



Groundwater Management Area #1 – GMA#1

MEMORANDUM

To: Honorable Chairman and Members

From: Kyle G. Ingham, Local Government Services Director

Date: August 19, 2014

Re: Agenda Item #9

RECEIVE AND DISCUSS – UPDATED AND SUMMARIZED INFORMATION REGARDING WATER SUPPLY NEEDS AND WATER MANAGEMENT STRATEGIES INCLUDED IN THE 2012 TEXAS STATE WATER PLAN. [TEXAS WATER CODE §36.108(D)(2)]

SUMMARY

The GMA-1 Joint Planning Committee initially received a presentation and on water supply needs and water management strategies within GMA-1 on May 30, 2014. From that discussion, information regarding Texas Water Code §36.108(d)(2) is expanded as recommended as part of the committee's consideration in developing desired future conditions. The presentations from that meeting will be included in the appendices of the draft explanatory report for further reference.

Texas Water Code §36.108 (d)(2) requires that before voting on the proposed desired future conditions of the aquifers, the districts shall consider the water supply needs and water management strategies included in the state water plan. Texas Water Code §16.051 requires that not later than January 5, 2002, and before the end of each successive five-year period after that date, the Texas Water Development Board shall prepare, develop, formulate, and adopt a comprehensive state water plan that incorporates the regional water plans. The state water plan shall provide for the orderly development, management, and conservation of water resources and preparation for and response to drought conditions, in order that sufficient water will be available at a reasonable cost to ensure public health, safety, and welfare; further economic development; and protect the agricultural and natural resources of the entire state. The most recent state water plan was approved in 2012. Since the 2012 State Water Plan incorporates the regional water plans, GMA-1 Joint Planning Committee

reviews the detailed information in the 2011 Panhandle Regional Water Plan. An “Existing Water Supply” means the maximum amount of water available from existing sources for use during drought of record conditions that is physically and legally available for use by a water user group. Projected water demand means the quantity of water needed on an annual basis according to the state water plan for the state water plan planning period. A “Water Management Strategy” is a plan or specific project to meet a need for additional water by a discrete user group, which can mean increasing the total water supply or maximizing an existing supply, including through reducing demands.

Texas Administrative Code Chapter 357 requires a regional water planning group to compare existing water supplies and projected water demands to identify water needs. Regional water planning groups compare projected water demands with existing water supplies available to WUGs and wholesale water providers in a planning area to determine whether WUGs will experience water supply surpluses or water supply needs. A “Wholesale Water Provider” (WWP) is any person or entity, including river authorities and irrigation districts, that has contracts to sell more than 1,000 acre-feet of water wholesale in any one year during the five years immediately preceding the adoption of the last regional water plan. The regional water planning groups shall include as wholesale water providers other persons and entities that enter or that the regional water planning group expects or recommends to enter contracts to sell more than 1,000 acre-feet of water wholesale during the period covered by the plan. Regional water planning groups report these results for WUGs and for WWPs by categories of use including municipal, manufacturing, irrigation, steam electric, mining, and livestock watering for each county or portion of a county in a regional water planning area. The social and economic impacts of not meeting water needs are evaluated by Regional water planning groups and reported for each Regional Water Planning Area.

Regional water planning groups identify and evaluate potentially feasible water management strategies for all WUGs and WWPs with identified water needs. Strategies are developed for WUGs and WWPs. In developing regional water plans, potentially feasible water management strategies may include, but are not limited to:

- (1) Expanded use of existing supplies including system optimization and conjunctive use of water resources, reallocation of reservoir storage to new uses, voluntary redistribution of water resources including contracts, water marketing, regional water banks, sales, leases, options, subordination agreements, and financing agreements, subordination of existing water rights through voluntary agreements, enhancements of yields of existing sources, and improvement of water quality including control of naturally occurring chlorides.
- (2) New supply development including construction and improvement of surface water and groundwater resources, brush control, precipitation enhancement, desalination, water supply that could be made available by cancellation of water rights based on data provided by the Commission, rainwater harvesting, and aquifer storage and recovery.
- (3) Conservation and drought management measures including demand management.
- (4) Reuse of wastewater.
- (5) Interbasin transfers of surface water.

(6) Emergency transfers of surface water including a determination of the part of each water right for non-municipal use in the REGIONAL WATER PLANNING AREA that may be transferred without causing unreasonable damage to the property of the non-municipal water rights holder in accordance with Texas Water Code §11.139 (relating to Emergency Authorizations).

The Panhandle Water Planning Group identified twenty-seven WUGs (accounting for basin and county designations) with identified shortages during the planning period. Of these, there are four cities and county other water users in three counties that are projected to experience a water shortage before 2060. The largest shortages are attributed to high irrigation use and comparably limited groundwater resources in Dallam, Hartley, Moore, and Sherman Counties. A shortage occurs when developed supplies are not sufficient to meet projected demands.

Total shortages for all water user groups are projected to be approximately 454,726 acre feet per year in 2010, increasing to 484,176 acre feet per year in 2030 and nearly 415,317 acre-feet per year by the year 2060. Of this amount, irrigation represents approximately 99 percent in the 2010 projections and over 84 percent of the total shortage in 2060 with shortages ranging from 454,000 to 381,000 acre-feet per year. The shortages attributed to the other water use categories total approximately 34,000 acre-feet per year in 2060.

The PWPG summarized the individual water user group shortages begin by county and demand type is presented in Table below. To account for the level of accuracy of the data, a shortage is defined as a demand greater than the current supply by more than or equal to 10 acre-feet per year.

Decade Shortage Begins by County and Category in GMA-1

County	Irrigation	Municipal	Manufacturing	Mining	Steam Electric Power	Livestock
Armstrong	-	-	-	-	-	-
Carson	-	-	-	-	-	-
Dallam	2010	-	-	-	-	-
Donley	-	-	-	-	-	-
Gray	-	-	-	-	-	-
Hansford	2020	2030	-	-	-	-
Hartley	2010	-	-	-	-	-
Hemphill	-	-	-	-	-	-
Hutchinson	2010	2040	2030	-	-	-
Lipscomb	-	-	-	-	-	-
Moore	2010	2020	2030	-	2010	-
Ochiltree	-	-	-	-	-	-
Oldham	-	-	-	-	-	-
Potter	-	2030	2040	-	-	-
Randall	-	2030	-	-	-	-
Roberts	-	-	-	-	-	-
Sherman	2010	-	-	-	-	-
Wheeler	-	-	-	-	-	-

Irrigation – The Panhandle Water Planning Group identifies irrigation shortages for Dallam, Hansford, Hartley, Hutchinson, Moore, and Sherman Counties. All of these counties rely heavily on the Ogallala for irrigation supplies. Shortages are observed in five counties starting in 2010. Projected irrigation shortages are shown in the table below

Table - Projected Irrigation Shortages (Values are in ac-ft /yr)

COUNTY	2010	2020	2030	2040	2050	2060
DALLAM	132,889	140,984	148,630	149,134	133,737	117,396
HANSFORD	150	1,005	1,484	4,548	3,077	1,640
HARTLEY	181,732	180,523	183,457	179,983	161,368	142,079
HUTCHINSON	15,008	12,175	11,652	10,612	7,534	5,455
MOORE	52,317	48,090	52,425	54,994	50,321	45,420
SHERMAN	72,532	69,367	79,690	82,955	77,118	69,190
TOTAL	454,628	452,144	477,338	482,226	433,155	381,180

Municipal - The Panhandle Water Planning Group identifies municipal supplies in GMA-1 as typically groundwater while surface water is used in counties with limited groundwater and by river authorities and their member cities to supply their customers. For some cities, there is additional groundwater supply but it is not fully developed. A list of the municipalities indicating a shortage is presented in the table below.

Table - Projected Municipal Shortages (Values are in ac-ft /yr)

	2010	2020	2030	2040	2050	2060
AMARILLO	0	0	4,097	9,042	14,065	18,337
BORGER	0	0	0	0	0	196
CACTUS	0	0	204	262	309	354
CANYON	0	422	1,245	1,903	2,452	2,859
COUNTY-OTHER MOORE	0	0	264	505	652	741
COUNTY-OTHER POTTER	0	103	329	885	1,574	2,139
COUNTY-OTHER RANDALL	0	5	597	1,273	2,009	2,619
DUMAS	0	387	1,163	1,672	2,219	2,478
GRUVER	0	77	229	282	333	334
LEFORS	0	0	0	29	35	36
MEMPHIS	0	81	140	140	140	142
SPEARMAN	0	0	276	611	831	849
SUNRAY	0	0	0	27	108	127
TOTAL	0	1,075	8,544	16,631	24,727	31,211

Manufacturing – The Panhandle Water Planning Group identifies three counties with manufacturing shortages identified in GMA-1. Most manufacturing interests buy water from

retail providers or develop their own groundwater supplies. For each of these counties, much of the shortage is associated with shortages associated with wholesale water providers. For Moore County, these shortages are the result of limited groundwater supplies for the city of Cactus. In Potter County, the shortages are associated with shortages identified with the city of Amarillo. In Hutchinson County the shortage is associated with the city of Borger.

Table - Projected Manufacturing Shortages (Values are in ac-ft /yr)

	2010	2020	2030	2040	2050	2060
HUTCHINSON	0	0	64	469	784	1,270
MOORE	173	800	1,033	1,396	1,718	2,067
POTTER	0	0	220	980	1,710	2,529
TOTAL	173	800	1,317	2,845	4,212	5,866

Mining - Panhandle Water Planning Group identified no mining shortages in GMA-1.

Steam Electric Power – Panhandle Water Planning Group identified one steam electric power shortage identified in Moore County. The shortage is projected to be less than 100 acre-feet per year beginning in 2010; by 2060 this shortage is projected to be approximately 150 acre-feet per year.

Panhandle Water Planning Group projects all of these shortages are expected to be met by increasing the supply coming from groundwater.

Livestock – Panhandle Water Planning Group projects that there are no identified livestock shortages in the Panhandle Planning Area. This is because it is assumed if there was sufficient supply available within the county, this supply would be developed by livestock producers. For most counties, water for livestock is from groundwater and/or local stock ponds. In the heavily pumped counties, there will be competition for groundwater supplies. It is assumed that the decrease in water used for irrigation will be available for livestock use.

The Panhandle Water Planning Group concludes, on a water user group basis, the total demands exceed the total developed supply starting in 2010, largely attributed to the geographical constraints of the demand centers and developed supplies. Most of the shortages are associated with large irrigation demands that cannot be met with groundwater sources beneath currently irrigated lands. Other shortages are due to limitations of infrastructure and/or growth. The evaluation of regional water supplies indicates that groundwater supplies could be further developed. However, often the needed infrastructure is not developed or the potential source is not located near a water supply shortage.

The Panhandle Water Planning Group recommended water management strategies in Chapter 4 of the 2011 Regional Water Plan including:

- Conservation,
- Developing new groundwater well fields in the Ogallala and Dockum aquifers,
- Purchasing water from wholesale providers as they develop new strategies, and

- Acquiring additional groundwater rights.

Conservation is an important strategy in the region, as it is the only recommended strategy for the large irrigation deficits projected for GMA-1. There are potential cumulative water savings of up to 29 million acre-feet over the planning period from these strategies for the region. For the counties with shortages, the recommended irrigation conservation water savings total 458,551 acre-feet per year by 2060. If realized, this represents a large percentage of the projected need in GMA-1.

Conservation alone cannot meet the entire irrigation shortage, or the other projected shortages. Continued reliance on groundwater from the Ogallala will be needed. Users will likely continue to acquire additional water rights and develop those rights as needed. Voluntary transfers of water are recommended, and will likely occur through natural economic changes in the region. In addition, opportunities for reuse in the PWPA will continue to be explored to meet manufacturing needs. Lists of the recommended and alternate strategies and the recipients are included in Attachment 4-1, in the 2011 Panhandle Regional Water Plan. Summaries by municipal water user are included in Attachment 4-2 in the 2011 Panhandle Regional Water Plan. A copy of the 2011 Panhandle Regional Water Plan and the 2012 State Water Plan will be included by reference in the explanatory report.

According to the State Water Plan, Approximately 2 percent of the state's total population resided in the Panhandle Region in the year 2010. Between 2010 and 2060, population is projected to increase 39 percent to 541,035. The region's total water demands, however, are projected to decrease, driven by a decline in agricultural irrigation, which is by far the largest water user in the region.

The region primarily relies upon groundwater supply sources, with approximately 88 percent of the existing water supply in the Panhandle Region coming from the Ogallala Aquifer. Other aquifers (Blaine, Dockum, Seymour, and Rita Blanca) provide approximately 7 percent of the total supply, and surface water contributes another 3 percent of supplies. Reuse contributes the remaining 2 percent of existing water supply in the planning area. Within the region, of the supplies available from the Ogallala Aquifer, 85 percent is used for irrigation purposes. Based on the region's adopted water management policy, annual water supplies for the region from the Ogallala Aquifer are projected to decline 37 percent by 2060.

The State Water Plan refers to the Panhandle Water Planning Group's "shortages" as "needs". In the event of drought, water needs occur across the region in all decades. The majority of the needs are in irrigation, with some other, smaller needs, primarily in municipal and manufacturing.

The Panhandle Planning Group recommended water management strategies focused on conservation and groundwater development. It also recommended connecting to the Palo Duro Reservoir. In all, the strategies would provide 648,221 acre-feet of additional water supply by the 2060 at a total capital cost of \$739 million. However, the Canadian River Municipal Water Authority will provide some of this water to customers in the Llano Estacado Region. Because there were no economically feasible strategies identified to meet their needs, up to six counties in the region have unmet irrigation needs across the planning horizon and 30,307 acre-feet of unmet irrigation needs in 2060.

The State Water Plan identifies that conservation strategies represent 86 percent of the total volume of water associated with all recommended strategies. Water conservation is

recommended for every municipal need and for all irrigation water user groups in the region. Irrigation conservation would be achieved through irrigation equipment improvements, conservation tillage practices, and the adoption of drought-resistant crop varieties.

Select major water management strategies in the State Water Plan include:

- Roberts County Well Field (City of Amarillo) would provide up to 22,420 acre-feet per year of groundwater in the year 2060 with a capital cost of \$287 million.
- Roberts County Well Field (Canadian River Municipal Water Authority) would provide 15,000 acre-feet per year of groundwater starting in 2030 with capital costs of \$22 million.
- Potter County Well Field would provide up to 11,182 acre-feet per year of groundwater starting in 2020 with a capital cost of \$129 million.
- Irrigation conservation would provide up to 552,385 acre-feet per year of water in 2060 with no capital cost.

Additional documentation used in this item is found in the reference folder under NEEDS AND STRATEGIES.

Discussion

1. In review of the information contained within this summary, what other information does the Joint Planning Committee wish to consider?

Notes:

2. This memo/summary is intended to help educate and facilitate discussion & joint planning among GMA#1 members at this time. It is not anticipated that this memo/summary will be acted upon in relationship to the Explanatory Report at this time.
3. Supporting documents related to this Factor will be included in a folder entitled with the Factor Number under the GMA#1 Shared Dropbox folder. These folders shall contain all factor related documents going forward.