krivoruchko, 2012).

Methods

Geostatistical Analyst license in ArcGIS was used to perform the EBK and create the hydraulic conductivity grid. We used the hydraulic conductivity point data as the input values for the EBK method and produced prediction and error grids. We then merged the prediction grid data with the TWDB grid file for the model to determine the predicted hydraulic conductivity at each cell location within the study area. These data were then exported and used to update the original hydraulic conductivity grid by incorporating the predicted values on a cell-by-cell basis. Attached are maps illustrating the revised hydraulic conductivity distribution along with the error associated with the predictions.

NTWGAM RUNS AND RESULTS

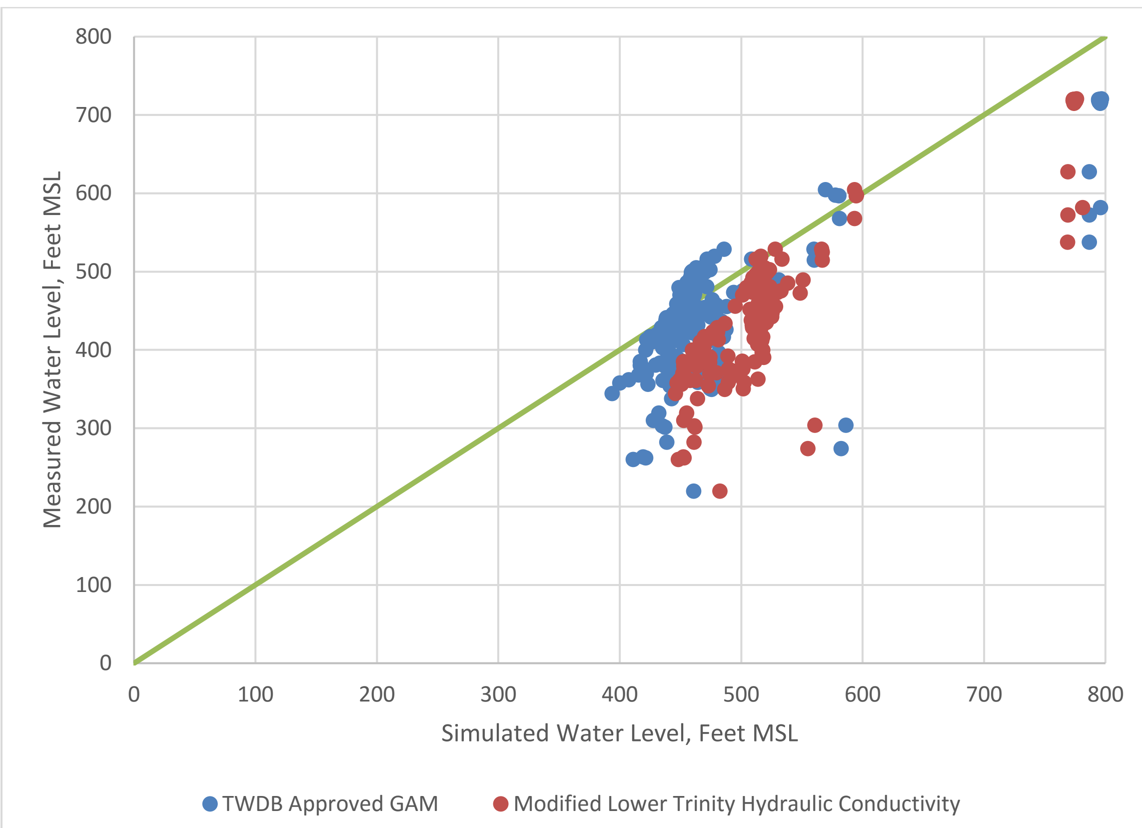
Using the modified Lower Trinity aquifer hydraulic conductivity data set we performed two simulations. The first simulation involved running the TWDB approved transient model which represents the calibration period from 1890 through 2012. Using the results from that model run, we then conducted the GMA 8 Run 10 simulation with the revised hydraulic conductivity values and the initial conditions as the January 1, 2010 results from the previous transient run.

Modified Transient Run Results

For the modified transient run, we used the same model inputs for all parameters except the layer 8 horizontal hydraulic conductivity within the area of interest. That is, we did not change vertical hydraulic conductivity, specific storage, pumping, or any other factor from the TWDB approved NTWGAM (Kelley, et al., 2014). The purpose for this run was to quantify how changing this one parameter would change the calibration of the model and to provide initial conditions for subsequent evaluations.

As expected, since only the horizontal hydraulic conductivity of layer 8 was changed the level of calibration of the model for the area declined. In most cases, the simulated water levels were higher than in the unmodified version of the NTWGAM. For model layer 8 Bell County, the geodatabase for the model contained 27 locations with water level measurements. For the calibration period there were a total of 260 water level measurements from these wells that were used as calibration targets. Figure 1 illustrates the measured versus simulated water levels for both the TWDB approved NTWGAM and the modified version.

Figure 1. Measured Versus Simulated Lower Trinity Water Levels in Bell County



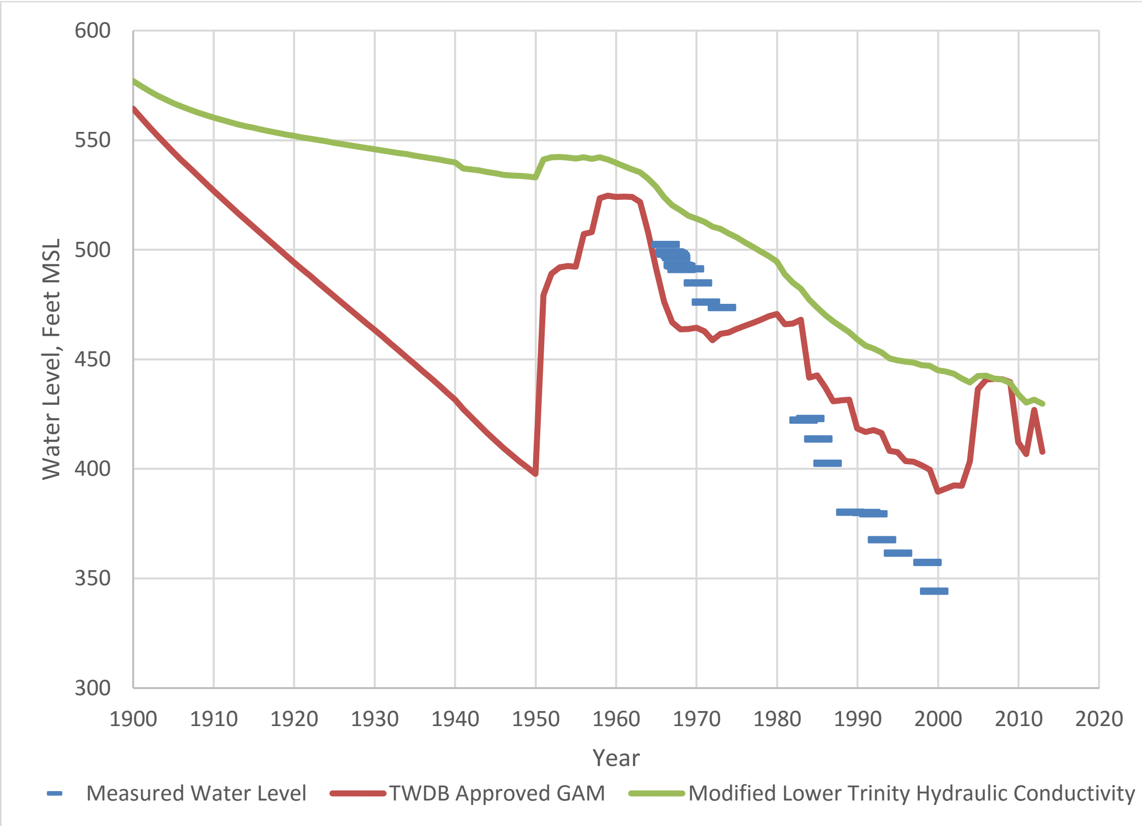
We also reviewed the calibration statistics for the 260 Lower Trinity water levels used for comparison. Once again, the statistics illustrate that changing the one parameter results in a decrease in the level of calibration. Table 1 provides the statistical calibration metrics for the local area and illustrates the departure from the calibration target value.

Table 1. Local Area Calibration Statistics

Calibration Metric	Target Value	TWDB Approved NTWGAM	Modified Lower Trinity Hydraulic Conductivity
Water Level Measurements	N/A	260	
Minimum Measured Water Level	N/A	219.65	
Maximum Measured Water Level	N/A	720.56	
Average Measured Water Level	N/A	505.01	
Range of Water Levels	N/A	500.91	
Mean Error	0	-42.95	-70.48
Mean Absolute Error	0	54.75	70.66
Root Mean Square Error	0	71.73	82.89
Relative Root Mean Square Error	0	0.14	0.16
Normalized Root Mean Square Error	0	0.14	0.17
Nash-Sutcliffe Model Efficiency	>0.9	0.71	0.62
Coefficient of Determination	1	0.26	0.08

While the calibration statistics for the modified version of the NTWGAM are not as good as the TWDB approved version of the model, both models appear to represent the trends in water levels similarly. That is, though the magnitude of fluctuations is not as great in the modified version, the overall change in water level is similar, though the difference in water levels from the beginning to the end of each simulation is typically greater in the TWDB version of the model. In addition, in the study area wells the departure from the measured water levels tends to increase in the more recent years. Figure 2 is a hydrograph for the City of Holland well that illustrates measured water levels and simulated water levels for both versions of the model. Attached are hydrographs for several of the area well illustrating how the model simulates water levels in the area.

Figure 2. Hydrograph of Measured and Simulated Water Levels at the City of Holland Well (CUWCD ID: N2-02-049G – State Well Number: 58-05-902)



The results of the calibration comparison were as expected. To re-calibrate the model to the revised hydraulic conductivity values would require adjustment of other parameters to more closely match the measured water levels. Nonetheless, the similarity in the water level trends suggests the evaluation of long-term predictive changes in water level is reasonable with the modified version of the model for comparison to recent model runs conducted with the TWDB version of the model for evaluation of potential DFCs.

Modified GMA 8 Run 10 Results

We used the simulated January 1, 2010 water levels from the modified transient run as the initial conditions for a modified GMA 8 Run 10. Like the transient run, we made no changes to Run 10 (Beach, et al., 2016), except the modification of the layer 8 horizontal hydraulic conductivity within the area of interest and the starting water levels. After conducting the run, we evaluated the model results in comparison to the Run 10 results discussed by Beach, et al. (2016). Attached is a map illustrating the extent of each aquifer reviewed for this evaluation.

As one would expect, the largest differences in results are in the Hosston aquifer (see Table 2). In the Hosston, the results show a decrease in average drawdown of more than 70 feet on December 31, 2070 and an increase in the percent of the January 1, 2010 water level remaining above the top and bottom of the aquifer on December 31, 2070 of about five percent. However, the results also show that modification of the hydraulic conductivity in the Hosston model layer changes the values in the overlying aquifers.

Table 2. Comparison of NTWGAM Simulation Results for Bell County.

Aquifer	Run 10			Modified Run 10		
	Average Drawdown	Above Top†	Above Base‡	Average Drawdown	Above Top†	Above Base‡
Paluxy	19 ft	92%	93%	16 ft	93%	94%
Glen Rose	83 ft	87%	93%	76 ft	88%	94%
Hensell	137 ft	89%	89%	121 ft	90%	90%
Hosston	330 ft	74%	79%	257 ft	80%	84%
Travis Peak*	300 ft	73%	81%	247 ft	78%	84%

*Travis Peak represents the combined results of the Hensell and Hosston
†Percent of January 1, 2010 Water Level Above Top of Aquifer Remaining on December 31, 2070
‡Percent of January 1, 2010 Water Level Above Bottom of Aquifer Remaining on December 31, 2070

The change in values in the overlying aquifers is likely due to a decrease in the amount of vertical leakage into the Hosston. The increase in model hydraulic conductivity in the area of interest allows water to flow laterally into the area to meet pumping demands with less change in water level. Because water level does not decline as much in the Hosston aquifer under the same pumping demands, there is less difference between water levels in the Hosston and water levels in the overlying aquifers. The decrease in the difference in water levels between the aquifers reduces the amount of leakage from the overlying aquifers and corresponding decline in water levels in those aquifers.

In addition to comparing the results for the two runs for the entire county, we also reviewed the results from each run for the proposed management zone. Attached is a map illustrating the proposed management zones along with the extent of the aquifers in each zone. Comparing Table 3 and Table 4, the difference in results between Run 10 and the Modified Run 10 is quite significant for proposed Management Zone 2.

For the Hosston aquifer in the proposed Management Zone 2, where we applied the most significant increases in hydraulic conductivity, there was a decrease in average drawdown in the Modified Run 10 of 125 feet. That is, for that area the District's per year average decline for comparison to the DFC would decrease by about two feet from 7.2 feet per year to 5.1 feet per year. Similarly, we observe an increase in the percent of the January 1, 2010 water level remaining above the top and bottom of the aquifer on December 31, 2070 of about six percent. In addition, as seen on the county basis, the changes in values also occur to a lesser extent in the overlying aquifers.

Changes in the proposed Management Zone 1 are not as significant as in the proposed Management Zone 2. Nonetheless, there is a decrease in average drawdown for the Hosston and Hensell of 30 feet and 10 feet, respectively. The model results show how the modification of the Lower Trinity horizontal hydraulic conductivity in the area of interest to more closely reflect recent pumping test results causes changes throughout the individual aquifers that make up the local Trinity aquifer.

Table 3. NTWGAM Run 10 Simulation Results for Proposed CUWCD Management Areas.

Aquifer	Run 10 – Mgmt. Zone 1			Run 10 – Mgmt. Zone 2		
	Average Drawdown	Above Top†	Above Base‡	Average Drawdown	Above Top†	Above Base‡
Paluxy	18 ft	92%	93%	55 ft	93%	93%
Glen Rose	40 ft	74%	94%	136 ft	89%	93%
Hensell	101 ft	83%	85%	181 ft	90%	91%
Hosston	243 ft	64%	71%	437 ft	79%	82%
Travis Peak*	205 ft	64%	76%	417 ft	77%	83%

*Travis Peak represents the combined results of the Hensell and Hosston
†Percent of January 1, 2010 Water Level Above Top of Aquifer Remaining on December 31, 2070
‡Percent of January 1, 2010 Water Level Above Bottom of Aquifer Remaining on December 31, 2070

Table 4. NTWGAM Modified Run 10 Simulation Results for Proposed CUWCD Management Areas.

Aquifer	Modified Run 10 – Mgmt. Zone 1			Modified Run 10 – Mgmt. Zone 2		
	Average Drawdown	Above Top†	Above Base‡	Average Drawdown	Above Top†	Above Base‡
Paluxy	16 ft	93%	94%	48 ft	94%	94%
Glen Rose	37 ft	77%	94%	125 ft	90%	94%
Hensell	91 ft	85%	86%	158 ft	92%	92%
Hosston	213 ft	68%	74%	312 ft	85%	88%
Travis Peak*	195 ft	65%	76%	310 ft	83%	88%

*Travis Peak represents the combined results of the Hensell and Hosston
†Percent of January 1, 2010 Water Level Above Top of Aquifer Remaining on December 31, 2070
‡Percent of January 1, 2010 Water Level Above Bottom of Aquifer Remaining on December 31, 2070

CONCLUSIONS

Relatively recent pumping tests conducted using wells completed in the Lower Trinity Aquifer have shown the existence of a higher transmissivity zone in eastern Bell County than currently exists in the TWDB approved NTWGAM. The difference raises a question of how the DFCs adopted by the District through evaluations using the NTWGAM could change if the model properties were to better reflect the local parameters derived from the pumping tests. In addition, the difference in parameters between the model and pumping test results potentially presents a problem for the District to correlate monitoring (that is, measured water levels) to model results.

The simulation results show that there is a significant effect on the predicted long-term change in water levels under the modified hydraulic conductivity and corresponding transmissivity of the modeled Lower Trinity aquifer. While the results are presented in multiple ways, each method of presentation is simply a reflection of the predicted change in water level. Looking specifically at average drawdown in the proposed Management Zone 2, the effect on a DFC could be more than 120 feet.

The changes in the predicted water levels by the model are due to changing only one parameter in a local area of interest. However, there are several model parameters that go into the equations for predicting a water level. It is possible that if other model parameters were modified to achieve a better calibration of the model, the results would be more similar to the TWDB approved NTWGAM. Nonetheless, since a higher aquifer transmissivity means pumping demands can be met with less water level decline, the difference in results using the modified Lower Trinity hydraulic conductivity is reasonable and as expected.

Understanding the difference in the potential effects from production with an aquifer with higher transmissivity than currently represented in the model allows the District to consider the anticipated modeled available groundwater (MAG) for the area as a conservative estimate of production under the proposed DFCs. That is, since the proposed DFCs are based on evaluations conducted using the TWDB approved NTWGAM, the predicted changes in water level may be greater than the actual changes the District will measure as part of its ongoing monitoring program. It is the monitoring program that will continue to inform the District regarding the reliability, accuracy, and applicability of model results and provide guidance to the District regarding the management and regulation of the local groundwater resources.

GEOSCIENTIST SEAL

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The seal appearing on this document was authorized by Michael R. Keester, P.G. on February 25, 2011.

Michael R. Keester, P.G.
Associate

REFERENCES

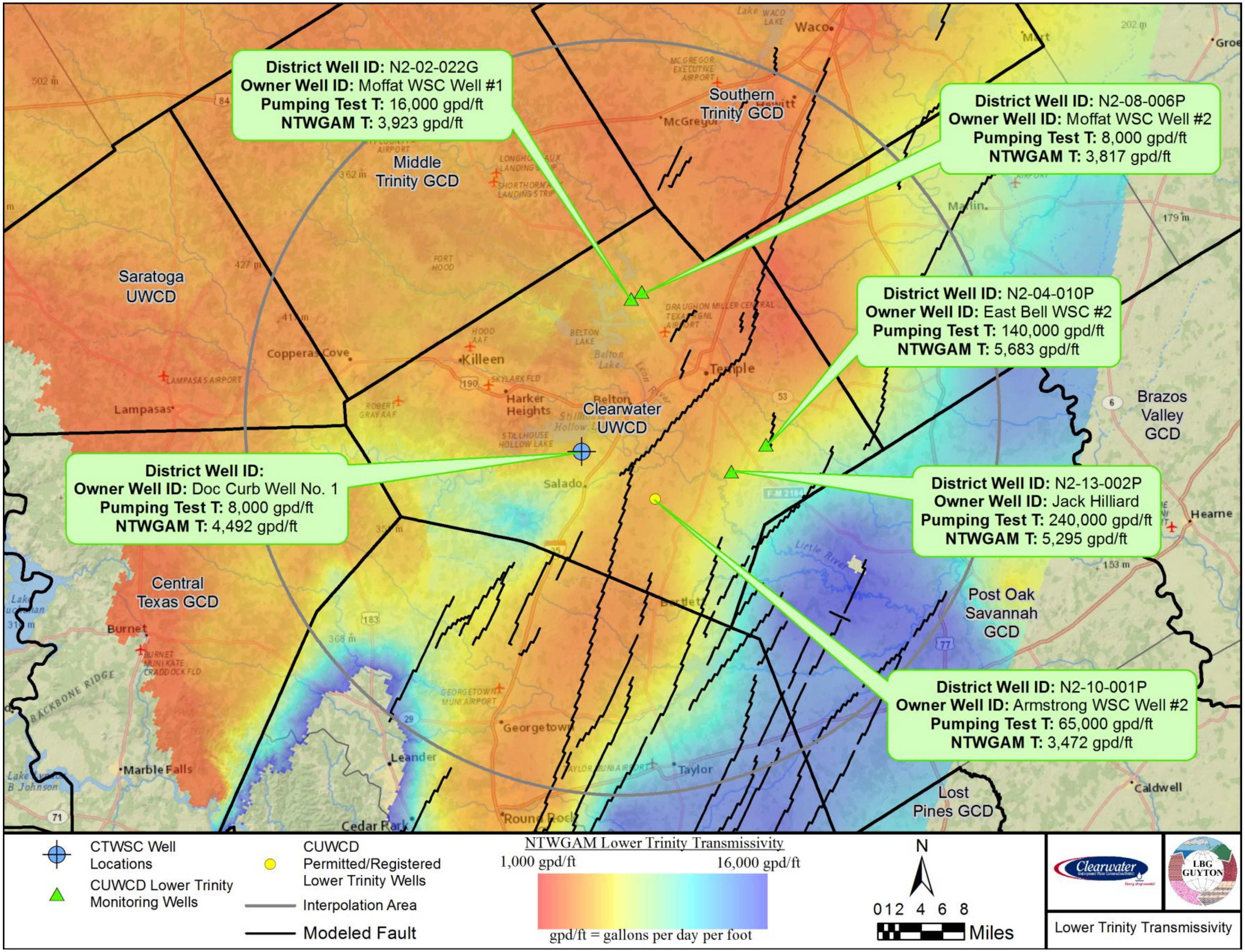
Beach, J., Keester, M. & Konetchy, B., 2016. *Results of Predictive Simulation in Support of GMA 8 Joint Planning – NTGCD GMA 8 Run 10,* Austin: LBG-Guyton Associates.

Driscoll, F. G., 1986. *Groundwater and Wells.* Second Edition ed. St. Paul(MN): Johnson Screens.

Kelley, V. A. et al., 2014. *Updated Groundwater Availability Model of the Northern Trinity and Woodbine Aquifers.* Austin(Texas): INTERA Incorporated.

Krivoruchko, K., 2012. Empirical Bayesian Kriging Implemented in ArcGIS Geostatistical Analyst. *ArcUser*, Fall, 15(4), pp. 6-10.

Attachment 1 — Maps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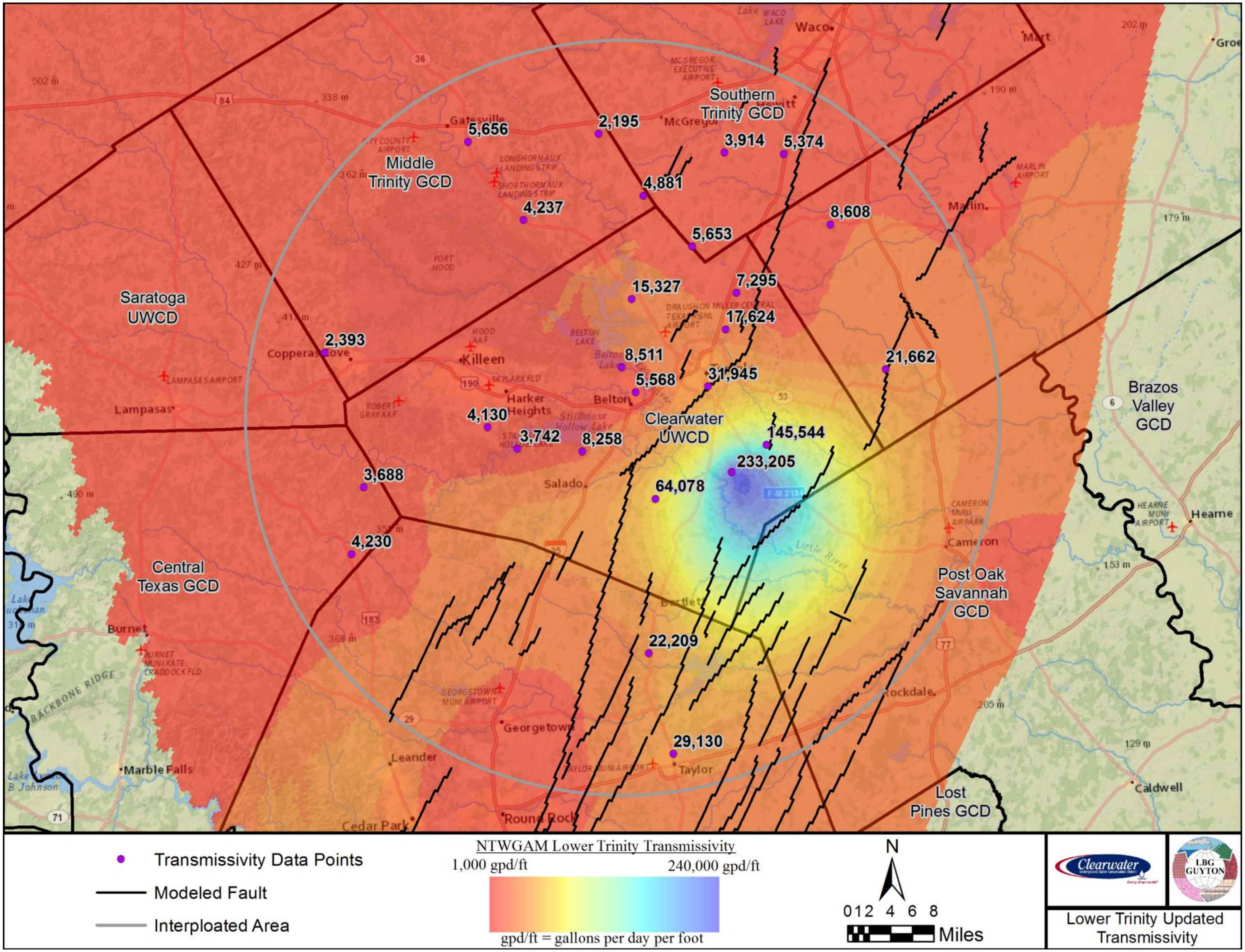
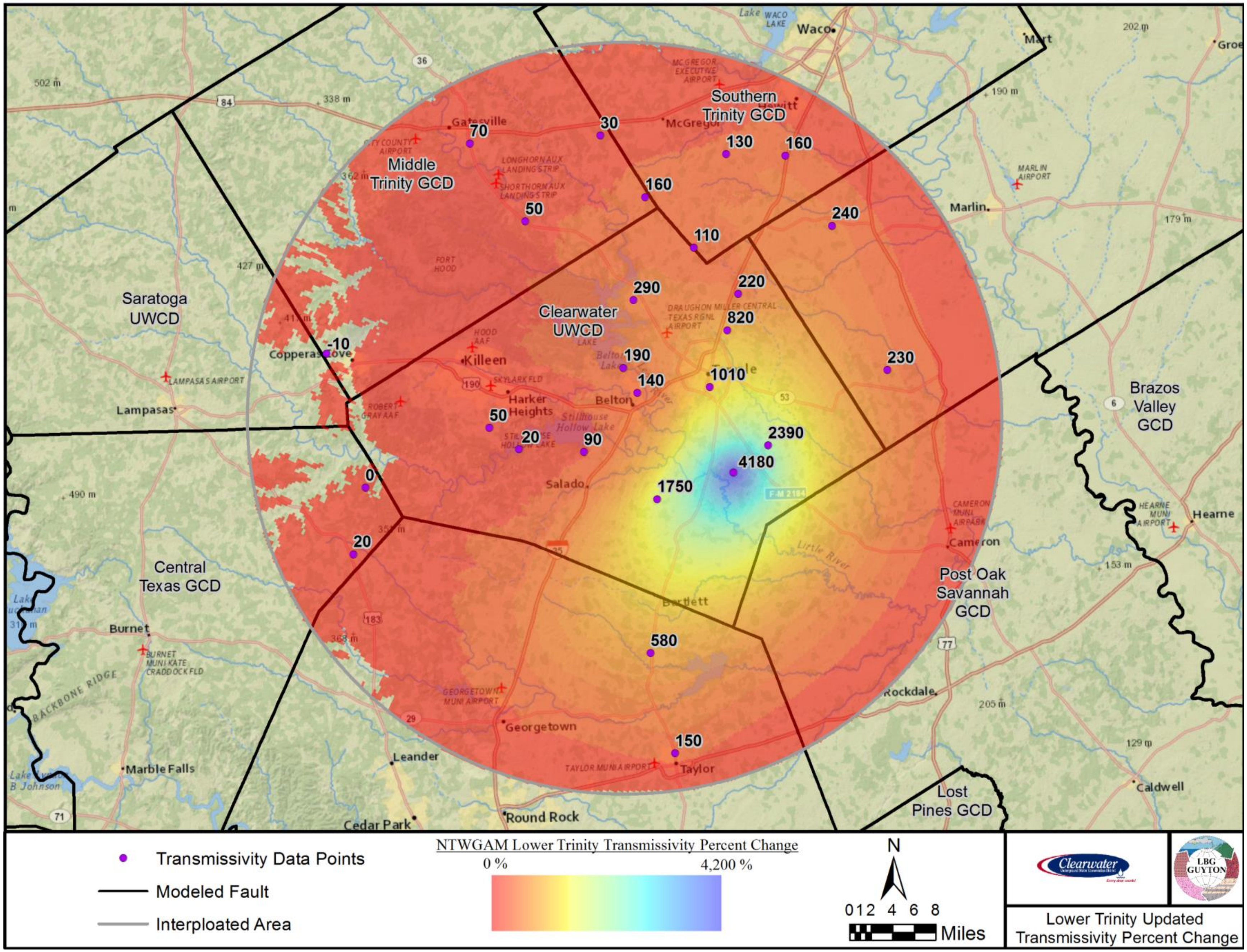
Owner Well ID: Moffat WSC Well #1
Pumping Test T: 16,000 gpd/ft
NTWGAM T: 3,923 gpd/ft
District Well ID: N2-08-006P
Owner Well ID: Moffat WSC Well #2
Pumping Test T: 8,000 gpd/ft
NTWGAM T: 3,817 gpd/ft
District Well ID: N2-04-010P
Owner Well ID: East Bell WSC #2
Pumping Test T: 140,000 gpd/ft
NTWGAM T: 5,683 gpd/ft
District Well ID:
Owner Well ID: Doc Curb Well No. 1
Pumping Test T: 8,000 gpd/ft
NTWGAM T: 4,492 gpd/ft
District Well ID: N2-13-002P
Owner Well ID: Jack Hilliard
Pumping Test T: 240,000 gpd/ft
NTWGAM T: 5,295 gpd/ft
District Well ID: N2-10-001P
Owner Well ID: Armstrong WSC Well #2
Pumping Test T: 65,000 gpd/ft
NTWGAM T: 3,472 gpd/ft
Southern Trinity GCD
Middle Trinity GCD
Saratoga UWCD
Clearwater UWCD
Brazos Valley GCD
Post Oak Savannah GCD
Central Texas GCD
Lost Pines GCD
Waco
McGregor
Killeen
Copperas Cove
Lampasas
Harker Heights
Belton
Temple
Salado
Marlin
Hearne
Burnet
Marble Falls
Georgetown
Leander
Cedar Park
Round Rock
Taylor
Caldwell
CTWSC Well Locations
CUWCD Lower Trinity Monitoring Wells
CUWCD Permitted/Registered Lower Trinity Wells
Interpolation Area
Modeled Fault
NTWGAM Lower Trinity Transmissivity
1,000 gpd/ft
16,000 gpd/ft
gpd/ft = gallons per day per foot
N
0 1 2 4 6 8
Miles
Clearwater
Lower Trinity Transmissivity


Middle Trinity GCD
Southern Trinity GCD
Saratoga UWCD
Clearwater UWCD
Central Texas GCD
Brazos Valley GCD
Post Oak Savannah GCD
Lost Pines GCD
5,656
2,195
3,914
5,374
4,881
4,237
8,608
5,653
15,327
7,295
17,624
2,393
8,511
5,568
31,945
21,662
4,130
3,742
8,258
145,544
233,205
3,688
64,078
4,230
22,209
29,130
Transmissivity Data Points
Modeled Fault
Interploated Area
NTWGAM Lower Trinity Transmissivity
1,000 gpd/ft
240,000 gpd/ft
gpd/ft = gallons per day per foot
N
0 1 2 4 6 8
Miles
Lower Trinity Updated Transmissivity


Middle Trinity GCD
Southern Trinity GCD
Clearwater UWCD
Saratoga UWCD
Central Texas GCD
Brazos Valley GCD
Post Oak Savannah GCD
Lost Pines GCD
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160
160
50
110
240
290
220
820
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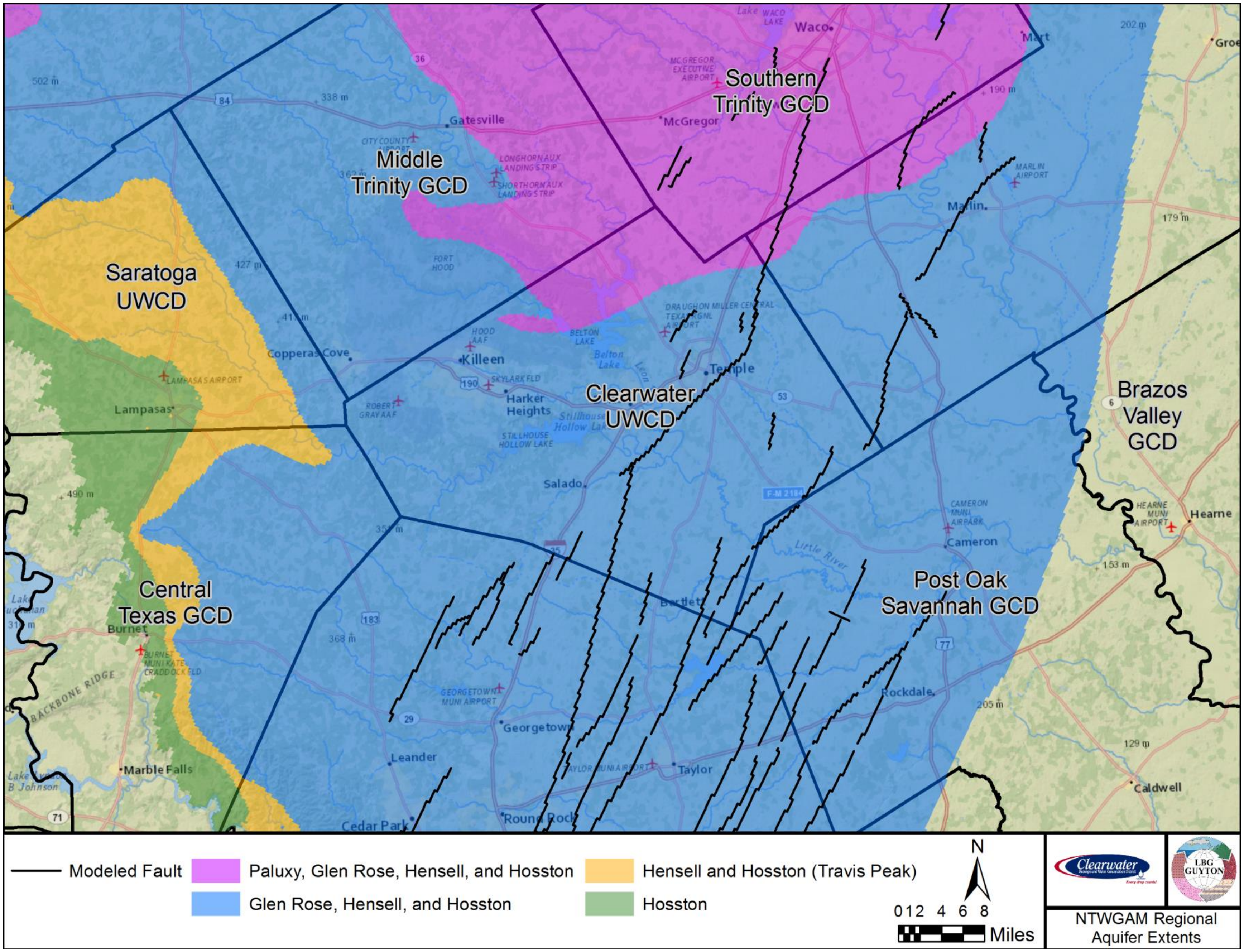
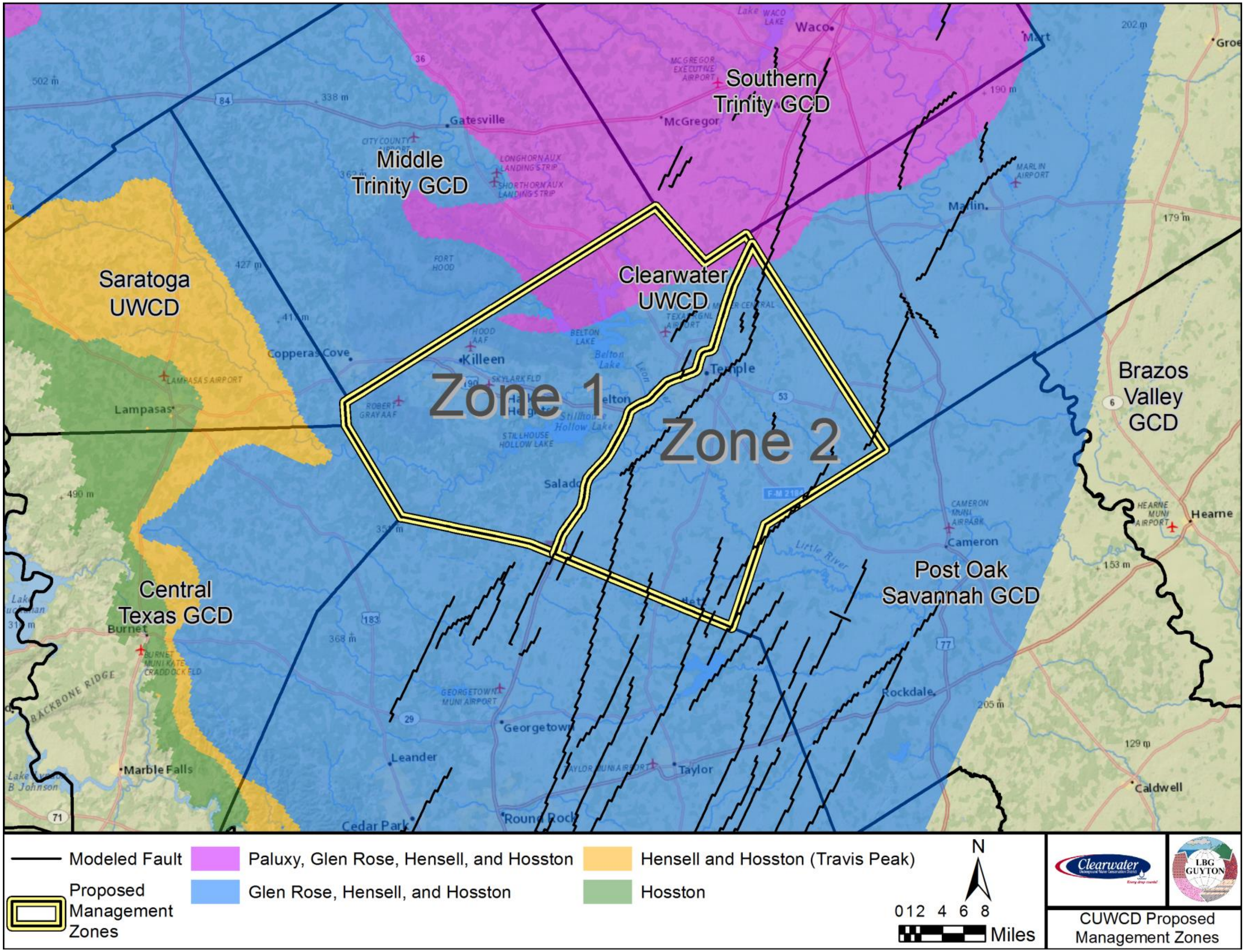
190
140
1010
230
50
20
90
2390
4180
0
1750
20
580
150
Waco
Gatesville
McGregor
Marlin
Killeen
Harker Heights
Belton
Copperas Cove
Lampasas
Salado
Cameron
Hearne
Bartlett
Burnet
Rockdale
Georgetown
Leander
Taylor
Marble Falls
Round Rock
Cedar Park
Caldwell
Transmissivity Data Points
Modeled Fault
Interploated Area
NTWGAM Lower Trinity Transmissivity Percent Change
0 %
4,200 %
N
0 1 2 4 6 8
Miles
Clearwater
LBG GUYTON
Lower Trinity Updated Transmissivity Percent Change


Southern Trinity GCD
Middle Trinity GCD
Saratoga UWCD
Clearwater UWCD
Brazos Valley GCD
Central Texas GCD
Post Oak Savannah GCD
Modeled Fault
Paluxy, Glen Rose, Hensell, and Hosston
Glen Rose, Hensell, and Hosston
Hensell and Hosston (Travis Peak)
Hosston
N
0 1 2 4 6 8
Miles
NTWGAM Regional Aquifer Extents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Saratoga UWCD
Clearwater UWCD
Zone 1
Zone 2
Brazos Valley GCD
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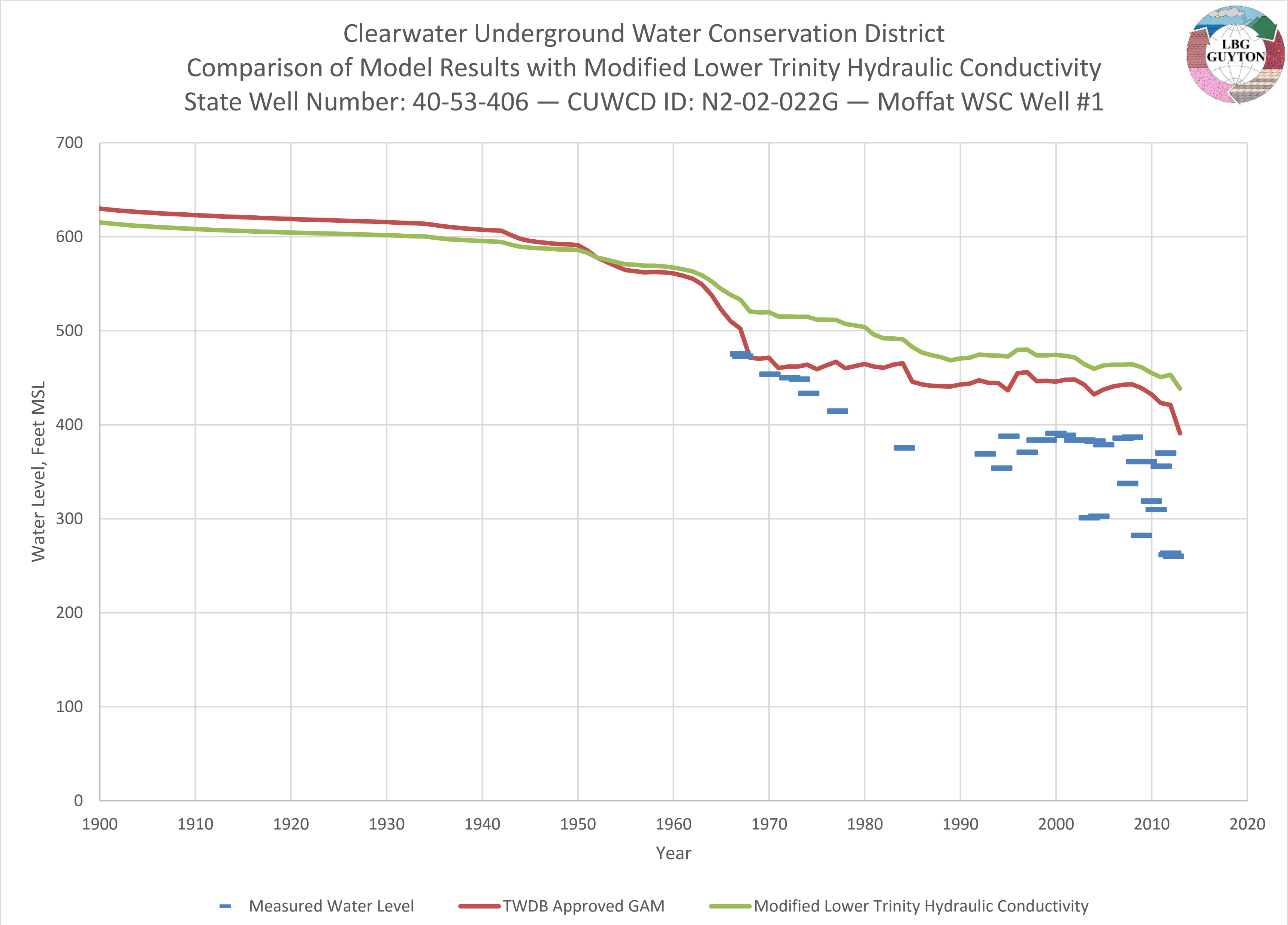
McGregor
Gatesville
Killeen
Copperas Cove
Lampasas
Temple
Belton
Salado
Marlin
Cameron
Hearne
Burnet
Rockdale
Georgetown
Leander
Taylor
Marble Falls
Cedar Park
Round Rock
Caldwell
Modeled Fault
Proposed Management Zones
Paluxy, Glen Rose, Hensell, and Hosston
Glen Rose, Hensell, and Hosston
Hensell and Hosston (Travis Peak)
Hosston
N
0 1 2 4 6 8
Miles
CUWCD Proposed Management Zones

Attachment 2 — Hydrographs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Comparison of Model Results with Modified Lower Trinity Hydraulic Conductivity
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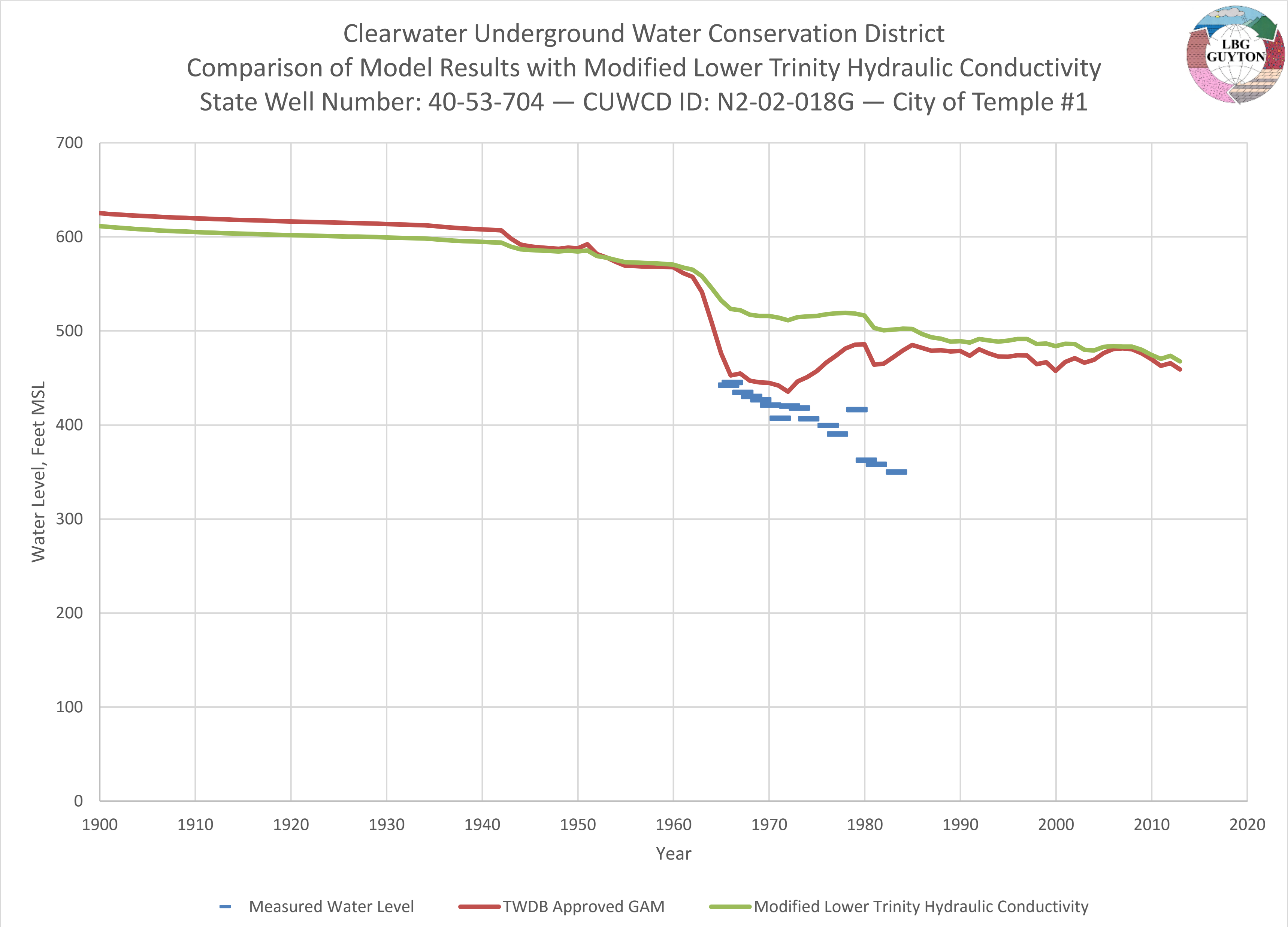
Water Level, Feet MSL
700
600
500
400
300
200
100
0
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
Year
Measured Water Level
TWDB Approved GAM
Modified Lower Trinity Hydraulic Conductivity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Water Level, Feet MSL
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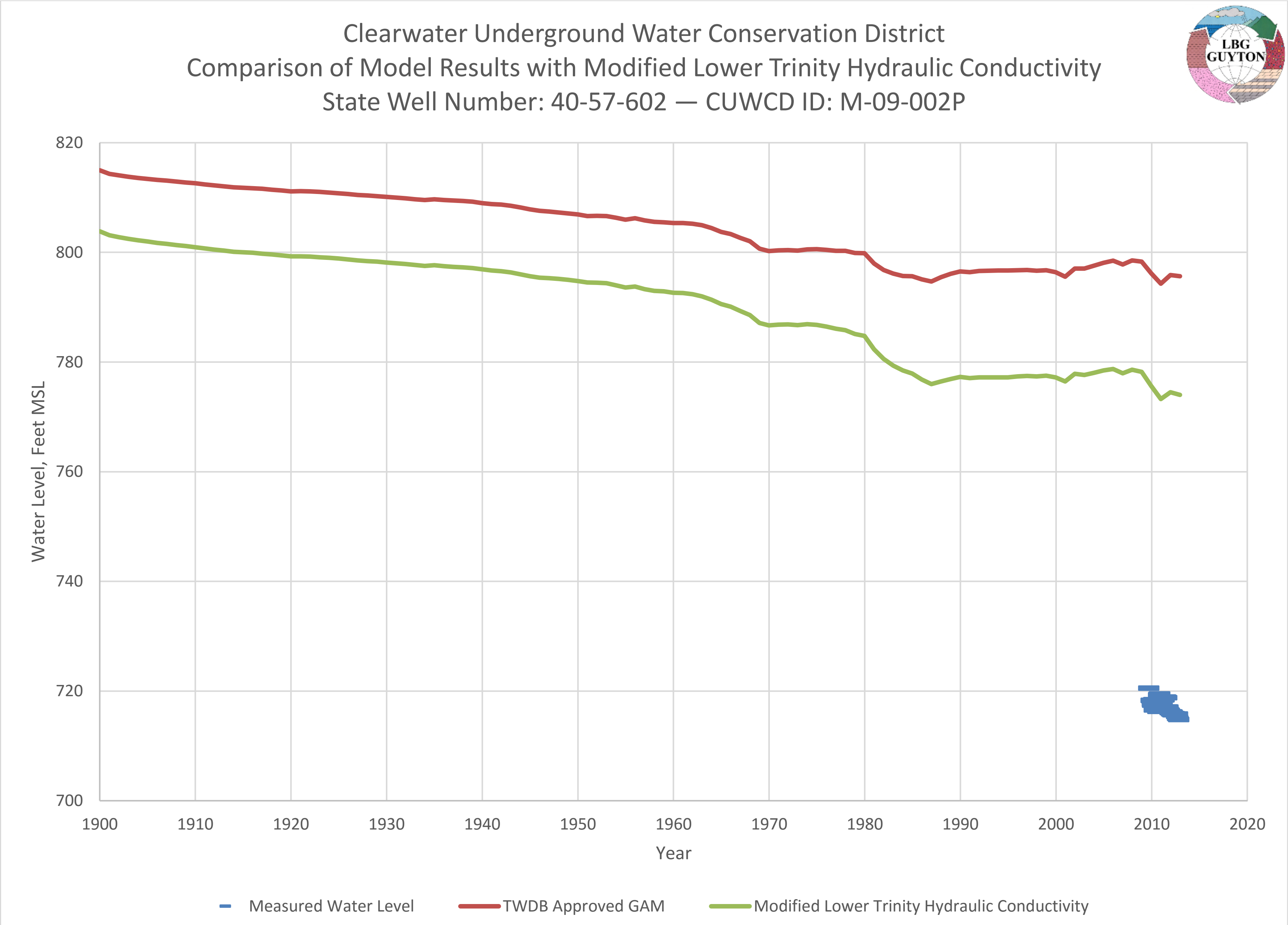
0
100
200
300
400
500
600
700
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
Measured Water Level
TWDB Approved GAM
Modified Lower Trinity Hydraulic Conductivity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Water Level, Feet MSL
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800
780
760
740
720
700
1900
1910
1920
1930
1940
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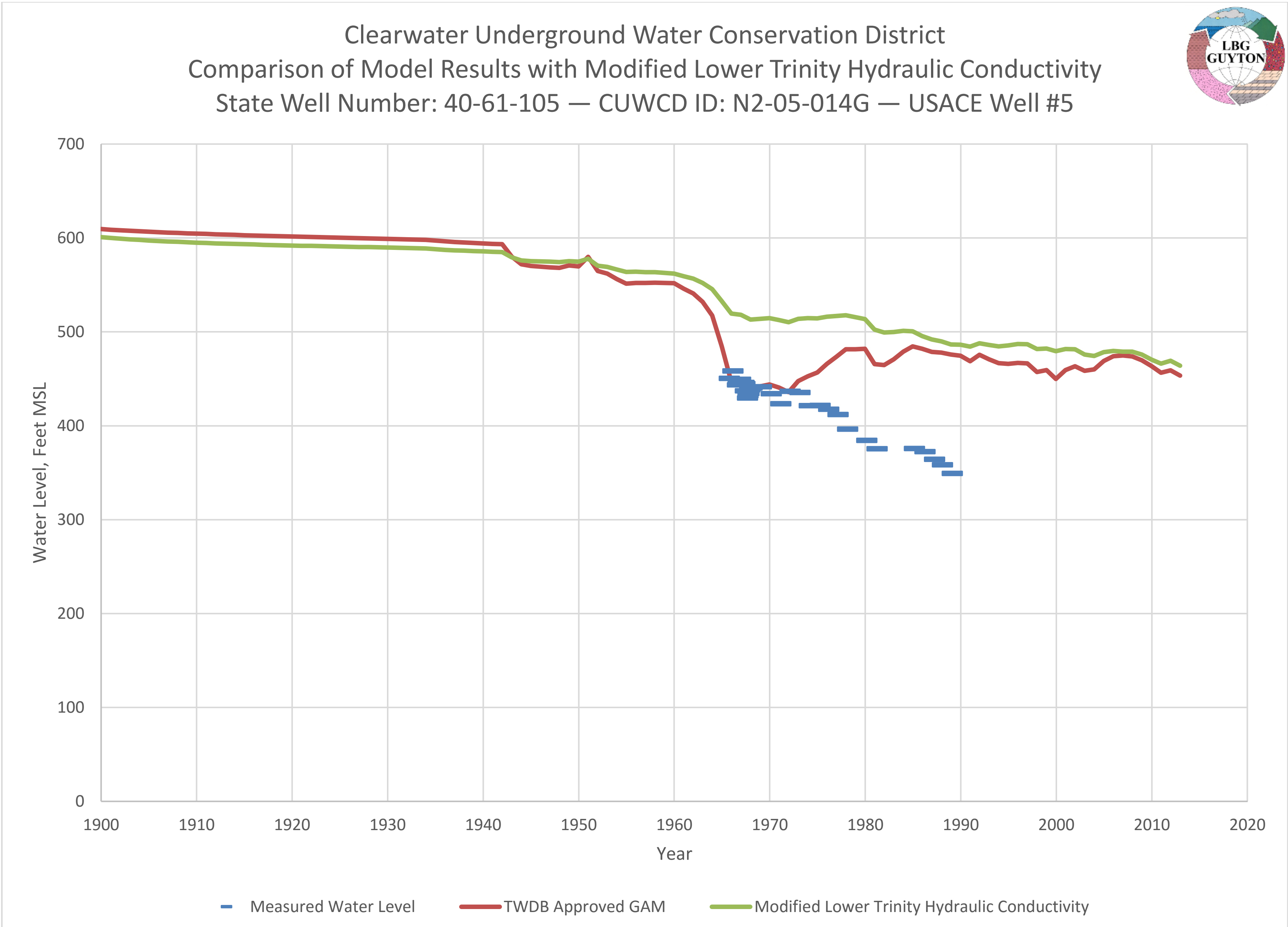
1970
1980
1990
2000
2010
2020
Year
Measured Water Level
TWDB Approved GAM
Modified Lower Trinity Hydraulic Conductivity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Water Level, Feet MSL
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200
300
400
500
600
700
1900
1910
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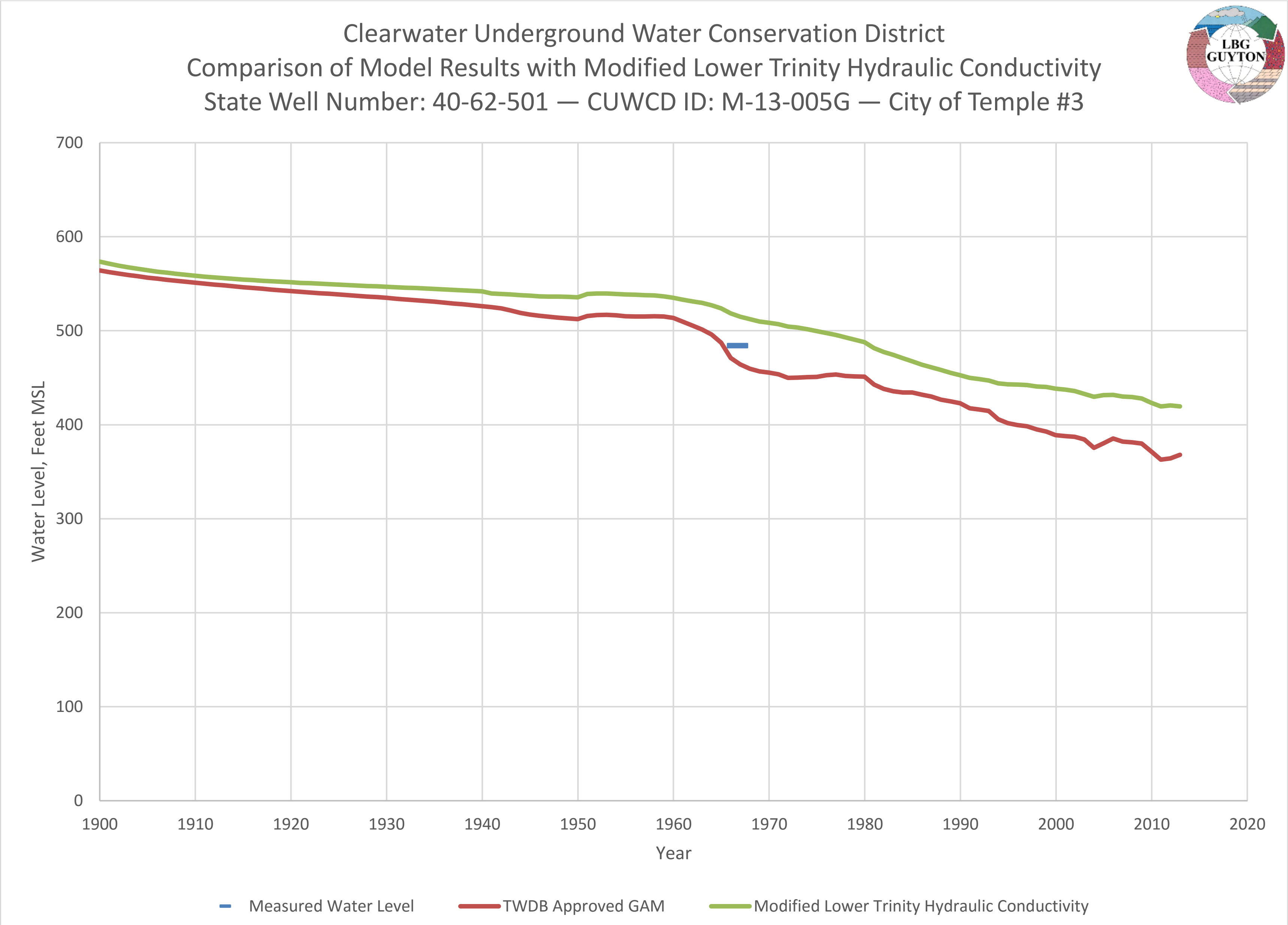
1990
2000
2010
2020
Measured Water Level
TWDB Approved GAM
Modified Lower Trinity Hydraulic Conductivity


Clearwater Underground Water Conservation District
Comparison of Model Results with Modified Lower Trinity Hydraulic Conductivity
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LBG GUYTON
Water Level, Feet MSL
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1970
1980
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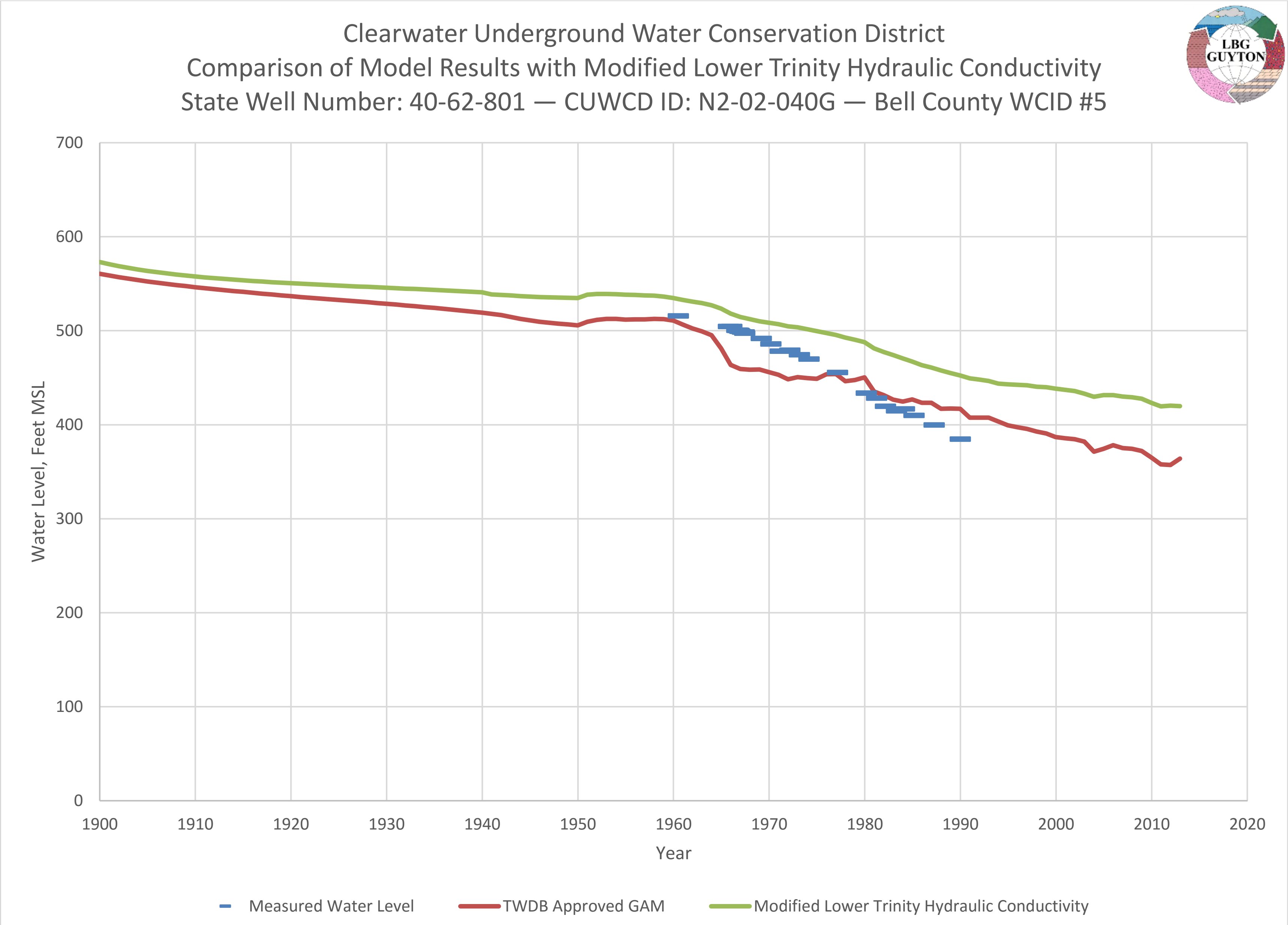
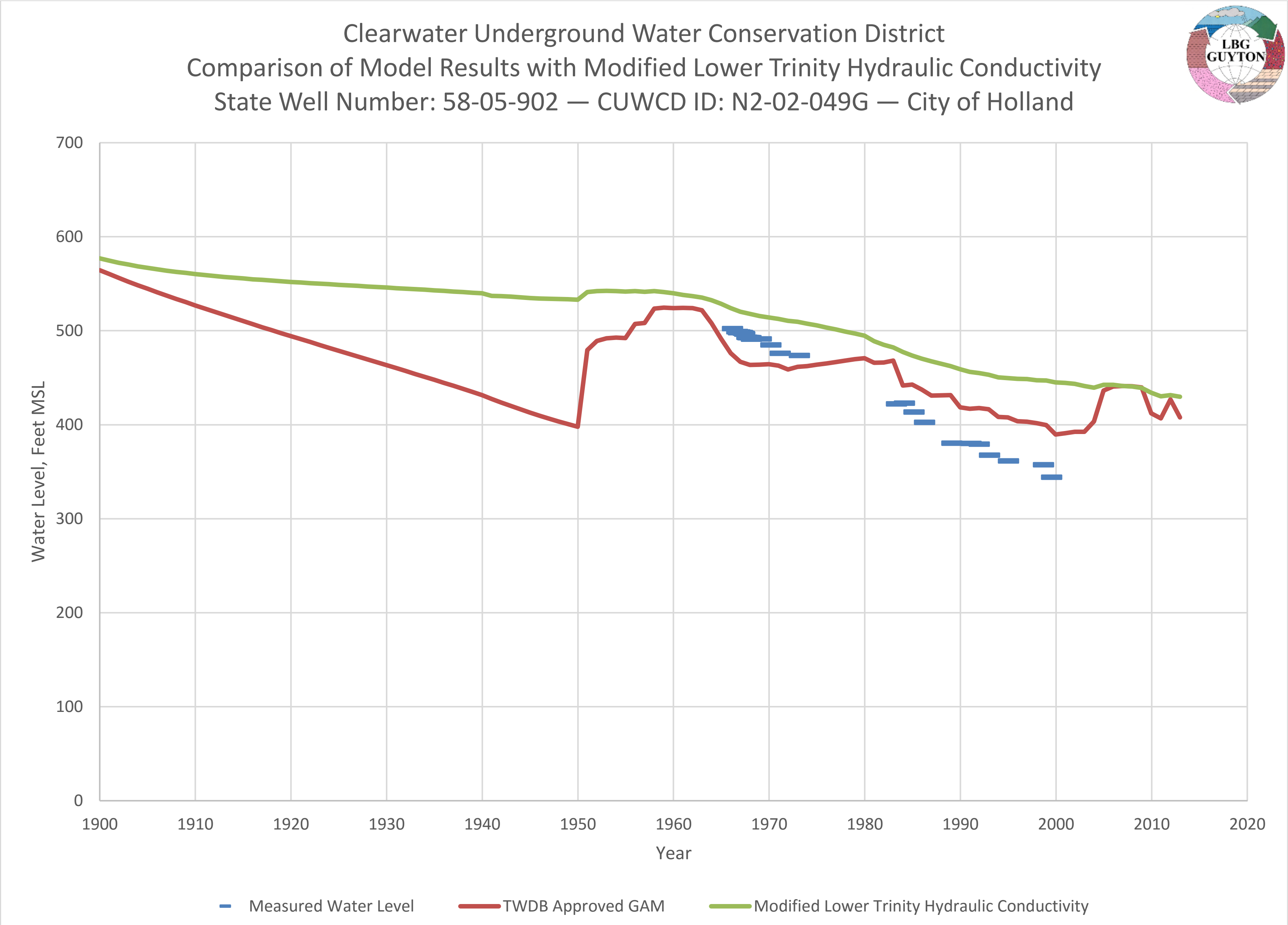
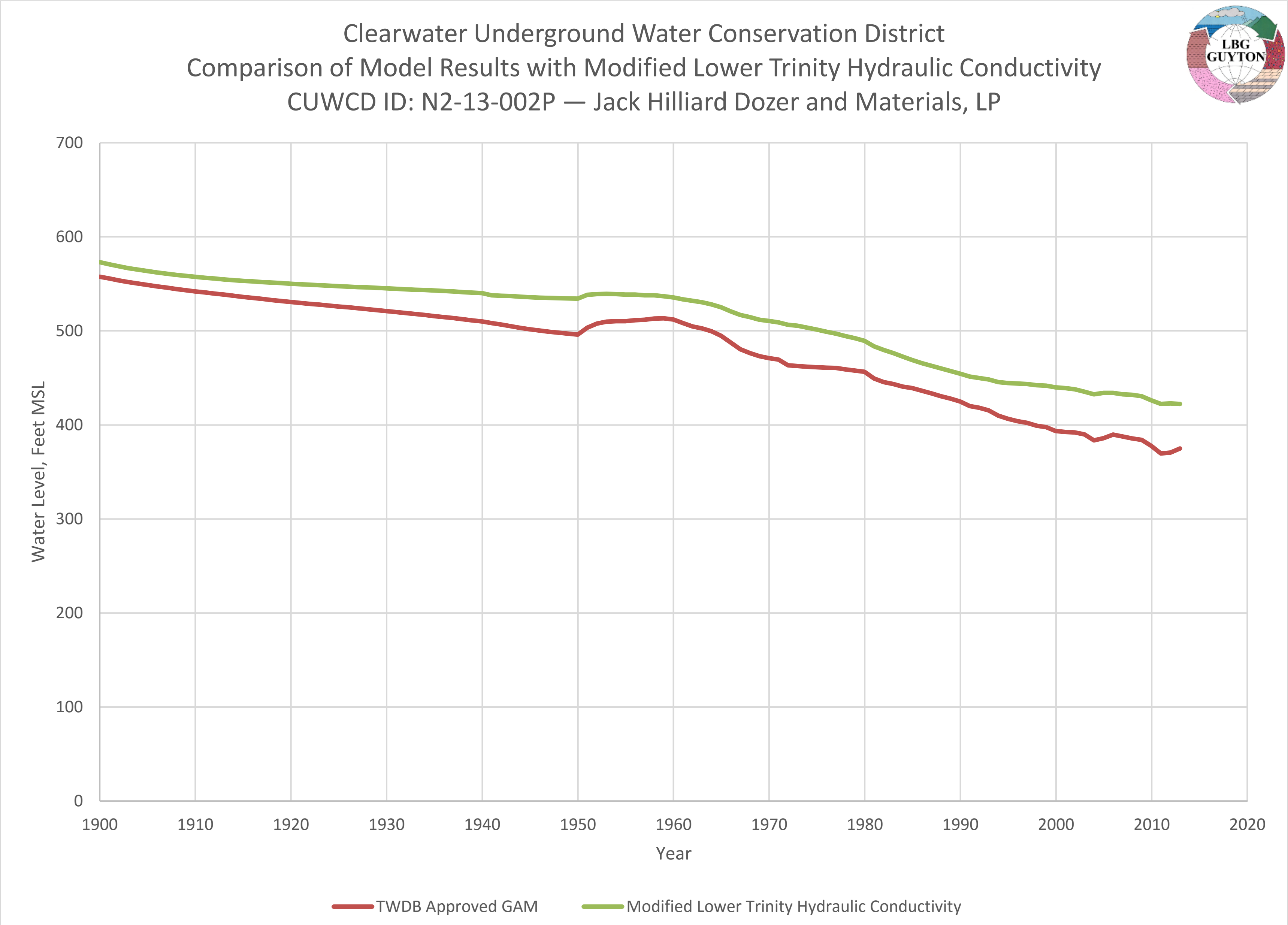
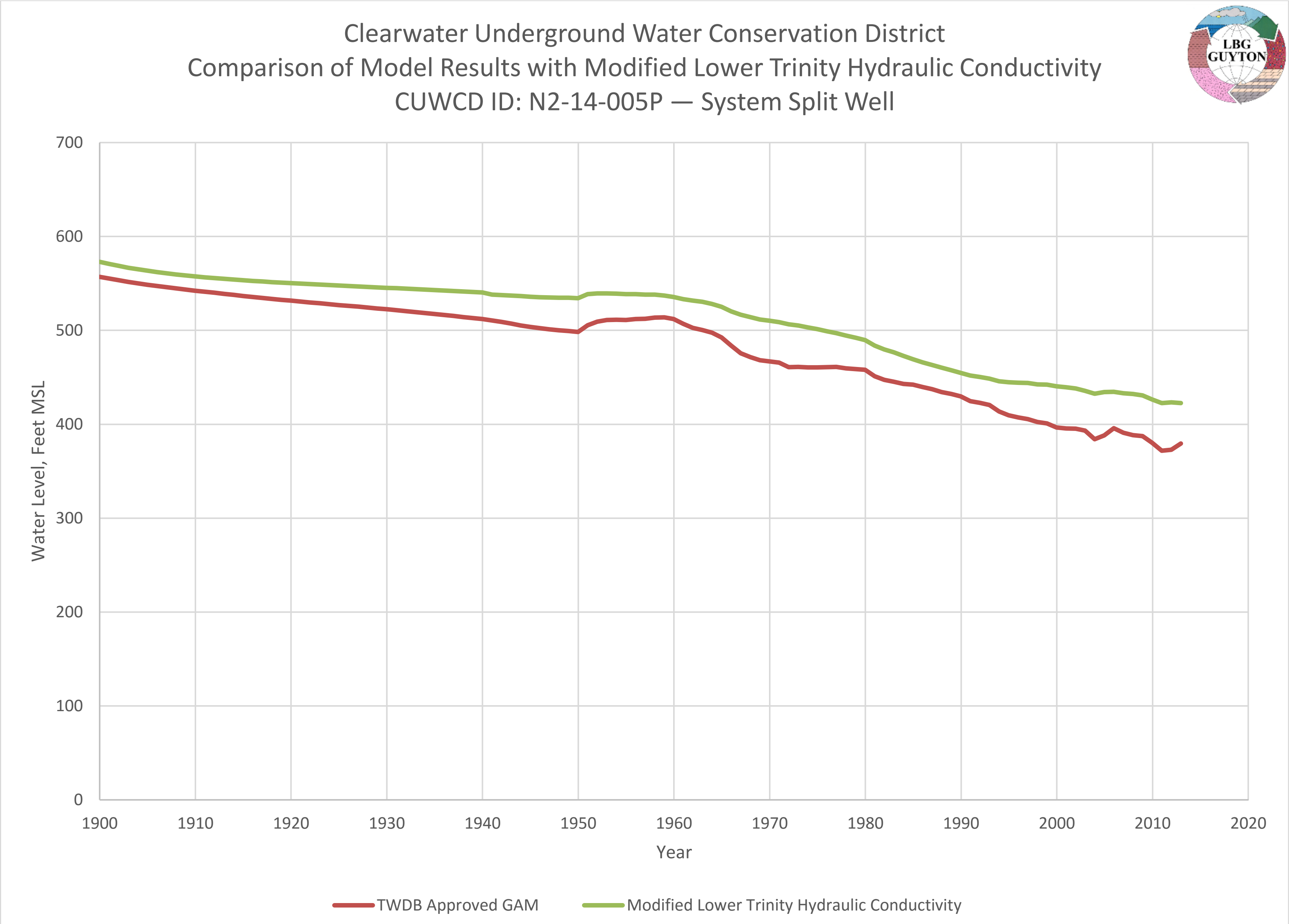
2020
Year
Measured Water Level
TWDB Approved GAM
Modified Lower Trinity Hydraulic Conductivity


Clearwater Underground Water Conservation District
Comparison of Model Results with Modified Lower Trinity Hydraulic Conductivity
State Well Number: 40-62-801 — CUWCD ID: N2-02-040G — Bell County WCID #5
LBG GUYTON
Water Level, Feet MSL
700
600
500
400
300
200
100
0
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
Year
Measured Water Level
TWDB Approved GAM
Modified Lower Trinity Hydraulic Conductivity

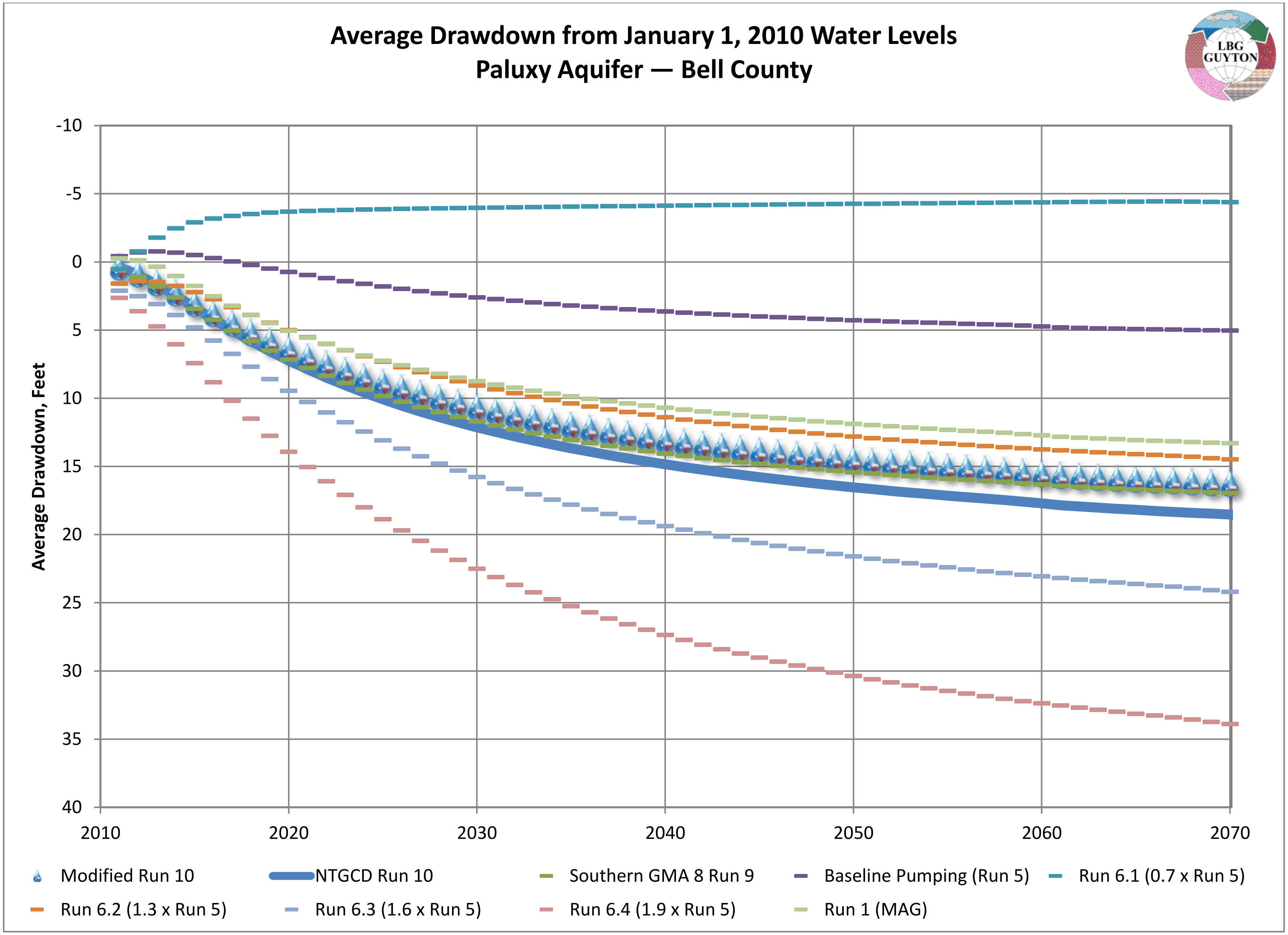

Clearwater Underground Water Conservation District
Comparison of Model Results with Modified Lower Trinity Hydraulic Conductivity
State Well Number: 58-05-902 — CUWCD ID: N2-02-049G — City of Holland
LBG GUYTON
Water Level, Feet MSL
0
100
200
300
400
500
600
700
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
Year
Measured Water Level
TWDB Approved GAM
Modified Lower Trinity Hydraulic Conductivity

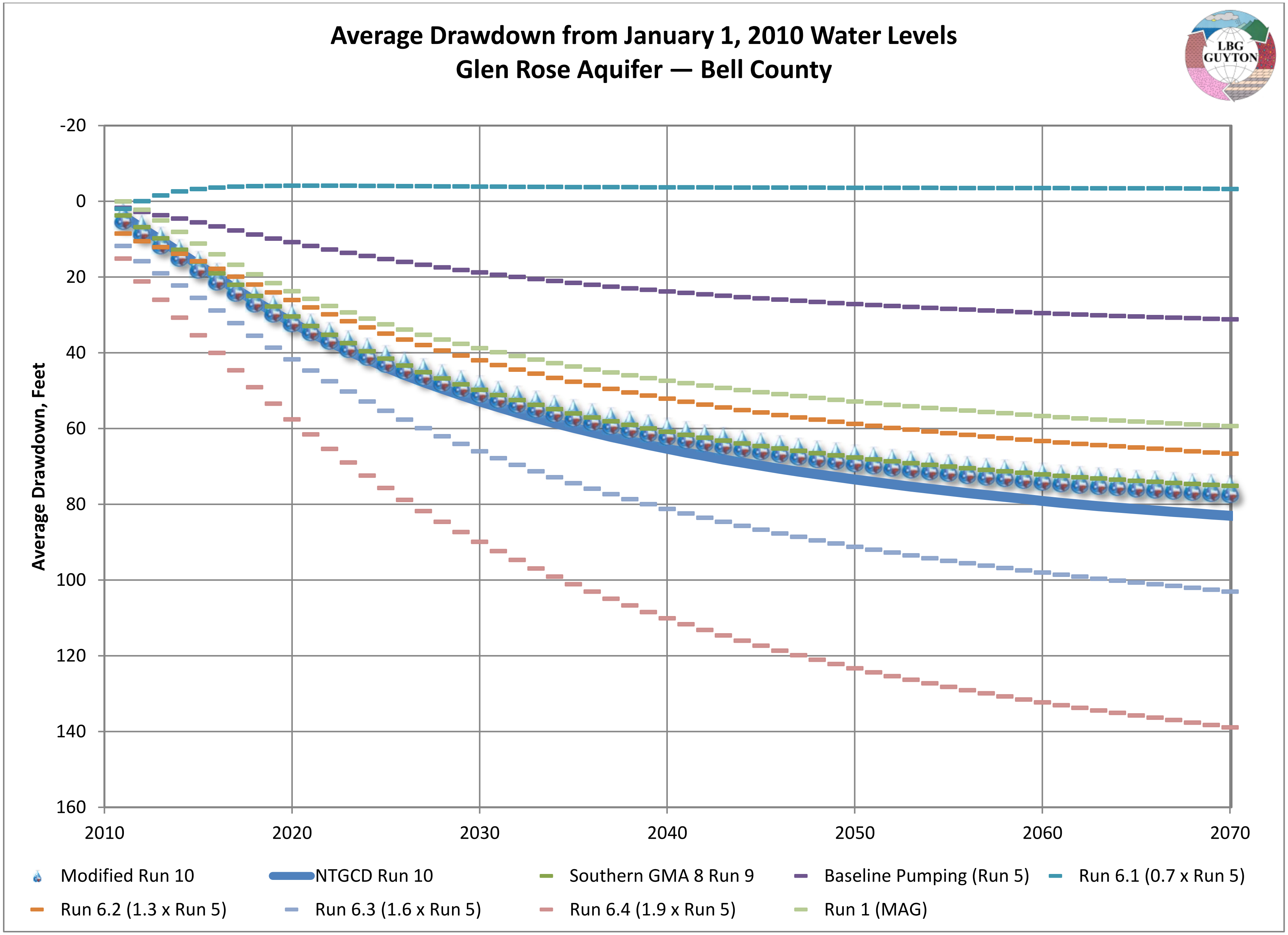

Clearwater Underground Water Conservation District
Comparison of Model Results with Modified Lower Trinity Hydraulic Conductivity
CUWCD ID: N2-13-002P — Jack Hilliard Dozer and Materials, LP
Water Level, Feet MSL
700
600
500
400
300
200
100
0
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
Year
TWDB Approved GAM
Modified Lower Trinity Hydraulic Conductivity

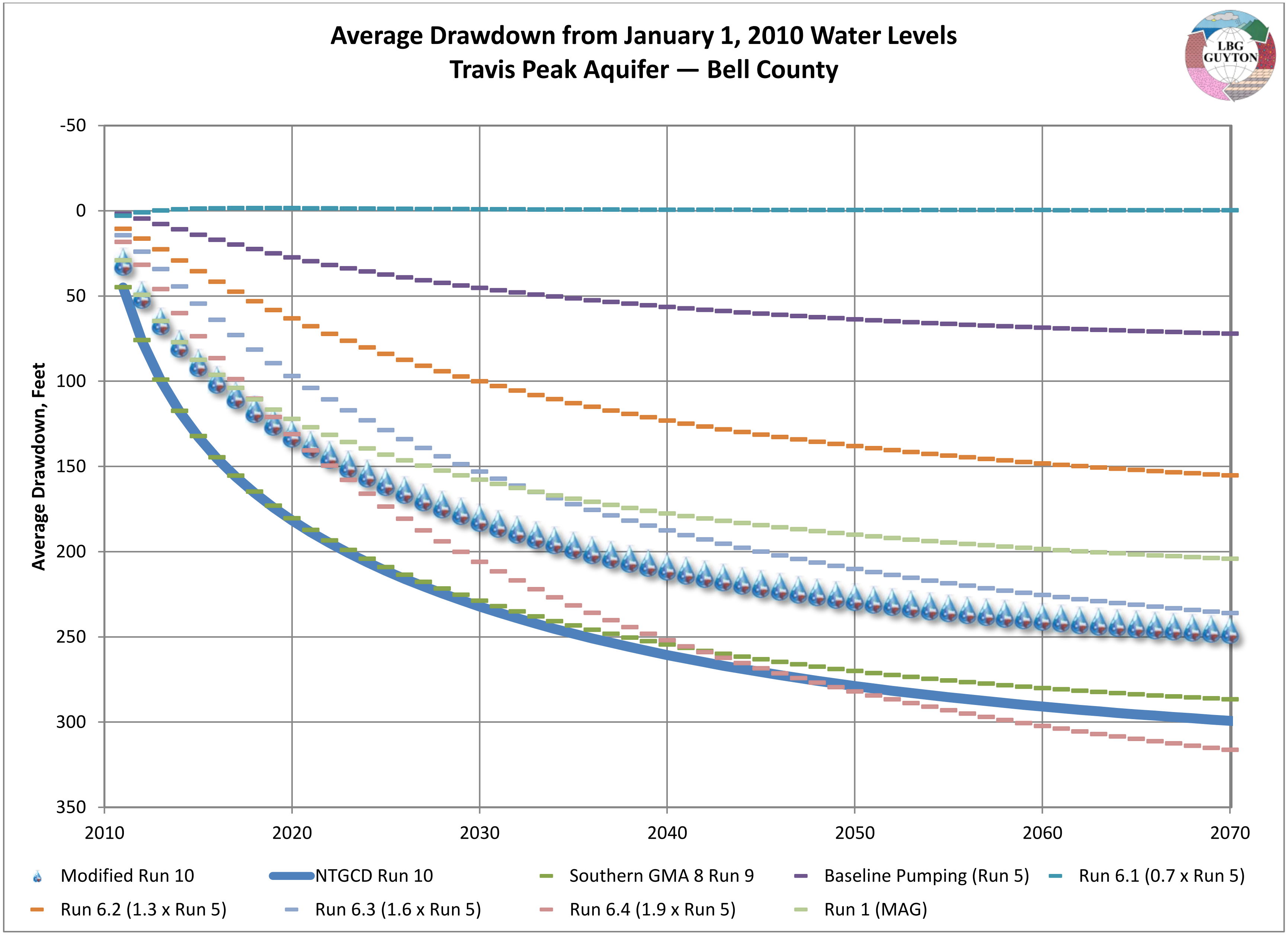

Clearwater Underground Water Conservation District
Comparison of Model Results with Modified Lower Trinity Hydraulic Conductivity
CUWCD ID: N2-14-005P — System Split Well
LBG GUYTON
Water Level, Feet MSL
0
100
200
300
400
500
600
700
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
Year
TWDB Approved GAM
Modified Lower Trinity Hydraulic Conductivity

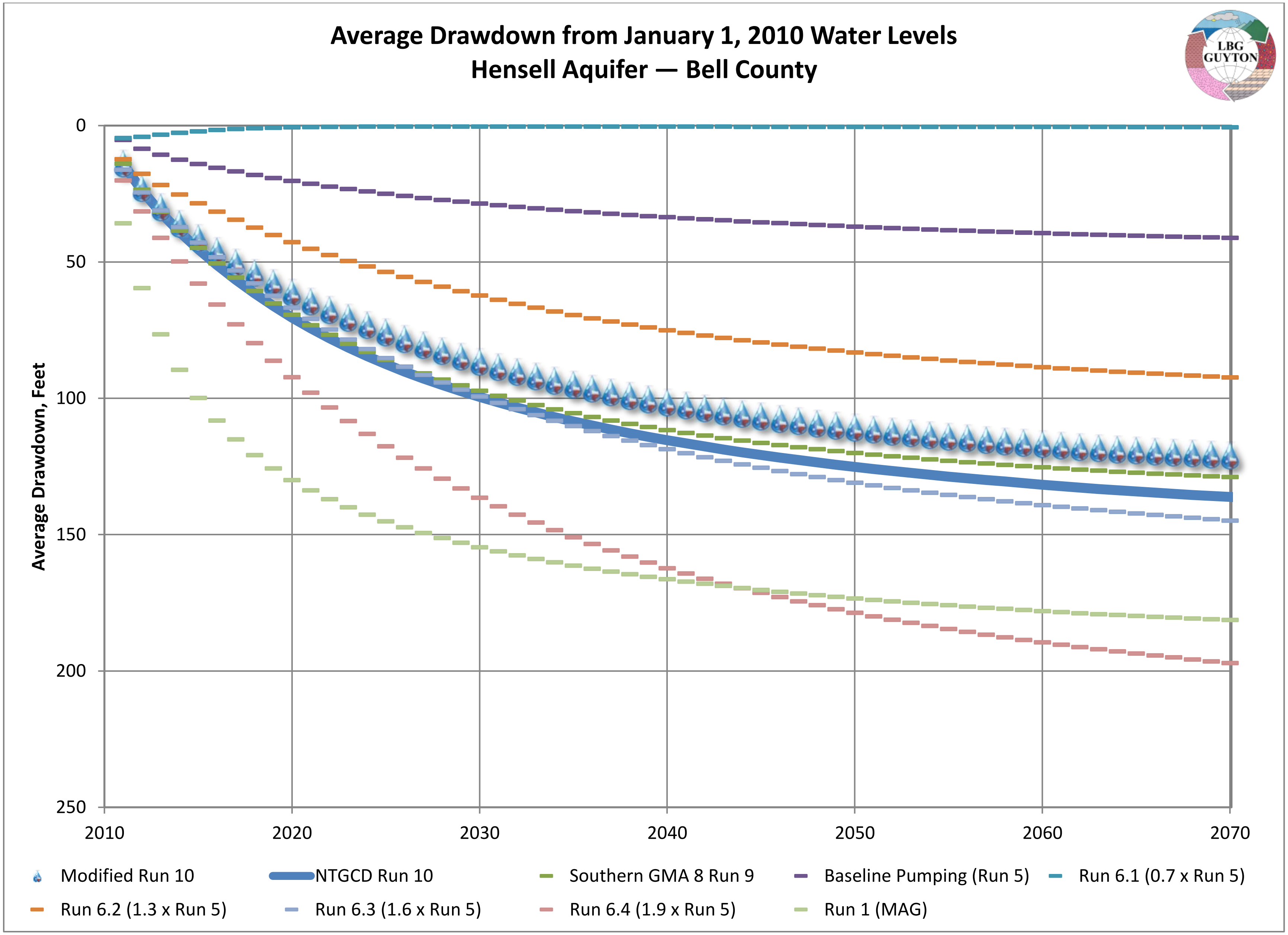
Attachment 3 —
Run Comparison Charts

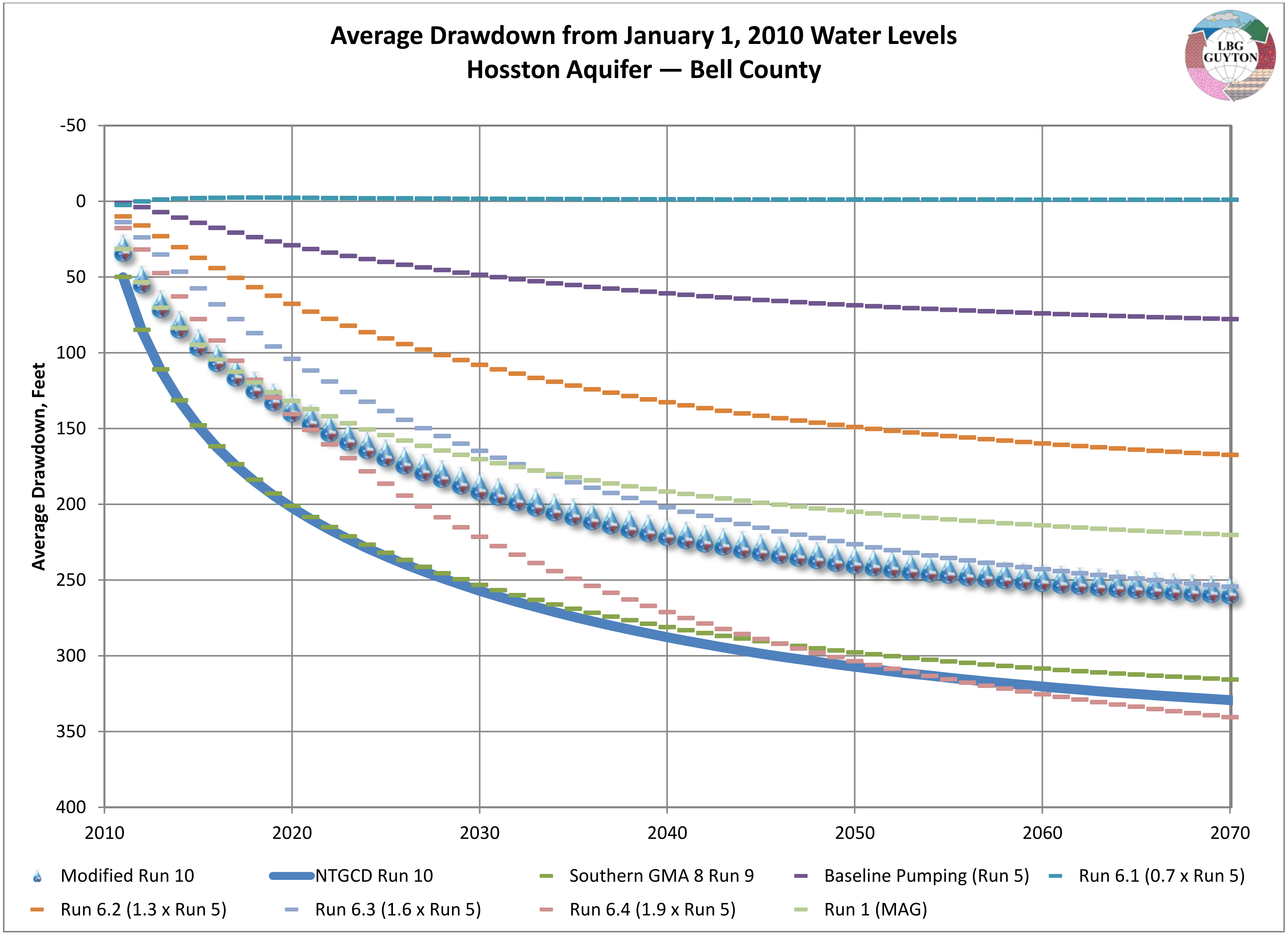
Attachment 3.1 —
County Average Drawdown


Average Drawdown from January 1, 2010 Water Levels
Paluxy Aquifer — Bell County
LBG GUYTON
Average Drawdown, Feet
-10
-5
0
5
10
15
20
25
30
35
40
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

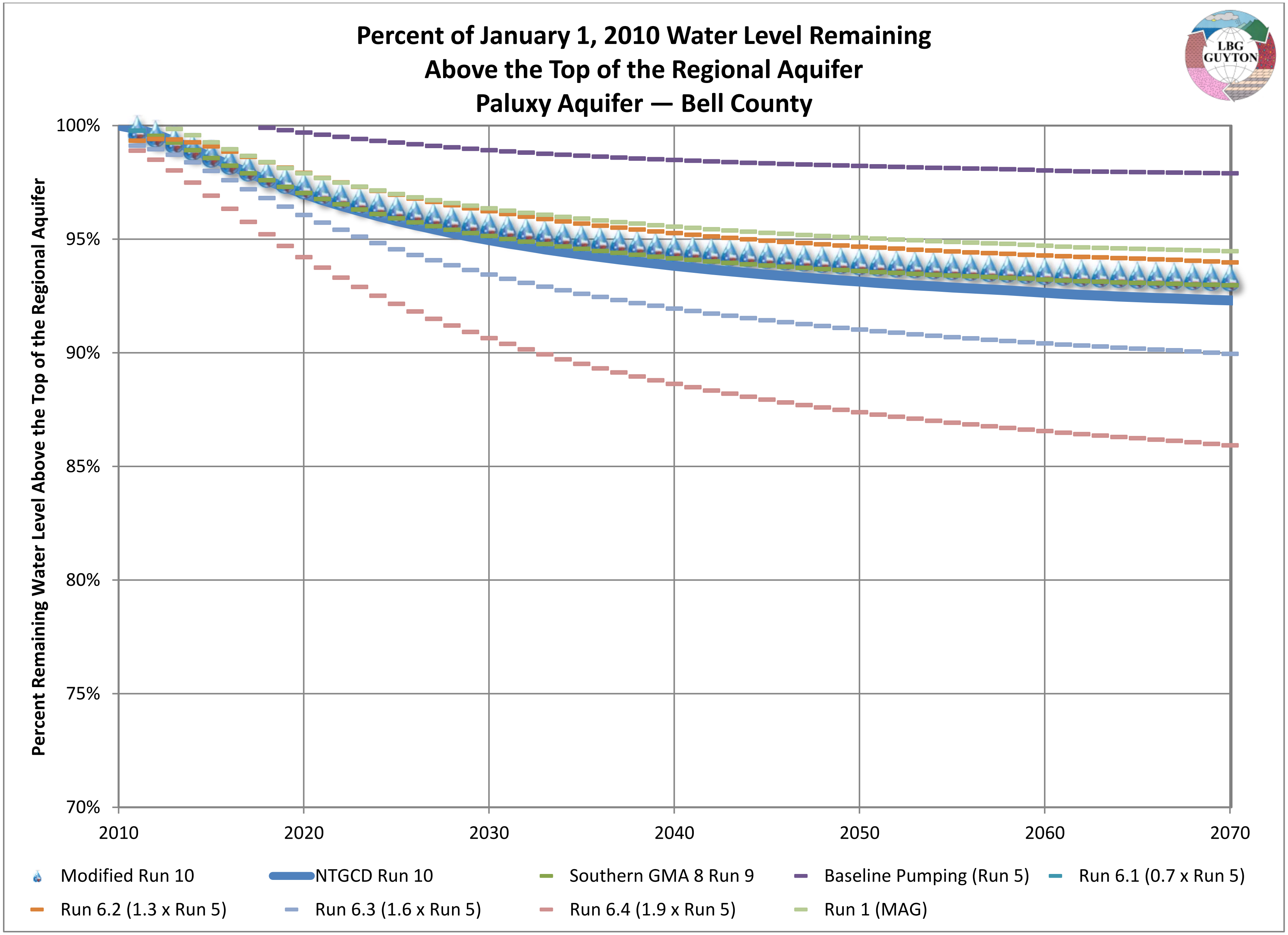

Average Drawdown from January 1, 2010 Water Levels
Glen Rose Aquifer — Bell County
LBG GUYTON
Average Drawdown, Feet
-20
0
20
40
60
80
100
120
140
160
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

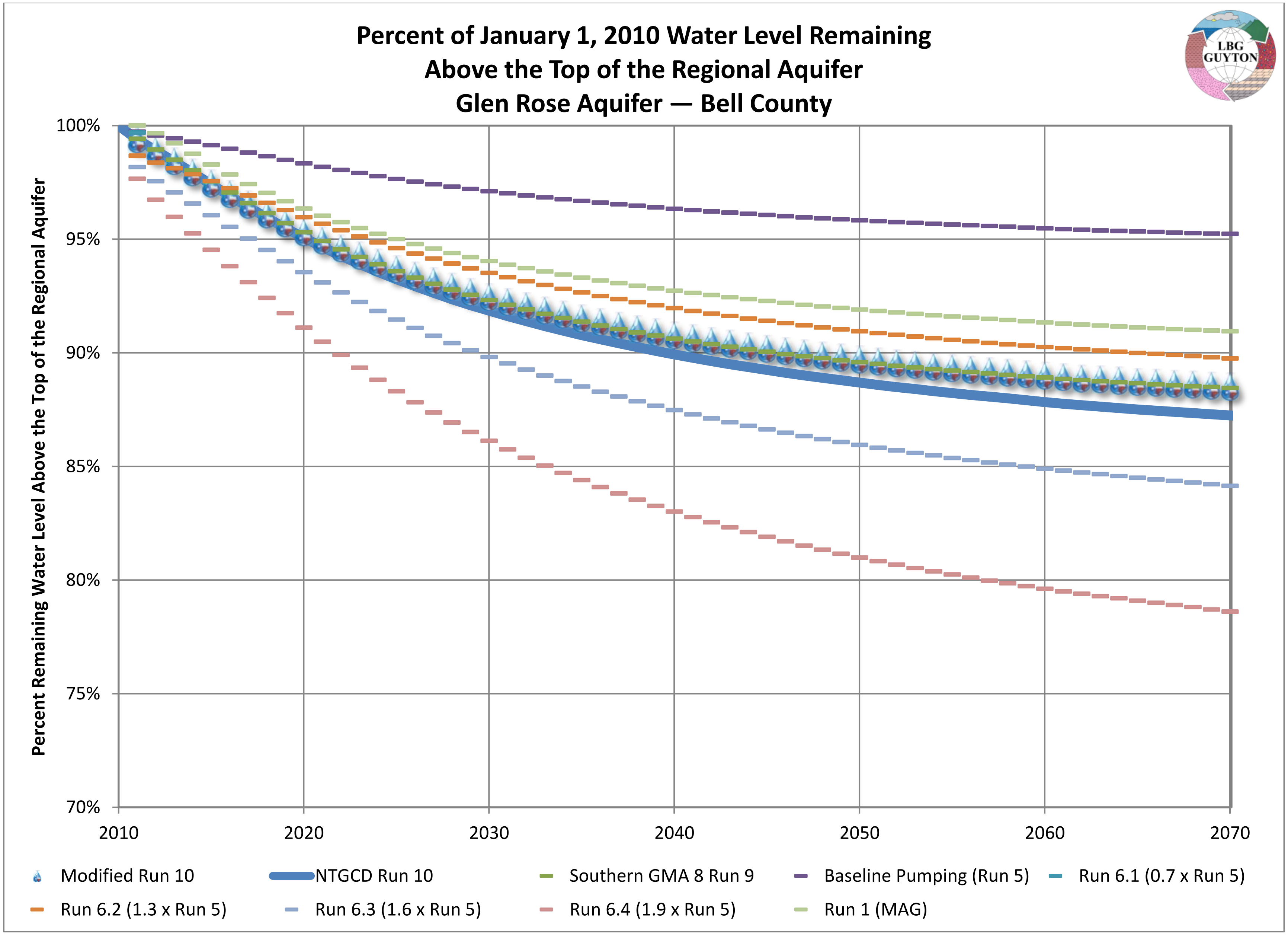

Average Drawdown from January 1, 2010 Water Levels
Travis Peak Aquifer — Bell County
LBG GUYTON
Average Drawdown, Feet
-50
0
50
100
150
200
250
300
350
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

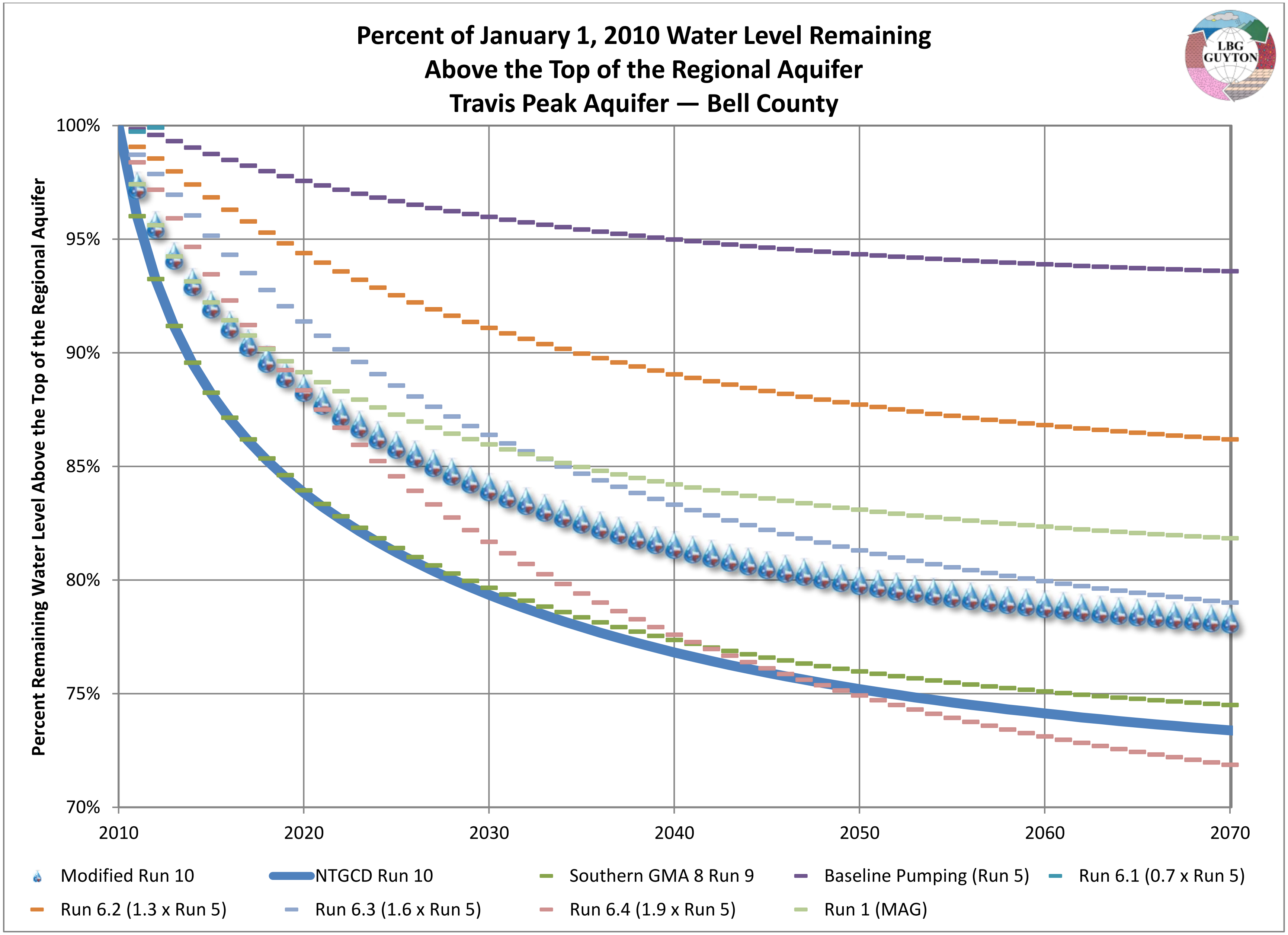

Average Drawdown from January 1, 2010 Water Levels
Hensell Aquifer — Bell County
LBG GUYTON
Average Drawdown, Feet
0
50
100
150
200
250
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

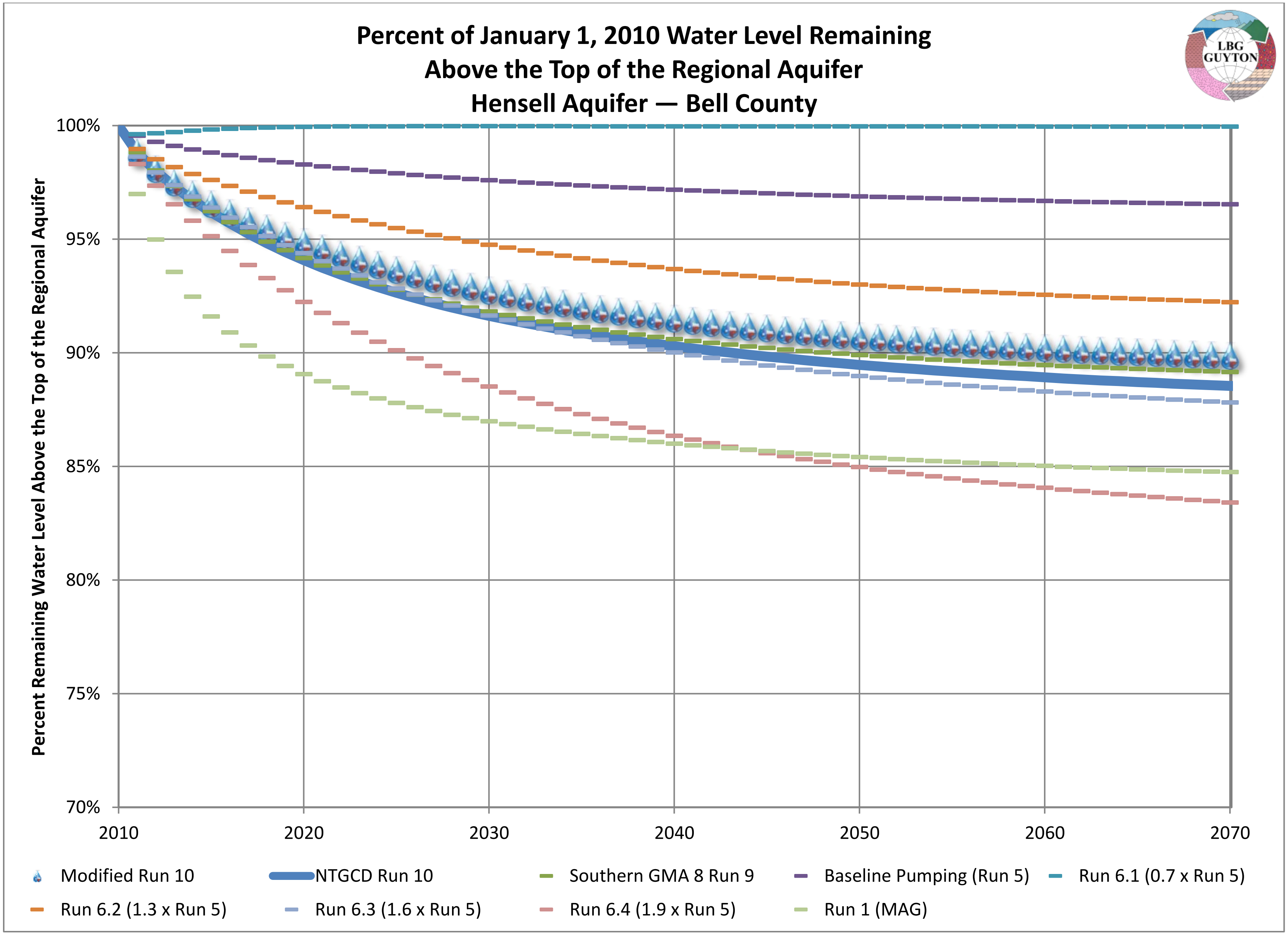

Average Drawdown from January 1, 2010 Water Levels
Hosston Aquifer — Bell County
Average Drawdown, Feet
-50
0
50
100
150
200
250
300
350
400
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)
LBG GUYTON

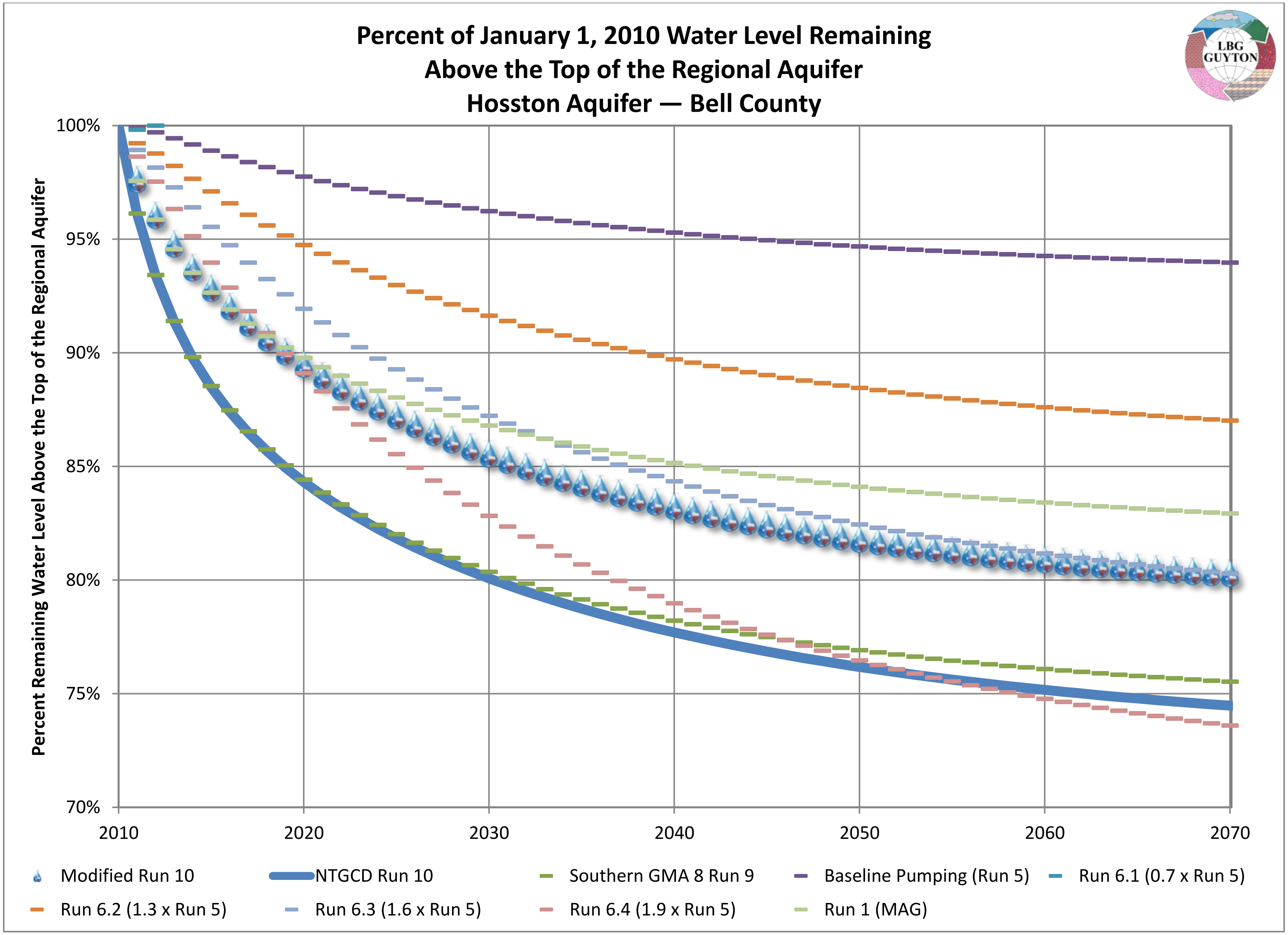
Attachment 3.2 — County Percent of January 1, 2010 Water Level Remaining Above the Top of the Regional Aquifer


Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Paluxy Aquifer — Bell County
LBG GUYTON
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

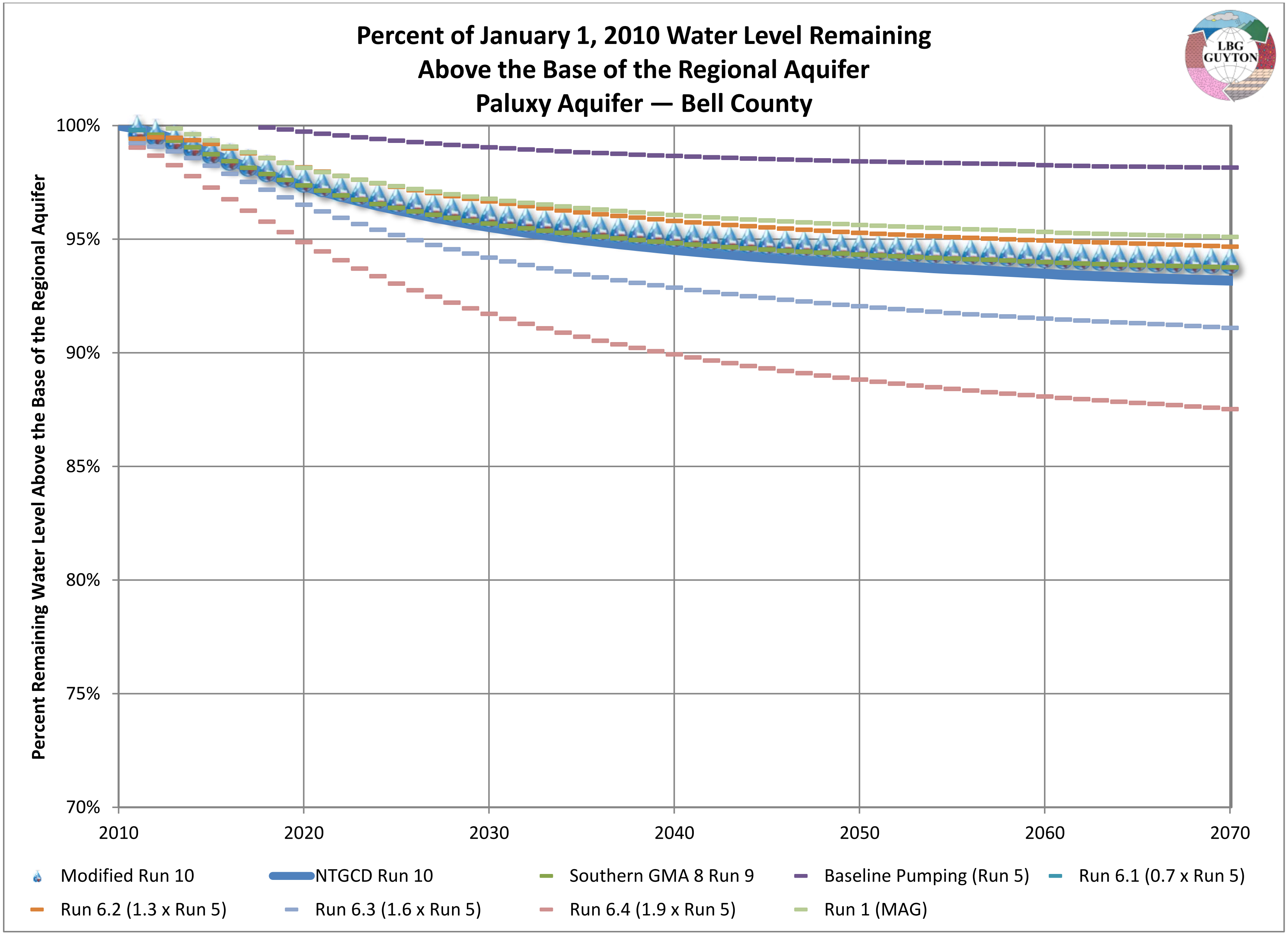

Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Glen Rose Aquifer — Bell County
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

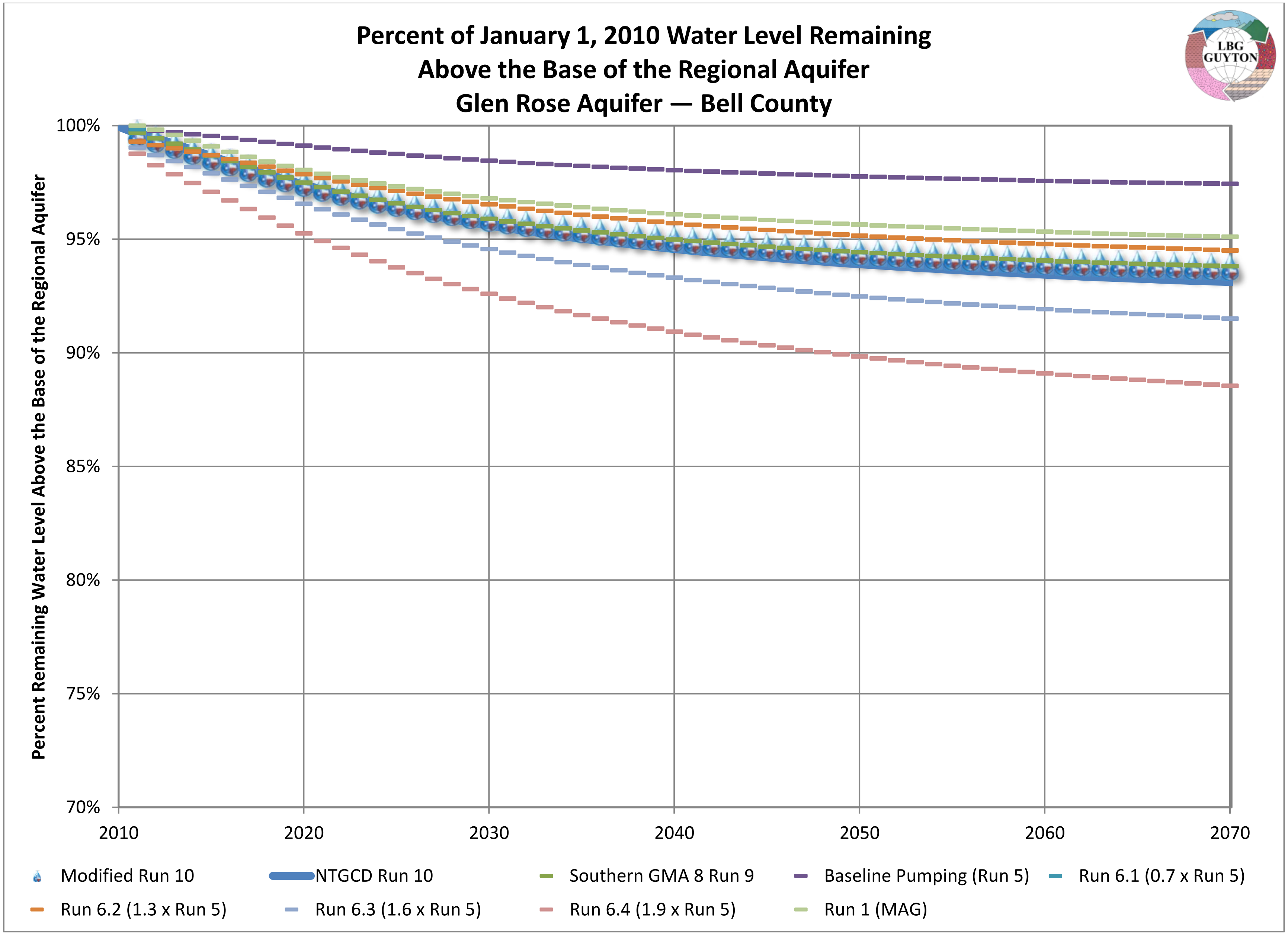

Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Travis Peak Aquifer — Bell County
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

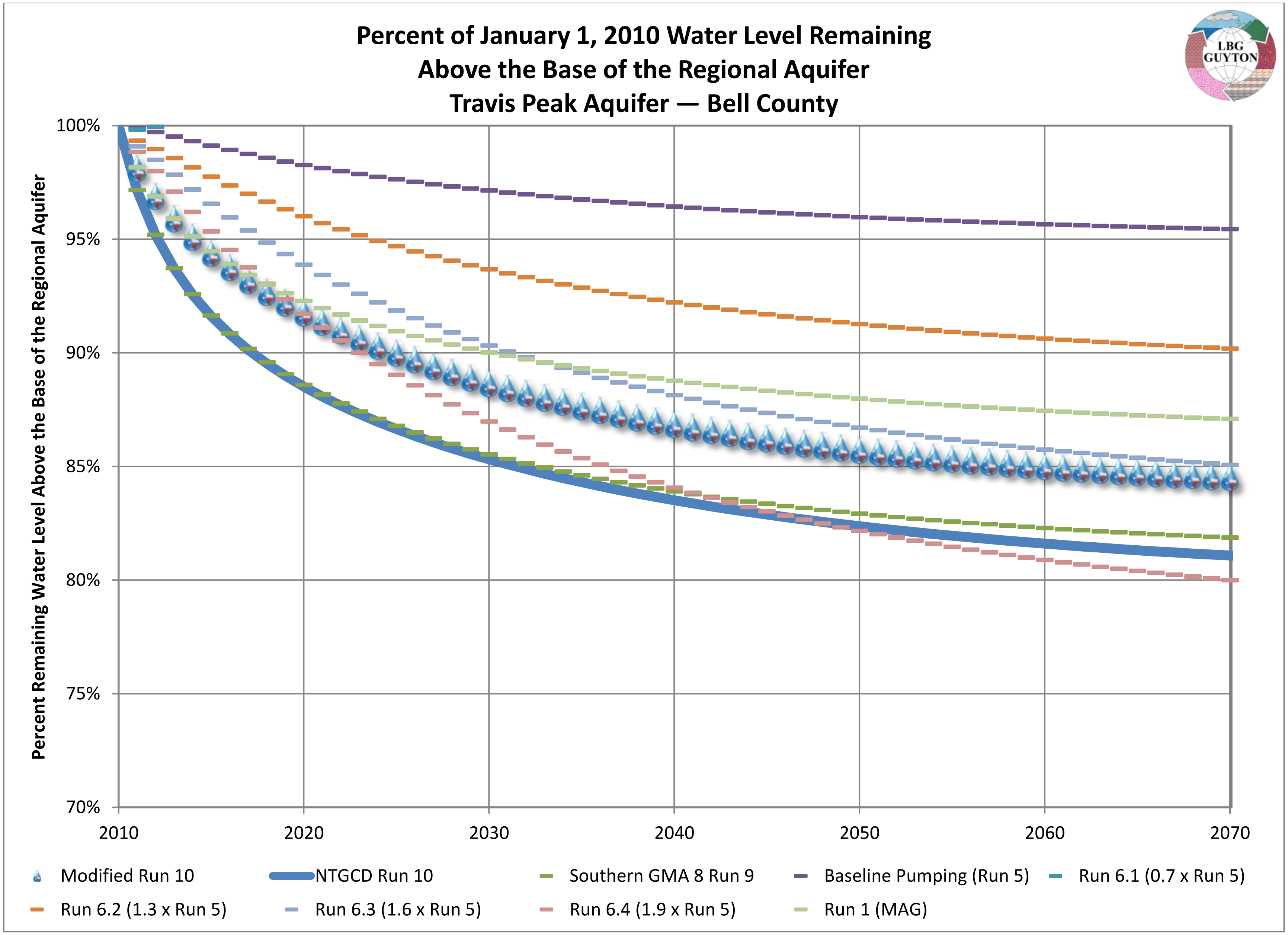

Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Hensell Aquifer — Bell County
LBG GUYTON
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

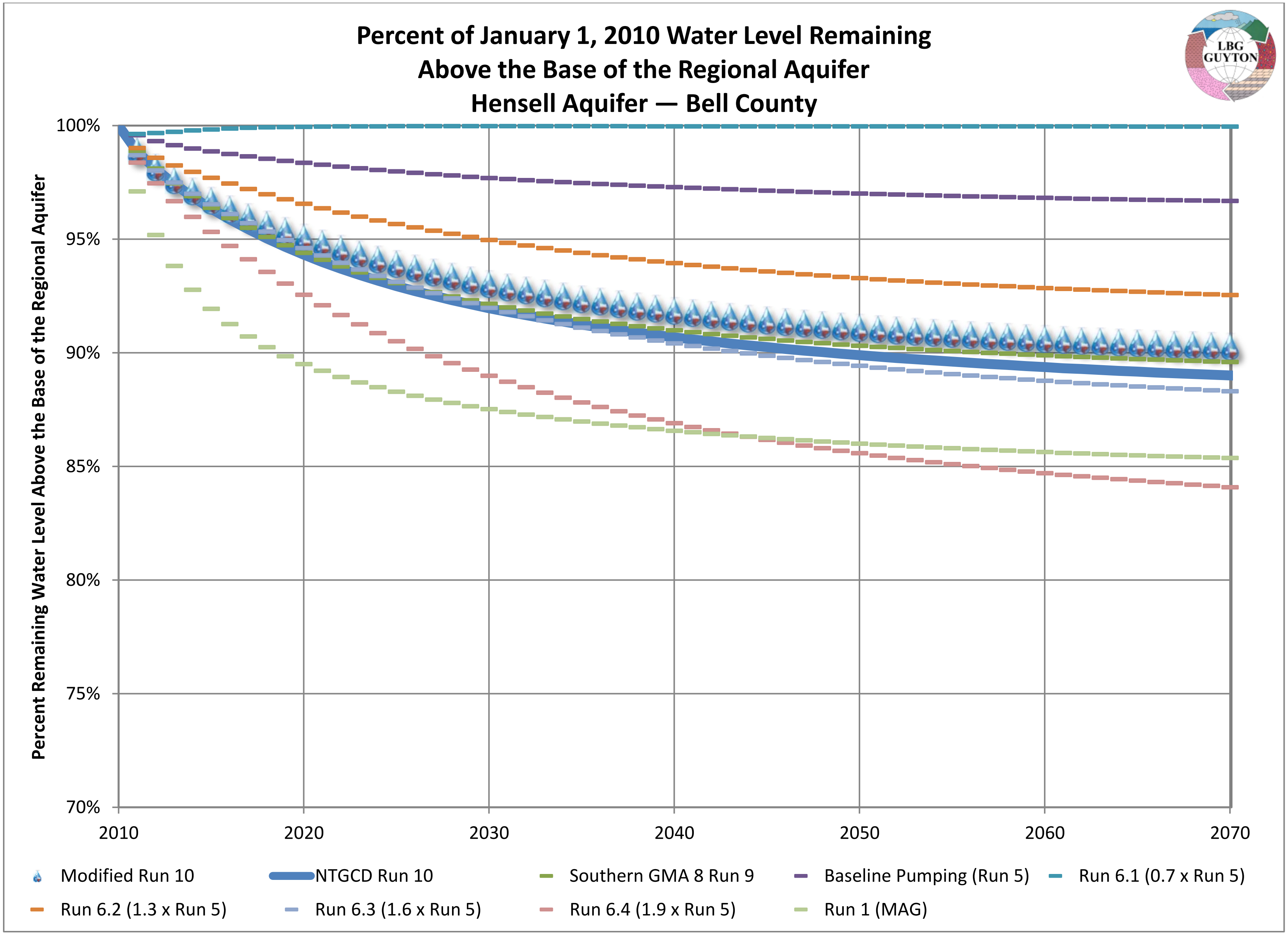

Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Hosston Aquifer — Bell County
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

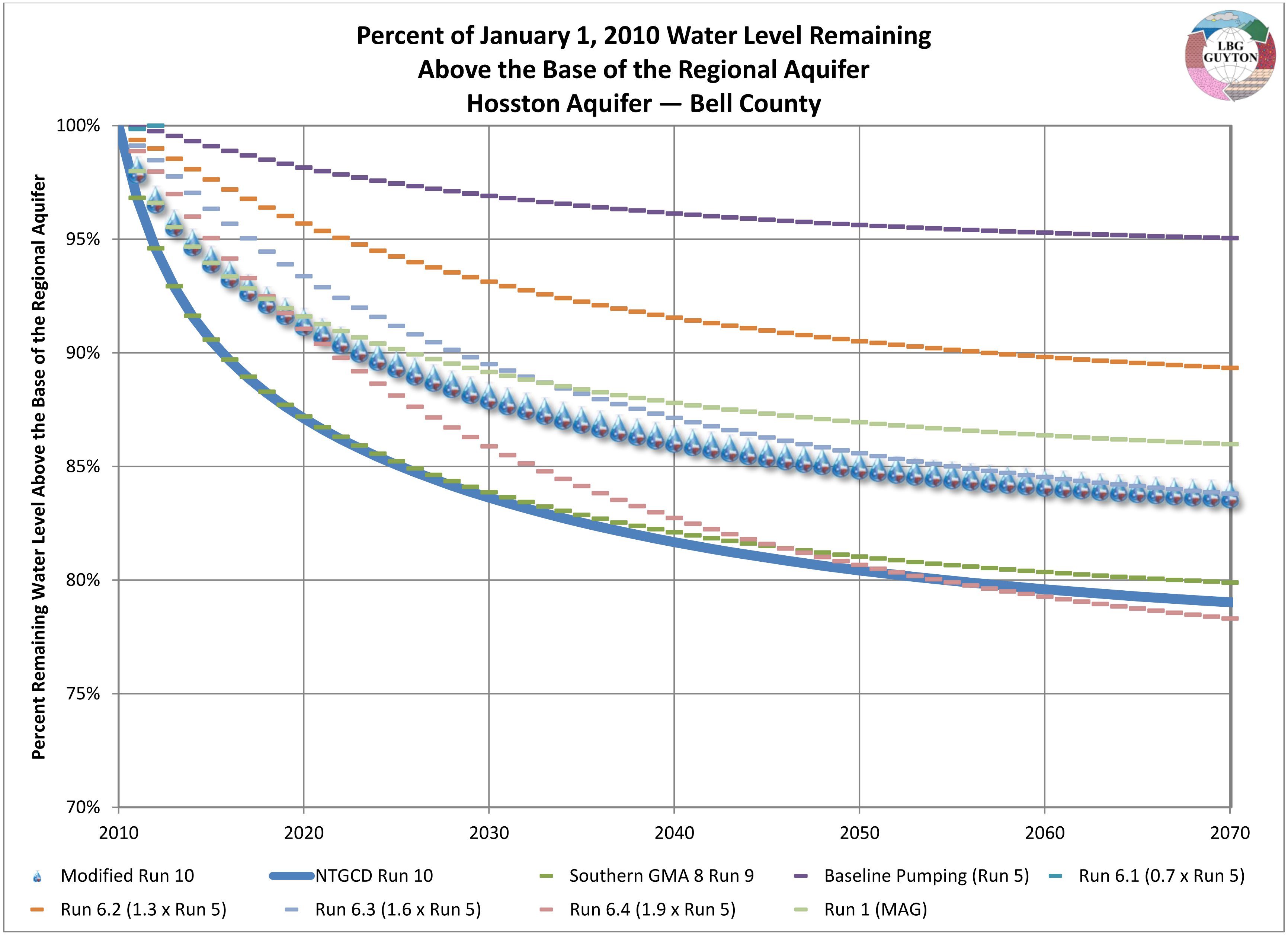
Attachment 3.3 —
County Percent of January 1, 2010 Water Level Remaining Above the Base of the Regional Aquifer


Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Paluxy Aquifer — Bell County
LBG GUYTON
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

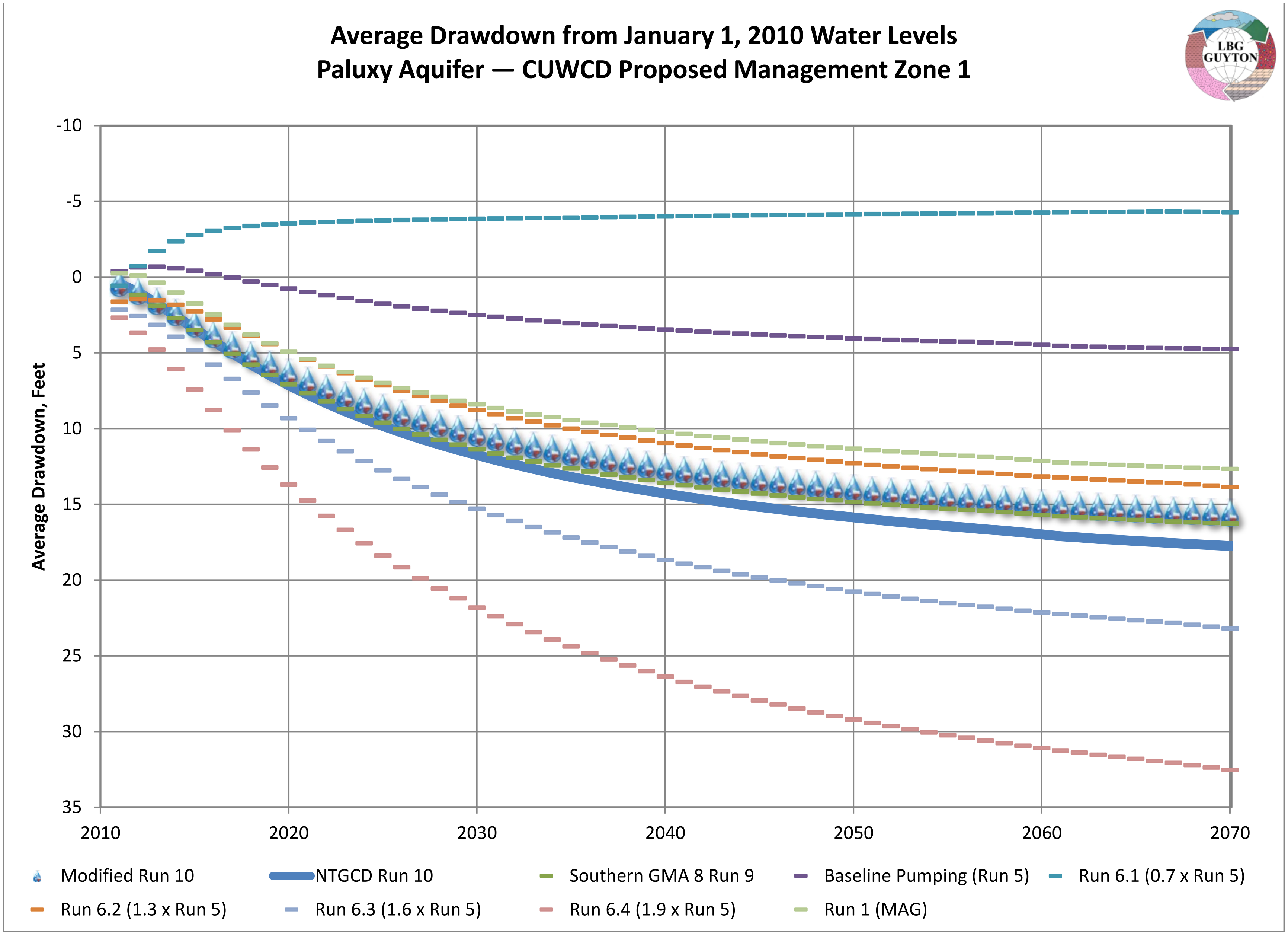

Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Glen Rose Aquifer — Bell County
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

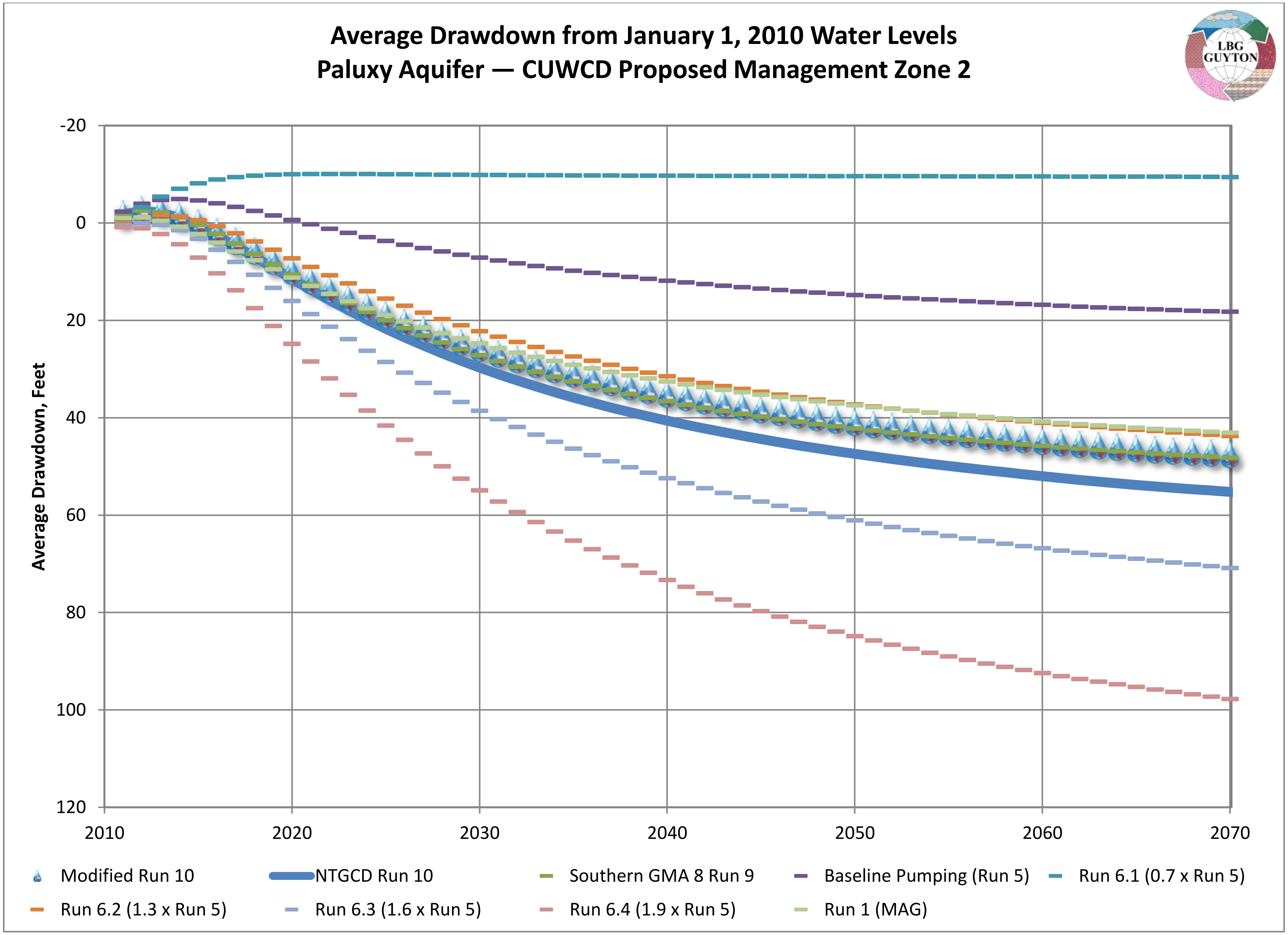

Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Travis Peak Aquifer — Bell County
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

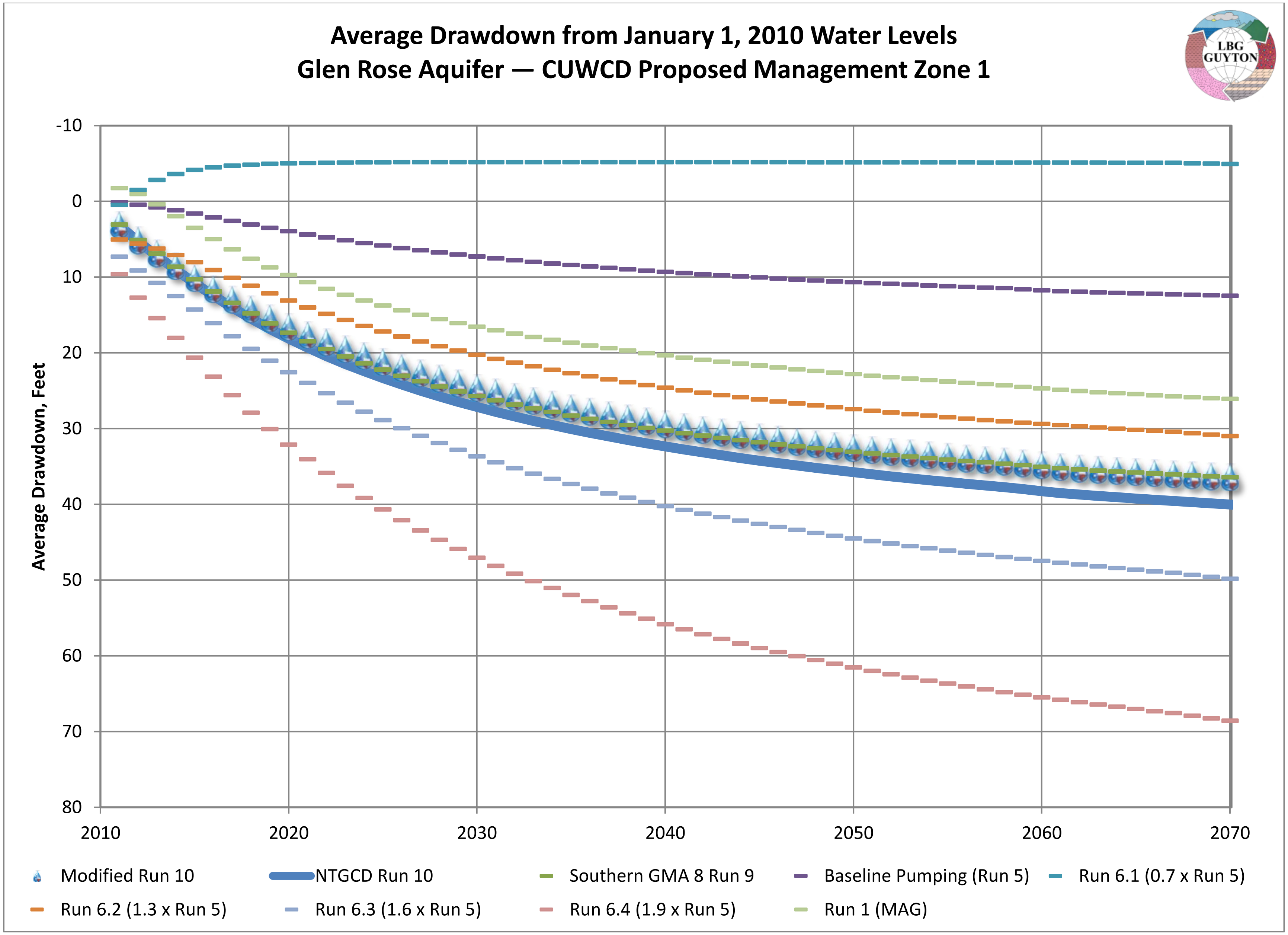

Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Hensell Aquifer — Bell County
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

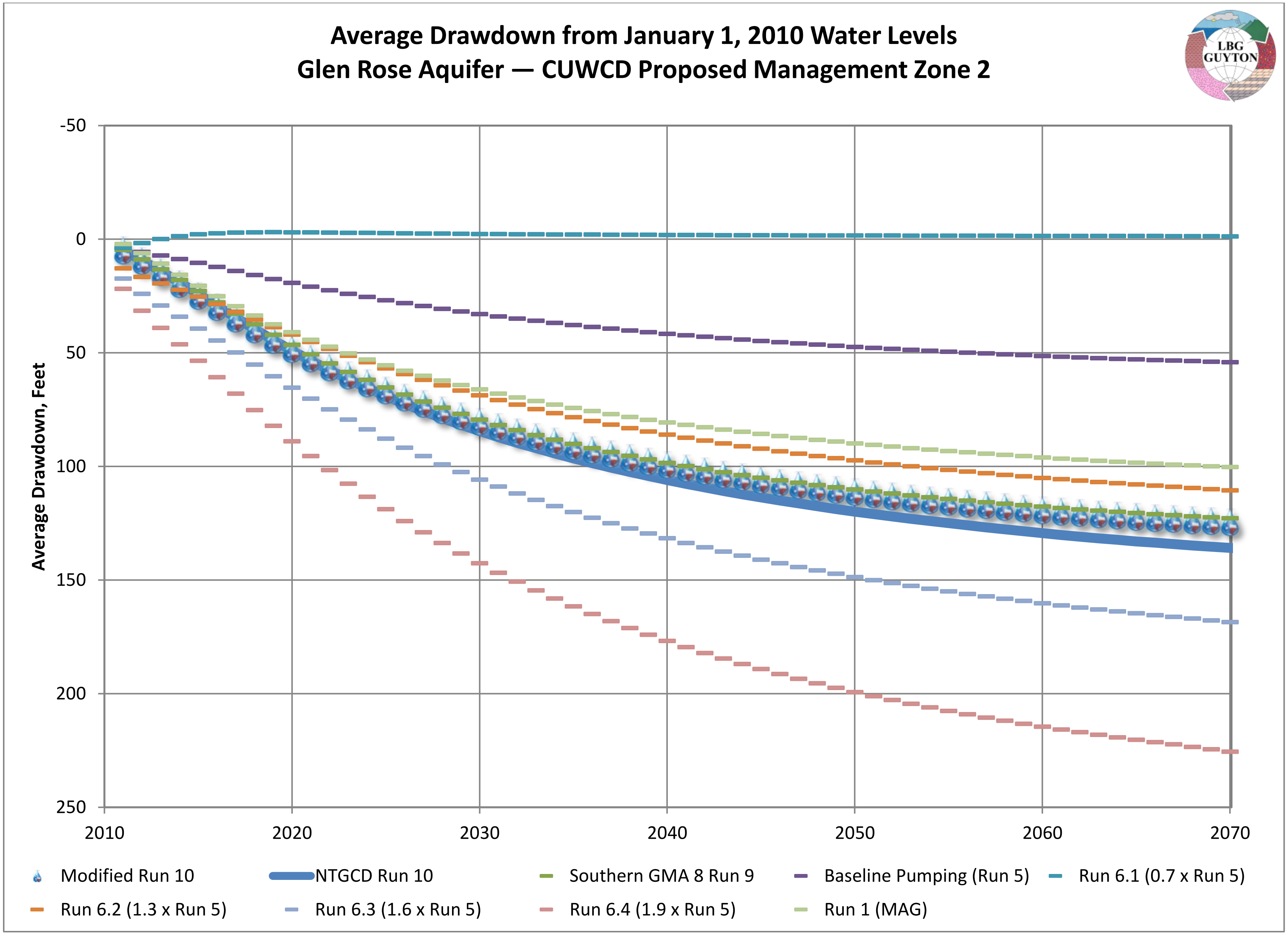

Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Hosston Aquifer — Bell County
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

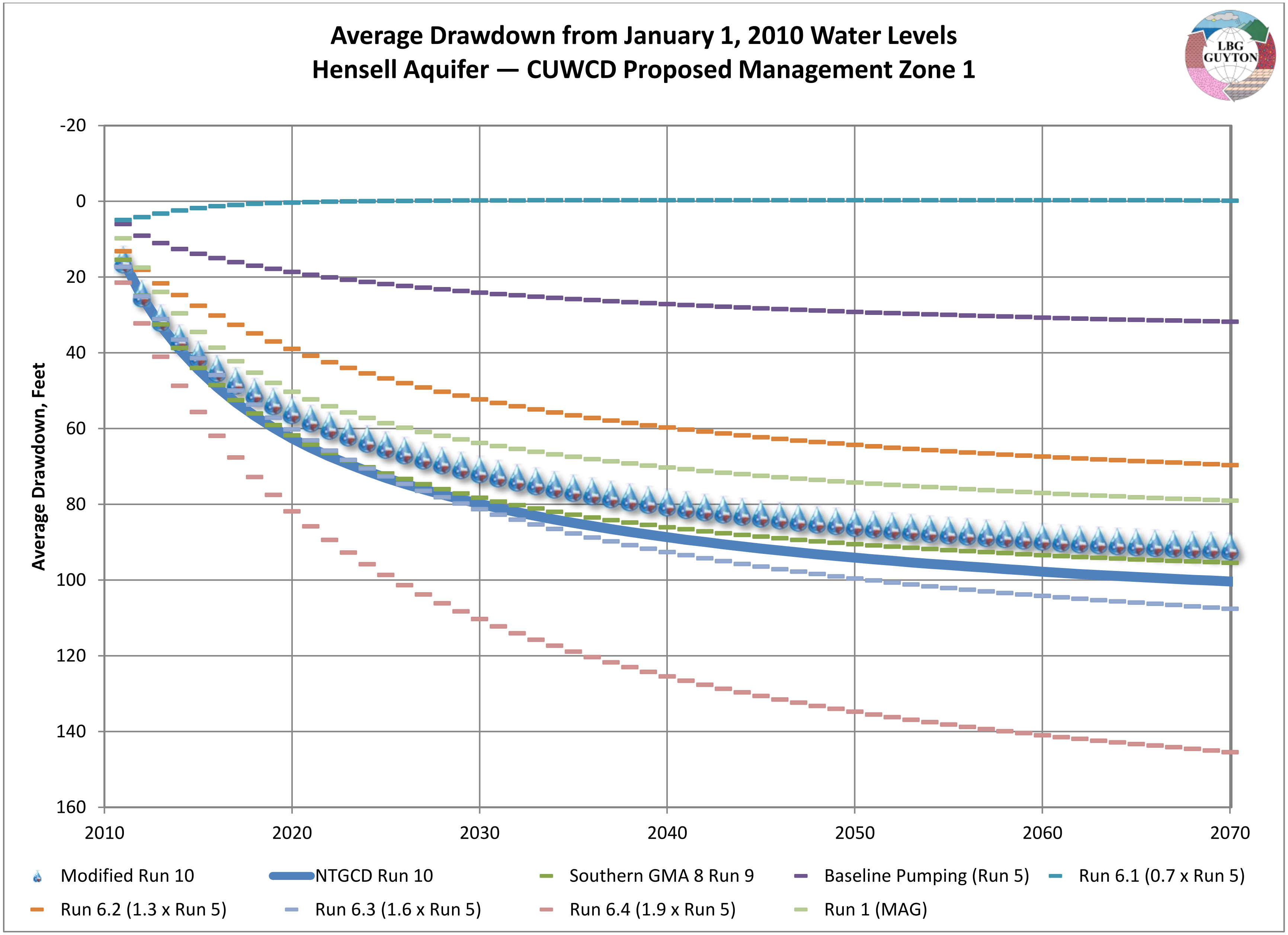
Attachment 3.4 —
Management Zone Average Drawdown

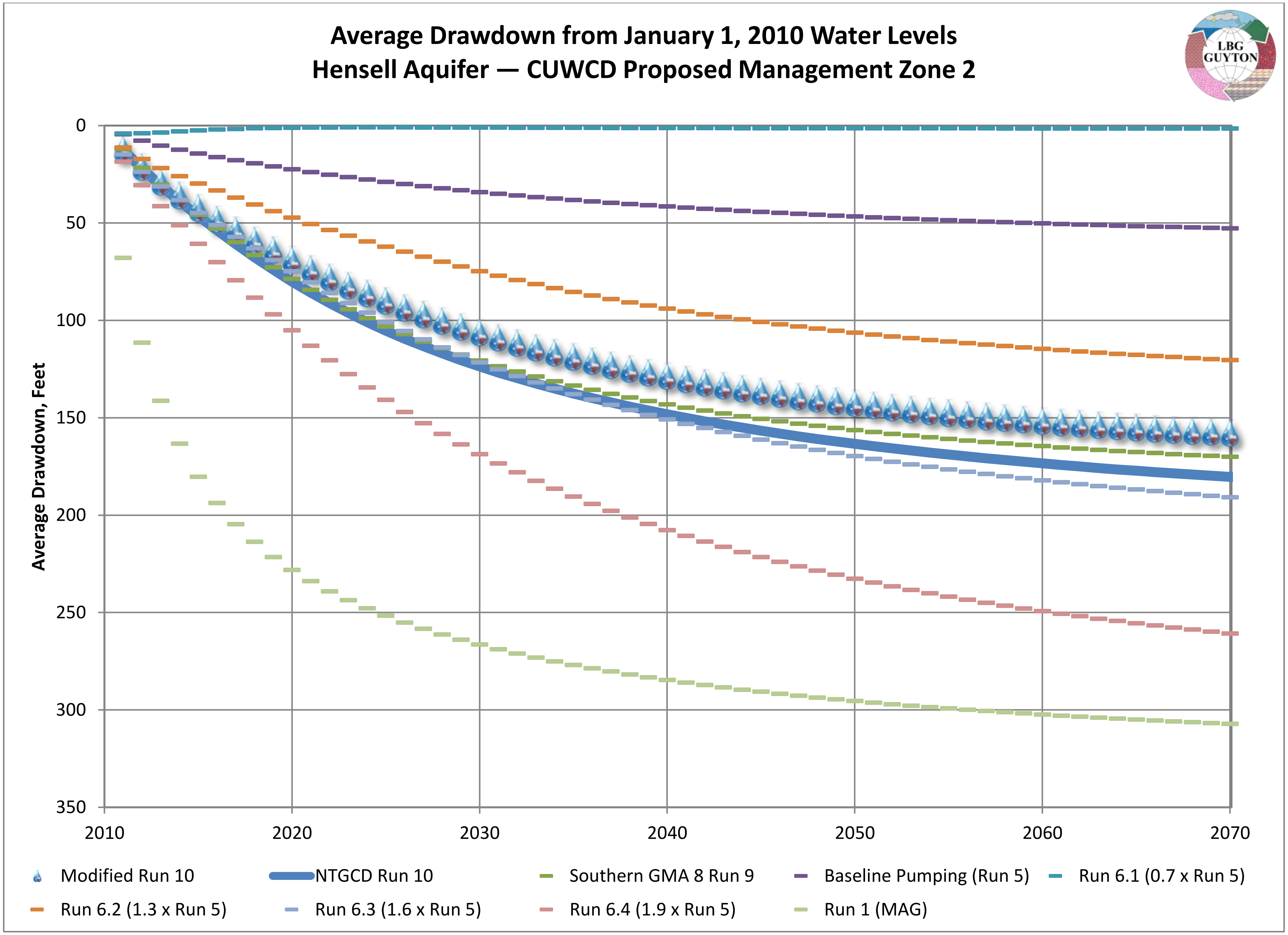

Average Drawdown from January 1, 2010 Water Levels
Paluxy Aquifer — CUWCD Proposed Management Zone 1
LBG GUYTON
Average Drawdown, Feet
-10
-5
0
5
10
15
20
25
30
35
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

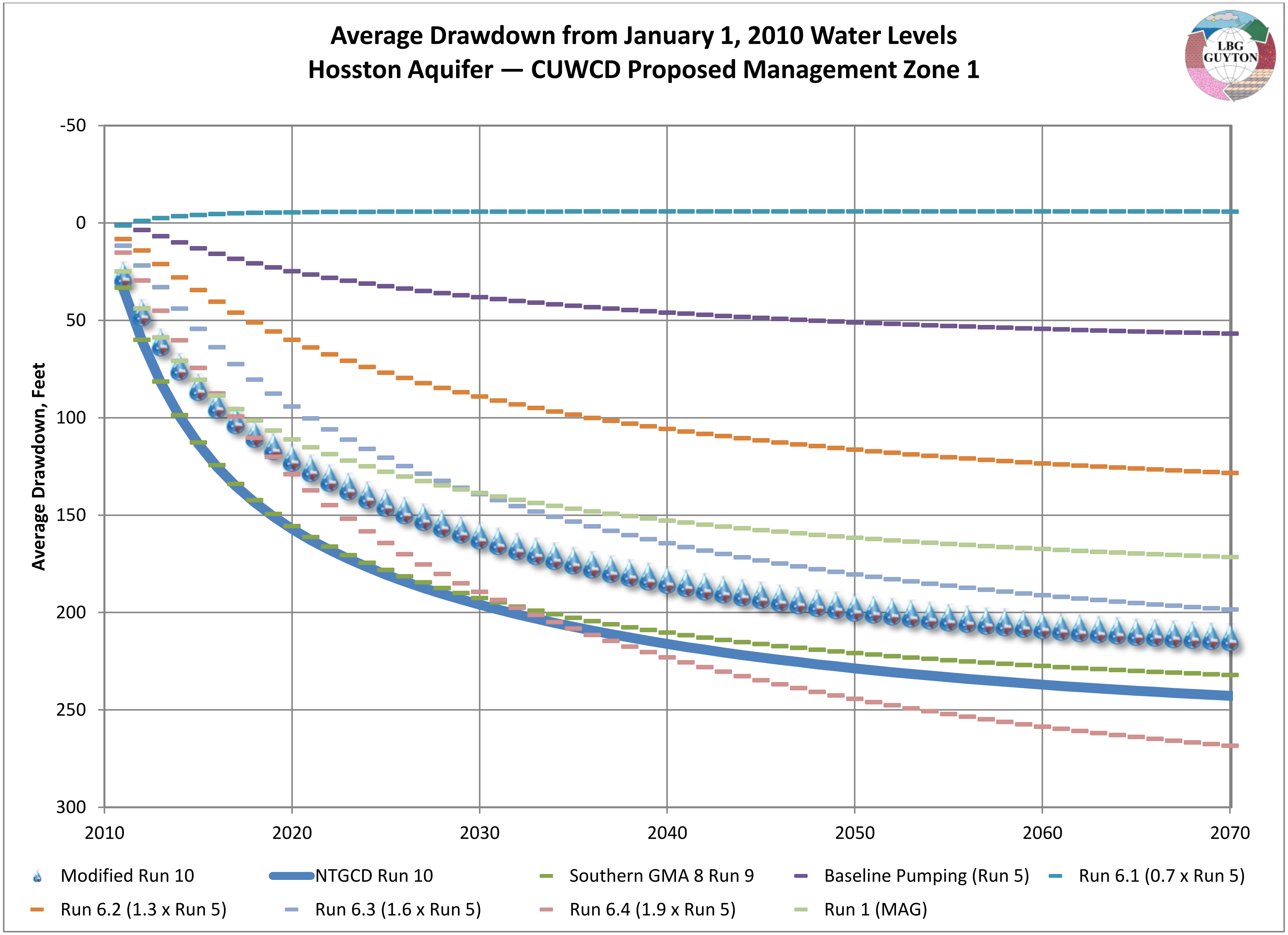

Average Drawdown from January 1, 2010 Water Levels
Paluxy Aquifer — CUWCD Proposed Management Zone 2
LBG GUYTON
Average Drawdown, Feet
-20
0
20
40
60
80
100
120
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

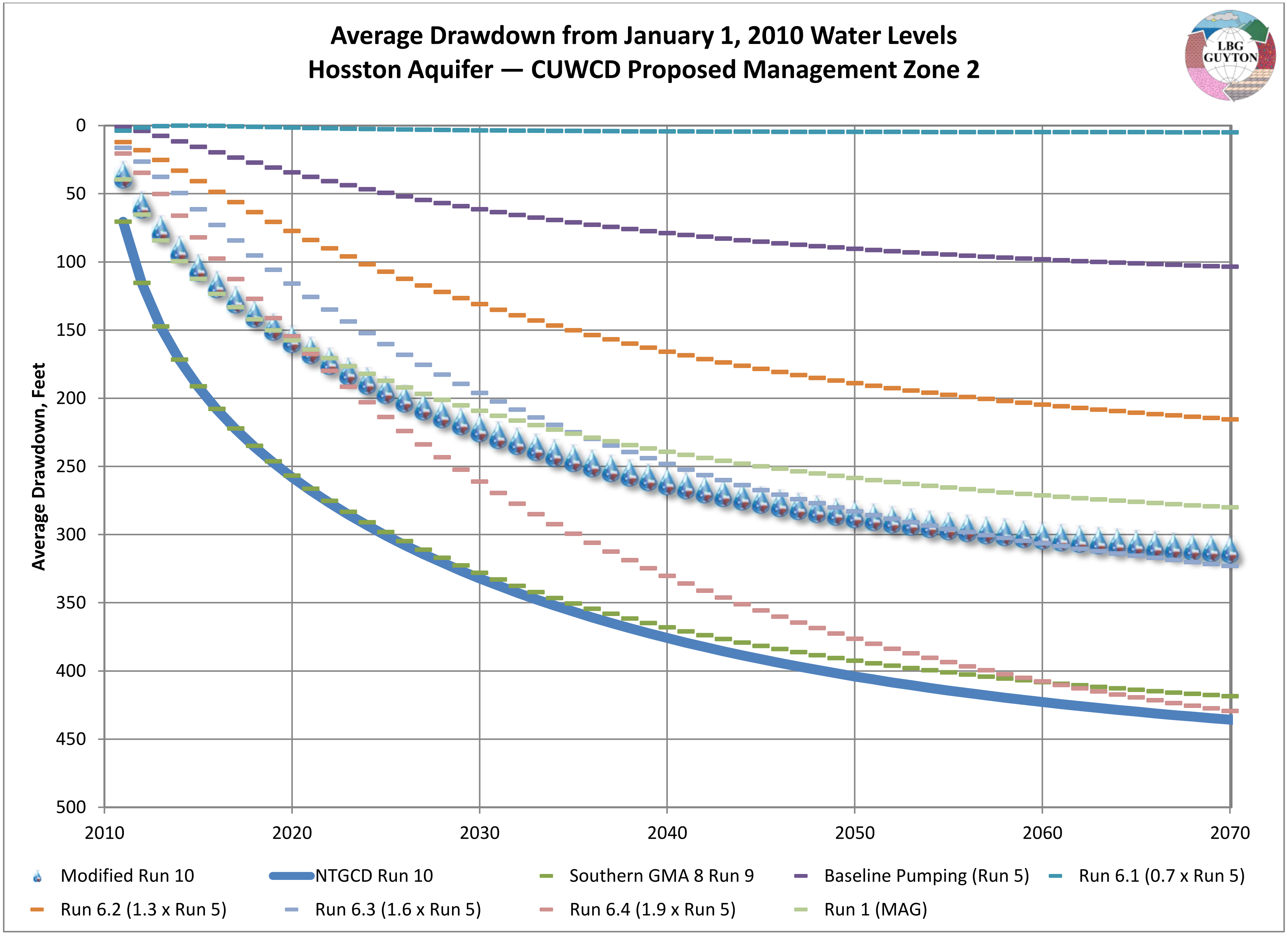

Average Drawdown from January 1, 2010 Water Levels
Glen Rose Aquifer — CUWCD Proposed Management Zone 1
LBG GUYTON
Average Drawdown, Feet
-10
0
10
20
30
40
50
60
70
80
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

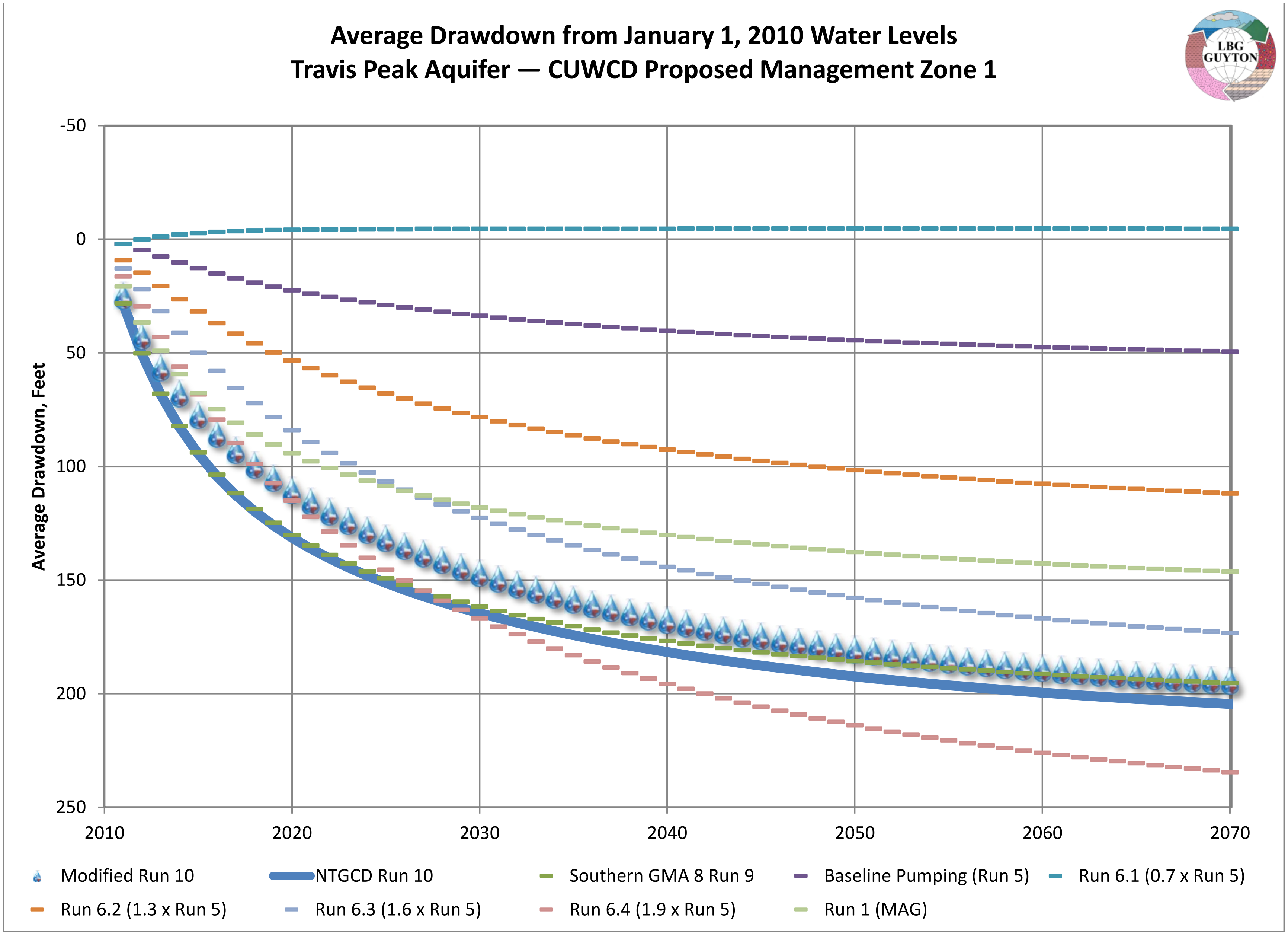

Average Drawdown from January 1, 2010 Water Levels
Glen Rose Aquifer — CUWCD Proposed Management Zone 2
LBG GUYTON
Average Drawdown, Feet
-50
0
50
100
150
200
250
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

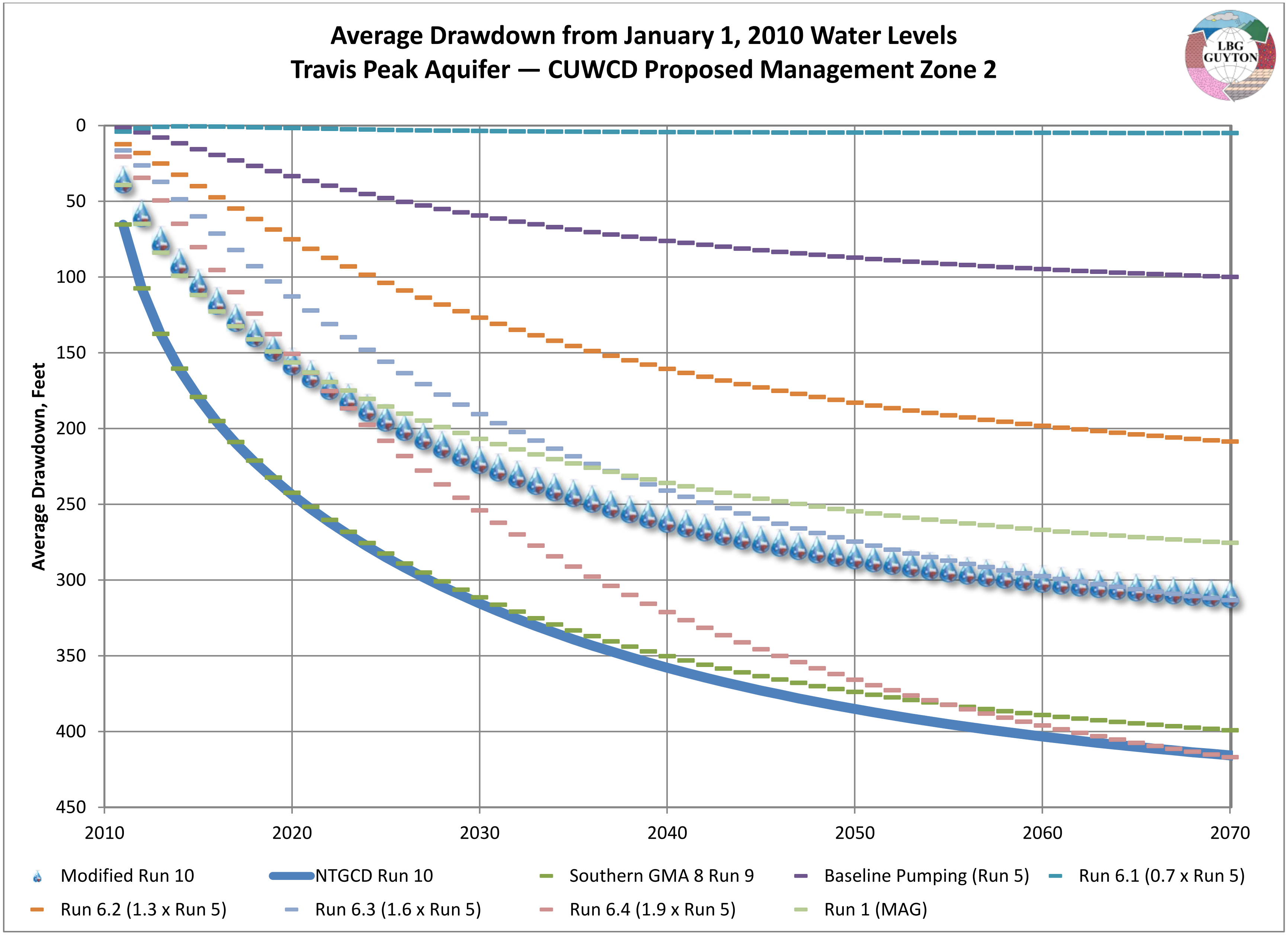

Average Drawdown from January 1, 2010 Water Levels
Hensell Aquifer — CUWCD Proposed Management Zone 1
LBG GUYTON
Average Drawdown, Feet
-20
0
20
40
60
80
100
120
140
160
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Average Drawdown from January 1, 2010 Water Levels
Hensell Aquifer — CUWCD Proposed Management Zone 2
LBG GUYTON
Average Drawdown, Feet
0
50
100
150
200
250
300
350
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

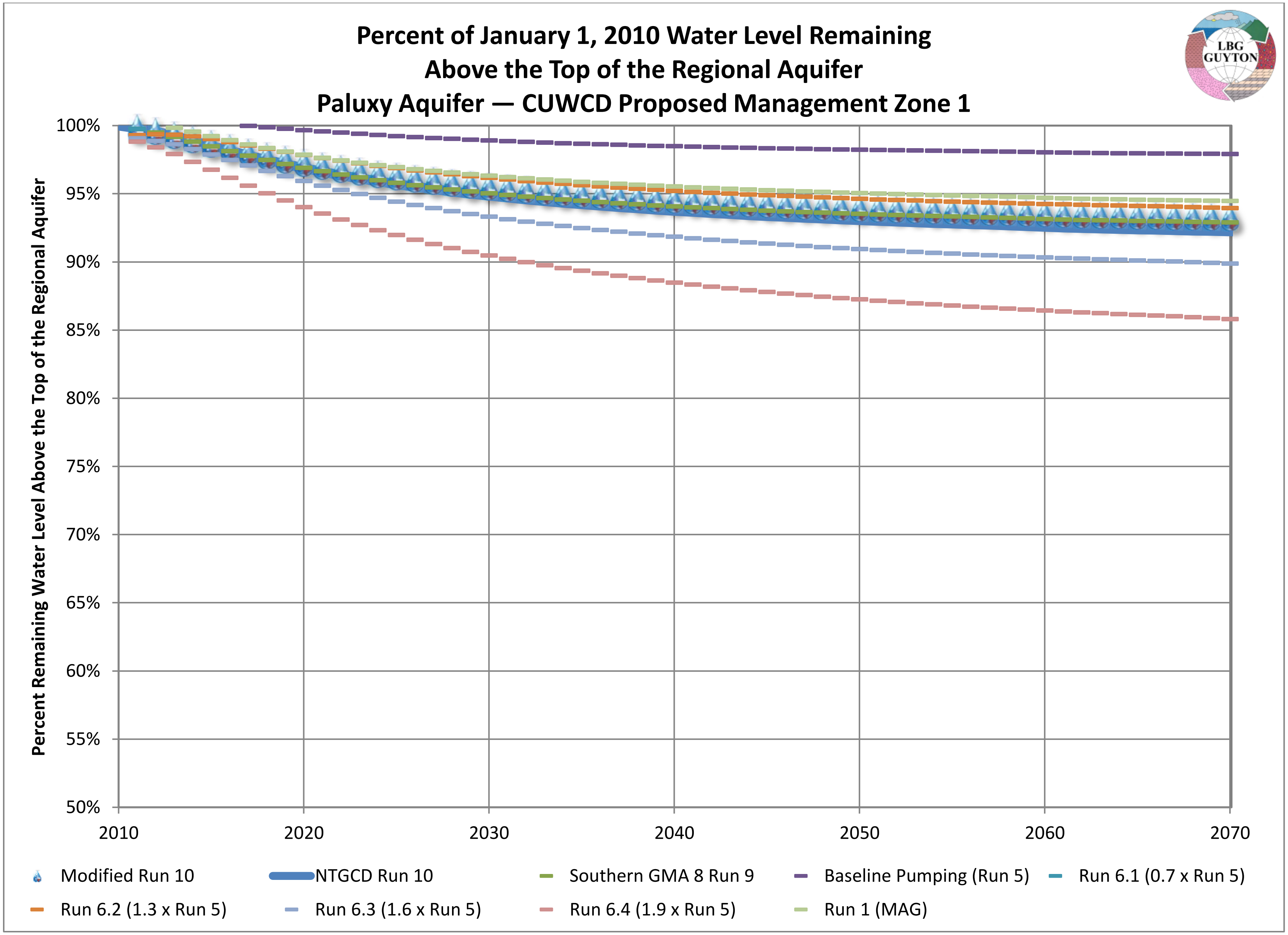

Average Drawdown from January 1, 2010 Water Levels
Hosston Aquifer — CUWCD Proposed Management Zone 1
Average Drawdown, Feet
-50
0
50
100
150
200
250
300
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

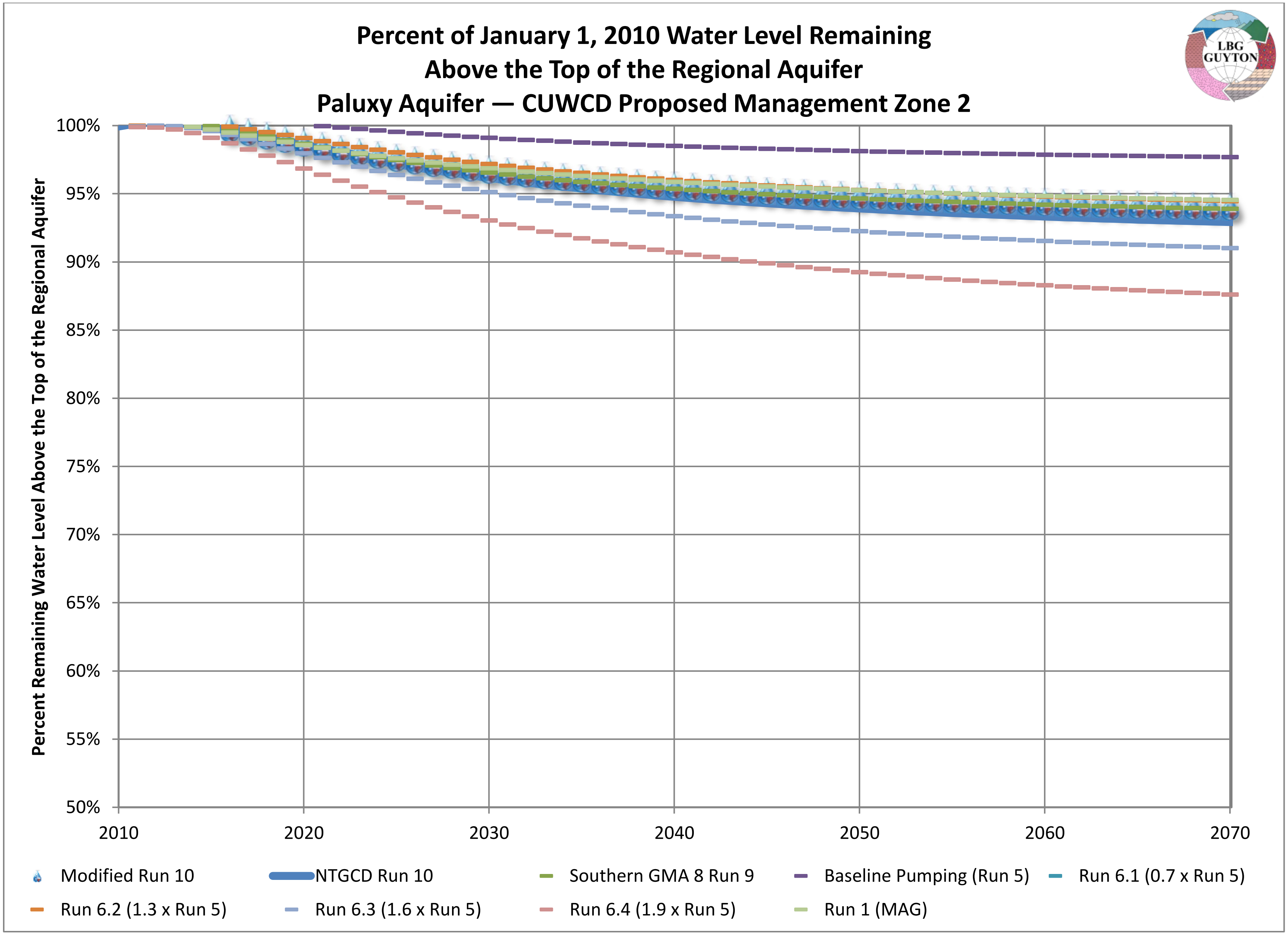

Average Drawdown from January 1, 2010 Water Levels
Hosston Aquifer — CUWCD Proposed Management Zone 2
LBG GUYTON
Average Drawdown, Feet
0
50
100
150
200
250
300
350
400
450
500
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

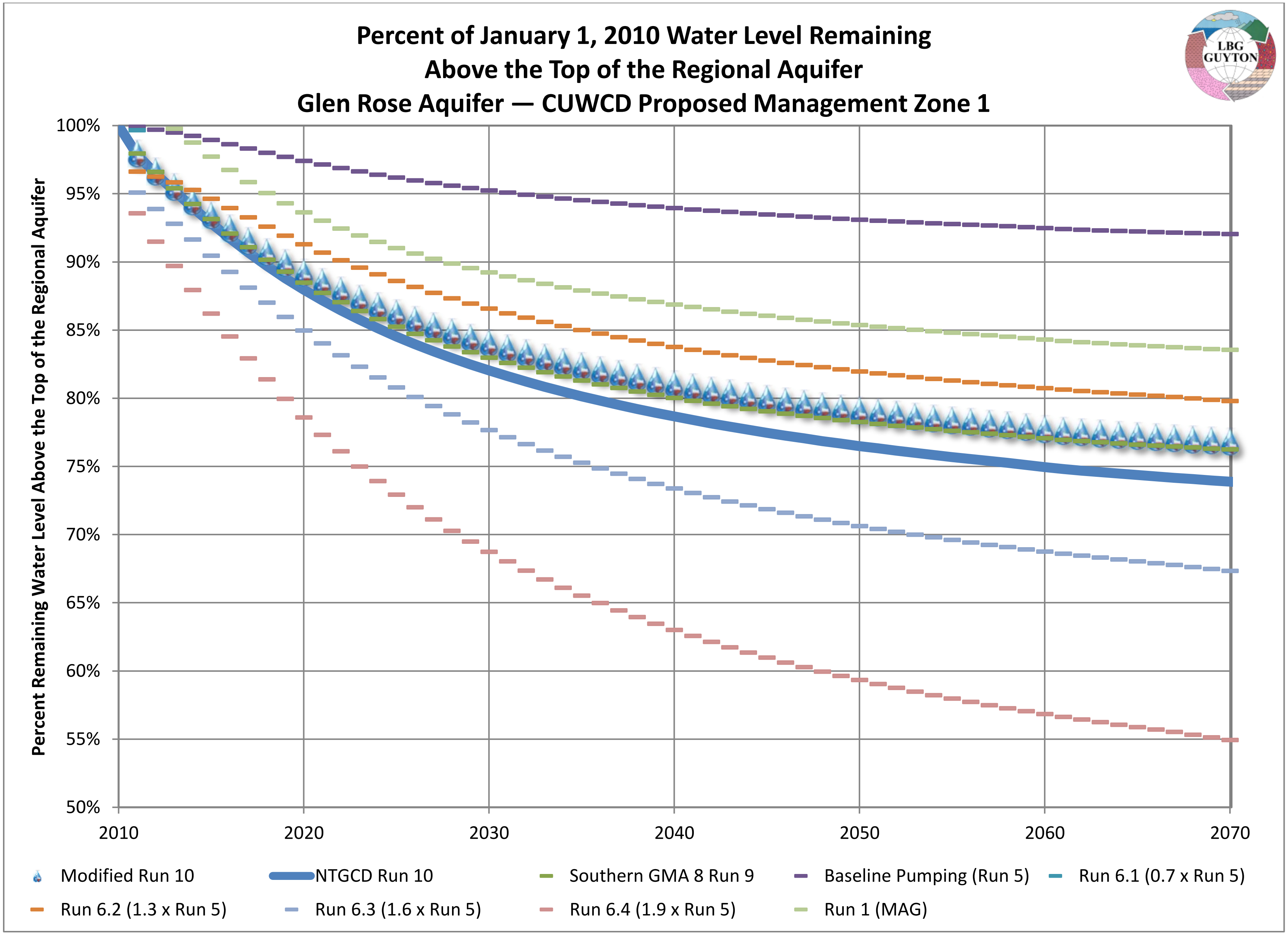

Average Drawdown from January 1, 2010 Water Levels
Travis Peak Aquifer — CUWCD Proposed Management Zone 1
LBG GUYTON
Average Drawdown, Feet
-50
0
50
100
150
200
250
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

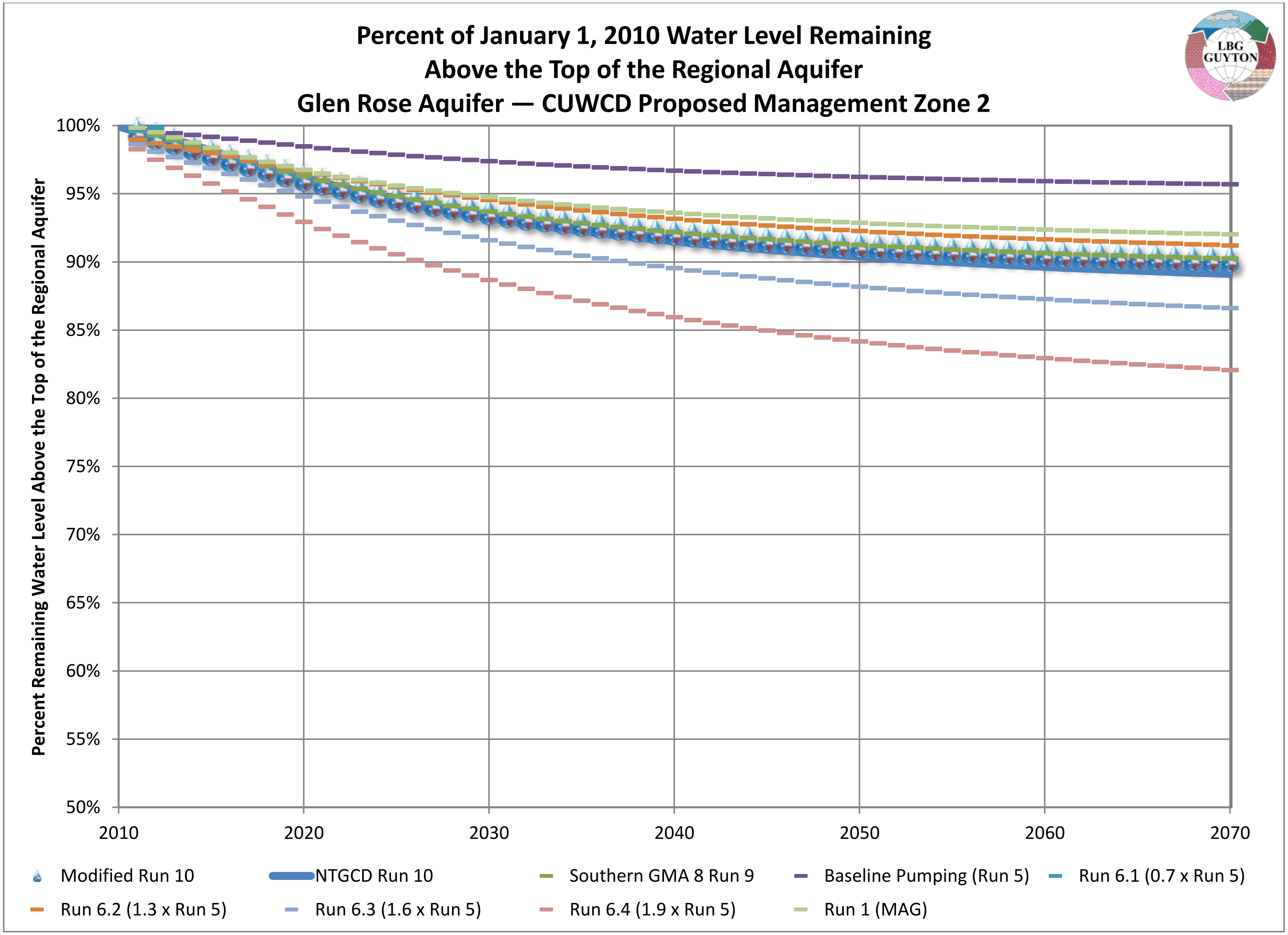

Average Drawdown from January 1, 2010 Water Levels
Travis Peak Aquifer — CUWCD Proposed Management Zone 2
LBG GUYTON
Average Drawdown, Feet
0
50
100
150
200
250
300
350
400
450
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

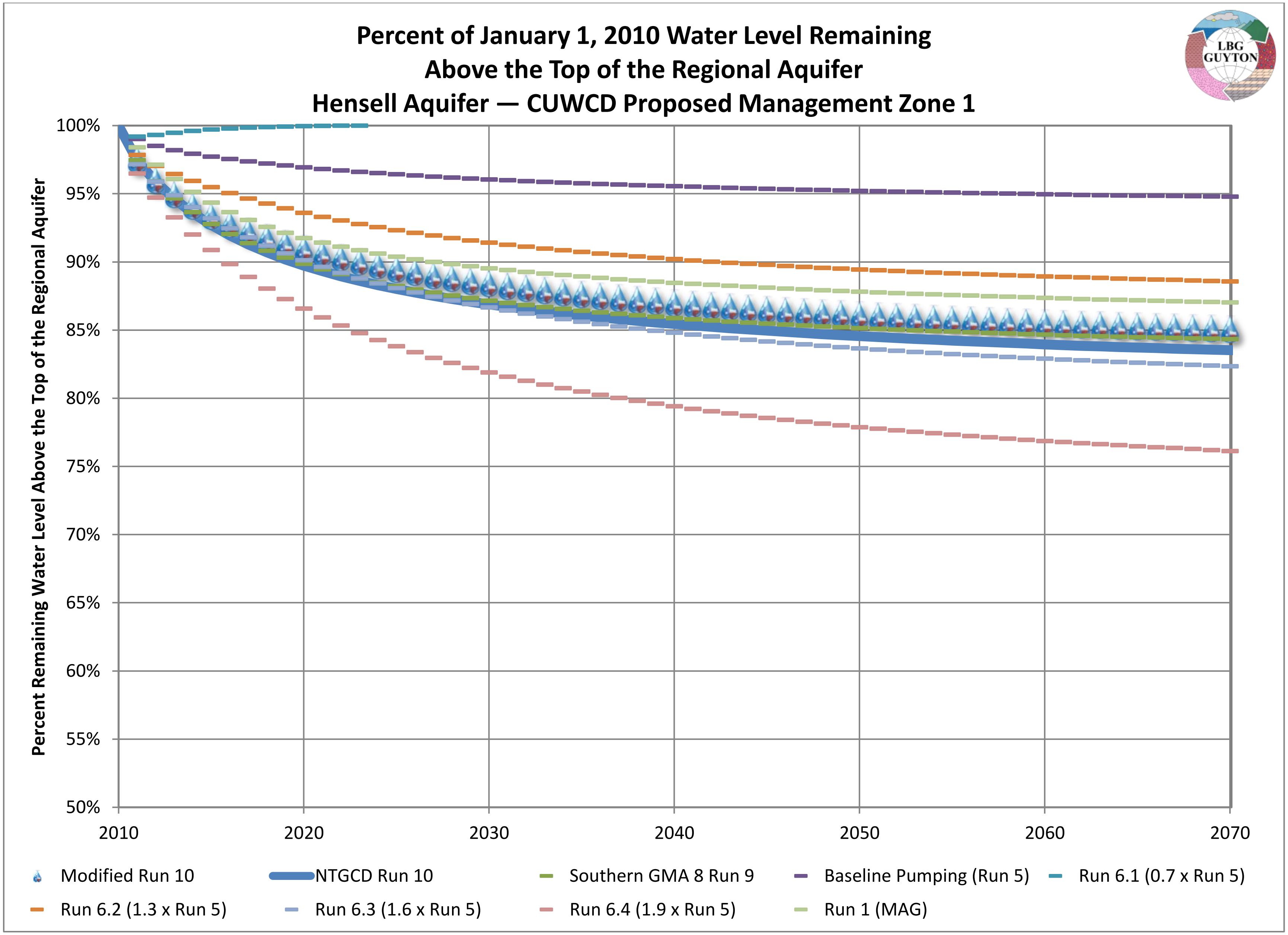
Attachment 3.5 —
Management Zone Percent of January 1, 2010 Water Level Remaining Above the Top of the Regional Aquifer


Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Paluxy Aquifer — CUWCD Proposed Management Zone 1
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Paluxy Aquifer — CUWCD Proposed Management Zone 2
LBG GUYTON
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Glen Rose Aquifer — CUWCD Proposed Management Zone 1
LBG GUYTON
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Glen Rose Aquifer — CUWCD Proposed Management Zone 2
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Hensell Aquifer — CUWCD Proposed Management Zone 1
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
2010
2020
2030
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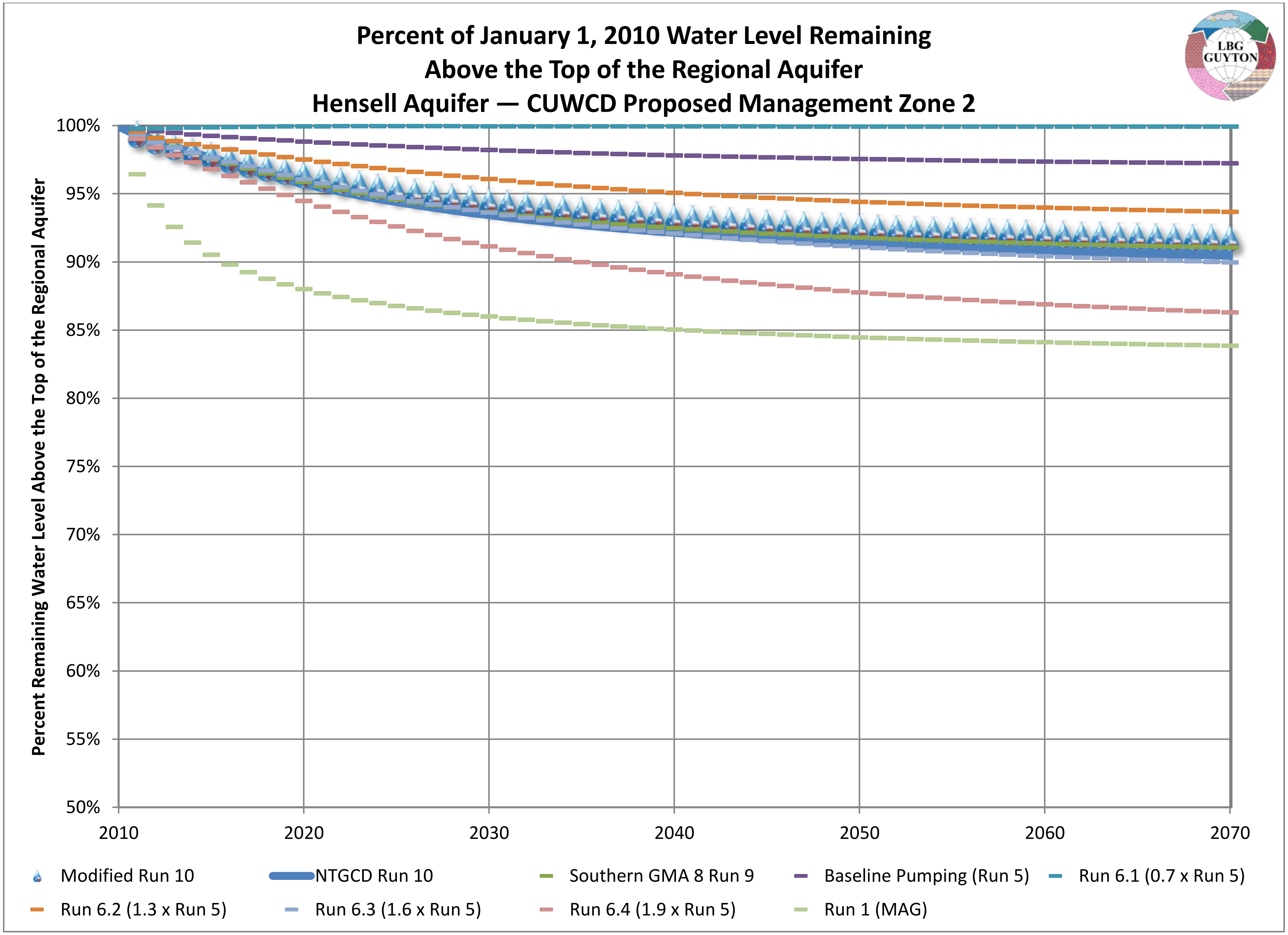
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)
LBG GUYTON


Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Hensell Aquifer — CUWCD Proposed Management Zone 2
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
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65%
60%
55%
50%
2010
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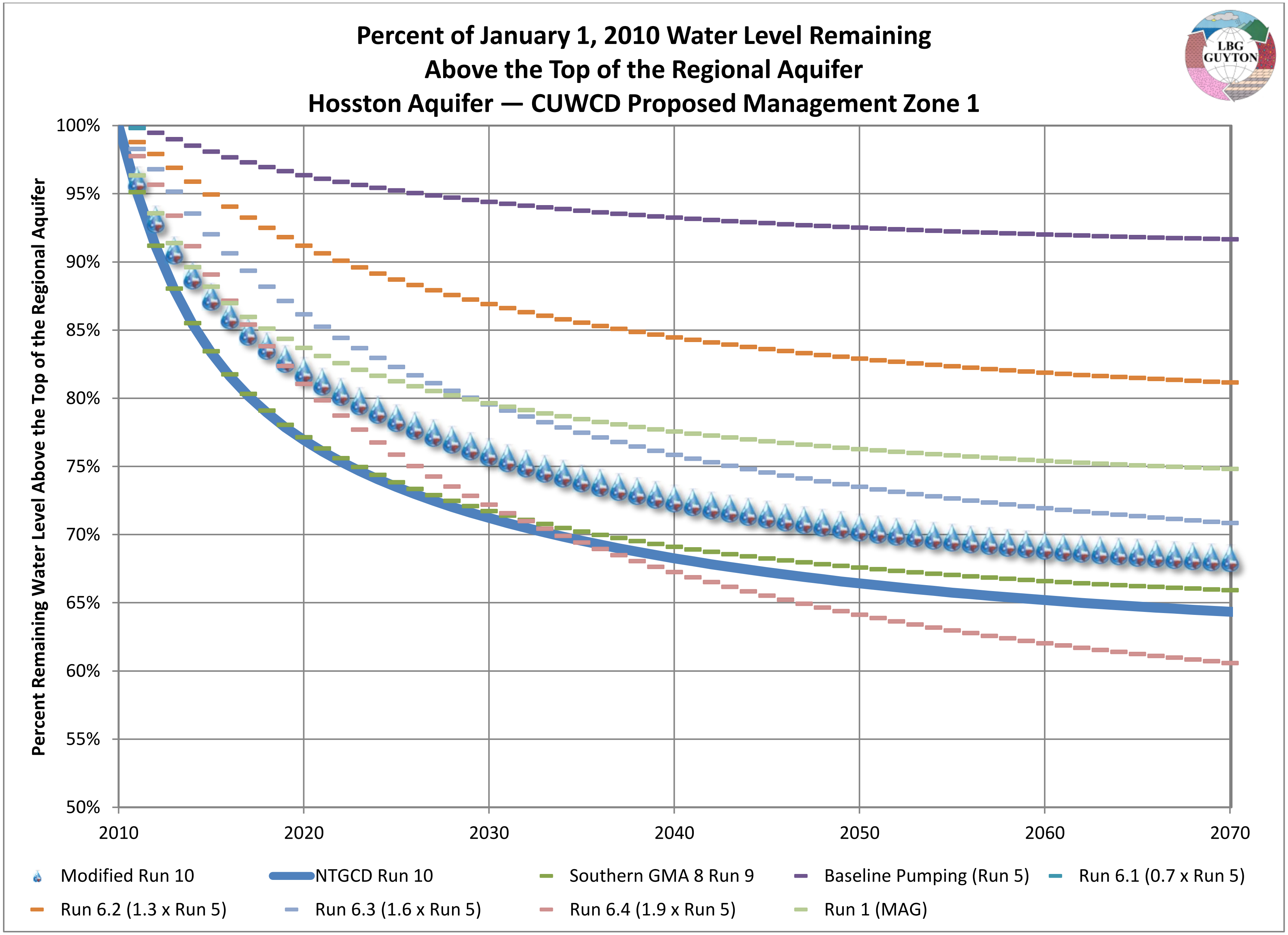
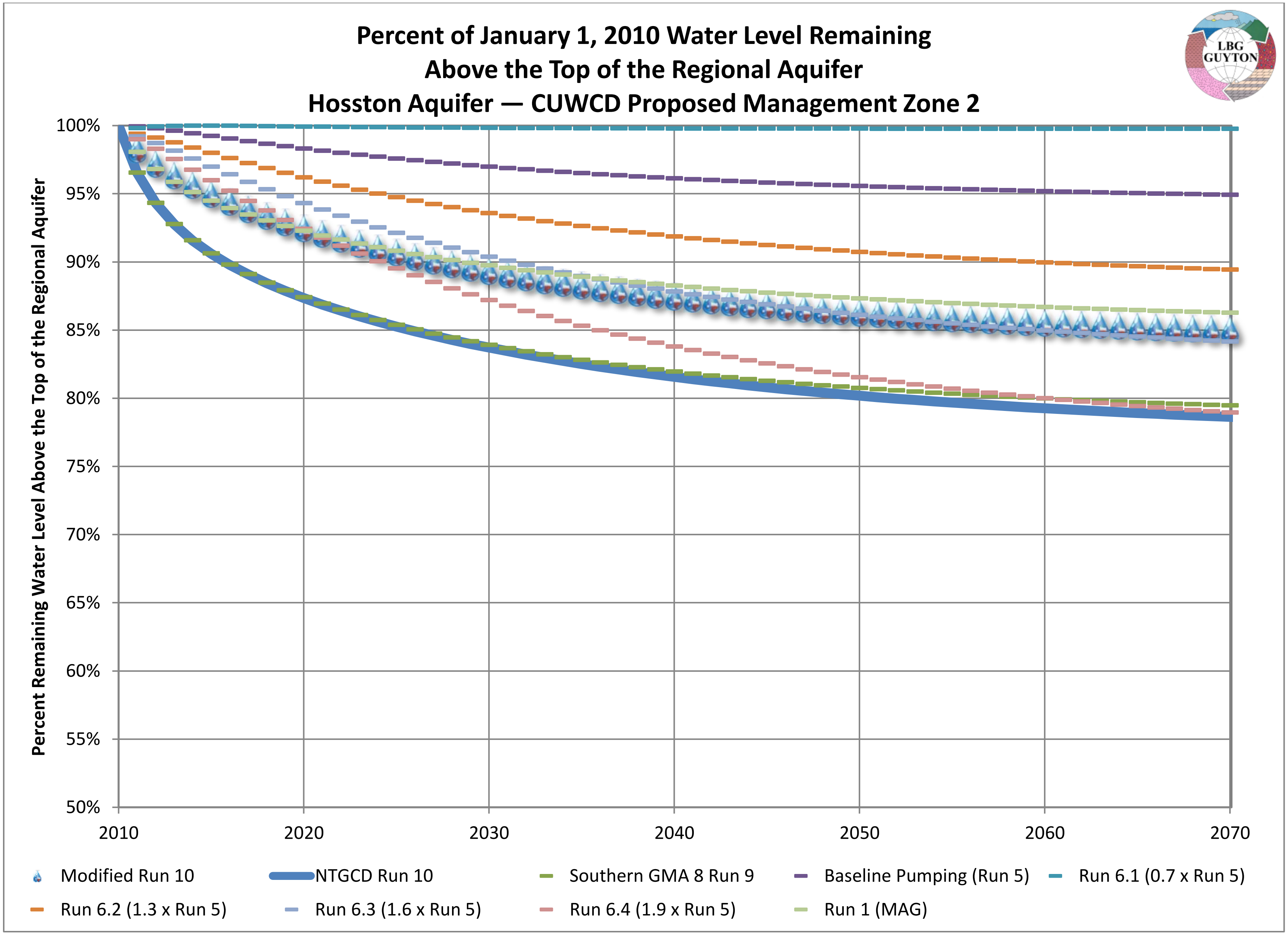
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Hosston Aquifer — CUWCD Proposed Management Zone 1
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Hosston Aquifer — CUWCD Proposed Management Zone 2
LBG GUYTON
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
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85%
80%
75%
70%
65%
60%
55%
50%
2010
2020
2030
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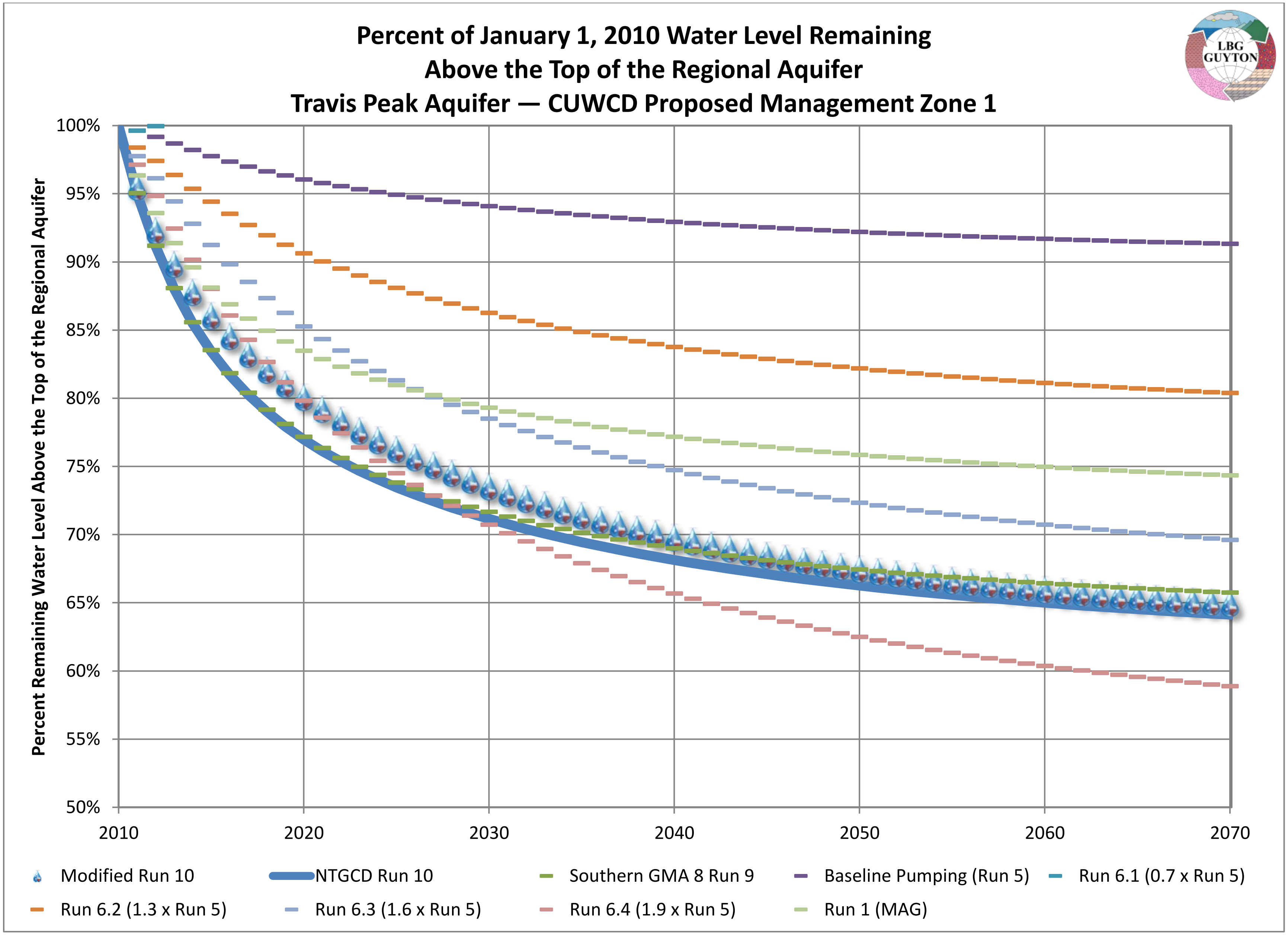
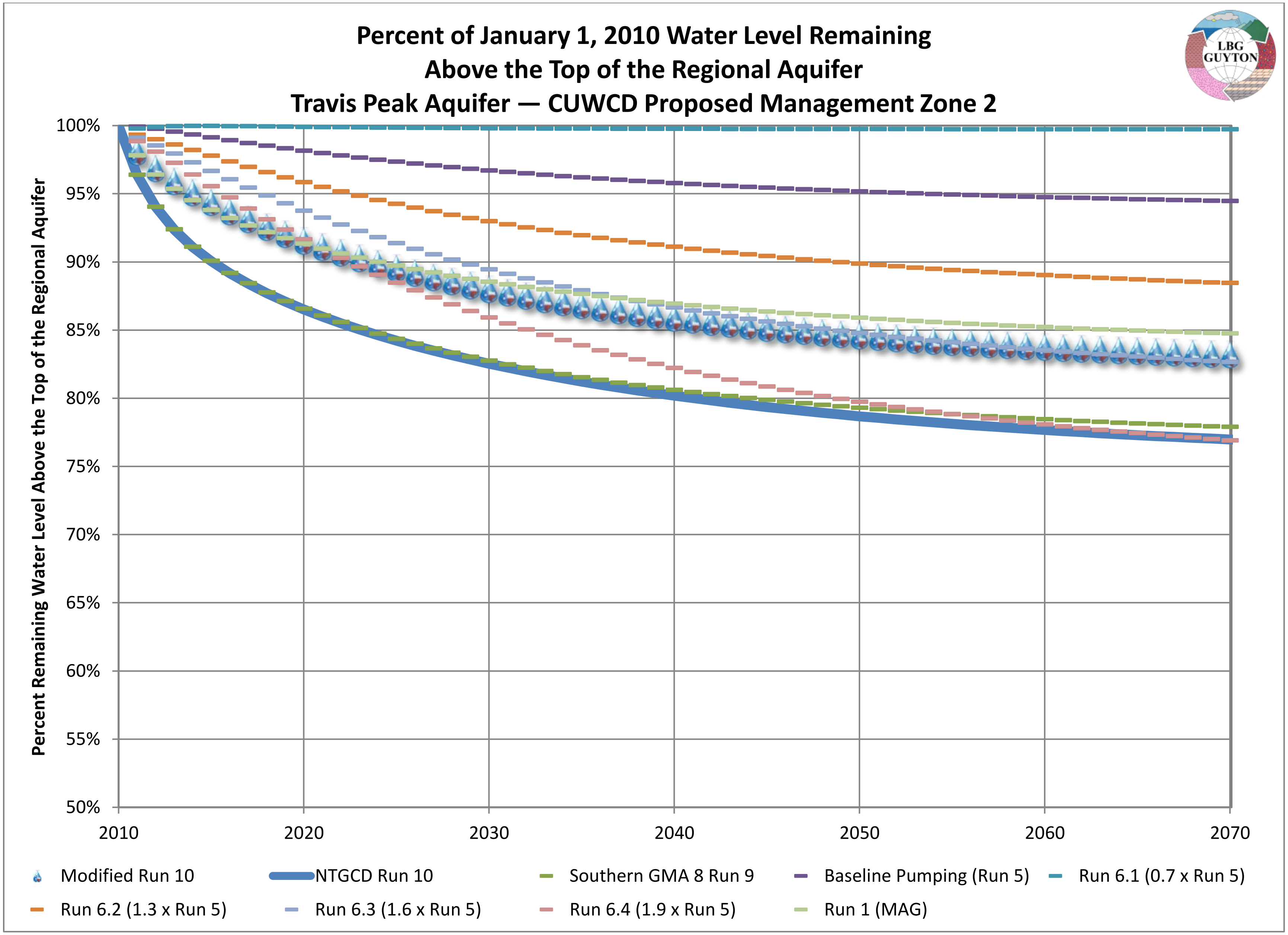
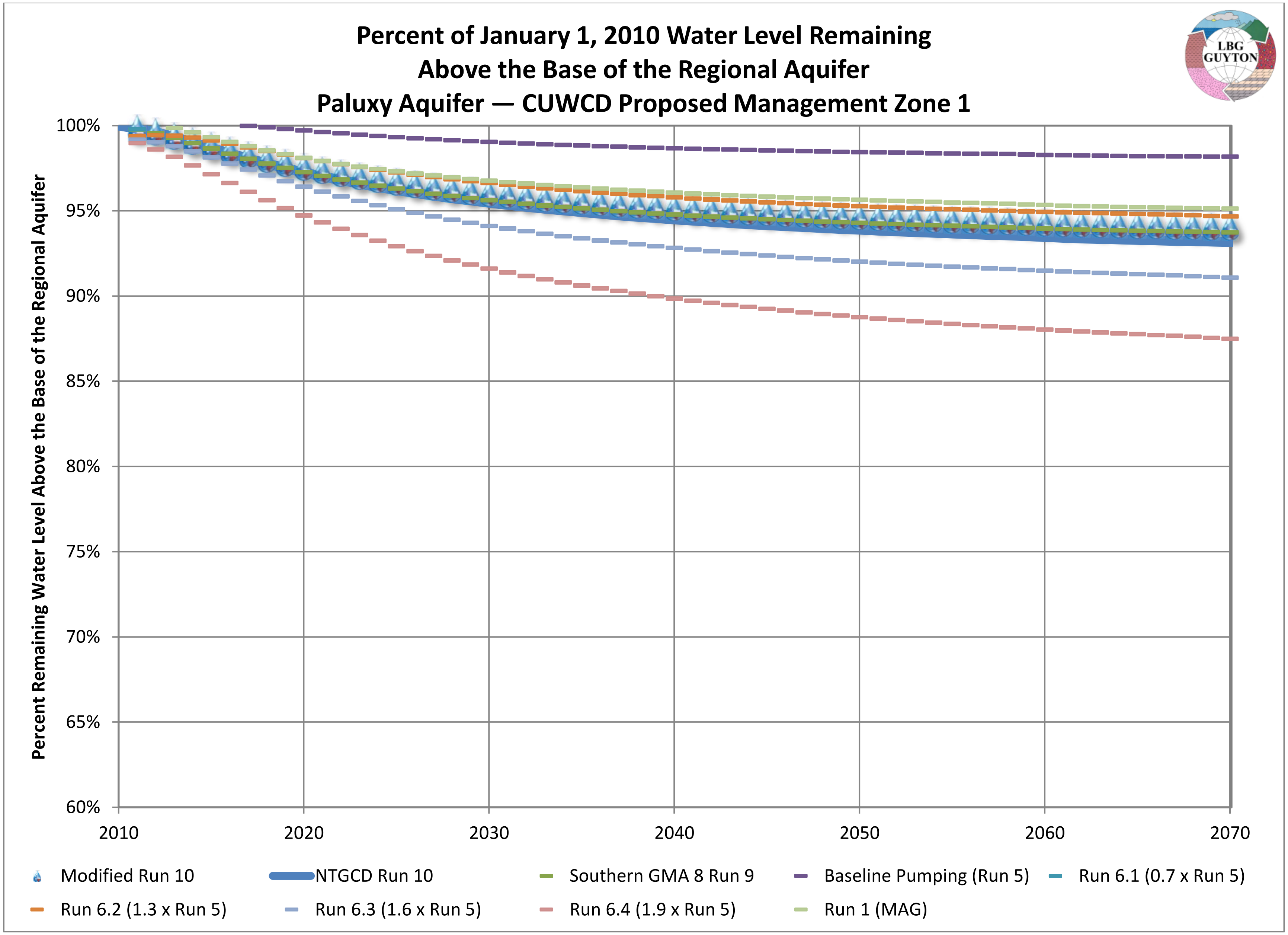
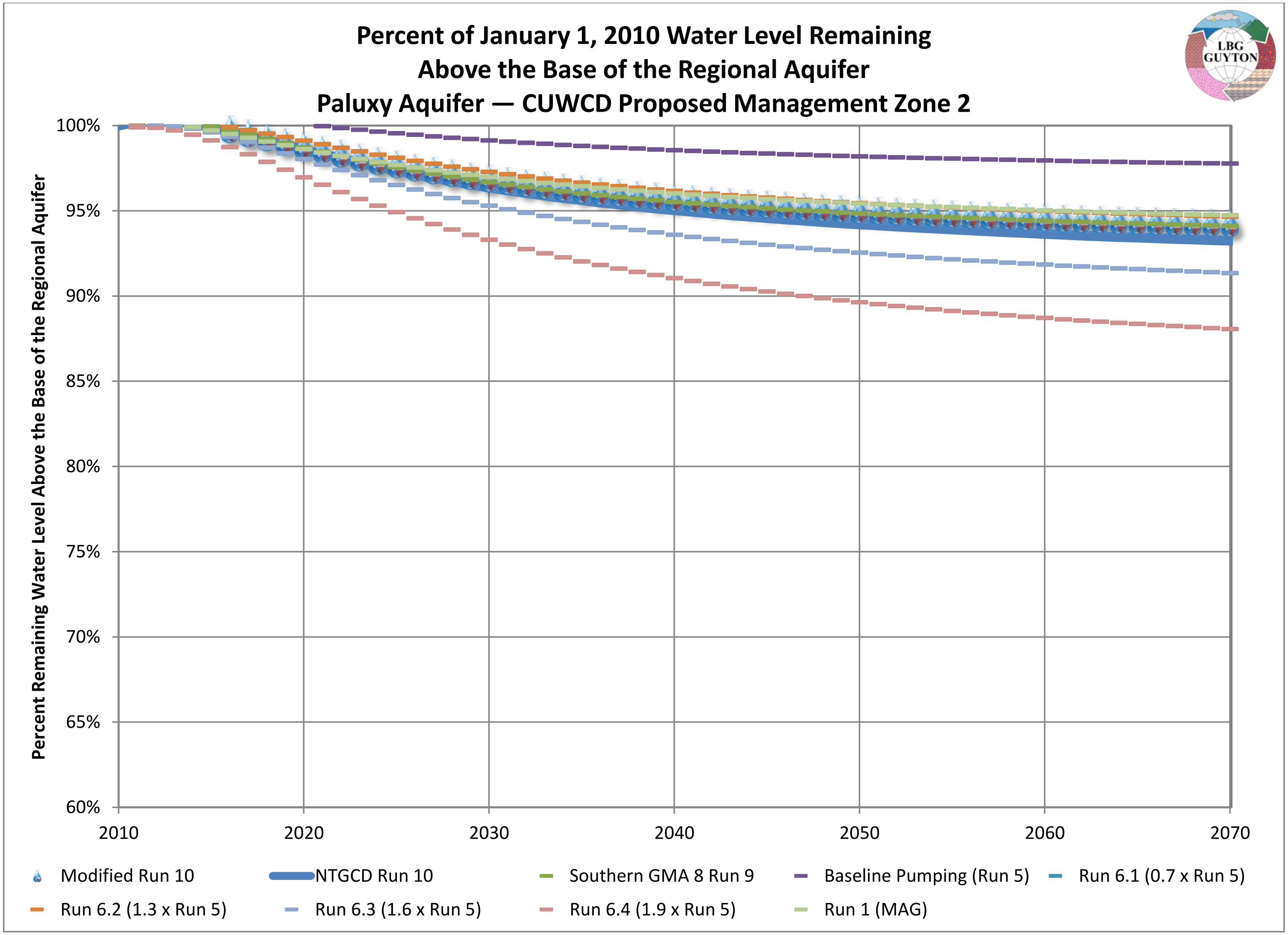
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

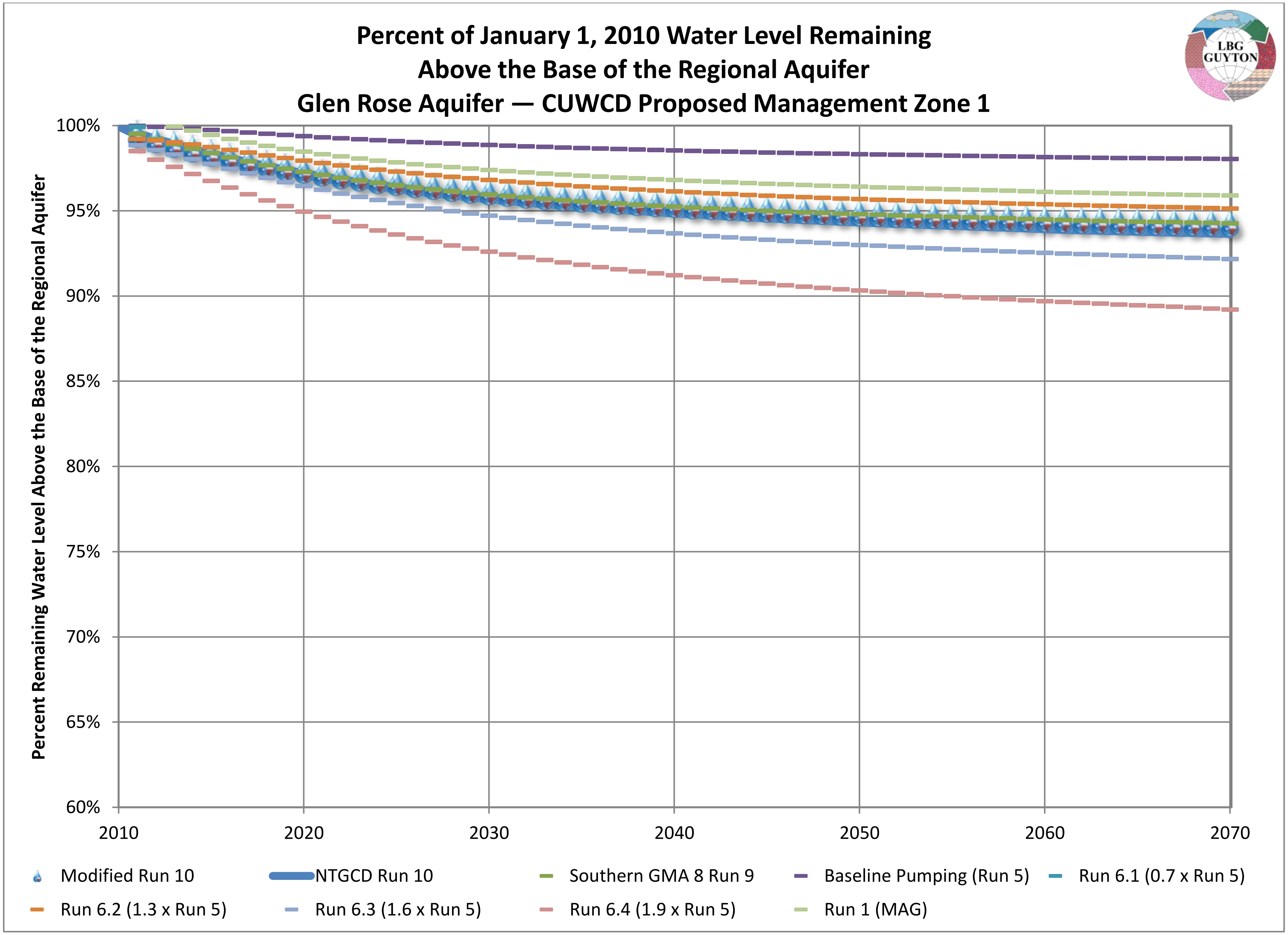

Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Travis Peak Aquifer — CUWCD Proposed Management Zone 1
LBG GUYTON
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Top of the Regional Aquifer
Travis Peak Aquifer — CUWCD Proposed Management Zone 2
LBG GUYTON
Percent Remaining Water Level Above the Top of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)

Attachment 3.6 —
Management Zone Percent of January 1, 2010 Water Level Remaining Above the Base of the Regional Aquifer


Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Paluxy Aquifer — CUWCD Proposed Management Zone 1
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Paluxy Aquifer — CUWCD Proposed Management Zone 2
LBG GUYTON
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Glen Rose Aquifer — CUWCD Proposed Management Zone 1
LBG GUYTON
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
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80%
75%
70%
65%
60%
2010
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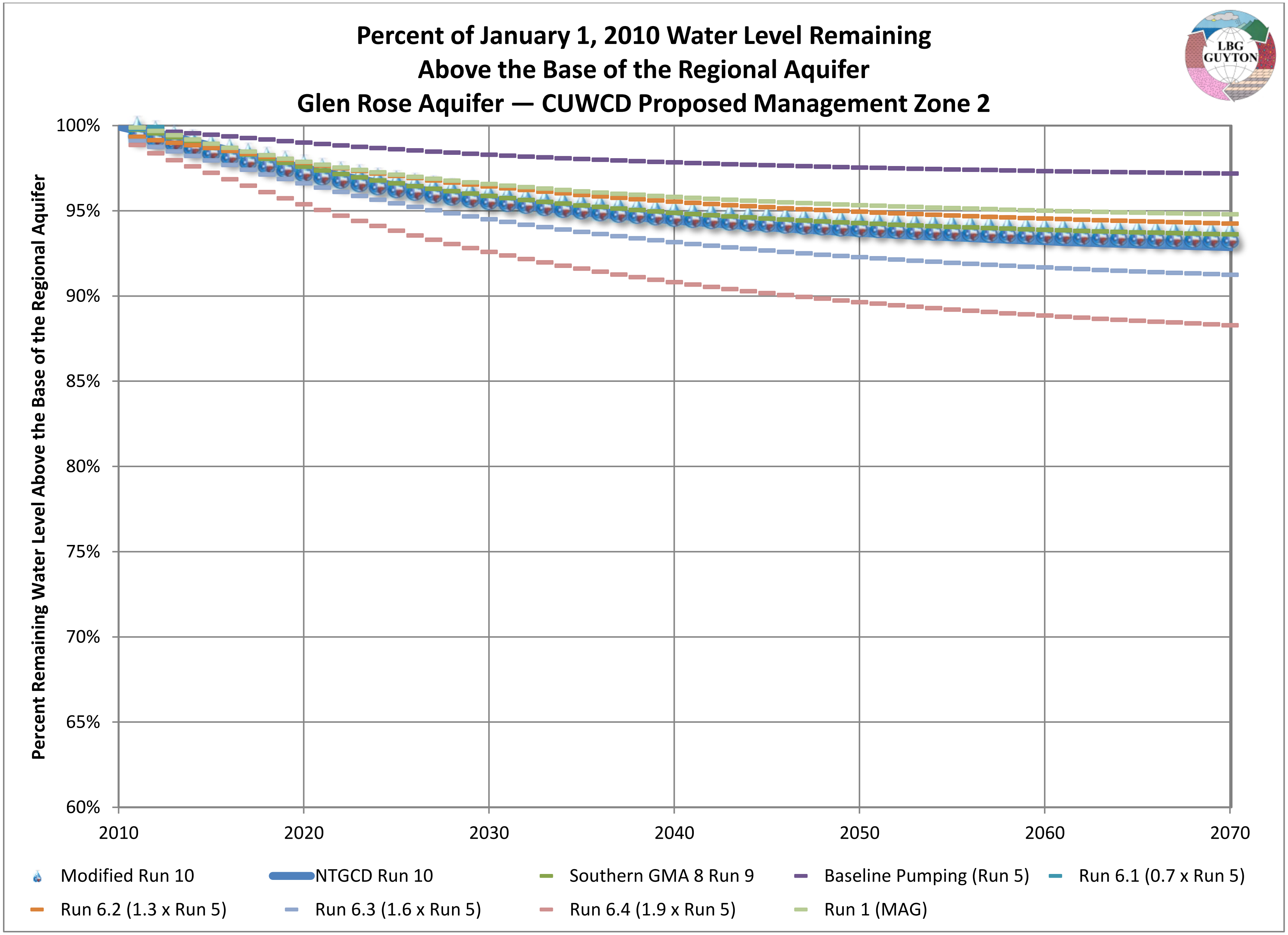
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Glen Rose Aquifer — CUWCD Proposed Management Zone 2
LBG GUYTON
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
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60%
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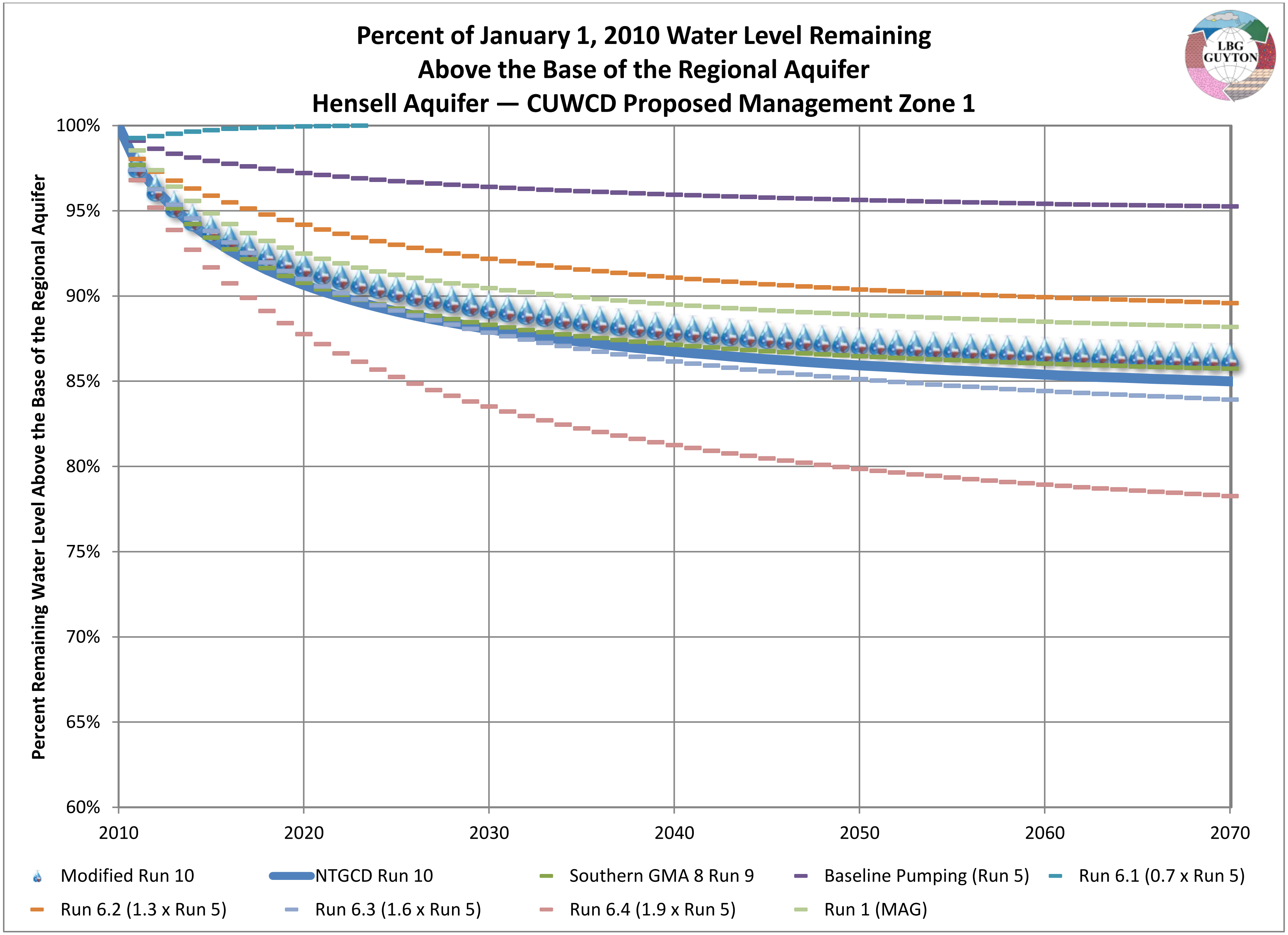
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Hensell Aquifer — CUWCD Proposed Management Zone 1
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
2010
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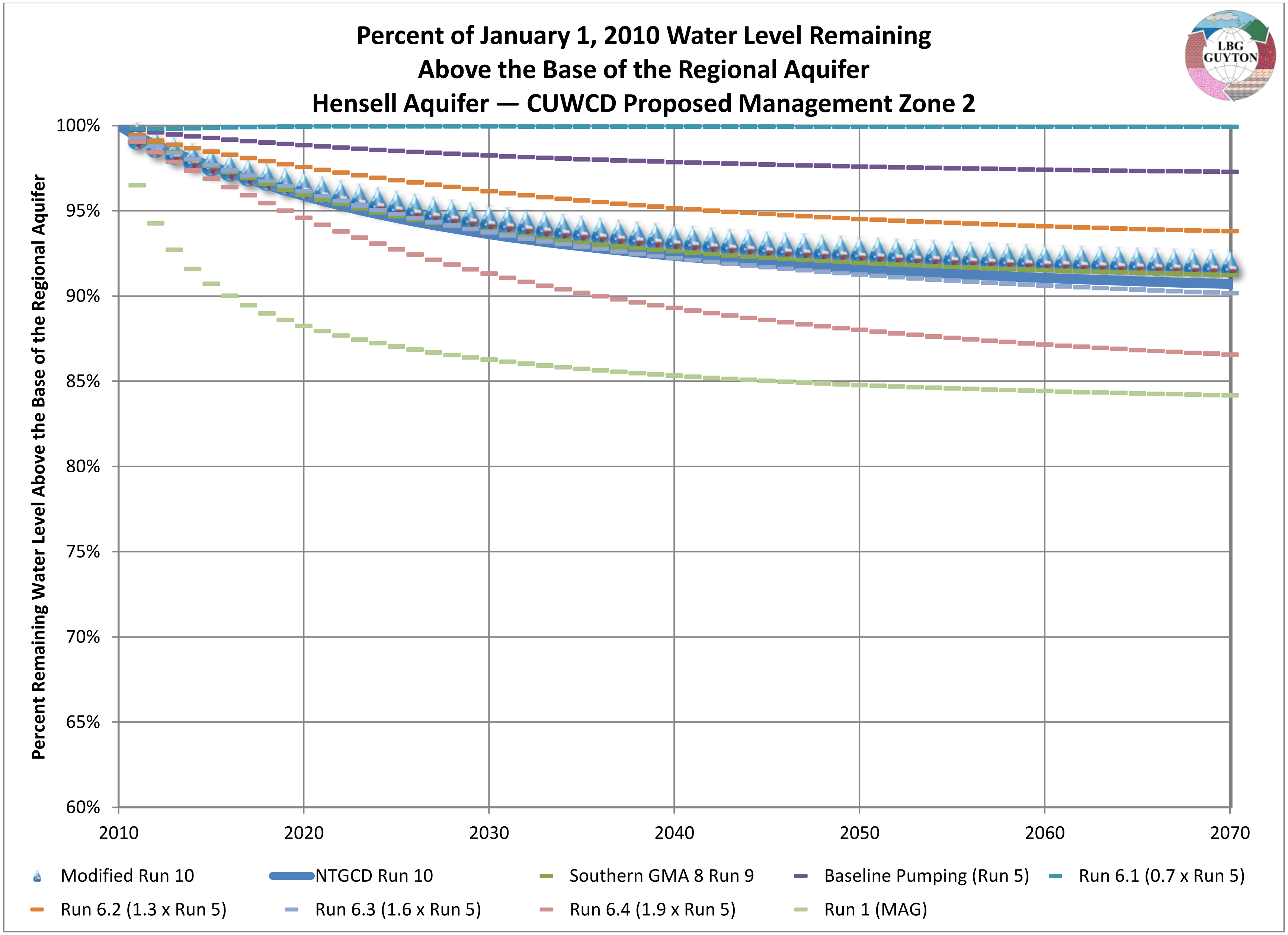
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Hensell Aquifer — CUWCD Proposed Management Zone 2
LBG GUYTON
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
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65%
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2010
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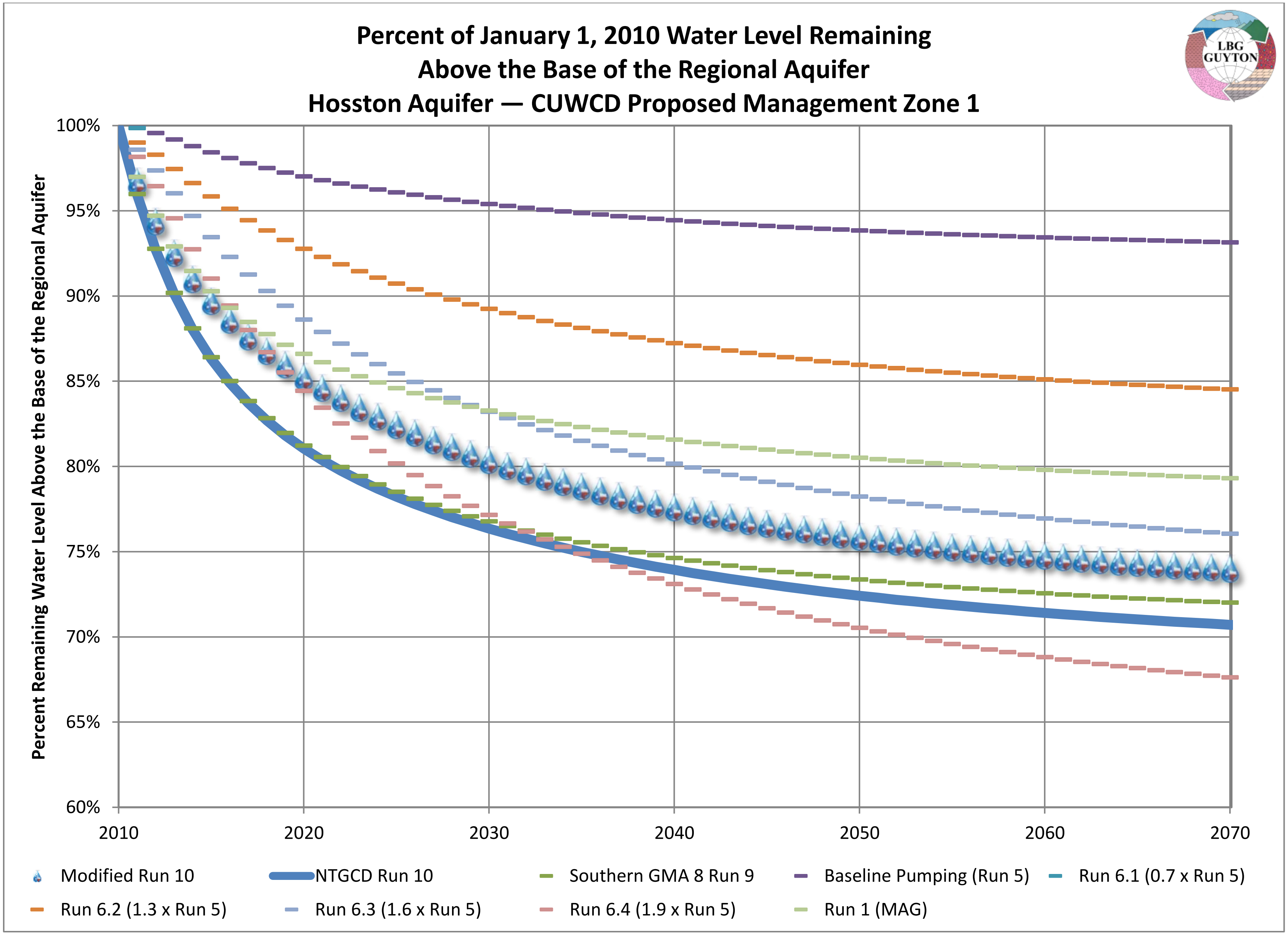
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Hosston Aquifer — CUWCD Proposed Management Zone 1
LBG GUYTON
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
2010
2020
2030
2040
2050
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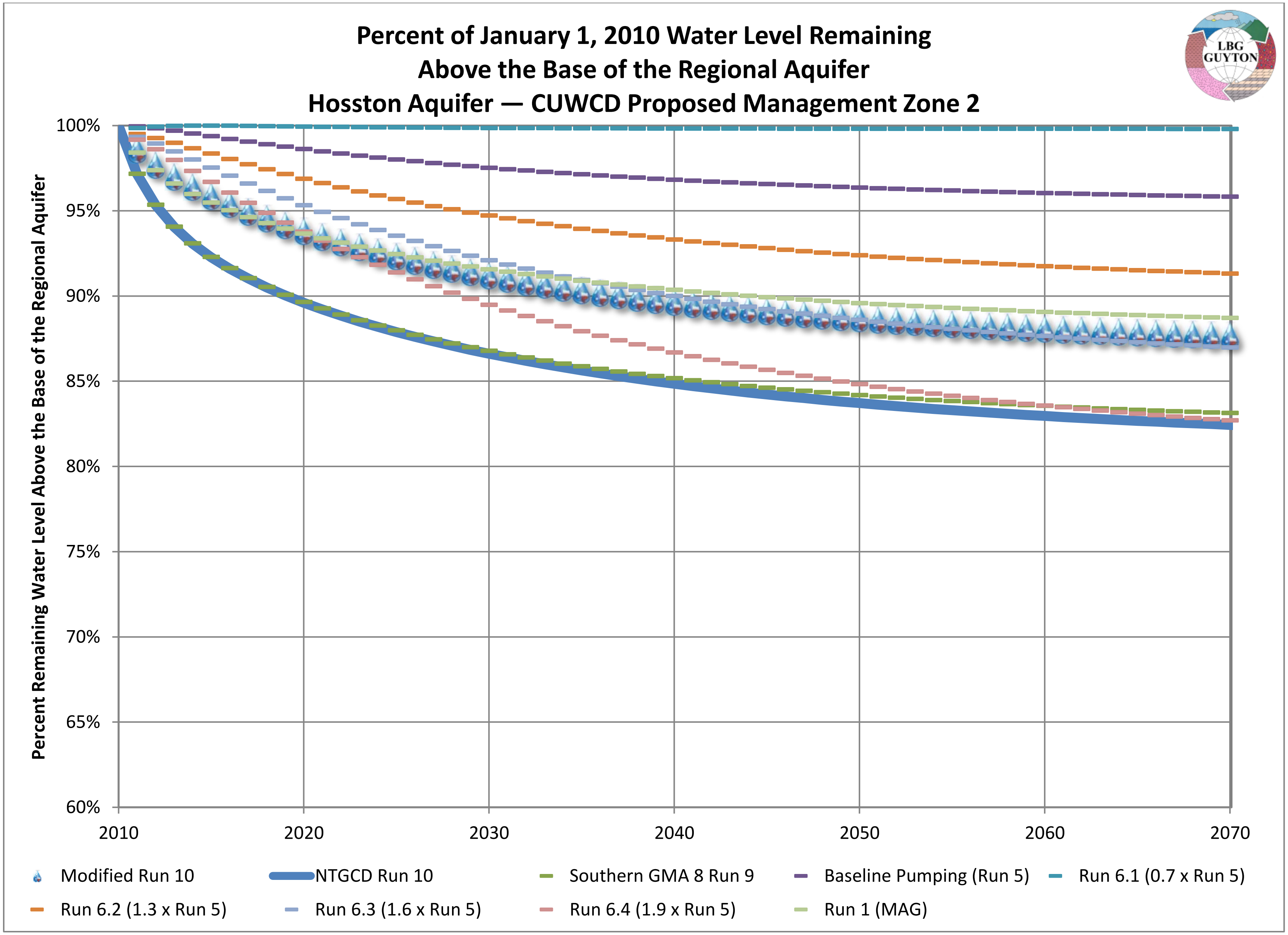
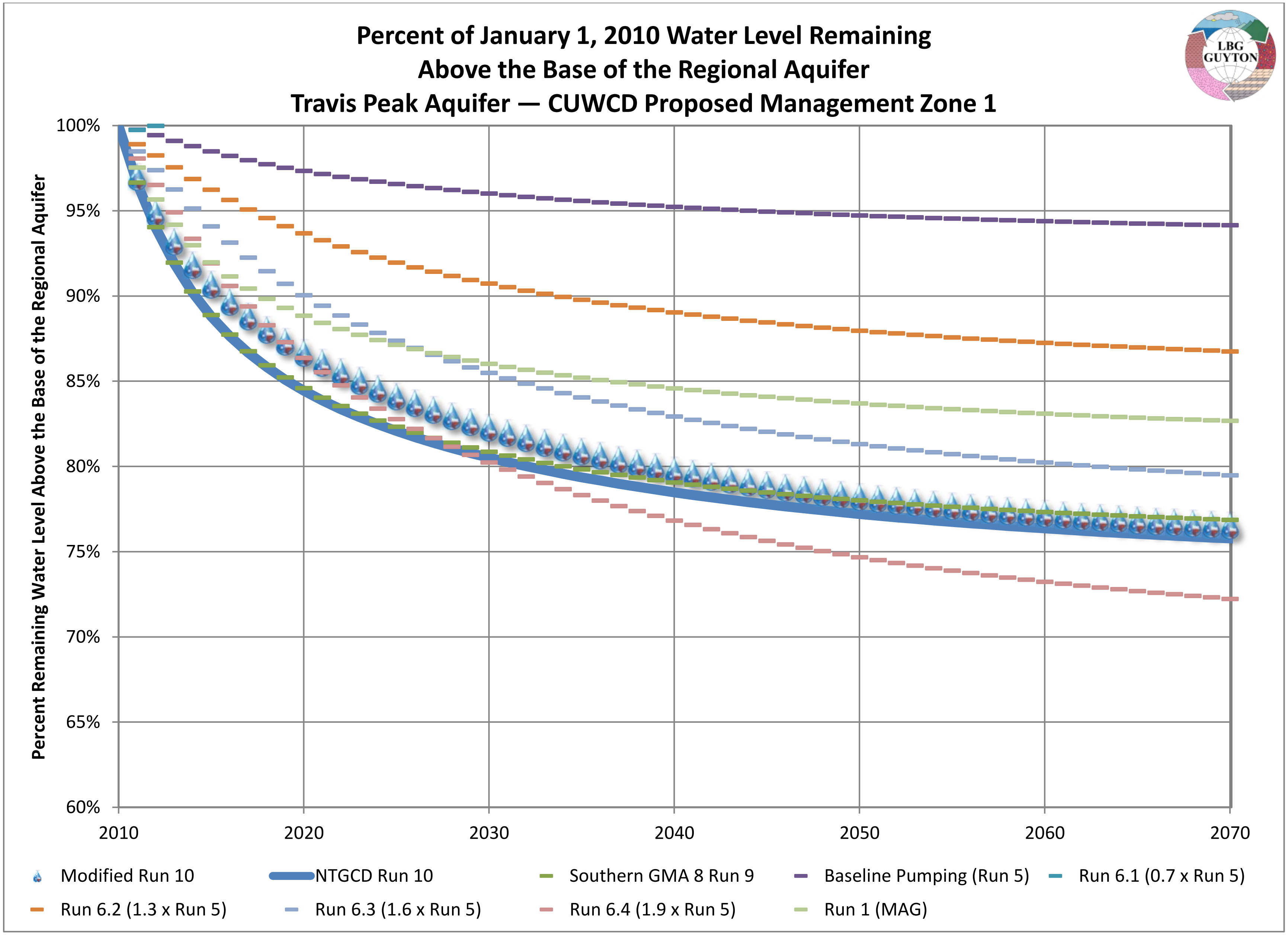
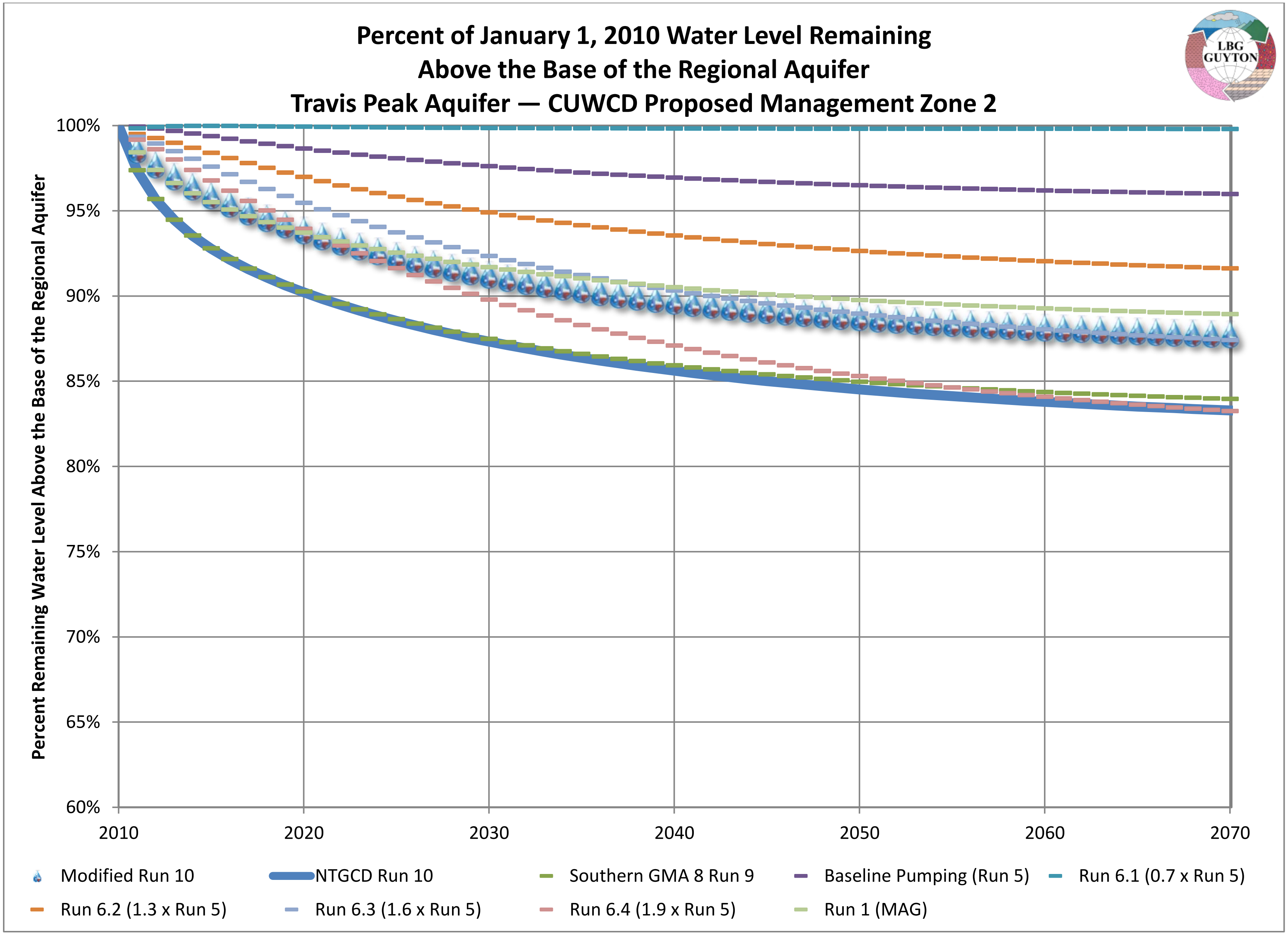
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Hosston Aquifer — CUWCD Proposed Management Zone 2
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Travis Peak Aquifer — CUWCD Proposed Management Zone 1
LBG GUYTON
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
2010
2020
2030
2040
2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)


Percent of January 1, 2010 Water Level Remaining
Above the Base of the Regional Aquifer
Travis Peak Aquifer — CUWCD Proposed Management Zone 2
Percent Remaining Water Level Above the Base of the Regional Aquifer
100%
95%
90%
85%
80%
75%
70%
65%
60%
2010
2020
2030
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2050
2060
2070
Modified Run 10
NTGCD Run 10
Southern GMA 8 Run 9
Baseline Pumping (Run 5)
Run 6.1 (0.7 x Run 5)
Run 6.2 (1.3 x Run 5)
Run 6.3 (1.6 x Run 5)
Run 6.4 (1.9 x Run 5)
Run 1 (MAG)