GMA 8
Joint Groundwater Planning Meeting

May 15, 2020

wsp

Blanton & Associates, Inc.
Environmental Consulting • Planning • Project Management

Agenda Item 6
Discussion and possible action on results from updated NTWGAM run related to Joint Planning in GMA 8. Discussion will include changes made in Upper Trinity GCD, Prairielands GCD, Southern Trinity GCD, Clearwater UWCD, Central Texas GCD, and Williamson and Travis County

- Run 11 – Update of NTWGAM DFC/MAG Run
- WSP has received pumping updates from:
  - *Upper Trinity GCD, Southern Trinity GCD, Prairielands GCD, Central Texas GCD (funded thru GMA 8 contract)*
  - *Clearwater UWCD, Travis and Williamson County (funded separately by Clearwater UWCD)*
- WSP has completed simulations for Central Texas GCD related to impacts in the Llano Uplift aquifers using the Llano Uplift GAM
  - *Central Texas GCD is funding this effort separately*

Summary of Run 11

- MAGs from this round of planning will be used in 2027 State Water Plan (2030-2080)

- Run 11
  - Begins in 2010 (no change)
  - Model extended to 2080
  - 2070 input will be used for 2071-2080
  - Each year is 365.25 days to remove leap year change in MAG
  - Pumping has been updated as provided by GCDs
  - One drought of record included from 2078-2080
  - WSP will provide files to TWDB as early as possible

Upper Trinity GCD Pumping

Aquifer	O/D	County	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	Outcrop	Hood	654	138	792
Glen Rose	Downdip	Hood	103	22	125
Paluxy	Outcrop	Hood	159	0	159
Twin Mountains	Outcrop	Hood	3,674	1,351	5,025
Twin Mountains	Downdip	Hood	7,854	2,914	10,768
Antlers	Outcrop	Montague	3,878	2,236	6,114
Antlers	Outcrop	Parker	2,899	6	2,905
Glen Rose	Outcrop	Parker	2,290	1,394	3,684
Glen Rose	Downdip	Parker	874	532	1,406
Paluxy	Outcrop	Parker	2,609	5	2,614
Paluxy	Downdip	Parker	50	0	50
Twin Mountains	Outcrop	Parker	1,074	220	1,294
Twin Mountains	Downdip	Parker	2,083	444	2,527
Antlers	Outcrop	Wise	7,702	1,404	9,106
Antlers	Downdip	Wise	2,058	381	2,439
		Total	37,961	11,048	49,009

Southern Trinity GCD pumping

Year	Hosston Run 10 AFY	Adjustement for Hosston	Hosston Run 11 AFY
2010	15,937	-4,135	11,802
2011	15,937	-4,635	11,302
2012	15,937	-5,361	10,576
2013	15,937	-6,978	8,959
2014	15,937	-8,424	7,513
2015	15,937	-7,565	8,372
2016	15,937	-7,074	8,863
2017	15,937	-7,929	8,008
2018	15,937	-8,130	7,807
2019	15,937	-8,135	7,802
2020-2080	15,937	0	15,937

Prairielands GCD Pumping

Aquifer	Run 10 AFY	Adjustment	Run 11 AFY
Hensell	3,603	-3,206	397
Pearsall	98	1,848	1,946
Hosston	13,237	1,358	14,595
Total	16,938	0	16,938

Clearwater UWCD Pumping

Aquifer	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	972	-697	275
Hensell	1,097	3	1,100
Hosston	7,179	721	7,900
Total	9,248	27	9,275

Central Texas GCD Pumping

Aquifer	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	424	-276	148
Hensell	1,891	773	2,664
Hosston	1,381	-493	888
Total	3,696	4	3,700

Travis County Pumping

Aquifer	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	973	-873	100
Hensell	1,144	1,156	2,300
Hosston	2,799	1,401	4,200
Total	4,916	1,684	6,600

Williamson County Pumping

Aquifer	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	689	-539	150
Hensell	752	848	1,600
Hosston	1,934	-184	1,750
Total	3,375	125	3,500

Run 11 Results - DFC

- DFC differences between Run 10 and Run 11 (compare 2070 results)
- Blue negative values indicate higher water levels
- Red positive values indicate greater drawdowns

Change in Drawdown in 2070
(Difference between Run 10 and Run 11)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Bell	-	-1	-4	-	32	4	37	-
Bosque	-	0	3	-	18	8	27	-
Brown	-	0	0	-	0	0	0	0
Burnet	-	-	0	-	2	1	-1	-
Callahan	-	-	-	-	-	-	-	0
Collin	1	4	7	16	-	-	-	11
Comanche	-	0	0	-	1	0	0	0
Cooke	0	-	-	-	-	-	-	9
Coryell	-	0	0	-	6	3	8	-
Dallas	2	5	10	34	45	12	48	-
Delta	-	2	3	-	3	-	-	-
Denton	0	1	6	22	-	-	-	11
Eastland	-	-	-	-	-	-	-	0

Blue negative values indicate higher water levels

Red positive values indicate greater drawdowns

Change in Drawdown in 2070
(Difference between Run 10 and Run 11)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Ellis	3	6	13	66	57	13	63	-
Erath	-	0	0	1	4	-1	2	1
Falls	-	8	15	-	33	16	34	-
Fannin	0	3	4	9	6	-	-	4
Grayson	0	3	4	10	-	-	-	5
Hamilton	-	0	0	-	1	0	2	-
Hill	1	2	9	-	55	17	64	-
Hunt	3	4	5	10	8	-	-	-
Johnson	0	1	3	23	43	-11	86	-
Kaufman	9	13	16	25	28	20	30	-
Lamar	0	1	1	-	2	-	-	2
Lampasas	-	0	0	-	0	0	0	-
Limestone	-	7	19	-	27	20	28	-

Blue negative values indicate higher water levels

Red positive values indicate greater drawdowns

Change in Drawdown in 2070
(Difference between Run 10 and Run 11)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
McLennan	0	3	9	-	26	15	30	-
Milam	-	-	18	-	54	20	54	-
Mills	-	0	0	-	2	0	0	-
Navarro	6	6	20	-	36	26	35	-
Red River	0	0	0	-	1	-	-	0
Rockwall	5	9	11	20	-	-	-	-
Somervell	-	-1	-1	18	11	-10	35	-
Tarrant	0	1	9	26	-	-	-	26
Taylor	-	-	-	-	-	-	-	0
Travis	-	-	0	-	68	12	69	-
Williamson	-	-	-3	-	39	10	40	-

Blue negative values indicate higher water levels

Red positive values indicate greater drawdowns

Run 11 Results – DFC Values for Run 11

- DFC values are calculated the same as Run 10
- DFC is taken as the average drawdown from the start of the model run (2010) until the end of the model run (2080)
- The DFC values are averaged over each county and GCD

Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Bell	-	17	83	0	333	145	375	0
Bosque	-	6	53	0	189	139	232	0
Brown	-	2	1	0	2	1	1	2
Burnet	0	0	2	0	19	7	21	0
Callahan	-	0	0	0	0	0	0	1
Collin	482	729	366	560	-	0	0	596
Comanche	-	2	2	0	4	2	3	12
Cooke	2	0	0	0	0	0	0	191
Coryell	-	5	15	0	107	70	141	0
Dallas	137	346	288	515	415	362	419	0
Delta	-	279	198	0	202	0	0	0
Denton	20	558	367	752	0	0	0	416
Eastland	-	0	0	0	0	0	0	4

Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Ellis	76	128	220	413	380	290	390	0
Erath	-	6	6	8	25	12	35	14
Falls	-	159	238	0	505	296	511	0
Fannin	259	709	305	400	291	0	0	269
Grayson	163	943	364	445	0	0	0	364
Hamilton	-	2	4	0	26	14	38	0
Hill	20	45	149	0	365	211	413	0
Hunt	631	610	326	399	350	0	0	0
Johnson	4	-57	66	184	235	120	329	0
Kaufman	242	311	305	427	372	349	345	0
Lamar	42	100	107	0	125	0	0	132
Lampasas	-	1	1	0	6	1	11	0
Limestone	-	199	301	0	433	214	445	0

Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
McLennan	6	41	148	0	504	242	582	0
Milam	0	0	241	0	412	261	412	0
Mills	-	1	1	0	9	2	13	0
Navarro	110	139	266	0	343	295	343	0
Red River	2	24	40	0	57	0	0	15
Rockwall	275	433	343	466	-	0	0	0
Somervell	-	4	4	50	64	17	120	0
Tarrant	6	105	163	348	0	0	0	177
Taylor	-	0	0	0	0	0	0	0
Travis	0	0	83	0	219	68	226	0
Williamson	0	0	78	0	220	89	225	0
McLennan	6	41	148	0	504	242	582	0

Run 11 Results – Drawdown (2010-2080)

County	O/D	Paluxy	Glen Rose	Twin Mnts	Antlers
Hood	Downdip	-	39	72	0
Hood	Outcrop	6	9	13	0
Montague	Downdip	0	0	0	-
Montague	Outcrop	0	0	0	40
Parker	Downdip	2	50	68	-
Parker	Outcrop	6	20	7	42
Wise	Downdip	0	0	0	154
Wise	Outcrop	0	0	0	59

Questions ?

Agenda Item 7

- Presentation and discussion regarding Socioeconomic Impacts, Feasibility of Desired Future Conditions (DFCs), and Other Relevant Information factors as they relate to Desired Future Conditions (DFCs) adoption pursuant to Texas Water Code Section 36.108(d)

GMA 8 Schedule to Discuss Nine Factors

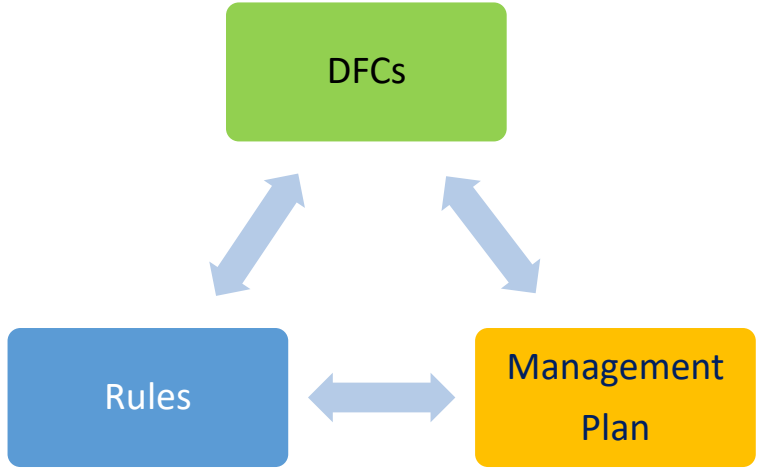
Feasibility of Achieving the DFC

- Physical Achievability
  - Is the DFC physically possible within the aquifer?

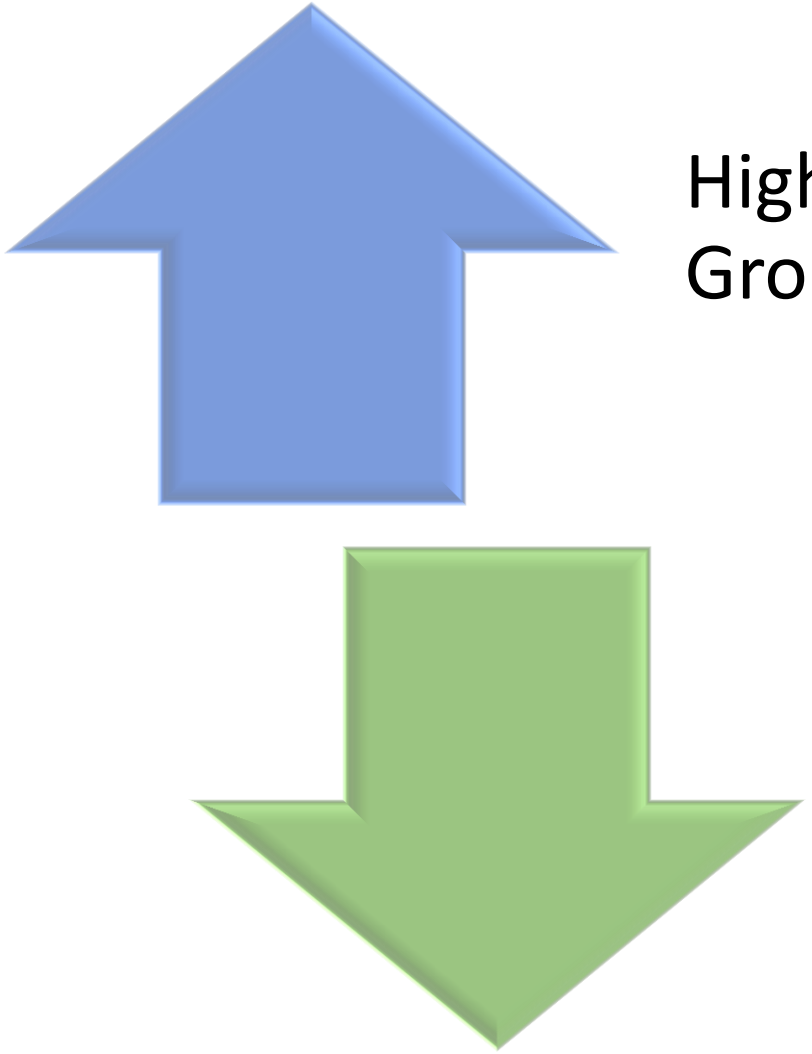
  ➢ Groundwater Availability Models help ensure that DFCs are generally physically achievable in the aquifer

- Regulatory Achievability
  - Can the DFC be achieved via GCD management plan and rules?
  - Does the regulated community and stakeholders agree with the management approach required to achieve the DFC?

  ➢ Have GCDs implemented Rules and have an approved Management Plan?



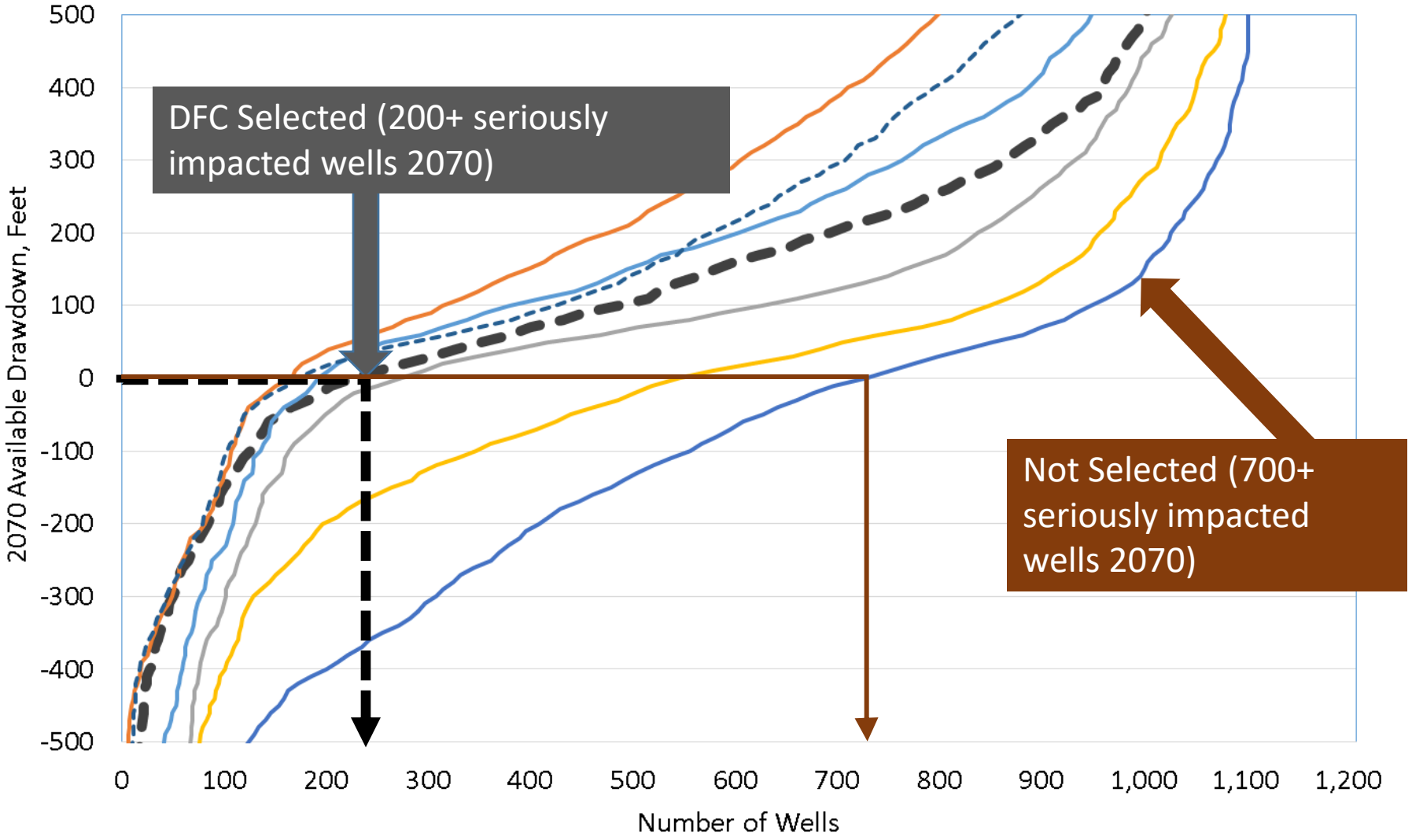
Standard for Desired Future Conditions



Highest Practicable Level of Groundwater Production

Conservation, Preservation, Protection, Recharging, and Prevention of Waste of Groundwater, and Control of Subsidence

Public Water Supply Well Impacts



Socioeconomic Impacts

Today's Meeting:

Socioeconomic Impacts factor as it relates to Desired Future Conditions (DFCs) pursuant to Texas Water Code (TWC) § 36.108(d) -

1. Review TWC § 36.108(d) requirements for socioeconomic impacts factor considerations
2. Review 31 Texas Administrative Code (TAC), Chapter 357, regional and state water plan socioeconomic considerations
3. Review GMA 8 socioeconomic impacts factor discussion during second round of DFC joint planning
4. Discuss next steps in GMA 8 socioeconomic impacts factor consideration

Socioeconomic Impacts Factor - TWC § 38.108(d) requirements

Before GMA votes on proposed DFCs, TWC § 36.108(d) requires that:

"(d) Not later than May 1, 2021, and every five years thereafter, the districts shall consider groundwater availability models and other data or information for the management area and shall propose for adoption desired future conditions for the relevant aquifers within the management area. **Before voting on the proposed desired future conditions of the aquifers under Subsection (d-2), the districts shall consider:**

. . .

(6) socioeconomic impacts reasonably expected to occur. . ."

Socioeconomic Impacts Factor – Title 31, TAC, Chapter 357

Regional and state water planning in Texas considers socioeconomic impacts in accordance with statutory guidance:

- 31 TAC § 357.11(j) states that "Upon request, the EA will provide technical assistance to RWPGs, including on water supply and demand analysis, methods to evaluate the social and economic impacts of not meeting needs, and regarding Drought Management Measures and water conservation practices."
- 31 TAC § 357.33(c) states that "The social and economic impacts of not meeting Water Needs shall be evaluated by RWPGs and reported for each RWPA."

Socioeconomic Impacts

Socioeconomic Impacts Factor – Title 31, TAC, Chapter 357

- The regional water planning analysis is based on water supply needs from the regional water plans and consists of a series of point estimates of 1-year droughts at 10-year intervals.
- The socioeconomic impacts analysis attempts to measure impacts that may be anticipated if water user groups do not meet their identified water supply needs associated with a drought-of-record for one year.
- For the socioeconomic impact analysis, multiple impacts are examined, including (1) sales, income, and tax revenue, (2) jobs, (3) population, and (4) school enrollment.
- Results from the analysis are incorporated into the final regional water plans, and comprehensively presented in the subsequent state water plan.

Socioeconomic Impacts

Socioeconomic Impacts Factor – Title 31, TAC, Chapter 357

- TWDB prepared information for use by RWPGs for the 2016 regional water plans – Regions B, C, D, F, G, and H.
- TWDB prepared information for use by RWPGs for the 2021 RWPG initially prepared regional water plans.
- New to 2021 planning cycle, TWDB developed an interactive dashboard to view region and county level socioeconomic impacts.
- While TWDB assessments are useful to understand importance of meeting projected water needs, analyses **do not** evaluate socioeconomic impacts of proposed DFCs at the GMA level and a similar analysis does not exist.
- DFCs result in groundwater availability amounts for potential water management strategies that can meet some of the water supply needs and, therefore, are indirectly tied to this discussion for regional and state water planning.

Socioeconomic Impacts Factor - GMA 8 DFC Joint Planning Second Round Discussions

- GMA 8 GCDS thoroughly discussed and considered socioeconomic impacts throughout second round.
- Formal discussions of socioeconomic impacts factor were held during GMA 8 meetings –
  - May 27, 2015
  - April 1, 2016
- Each GCD also held discussions to consider socioeconomic impacts of proposed DFCs.

Socioeconomic Impacts Factor - GMA 8 DFC Joint Planning Second Round Discussions

- Information regarding socioeconomic impacts reasonably expected to occur as a result of the proposed DFCs was developed by District Representatives utilizing a survey tool developed specifically for use by GMA 8.
- The survey tool was used by individual District Representatives to discuss and consider socioeconomic impacts of DFCs under consideration with each GMA 8 GCD board of directors.
- The GMA 8 survey asked individual GCDs for “yes or no” responses to a set of questions and, for certain questions, requested any additional information that the GCD considered during discussions of potential socioeconomic impacts.
- Survey results were summarized in Table 23 of the GMA 8 Desired Future Conditions Explanatory Report (February 2017).

Socioeconomic Impacts

Socioeconomic Impacts Factor – GMA 8 DFC Joint Planning Second Round Discussions

Table 23. Summary of GMA 8 survey regarding socioeconomic impacts of proposed DFCs.

Survey questions regarding socioeconomic impacts of proposed DFCs	GMA 8 GCD Survey Responses										
	CTGCD	CUWCD	MTGCD	NTGCD	Ntrinty GCD	POSGCD	PGCD	RRGCD	SUWCD	STGCD	UTGCD
Has your GCD identified any socioeconomic studies that relate directly or indirectly to the Section 36.108 (d)(6) planning criterion that should be considered by GMA 8 as part of the joint planning process?	Y	Y	N	N	N	Y	N	N	N	Y	Y
Did your GCD discuss and consider the information provided by the Texas Water Development Board on socioeconomic impacts of not meeting needs included in the applicable 2011 regional water plans and the 2012 state water plan?	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y
From a qualitative perspective, both positive and negative socioeconomic impacts may potentially result from implementation of proposed DFCs. Did your GCD discuss the potential socioeconomic impacts that may result from proposed DFCs due to a need for conversion to an alternative supply, including increased costs associated to infrastructure, operation, and maintenance?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y
Did your GCD discuss how proposed DFCs may reduce/eliminate the costs of lowering pumps and either deepening existing wells or drilling new wells?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y
Did your GCD discuss the potential that proposed DFCs may serve to sustain/enhance economic growth due to assurances provided by a diversified water portfolio?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y
Did your GCD discuss how proposed DFCs may result in short-term reduction in utility rates due to reduction in cost of alternative water management strategy implementation?	N	Y	Y	Y	N	NA	Y	Y	Y	Y	Y
Did your GCD discuss how proposed DFCs may result in significant but unquantified production costs due to lowering of artesian water levels in local aquifers?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y

Socioeconomic Impacts Factor - GMA 8 DFC Joint Planning Second Round Discussions

- Survey responses illustrated that the GCDs in GMA 8 held focused discussions during multiple properly noticed board of directors' meetings on the socioeconomic impacts of proposed DFCs within their individual GCDs.
- Survey responses clearly indicated that GMA 8 GCDs recognized that in their deliberation and adoption of DFCs, management plans, and rules, it is critical to evaluate all policy decisions based, in part, on the potential socioeconomic impacts of the policy question under consideration.

Socioeconomic Impacts Factor - GMA 8 DFC Joint Planning Second Round Discussions

- Potential socioeconomic impacts considered included: impacts of lowering water levels on costs of production including increased pumping lifts, decreasing well yields and potential need for additional wells, potential for and additional costs of developing alternative supplies, and the need to meet water supply needs in order to avoid socioeconomic impacts of water shortages.
- Overall, almost all the questions regarding whether a GCD's board of directors considered a specific aspect of socioeconomic impacts potentially resulting from proposed DFCs were answered in the affirmative (61 – yes; 4 – no).

Socioeconomic Impacts Factor - GMA 8 DFC Joint Planning Second Round Discussions

- Due to the absence of non-exempt pumping in the Northern Trinity and Woodbine aquifers in Post Oak Savannah GCD, the District's responses to questions pertaining to socioeconomic impacts of proposed DFCs were determined to be "not applicable."
- Five GCDs provided specific information regarding additional socioeconomic impact studies deemed to be relevant to the individual GCD. GCDs submitting district-specific information on socioeconomic impacts included Central Texas GD, Clearwater UWCD, Post Oak Savannah GCD, Southern Trinity GCD, and Upper Trinity GCD.

All the topics/issues considered by GMA 8 GCDs during the second round of joint planning continue to be relevant considerations in this third round.

Next Steps in GMA 8 Socioeconomic Impacts Factor Consideration

- Are there additional socioeconomic impacts for proposed DFCs identified by GMA 8 GCDs, or are those considered during second round still reflective of today's issues?
- Once actual DFCs are being considered and reviewed relative to the nine factors, WSP Team to develop presentation of impacts of proposed DFCs on nine factors.
- Information from presentations to be incorporated into the GMA 8 Desired Future Conditions Explanatory Report.

Socioeconomic Impacts

Questions?

Agenda Item 10

- Discussion of possible agenda items and dates for next GMA 8 meeting
  - *Presentation of Central Texas GCD run results for Llano Uplift aquifers*
  - *Discussion of slivers as per TWDB*
  - *Discussion and possible action on DFCs for:*
    - Trinity
    - Woodbine
    - Edwards
    - Llano Uplift Aquifer (Hickory, Ellenburger, and Marble Falls)
  - *Discussion and possible action on designation of Non-Relevant Aquifers*

Thank you!

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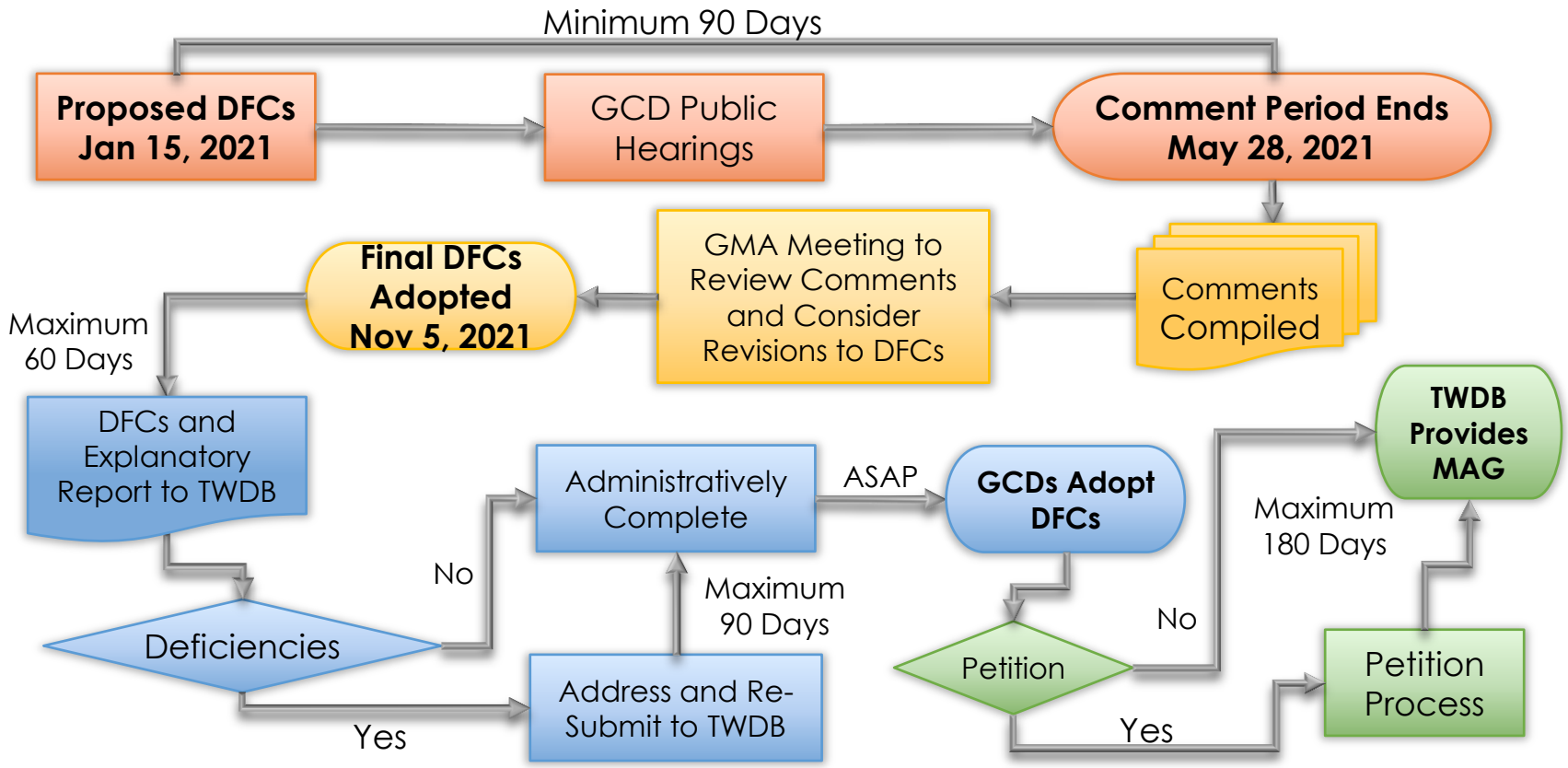
Anticipated Timeline for GMA 8 DFC Process



DFC Process
(TWC Sec. 36.108 & 31 TAC Ch. 356)