

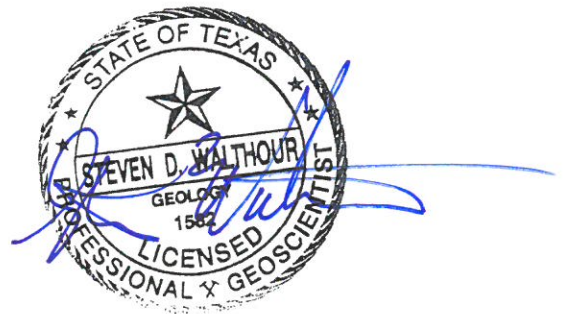
GROUNDWATER MANAGEMENT AREA 1:

MINOR AQUIFERS, OTHER AQUIFERS AND UNKNOWN AQUIFERS PUMPING FOR MUNICIPAL, MANUFACTURING, MINING, STEAM ELECTRIC POWER, IRRIGATION AND LIVESTOCK USES FOR 2004-2013 FROM THE TEXAS WATER DEVELOPMENT BOARD.

By

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February 23, 2016

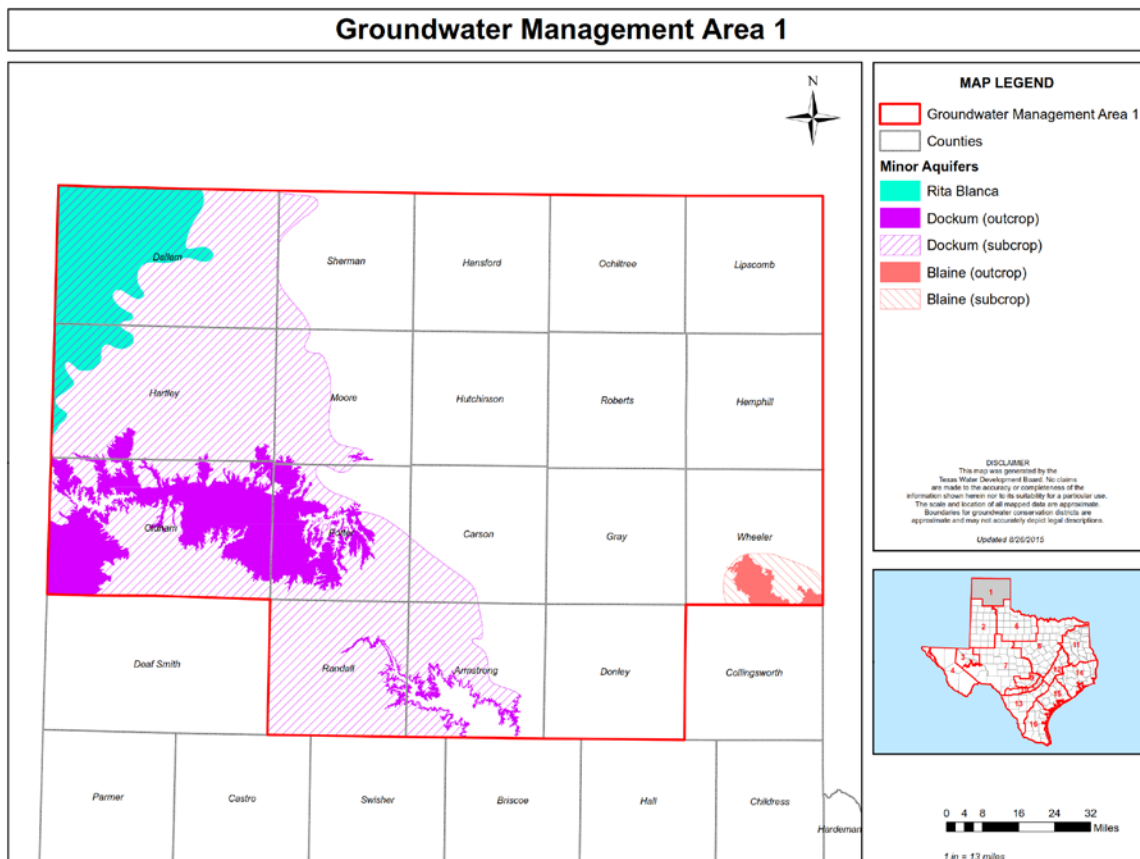


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GMA-1: MINOR AQUIFERS, OTHER AQUIFERS AND UNKNOWN AQUIFERS PUMPING FOR MUNICIPAL, MANUFACTURING, MINING, STEAM ELECTRIC POWER, IRRIGATION AND LIVESTOCK USES FOR 2004-2013 FROM THE TEXAS WATER DEVELOPMENT BOARD.

The Texas Water Development Board identifies the Blaine Aquifer, Dockum Aquifer, and Rita Blanca Aquifer as minor aquifers partially within Groundwater Management Area 1. The map below shows the location of these minor aquifers within the management area (TWDB, August 2015). Texas Water Code Sec. 36.108 requires that before voting on the proposed desired future conditions of the aquifers under Subsection 36.108(d)(1), the districts shall consider, among other things, aquifer uses or conditions within the management area, including conditions that differ substantially from one geographic area to another.



Texas Administrative Code Rule 356.10 defines the amount of groundwater being used on an annual basis as an estimate of the quantity of groundwater annually withdrawn or flowing from wells in an aquifer for at least the most recent five years that information is available. It may include an estimate of exempt uses.

Groundwater Uses

The 2012 State Water Plan (TWDB, 2012) defines users or groups of users for which water demands and water supplies have been identified and analyzed and plans developed to meet water needs. Water user groups are defined at the county level for the

manufacturing, irrigation, livestock, steam-electric power generation, and mining water use categories. Municipal water user groups include (a) incorporated cities and selected Census Designated Places with a population of 500 or more; (b) individual or groups of selected water utilities serving smaller municipalities or unincorporated areas; and (c) rural areas not included in a listed city or utility, aggregated for each county. According to the 2011 Panhandle Regional Water Plan, manufacturing water users are mostly associated with agribusiness or energy production (oil and gas) in the Panhandle Water Planning Area. In the area, mining water use primarily includes water used in mining activities associated with the oil and gas industry. Steam electric power use includes only water consumed during the power generation process (typically losses due to evaporation during cooling) for the purpose of selling electricity. Water use for power generation that is part of a manufacturing facility is included in the manufacturing use. Livestock water user groups include uses for beef cattle (cows, feedlot cattle, dairy cattle, and stockers on pasture winter or summer) and calves, poultry, sheep and lambs, and hogs and pigs. .

TWDB Database Compilation of Groundwater Pumped from 2004-2013.

As of February 21, 2016, the TWDB database makes available groundwater pumping estimates through 2013 for the counties in GMA-1. For the purposes of joint planning by the districts, ten years of groundwater pumping information for municipal, manufacturing, mining, steam electric power, irrigation and livestock uses from 2004 to 2013 are compiled by the author for this report. Though additional groundwater use and pumping information may be provided from other sources, the TWDB database provides consistent groundwater pumping and use estimates for all counties in GMA-1.

Blaine Aquifer

A very minor part of the Blaine Aquifer is located within Wheeler County, in the Panhandle Groundwater Conservation District. The table shows pumping from the Blaine Aquifer by use in GMA-1 from 2004 to 2013 (from TWDB, February 2016).

Blaine Aquifer Pumping by Use in GMA-1 2004-2013 (in acre-feet)							
Year	Total	Municipal	Manufact- uring	Mining	Steam Electric Power	Irrigation	Livestock
2004	1062	1	0	0	0	1044	17
2005	1435	2	0	0	0	1299	134
2006	1573	11	0	0	0	1353	209
2007	1667	9	0	0	0	1537	121
2008	1641	11	0	0	0	1514	116
2009	1559	13	0	0	0	1428	118
2010	1505	16	0	0	0	1391	98
2011	1786	18	0	0	0	1660	108
2012	2523	17	0	0	0	2407	99
2013	1776	12	0	0	0	1681	83

Rita Blanca Aquifer

Part of the Rita Blanca Aquifer is located in Dallam and Hartley Counties, in the North Plains Groundwater Conservation District. The TWDB database shows pumping from the aquifer only in Dallam County. The North Plains Groundwater District anticipates that significant pumping attributed to the Rita Blanca Aquifer is actually sourced from the Ogallala Aquifer or the Dockum Aquifer. The table below shows pumping from the Rita Blanca Aquifer in GMA-1 from 2004 to 2013 (from TWDB, February 2016).

Rita Blanca Aquifer Pumping by Use in GMA-1 2004-2013 (in acre-feet)							
Year	Total	Municipal	Manufacturing	Mining	Steam Electric Power	Irrigation	Livestock
2004	38196	178	0	0	0	36766	1252
2005	38393	166	0	0	0	37022	1205
2006	33270	155	0	0	0	31628	1487
2007	35127	143	0	0	0	33422	1562
2008	38676	144	0	0	0	37245	1287
2009	39574	182	0	0	0	38339	1053
2010	33694	38	0	0	0	33202	454
2011	45504	8	0	0	0	44967	529
2012	46360	8	0	0	0	45259	1093
2013	36833	6	0	0	0	35771	1056

Reported Pumping from Unknown or Other Aquifers

The TWDB database reports pumping within GMA-1 from unknown or other aquifers. The TWDB assigned pumping from these sources because the TWDB could not determine whether it was from one of the named aquifers or was pumped from another geologic formation. The table below shows reported pumping from unknown or other aquifers by use in GMA-1 from 2004 to 2013 (from TWDB, February 2016).

Total Pumping from Unknown or Other Aquifers by Use in GMA-1 2004-2013 (in acre-feet)							
Year	Total	Municipal	Manufacturing	Mining	Steam Electric Power	Irrigation	Livestock
2004	3830	6	0	0	0	3691	133
2005	5418	6	0	0	0	4513	899
2006	5784	131	0	0	0	4485	1168
2007	5953	107	0	0	0	4991	855
2008	8551	154	0	2434	0	5180	783
2009	8030	159	0	2300	0	4778	793
2010	7480	271	0	2163	0	4355	691
2011	11965	287	0	4950	0	5962	766
2012	12520	289	0	4032	0	7503	696
2013	9073	238	0	2579	0	5639	617

Dockum Aquifer

Part of the Dockum Aquifer is located in all or part of Dallam, Sherman, Hartley, Moore, Oldham, Potter, Carson, Randall, and Armstrong Counties, in the High Plains Underground Water Conservation District, the North Plains Groundwater Conservation District, the Panhandle Groundwater Conservation District and in outside of district jurisdictions. The table shows total pumping from the Dockum Aquifer by use in GMA-1 from 2004 to 2013 (from TWDB, February 2016).

Dockum Aquifer Pumping by Use in GMA-1 2004-2013 (in acre-feet)							
Year	Total	Municipal	Manufacturing	Mining	Steam Electric Power	Irrigation	Livestock
2004	4705	837	0	0	0	3007	861
2005	5554	876	0	0	0	3220	1458
2006	6510	1803	0	0	0	2257	2450
2007	5851	1434	0	0	0	2751	1666
2008	5335	1613	0	0	0	2343	1379
2009	5423	1800	0	0	0	2293	1330
2010	7174	4074	0	0	0	1770	1330
2011	7646	3228	0	0	0	2837	1581
2012	6787	2602	0	0	0	2579	1606
2013	6376	2469	0	0	0	2440	1467

The following table shows Dockum Aquifer pumping by county and by use in GMA-1 from 2004 to 2013 (TWDB, February 2016).

Dockum Aquifer Pumping By County and by Use in GMA-1 2004-2013 (in acre-feet)								
County	Year	Total	Municipal	Manufacturing	Mining	Steam Electric Power	Irrigation	Livestock
ARMSTRONG	2004	138	0	0	0	0	50	88
ARMSTRONG	2005	146	0	0	0	0	53	93
ARMSTRONG	2006	163	14	0	0	0	45	104
ARMSTRONG	2007	109	12	0	0	0	40	57
ARMSTRONG	2008	122	13	0	0	0	49	60
ARMSTRONG	2009	114	12	0	0	0	41	61
ARMSTRONG	2010	92	11	0	0	0	30	51
ARMSTRONG	2011	127	13	0	0	0	58	56
ARMSTRONG	2012	131	12	0	0	0	66	53
ARMSTRONG	2013	93	11	0	0	0	54	28
CARSON	2006	8	8	0	0	0	0	0
CARSON	2007	6	6	0	0	0	0	0
CARSON	2008	7	7	0	0	0	0	0
CARSON	2009	12	12	0	0	0	0	0

Cont. Dockum Aquifer Pumping By County and by Use in GMA-1 2004-2013 (in acre-feet)								
County	Year	Total	Municipal	Manufacturing	Mining	Steam Electric Power	Irrigation	Livestock
CARSON	2010	17	17	0	0	0	0	0
CARSON	2011	19	19	0	0	0	0	0
CARSON	2012	18	18	0	0	0	0	0
CARSON	2013	11	11	0	0	0	0	0
HARTLEY	2004	394	0	0	0	0	0	394
HARTLEY	2005	621	0	0	0	0	0	621
HARTLEY	2006	1054	19	0	0	0	0	1035
HARTLEY	2007	692	16	0	0	0	0	676
HARTLEY	2008	831	18	0	0	0	0	813
HARTLEY	2009	791	19	0	0	0	0	772
HARTLEY	2010	694	20	0	0	0	0	674
HARTLEY	2011	948	165	0	0	0	0	783
HARTLEY	2012	1003	154	0	0	0	0	849
HARTLEY	2013	982	146	0	0	0	0	836
MOORE	2004	2021	0	0	0	0	2021	0
MOORE	2005	2008	0	0	0	0	2008	0
MOORE	2006	1261	7	0	0	0	1254	0
MOORE	2007	1733	5	0	0	0	1728	0
MOORE	2008	1297	6	0	0	0	1291	0
MOORE	2009	1362	6	0	0	0	1356	0
MOORE	2010	1129	7	0	0	0	1122	0
MOORE	2011	1853	8	0	0	0	1845	0
MOORE	2012	1627	6	0	0	0	1621	0
MOORE	2013	1544	6	0	0	0	1538	0
OLDHAM	2004	736	419	0	0	0	243	74
OLDHAM	2005	1223	424	0	0	0	341	458
OLDHAM	2006	1497	368	0	0	0	370	759
OLDHAM	2007	1163	235	0	0	0	316	612
OLDHAM	2008	814	276	0	0	0	403	135
OLDHAM	2009	758	284	0	0	0	355	119
OLDHAM	2010	794	291	0	0	0	213	290
OLDHAM	2011	1056	388	0	0	0	310	358
OLDHAM	2012	959	321	0	0	0	292	346
OLDHAM	2013	961	347	0	0	0	304	310
POTTER	2004	566	414	0	0	0	151	1
POTTER	2005	626	448	0	0	0	169	9
POTTER	2006	1138	1000	0	0	0	129	9
POTTER	2007	1020	828	0	0	0	181	11
POTTER	2008	1022	922	0	0	0	95	5

Cont. Dockum Aquifer Pumping By County and by Use in GMA-1 2004-2013 (in acre-feet)								
County	Year	Total	Municipal	Manufacturing	Mining	Steam Electric Power	Irrigation	Livestock
POTTER	2009	1111	998	0	0	0	108	5
POTTER	2010	1131	1085	0	0	0	37	9
POTTER	2011	1011	928	0	0	0	73	10
POTTER	2012	1046	929	0	0	0	110	7
POTTER	2013	1020	888	0	0	0	126	6
RANDALL	2004	850	4	0	0	0	542	304
RANDALL	2005	930	4	0	0	0	649	277
RANDALL	2006	1389	387	0	0	0	459	543
RANDALL	2007	1128	332	0	0	0	486	310
RANDALL	2008	1242	371	0	0	0	505	366
RANDALL	2009	1275	469	0	0	0	433	373
RANDALL	2010	3317	2643	0	0	0	368	306
RANDALL	2011	2632	1707	0	0	0	551	374
RANDALL	2012	2003	1162	0	0	0	490	351
RANDALL	2013	1765	1060	0	0	0	418	287

Disclaimer

The data and maps provided in this document are compiled from TWDB sources that may be updated without notice.

References

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