Region D 2021 - North Easat Texas Regional Water Planning Group
Recommended Water Management Strategies by Source

Supply Source		County	Entity	Projected Deficit (-) / Recommendation (ac-ft/yr) by Decade						Strategy	Contingency	Seller (if applicable)	County	Basin	Reliability of Source
Groundwater	Surface Water			2020	2030	2040	2050	2060	2070						
BLOSSOM AQUIFER		RED RIVER	LIVESTOCK RED RIVER	10	11	10	11	10	11	DRILL NEW WELLS			RED RIVER	RED	HIGH
CARRIZO-WILCOX AQUIFER		BOWIE	IRRIGATION BOWIE	4,134	4,134	4,134	4,134	4,134	4,134	DRILL NEW WELLS			BOWIE	SULPHUR	HIGH
CARRIZO-WILCOX AQUIFER		BOWIE	LIVESTOCK BOWIE	417	417	378	325	278	260	DRILL NEW WELLS			BOWIE	SULPHUR	HIGH
CARRIZO-WILCOX AQUIFER		CASS	COUNTY-OTHER, CASS	323	323	323	323	323	323	DRILL NEW WELLS			CASS	CYPRESS	HIGH
CARRIZO-WILCOX AQUIFER		CASS	COUNTY-OTHER, CASS	216	216	216	216	216	216	DRILL NEW WELLS			CASS	SULPHUR	HIGH
CARRIZO-WILCOX AQUIFER		FRANKLIN	LIVESTOCK FRANKLIN	805	805	805	805	805	805	DRILL NEW WELLS			FRANKLIN	CYPRESS	HIGH
CARRIZO-WILCOX AQUIFER		FRANKLIN	LIVESTOCK FRANKLIN	1,129	1,129	1,129	1,129	1,129	1,129	DRILL NEW WELLS			FRANKLIN	SULPHUR	HIGH
CARRIZO-WILCOX AQUIFER		GREGG	MINING GREGG	27	27	27	27	27	27	DRILL NEW WELLS			GREGG	SABINE	HIGH
CARRIZO-WILCOX AQUIFER		HOPKINS	IRRIGATION HOPKINS	0	0	111	387	575	931	DRILL NEW WELLS			HOPKINS	SABINE	HIGH
CARRIZO-WILCOX AQUIFER		HOPKINS	IRRIGATION HOPKINS	4,627	4,627	4,516	4,240	4,052	3,696	DRILL NEW WELLS			HOPKINS	SULPHUR	HIGH
CARRIZO-WILCOX AQUIFER		HOPKINS	LIVESTOCK HOPKINS	1,068	1,090	1,140	1,143	1,196	1,219	DRILL NEW WELLS			HOPKINS	SULPHUR	HIGH
CARRIZO-WILCOX AQUIFER		HOPKINS	MILLER GROVE WSC	8	16	23	29	40	52	DRILL NEW WELLS			HOPKINS	SULPHUR	HIGH
CARRIZO-WILCOX AQUIFER		HOPKINS	MINING HOPKINS	227	283	360	444	533	639	DRILL NEW WELLS			HOPKINS	SULPHUR	HIGH
CARRIZO-WILCOX AQUIFER		SMITH	CRYSTAL SYSTEMS TEXAS	0	0	135	135	269	538	DRILL NEW WELLS			SMITH	SABINE	HIGH
CARRIZO-WILCOX AQUIFER		SMITH	CRYSTAL SYSTEMS TEXAS	0	0	134	134	269	538	DRILL NEW WELLS			SMITH	NECHES	HIGH
CARRIZO-WILCOX AQUIFER		SMITH	LINDALE	322	644	966	1,288	1,610	1,932	DRILL NEW WELLS			SMITH	SABINE	HIGH
CARRIZO-WILCOX AQUIFER		SMITH	STARRVILLE-FRIENDSHIP WSC	0	0	0	0	108	108	DRILL NEW WELLS			SMITH	SABINE	HIGH
CARRIZO-WILCOX AQUIFER		SMITH	WINONA	0	0	0	108	108	108	DRILL NEW WELLS			SMITH	SABINE	HIGH
CARRIZO-WILCOX AQUIFER		TITUS	LIVESTOCK TITUS	275	334	379	425	517	560	DRILL NEW WELLS			TITUS	CYPRESS	HIGH
CARRIZO-WILCOX AQUIFER		TITUS	LIVESTOCK TITUS	1,664	1,605	1,560	1,514	1,467	1,445	DRILL NEW WELLS			TITUS	SULPHUR	HIGH
CARRIZO-WILCOX AQUIFER		UPSHUR	GILMER	0	0	216	216	216	216	DRILL NEW WELLS			UPSHUR	CYPRESS	HIGH
CARRIZO-WILCOX AQUIFER		UPSHUR	MANUFACTURING UPSHUR	161	161	161	161	161	161	DRILL NEW WELLS			UPSHUR	CYPRESS	HIGH
CARRIZO-WILCOX AQUIFER		VAN ZANDT	CANTON	100	100	100	100	100	100	DRILL NEW WELLS			VAN ZANDT	SABINE	HIGH
CARRIZO-WILCOX AQUIFER		VAN ZANDT	EDOM WSC	13	21	27	37	49	64	DRILL NEW WELLS			VAN ZANDT	NECHES	HIGH
CARRIZO-WILCOX AQUIFER		VAN ZANDT	LITTLE HOPE MOORE WSC	0	0	0	3	11	17	DRILL NEW WELLS			VAN ZANDT	NECHES	HIGH
CARRIZO-WILCOX AQUIFER		VAN ZANDT	MANUFACTURING VAN ZANDT	242	504	504	356	238	143	DRILL NEW WELLS			VAN ZANDT	TRINITY	HIGH

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Supply Source		County	Entity	Projected Deficit (-) / Recommendation (ac-ft/yr) by Decade						Strategy	Contingency	Seller (if applicable)	County	Basin	Reliability of Source
Groundwater	Surface Water			2020	2030	2040	2050	2060	2070						
CARRIZO-WILCOX AQUIFER		VAN ZANDT	R P M WSC	0	34	79	131	175	217	DRILL NEW WELLS			VAN ZANDT	NECHES	HIGH
CARRIZO-WILCOX AQUIFER		VAN ZANDT	MANUFACTURING VAN ZANDT	0	0	0	0	0	72	INCREASE CONTRACT		GRAND SALINE	VAN ZANDT	SABINE	HIGH
CARRIZO-WILCOX AQUIFER		VAN ZANDT	MANUFACTURING VAN ZANDT	0	0	0	62	191	214	INCREASE CONTRACT		GOLDEN WSC	WOOD	SABINE	HIGH
NACATOCH AQUIFER		BOWIE	LIVESTOCK BOWIE	252	252	229	196	168	156	DRILL NEW WELLS			BOWIE	RED	HIGH
NACATOCH AQUIFER		DELTA	LIVESTOCK DELTA	262	250	250	250	250	250	DRILL NEW WELLS			DELTA	SULPHUR	HIGH
NACATOCH AQUIFER		HOPKINS	CUMBY	13	29	44	58	77	88	DRILL NEW WELLS			HOPKINS	SABINE	HIGH
NACATOCH AQUIFER		HUNT	IRRIGATION HUNT	230	230	230	230	230	230	DRILL NEW WELLS			HUNT	SABINE	HIGH
NACATOCH AQUIFER		HUNT	NORTH HUNT SUD	89	165	266	405	603	888	DRILL NEW WELLS			HUNT	SABINE	HIGH
NACATOCH AQUIFER		RED RIVER	IRRIGATION RED RIVER	2,057	2,057	2,057	2,057	2,057	2,057	DRILL NEW WELLS			RED RIVER	SULPHUR	HIGH
QUEEN CITY AQUIFER		CAMP	LIVESTOCK CAMP	3,962	3,962	3,962	3,962	3,962	3,962	DRILL NEW WELLS			CAMP	CYPRESS	HIGH
QUEEN CITY AQUIFER		CASS	LIVESTOCK CASS	968	968	968	968	968	968	DRILL NEW WELLS			CASS	CYPRESS	HIGH
QUEEN CITY AQUIFER		CASS	LIVESTOCK CASS	966	966	966	966	966	966	DRILL NEW WELLS			CASS	SULPHUR	HIGH
QUEEN CITY AQUIFER		HARRISON	IRRIGATION HARRISON	484	484	484	484	484	484	DRILL NEW WELLS			HARRISON	CYPRESS	HIGH
QUEEN CITY AQUIFER		HARRISON	IRRIGATION HARRISON	161	161	161	161	161	161	DRILL NEW WELLS			HARRISON	SABINE	HIGH
QUEEN CITY AQUIFER		HARRISON	LEIGH WSC	0	0	54	108	108	162	DRILL NEW WELLS			HARRISON	CYPRESS	HIGH
QUEEN CITY AQUIFER		HARRISON	MINING HARRISON	332	332	332	332	332	332	DRILL NEW WELLS			HARRISON	CYPRESS	HIGH
QUEEN CITY AQUIFER		HARRISON	MINING HARRISON	1,452	1,452	1,452	1,452	1,452	1,452	DRILL NEW WELLS			HARRISON	SABINE	HIGH
QUEEN CITY AQUIFER		HARRISON	NORTH HARRISON WSC	0	0	0	0	54	54	DRILL NEW WELLS			HARRISON	CYPRESS	HIGH
QUEEN CITY AQUIFER		HARRISON	PANOLA-BETHANY WSC	0	54	108	216	270	324	DRILL NEW WELLS			HARRISON	SABINE	HIGH
QUEEN CITY AQUIFER		HARRISON	SCOTTSVILLE	54	54	108	108	162	162	DRILL NEW WELLS			HARRISON	CYPRESS	HIGH
QUEEN CITY AQUIFER		HARRISON	WASKOM	108	162	162	216	270	324	DRILL NEW WELLS			HARRISON	CYPRESS	HIGH
QUEEN CITY AQUIFER		MARION	MINING MARION	432	645	654	654	654	654	DRILL NEW WELLS			MARION	CYPRESS	HIGH
QUEEN CITY AQUIFER		MORRIS	LIVESTOCK MORRIS	483	483	483	483	483	483	DRILL NEW WELLS			MORRIS	SULPHUR	HIGH
QUEEN CITY AQUIFER		MORRIS	LIVESTOCK MORRIS	644	644	644	644	644	644	DRILL NEW WELLS			MORRIS	CYPRESS	HIGH
QUEEN CITY AQUIFER		SMITH	SMITH COUNTY MUD 1	0	0	108	216	432	648	DRILL NEW WELLS			SMITH	SABINE	HIGH
QUEEN CITY AQUIFER		SMITH	STAR MOUNTAIN WSC	108	108	108	108	216	216	DRILL NEW WELLS			SMITH	SABINE	HIGH
QUEEN CITY AQUIFER		UPSHUR	LIVESTOCK UPSHUR	161	161	161	161	161	161	DRILL NEW WELLS			UPSHUR	CYPRESS	HIGH

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Supply Source		County	Entity	Projected Deficit (-) / Recommendation (ac-ft/yr) by Decade						Strategy	Contingency	Seller (if applicable)	County	Basin	Reliability of Source
Groundwater	Surface Water			2020	2030	2040	2050	2060	2070						
QUEEN CITY AQUIFER		UPSHUR	LIVESTOCK UPSHUR	161	161	161	161	161	161	DRILL NEW WELLS			UPSHUR	SABINE	HIGH
QUEEN CITY AQUIFER		VAN ZANDT	IRRIGATION VAN ZANDT	43	61	63	64	66	68	DRILL NEW WELLS			VAN ZANDT	NECHES	HIGH
QUEEN CITY AQUIFER		WOOD	LIVESTOCK WOOD	1,129	1,129	1,129	1,129	1,129	1,129	DRILL NEW WELLS			WOOD	SABINE	HIGH
QUEEN CITY AQUIFER		WOOD	MANUFACTURING WOOD	1,129	1,610	1,610	1,610	1,610	1,610	DRILL NEW WELLS			WOOD	SABINE	HIGH
TRINITY AQUIFER		HUNT	LIVESTOCK HUNT	2	2	2	2	2	2	DRILL NEW WELLS			HUNT	SABINE	HIGH
TRINITY AQUIFER		HUNT	MINING HUNT	73	64	35	19	7	0	DRILL NEW WELLS			HUNT	SABINE	HIGH
TRINITY AQUIFER		RED RIVER	LIVESTOCK RED RIVER	174	173	174	173	174	173	DRILL NEW WELLS			RED RIVER	SULPHUR	HIGH
WOODBINE AQUIFER		HUNT	CELESTE	29	52	86	136	209	229	DRILL NEW WELLS			HUNT	TRINITY	HIGH
	BOB SANDLIN LAKE /RESERVOIR	TITUS	MANUFACTURING TITUS	0	1,003	880	890	1,149	1,279	RENEW AND INCREASE CONTRACT		MOUNT PLEASANT	RESERVOIR	CYPRESS	HIGH
	BOB SANDLIN LAKE /RESERVOIR	TITUS	STEAM-ELECTRIC POWER GENERATION TITUS	5,451	6,119	5,860	5,816	4,968	4,272	INCREASE CONTRACT		NETMWD	RESERVOIR	CYPRESS	HIGH
	CHAPMAN /COOPER LAKE / RESERVOIR NON-SYSTEM PORTION	HOPKINS	MARTIN SPRINGS WSC	0	0	0	0	0	29	INCREASE CONTRACT		SULPHUR SPRINGS	RESERVOIR	SULPHUR	HIGH
	LAKE O' THE PINES /RESERVOIR	CASS	HOLLY SPRINGS WSC	80	80	80	80	80	80	INCREASE CONTRACT		NETMWD	RESERVOIR	CYPRESS	HIGH
	LAKE O' THE PINES /RESERVOIR	HARRISON, MARION	HARLETON WSC	62	74	91	127	173	230	INCREASE CONTRACT		NETMWD	RESERVOIR	CYPRESS	HIGH
	LAKE O' THE PINES /RESERVOIR	TITUS	STEAM-ELECTRIC POWER GENERATION TITUS	24,615	24,747	25,906	26,750	27,846	28,811	INCREASE CONTRACT		NETMWD	RESERVOIR	CYPRESS	HIGH
	LOCAL SUPPLY	MORRIS	LIVESTOCK MORRIS	60	60	60	60	60	60	LIVESTOCK LOCAL SUPPLY			MORRIS	SULPHUR	HIGH
	LOCAL SUPPLY	WOOD	LIVESTOCK WOOD	34	34	34	34	34	34	LIVESTOCK LOCAL SUPPLY			WOOD	SABINE	HIGH
	NTMWD SYSTEM	HUNT	B H P WSC	2	71	124	208	331	502	INCREASE CONTRACT	REGION C NTMWD WMS	ROYSE CITY	RESERVOIR	TRINITY	HIGH
	NTMWD SYSTEM	HUNT	CADDO BASIN SUD	5	216	402	715	1,190	1,848	INCREASE CONTRACT	REGION C NTMWD WMS	NTMWD	RESERVOIR	TRINITY	HIGH
	NTMWD SYSTEM	HUNT	CASH SUD	0	0	457	711	881	355	INCREASE CONTRACT	REGION C NTMWD WMS	NTMWD	RESERVOIR	TRINITY	HIGH
	NTMWD SYSTEM	HUNT	POETRY WSC	0	64	114	197	326	503	INCREASE CONTRACT	REGION C TERRELL INCREASE CONTRACT & REGION C NTMWD WMS	TERRELL	RESERVOIR	TRINITY	HIGH
	PAT MAYSE LAKE /RESERVOIR	LAMAR	COUNTY-OTHER, LAMAR	204	204	212	224	234	244	INCREASE CONTRACT		LAMAR COUNTY WSD	RESERVOIR	RED	HIGH
	PAT MAYSE LAKE /RESERVOIR	LAMAR	IRRIGATION LAMAR	1,468	1,468	1,468	1,468	1,468	1,468	PAT MAYSE RAW WATER PIPELINE		PARIS	RESERVOIR	RED	HIGH
	PAT MAYSE LAKE /RESERVOIR	LAMAR	LIVESTOCK LAMAR	617	617	617	617	617	617	LIVESTOCK WATER PIPELINE		LAMAR COUNTY WSD	LAMAR	RED	HIGH
	SULPHUR SPRINGS LAKE /RESERVOIR	HOPKINS	BRINKER WSC	0	0	0	12	47	83	INCREASE CONTRACT		SULPHUR SPRINGS	RESERVOIR	SULPHUR	HIGH

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Supply Source		County	Entity	Projected Deficit (-) / Recommendation (ac-ft/yr) by Decade						Strategy	Contingency	Seller (if applicable)	County	Basin	Reliability of Source
Groundwater	Surface Water			2020	2030	2040	2050	2060	2070						
	TAWAKONI LAKE / RESERVOIR	HUNT	CADDO MILLS	0	1	36	68	108	254	INCREASE CONTRACT	GREENVILLE WMSPS	GREENVILLE	RESERVOIR	SULPHUR, SABINE	HIGH
	TAWAKONI LAKE / RESERVOIR	HUNT	CELESTE	0	0	0	0	0	87	TREATED PIPELINE AND NEW CONTRACT	GREENVILLE WMSPS	GREENVILLE	RESERVOIR	SABINE, SULPHUR	HIGH
	TAWAKONI LAKE / RESERVOIR	HUNT	COUNTY-OTHER, HUNT	0	0	166	703	1,817	3,834	INCREASE CONTRACT	GREENVILLE WMSPS	GREENVILLE	RESERVOIR	SABINE, SULPHUR	HIGH
	TAWAKONI LAKE /RESERVOIR	HUNT	GREENVILLE	0	0	0	0	0	455	VOLUNTARY REALLOCATION (HUNT MANUFACTURING)			RESERVOIR	SABINE	HIGH
	TAWAKONI LAKE / RESERVOIR	HUNT	GREENVILLE	0	9,335	9,335	9,335	9,335	9,335	WTP EXPANSION (15 MGD)	ADVANCED CONSERVATION		RESERVOIR	SABINE	HIGH
	TAWAKONI LAKE / RESERVOIR	HUNT	GREENVILLE	0	0	0	0	0	9,335	NEW WTP (15 MGD)	ADVANCED CONSERVATION		RESERVOIR	SABINE, SULPHUR	HIGH
	TAWAKONI LAKE / RESERVOIR	HUNT	HICKORY CREEK SUD	96	273	519	866	1,366	2,095	GREENVILLE TIE-IN PIPELINE	GREENVILLE WMSPS	GREENVILLE	HUNT	SABINE, SULPHUR	HIGH
	TAWAKONI LAKE / RESERVOIR	HUNT	WOLFE CITY	0	0	0	54	157	308	GREENVILLE TIE-IN PIPELINE	GREENVILLE WMSPS	GREENVILLE	HUNT	SABINE, SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	RIVERBEND WATER RESOURCES DISTRICT	13,810	73,099	80,081	88,793	97,520	115,820	RIVERBEND WMS			RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	RIVERBEND WATER RESOURCES DISTRICT	0	1,370	1,423	1,496	1,493	1,493	NEW 2.5 MGD PACKAGE WTP AND TRANSMISSION LINE	RIVERBEND WMS		RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	BURNS REDBANK WSC	201	199	196	194	193	193	RENEW EXISTING CONTRACT	RIVERBEND WMS	CITY OF HOOKS	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	CENTRAL BOWIE COUNTY WSC	619	639	708	784	869	962	RENEW EXISTING CONTRACT	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	DE KALB	295	292	289	291	294	298	RENEW EXISTING CONTRACT	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	HOOKS	281	278	276	271	269	269	RENEW EXISTING CONTRACT	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	MACEDONIA EYLAU MUD 1	588	598	601	601	601	601	RENEW EXISTING CONTRACT	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	MANUFACTURING BOWIE	789	59,724	66,305	74,531	82,757	100,609	RENEW EXISTING CONTRACT	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	MAUD	211	226	241	238	237	237	RENEW EXISTING CONTRACT	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	NASH	392	458	523	589	589	589	RENEW EXISTING CONTRACT	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	NEW BOSTON	1,390	1,399	1,385	1,381	1,379	1,379	RENEW EXISTING CONTRACT	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	REDWATER	440	487	535	588	616	616	RENEW EXISTING CONTRACT	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	TEXARKANA	7,145	7,282	7,459	7,706	8,028	8,380	RENEW EXISTING CONTRACT	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	BOWIE	WAKE VILLAGE	699	750	802	861	932	931	RENEW EXISTING CONTRACT	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH

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Groundwater	Surface Water			2020	2030	2040	2050	2060	2070						
	WRIGHT PATMAN LAKE /RESERVOIR	CASS	MANUFACTURING CASS	0	1,075	1,135	1,209	1,206	1,206	VOLUNTARY REALLOCATION (ATLANTA)	NEW 2.5 MGD PACKAGE WTP AND TRANSMISSION LINE, RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	CASS	ATLANTA	0	1,075	1,135	1,209	1,206	1,206	RENEW EXISTING CONTRACT	NEW 2.5 MGD PACKAGE WTP AND TRANSMISSION LINE, RIVERBEND WMS, AND VOLUNTARY REALLOCATION (CASS MANUFACTURING)	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	CASS	MANUFACTURING CASS	0	44	44	44	44	44	VOLUNTARY REALLOCATION (COUNTY-OTHER, CASS)	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	CASS	COUNTY-OTHER, CASS	0	44	44	44	44	44	RENEW EXISTING CONTRACT	NEW 2.5 MGD PACKAGE WTP AND TRANSMISSION LINE, RIVERBEND WMS, AND VOLUNTARY REALLOCATION (CASS MANUFACTURING)	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	WRIGHT PATMAN LAKE /RESERVOIR	RED RIVER	CLARKSVILLE	237	231	222	221	219	219	CONTRACT WITH RIVERBEND WRD AND TREATED WATER PIPELINE TO DEKALB	RIVERBEND WMS	RIVERBEND WATER RESOURCES DISTRICT	RESERVOIR	SULPHUR	HIGH
	INDIRECT REUSE	VAN ZANDT	CANTON	323	323	323	323	323	323	INDIRECT REUSE			VAN ZANDT	SABINE	HIGH
		BOWIE	MANUFACTURING BOWIE	161	204	204	204	204	204	ADVANCED WATER CONSERVATION					HIGH
		HUNT	B H P WSC	0	1	1	1	2	3	ADVANCED WATER CONSERVATION					HIGH
		HUNT	CADDO BASIN SUD	2	4	4	7	12	18	ADVANCED WATER CONSERVATION					HIGH
		HUNT	CASH SUD	5	7	9	11	14	18	ADVANCED WATER CONSERVATION					HIGH
		HUNT	GREENVILLE	4,051	4,486	5,140	6,124	7,593	9,741	ADVANCED WATER CONSERVATION					HIGH
		HUNT	POETRY WSC	1	2	1	3	4	7	ADVANCED WATER CONSERVATION					HIGH
		TITUS	MANUFACTURING TITUS	0	415	415	415	415	415	ADVANCED WATER CONSERVATION					HIGH
		VAN ZANDT	MANUFACTURING VAN ZANDT	0	75	75	75	75	75	ADVANCED WATER CONSERVATION					HIGH

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Region D Water User Group (WUG) Management Supply Factor

WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. To calculate the Management Supply Factor for each WUG as a whole, not split by region-county-basin, the combined total of existing and future supply is divided by the total projected demand. If a WUG is split by more than one planning region, the whole WUG's management supply factor will show up in each of its planning region's management supply factor reports.

	WUG MANAGEMENT SUPPLY FACTOR					
WUG NAME	2020	2030	2040	2050	2060	2070
410 WSC	1.0	1.0	1.0	1.0	1.0	1.0
ABLES SPRINGS WSC*	1.0	1.0	1.0	1.0	1.0	1.0
ALGONQUIN WATER RESOURCES OF TEXAS*	3.5	3.1	2.8	2.6	2.3	2.1
ATLANTA	1.0	1.0	1.0	1.0	1.0	1.0
B H P WSC*	1.0	1.0	1.0	1.0	1.0	1.0
BEN WHEELER WSC*	1.9	1.9	1.8	1.7	1.7	1.6
BETHEL ASH WSC*	1.9	1.7	1.5	1.4	1.3	1.2
BI COUNTY WSC	1.6	1.4	1.3	1.2	1.1	1.0
BIG SANDY	1.3	1.3	1.2	1.2	1.1	1.1
BLACKLAND WSC*	1.0	1.0	1.0	1.0	1.0	1.0
BLOCKER CROSSROADS WSC	1.6	1.6	1.5	1.4	1.3	1.2
BLOSSOM	1.6	1.7	1.9	1.9	1.8	1.8
BOGATA	4.1	4.4	4.5	4.6	4.6	4.6
BRASHEAR WSC	1.0	1.0	1.0	1.0	1.0	1.0
BRIGHT STAR SALEM SUD	2.9	4.1	4.3	4.2	4.2	4.1
BRINKER WSC	1.3	1.2	1.1	1.0	1.0	1.0
BURNS REDBANK WSC	1.0	1.0	1.0	1.0	1.0	1.0
CADDO BASIN SUD*	1.0	1.0	1.0	1.0	1.0	1.0
CADDO MILLS	1.2	1.0	1.0	1.0	1.0	1.0
CANTON	2.1	2.0	1.9	1.8	1.7	1.6
CARROLL WSC*	1.0	1.0	1.0	1.0	1.0	1.0
CASH SUD*	1.2	1.1	1.0	1.0	1.0	1.1
CELESTE	1.0	1.0	1.0	1.0	1.0	1.0
CENTRAL BOWIE COUNTY WSC	1.0	1.0	1.0	1.0	1.0	1.0
CLARKSVILLE	1.1	1.1	1.1	1.1	1.1	1.1
CLARKSVILLE CITY	2.5	2.3	2.2	2.0	1.8	1.7
COMBINED CONSUMERS SUD	1.0	1.0	1.0	1.0	1.0	1.0
COMMERCE	1.2	3.1	2.8	2.2	1.2	1.1
COOPER	2.2	2.2	2.3	2.3	2.3	2.3
CORNERSVILLE WSC	2.0	1.9	1.8	1.7	1.6	1.5
COUNTY-OTHER, BOWIE	2.2	2.8	4.5	4.4	4.4	4.4
COUNTY-OTHER, CAMP	2.5	2.8	3.0	3.3	3.6	4.0
COUNTY-OTHER, CASS	1.1	1.2	1.3	1.4	1.4	1.4
COUNTY-OTHER, DELTA	2.4	2.2	2.2	2.3	2.3	2.4
COUNTY-OTHER, FRANKLIN	2.0	2.0	2.1	2.0	2.0	2.0
COUNTY-OTHER, GREGG	2.2	3.1	3.1	3.1	3.1	2.8
COUNTY-OTHER, HARRISON	2.6	2.6	2.6	2.6	2.5	2.3
COUNTY-OTHER, HOPKINS	7.6	9.3	10.9	9.5	10.5	10.0
COUNTY-OTHER, HUNT	2.1	1.3	1.0	1.0	1.0	1.0
COUNTY-OTHER, LAMAR	1.0	1.0	1.0	1.0	1.0	1.0
COUNTY-OTHER, MARION	17.7	18.7	20.0	22.0	24.7	28.8
COUNTY-OTHER, MORRIS	1.5	1.6	1.6	1.5	1.5	1.5
COUNTY-OTHER, RAINS	5.3	5.5	5.9	6.0	6.4	6.7
COUNTY-OTHER, RED RIVER	1.0	1.5	2.5	3.3	4.1	20.1

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Region D Water User Group (WUG) Management Supply Factor

	WUG MANAGEMENT SUPPLY FACTOR					
WUG NAME	2020	2030	2040	2050	2060	2070
COUNTY-OTHER, SMITH*	1.4	1.3	1.3	1.3	1.3	1.3
COUNTY-OTHER, TITUS	3.3	1.8	1.7	1.6	1.4	1.3
COUNTY-OTHER, UPSHUR	2.6	2.6	2.6	2.5	2.4	2.3
COUNTY-OTHER, VAN ZANDT	2.5	2.5	2.4	2.3	2.4	2.3
COUNTY-OTHER, WOOD	15.3	15.7	16.5	17.2	18.4	20.1
CROSS ROADS SUD*	2.5	2.5	2.4	2.3	2.2	2.1
CRYSTAL SYSTEMS TEXAS*	1.4	1.3	1.4	1.3	1.3	1.4
CUMBY	1.0	1.0	1.0	1.0	1.0	1.0
CYPRESS SPRINGS SUD	5.5	5.3	5.1	4.9	4.6	4.3
DAINGERFIELD	3.4	3.4	3.4	3.4	3.3	3.2
DE KALB	1.0	1.0	1.0	1.0	1.0	1.0
DELTA COUNTY MUD*	1.0	1.0	1.0	1.0	1.0	1.0
DIANA SUD	2.6	2.5	2.5	2.4	2.3	2.2
E M C WSC	1.4	1.4	1.4	1.4	1.4	1.4
EAST MOUNTAIN WATER SYSTEM	1.5	1.4	1.4	1.3	1.3	1.2
EAST TAWAKONI	1.0	1.0	1.0	1.0	1.0	1.0
EASTERN CASS WSC	3.8	3.9	4.0	4.1	4.2	4.2
EDGEWOOD	1.6	1.6	1.5	1.5	1.5	1.5
EDOM WSC*	1.0	1.0	1.0	1.0	1.0	1.0
ELDERVILLE WSC*	2.1	1.9	1.8	1.6	1.4	1.3
EMORY	1.0	1.0	1.0	1.0	1.0	1.0
FOUKE WSC	1.3	1.3	1.3	1.3	1.3	1.3
FROGNOT WSC*	2.1	1.9	1.6	1.3	1.1	1.0
FRUITVALE WSC	1.6	1.5	1.5	1.4	1.4	1.3
GAFFORD CHAPEL WSC	1.5	1.5	1.5	1.5	1.4	1.4
GILL WSC*	1.7	1.7	1.6	1.6	1.5	1.4
GILMER	1.1	1.0	1.2	1.1	1.1	1.0
GLADEWATER	1.3	1.3	1.2	1.1	1.0	1.0
GLENWOOD WSC	1.2	1.2	1.2	1.1	1.1	1.0
GOLDEN WSC	1.8	1.8	1.9	1.6	1.1	1.0
GRAND SALINE	1.7	1.7	1.7	1.6	1.5	1.3
GREENVILLE	1.1	1.0	1.0	1.0	1.0	1.0
GUM SPRINGS WSC	4.4	4.3	4.1	3.9	3.6	3.2
HALLSVILLE	1.5	1.4	1.4	1.3	1.2	1.1
HARLETON WSC	1.0	1.0	1.0	1.0	1.0	1.0
HAWKINS	3.0	2.9	2.9	2.9	2.8	2.8
HICKORY CREEK SUD*	1.0	1.0	1.0	1.0	1.0	1.0
HOLLY SPRINGS WSC	1.0	1.1	1.1	1.1	1.1	1.1
HOOKS	1.0	1.0	1.0	1.0	1.0	1.0
HUGHES SPRINGS	2.0	2.1	2.2	2.2	2.2	2.2
IRRIGATION, BOWIE	1.1	1.1	1.1	1.1	1.1	1.1
IRRIGATION, DELTA	3.8	3.8	3.8	3.8	3.8	3.8
IRRIGATION, FRANKLIN	3.0	3.0	3.0	3.0	3.0	3.0
IRRIGATION, GREGG	4.8	4.8	4.8	4.8	4.8	4.8
IRRIGATION, HARRISON	1.2	1.2	1.2	1.2	1.2	1.2
IRRIGATION, HOPKINS	1.0	1.0	1.0	1.0	1.0	1.0
IRRIGATION, HUNT	1.0	1.0	1.0	1.0	1.0	1.0
IRRIGATION, LAMAR	1.0	1.0	1.0	1.0	1.0	1.0

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Region D Water User Group (WUG) Management Supply Factor

	WUG MANAGEMENT SUPPLY FACTOR					
WUG NAME	2020	2030	2040	2050	2060	2070
IRRIGATION, MARION	26.8	26.8	26.8	26.8	26.8	26.8
IRRIGATION, MORRIS	6.4	6.4	6.4	6.4	6.4	6.4
IRRIGATION, RAINS	3.2	3.2	3.2	3.2	3.2	3.2
IRRIGATION, RED RIVER	1.2	1.2	1.2	1.2	1.2	1.2
IRRIGATION, SMITH*	1.6	1.6	1.6	1.6	1.6	1.6
IRRIGATION, TITUS	1.4	1.4	1.4	1.4	1.4	1.4
IRRIGATION, UPSHUR	4.2	4.2	4.2	4.2	4.2	4.2
IRRIGATION, VAN ZANDT	1.4	1.3	1.3	1.3	1.3	1.3
IRRIGATION, WOOD	2.8	2.8	2.8	2.8	2.8	2.8
JACKSON WSC*	1.0	2.9	2.8	2.6	2.5	2.3
JEFFERSON	3.9	4.0	4.1	4.1	4.1	4.1
JONES WSC	2.1	2.1	2.1	2.1	2.1	2.1
JOSEPHINE*	1.0	1.0	1.0	1.0	1.0	1.0
KELLYVILLE-BEREA WSC	1.4	1.5	1.5	1.6	1.6	1.6
KILGORE*	1.1	2.0	1.8	1.6	1.5	1.4
LAKE FORK WSC	3.0	3.0	3.1	3.1	3.0	3.0
LAMAR COUNTY WSD	3.6	3.6	3.5	3.4	3.3	3.3
LEIGH WSC	1.1	1.0	1.1	1.1	1.0	1.0
LIBERTY CITY WSC	1.8	1.7	1.6	1.5	1.3	1.2
LINDALE RURAL WSC*	2.2	2.1	1.9	1.8	1.6	1.4
LINDALE*	1.2	1.3	1.3	1.4	1.4	1.3
LINDEN	1.5	1.5	1.6	1.6	1.6	1.6
LITTLE HOPE MOORE WSC	1.1	1.1	1.0	1.0	1.0	1.0
LIVESTOCK, BOWIE	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, CAMP	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, CASS	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, DELTA	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, FRANKLIN	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, GREGG	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, HARRISON	1.5	1.6	1.6	1.6	1.6	1.6
LIVESTOCK, HOPKINS	1.1	1.1	1.1	1.1	1.1	1.1
LIVESTOCK, HUNT	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, LAMAR	1.5	1.5	1.5	1.5	1.5	1.5
LIVESTOCK, MARION	2.2	2.2	2.2	2.2	2.2	2.2
LIVESTOCK, MORRIS	1.1	1.1	1.1	1.1	1.1	1.1
LIVESTOCK, RAINS	1.2	1.2	1.2	1.2	1.2	1.2
LIVESTOCK, RED RIVER	1.1	1.1	1.1	1.1	1.1	1.1
LIVESTOCK, SMITH*	1.5	1.5	1.5	1.5	1.5	1.5
LIVESTOCK, TITUS	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, UPSHUR	1.1	1.1	1.1	1.1	1.1	1.1
LIVESTOCK, VAN ZANDT	1.6	1.6	1.6	1.6	1.5	1.5
LIVESTOCK, WOOD	1.0	1.0	1.0	1.0	1.0	1.0
LONE STAR	4.0	4.1	4.1	4.1	4.0	3.9
LONGVIEW	1.8	2.0	1.8	1.7	1.5	1.4
MABANK*	1.0	1.0	1.0	1.0	1.0	1.0
MACBEE SUD*	1.2	1.1	1.1	1.1	1.1	1.1
MACEDONIA EYLAU MUD 1	1.0	1.0	1.0	1.0	1.0	1.0
MANUFACTURING, BOWIE	0.6	29.3	32.5	36.5	40.5	49.3

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Region D Water User Group (WUG) Management Supply Factor

	WUG MANAGEMENT SUPPLY FACTOR					
WUG NAME	2020	2030	2040	2050	2060	2070
MANUFACTURING, CAMP	2.9	2.0	2.0	2.0	2.0	2.0
MANUFACTURING, CASS	1.0	1.0	1.0	1.0	1.0	1.0
MANUFACTURING, FRANKLIN	1.4	1.0	1.0	1.0	1.0	1.0
MANUFACTURING, GREGG	1.3	1.0	1.0	1.0	1.0	1.0
MANUFACTURING, HARRISON	4.4	3.9	3.9	3.9	3.9	3.9
MANUFACTURING, HOPKINS	1.8	1.9	2.0	2.1	2.2	2.4
MANUFACTURING, HUNT	2.0	1.9	2.2	2.4	2.6	2.2
MANUFACTURING, LAMAR	1.2	1.2	1.3	1.3	1.4	1.5
MANUFACTURING, MORRIS	4.7	4.5	4.3	4.4	4.7	4.5
MANUFACTURING, RAINS	1.0	1.0	1.0	1.0	1.0	1.0
MANUFACTURING, RED RIVER	2,842.3	2,842.3	2,840.0	2,840.0	2,840.0	2,840.0
MANUFACTURING, SMITH*	1.0	1.0	1.0	1.0	1.0	1.0
MANUFACTURING, TITUS	1.3	1.0	1.0	1.0	1.0	1.0
MANUFACTURING, UPSHUR	2.4	2.2	2.2	2.2	2.2	2.2
MANUFACTURING, VAN ZANDT	1.1	1.1	1.1	1.0	1.0	1.0
MANUFACTURING, WOOD	1.0	1.0	1.0	1.0	1.0	1.0
MARSHALL	2.8	2.6	2.5	2.3	2.1	1.9
MARTIN SPRINGS WSC	1.6	1.4	1.3	1.2	1.0	1.0
MAUD	1.0	1.0	1.0	1.0	1.0	1.0
MILLER GROVE WSC	1.0	1.0	1.0	1.0	1.0	1.0
MIMS WSC	7.0	7.0	7.0	7.0	7.0	7.0
MINEOLA	1.6	1.6	1.6	1.6	1.6	1.5
MINING, CAMP	1.9	2.1	2.3	2.6	2.9	3.3
MINING, CASS	21.5	14.9	14.7	20.1	30.9	47.6
MINING, FRANKLIN	208.0	203.2	248.5	243.5	318.0	477.0
MINING, GREGG	1.1	1.0	1.0	1.0	1.1	1.1
MINING, HARRISON	1.0	1.2	1.5	1.9	2.4	3.1
MINING, HOPKINS	1.0	1.0	1.0	1.0	1.0	1.0
MINING, HUNT	1.0	1.0	1.0	1.0	1.0	1.1
MINING, MARION	1.1	1.0	1.1	1.3	1.6	2.0
MINING, RED RIVER	1.0	1.0	1.0	1.0	1.0	1.0
MINING, SMITH*	1.6	1.6	1.6	1.5	1.5	1.5
MINING, TITUS	2.8	2.7	2.6	2.6	2.3	2.0
MINING, UPSHUR	1.3	1.1	1.1	1.2	1.2	1.3
MINING, VAN ZANDT	11.1	10.9	10.3	9.7	9.2	8.8
MINING, WOOD	12.4	12.5	13.8	15.3	16.2	17.3
MOUNT PLEASANT	4.6	3.8	3.4	3.0	2.6	2.3
MOUNT VERNON	5.3	5.0	4.8	4.5	4.3	4.0
MYRTLE SPRINGS WSC	1.7	1.6	1.6	1.5	1.4	1.3
NAPLES	1.5	1.5	1.5	1.5	1.5	1.4
NASH	1.0	1.0	1.0	1.0	1.0	1.0
NEW BOSTON	1.0	1.0	1.0	1.0	1.0	1.0
NEW HOPE SUD	1.1	1.1	1.1	1.1	1.1	1.1
NORTH HARRISON WSC	1.1	1.1	1.1	1.0	1.2	1.1
NORTH HOPKINS WSC	1.9	1.9	1.8	1.7	1.5	1.4
NORTH HUNT SUD*	1.0	1.0	1.0	1.0	1.0	1.0
OMAHA	1.4	1.4	1.4	1.4	1.3	1.3
ORE CITY	11.1	10.7	10.3	9.9	9.4	9.0

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Region D Water User Group (WUG) Management Supply Factor

	WUG MANAGEMENT SUPPLY FACTOR					
WUG NAME	2020	2030	2040	2050	2060	2070
OVERTON*	1.0	1.0	1.0	1.0	1.0	1.0
PANOLA-BETHANY WSC*	1.0	1.1	1.0	1.0	1.0	1.0
PARIS	8.6	8.6	8.6	8.4	8.2	8.0
PINE RIDGE WSC	1.8	1.7	1.6	1.4	1.3	1.2
PITTSBURG	2.0	2.0	1.9	1.9	1.8	1.8
POETRY WSC*	1.0	1.0	1.0	1.0	1.0	1.0
POINT	1.0	1.0	1.0	1.0	1.0	1.0
PRITCHETT WSC	1.5	1.5	1.4	1.4	1.3	1.3
PRUITT SANDFLAT WSC	2.1	2.0	1.9	1.8	1.8	1.7
QUEEN CITY	1.0	1.1	1.1	1.1	1.1	1.1
QUINLAN	1.0	1.0	1.0	1.0	1.0	1.0
QUITMAN	1.0	3.2	3.2	3.1	3.0	3.0
R P M WSC*	1.1	1.0	1.0	1.0	1.0	1.0
RAMEY WSC	2.3	2.3	2.4	2.4	2.4	2.3
RED RIVER COUNTY WSC	1.4	1.4	1.4	1.4	1.4	1.3
REDWATER	1.0	1.0	1.0	1.0	1.0	1.0
RENO (Lamar)	1.1	1.3	1.3	1.4	1.5	1.6
RIVERBEND WATER RESOURCES DISTRICT	1.0	1.0	1.0	1.0	1.0	1.0
ROYSE CITY*	1.0	1.0	1.0	1.0	1.0	1.0
SAND FLAT WSC	2.2	2.1	1.9	1.8	1.6	1.5
SCOTTSVILLE	1.1	1.0	1.2	1.1	1.2	1.1
SHADY GROVE NO 2 WSC	1.0	1.0	1.0	1.0	1.0	1.0
SHADY GROVE WSC	1.0	1.0	1.0	1.0	1.0	1.0
SHARON WSC	2.2	2.2	2.3	2.2	2.1	2.1
SHIRLEY WSC	1.5	1.5	1.4	1.4	1.3	1.3
SMITH COUNTY MUD 1	1.3	1.1	1.1	1.0	1.0	1.0
SOUTH RAINS SUD	1.5	1.5	1.5	1.5	1.5	1.5
SOUTH TAWAKONI WSC	1.0	1.0	1.0	1.0	1.0	1.0
SOUTHERN UTILITIES*	1.1	1.1	1.1	1.1	1.1	1.1
STAR MOUNTAIN WSC	1.4	1.3	1.2	1.1	1.3	1.2
STARRVILLE-FRIENDSHIP WSC	1.4	1.3	1.2	1.1	1.3	1.2
STEAM ELECTRIC POWER, GREGG	2.4	2.4	2.4	2.4	2.4	2.4
STEAM ELECTRIC POWER, HARRISON	1.3	1.3	1.3	1.3	1.3	1.3
STEAM ELECTRIC POWER, HUNT	1.0	1.0	1.0	1.0	1.0	1.0
STEAM ELECTRIC POWER, LAMAR	1.6	1.6	1.6	1.6	1.6	1.6
STEAM ELECTRIC POWER, MARION	1.0	1.0	1.1	1.2	1.4	1.5
STEAM ELECTRIC POWER, MORRIS	16.4	16.4	16.4	16.4	16.4	16.4
STEAM ELECTRIC POWER, TITUS	1.0	1.0	1.0	1.0	1.0	1.0
SULPHUR SPRINGS	1.6	1.6	1.5	1.5	1.4	1.4
TALLEY WSC	2.0	2.0	2.0	1.8	1.7	1.5
TEXARKANA	1.0	1.0	1.0	1.0	1.0	1.0
TEXAS A&M UNIVERSITY COMMERCE	1.0	1.0	1.0	1.0	1.1	1.1
TRI SUD	1.0	1.0	1.0	1.0	1.0	1.0
TRYON ROAD SUD	2.5	2.4	2.2	2.1	1.9	1.7
TYLER*	1.0	1.1	1.1	1.1	1.1	1.1
UNION GROVE WSC	2.4	2.3	2.2	2.1	2.0	1.9
VAN	2.7	2.5	2.4	2.2	2.1	2.0
WAKE VILLAGE	1.0	1.0	1.0	1.0	1.0	1.0

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Region D Water User Group (WUG) Management Supply Factor

	WUG MANAGEMENT SUPPLY FACTOR					
WUG NAME	2020	2030	2040	2050	2060	2070
WASKOM	1.0	1.1	1.1	1.1	1.1	1.1
WEST GREGG SUD*	1.7	1.6	1.5	1.4	1.2	1.1
WEST HARRISON WSC	2.8	2.7	2.6	2.5	2.3	2.1
WEST LEONARD WSC*	1.9	1.8	1.8	1.6	1.3	1.0
WEST TAWAKONI	1.0	2.6	2.2	1.7	1.4	1.1
WESTERN CASS WSC	5.0	5.2	5.4	5.4	5.5	5.5
WHITE OAK	1.9	1.8	1.7	1.5	1.4	1.3
WILLS POINT	1.2	2.3	2.3	1.9	1.6	1.6
WINNSBORO	2.8	2.6	2.5	2.4	2.2	2.1
WINONA	1.3	1.1	1.0	1.5	1.3	1.1
WOLFE CITY*	1.5	1.3	1.1	1.0	1.0	1.0

*A single asterisk next to a WUG's name denotes that the WUG is split by more than one planning region.

Region D Recommended Water Managment Strategy (WMS) Supply Associated with a New or Amended Inter-Basin Transfer (IBT) Permit

IBT WMS supply is the portion of the total WMS benefitting WUGs that will require a new or amended IBT permit that is not considered exempt under the Texas Water Code § 11.085.

			IBT WMS SUPPLY (ACRE-FEET PER YEAR)					
WMS NAME	SOURCE BASIN	RECIPIENT WUG BASIN	2020	2030	2040	2050	2060	2070

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Region D Water User Groups (WUGs)
Recommended Water Managment Strategy (WMS) Supply Associated with a New or Amended Inter-Basin Transfer (IBT) Permit and Total Recommended Conservation WMS Supply

IBT WMS supply is the portion of the total WMS benefitting the WUG basin split listed that will require a new or amended IBT permit that is not considered exempt under the Texas Water Code § 11.085. Total conservation supply represents all conservation WMS volumes recommended within the WUG's region-basin geographic split.

BENEFITTING WUG NAME | BASIN	WMS SOURCE ORIGIN BASIN | WMS NAME	WMS SUPPLY (ACRE-FEET PER YEAR)					
		2020	2030	2040	2050	2060	2070

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Region D Sponsored Recommended Water Management Strategy (WMS) Supplies Unallocated* to Water User Groups (WUG)

WMS NAME	WMS SPONSOR	SOURCE NAME	UNALLOCATED STRATEGY SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
TOTAL UNALLOCATED STRATEGY SUPPLIES								

* Strategy supplies created through the WMS that have not been assigned to a WUG will be allocated to the entity responsible for the water through an‘unassigned water volumes’ entity. Only strategy supplies associated with an 'unassigned water volume' entity are shown in this report, and may not represent all strategy supplies associated with the listed WMS.

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Region D Water User Group (WUG) Strategy Supplies by Water Management Strategy (WMS) Type

WMS TYPE *	STRATEGY SUPPLY (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
GROUNDWATER WELLS & OTHER	31,819	33,283	34,332	35,085	36,537	37,884
INDIRECT REUSE	323	354	404	442	584	693
MUNICIPAL CONSERVATION	4,054	4,493	5,148	6,138	7,615	9,776
NEW MAJOR RESERVOIR	0	12	18	16	27	35
OTHER CONSERVATION	211	694	694	694	694	694
OTHER SURFACE WATER	46,507	109,680	119,726	132,777	146,913	173,088
SEAWATER DESALINATION	0	0	0	0	0	0
CONJUNCTIVE USE	0	0	0	0	0	0
DIRECT POTABLE REUSE	0	0	0	0	0	0
OTHER STRATEGIES	0	0	0	0	0	0
GROUNDWATER DESALINATION	0	0	0	0	0	0
OTHER DIRECT REUSE	0	0	0	0	0	0
AQUIFER STORAGE & RECOVERY	0	0	0	0	0	0
IRRIGATION CONSERVATION	0	0	0	0	0	0
DROUGHT MANAGEMENT	0	0	0	0	0	0
TOTAL STRATEGY SUPPLIES	**82,914**	**148,516**	**160,322**	**175,152**	**192,370**	**222,170**

* WMS type descriptions can be found on the interactive state water plan website at http://texasstatewaterplan.org/ using the 'View data for' drop-down menus to navigate to a specific WMS Type page. The data used to create each WMS type valueis available in Appendix 3 of the Guidelines for Regional Water Planning Data Deliverable (Exhibit D) document at http://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2021/doc/current_docs/contract_docs/ExhibitD.pdf.

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Region D Water User Group (WUG)
Recommended Water Management Strategy (WMS) Supplies by Source Type

SOURCE SUBTYPE*	STRATEGY SUPPLY (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
AQUIFER STORAGE & RECOVERY	0	0	1	0	1	1
GROUNDWATER	31,819	33,283	34,335	35,088	36,542	37,891
GROUNDWATER TOTAL STRATEGY SUPPLIES	**31,819**	**33,283**	**34,336**	**35,088**	**36,543**	**37,892**
DIRECT NON-POTABLE REUSE	0	0	0	0	0	0
DIRECT POTABLE REUSE	0	0	0	0	0	0
INDIRECT NON-POTABLE REUSE	0	0	0	0	0	0
INDIRECT POTABLE REUSE	323	373	426	468	639	770
REUSE TOTAL STRATEGY SUPPLIES	**323**	**373**	**426**	**468**	**639**	**770**
ATMOSPHERE	0	0	0	0	0	0
GULF OF MEXICO	0	0	0	0	0	0
LIVESTOCK LOCAL SUPPLY	0	0	0	0	0	0
OTHER LOCAL SUPPLY	0	0	0	0	0	0
RAINWATER HARVESTING	0	0	0	0	0	0
RESERVOIR	46,506	109,616	119,456	132,391	146,346	172,106
RESERVOIR SYSTEM	20	97	333	521	768	1,023
RUN-OF-RIVER	0	0	0	0	0	267
SURFACE WATER TOTAL STRATEGY SUPPLIES	**46,526**	**109,713**	**119,789**	**132,912**	**147,114**	**173,396**
REGION D TOTAL STRATEGY SUPPLIES	**78,668**	**143,369**	**154,551**	**168,468**	**184,296**	**212,058**

* A full list of source subtype definitions can be found in section 3 of the Guidelines for Regional Water Planning Data Deliverable (Exhibit D) document at http://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2021/doc/current_docs/contract_docs/ExhibitD.pdf.

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Region D Major Water Provider (MWP) Existing Sales and Transfers

Major Water Providers are entities of particular significance to a region's water supply as defined by the Regional Water Planning Group (RWPG), and may be a Water User Group (WUG) entity, Wholesale Water Provider (WWP) entity , or both (WUG/WWP).

Retail denotes WUG projected demands and existing water supplies used by the WUG. Wholesale denotes a WWP or WUG/WWP selling water to another entity.

CASH SUD - WUG/WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
PROJECTED RETAIL WUG DEMANDS	2,353	2,736	3,215	3,808	4,537	5,411
PROJECTED WHOLESALE CONTRACT DEMANDS	926	1,155	1,491	1,765	2,367	3,351
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**3,279**	**3,891**	**4,706**	**5,573**	**6,904**	**8,762**
REUSE SALES TO RETAIL CUSTOMERS	524	641	729	772	697	642
SURFACE WATER SALES TO RETAIL CUSTOMERS	2,248	2,128	2,020	2,314	2,945	4,396
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	357	507	738	930	1,354	2,082
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**3,129**	**3,276**	**3,487**	**4,016**	**4,996**	**7,120**

CHEROKEE WATER COMPANY- WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
PROJECTED WHOLESALE CONTRACT DEMANDS	18,000	18,000	18,000	18,000	18,000	18,094
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**18,000**	**18,000**	**18,000**	**18,000**	**18,000**	**18,094**
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	18,000	18,000	18,000	18,000	18,000	18,094
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**18,000**	**18,000**	**18,000**	**18,000**	**18,000**	**18,094**

COMMERCE - WUG/WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
PROJECTED RETAIL WUG DEMANDS	1,427	1,555	1,749	2,039	2,473	3,108
PROJECTED WHOLESALE CONTRACT DEMANDS	796	808	808	808	808	808
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**2,223**	**2,363**	**2,557**	**2,847**	**3,281**	**3,916**
GROUNDWATER SALES TO RETAIL CUSTOMERS	244	244	244	244	244	244
SURFACE WATER SALES TO RETAIL CUSTOMERS	1,427	4,586	4,609	4,249	2,694	3,078
GROUNDWATER SALES TO WHOLESALE CUSTOMERS	78	78	78	78	78	78
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	202	214	214	214	214	214
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**1,951**	**5,122**	**5,145**	**4,785**	**3,230**	**3,614**

EMORY - WUG/WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
PROJECTED RETAIL WUG DEMANDS	791	829	837	842	845	847
PROJECTED WHOLESALE CONTRACT DEMANDS	963	965	961	960	960	961
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**1,754**	**1,794**	**1,798**	**1,802**	**1,805**	**1,808**
SURFACE WATER SALES TO RETAIL CUSTOMERS	791	829	837	842	845	847
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	427	438	435	434	435	436
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**1,218**	**1,267**	**1,272**	**1,276**	**1,280**	**1,283**

FRANKLIN COUNTY WD - WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
PROJECTED WHOLESALE CONTRACT DEMANDS	9,500	9,500	9,500	9,500	9,500	9,500
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**9,500**	**9,500**	**9,500**	**9,500**	**9,500**	**9,500**
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	9,031	8,649	8,265	7,960	7,577	7,271
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**9,031**	**8,649**	**8,265**	**7,960**	**7,577**	**7,271**

GREENVILLE - WUG/WWP	WATER VOLUMES (ACRE-FEET PER YEAR)

Region D Major Water Provider (MWP) Existing Sales and Transfers

DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
PROJECTED RETAIL WUG DEMANDS	9,271	10,481	12,187	14,624	18,163	23,319
PROJECTED WHOLESALE CONTRACT DEMANDS	2,431	2,608	2,807	3,022	3,213	3,410
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**11,702**	**13,089**	**14,994**	**17,646**	**21,376**	**26,729**
SURFACE WATER SALES TO RETAIL CUSTOMERS	6,032	5,855	5,656	5,441	5,250	5,053
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	2,431	2,608	2,807	3,022	3,213	3,410
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**8,463**	**8,463**	**8,463**	**8,463**	**8,463**	**8,463**

LAMAR COUNTY WSD - WUG/WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED RETAIL WUG DEMANDS	2,216	2,238	2,252	2,280	2,316	2,349
PROJECTED WHOLESALE CONTRACT DEMANDS	2,776	2,900	3,008	3,100	3,222	3,317
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**4,992**	**5,138**	**5,260**	**5,380**	**5,538**	**5,666**
SURFACE WATER SALES TO RETAIL CUSTOMERS	8,891	8,796	8,715	8,655	8,597	8,512
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	2,637	2,761	2,869	2,961	3,083	3,178
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**11,528**	**11,557**	**11,584**	**11,616**	**11,680**	**11,690**

LONGVIEW - WUG/WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED RETAIL WUG DEMANDS	24,268	26,122	28,353	31,051	34,232	37,865
PROJECTED WHOLESALE CONTRACT DEMANDS	26,765	26,767	26,767	26,767	26,767	26,767
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**51,033**	**52,889**	**55,120**	**57,818**	**60,999**	**64,632**
SURFACE WATER SALES TO RETAIL CUSTOMERS	43,410	52,251	52,284	52,316	52,351	52,386
REUSE SALES TO WHOLESALE CUSTOMERS	6,161	6,161	6,161	6,161	6,161	6,161
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	14,144	14,146	14,146	14,146	14,146	14,146
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**63,715**	**72,558**	**72,591**	**72,623**	**72,658**	**72,693**

MARSHALL - WUG/WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED RETAIL WUG DEMANDS	4,994	5,232	5,499	5,959	6,500	7,148
PROJECTED WHOLESALE CONTRACT DEMANDS	2,423	2,423	2,423	2,423	2,423	2,423
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**7,417**	**7,655**	**7,922**	**8,382**	**8,923**	**9,571**
SURFACE WATER SALES TO RETAIL CUSTOMERS	13,748	13,748	13,748	13,748	13,748	13,748
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	2,423	2,423	2,423	2,423	2,423	2,423
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**16,171**	**16,171**	**16,171**	**16,171**	**16,171**	**16,171**

MOUNT PLEASANT - WUG/WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED RETAIL WUG DEMANDS	3,890	4,302	4,745	5,260	5,828	6,433
PROJECTED WHOLESALE CONTRACT DEMANDS	5,773	6,027	6,276	6,510	6,899	7,208
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**9,663**	**10,329**	**11,021**	**11,770**	**12,727**	**13,641**
SURFACE WATER SALES TO RETAIL CUSTOMERS	17,800	17,428	17,062	16,734	16,228	15,825
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	5,773	6,027	6,276	6,510	6,899	7,208
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**23,573**	**23,455**	**23,338**	**23,244**	**23,127**	**23,033**

NORTHEAST TEXAS MWD - WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED WHOLESALE CONTRACT DEMANDS	164,561	163,892	163,126	162,472	161,810	161,747
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**164,561**	**163,892**	**163,126**	**162,472**	**161,810**	**161,747**

Region D Major Water Provider (MWP) Existing Sales and Transfers

SURFACE WATER SALES TO WHOLESALE CUSTOMERS	133,659	132,689	131,746	130,988	130,233	129,427
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**133,659**	**132,689**	**131,746**	**130,988**	**130,233**	**129,427**

PARIS - WUG/WWP	**WATER VOLUMES (ACRE-FEET PER YEAR)**					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED RETAIL WUG DEMANDS	3,059	3,042	3,017	3,033	3,079	3,123
PROJECTED WHOLESALE CONTRACT DEMANDS	27,494	27,743	27,983	28,190	28,586	28,789
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**30,553**	**30,785**	**31,000**	**31,223**	**31,665**	**31,912**
SURFACE WATER SALES TO RETAIL CUSTOMERS	27,896	27,601	27,314	27,074	26,614	26,372
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	25,608	25,905	26,191	26,431	26,892	27,105
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**53,504**	**53,506**	**53,505**	**53,505**	**53,506**	**53,477**

RIVERBEND WATER RESOURCES DISTRICT - WUG/WWP	**WATER VOLUMES (ACRE-FEET PER YEAR)**					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED RETAIL WUG DEMANDS	523	536	539	537	537	537
PROJECTED WHOLESALE CONTRACT DEMANDS	168,443	194,985	201,822	210,348	218,967	237,176
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**168,966**	**195,521**	**202,361**	**210,885**	**219,504**	**237,713**
SURFACE WATER SALES TO RETAIL CUSTOMERS	0	0	0	0	0	0
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	122,630	122,623	122,616	122,615	122,615	122,615
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**122,630**	**122,623**	**122,616**	**122,615**	**122,615**	**122,615**

SABINE RIVER AUTHORITY - WWP	**WATER VOLUMES (ACRE-FEET PER YEAR)**					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED WHOLESALE CONTRACT DEMANDS	511,655	511,655	511,655	511,655	511,655	511,655
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**511,655**	**511,655**	**511,655**	**511,655**	**511,655**	**511,655**
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	498,516	471,813	468,758	465,472	461,996	461,907
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**498,516**	**471,813**	**468,758**	**465,472**	**461,996**	**461,907**

SULPHUR RIVER MWD - WWP	**WATER VOLUMES (ACRE-FEET PER YEAR)**					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED WHOLESALE CONTRACT DEMANDS	13,548	13,470	13,393	13,317	13,240	13,163
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**13,548**	**13,470**	**13,393**	**13,317**	**13,240**	**13,163**
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	13,548	13,470	13,393	13,317	13,240	13,163
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**13,548**	**13,470**	**13,393**	**13,317**	**13,240**	**13,163**

SULPHUR SPRINGS - WUG/WWP	**WATER VOLUMES (ACRE-FEET PER YEAR)**					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED RETAIL WUG DEMANDS	3,118	3,199	3,278	3,403	3,547	3,697
PROJECTED WHOLESALE CONTRACT DEMANDS	5,206	5,413	5,701	5,767	6,116	6,397
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**8,324**	**8,612**	**8,979**	**9,170**	**9,663**	**10,094**
SURFACE WATER SALES TO RETAIL CUSTOMERS	5,002	5,002	5,002	5,002	5,002	5,002
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	5,206	5,413	5,701	5,767	6,116	6,397
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**10,208**	**10,415**	**10,703**	**10,769**	**11,118**	**11,399**

TEXARKANA - WUG/WWP	**WATER VOLUMES (ACRE-FEET PER YEAR)**					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED RETAIL WUG DEMANDS	7,145	7,282	7,459	7,706	8,028	8,380
PROJECTED WHOLESALE CONTRACT DEMANDS	180,000	180,000	180,000	180,000	180,000	180,000
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**187,145**	**187,282**	**187,459**	**187,706**	**188,028**	**188,380**

Region D Major Water Provider (MWP) Existing Sales and Transfers

SURFACE WATER SALES TO RETAIL CUSTOMERS	0	0	0	0	0	0
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	122,630	122,623	122,616	122,615	122,615	122,615
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**122,630**	**122,623**	**122,616**	**122,615**	**122,615**	**122,615**

TITUS COUNTY FWD #1 - WWP	**WATER VOLUMES (ACRE-FEET PER YEAR)**					
DATA DESCRIPTION	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
PROJECTED WHOLESALE CONTRACT DEMANDS	40,000	40,000	40,000	40,000	40,000	40,000
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**40,000**	**40,000**	**40,000**	**40,000**	**40,000**	**40,000**
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	28,900	28,900	28,900	28,900	28,900	28,900
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**28,900**	**28,900**	**28,900**	**28,900**	**28,900**	**28,900**

Region D Major Water Provider (MWP) Water Management Strategy (WMS) Summary

MWPs are entities of significance to a region's water supply as defined by the Regional Water Planning Group (RWPG) and may be a Water User Group (WUG) entity, Wholesale Water Provider (WWP) entity, or both (WUG/WWP).'MWP Retail Customers' denotes recommended WMS supply used by the WUG. 'Transfers Related to Wholesale Customers' denotes a WWP or WUG/WWP selling or transferring recommended WMS supply to another entity. Supply associated with the MWP's wholesale transfers will only display if it is listed as the main seller in the State Water Planning database, even if multiple sellers are involved with the sale o water to WUGs. Unallocated water volumes represent MWP recommended WMS supply not currently allocated to a customer of the MWP.'Total MWP Related WMS Supply' will display if the MWP's WMS is related to more than one WMS supply type (retail, wholesale, and/or unallocated). Associated WMS Projects are listed when the MWP is one of the project's sponsors. Report contains draft data and is subject to change.

CASH SUD | ADVANCED WATER CONSERVATION (CASH SUD)						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	1	1	0	0	0
WMS RELATED MWP SPONSORED PROJECTS	PROJECT DESCRIPTION					
ADVANCED WATER CONSERVATION (CASH SUD)	CONSERVATION - MUNICIPAL (DOES NOT INCLUDE METER REPLACEMENT OR WATER LOSS)					

CASH SUD | CONSERVATION - CASH SUD						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	1	2	3	5	7

CASH SUD | CONSERVATION, IRRIGATION RESTRICTIONS– CASH SUD						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	4	4	6	8	9	11

CASH SUD | CONSERVATION, WATER LOSS CONTROL - CASH SUD						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	1	1	0	0	0	0
WMS RELATED MWP SPONSORED PROJECTS	PROJECT DESCRIPTION					
CONSERVATION, WATER LOSS CONTROL - CASH SUD	WATER LOSS CONTROL					

CASH SUD | MARVIN NICHOLS (328) STRATEGY FOR NTMWD, TRWD, AND UTRWD						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	0	0	277	329	285

CASH SUD | NTMWD - ADDITIONAL LAVON WATERSHED REUSE						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	0	0	20	51	66

CASH SUD | NTMWD - ADDITIONAL MEASURES TO ACCESS FULL LAVON YIELD						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	25	30	19	21	16

CASH SUD | NTMWD - BOIS D'ARC LAKE						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	1	230	288	197	232	200

Region D Major Water Provider (MWP) Water Management Strategy (WMS) Summary

CASH SUD | NTMWD - CONSERVATION SURPLUS REALLOCATION

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	1	0	0	0	0	0

CASH SUD | NTMWD - EXPANDED WETLAND REUSE

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	17	44	40	61	64

CASH SUD | NTMWD - OKLAHOMA

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	0	0	0	0	85

CASH SUD | NTMWD - TEXOMA BLENDING

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	0	95	158	187	194

CASH SUD | WRIGHT PATMAN REALLOCATION FOR NTMWD, TRWD, AND UTRWD

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	0	0	0	0	96

CHEROKEE WATER COMPANY | NO RECOMMENDED WMS SUPPLY RELATED TO MWP

COMMERCE | NO RECOMMENDED WMS SUPPLY RELATED TO MWP

EMORY | NO RECOMMENDED WMS SUPPLY RELATED TO MWP

FRANKLIN COUNTY WD | NO RECOMMENDED WMS SUPPLY RELATED TO MWP

GREENVILLE | GREENVILLE CONSERVATION AND WTP

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	140	1,391	3,059	5,320	3,212
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	1	202	771	1,925	4,088
TOTAL MWP RELATED WMS SUPPLY	4,051	4,627	6,733	9,954	14,838	17,041
WMS RELATED MWP SPONSORED PROJECTS	**PROJECT DESCRIPTION**					
WTP EXPANSION 2030 (GREENVILLE, SABINE)	WATER TREATMENT PLANT EXPANSION					
NEW WTP GREENVILLE	NEW WATER TREATMENT PLANT					

GREENVILLE | NEW CONTRACT WITH GREENVILLE AND PIPELINE TO CELESTE

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	0	0	0	0	87
WMS RELATED MWP SPONSORED PROJECTS	**PROJECT DESCRIPTION**					
WTP EXPANSION 2030 (GREENVILLE, SABINE)	WATER TREATMENT PLANT EXPANSION					

GREENVILLE | NEW CONTRACT WITH GREENVILLE AND PIPELINE TO HICKORY CREEK SUD

Region D Major Water Provider (MWP) Water Management Strategy (WMS) Summary

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	96	273	519	866	1,366	2,095
WMS RELATED MWP SPONSORED PROJECTS	**PROJECT DESCRIPTION**					
WTP EXPANSION 2030 (GREENVILLE, SABINE)	WATER TREATMENT PLANT EXPANSION					

GREENVILLE | NEW CONTRACT WITH GREENVILLE AND PIPELINE TO WOLFE CITY

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	0	0	54	157	308
WMS RELATED MWP SPONSORED PROJECTS	**PROJECT DESCRIPTION**					
WTP EXPANSION 2030 (GREENVILLE, SABINE)	WATER TREATMENT PLANT EXPANSION					

GREENVILLE | NEW WTP GREENVILLE

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	0	0	0	0	5,313
WMS RELATED MWP SPONSORED PROJECTS	**PROJECT DESCRIPTION**					
NEW WTP GREENVILLE	NEW WATER TREATMENT PLANT					

LAMAR COUNTY WSD | INCREASE EXISTING CONTRACT (COUNTY-OTHER LAMAR)

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	204	204	212	224	234	244

LAMAR COUNTY WSD | LAMAR LIVESTOCK PIPELINE AND CONTRACT WITH LAMAR CO WSD

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	617	617	617	617	617	617

LONGVIEW | NO RECOMMENDED WMS SUPPLY RELATED TO MWP

MARSHALL | NO RECOMMENDED WMS SUPPLY RELATED TO MWP

MOUNT PLEASANT | INCREASE EXISTING CONTRACT (MANUFACTURING TITUS FROM MT PLEASANT SURPLUS)

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	1,003	880	890	1,149	1,279

NORTHEAST TEXAS MWD | INCREASE EXISTING CONTRACT (HARLETON, CYPRESS)

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	62	74	91	127	173	230

NORTHEAST TEXAS MWD | INCREASE EXISTING CONTRACT (STEAM ELECTRIC POWER TITUS)

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	30,066	30,866	31,766	32,566	32,814	33,083

PARIS | PAT MAYSE RAW WATER PIPELINE (IRRIGATION LAMAR)

	WATER VOLUMES (ACRE-FEET PER YEAR)

Region D Major Water Provider (MWP) Water Management Strategy (WMS) Summary

DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	1,468	1,468	1,468	1,468	1,468	1,468

RIVERBEND WATER RESOURCES DISTRICT | RIVERBEND STRATEGY						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	523	536	539	537	537	537
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	13,152	72,436	79,427	88,144	96,874	115,174
TOTAL MWP RELATED WMS SUPPLY	13,675	72,972	79,966	88,681	97,411	115,711
WMS RELATED MWP SPONSORED PROJECTS	**PROJECT DESCRIPTION**					
RIVERBEND WMS INTERIM TO ULTIMATE STORAGE CONVERSION	CONTRACT AMENDMENT; RAISE CONSERVATION POOL					
RIVERBEND WMS WATER RIGHT AMENDMENT	NEW WATER RIGHT/PERMIT AMENDMENT NON-EXEMPT IBT					
RIVERBEND WMS NEW RAW WATER INTAKE 120 MGD 2030	NEW SURFACE WATER INTAKE					
RIVERBEND WMS RAW WATER PUMP STATION 66 MGD 2030	PUMP STATION					
RIVERBEND WMS RAW WATER PIPELINE 72 MGD 2030	CONVEYANCE/TRANSMISSION PIPELINE					
RIVERBEND WMS NEW WTP 25 MGD 2030	NEW WATER TREATMENT PLANT					
RIVERBEND WMS WTP EXPANSION 5 MGD 2040	WATER TREATMENT PLANT EXPANSION					
RIVERBEND WMS PUMP STATION EXPANSION 6 MGD 2040	PUMP STATION					
RIVERBEND WMS WTP EXPANSION 10 MGD 2050	WATER TREATMENT PLANT EXPANSION					
RIVERBEND WMS PUMP STATION EXPANSION 18 MGD 2050	PUMP STATION					
RIVERBEND WMS NEW RAW WATER PIPELINE 32 MGD 2050	CONVEYANCE/TRANSMISSION PIPELINE					
RIVERBEND WMS PUMP STATION EXPANSION 30 MGD 2060	PUMP STATION					

RIVERBEND WATER RESOURCES DISTRICT | RIVERBEND STRATEGY CASS COUNTY						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	1,119	1,179	1,253	1,250	1,250
WMS RELATED MWP SPONSORED PROJECTS	**PROJECT DESCRIPTION**					
RIVERBEND STRATEGY CASS NEW WTP AND TRANSMISSION LINE	CONVEYANCE/TRANSMISSION PIPELINE; NEW WATER TREATMENT PLANT					

SABINE RIVER AUTHORITY | CENT-TOL - TOLEDO BEND PIPELINE						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	0	2,242	2,242	2,242	2,242

SABINE RIVER AUTHORITY | EAST TEXAS TRANSFER						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	0	0	250,000	250,000	250,000
WMS RELATED MWP SPONSORED PROJECTS	**PROJECT DESCRIPTION**					
EAST TEXAS TRANSFER	CONVEYANCE/TRANSMISSION PIPELINE; PUMP STATION					

SABINE RIVER AUTHORITY | LNVA-SRA NEW CONTRACT						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	0	0	200,000	200,000	200,000

SABINE RIVER AUTHORITY | NEWTON MINING - TRANSFER FROM SRA						
	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070

Region D Major Water Provider (MWP) Water Management Strategy (WMS) Summary

TRANSFERS RELATED TO WHOLESALE CUSTOMERS	115	59	0	0	0	0

SABINE RIVER AUTHORITY | ORANGE IRRIGATION - TRANSFER FROM SRA

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	526	526	526	526	526	526

SABINE RIVER AUTHORITY | RUSK-SEP NEW CONTRACT

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	1,103	1,103	1,103	1,103	1,103	1,103

SABINE RIVER AUTHORITY | SAN AUGUSTINE LIVESTOCK

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	1,333	1,539	1,774	2,048	2,349	2,349

SABINE RIVER AUTHORITY | SAND HILLS WSC - TRANSFER FROM SRA

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	61	68	77	87	97	105

SABINE RIVER AUTHORITY | SHEL-LTK NEW CONTRACT

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	6,491	8,761	11,524	14,896	19,006	19,006

SULPHUR RIVER MWD | NO RECOMMENDED WMS SUPPLY RELATED TO MWP

SULPHUR SPRINGS | INCREASE EXISTING CONTRACT (BRINKER WSC, SULPHUR)

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	0	0	12	47	83

SULPHUR SPRINGS | INCREASE EXISTING CONTRACT (MARTIN SPRINGS)

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	0	0	0	0	29

TEXARKANA | RIVERBEND STRATEGY

	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	7,145	7,282	7,459	7,706	8,028	8,380

TITUS COUNTY FWD #1 | NO RECOMMENDED WMS SUPPLY RELATED TO MWP

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Region D Water User Group (WUG) Unmet Needs

WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The unmet needs shown in the WUG Unmet Needs report are calculated by first deducting the WUG split's projected demand from the sum of its total existing water supply volume and all associated recommended water management strategy water volumes. If the WUG split has a greater future supply volume than projected demand in any given decade, this amount is considered a surplus volume. In order to display only unmet needs associated with the WUG split, these surplus volumes are updated to a zero and the unmet needs water volumes are shown as absolute values.

	WUG UNMET NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
BOWIE COUNTY - SULPHUR BASIN						
MANUFACTURING	631	0	0	0	0	0
RED RIVER COUNTY - SULPHUR BASIN						
IRRIGATION	97	97	97	97	97	97

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

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Region D Water User Group (WUG) Unmet Needs Summary

WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The unmet needs shown in the WUG Unmet Needs Summary report are calculated by first deducting the WUG split's projected demand from the sum of its total existing water supply volume and all associated recommended water management strategy water volumes. If the WUG split has a greater future supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG category level, calculated surpluses are updated to zero so that only the WUGs with unmet needs in the decade are included with the Needs totals. Unmet needs water volumes are shown as absolute values.

WUG CATEGORY	NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
MUNICIPAL	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	631	0	0	0	0	0
MINING	0	0	0	0	0	0
STEAM ELECTRIC POWER	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	97	97	97	97	97	97

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WUG Name	Reported Water Conservation Plan		Decadal Goals					
	Total Five Year Goal	Total Ten Year Goal	2020	2030	2040	2050	2060	2070
410 WSC			143	138	135	134	134	134
ALGONQUIN WATER RESOURCES OF TEXAS			60	60	60	60	60	60
ATLANTA			154	150	147	145	145	145
B H P WSC			67	63	61	61	61	61
BEN WHEELER WSC			75	72	69	68	67	67
BI COUNTY WSC			92	89	87	86	86	86
BIG SANDY			136	132	129	127	127	127
BLOCKER CROSSROADS WSC			82	78	75	73	73	73
BLOSSOM			78	74	71	69	69	69
BOGATA			93	88	85	85	85	85
BRASHEAR WSC			168	164	161	160	160	160
BRIGHT STAR SALEM SUD	62	61	72	67	64	63	63	63
BRINKER WSC			96	92	89	88	88	88
BURNS REDBANK WSC			114	110	107	106	105	105
CADDO BASIN SUD			100	95	93	92	92	92
CADDO MILLS			79	75	73	72	72	72
CANTON			216	212	210	208	208	208
CASH SUD	78	68	103	99	97	97	96	96
CELESTE			109	105	102	101	100	100
CENTRAL BOWIE COUNTY WSC	74	69	73	71	71	71	71	71
CLARKSVILLE			167	162	160	159	159	159
CLARKSVILLE CITY			94	90	88	86	86	86
COMBINED CONSUMERS SUD			74	70	67	66	66	66
COMMERCE	133	133	143	139	136	135	135	134
COOPER	118	113	196	192	188	188	187	187
CORNERSVILLE WSC			118	114	111	110	110	110
CRYSTAL SYSTEMS TEXAS			279	276	275	275	275	274
CUMBY			114	110	107	106	106	106

2021 North East Texas Regional Water Plan
GPCD Goals for Municipal Water User Groups

WUG Name	Total Five Year Goal	Total Ten Year Goal	2020	2030	2040	2050	2060	2070
CYPRESS SPRINGS SUD	78	72	81	77	75	73	73	73
DAINGERFIELD			159	155	152	150	150	150
DE KALB			154	149	146	146	145	145
DELTA COUNTY MUD			63	60	60	60	60	60
DIANA SUD			77	74	71	70	70	70
E M C WSC			60	60	60	60	60	60
EAST MOUNTAIN WATER SYSTEM			107	103	100	99	99	99
EAST TAWAKONI			183	179	176	175	175	175
EASTERN CASS WSC			70	68	65	64	64	64
EDGEWOOD	115	110	155	151	148	147	147	147
EDOM WSC			97	94	91	90	89	89
ELDERVILLE WSC			60	60	60	60	60	60
EMORY	100	100	329	325	323	321	321	321
FOUKE WSC			98	94	92	91	91	91
FRUITVALE WSC			80	77	74	73	72	72
GAFFORD CHAPEL WSC			80	76	73	72	72	72
GILL WSC			103	98	95	94	94	94
GILMER			176	172	169	167	167	167
GLADEWATER	155	144	149	145	142	140	140	140
GLENWOOD WSC			89	85	82	81	80	80
GOLDEN WSC			72	68	65	63	63	63
GRAND SALINE			102	98	95	93	93	93
GREENVILLE	149	147	277	273	270	268	268	268
GUM SPRINGS WSC			83	79	76	75	74	74
HALLSVILLE			122	118	116	114	114	114
HARLETON WSC			91	87	84	82	82	82
HAWKINS			228	224	220	219	219	219
HICKORY CREEK SUD			89	85	84	83	83	83
HOLLY SPRINGS WSC			82	78	75	74	73	73

2021 North East Texas Regional Water Plan
GPCD Goals for Municipal Water User Groups

WUG Name	Total Five Year Goal	Total Ten Year Goal	2020	2030	2040	2050	2060	2070
HOOKS			82	78	75	73	73	73
HUGHES SPRINGS			100	96	92	91	91	91
JEFFERSON			164	160	156	154	154	154
JONES WSC			80	76	73	71	71	71
KELLYVILLE-BEREA WSC			74	70	66	65	65	65
KILGORE			193	189	186	184	184	184
LAKE FORK WSC			89	84	81	80	80	80
LAMAR COUNTY WSD			117	113	111	110	109	109
LEIGH WSC			199	195	192	190	190	190
LIBERTY CITY WSC			90	86	83	82	82	81
LINDALE			202	199	198	197	197	197
LINDALE RURAL WSC	90	92	70	66	64	63	62	62
LINDEN			127	122	119	119	119	119
LITTLE HOPE MOORE WSC			89	86	83	82	81	81
LONE STAR			101	97	94	92	92	92
LONGVIEW	239	234	245	241	238	237	237	237
MACBEE SUD			60	60	60	60	60	60
MACEDONIA EYLAU MUD 1			60	60	60	60	60	60
MARSHALL	220	215	180	176	172	171	170	170
MARTIN SPRINGS WSC			108	104	102	101	100	100
MAUD			139	134	131	129	129	129
MILLER GROVE WSC			123	119	116	115	115	115
MIMS WSC			60	60	60	60	60	60
MINEOLA			141	137	134	132	132	132
MOUNT PLEASANT	134	132	198	194	192	190	190	190
MOUNT VERNON	149	141	175	171	168	167	167	167
MYRTLE SPRINGS WSC			65	62	60	60	60	60
NAPLES			103	99	95	94	94	94
NASH			86	86	86	86	86	86

2021 North East Texas Regional Water Plan
GPCD Goals for Municipal Water User Groups

WUG Name	Total Five Year Goal	Total Ten Year Goal	2020	2030	2040	2050	2060	2070
NEW BOSTON			208	204	200	199	199	199
NEW HOPE SUD			116	112	110	108	108	108
NORTH HARRISON WSC			92	88	85	83	83	83
NORTH HOPKINS WSC			70	65	62	61	61	61
NORTH HUNT SUD			60	60	60	60	60	60
OMAHA			157	153	150	148	147	147
ORE CITY			106	102	99	98	97	97
PANOLA-BETHANY WSC			177	173	170	169	168	168
PARIS	443	432	100	96	93	91	91	91
PINE RIDGE WSC			105	101	99	97	97	97
PITTSBURG			158	154	150	149	148	148
POETRY WSC			98	94	93	92	92	91
POINT			219	215	212	211	210	210
PRITCHETT WSC			79	75	72	70	70	70
PRUITT SANDFLAT WSC			98	95	92	91	90	90
QUEEN CITY			135	131	127	127	126	126
QUINLAN			79	74	71	69	69	69
QUITMAN			138	134	130	129	129	129
R P M WSC			97	94	92	91	91	91
RAMEY WSC			67	63	61	60	60	60
RED RIVER COUNTY WSC			67	63	60	60	60	60
REDWATER			120	117	114	112	112	112
RENO (Lamar)			148	144	142	140	140	140
RIVERBEND WATER RESOURCES DISTRICT	150	128	861	857	854	852	852	852
SAND FLAT WSC			64	60	60	60	60	60

2021 North East Texas Regional Water Plan
GPCD Goals for Municipal Water User Groups

WUG Name	Total Five Year Goal	Total Ten Year Goal	2020	2030	2040	2050	2060	2070
SCOTTSVILLE			194	190	187	185	185	185
SHADY GROVE NO 2 WSC			169	165	162	161	161	161
SHADY GROVE WSC			84	80	78	77	77	77
SHARON WSC			71	67	63	63	62	62
SHIRLEY WSC			120	116	113	112	112	112
SMITH COUNTY MUD 1			400	396	395	394	393	393
SOUTH RAINS SUD			80	76	74	73	72	72
SOUTH TAWAKONI WSC			84	79	77	75	75	75
STAR MOUNTAIN WSC			150	146	144	142	142	142
STARRVILLE-FRIENDSHIP WSC			105	101	99	97	97	97
SULPHUR SPRINGS	200	195	176	172	168	167	166	166
TALLEY WSC			67	63	60	60	60	60
TEXARKANA			168	164	161	159	159	159
TEXAS A&M UNIVERSITY COMMERCE			150	146	144	143	143	143
TRI SUD	90	89	89	85	83	82	82	82
TRYON ROAD SUD			130	126	123	121	121	121
UNION GROVE WSC			63	60	60	60	60	60
VAN			111	107	104	103	103	103
WAKE VILLAGE			101	98	95	93	93	93
WASKOM			133	129	126	124	124	124
WEST GREGG SUD			77	74	71	70	70	69
WEST HARRISON WSC			88	84	81	79	79	79
WEST TAWAKONI			92	88	86	85	84	84
WESTERN CASS WSC			84	80	77	76	75	75
WHITE OAK			173	169	166	164	164	164
WILLS POINT			155	151	148	146	146	146
WINNSBORO			166	162	159	158	157	157
WINONA			185	180	177	176	175	175
WOLFE CITY	100	97	88	83	80	80	79	79

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Appendix C6 – Chapter 6:

IMPACTS OF THE REGIONAL WATER PLAN

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APPENDIX C6

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Region D 2021 - North East Texas Regional Water Plan
Summary of Evaluation of Recommended Water Management Strategies

County	Entity	Strategy	Quantity (Ac-Ft/Yr)	Start Decade	Reliability	Cost ($/Ac-Ft)	Impacts of Strategy on:					Key Water Quality Parameters	Political Feasibility
							Environmental Factors	Env. Factors	Agricultural Resources/ Rural Areas	Agricultural Resources/ Rural Areas	Other Natural Resources		
			#		*(1-5)	$	(Acres)	**(1-5)	(Acres)	**(1-5)	**(1-5)	**(1-5)	**(1-5)
BOWIE	BURNS REDBANK WSC	Renew Existing Contract (Hooks)	201	2020	1	$483	N/A	1	N/A	1	1	1	1
BOWIE	CENTRAL BOWIE COUNTY WSC	Renew Existing Contract (Riverbend WRD)	962	2020	1	$482	N/A	1	N/A	1	1	1	1
BOWIE	DE KALB	Renew Existing Contract (Riverbend WRD)	298	2020	1	$242	N/A	1	N/A	1	1	1	1
BOWIE	HOOKS	Renew Existing Contract (Riverbend WRD)	281	2020	1	$242	N/A	1	N/A	1	1	1	1
BOWIE	IRRIGATION	Drill New Wells (Carrizo-Wilcox, Sulphur)	4,134	2020	1	$778	17	1	17	2	1	1	2
BOWIE	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Sulphur)	417	2020	1	$1,017	6	1	2	1	1	1	1
BOWIE	LIVESTOCK	Drill New Wells (Nacatoch, Red)	252	2020	1	$1,063	7	1	2	1	1	1	1
BOWIE	MACEDONIA-EYLAU MUD #1	Renew Existing Contract (Riverbend WRD)	601	2020	1	$483	N/A	1	N/A	1	1	1	1
BOWIE	MANUFACTURING BOWIE	Advanced Water Conservation	204	2020	1	$0	N/A	1	N/A	1	1	1	1
BOWIE	MANUFACTURING BOWIE	Renew Existing Contract (Riverbend WRD)	100,609	2020	1	$482	N/A	1	N/A	1	1	1	1
BOWIE	MAUD	Renew Existing Contract (Riverbend WRD)	238	2020	1	$241	N/A	1	N/A	1	1	1	1
BOWIE	NASH	Renew Existing Contract (Riverbend WRD)	589	2020	1	$243	N/A	1	N/A	1	1	1	1
BOWIE	NEW BOSTON	Renew Existing Contract (Riverbend WRD)	1,399	2020	1	$243	N/A	1	N/A	1	1	1	1
BOWIE	REDWATER	Renew Existing Contract (Riverbend WRD)	616	2020	1	$242	N/A	1	N/A	1	1	1	1
BOWIE	TEXARKANA	Renew Existing Contract (Riverbend WRD)	8,380	2020	1	$243	N/A	1	N/A	1	1	1	1
BOWIE	RIVERBEND WRD	Riverbend WMS	115,820	2020	1	$592	46	1	0	1	1	1	1
BOWIE	WAKE VILLAGE	Renew Existing Contract (Riverbend WRD)	932	2020	1	$242	N/A	1	N/A	1	1	1	1
CAMP	LIVESTOCK	Drill New Wells (Queen City, Cypress)	4,025	2020	1	$123	1	1	1	1	1	1	1
CASS	ATLANTA	Renew Existing Contract (Riverbend WRD)	1,206	2030	1	$242	N/A	1	N/A	1	1	1	1
CASS	COUNTY-OTHER	Drill New Wells (Carrizo-Wilcox, Cypress)	323	2020	1	$514	1	1	0	1	1	1	1
CASS	COUNTY-OTHER	Drill New Wells (Carrizo-Wilcox, Sulphur)	216	2020	1	$528	1	1	0	1	1	1	1
CASS	COUNTY-OTHER	Renew Existing Contract (Riverbend WRD)	44	2030	1	$483	N/A	1	N/A	1	1	1	1
CASS	HOLLY SPRINGS WSC	Increase Existing Contract (NETMWD)	80	2020	1	$1,629	N/A	1	N/A	1	1	1	1
CASS	LIVESTOCK	Drill New Wells (Queen City, Cypress)	968	2020	1	$111	1	1	1	1	1	1	1
CASS	LIVESTOCK	Drill New Wells (Queen City, Sulphur)	968	2020	1	$111	1	1	1	1	1	1	1
CASS	MANUFACTURING	Voluntary Reallocation Supply for Atlanta	1,206	2030	1	$0	N/A	1	N/A	1	1	1	1
CASS	MANUFACTURING	Voluntary Reallocation Supply for Cass County-Oth	44	2030	1	$0	N/A	1	N/A	1	1	1	1
CASS	RIVERBEND WRD	New 2.5 MGD Package WTP and Transmission Line	1,493	2030	1	$1,812	18	1	1	1	1	1	1
DELTA	LIVESTOCK	Drill New Wells (Nacatoch, Sulphur))	262	2020	1	$1,134	1	1	1	1	1	1	1
FRANKLIN	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Cypress)	805	2020	1	$111	1	1	1	1	1	1	1
FRANKLIN	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Sulphur)	1,129	2020	1	$111	1	1	1	1	1	1	1
GREGG	MINING	Drill New Wells (Carrizo-Wilcox, Sabine)	27	2020	1	$370	1	1	0	1	1	1	1
HARRISON	HARLETON WSC	Increase Existing Contract (NETMWD)	230	2020	1	$652	N/A	1	N/A	1	1	1	1
HARRISON	IRRIGATION	Drill New Wells (Queen City, Cypress)	484	2020	1	$120	1	1	1	1	1	1	1
HARRISON	IRRIGATION	Drill New Wells (Queen City, Sabine)	161	2020	1	$118	1	1	1	1	1	1	1

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Region D 2021 - North East Texas Regional Water Plan
Summary of Evaluation of Recommended Water Management Strategies

County	Entity	Strategy	Quantity (Ac-Ft/Yr)	Start Decade	Reliability	Cost ($/Ac-Ft)	Impacts of Strategy on:					Key Water Quality Parameters	Political Feasibility
							Environmental Factors	Env. Factors	Agricultural Resources/ Rural Areas	Agricultural Resources/ Rural Areas	Other Natural Resources		
			#		*(1-5)	$	(Acres)	**(1-5)	(Acres)	**(1-5)	**(1-5)	**(1-5)	**(1-5)
HARRISON	LEIGH WSC	Drill New Wells (Queen City, Cypress)	162	2040	1	$981	1	1	0	1	1	1	1
HARRISON	MINING	Drill New Wells (Queen City, Cypress)	332	2020	1	$117	1	1	0	1	1	1	1
HARRISON	MINING	Drill New Wells (Queen City, Sabine)	1,452	2020	1	$126	1	1	0	1	1	1	1
HARRISON	NORTH HARRISON WSC	Drill New Wells (Queen City, Cypress)	54	2060	1	$926	1	1	0	1	1	1	1
HARRISON	PANOLA-BETHANY WSC	Drill New Wells (Queen City, Sabine)	324	2030	1	$602	1	1	0	1	1	1	1
HARRISON	SCOTTSVILLE	Drill New Wells (Queen City, Cypress)	162	2020	1	$716	1	1	0	1	1	1	1
HARRISON	WASKOM	Drill New Wells (Queen City, Cypress)	324	2020	1	$602	1	1	0	1	1	1	1
HOPKINS	BRINKER WSC	Increase Existing Contract (Sulphur Springs)	83	2050	1	$1,145	N/A	1	N/A	1	1	1	1
HOPKINS	CUMBY	Drill New Wells (Nacatoch, Sabine)	88	2020	1	$1,614	2	1	0	1	1	1	1
HOPKINS	IRRIGATION	Drill New Wells (Carrizo-Wilcox, Sabine)	931	2040	1	$803	5	1	5	1	1	1	1
HOPKINS	IRRIGATION	Drill New Wells (Carrizo-Wilcox, Sulphur)	4,627	2020	1	$759	15	1	12	2	1	1	1
HOPKINS	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Sulphur)	1,219	2020	1	$979	18	1	6	1	1	1	1
HOPKINS	MARTIN SPRINGS WSC	Increase Existing Contract (Sulphur Springs)	29	2070	1	$1,172	N/A	1	N/A	1	1	1	1
HOPKINS	MILLER GROVE WSC	Drill New Wells (Carrizo-Wilcox, Sulphur)	52	2020	1	$2,173	2	1	0	1	1	1	1
HOPKINS	MINING	Drill New Wells (Carrizo-Wilcox, Sulphur)	639	2020	1	$983	10	1	0	1	1	1	1
HUNT	B H P WSC	Advanced Water Conservation	3	2030	1	$770	N/A	1	N/A	1	1	1	1
HUNT	B H P WSC	Increase Existing Contract (Royse City)	502	2020	1	$500	N/A	1	N/A	1	1	1	1
HUNT	CADDO BASIN SUD	Advanced Water Conservation	18	2020	1	$770	N/A	1	N/A	1	1	1	1
HUNT	CADDO BASIN SUD	Increase Existing Contract (NTMWD)	1,848	2020	1	$228	N/A	1	N/A	1	1	1	1
HUNT	CADDO MILLS	Increase Existing Contract (Greenville)	254	2030	1	$882	N/A	1	N/A	1	1	1	1
HUNT	CASH SUD	Advanced Water Conservation	18	2020	1	$770	N/A	1	N/A	1	1	1	1
HUNT	CASH SUD	Increase Existing Contract (NTMWD)	881	2040	1		N/A	1	N/A	1	1	1	1
HUNT	CELESTE	Drill New Wells (Woodbine, Trinity)	229	2020	1	$1,275	4	1	0	1	1	1	1
HUNT	CELESTE	Treated Water Pipeline and New Contract (Greenv	87	2070	1	$3,920	34	1	1	1	1	1	1
HUNT	COUNTY-OTHER	Increase Existing Contract (Greenville)	3,834	2060	1	$883	N/A	1	N/A	1	1	1	1
HUNT	GREENVILLE	Voluntary Reallocation (Hunt Manuf)	455	2070	1	$0	N/A	1	N/A	1	1	1	1
HUNT	GREENVILLE	Advanced Water Conservation	9,741	2020	1	$681	N/A	1	N/A	1	1	1	1
HUNT	GREENVILLE	WTP Expansion	9,335	2020	1	$569	8	1	1	1	1	1	1
HUNT	GREENVILLE	New WTP	9,335	2070	1	$529	8	1	1	1	1	1	1
HUNT	HICKORY CREEK SUD	Greenville Tie-in Pipeline	2,095	2020	1	$1,239	22	1	0	1	1	1	1
HUNT	IRRIGATION	Drill New Wells (Nacatoch Aquifer, Sabine)	230	2020	1	$983	5	1	5	1	1	1	1
HUNT	LIVESTOCK	Drill New Wells (Trinity Aquifer, Sabine)	2	2020	1	$16,500	1	1	1	1	1	1	1
HUNT	MINING	Drill New Wells (Trinity Aquifer, Sabine)	73	2020	1	$1,384	2	1	0	1	1	1	1
HUNT	NORTH HUNT SUD	Drill New Wells (Nacatoch Aquifer, Sabine)	888	2020	1	$1,642	28	1	14	2	1	1	2
HUNT	POETRY WSC	Advanced Water Conservation	7	2020	1	$770	N/A	1	N/A	1	1	1	1
HUNT	POETRY WSC	Increase Existing Contract (NTMWD)	503	2030	1		N/A	1	N/A	1	1	1	1
HUNT	WOLFE CITY	Greenville Tie-in Pipeline	308	2050	1	$2,747	44	1	3	1	1	1	1
LAMAR	COUNTY-OTHER	Increase Existing Contract (Lamar County WSD)	244	2020	1	$1,631	N/A	1	N/A	1	1	1	1

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Region D 2021 - North East Texas Regional Water Plan
Summary of Evaluation of Recommended Water Management Strategies

County	Entity	Strategy	Quantity (Ac-Ft/Yr)	Start Decade	Reliability	Cost ($/Ac-Ft)	Impacts of Strategy on:					Key Water Quality Parameters	Political Feasibility
							Environmental Factors	Env. Factors	Agricultural Resources/ Rural Areas	Agricultural Resources/ Rural Areas	Other Natural Resources		
			#		*(1-5)	$	(Acres)	**(1-5)	(Acres)	**(1-5)	**(1-5)	**(1-5)	**(1-5)
LAMAR	IRRIGATION	Pat Mayse Raw Water Pipeline (Paris)	1,468	2020	1	$897	50	1	8	1	1	1	1
LAMAR	LIVESTOCK	Water Pipeline (Lamar County WSD)	617	2020	1	$3,626	50	1	6	1	1	1	1
MARION	MINING	Drill New Wells (Queen City, Cypress)	645	121	1	$121	1	1	1	1	1	1	1
MORRIS	LIVESTOCK	Local Supply	60	2020	1	$0	N/A	1	N/A	1	1	1	1
MORRIS	LIVESTOCK	Drill New Wells (Queen City, Sulphur)	483	2020	1	$97	1	1	1	1	1	1	1
MORRIS	LIVESTOCK	Drill New Wells (Queen City, Cypress)	644	2020	1	$121	1	1	1	1	1	1	1
RAINS	MANUFACTURING	Advanced Water Conservation	1	2020	1	$0	N/A	1	N/A	1	1	1	1
RED RIVER	CLARKSVILLE	Wright Patman Pipeline (Riverbend WRD)	237	2020	1	$3,865	70	2	0	1	1	1	3
RED RIVER	IRRIGATION	Drill New Wells (Nacatoch, Sulphur)	2,057	2020	1	$790	1	1	1	1	1	1	1
RED RIVER	LIVESTOCK	Drill New Wells (Blossom, Red)	11	2020	1	$3,636	1	1	1	1	1	1	1
RED RIVER	LIVESTOCK	Drill New Wells (Trinity Aquifer, Sulphur)	174	2020	1	$1,207	5	1	1	1	1	1	1
SMITH	CRYSTAL SYSTEMS INC	Drill New Wells (Carrizo-Wilcox, Sabine)	538	2040	1	$429	1	1	0	1	1	1	1
SMITH	CRYSTAL SYSTEMS INC	Drill New Wells (Carrizo-Wilcox, Neches)	538	2040	1	$429	1	1	0	1	1	1	1
SMITH	LINDALE	Drill New Wells (Carrizo-Wilcox, Sabine)	1,932	2020	1	$370	18	1	6	1	1	1	1
SMITH	SMITH COUNTY MUD 1	Drill New Wells (Queen City, Sabine)	648	2040	1	$537	1	1	0	1	1	1	1
SMITH	STAR MOUNTAIN WSC	Drill New Wells (Queen City, Sabine)	216	2020	1	$611	1	1	0	1	1	1	1
SMITH	STARRVILLE-FRIENDSHIP WSC	Drill New Wells (Carrizo-Wilcox, Sabine)	108	2060	1	$574	1	1	0	1	1	1	1
SMITH	WINONA	Drill New Wells (Carrizo-Wilcox, Sabine)	108	2050	1	$611	1	1	0	1	1	1	1
TITUS	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Cypress)	560	2020	1	$886	1	1	0	1	1	1	1
TITUS	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Sulphur)	1,664	2020	1	$819	1	1	0	1	1	1	1
TITUS	MANUFACTURING	Advanced Water Conservation	415	2030	1	$0	N/A	1	N/A	1	1	1	1
TITUS	MANUFACTURING	Increase Existing Contract (Mount Pleasant)	1,279	2030	1	$782	N/A	1	N/A	1	1	1	1
TITUS	STEAM ELECTRIC POWER	Increase Existing Contract (NETMWD, Lake O' The	28,811	2020	1	$100	N/A	1	N/A	1	1	1	1
TITUS	STEAM ELECTRIC POWER	Increase Existing Contract (NETMWD; Bob Sandlin	6,119	2020	1	$100	N/A	1	N/A	1	1	1	1
UPSHUR	GILMER	Drill New Wells (Carrizo-Wilcox, Cypress)	216	2030	1	$319	1	1	0	1	1	1	1
UPSHUR	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Cypress)	161	2020	1	$106	1	1	0	1	1	1	1
UPSHUR	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Sabine)	161	2020	1	$106	1	1	0	1	1	1	1
UPSHUR	MANUFACTURING	Drill New Wells (Carrizo-Wilcox, Cypress)	161	2020	1	$106	1	1	0	1	1	1	1
VAN ZANDT	CANTON	Drill New Wells (Carrizo-Wilcox, Sabine)	100	2020	1	$1,420	1	1	0	1	1	1	1
VAN ZANDT	CANTON	Indirect Reuse	323	2020	1	$3,291	81	2	46	3	1	1	2
VAN ZANDT	EDOM WSC	Drill New Wells (Carrizo-Wilcox, Neches)	64	2020	1	$2,125	3	1	1	1	1	1	1
VAN ZANDT	IRRIGATION	Drill New Wells (Queen City, Neches)	227	2020	1	$1,137	6	1	6	1	1	1	1
VAN ZANDT	LITTLE HOPE MOORE WSC	Drill New Wells (Carrizo-Wilcox, Neches)	17	2050	1	$2,588	1	1	0	1	1	1	1

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Region D 2021 - North East Texas Regional Water Plan

Summary of Evaluation of Recommended Water Management Strategies

County	Entity	Strategy	Quantity (Ac-Ft/Yr)	Start Decade	Reliability	Cost ($/Ac-Ft)	Impacts of Strategy on:					Key Water Quality Parameters	Political Feasibility
							Environmental Factors	Env. Factors	Agricultural Resources/ Rural Areas	Agricultural Resources/ Rural Areas	Other Natural Resources		
			#		*(1-5)	$	(Acres)	**(1-5)	(Acres)	**(1-5)	**(1-5)	**(1-5)	**(1-5)
VAN ZANDT	MANUFACTURING	Advanced Water Conservation	75	2030	1	$0	N/A	1	N/A	1	1	1	1
VAN ZANDT	MANUFACTURING	Drill New Wells (Carrizo-Wilcox, Trinity)	207	2030	1	$1,106	1	1	0	1	1	1	1
VAN ZANDT	MANUFACTURING	Increase Existing Contract (Grand Saline)	72	2070	1	$2,806	N/A	1	N/A	1	1	1	1
VAN ZANDT	MANUFACTURING	Increase Existing Contract (Golden WSC)	62	2050	1	$1,304	N/A	1	N/A	1	1	1	1
VAN ZANDT	R P M WSC	Drill New Wells (Carrizo-Wilcox, Neches)	217	2030	1	$1,945	12	1	4	1	1	1	1
WOOD	LIVESTOCK	Local Supply	34	2020	1	$0	N/A	1	N/A	1	1	1	1
WOOD	LIVESTOCK	Drill New Wells (Queen City, Sabine)	1,129	2020	1	$111	1	1	1	1	1	1	1
WOOD	MANUFACTURING	Drill New Wells (Queen City, Sabine)	1,610	2020	1	$78	1	1	0	1	1	1	1

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Region D 2021 - North East Texas Regional Water Plan
Summary of Environmental Assessment of Recommended Water Management Strategies

County	Entity	Strategy		Environmental Factors									
			Total Acres Impacted	Total Acres Impacted	Wetland Acres	Wetland Acres	Envir Water Needs	Habitat	Threat and Endangered Species	Cultural Resources	Bays & Estuaries	Envir Water Quality	Overall Environmental Impacts
			(Acres)	(1-5)	(Acres)	(1-5)	(1-5)	(1-5)	#	(1-5)	(1-5)	(1-5)	(1-5)
BOWIE	BURNS REDBANK WSC	Renew Existing Contract (Hooks)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	CENTRAL BOWIE COUNTY WSC	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	DE KALB	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	HOOKS	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	IRRIGATION	Drill New Wells (Carrizo-Wilcox, Sulphur)	17	2	0	1	1	1	15	1	N/A	1	1
BOWIE	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Sulphur)	6	1	0	1	1	1	15	1	N/A	1	1
BOWIE	LIVESTOCK	Drill New Wells (Nacatoch, Red)	7	1	0	1	1	1	15	1	N/A	1	1
BOWIE	MACEDONIA-EYLAU MUD #1	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	MANUFACTURING BOWIE	Advanced Water Conservation	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	MANUFACTURING BOWIE	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	MAUD	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	NASH	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	NEW BOSTON	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	REDWATER	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	TEXARKANA	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
BOWIE	RIVERBEND WRD	Riverbend WMS	46	3	2	1	1	2	15	2	N/A	1	1
BOWIE	WAKE VILLAGE	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
CAMP	LIVESTOCK	Drill New Wells (Queen City, Cypress)	1	1	0	1	1	1	12	1	N/A	1	1
CASS	ATLANTA	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	17	1	N/A	1	1
CASS	COUNTY-OTHER	Drill New Wells (Carrizo-Wilcox, Cypress)	1	1	0	1	1	1	17	1	N/A	1	1
CASS	COUNTY-OTHER	Drill New Wells (Carrizo-Wilcox, Sulphur)	1	1	0	1	1	1	17	1	N/A	1	1
CASS	COUNTY-OTHER	Renew Existing Contract (Riverbend WRD)	N/A	1	N/A	1	1	1	17	1	N/A	1	1
CASS	HOLLY SPRINGS WSC	Increase Existing Contract (NETMWD)	N/A	1	N/A	1	1	1	17	1	N/A	1	1
CASS	LIVESTOCK	Drill New Wells (Queen City, Cypress)	1	1	0	1	1	1	17	1	N/A	1	1
CASS	LIVESTOCK	Drill New Wells (Queen City, Sulphur)	1	1	0	1	1	1	17	1	N/A	1	1
CASS	MANUFACTURING	Voluntary Reallocation Supply for Atlanta	N/A	1	N/A	1	1	1	17	1	N/A	1	1
CASS	MANUFACTURING	Voluntary Reallocation Supply for Cass County-Oth	N/A	1	N/A	1	1	1	17	1	N/A	1	1
CASS	RIVERBEND WRD	New 2.5 MGD Package WTP and Transmission Line	18	2	2	1	1	2	17	2	N/A	1	1
DELTA	LIVESTOCK	Drill New Wells (Nacatoch, Sulphur))	1	1	0	1	1	1	10	1	N/A	1	1
FRANKLIN	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Cypress)	1	1	0	1	1	1	14	1	N/A	1	1
FRANKLIN	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Sulphur)	1	1	0	1	1	1	14	1	N/A	1	1
GREGG	MINING	Drill New Wells (Carrizo-Wilcox, Sabine)	1	1	0	1	1	1	20	1	N/A	1	1
HARRISON	HARLETON WSC	Increase Existing Contract (NETMWD)	N/A	1	N/A	1	1	1	24	1	N/A	1	1
HARRISON	IRRIGATION	Drill New Wells (Queen City, Cypress)	1	1	0	1	1	1	24	1	N/A	1	1
HARRISON	IRRIGATION	Drill New Wells (Queen City, Sabine)	1	1	0	1	1	1	24	1	N/A	1	1
HARRISON	LEIGH WSC	Drill New Wells (Queen City, Cypress)	1	1	0	1	1	1	24	1	N/A	1	1
HARRISON	MINING	Drill New Wells (Queen City, Cypress)	1	1	0	1	1	1	24	1	N/A	1	1
HARRISON	MINING	Drill New Wells (Queen City, Sabine)	1	1	0	1	1	1	24	1	N/A	1	1
HARRISON	NORTH HARRISON WSC	Drill New Wells (Queen City, Cypress)	1	1	0	1	1	1	24	1	N/A	1	1

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Region D 2021 - North East Texas Regional Water Plan
Summary of Environmental Assessment of Recommended Water Management Strategies

County	Entity	Strategy		Environmental Factors									
			Total Acres Impacted	Total Acres Impacted	Wetland Acres	Wetland Acres	Envir Water Needs	Habitat	Threat and Endangered Species	Cultural Resources	Bays & Estuaries	Envir Water Quality	Overall Environmental Impacts
			(Acres)	(1-5)	(Acres)	(1-5)	(1-5)	(1-5)	#	(1-5)	(1-5)	(1-5)	(1-5)
HARRISON	PANOLA-BETHANY WSC	Drill New Wells (Queen City, Sabine)	1	1	0	1	1	1	24	1	N/A	1	1
HARRISON	SCOTTSVILLE	Drill New Wells (Queen City, Cypress)	1	1	0	1	1	1	24	1	N/A	1	1
HARRISON	WASKOM	Drill New Wells (Queen City, Cypress)	1	1	0	1	1	1	24	1	N/A	1	1
HOPKINS	BRINKER WSC	Increase Existing Contract (Sulphur Springs)	N/A	1	N/A	1	1	1	12	1	N/A	1	1
HOPKINS	CUMBY	Drill New Wells (Nacatoch, Sabine)	2	1	0	1	1	1	12	1	N/A	1	1
HOPKINS	IRRIGATION	Drill New Wells (Carrizo-Wilcox, Sabine)	5	1	0	1	1	1	12	1	N/A	1	1
HOPKINS	IRRIGATION	Drill New Wells (Carrizo-Wilcox, Sulphur)	15	2	0	1	1	1	12	1	N/A	1	1
HOPKINS	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Sulphur)	18	2	0	1	1	1	12	1	N/A	1	1
HOPKINS	MARTIN SPRINGS WSC	Increase Existing Contract (Sulphur Springs)	N/A	1	N/A	1	1	1	12	1	N/A	1	1
HOPKINS	MILLER GROVE WSC	Drill New Wells (Carrizo-Wilcox, Sulphur)	2	1	0	1	1	1	12	1	N/A	1	1
HOPKINS	MINING	Drill New Wells (Carrizo-Wilcox, Sulphur)	10	1	0	1	1	1	12	1	N/A	1	1
HUNT	B H P WSC	Advanced Water Conservation	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	B H P WSC	Increase Existing Contract (Royse City)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	CADDO BASIN SUD	Advanced Water Conservation	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	CADDO BASIN SUD	Increase Existing Contract (NTMWD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	CADDO MILLS	Increase Existing Contract (Greenville)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	CASH SUD	Advanced Water Conservation	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	CASH SUD	Increase Existing Contract (NTMWD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	CELESTE	Drill New Wells (Woodbine, Trinity)	4	1	0	1	1	1	15	1	N/A	1	1
HUNT	CELESTE	Treated Water Pipeline and New Contract (Greenv	34	3	0	1	1	1	15	1	N/A	1	1
HUNT	COUNTY-OTHER	Increase Existing Contract (Greenville)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	GREENVILLE	Voluntary Reallocation (Hunt Manuf)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	GREENVILLE	Advanced Water Conservation	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	GREENVILLE	WTP Expansion	8	1	0	1	1	2	15	2	N/A	1	1
HUNT	GREENVILLE	New WTP	8	1	0	1	1	2	15	2	N/A	1	1
HUNT	HICKORY CREEK SUD	Greenville Tie-in Pipeline	22	3	0	1	1	1	15	1	N/A	1	1
HUNT	IRRIGATION	Drill New Wells (Nacatoch Aquifer, Sabine)	5	1	0	1	1	1	15	1	N/A	1	1
HUNT	LIVESTOCK	Drill New Wells (Trinity Aquifer, Sabine)	1	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	MINING	Drill New Wells (Trinity Aquifer, Sabine)	2	1	0	1	1	1	15	1	N/A	1	1
HUNT	NORTH HUNT SUD	Drill New Wells (Nacatoch Aquifer, Sabine)	28	3	0	1	1	2	15	2	N/A	1	1
HUNT	POETRY WSC	Advanced Water Conservation	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	POETRY WSC	Increase Existing Contract (NTMWD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
HUNT	WOLFE CITY	Greenville Tie-in Pipeline	44	3	0	1	1	1	15	1	N/A	1	1
LAMAR	COUNTY-OTHER	Increase Existing Contract (Lamar County WSD)	N/A	1	N/A	1	1	1	15	1	N/A	1	1
LAMAR	IRRIGATION	Pat Mayse Raw Water Pipeline (Paris)	50	3	0	1	1	2	15	2	N/A	1	1
LAMAR	LIVESTOCK	Water Pipeline (Lamar County WSD)	50	3	0	1	1	2	15	2	N/A	1	1
MARION	MINING	Drill New Wells (Queen City, Cypress)	1	1	0	1	1	1	16	1	N/A	1	1
MORRIS	LIVESTOCK	Local Supply	N/A	1	N/A	1	1	1	14	1	N/A	1	1
MORRIS	LIVESTOCK	Drill New Wells (Queen City, Sulphur)	1	1	0	1	1	1	14	1	N/A	1	1
MORRIS	LIVESTOCK	Drill New Wells (Queen City, Cypress)	1	1	0	1	1	1	14	1	N/A	1	1

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Region D 2021 - North East Texas Regional Water Plan
Summary of Environmental Assessment of Recommended Water Management Strategies

County	Entity	Strategy		Environmental Factors									
			Total Acres Impacted	Total Acres Impacted	Wetland Acres	Wetland Acres	Envir Water Needs	Habitat	Threat and Endangered Species	Cultural Resources	Bays & Estuaries	Envir Water Quality	Overall Environmental Impacts
			(Acres)	(1-5)	(Acres)	(1-5)	(1-5)	(1-5)	#	(1-5)	(1-5)	(1-5)	(1-5)
RAINS	MANUFACTURING	Advanced Water Conservation	N/A	1	N/A	1	1	1	15	1	N/A	1	1
RED RIVER	CLARKSVILLE	Wright Patman Pipeline (Riverbend WRD)	70	4	1	1	1	2	16	2	N/A	1	2
RED RIVER	IRRIGATION	Drill New Wells (Nacatoch, Sulphur)	1	1	0	1	1	1	16	1	N/A	1	1
RED RIVER	LIVESTOCK	Drill New Wells (Blossom, Red)	1	1	0	1	1	1	16	1	N/A	1	1
RED RIVER	LIVESTOCK	Drill New Wells (Trinity Aquifer, Sulphur)	5	1	0	1	1	1	16	1	N/A	1	1
SMITH	CRYSTAL SYSTEMS INC	Drill New Wells (Carrizo-Wilcox, Sabine)	1	1	0	1	1	1	18	1	N/A	1	1
SMITH	CRYSTAL SYSTEMS INC	Drill New Wells (Carrizo-Wilcox, Neches)	1	1	0	1	1	1	18	1	N/A	1	1
SMITH	LINDALE	Drill New Wells (Carrizo-Wilcox, Sabine)	18	2	0	1	1	1	18	1	N/A	1	1
SMITH	SMITH COUNTY MUD 1	Drill New Wells (Queen City, Sabine)	1	1	0	1	1	1	18	1	N/A	1	1
SMITH	STAR MOUNTAIN WSC	Drill New Wells (Queen City, Sabine)	1	1	0	1	1	1	18	1	N/A	1	1
SMITH	STARRVILLE-FRIENDSHIP WSC	Drill New Wells (Carrizo-Wilcox, Sabine)	1	1	0	1	1	1	18	1	N/A	1	1
SMITH	WINONA	Drill New Wells (Carrizo-Wilcox, Sabine)	1	1	0	1	1	1	18	1	N/A	1	1
TITUS	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Cypress)	1	1	0	1	1	1	14	1	N/A	1	1
TITUS	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Sulphur)	1	1	0	1	1	1	14	1	N/A	1	1
TITUS	MANUFACTURING	Advanced Water Conservation	N/A	1	N/A	1	1	1	14	1	N/A	1	1
TITUS	MANUFACTURING	Increase Existing Contract (Mount Pleasant)	N/A	1	N/A	1	1	1	14	1	N/A	1	1
TITUS	STEAM ELECTRIC POWER	Increase Existing Contract (NETMWD, Lake O' The	N/A	1	N/A	1	1	1	14	1	N/A	1	1
TITUS	STEAM ELECTRIC POWER	Increase Existing Contract (NETMWD; Bob Sandlin)	N/A	1	N/A	1	1	1	14	1	N/A	1	1
UPSHUR	GILMER	Drill New Wells (Carrizo-Wilcox, Cypress)	1	1	0	1	1	1	18	1	N/A	1	1
UPSHUR	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Cypress)	1	1	0	1	1	1	18	1	N/A	1	1
UPSHUR	LIVESTOCK	Drill New Wells (Carrizo-Wilcox, Sabine)	1	1	0	1	1	1	18	1	N/A	1	1
UPSHUR	MANUFACTURING	Drill New Wells (Carrizo-Wilcox, Cypress)	1	1	0	1	1	1	18	1	N/A	1	1
VAN ZANDT	CANTON	Drill New Wells (Carrizo-Wilcox, Sabine)	1	1	0	1	1	1	17	1	N/A	1	1
VAN ZANDT	CANTON	Indirect Reuse	81	4	2	1	1	1	17	1	N/A	1	2
VAN ZANDT	EDOM WSC	Drill New Wells (Carrizo-Wilcox, Neches)	3	1	0	1	1	1	17	1	N/A	1	1
VAN ZANDT	IRRIGATION	Drill New Wells (Queen City, Neches)	6	1	0	1	1	1	17	1	N/A	1	1
VAN ZANDT	LITTLE HOPE MOORE WSC	Drill New Wells (Carrizo-Wilcox, Neches)	1	1	0	1	1	1	17	1	N/A	1	1
VAN ZANDT	MANUFACTURING	Advanced Water Conservation	N/A	1	N/A	1	1	1	17	1	N/A	1	1
VAN ZANDT	MANUFACTURING	Drill New Wells (Carrizo-Wilcox, Trinity)	1	1	0	1	1	1	17	1	N/A	1	1
VAN ZANDT	MANUFACTURING	Increase Existing Contract (Grand Saline)	N/A	1	N/A	1	1	1	17	1	N/A	1	1
VAN ZANDT	MANUFACTURING	Increase Existing Contract (Golden WSC)	N/A	1	N/A	1	1	1	17	1	N/A	1	1
VAN ZANDT	R P M WSC	Drill New Wells (Carrizo-Wilcox, Neches)	12	2	0	1	1	1	17	1	N/A	1	1
WOOD	LIVESTOCK	Local Supply	N/A	1	N/A	1	1	1	20	1	N/A	1	1
WOOD	LIVESTOCK	Drill New Wells (Queen City, Sabine)	1	1	0	1	1	1	20	1	N/A	1	1
WOOD	MANUFACTURING	Drill New Wells (Queen City, Sabine)	1	1	0	1	1	1	20	1	N/A	1	1

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Region D 2021 - North East Texas Regional Water Plan
Summary of Evaluation of Alternative Water Management Strategies

County	Entity	Strategy	Quantity (Ac-Ft/Yr)	Start Decade	Reliability	Cost ($/Ac-Ft)	Impacts of Strategy on:					Key Water Quality Parameters	Political Feasibility
							Environmental Factors	Environmental Factors	Agricultural Resources/ Rural Areas	Agricultural Resources/ Rural Areas	Other Natural Resources		
			#		*(1-5)	$	(acres)	**(1-5)	(acres)	**(1-5)	**(1-5)	**(1-5)	**(1-5)
CASS	MANUFACTURING CASS	VOLUNTARY REALLOCATION (QUEEN CITY)	251	2030	1	$0	0	1	0	1	1	1	1
CASS	QUEEN CITY	NEW CONTRACT	251	2030	1	$482	0	1	0	1	1	1	1
HOPKINS	BRINKER WSC	Drill New Wells (Carrizo-Wilcox, Sulphur)	83	2050	1	$2,108	4	1	1	1	1	1	1
HOPKINS	BRINKER WSC	Wood County Pipeline	83	2050	1	$4,983	35	2	15	2	1	1	3
HOPKINS	CUMBY	Wood County Pipeline	88	2020	1	$5,865	35	2	16	2	1	1	3
HOPKINS	IRRIGATION	Wood County Pipeline	4,627	2020	1	$1,501	35	2	15	2	1	1	3
HOPKINS	LIVESTOCK	Wood County Pipeline	1,219	2020	1	$1,501	35	2	15	2	1	1	3
HOPKINS	MARTIN SPRINGS WSC	Wood County Pipeline	29	2070	1	$5,777	35	2	15	2	1	1	3
HOPKINS	MILLER GROVE WSC	Wood County Pipeline	52	2020	1	$3,905	35	2	16	2	1	1	3
HOPKINS	MINING HOPKINS	Wood County Pipeline	639	2020	1	$1,501	35	2	15	2	1	1	3
HUNT	B H P WSC	Wood County Pipeline	505	2020	1	$1,493	35	2	17	2	1	1	3
HUNT	CADDO BASIN SUD	Wood County Pipeline	1,866	2020	1	$1,493	35	2	17	2	1	1	3
HUNT	CADDO MILLS	Wood County Pipeline	254	2030	1	$1,493	35	2	17	2	1	1	3
HUNT	CASH SUD	Wood County Pipeline	895	2040	1	$1,286	35	2	19	2	1	1	3
HUNT	CELESTE	Wood County Pipeline	316	2020	1	$1,718	35	2	16	2	1	1	3
HUNT	COUNTY-OTHER, HUNT	Wood County Pipeline	3,834	2050	1	$1,286	35	2	19	2	1	1	3
HUNT	GREENVILLE	Wood County Pipeline	6,491	2020	1	$1,286	35	2	19	2	1	1	3
HUNT	HICKORY CREEK SUD	Wood County Pipeline	2,095	2020	1	$1,718	35	2	16	2	1	1	3
HUNT	MINING HUNT	Wood County Pipeline	73	2020	1	$1,286	35	2	19	2	1	1	3
HUNT	NORTH HUNT SUD	Wood County Pipeline	888	2020	1	$1,922	35	2	17	2	1	1	3
HUNT	POETRY WSC	Wood County Pipeline	510	2030	1	$1,286	35	2	19	2	1	1	3
HUNT	WOLFE CITY	Wood County Pipeline	308	2050	1	$4,033	35	2	16	2	1	1	3
RED RIVER	CLARKSVILLE	Pat Mayse Pipeline Treated Water (Contract w/ Lamar WSD)	303	2040	1	$4,993	93	2	29	3	1	1	3
RED RIVER	CLARKSVILLE	Dimple Reservoir	303	2040	1	$757	1,891	5	1,734	5	1	1	5
RED RIVER	CLARKSVILLE	Drill New Wells (Nacatoch, Sulphur) and RO Treatment	388	2040	1	$2,058	25	2	1	1	1	3	3
VAN ZANDT	CANTON	Grand Saline Reservoir	1,810	2020	1	$3,087	1,935	5	1,748	5	1	1	3
VAN ZANDT	MANUFACTURING VAN ZANDT	Wood County Pipeline	429	2030	1	$2,995	35	2	18	2	1	1	3
WOOD	LIVESTOCK WOOD	Wood County Pipeline	1,132	2020	1	$739	35	2	19	2	1	1	3
WOOD	MANUFACTURING WOOD	Wood County Pipeline	1,583	2020	1	$739	35	2	19	2	1	1	3

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County	Entity	Strategy	Environmental Factors										
			Total Acres Impacted	Total Acres Impacted	Wetland Acres	Wetland Acres	Envir Water Needs	Habitat	Threatened and Endangered Species	Cultural Resources	Bays & Estuaries	Envir Water Quality	Overall Environmental Impacts
			(Acres)	(1-5)	(Acres)	(1-5)	(1-5)	(1-5)	#	(1-5)	(1-5)	(1-5)	(1-5)
CASS	MANUFACTURING CASS	VOLUNTARY REALLOCATION (QUEEN CITY)	N/A	1	N/A	1	1	1	17	1	N/A	1	1
CASS	QUEEN CITY	NEW CONTRACT	N/A	1	N/A	1	1	1	17	1	N/A	1	1
HOPKINS	BRINKER WSC	Drill New Wells (Carrizo-Wilcox, Sulphur)	4	1	N/A	1	1	1	12	1	N/A	1	1
HOPKINS	BRINKER WSC	Wood County Pipeline	35	3	7	1	1	1	12	1	N/A	1	2
HOPKINS	CUMBY	Wood County Pipeline	35	3	7	1	1	1	12	1	N/A	1	2
HOPKINS	IRRIGATION	Wood County Pipeline	35	3	6	1	1	1	12	1	N/A	1	2
HOPKINS	LIVESTOCK	Wood County Pipeline	35	3	6	1	1	1	12	1	N/A	1	2
HOPKINS	MARTIN SPRINGS WSC	Wood County Pipeline	35	3	6	1	1	1	12	1	N/A	1	2
HOPKINS	MILLER GROVE WSC	Wood County Pipeline	35	3	7	1	1	1	12	1	N/A	1	2
HOPKINS	MINING HOPKINS	Wood County Pipeline	35	3	6	1	1	1	12	1	N/A	1	2
HUNT	B H P WSC	Wood County Pipeline	35	3	7	1	1	1	15	1	N/A	1	2
HUNT	CADDO BASIN SUD	Wood County Pipeline	35	3	7	1	1	1	15	1	N/A	1	2
HUNT	CADDO MILLS	Wood County Pipeline	35	3	7	1	1	1	15	1	N/A	1	2
HUNT	CASH SUD	Wood County Pipeline	35	3	7	1	1	1	15	1	N/A	1	2
HUNT	CELESTE	Wood County Pipeline	35	3	10	1	1	1	15	1	N/A	1	2
HUNT	COUNTY-OTHER, HUNT	Wood County Pipeline	35	3	7	1	1	1	15	1	N/A	1	2
HUNT	GREENVILLE	Wood County Pipeline	35	3	7	1	1	1	15	1	N/A	1	2
HUNT	HICKORY CREEK SUD	Wood County Pipeline	35	3	10	1	1	1	15	1	N/A	1	2
HUNT	MINING HUNT	Wood County Pipeline	35	3	7	1	1	1	15	1	N/A	1	2
HUNT	NORTH HUNT SUD	Wood County Pipeline	35	3	8	1	1	1	15	1	N/A	1	2
HUNT	POETRY WSC	Wood County Pipeline	35	3	7	1	1	1	15	1	N/A	1	2
HUNT	WOLFE CITY	Wood County Pipeline	35	3	9	1	1	1	15	1	N/A	1	2
RED RIVER	CLARKSVILLE	Pat Mayse Pipeline Treated Water (Contract w/ Lamar WSD)	93	4	3	1	1	1	16	1	N/A	1	2
RED RIVER	CLARKSVILLE	Dimple Reservoir	1,891	5	381	5	1	1	16	1	N/A	1	5
RED RIVER	CLARKSVILLE	Drill New Wells (Nacatoch, Sulphur) and RO Treatment	25	3	1	1	1	1	16	1	N/A	1	2
VAN ZANDT	CANTON	Grand Saline Reservoir	1,935	5	303	5	1	1	17	1	N/A	1	5
VAN ZANDT	MANUFACTURING VAN ZANDT	Wood County Pipeline	35	3	8	1	1	1	17	1	N/A	1	2
WOOD	LIVESTOCK WOOD	Wood County Pipeline	35	3	1	1	1	1	20	1	N/A	1	2
WOOD	MANUFACTURING WOOD	Wood County Pipeline	35	3	1	1	1	1	20	1	N/A	1	2

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Socioeconomic Impacts of Projected Water Shortages for the North East Texas (Region D) Regional Water Planning Area

Prepared in Support of the 2021 Region D Regional Water Plan

Dr. John R. Ellis
Water Use, Projections, & Planning Division
Texas Water Development Board

November 2019

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Executive Summary

Evaluating the social and economic impacts of not meeting identified water needs is a required analysis in the regional water planning process. The Texas Water Development Board (TWDB) estimates these impacts for regional water planning groups (RWPGs) and summarizes the impacts in the state water plan. The analysis presented is for the North East Texas Regional Water Planning Group (Region D).

Based on projected water demands and existing water supplies, Region D identified water needs (potential shortages) that could occur within its region under a repeat of the drought of record for six water use categories (irrigation, livestock, manufacturing, mining, municipal and steam-electric power). The TWDB then estimated the annual socioeconomic impacts of those needs—if they are not met—for each water use category and as an aggregate for the region.

This analysis was performed using an economic impact modeling software package, IMPLAN (Impact for Planning Analysis), as well as other economic analysis techniques, and represents a snapshot of socioeconomic impacts that may occur during a single year repeat of the drought of record with the further caveat that no mitigation strategies are implemented. Decade specific impact estimates assume that growth occurs, and future shocks are imposed on an economy at 10-year intervals. The estimates presented are not cumulative (i.e., summing up expected impacts from today up to the decade noted), but are simply snapshots of the estimated annual socioeconomic impacts should a drought of record occur in each particular decade based on anticipated water supplies and demands for that same decade.

For regional economic impacts, income losses and job losses are estimated within each planning decade (2020 through 2070). The income losses represent an approximation of gross domestic product (GDP) that would be foregone if water needs are not met.

The analysis also provides estimates of financial transfer impacts, which include tax losses (state, local, and utility tax collections); water trucking costs; and utility revenue losses. In addition, social impacts are estimated, encompassing lost consumer surplus (a welfare economics measure of consumer wellbeing); as well as population and school enrollment losses.

IMPLAN data reported that Region D generated more than $30 billion in GDP (2018 dollars) and supported more than 393,000 jobs in 2016. The Region D estimated total population was approximately 783,000 in 2016.

It is estimated that not meeting the identified water needs in Region D would result in an annually combined lost income impact of approximately $5.9 billion in 2020, increasing to $6.1 billion in 2070 (Table ES-1). In 2020, the region would lose approximately 46,000 jobs, and by 2070 job losses would increase to approximately 60,000 if anticipated needs are not mitigated.

All impact estimates are in year 2018 dollars and were calculated using a variety of data sources and tools including the use of a region-specific IMPLAN model, data from TWDB annual water use

estimates, the U.S. Census Bureau, Texas Agricultural Statistics Service, and the Texas Municipal League.

Table ES-1 Region D socioeconomic impact summary

Regional Economic Impacts	2020	2030	2040	2050	2060	2070
Income losses ($ millions)*	$5,868	$7,000	$6,602	$6,211	$6,068	$6,148
Job losses	46,069	57,405	55,266	54,160	56,434	59,710
Financial Transfer Impacts	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Tax losses on production and imports ($ millions)*	$445	$548	$500	$454	$440	$450
Water trucking costs ($ millions)*	$92	$94	$97	$101	$105	$114
Utility revenue losses ($ millions)*	$44	$46	$52	$69	$96	$139
Utility tax revenue losses ($ millions)*	$1	$1	$1	$1	$1	$2
Social Impacts	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Consumer surplus losses ($ millions)*	$141	$146	$155	$173	$220	$300
Population losses	8,458	10,540	10,147	9,944	10,361	10,963
School enrollment losses	1,618	2,016	1,941	1,902	1,982	2,097

* Year 2018 dollars, rounded**.** Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

1 Introduction

Water shortages during a repeat of the drought of record would likely curtail or eliminate certain economic activity in businesses and industries that rely heavily on water. Insufficient water supplies could not only have an immediate and real impact on the regional economy in the short term, but they could also adversely and chronically affect economic development in Texas. From a social perspective, water supply reliability is critical as well. Shortages could disrupt activity in homes, schools and government, and could adversely affect public health and safety. For these reasons, it is important to evaluate and understand how water supply shortages during drought could impact communities throughout the state.

As part of the regional water planning process, RWPGs must evaluate the social and economic impacts of not meeting water needs (31 Texas Administrative Code §357.33 (c)). Due to the complexity of the analysis and limited resources of the planning groups, the TWDB has historically performed this analysis for the RWPGs upon their request. Staff of the TWDB's Water Use, Projections, & Planning Division designed and conducted this analysis in support of Region D, and those efforts for this region as well as the other 15 regions allow consistency and a degree of comparability in the approach.

This document summarizes the results of the analysis and discusses the methodology used to generate the results. Section 1 provides a snapshot of the region's economy and summarizes the identified water needs in each water use category, which were calculated based on the RWPG's water supply and demand established during the regional water planning process. Section 2 defines each of ten impact assessment measures used in this analysis. Section 3 describes the methodology for the impact assessment and the approaches and assumptions specific to each water use category (i.e., irrigation, livestock, manufacturing, mining, municipal, and steam-electric power). Section 4 presents the impact estimates for each water use category with results summarized for the region as a whole. Appendix A presents a further breakdown of the socioeconomic impacts by county.

1.1 Regional Economic Summary

The Region D Regional Water Planning Area generated more than $30 billion in gross domestic product (2018 dollars) and supported more than 393,000 jobs in 2016, according to the IMPLAN dataset utilized in this socioeconomic analysis. This activity accounted for nearly 2 percent of the state's total gross domestic product of 1.73 trillion dollars for the year based on IMPLAN. Table 1-1 lists all economic sectors ranked by the total value-added to the economy in Region D. The manufacturing sector (including agribusiness and timber production) generated 18 percent of the region's total value-added and was also a significant source of tax revenue. The top employers in the region were in the public administration, health care, retail trade, and manufacturing sectors. Region D's estimated total population was approximately 783,000 in 2016, close to 3 percent of the state's total.

This represents a snapshot of the regional economy as a whole, and it is important to note that not all economic sectors were included in the TWDB socioeconomic impact analysis. Data

considerations prompted use of only the more water-intensive sectors within the economy because damage estimates could only be calculated for those economic sectors which had both reliable income and water use estimates.

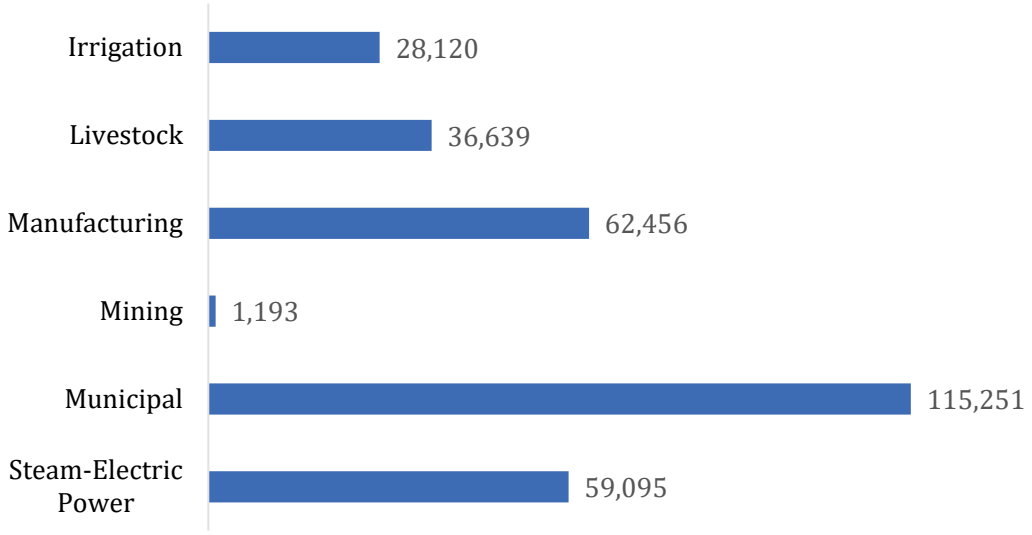
Table 1-1 Region D regional economy by economic sector*

Economic sector	Value-added ($ millions)	Tax ($ millions)	Jobs
Manufacturing	$5,446.6	$240.3	38,589
Public Administration	$3,360.9	$(14.8)	46,555
Real Estate and Rental and Leasing	$2,676.3	$465.8	11,460
Health Care and Social Assistance	$2,136.7	$39.1	42,208
Retail Trade	$2,120.1	$562.8	39,363
Wholesale Trade	$2,105.1	$405.9	13,804
Construction	$1,974.9	$32.3	29,218
Mining, Quarrying, and Oil and Gas Extraction	$1,940.3	$519.4	15,703
Utilities	$1,424.3	$265.9	2,452
Professional, Scientific, and Technical Services	$1,102.8	$38.6	17,643
Accommodation and Food Services	$974.6	$171.6	27,595
Other Services (except Public Administration)	$964.3	$106.9	23,534
Transportation and Warehousing	$922.6	$47.8	13,758
Finance and Insurance	$910.1	$66.8	15,397
Administrative and Support and Waste Management and Remediation Services	$664.1	$28.6	17,688
Agriculture, Forestry, Fishing and Hunting	$539.9	$23.6	24,728
Information	$500.2	$162.6	3,105
Management of Companies and Enterprises	$126.6	$7.2	2,555
Educational Services	$93.7	$6.8	3,988
Arts, Entertainment, and Recreation	$83.7	$25.6	3,793
Grand Total	$30,067.9	$3,202.7	393,138

*Source: 2016 IMPLAN for 536 sectors aggregated by 2-digit NAICS (North American Industry Classification System)

While the manufacturing sector led the region in economic output, the municipal category used the most water in 2016 (38 percent of the region's total). Notably, nearly 13 percent of the state's water use for steam-electric power generation occurred in Region D. Figure 1-1 illustrates Region D's breakdown of the 2016 water use estimates by TWDB water use category.

Figure 1-1 Region D 2016 water use estimates by water use category (in acre-feet)



Source: TWDB Annual Water Use Estimates (all values in acre-feet)

1.2 Identified Regional Water Needs (Potential Shortages)

As part of the regional water planning process, the TWDB adopted water demand projections for water user groups (WUG) in Region D with input from the planning group. WUG-level demand projections were established for utilities that provide more than 100 acre-feet of annual water supply, combined rural areas (designated as county-other), and county-wide water demand projections for five non-municipal categories (irrigation, livestock, manufacturing, mining and steam-electric power). The RWPG then compared demands to the existing water supplies of each WUG to determine potential shortages, or needs, by decade.

Table 1-2 summarizes the region's identified water needs in the event of a repeat of the drought of record. Demand management, such as conservation, or the development of new infrastructure to increase supplies, are water management strategies that may be recommended by the planning group to address those needs. This analysis assumes that no strategies are implemented, and that the identified needs correspond to future water shortages. Note that projected water needs generally increase over time, primarily due to anticipated population growth, economic growth, or declining supplies. To provide a general sense of proportion, total projected needs as an overall percentage of total demand by water use category are also presented in aggregate in Table 1-2. Projected needs for individual water user groups within the aggregate can vary greatly and may reach 100% for a given WUG and water use category. A detailed summary of water needs by WUG and county appears in Chapter 4 of the 2021 Region D Regional Water Plan.

Table 1-2 Regional water needs summary by water use category

Water Use Category		2020	2030	2040	2050	2060	2070
Irrigation	water needs (acre-feet per year)	13,696	13,696	13,696	13,696	13,696	13,696
	% of the category's total water demand	39%	39%	39%	39%	39%	39%
Livestock	water needs (acre-feet per year)	15,005	15,015	15,003	14,918	14,940	14,954
	% of the category's total water demand	42%	42%	42%	42%	42%	43%
Manufacturing	water needs (acre-feet per year)	2,683	5,308	5,159	5,148	5,380	5,489
	% of the category's total water demand	3%	5%	5%	5%	5%	5%
Mining	water needs (acre-feet per year)	2,250	2,138	1,776	1,423	1,113	928
	% of the category's total water demand	32%	28%	23%	20%	16%	14%
Municipal*	water needs (acre-feet per year)	15,034	15,716	17,594	23,230	31,981	45,627
	% of the category's total water demand	12%	11%	12%	14%	18%	22%
Steam-electric power	water needs (acre-feet per year)	30,066	30,866	31,766	32,566	32,814	33,083
	% of the category's total water demand	32%	33%	34%	35%	35%	35%
Total water needs (acre-feet per year)		**78,734**	**82,739**	**84,994**	**90,981**	**99,924**	**113,777**

***** Municipal category consists of residential and non-residential (commercial and institutional) subcategories.

2 Impact Assessment Measures

A required component of the regional and state water plans is to estimate the potential economic and social impacts of potential water shortages during a repeat of the drought of record. Consistent with previous water plans, ten impact measures were estimated and are described in Table 2-1.

Table 2-1 Socioeconomic impact analysis measures

Regional economic impacts	Description
Income losses - value-added	The value of output less the value of intermediate consumption; it is a measure of the contribution to gross domestic product (GDP) made by an individual producer, industry, sector, or group of sectors within a year. Value-added measures used in this report have been adjusted to include the direct, indirect, and induced monetary impacts on the region.
Income losses - electrical power purchase costs	Proxy for income loss in the form of additional costs of power as a result of impacts of water shortages.
Job losses	Number of part-time and full-time jobs lost due to the shortage. These values have been adjusted to include the direct, indirect, and induced employment impacts on the region.
Financial transfer impacts	**Description**
Tax losses on production and imports	Sales and excise taxes not collected due to the shortage, in addition to customs duties, property taxes, motor vehicle licenses, severance taxes, other taxes, and special assessments less subsidies. These values have been adjusted to include the direct, indirect and induced tax impacts on the region.
Water trucking costs	Estimated cost of shipping potable water.
Utility revenue losses	Foregone utility income due to not selling as much water.
Utility tax revenue losses	Foregone miscellaneous gross receipts tax collections.
Social impacts	**Description**
Consumer surplus losses	A welfare measure of the lost value to consumers accompanying restricted water use.
Population losses	Population losses accompanying job losses.
School enrollment losses	School enrollment losses (K-12) accompanying job losses.

2.1 Regional Economic Impacts

The two key measures used to assess regional economic impacts are income losses and job losses. The income losses presented consist of the sum of value-added losses and the additional purchase costs of electrical power.

Income Losses - Value-added Losses

Value-added is the value of total output less the value of the intermediate inputs also used in the production of the final product. Value-added is similar to GDP, a familiar measure of the productivity of an economy. The loss of value-added due to water shortages is estimated by input-output analysis using the IMPLAN software package, and includes the direct, indirect, and induced monetary impacts on the region. The indirect and induced effects are measures of reduced income as well as reduced employee spending for those input sectors which provide resources to the water shortage impacted production sectors.

Income Losses - Electric Power Purchase Costs

The electrical power grid and market within the state is a complex interconnected system. The industry response to water shortages, and the resulting impact on the region, are not easily modeled using traditional input/output impact analysis and the IMPLAN model. Adverse impacts on the region will occur and are represented in this analysis by estimated additional costs associated with power purchases from other generating plants within the region or state. Consequently, the analysis employs additional power purchase costs as a proxy for the value-added impacts for the steam-electric power water use category, and these are included as a portion of the overall income impact for completeness.

For the purpose of this analysis, it is assumed that power companies with insufficient water will be forced to purchase power on the electrical market at a projected higher rate of 5.60 cents per kilowatt hour. This rate is based upon the average day-ahead market purchase price of electricity in Texas that occurred during the recent drought period in 2011. This price is assumed to be comparable to those prices which would prevail in the event of another drought of record.

Job Losses

The number of jobs lost due to the economic impact is estimated using IMPLAN output associated with each TWDB water use category. Because of the difficulty in predicting outcomes and a lack of relevant data, job loss estimates are not calculated for the steam-electric power category.

2.2 Financial Transfer Impacts

Several impact measures evaluated in this analysis are presented to provide additional detail concerning potential impacts on a portion of the economy or government. These financial transfer impact measures include lost tax collections (on production and imports), trucking costs for imported water, declines in utility revenues, and declines in utility tax revenue collected by the

state. These measures are not solely adverse, with some having both positive and negative impacts. For example, cities and residents would suffer if forced to pay large costs for trucking in potable water. Trucking firms, conversely, would benefit from the transaction. Additional detail for each of these measures follows.

Tax Losses on Production and Imports

Reduced production of goods and services accompanying water shortages adversely impacts the collection of taxes by state and local government. The regional IMPLAN model is used to estimate reduced tax collections associated with the reduced output in the economy. Impact estimates for this measure include the direct, indirect, and induced impacts for the affected sectors.

Water Trucking Costs

In instances where water shortages for a municipal water user group are estimated by RWPGs to exceed 80 percent of water demands, it is assumed that water would need to be trucked in to support basic consumption and sanitation needs. For water shortages of 80 percent or greater, a fixed, maximum of $35,000[1] per acre-foot of water applied as an economic cost. This water trucking cost was utilized for both the residential and non-residential portions of municipal water needs.

Utility Revenue Losses

Lost utility income is calculated as the price of water service multiplied by the quantity of water not sold during a drought shortage. Such estimates are obtained from utility-specific pricing data provided by the Texas Municipal League, where available, for both water and wastewater. These water rates are applied to the potential water shortage to estimate forgone utility revenue as water providers sold less water during the drought due to restricted supplies.

Utility Tax Losses

Foregone utility tax losses include estimates of forgone miscellaneous gross receipts taxes. Reduced water sales reduce the amount of utility tax that would be collected by the State of Texas for water and wastewater service sales.

2.3 Social Impacts

Consumer Surplus Losses for Municipal Water Users

Consumer surplus loss is a measure of impact to the wellbeing of municipal water users when their water use is restricted. Consumer surplus is the difference between how much a consumer is

[1] Based on staff survey of water hauling firms and historical data concerning transport costs for potable water in the recent drought in California for this estimate. There are many factors and variables that would determine actual water trucking costs including distance to, cost of water, and length of that drought.

willing and able to pay for a commodity (i.e., water) and how much they actually have to pay. The difference is a benefit to the consumer's wellbeing since they do not have to pay as much for the commodity as they would be willing to pay. Consumer surplus may also be viewed as an estimate of how much consumers would be willing to pay to keep the original quantity of water which they used prior to the drought. Lost consumer surplus estimates within this analysis only apply to the residential portion of municipal demand, with estimates being made for reduced outdoor and indoor residential use. Lost consumer surplus estimates varied widely by location and degree of water shortage.

Population and School Enrollment Losses

Population loss due to water shortages, as well as the associated decline in school enrollment, are based upon the job loss estimates discussed in Section 2.1. A simplified ratio of job and net population losses are calculated for the state as a whole based on a recent study of how job layoffs impact the labor market population.[2] For every 100 jobs lost, 18 people were assumed to move out of the area. School enrollment losses are estimated as a proportion of the population lost based upon public school enrollment data from the Texas Education Agency concerning the age K-12 population within the state (approximately 19%).

[2] Foote, Andrew, Grosz, Michel, Stevens, Ann. "Locate Your Nearest Exit: Mass Layoffs and Local Labor Market Response." University of California, Davis. April 2015, http://paa2015.princeton.edu/papers/150194. The study utilized Bureau of Labor Statistics data regarding layoffs between 1996 and 2013, as well as Internal Revenue Service data regarding migration, to model the change in the population as the result of a job layoff event. The study found that layoffs impact both out-migration and in-migration into a region, and that a majority of those who did move following a layoff moved to another labor market rather than an adjacent county.

3 Socioeconomic Impact Assessment Methodology

This portion of the report provides a summary of the methodology used to estimate the potential economic impacts of future water shortages. The general approach employed in the analysis was to obtain estimates for income and job losses on the smallest geographic level that the available data would support, tie those values to their accompanying historic water use estimate, and thereby determine a maximum impact per acre-foot of shortage for each of the socioeconomic measures. The calculations of economic impacts are based on the overall composition of the economy divided into many underlying economic sectors. Sectors in this analysis refer to one or more of the 536 specific production sectors of the economy designated within IMPLAN, the economic impact modeling software used for this assessment. Economic impacts within this report are estimated for approximately 330 of these sectors, with the focus on the more water-intensive production sectors. The economic impacts for a single water use category consist of an aggregation of impacts to multiple, related IMPLAN economic sectors.

3.1 Analysis Context

The context of this socioeconomic impact analysis involves situations where there are physical shortages of groundwater or surface water due to a recurrence of drought of record conditions. Anticipated shortages for specific water users may be nonexistent in earlier decades of the planning horizon, yet population growth or greater industrial, agricultural or other sector demands in later decades may result in greater overall demand, exceeding the existing supplies. Estimated socioeconomic impacts measure what would happen if water user groups experience water shortages for a period of one year. Actual socioeconomic impacts would likely become larger as drought of record conditions persist for periods greater than a single year.

3.2 IMPLAN Model and Data

Input-Output analysis using the IMPLAN software package was the primary means of estimating the value-added, jobs, and tax related impact measures. This analysis employed regional level models to determine key economic impacts. IMPLAN is an economic impact model, originally developed by the U.S. Forestry Service in the 1970's to model economic activity at varying geographic levels. The model is currently maintained by the Minnesota IMPLAN Group (MIG Inc.) which collects and sells county and state specific data and software. The year 2016 version of IMPLAN, employing data for all 254 Texas counties, was used to provide estimates of value-added, jobs, and taxes on production for the economic sectors associated with the water user groups examined in the study. IMPLAN uses 536 sector-specific Industry Codes, and those that rely on water as a primary input were assigned to their appropriate planning water user categories (irrigation, livestock, manufacturing, mining, and municipal). Estimates of value-added for a water use category were obtained by summing value-added estimates across the relevant IMPLAN sectors associated with that water use category. These calculations were also performed for job losses as well as tax losses on production and imports.

The adjusted value-added estimates used as an income measure in this analysis, as well as the job and tax estimates from IMPLAN, include three components:

- ***Direct effects*** representing the initial change in the industry analyzed;
- ***Indirect effects*** that are changes in inter-industry transactions as supplying industries respond to reduced demands from the directly affected industries; and,
- ***Induced effects*** that reflect changes in local spending that result from reduced household income among employees in the directly and indirectly affected industry sectors.

Input-output models such as IMPLAN only capture backward linkages and do not include forward linkages in the economy.

3.3 Elasticity of Economic Impacts

The economic impact of a water need is based on the size of the water need relative to the total water demand for each water user group. Smaller water shortages, for example, less than 5 percent, are generally anticipated to result in no initial negative economic impact because water users are assumed to have a certain amount of flexibility in dealing with small shortages. As a water shortage intensifies, however, such flexibility lessens and results in actual and increasing economic losses, eventually reaching a representative maximum impact estimate per unit volume of water. To account for these characteristics, an elasticity adjustment function is used to estimate impacts for the income, tax and job loss measures. Figure 3-1 illustrates this general relationship for the adjustment functions. Negative impacts are assumed to begin accruing when the shortage reaches the lower bound 'b1' (5 percent in Figure 3-1), with impacts then increasing linearly up to the 100 percent impact level (per unit volume) once the upper bound reaches the 'b2' level shortage (40 percent in Figure 3-1).

To illustrate this, if the total annual value-added for manufacturing in the region was $2 million and the reported annual volume of water used in that industry is 10,000 acre-feet, the estimated economic measure of the water shortage would be $200 per acre-foot. The economic impact of the shortage would then be estimated using this value-added amount as the maximum impact estimate ($200 per acre-foot) applied to the anticipated shortage volume and then adjusted by the elasticity function. Using the sample elasticity function shown in Figure 3-1, an approximately 22 percent shortage in the livestock category would indicate an economic impact estimate of 50% of the original $200 per acre-foot impact value (i.e., $100 per acre-foot).

Such adjustments are not required in estimating consumer surplus, utility revenue losses, or utility tax losses. Estimates of lost consumer surplus rely on utility-specific demand curves with the lost consumer surplus estimate calculated based on the relative percentage of the utility's water shortage. Estimated changes in population and school enrollment are indirectly related to the elasticity of job losses.

Assumed values for the lower and upper bounds 'b1' and 'b2' vary by water use category and are presented in Table 3-1.

Figure 3-1 Example economic impact elasticity function (as applied to a single water user's shortage)

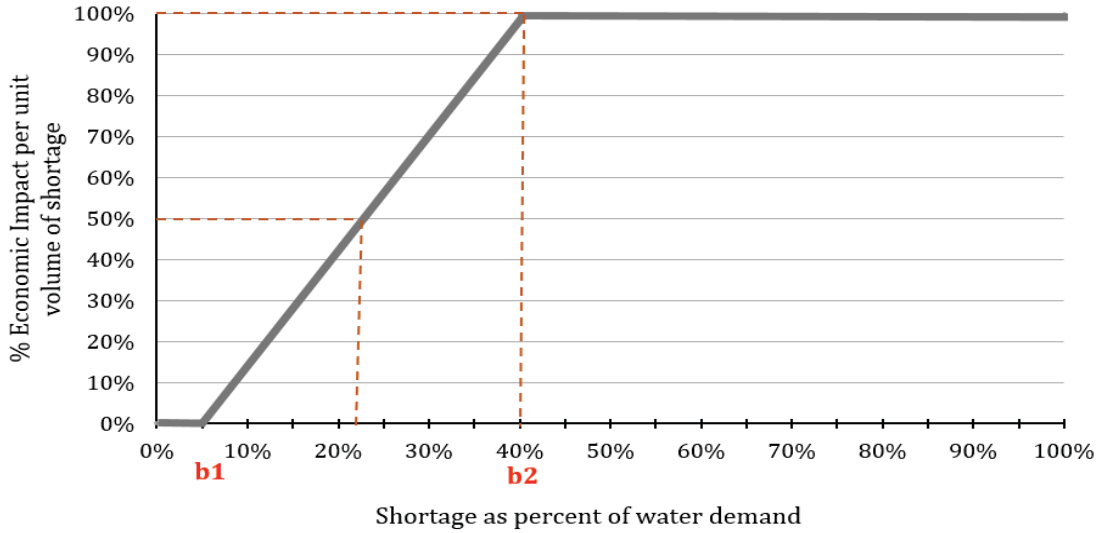


Table 3-1 Economic impact elasticity function lower and upper bounds

Water use category	Lower bound (b1)	Upper bound (b2)
Irrigation	**5%**	**40%**
Livestock	**5%**	**10%**
Manufacturing	**5%**	**40%**
Mining	**5%**	**40%**
Municipal (non-residential water intensive subcategory)	**5%**	**40%**
Steam-electric power	**N/A**	**N/A**

3.4 Analysis Assumptions and Limitations

The modeling of complex systems requires making many assumptions and acknowledging the model's uncertainty and limitations. This is particularly true when attempting to estimate a wide range of socioeconomic impacts over a large geographic area and into future decades. Some of the key assumptions and limitations of this methodology include:

1. The foundation for estimating the socioeconomic impacts of water shortages resulting from a drought are the water needs (potential shortages) that were identified by RWPGs as part of the

regional water planning process. These needs have some uncertainty associated with them but serve as a reasonable basis for evaluating the potential impacts of a drought of record event.

2. All estimated socioeconomic impacts are snapshots for years in which water needs were identified (i.e., 2020, 2030, 2040, 2050, 2060, and 2070). The estimates are independent and distinct "what if" scenarios for each particular year, and water shortages are assumed to be temporary events resulting from a single year recurrence of drought of record conditions. The evaluation assumed that no recommended water management strategies are implemented. In other words, growth occurs and future shocks are imposed on an economy at 10-year intervals, and the resulting impacts are estimated. Note that the estimates presented are not cumulative (i.e., summing up expected impacts from today up to the decade noted), but are simply snapshots of the estimated annual socioeconomic impacts should a drought of record occur in each particular decade based on anticipated water supplies and demands for that same decade.

3. Input-output models such as IMPLAN rely on a static profile of the structure of the economy as it appears today. This presumes that the relative contributions of all sectors of the economy would remain the same, regardless of changes in technology, availability of limited resources, and other structural changes to the economy that may occur in the future. Changes in water use efficiency will undoubtedly take place in the future as supplies become more stressed. Use of the static IMPLAN structure was a significant assumption and simplification considering the 50-year time period examined in this analysis. To presume an alternative future economic makeup, however, would entail positing many other major assumptions that would very likely generate as much or more error.

4. This is not a form of cost-benefit analysis. That approach to evaluating the economic feasibility of a specific policy or project employs discounting future benefits and costs to their present value dollars using some assumed discount rate. The methodology employed in this effort to estimate the economic impacts of future water shortages did not use any discounting methods to weigh future costs differently through time.

5. All monetary values originally based upon year 2016 IMPLAN and other sources are reported in constant year 2018 dollars to be consistent with the water management strategy requirements in the State Water Plan.

6. IMPLAN based loss estimates (income-value-added, jobs, and taxes on production and imports) are calculated only for those IMPLAN sectors for which the TWDB's Water Use Survey (WUS) data was available and deemed reliable. Every effort is made in the annual WUS effort to capture all relevant firms who are significant water users. Lack of response to the WUS, or omission of relevant firms, impacts the loss estimates.

7. Impacts are annual estimates. The socioeconomic analysis does not reflect the full extent of impacts that might occur as a result of persistent water shortages occurring over an extended duration. The drought of record in most regions of Texas lasted several years.

8. Value-added estimates are the primary estimate of the economic impacts within this report. One may be tempted to add consumer surplus impacts to obtain an estimate of total adverse economic impacts to the region, but the consumer surplus measure represents the change to the wellbeing of households (and other water users), not an actual change in the flow of dollars through the economy. The two measures (value-added and consumer surplus) are both valid impacts but ideally should not be summed.

9. The value-added, jobs, and taxes on production and import impacts include the direct, indirect and induced effects to capture backward linkages in the economy described in Section 2.1. Population and school enrollment losses also indirectly include such effects as they are based on the associated losses in employment. The remaining measures (consumer surplus, utility revenue, utility taxes, additional electrical power purchase costs, and potable water trucking costs), however, do not include any induced or indirect effects.

10. The majority of impacts estimated in this analysis may be more conservative (i.e., smaller) than those that might actually occur under drought of record conditions due to not including impacts in the forward linkages in the economy. Input-output models such as IMPLAN only capture backward linkages on suppliers (including households that supply labor to directly affected industries). While this is a common limitation in this type of economic modeling effort, it is important to note that forward linkages on the industries that use the outputs of the directly affected industries can also be very important. A good example is impacts on livestock operators. Livestock producers tend to suffer substantially during droughts, not because there is not enough water for their stock, but because reductions in available pasture and higher prices for purchased hay have significant economic effects on their operations. Food processors could be in a similar situation if they cannot get the grains or other inputs that they need. These effects are not captured in IMPLAN, resulting in conservative impact estimates.

11. The model does not reflect dynamic economic responses to water shortages as they might occur, nor does the model reflect economic impacts associated with a recovery from a drought of record including:
    a. The likely significant economic rebound to some industries immediately following a drought, such as landscaping;
    b. The cost and time to rebuild liquidated livestock herds (a major capital investment in that industry);
    c. Direct impacts on recreational sectors (i.e., stranded docks and reduced tourism); or,
    d. Impacts of negative publicity on Texas' ability to attract population and business in the event that it was not able to provide adequate water supplies for the existing economy.

12. Estimates for job losses and the associated population and school enrollment changes may exceed what would actually occur. In practice, firms may be hesitant to lay off employees, even in difficult economic times. Estimates of population and school enrollment changes are based on regional evaluations and therefore do not necessarily reflect what might occur on a statewide basis.

13. **The results must be interpreted carefully. It is the general and relative magnitudes of impacts as well as the changes of these impacts over time that should be the focus rather than the absolute numbers.** Analyses of this type are much better at predicting relative percent differences brought about by a shock to a complex system (i.e., a water shortage) than the precise size of an impact. To illustrate, assuming that the estimated economic impacts of a drought of record on the manufacturing and mining water user categories are $2 and $1 million, respectively, one should be more confident that the economic impacts on manufacturing are twice as large as those on mining and that these impacts will likely be in the millions of dollars. But one should have less confidence that the actual total economic impact experienced would be $3 million.

14. The methodology does not capture "spillover" effects between regions – or the secondary impacts that occur outside of the region where the water shortage is projected to occur.

15. The methodology that the TWDB has developed for estimating the economic impacts of unmet water needs, and the assumptions and models used in the analysis, are specifically designed to estimate potential economic effects at the regional and county levels. Although it may be tempting to add the regional impacts together in an effort to produce a statewide result, the TWDB cautions against that approach for a number of reasons. The IMPLAN modeling (and corresponding economic multipliers) are all derived from regional models – a statewide model of Texas would produce somewhat different multipliers. As noted in point 14 within this section, the regional modeling used by TWDB does not capture spillover losses that could result in other regions from unmet needs in the region analyzed, or potential spillover gains if decreased production in one region leads to increases in production elsewhere. The assumed drought of record may also not occur in every region of Texas at the same time, or to the same degree.

4 Analysis Results

This section presents estimates of potential economic impacts that could reasonably be expected in the event of water shortages associated with a drought of record and if no recommended water management strategies were implemented. Projected economic impacts for the six water use categories (irrigation, livestock, manufacturing, mining, municipal, and steam-electric power) are reported by decade.

4.1 Impacts for Irrigation Water Shortages

Eight of the 19 counties in the region are projected to experience water shortages in the irrigated agriculture water use category for one or more decades within the planning horizon. Estimated impacts to this water use category appear in Table 4-1. Note that tax collection impacts were not estimated for this water use category. IMPLAN data indicates a negative tax impact (i.e., increased tax collections) for the associated production sectors, primarily due to past subsidies from the federal government. However, it was not considered realistic to report increasing tax revenues during a drought of record.

Table 4-1 Impacts of water shortages on irrigation in Region D

Impact measure	2020	2030	2040	2050	2060	2070
Income losses ($ millions)*	$3	$3	$3	$3	$3	$3
Job losses	94	94	94	94	94	94

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.2 Impacts for Livestock Water Shortages

Fourteen of the 19 counties in the region are projected to experience water shortages in the livestock water use category for one or more decades within the planning horizon. Estimated impacts to this water use category appear in Table 4-2.

Table 4-2 Impacts of water shortages on livestock in Region D

Impact measure	2020	2030	2040	2050	2060	2070
Income losses ($ millions)*	$523	$523	$524	$522	$524	$525
Jobs losses	13,614	13,618	13,596	13,514	13,523	13,530
Tax losses on production and imports ($ millions)*	$31	$31	$31	$31	$31	$31

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.3 Impacts of Manufacturing Water Shortages

Manufacturing water shortages in the region are projected to occur in eight of the 19 counties in the region for at least one decade of the planning horizon. Estimated impacts to this water use category appear in Table 4-3.

Table 4-3 Impacts of water shortages on manufacturing in Region D

Impacts measure	2020	2030	2040	2050	2060	2070
Income losses ($ millions)*	$2,627	$3,843	$3,769	$3,754	$3,841	$3,881
Job losses	21,846	33,544	32,571	32,428	33,771	34,407
Tax losses on production and Imports ($ millions)*	$189	$303	$295	$294	$308	$315

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.4 Impacts of Mining Water Shortages

Mining water shortages in the region are projected to occur in five of the 19 counties in the region for one or more decades within the planning horizon. Estimated impacts to this water use type appear in Table 4-4.

Table 4-4 Impacts of water shortages on mining in Region D

Impacts measure	2020	2030	2040	2050	2060	2070
Income losses ($ millions)*	$1,791	$1,682	$1,327	$900	$561	$453
Job losses	6,779	6,300	4,983	3,411	2,171	1,814
Tax losses on production and Imports ($ millions)*	$206	$195	$154	$105	$66	$54

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.5 Impacts for Municipal Water Shortages

Sixteen of the 19 counties in the region are projected to experience water shortages in the municipal water use category for one or more decades within the planning horizon.

Impact estimates were made for two sub-categories within municipal water use: residential and non-residential. Non-residential municipal water use includes commercial and institutional users, which are further divided into non-water-intensive and water-intensive subsectors including car wash, laundry, hospitality, health care, recreation, and education. Lost consumer surplus estimates were made only for needs in the residential portion of municipal water use. Available IMPLAN and TWDB Water Use Survey data for the non-residential, water-intensive portion of municipal demand allowed these sectors to be included in income, jobs, and tax loss impact estimate.

Trucking cost estimates, calculated for shortages exceeding 80 percent, assumed a fixed, maximum cost of $35,000 per acre-foot to transport water for municipal use. The estimated impacts to this water use category appear in Table 4-5.

Table 4-5 Impacts of water shortages on municipal water users in Region D

Impacts measure	2020	2030	2040	2050	2060	2070
Income losses[1] ($ millions)*	$176	$181	$189	$222	$324	$464
Job losses[1]	3,736	3,849	4,022	4,712	6,876	9,866
Tax losses on production and imports[1] ($ millions)*	$19	$20	$20	$24	$35	$50
Trucking costs ($ millions)*	$92	$94	$97	$101	$105	$114
Utility revenue losses ($ millions)*	$44	$46	$52	$69	$96	$139
Utility tax revenue losses ($ millions)*	$1	$1	$1	$1	$1	$2

[1] Estimates apply to the water-intensive portion of non-residential municipal water use.
* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.6 Impacts of Steam-Electric Water Shortages

Steam-electric water shortages in the region are projected to occur in one of the 19 counties in the region for one or more decades within the planning horizon. Estimated impacts to this water use category appear in Table 4-6.

Note that estimated economic impacts to steam-electric water users:

- Are reflected as an income loss proxy in the form of estimated additional purchasing costs for power from the electrical grid to replace power that could not be generated due to a shortage;
- Do not include estimates of impacts on jobs. Because of the unique conditions of power generators during drought conditions and lack of relevant data, it was assumed that the industry would retain, perhaps relocating or repurposing, their existing staff in order to manage their ongoing operations through a severe drought.
- Do not presume a decline in tax collections. Associated tax collections, in fact, would likely increase under drought conditions since, historically, the demand for electricity increases during times of drought, thereby increasing taxes collected on the additional sales of power.

Table 4-6 Impacts of water shortages on steam-electric power in Region D

Impacts measure	2020	2030	2040	2050	2060	2070
Income Losses ($ millions)*	$748	$768	$790	$810	$816	$823

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.7 Regional Social Impacts

Projected changes in population, based upon several factors (household size, population, and job loss estimates), as well as the accompanying change in school enrollment, were also estimated and are summarized in Table 4-7.

Table 4-7 Region-wide social impacts of water shortages in Region D

Impacts measure	2020	2030	2040	2050	2060	2070
Consumer surplus losses ($ millions)*	$141	$146	$155	$173	$220	$300
Population losses	8,458	10,540	10,147	9,944	10,361	10,963
School enrollment losses	1,618	2,016	1,941	1,902	1,982	2,097

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

Appendix A - County Level Summary of Estimated Economic Impacts for Region D

County level summary of estimated economic impacts of not meeting identified water needs by water use category and decade (in 2018 dollars, rounded). Values are presented only for counties with projected economic impacts for at least one decade.

(* Entries denoted by a dash (-) indicate no estimated economic impact)

		Income losses (Million $)*						Job losses					
County	Water Use Category	2020	2030	2040	2050	2060	2070	2020	2030	2040	2050	2060	2070
BOWIE	IRRIGATION	$0.82	$0.82	$0.82	$0.82	$0.82	$0.82	23	23	23	23	23	23
BOWIE	LIVESTOCK	$15.18	$15.18	$13.77	$11.82	$10.12	$9.44	646	646	586	503	431	402
BOWIE	MANUFACTURING	$1,779.61	$2,269.87	$2,269.87	$2,269.87	$2,269.87	$2,269.87	15,731	20,065	20,065	20,065	20,065	20,065
BOWIE	MUNICIPAL	$169.95	$173.24	$176.26	$180.55	$185.61	$190.83	3,616	3,685	3,750	3,841	3,949	4,060
BOWIE Total		**$1,965.55**	**$2,459.10**	**$2,460.72**	**$2,463.06**	**$2,466.42**	**$2,470.96**	**20,016**	**24,420**	**24,424**	**24,433**	**24,468**	**24,550**
CAMP	LIVESTOCK	$147.01	$147.01	$147.01	$147.01	$147.01	$147.01	3,628	3,628	3,628	3,628	3,628	3,628
CAMP	MANUFACTURING	-	$0.31	-	-	-	-	-	3	-	-	-	-
CAMP Total		**$147.01**	**$147.32**	**$147.01**	**$147.01**	**$147.01**	**$147.01**	**3,628**	**3,630**	**3,628**	**3,628**	**3,628**	**3,628**
CASS	LIVESTOCK	$62.51	$62.51	$62.51	$62.44	$62.44	$62.44	1,728	1,728	1,728	1,727	1,727	1,727
CASS	MUNICIPAL	$0.58	$0.41	$0.26	$0.17	$0.17	$0.17	12	9	5	4	4	4
CASS Total		**$63.09**	**$62.92**	**$62.77**	**$62.61**	**$62.61**	**$62.61**	**1,741**	**1,737**	**1,734**	**1,730**	**1,730**	**1,730**
DELTA	LIVESTOCK	$4.90	$4.67	$4.67	$4.67	$4.67	$4.67	276	264	264	264	264	264
DELTA	MUNICIPAL	$0.00	$0.00	$0.00	$0.00	$0.01	$0.01	0	0	0	0	0	0
DELTA Total		**$4.90**	**$4.68**	**$4.68**	**$4.68**	**$4.68**	**$4.68**	**276**	**264**	**264**	**264**	**264**	**264**
FRANKLIN	LIVESTOCK	$70.65	$70.65	$70.65	$70.65	$70.65	$70.65	1,492	1,492	1,492	1,492	1,492	1,492
FRANKLIN Total		**$70.65**	**$70.65**	**$70.65**	**$70.65**	**$70.65**	**$70.65**	**1,492**	**1,492**	**1,492**	**1,492**	**1,492**	**1,492**
GREGG	MUNICIPAL	-	-	-	-	-	$0.01	-	-	-	-	-	0
GREGG Total		**-**	**-**	**-**	**-**	**-**	**$0.01**	**-**	**-**	**-**	**-**	**-**	**0**
HARRISON	IRRIGATION	$0.11	$0.11	$0.11	$0.11	$0.11	$0.11	6	6	6	6	6	6
HARRISON	MINING	$1,331.43	$958.19	$656.36	$330.47	$73.77	-	5,122	3,686	2,525	1,271	284	-
HARRISON	MUNICIPAL	$0.57	$0.88	$1.64	$3.55	$5.48	$7.57	12	19	35	75	117	161
HARRISON Total		**$1,332.12**	**$959.19**	**$658.12**	**$334.13**	**$79.37**	**$7.68**	**5,140**	**3,710**	**2,565**	**1,352**	**406**	**167**
HOPKINS	IRRIGATION	$1.13	$1.13	$1.13	$1.13	$1.13	$1.13	30	30	30	30	30	30
HOPKINS	LIVESTOCK	$33.47	$34.16	$35.73	$35.82	$37.48	$38.21	818	835	873	875	916	933
HOPKINS	MINING	$35.15	$51.97	$80.13	$114.79	$154.54	$203.53	160	237	365	523	704	927
HOPKINS	MUNICIPAL	$0.01	$0.07	$0.17	$0.29	$0.58	$0.96	0	2	4	6	12	20
HOPKINS Total		**$69.77**	**$87.33**	**$117.17**	**$152.03**	**$193.74**	**$243.83**	**1,008**	**1,102**	**1,271**	**1,434**	**1,662**	**1,910**
HUNT	IRRIGATION	$0.06	$0.06	$0.06	$0.06	$0.06	$0.06	3	3	3	3	3	3

		Income losses (Million $)*						Job losses					
County	Water Use Category	2020	2030	2040	2050	2060	2070	2020	2030	2040	2050	2060	2070
HUNT	MINING	$74.10	$64.96	$35.29	$11.99	$1.44	-	249	218	119	40	5	-
HUNT	MUNICIPAL	$1.28	$2.73	$5.59	$29.22	$117.52	$240.13	27	58	118	619	2,495	5,100
HUNT Total		**$75.43**	**$67.75**	**$40.94**	**$41.27**	**$119.01**	**$240.19**	**279**	**279**	**239**	**662**	**2,502**	**5,103**
LAMAR	IRRIGATION	$0.09	$0.09	$0.09	$0.09	$0.09	$0.09	3	3	3	3	3	3
LAMAR	LIVESTOCK	$12.86	$12.86	$12.86	$12.86	$12.86	$12.86	598	598	598	598	598	598
LAMAR	MUNICIPAL	$1.52	$1.52	$1.58	$1.66	$1.74	$1.81	32	32	34	35	37	39
LAMAR Total		**$14.46**	**$14.46**	**$14.52**	**$14.61**	**$14.69**	**$14.76**	**634**	**634**	**635**	**637**	**638**	**640**
MARION	MINING	$350.77	$606.56	$554.84	$442.93	$331.02	$249.21	1,249	2,159	1,975	1,577	1,178	887
MARION	MUNICIPAL	$0.03	$0.04	$0.06	$0.13	$0.23	$0.38	1	1	1	3	5	8
MARION Total		**$350.80**	**$606.61**	**$554.91**	**$443.06**	**$331.25**	**$249.59**	**1,249**	**2,160**	**1,976**	**1,579**	**1,183**	**895**
MORRIS	LIVESTOCK	$34.19	$34.19	$34.19	$34.19	$34.19	$34.19	931	931	931	931	931	931
MORRIS	MUNICIPAL	$0.02	$0.02	$0.01	$0.01	$0.01	$0.01	0	0	0	0	0	0
MORRIS Total		**$34.21**	**$34.21**	**$34.21**	**$34.21**	**$34.21**	**$34.21**	**931**	**931**	**931**	**931**	**931**	**931**
RAINS	MANUFACTURING	$13.09	$13.09	$13.09	$13.09	$13.09	$13.09	139	139	139	139	139	139
RAINS	MUNICIPAL	$1.06	$0.73	$0.78	$0.84	$0.92	$1.04	22	16	17	18	20	22
RAINS Total		**$14.15**	**$13.82**	**$13.88**	**$13.93**	**$14.01**	**$14.14**	**161**	**154**	**156**	**157**	**158**	**161**
RED RIVER	IRRIGATION	$0.41	$0.41	$0.41	$0.41	$0.41	$0.41	16	16	16	16	16	16
RED RIVER	LIVESTOCK	$4.09	$4.09	$4.09	$4.09	$4.09	$4.09	190	190	190	190	190	190
RED RIVER	MUNICIPAL	$0.49	$0.48	$0.45	$0.44	$0.44	$0.44	10	10	9	9	9	9
RED RIVER Total		**$4.98**	**$4.97**	**$4.94**	**$4.94**	**$4.93**	**$4.93**	**217**	**217**	**216**	**216**	**216**	**216**
SMITH	IRRIGATION	$0.33	$0.33	$0.33	$0.33	$0.33	$0.33	12	12	12	12	12	12
SMITH	LIVESTOCK	$11.52	$11.52	$11.52	$11.52	$11.52	$11.52	473	473	473	473	473	473
SMITH	MUNICIPAL	$0.02	$0.67	$2.12	$4.43	$9.83	$18.91	0	14	45	94	209	402
SMITH Total		**$11.86**	**$12.52**	**$13.96**	**$16.27**	**$21.67**	**$30.75**	**485**	**499**	**530**	**579**	**694**	**887**
TITUS	LIVESTOCK	$84.02	$84.02	$84.02	$84.02	$85.97	$86.88	1,752	1,752	1,752	1,752	1,793	1,812
TITUS	MANUFACTURING	-	$268.59	$220.36	$224.10	$331.98	$385.55	-	3,904	3,203	3,258	4,826	5,605
TITUS	STEAM ELECTRIC POWER	$748.02	$767.93	$790.32	$810.22	$816.39	$823.08	-	-	-	-	-	-
TITUS Total		**$832.05**	**$1,120.53**	**$1,094.70**	**$1,118.35**	**$1,234.34**	**$1,295.52**	**1,752**	**5,657**	**4,956**	**5,010**	**6,619**	**7,417**
UPSHUR	LIVESTOCK	$2.42	$2.42	$2.42	$2.42	$2.42	$2.42	89	89	89	89	89	89
UPSHUR	MANUFACTURING	$227.70	$253.00	$253.00	$253.00	$253.00	$253.00	2,052	2,280	2,280	2,280	2,280	2,280
UPSHUR	MUNICIPAL	$0.00	$0.00	$0.00	$0.03	$0.42	$1.05	0	0	0	1	9	22
UPSHUR Total		**$230.12**	**$255.42**	**$255.42**	**$255.45**	**$255.84**	**$256.47**	**2,141**	**2,369**	**2,369**	**2,370**	**2,378**	**2,391**
VAN ZANDT	IRRIGATION	$0.02	$0.02	$0.02	$0.02	$0.02	$0.02	2	2	2	2	2	2
VAN ZANDT	MANUFACTURING	-	$106.62	$81.01	$62.33	$40.92	$27.31	-	1,123	853	656	431	288
VAN ZANDT	MUNICIPAL	$0.14	$0.20	$0.25	$0.43	$0.72	$1.14	2	3	4	6	11	17
VAN ZANDT Total		**$0.17**	**$106.85**	**$81.29**	**$62.78**	**$41.67**	**$28.48**	**4**	**1,127**	**858**	**664**	**443**	**307**

		Income losses (Million $)*						Job losses					
County	Water Use Category	2020	2030	2040	2050	2060	2070	2020	2030	2040	2050	2060	2070
WOOD	LIVESTOCK	$40.14	$40.14	$40.14	$40.14	$40.14	$40.14	991	991	991	991	991	991
WOOD	MANUFACTURING	$606.23	$931.71	$931.71	$931.71	$931.71	$931.71	3,924	6,031	6,031	6,031	6,031	6,031
WOOD	MUNICIPAL	$0.00	-	-	-	-	-	0	-	-	-	-	-
WOOD Total		**$646.37**	**$971.85**	**$971.85**	**$971.85**	**$971.85**	**$971.85**	**4,915**	**7,022**	**7,022**	**7,022**	**7,022**	**7,022**
REGION D Total		**$5,867.69**	**$7,000.18**	**$6,601.72**	**$6,210.89**	**$6,067.93**	**$6,148.30**	**46,069**	**57,405**	**55,266**	**54,160**	**56,434**	**59,710**

Appendix C7 – Chapter 7:

DROUGHT RESPONSE INFORMATION, ACTIVITIES, AND RECOMMENDATIONS

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APPENDIX C7

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Table C7-1

Region D 2021 - North East Texas Regional Water Plan
TCEQ Listed Drought-Affected Entities as of July 2019

PWS ID	PWS Name	County	Priority	TCEQ Stage	Population	Connections	Date Notified
190021	RIVERBEND WATER RESOURCES DISTRICT	BOWIE	W	V	5180	3363	10/5/2017
600001	CITY OF COOPER	DELTA	W	2	2146	1060	8/19/2013
920028	SUN ACRES MOBILE HOME PARK	GREGG	W	2	183	61	9/4/2013
920006	CITY OF WHITE OAK	GREGG	W	2	7119	2991	8/26/2013
1020004	CITY OF HALLSVILLE	HARRISON	W	V	3577	1400	10/17/2018
1020078	WEST HARRISON WSC	HARRISON	W	V	1437	479	7/6/2015
1120011	BRINKER WSC	HOPKINS	W	V	2508	836	9/13/2013
1120018	PICKTON WSC	HOPKINS	W	V	654	218	9/13/2013
1120013	CORNERSVILLE WSC	HOPKINS	W	V	1089	363	8/13/2013
1120015	MARTIN SPRINGS WSC	HOPKINS	W	V	3549	1183	7/19/2013
1120001	CITY OF CUMBY	HOPKINS	W	1	777	451	7/18/2013
1160018	CASH SUD	HUNT	W	V	16542	5908	9/14/2015
1160012	CITY OF WEST TAWAKONI	HUNT	W	V	3600	1250	5/5/2015
1160004	CITY OF GREENVILLE	HUNT	W	V	25557	9506	10/29/2013
1160006	CITY OF LONE OAK	HUNT	W	V	598	286	8/26/2013
1160031	JACOBIA WSC	HUNT	W	2	972	324	8/21/2013
1160029	CADDO BASIN SUD	HUNT	W	1	10419	3473	8/19/2013
1160042	SHADY GROVE SUD	HUNT	W	1	1374	458	7/16/2013
1160007	CITY OF QUINLAN	HUNT	W	1	2448	816	7/15/2013
1160005	CITY OF WOLFE CITY	HUNT	W	1	1412	620	7/25/2012
1160028	HOLIDAY ESTATES WATER	HUNT	W	V	216	72	4/23/2012
1160017	CAMPBELL WSC	HUNT	W	V	1482	494	3/19/2012
1390012	PETTY WSC	LAMAR	W	V	132	44	11/20/2011
1390001	CITY OF DEPORT	LAMAR	W	1	927	309	9/30/2011
1900011	CITY OF EAST TAWAKONI	RAINS	W	1	1959	945	5/1/2014
1900009	SOUTH RAINS SUD	RAINS	W	2	2847	949	3/31/2014
1940002	CITY OF CLARKSVILLE	RED RIVER	W	V	3237	1610	9/9/2013
2120005	EAST TEXAS MUD OF SMITH COUNTY	SMITH	W	1	2343	781	9/30/2011
2300002	CITY OF GILMER	UPSHUR	W	1	5243	2844	9/12/2011
2300008	UNION GROVE WSC	UPSHUR	W	V	2793	931	8/26/2011
2340009	EDOM WSC	VAN ZANDT	W	V	1443	481	5/2/2013
2340007	CALLENDER LAKE	VAN ZANDT	W	1	1842	614	3/26/2012
2500007	JONES WSC	WOOD	W	V	5352	1784	8/25/2013
2500015	BRIGHT STAR-SALEM SUD	WOOD	W	1	5871	1957	8/10/2011

Priority of Water Use

Priority	Description
O - Outage	Water service interrupted.
E - Emergency	Could be out of water in 45 days or less.
P - Priority	Could be out of water in 90 days or less.
C - Concern	Could be out of water in 180 days or less.
W - Watch	Has greater than a 180-day supply of water remaining.
R - Resolved	No longer experiencing water capacity problems.

TCEQ Drought Response Stages

TCEQ Stage	Description
V - Voluntary	Customers requested to voluntarily limit water use.
1 - Mild restrictions	Use of water for non-essential uses is restricted (i.e. outdoor watering limited to no more than twice or once a week)
2 - Moderate restrictions	All outdoor water usage is prohibited except by hand-held hoses with manual on/off nozzles. Water usage for livestock is exempt from this restriction.
3 - Severe restrictions	All outdoor water usage is prohibited; livestock watering may be exempted by the utility. All consumption may also be limited to each customer in specific ways.
Date Notified	The "date notified" is the most recent date that the Public Water System notified TCEQ of changes to their drought response stage.

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7.2MODEL DROUGHT CONTINGENCY PLAN – WHOLESALE WATER PROVIDERS

General Information

Introduction

Drought is a very real natural disaster that occurs in Texas, even in the verdant bottomlands, green pastures, and piney woods of northeast Texas. As recently as 2008, drought strained water systems in the northeast Texas region. In addition to natural drought, there are also water supply emergencies that occur from time to time in which water supply becomes contaminated. A good example of this is the MTBE spill into Lake Tawakoni in May 2000, which contaminated supply for several Hunt County water systems for multiple days.

In an effort to better respond to drought conditions than we've been able to in the past, the North East Texas Regional Water Planning Group (NETRWPG) has prepared this document, with the idea that if water providers study their water supply system before a drought or emergency occurs, then they will be better prepared to respond. In preparing this document, several references were used, including Chapters 288 and 363 of the Texas Administrative Code, the Texas Commission on Environmental Quality's (TCEQ) 'Handbook for Drought Contingency Planning for Retail Public Water Suppliers,' Texas Water Code § 11.1272, and the TCEQ and TWDB websites. All of these resources are available to you if you need further information or clarification. You may also contact the TCEQ at 512-239-4691 with questions or for information. Example wording for your plan will be found throughout in bold italics.

According to the requirements set forth in the amended Chapter 288, Subchapter C of the Texas Administrative Code, retail public water suppliers providing water service to 3,300 or more connections must submit revisions to existing drought contingency plans to the executive director not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. Any new or revised plans must be submitted to the executive director within 90 days of adoption by the community water system. Any new retail public water suppliers providing water service to 3,300 or more connections shall prepare and adopt a drought contingency plan within 180 days of commencement of operation, and submit the plan to the executive director within 90 days of adoption. If you are a retail supplier, but serve less than 3,300 connections, you are still required to develop and implement a plan, but you do not need to submit the plan unless specifically requested by TCEQ. If you provide retail supply in addition to wholesale supply, you will also need to develop a retail drought contingency plan. Please see the Northeast Texas Region's guidance for retail drought contingency plans.

The _____(water provider) understands that water conservation is a viable strategy for protecting water resources both now and in the future, and that adequate planning for times of drought or emergency is a necessary part of conservation. The purpose of this plan is to prepare for the possibility of a drought or emergency situation where water is in short supply. This plan will help to ensure that _____(water supplier) and its wholesale customers use water wisely and efficiently during periods of drought.

Though not specifically required by rule, it is helpful to the reader if you summarize your water supply and distribution systems in the introduction. This will familiarize users of the Plan with your system, and help them to make sense of the actions that you intend to take. In addition, discussing your water system here will assist those who update the plan in five years, because they will know exactly what the system looked like when the plan was created.

The _____(water supplier) utilizes groundwater /surface water from _____(source). Supply is secured by a (water right, water supply contract, etc.) through the year _____. Our customers include _____, and their current contracted amounts are _____. Our storage and distribution systems consist of _____.

Coordination with the North East Texas Regional Water Planning Group

The drought contingency plan must document coordination with the regional water planning groups for the service area of the wholesale public water supplier to ensure consistency with the appropriate approved regional water plans. – 30 TAC Chapter 288

A copy of this adopted plan will be submitted to the NETRWPG via its administrator, Mr. Walt Sears, Northeast Texas Municipal Water District, P. O. Box 955, Hughes Springs, Texas 75656. Proof of submittal is attached hereto as Figure ___.

Informing the Public/Requesting Input

According to 30 TAC Chapter 288, Subchapter B.a.1, "Preparation of the plan shall include provisions to actively inform the public and to affirmatively provide opportunity for user input in the preparation of the plan and for informing wholesale customers about the plan. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the public and providing written notice to the public concerning the proposed plan and meeting."

The _____(water supplier) gave the public and its wholesale customers an opportunity to provide input into this plan by _____(public notice, public hearing, letter requesting comments, etc.). Public comments included _____.

Efforts to inform wholesale customers and the public about each stage of the plan, and when stages are implemented or rescinded, will be through _____ (certified letter, newspaper articles, radio announcements, website announcements, etc.).

Authorization/Applicability

The _____ (mayor, president, city administrator, etc.) is hereby authorized to monitor weather conditions as well as water supply and demand conditions and to implement the Drought Contingency Plan as appropriate.

The _____(City Council, Board of Directors, etc.) authorizes the Plan by a _____(resolution, ordinance), which has been included in this Plan.

Coordination with the Texas Commission on Environmental Quality

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According to 30 TAC Chapter 288, Subchapter C, "Wholesale public water suppliers shall submit a drought contingency plan meeting the requirements of Subchapter B of this chapter to the executive director not later than May 1, 2005, after adoption of the drought contingency plan by the governing body of the water supplier. Thereafter, the wholesale public water suppliers shall submit the next revision of the plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. Any new or revised plans must be submitted to the executive director within 90 days of adoption by the governing body of the wholesale public water supplier."

This plan was submitted to the executive director of the Texas Commission of Environmental Quality on _____(date).

Send your plan to the following address: TCEQ, Resource Protection Team, Mail Code 160, P.O. Box 13087, Austin, TX 78711-3087 for regular and certified mail, or 12100 Park 35 Circle, Austin, TX 78753 for express carrier deliveries (U.S. Post Office Express Mail, FedEx, UPS, etc.).

For questions to the TCEQ, see the website at www.tceq.state.tx.us, or call: 512/239-4691.

Coordination with Wholesale Water Supplier

This section only applies if you purchase supply from a wholesale provider. If you have a contract or agreement with a water provider, then complete this section. If you have your own water rights or otherwise own your supply, this section does not apply.

This plan has been created with our water provider, _____'s drought contingency plan in mind. We have included _____'s (water provider) requirements within our plan and have created this plan to compliment _____'s (water provider) plan. _____(water provider) has been provided a copy of this plan.

Plan Definitions

For the purposes of this Plan**,** the following definitions, taken from TCEQ guidance, shall apply:

Aesthetic water use: water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

Commercial and institutional water use: water use which is integral to the operations of commercial and non-profit establishments and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

Customer: any person, company, or organization using water supplied by _____ (name of water supplier).

Domestic water use: water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

Even number address: street addresses, box numbers, or rural postal route numbers ending in 0, 2, 4, 6, or 8 and locations without addresses.

Industrial water use: the use of water in processes designed to convert materials of lower value into forms having greater usability and value.

Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, rights-of-way and medians.

Non-essential water use: water uses that are not essential nor required for the protection of public, health, safety, and welfare, including:

(a) irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this Plan;
(b) use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;
(c) use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;
(d) use of water to wash down buildings or structures for purposes other than immediate fire protection;
(e) flushing gutters or permitting water to run or accumulate in any gutter or street;

(f) use of water to fill, refill, or add to any indoor or outdoor swimming pools or jacuzzi-type pools;
(g) use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;
(h) failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and
(i) use of water from hydrants for construction purposes or any other purposes other than fire fighting.

Odd numbered address: street addresses, box numbers, or rural postal route numbers ending in 1, 3, 5, 7, or 9.

RESPONSE TO A DROUGHT EVENT

In this portion of the plan, it will need to be determined whether a water constraint will more likely be caused by a shortage in water supply or by constraints in the storage and distribution system. Associated goals and water management measures should correspond to the type of constraint expected. For example, if insufficient storage is determined to be the most likely cause of water shortage during a drought, then an emergency back-up supply source would not solve the problem; reduced use during peak hours (banning lawn watering, etc.) would more likely solve the problem by giving storage tanks a better opportunity to refill.

The drought contingency plan should be designed for a drought condition at least as severe as the drought of record according to TCEQ rules. Since the drought of record in Texas occurred in the 1950's, few systems will have water use records still available to plan by. Therefore, the NETRWPG suggests using the most recent drought for the State, which occurred in 1996. If your system does not have records for 1996, use the time period in your records when your system was the most strained by dry weather conditions.

The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record. – 30 TAC Chapter 288

The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable. – 30 TAC Chapter 288

A minimum of three drought stages is required in this plan. During each stage, it will need to be determined what will trigger initiation, what the water use reduction target goal is, what water management strategies will be put into place, and, finally, what will terminate the stage. Keep in mind that a supplier who is also a customer of its wholesale provider must comply with its provider's Drought Contingency Plan. Do not develop stages or management strategies that are in conflict with your water provider's DCP. Also note that the NETRWPG has developed water

management strategies for all providers who are projected to have a water shortage within the planning period (50 years). You should review the latest version of the Regional Water Plan to determine if you have had strategies prepared for you.

Include an opening paragraph in this section that describes what information should be monitored in order to initiate the stages, and a rationale of why you chose the triggering criteria that you chose.

The drought contingency plan must include a provision in every wholesale water contract entered into or renewed after adoption of the plan, including contract extensions, that in case of a shortage of water resulting from drought, the water to be distributed shall be divided in accordance with Texas Water Code, §11.039. – 30 TAC Chapter 288

Texas Water Code, §11.039 states, "DISTRIBUTION OF WATER DURING SHORTAGE. (a) If a shortage of water in a water supply not covered by a water conservation plan prepared in compliance with Texas Natural Resource Conservation Commission or Texas Water Development Board rules results from drought, accident, or other cause, the water to be distributed shall be divided among all customers pro rata, according to the amount each may be entitled to, so that preference is given to no one and everyone suffers alike. (b) If a shortage of water in a water supply covered by a water conservation plan prepared in compliance with Texas Natural Resource Conservation Commission or Texas Water Development Board rules results from drought, accident, or other cause, the person, association of persons, or corporation owning or controlling the water shall divide the water to be distributed among all customers pro rata, according to: (1) the amount of water to which each customer may be entitled; or (2) the amount of water to which each customer may be entitled, less the amount of water the customer would have saved if the customer had operated its water system in compliance with the water conservation plan.(c) Nothing in Subsection (a) or (b) precludes the person, association of persons, or corporation owning or controlling the water from supplying water to a person who has a prior vested right to the water under the laws of this state.

Stage 1 – Mild Water Shortage

Initiation: The _____(name of water supplier) will consider that a mild water shortage exists when_____ (i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by*** _____ (entity's water provider) if applicable**.**

Target Goal: When a mild water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 1 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage I is rescinded by*** _____ (entity's water provider) if applicable***.***

Water Management Strategies: During Stage 1, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Request voluntary water conservation from all customers
- Recommend that customers initiate Stage 1 of their Drought Contingency Plans
- Reduce operating procedures that use water (i.e. flushing of mains) as appropriate

<u>Stage 2 – Moderate Water Shortage</u>

Initiation: The _____(water supplier) will consider that a moderate water shortage exists when_____(i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by _____ (entity's water provider)*** if applicable.

Target Goal: When a moderate water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 2 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage 2 is rescinded by***

_____ (entity's water provider) if applicable. ***Upon termination of Stage 2, Stage 1 becomes operative.***

Water Management Strategies: During Stage 2, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Recommend that customers initiate Stage 2 of their Drought Contingency Plans, which should, at a minimum, contain lawn watering restrictions
- Modify reservoir operations if applicable
- Initiate strong public awareness campaign in service area to warn of impending shortages

<u>Stage 3 – Severe Water Shortage</u>

Initiation: The _____(water supplier) will consider that a severe water shortage exists when_____(i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by _____*** (entity's water provider) if applicable***.***

Target Goal: When a severe water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 3 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage 3 is rescinded by*** _____ (entity's water provider) if applicable***. Upon termination of Stage 3, Stage 2 becomes operative.***

Water Management Strategies: During Stage 3, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Recommend that customers initiate Stage 3 of their Drought Contingency Plans, which, at a minimum, must include a ban on lawn watering
- Begin pro rata water allocation (Pro rata curtailment of water deliveries to or diversions by wholesale water customers must be considered in a wholesale DCP according to 30 TAC Chapter 288, Subchapter B. Rules for pro rata curtailment are provided in Texas Water Code, §11.039.)
- Implement water rate surcharges (i.e. a set charge for any use above average monthly use)
- Implement price adjustments (i.e. increase the price per 1,000 gallons of water used above the average monthly use)
- Utilize alternate or emergency water sources

Stage 4 – Emergency Water Shortage

This Stage could apply in the instance of a major water line break, a contamination of the water supply source, or other urgent water system conditions. Most likely, this stage would be initiated by decision of the authorized plan implementer (Mayor, President, Manager, etc.)

Initiation: The _____(water supplier) will consider that an emergency water shortage exists when_____ (i.e. the water main at the water treatment plant bursts or is otherwise significantly damaged; the reservoir is contaminated by oil spill; etc.,)***, or when requested by _____*** (entity's water provider) if applicable.

Target Goal: When an emergency water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 4 shall be rescinded when _____ (i.e. the main at the water treatment plant is restored and storage tanks have been allowed to refill; analysis of the source water indicates that supply is safe to use; etc.), ***or when Stage 4 is rescinded by*** _____(entity's water provider) if applicable.

Water Management Strategies: During Stage 4, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Utilize alternative or emergency water supplies (i.e. tying into a neighboring water system, etc. This may require approval by the TCEQ Executive Director)
- Modify reservoir operations
- Strategies listed in Stage 3

PLAN EXECUTION

Public Involvement

This section should discuss the ways in which the supplier will inform its wholesale customers about the initiation and termination of drought stages, as well as management strategies that customers are expected to follow. Public involvement can be in the form of special public hearings, articles and notices in the local newspaper, radio announcements, announcements on local television stations, notices in billing statements, etc.

The _____ (water provider) will keep its customers apprised of initiation of the drought contingency plan, and changes in stages, by means of _____.

Enforcement

The _____ (Mayor, City Manager, President, etc.), or his/her designee, is responsible for monitoring weather conditions and water supplies, and determining when to initiate and terminate stages of the DCP.

The drought contingency plan must include procedures for the enforcement of any mandatory water use restrictions including specification of penalties (e.g., liquidated damages, water rate surcharges, discontinuation of service) for violations of such restrictions. – 30 TAC Chapter 288, Subchapter B.a.10.

The _____ (governing body) has adopted this plan through _____ (ordinance, resolution), and has made it an official _____ (city, Corporation, etc.) policy. The _____ (ordinance, resolution, etc.) is attached hereto as Figure ___.

Provision for responding to wholesale provider restrictions

Any water supplier that receives all or a portion of its water supply from another water supplier shall consult with that supplier and shall include in the drought contingency plan appropriate provisions for responding to reductions in that water supply. – 30 TAC Chapter 288

If you have a wholesale provider, then add this section. If you own your own supply, please skip this section.

As stated in each water shortage stage, we intend to comply with all requirements of our wholesale provider's drought contingency plan. This plan is as stringent as our provider's plan, and in some cases may be more so.

Notification of TCEQ on mandatory provisions

A wholesale or retail water supplier shall notify the executive director within five business days of the implementation of any mandatory provisions of the drought contingency plan. – 30 TAC Chapter 288

The Executive Director at TCEQ shall be notified with 5 business days if any mandatory provisions of this plan are implemented. The Executive Director can be reached at 512-239-3900.

Variance procedures

The drought contingency plan must include procedures for granting variances to the plan. – 30 TAC Chapter 288

The _____ (authorized representative) may, in writing, grant temporary variance for existing water uses otherwise prohibited under this Plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire protection for the public or the customer requesting such variance and if one or more of the following conditions are met:

(a) Compliance with this Plan cannot be technically accomplished during the duration of the water supply shortage or other condition for which the Plan is in effect.

(b) Alternative methods can be implemented which will achieve the same level of reduction in water use.

Customers requesting an exemption from the provisions of this Plan shall file a petition for variance with the _____ (water supplier) within 5 days after the Plan or a particular drought response stage has been invoked. All petitions for variances shall be reviewed by the _____ (authorized representative), and shall include the following:

(a) Name and address of the petitioner(s).
(b) Purpose of water use.
(c) Specific provision(s) of the Plan from which the petitioner is requesting relief.
(d) Detailed statement as to how the specific provision of the Plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this Ordinance.
(e) Description of the relief requested.
(f) Period of time for which the variance is sought.
(g) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this Plan and the compliance date.
(h) Other pertinent information.

Variances granted by the _____ (water supplier) shall be subject to the following conditions, unless waived or modified:

(a) Variances granted shall include a timetable for compliance.
(b) Variances granted shall expire when the Plan is no longer in effect, unless the petitioner has failed to meet specified requirements.

No variance shall be retroactive or otherwise justify any violation of this Plan occurring prior to the issuance of the variance.

5-year updates

The retail public water supplier shall review and update, as appropriate, the drought contingency plan, at least every five years, based on new or updated information, such as the adoption or revision of the regional water plan. – 30 TAC Chapter 288

This plan shall be re-evaluated and updated every five years based on updated information; especially the latest adopted NETRWPG Regional Water Plan.

7.2 MODEL DROUGHT CONTINGENCY PLAN –GROUNDWATER USER

Plan Definitions

For the purposes of this Plan**,** the following definitions, taken from TCEQ guidance, are provided for reference:

Aesthetic water use: water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

Domestic water use: water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, rights-of-way and medians.

Non-essential water use: water uses that are not essential nor required for the protection of public, health, safety, and welfare, including:

(j) irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this Plan;
(k) use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;
(l) use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;
(m) use of water to wash down buildings or structures for purposes other than immediate fire protection;
(n) flushing gutters or permitting water to run or accumulate in any gutter or street;
(o) use of water to fill, refill, or add to any indoor or outdoor swimming pools or jacuzzi-type pools;
(p) use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;
(q) failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and
(r) use of water from hydrants for construction purposes or any other purposes other than fire fighting.

RESPONSE TO A DROUGHT EVENT

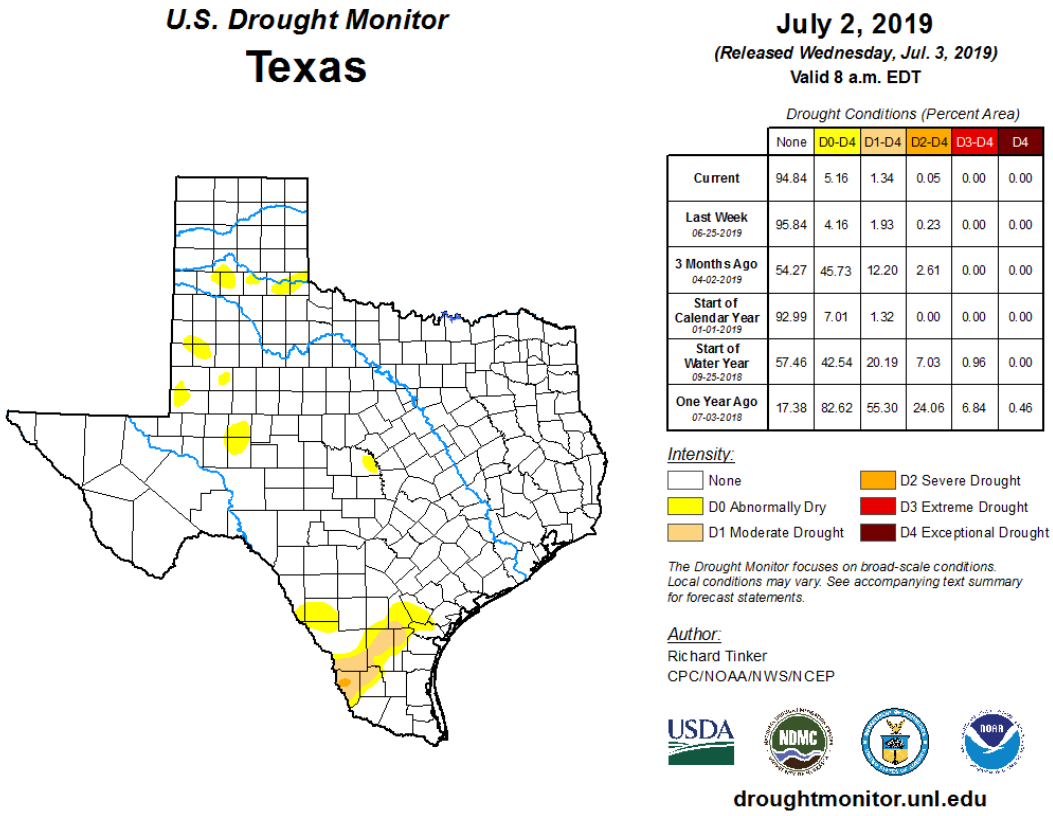
The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record. – 30 TAC Chapter 288

The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable. – 30 TAC Chapter 288

This model DCP is intended to follow the regional recommendations for groundwater users. This recommendation is to monitor drought intensity using the U.S. Drought Monitor website. Drought intensity is updated weekly with a map of Texas shaded with the applicable drought condition.

Category	Description	Possible Impacts	Palmer Drought Index	USGS Weekly Streamflow (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	-1.0 to -1.9	21-30
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested	-2.0 to -2.9	11-20
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions	-4.0 to -4.9	3-5
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0-2

Go to https://droughtmonitor.unl.edu/Maps/MapArchive.aspx
Select “current” “state” and “Texas” from the drop-down menus.



Once the specific drought intensity is determined using the map, the groundwater user is encouraged to voluntarily follow the drought responses recommended by the nearest public water supplier(s) to the groundwater user.

Stage 1 – Mild Water Shortage

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive.

- Request voluntary water conservation from all customers

Stage 2 – Moderate Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D1 - moderate drought.

Termination: Stage 2 shall be rescinded when the local weekly drought category is D0 - abnormally dry.

Water Management Strategies: During Stage 2, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage.

- Lawn watering restrictions

Stage 3 – Severe Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D2 - severe drought.

Termination: Stage 3 shall be rescinded when the local weekly drought category is D1 – moderate drought.

Water Management Strategies: During Stage 3, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

- A ban on lawn watering and all other non-essential water use
- Utilize alternate or emergency water sources

Stage 4 – Emergency Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D3 - extreme drought.

Termination: Stage 4 shall be rescinded when the local weekly drought category is D2 – severe drought.

Water Management Strategies: During Stage 4, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive.

- Utilize alternative or emergency water supplies (i.e. tying into a neighboring water system, etc.
- Strategies listed in Stage 3

7.3.1 MODEL DROUGHT CONTINGENCY PLAN – MUNICPAL USER

General Information

Introduction

Drought is a very real natural disaster that occurs in Texas, even in the verdant bottomlands, green pastures, and piney woods of northeast Texas. As recently as 2011, drought strained water systems in the northeast Texas region. In addition to natural drought, there are also water supply emergencies that occur from time to time in which water supply becomes contaminated. A good example of this is the MTBE spill into Lake Tawakoni in May 2000, which contaminated supply for several Hunt County water systems for multiple days.

In an effort to better respond to drought conditions than we've been able to in the past, the North East Texas Regional Water Planning Group (NETRWPG) has prepared this document, with the idea that if water providers study their water supply system before a drought or emergency occurs, then they will be better prepared to respond. In preparing this document, several references were used, including Chapters 288 and 363 of the Texas Administrative Code, the Texas Commission on Environmental Quality's (TCEQ) 'Handbook for Drought Contingency Planning for Retail Public Water Suppliers,' Texas Water Code § 11.1272, and the TCEQ and TWDB websites. All of these resources are available to you if you need further information or clarification. You may also contact the TCEQ at 512-239-4691 with questions or for information. Example wording for your plan will be found throughout in bold italics.

According to the requirements set forth in the amended Chapter 288, Subchapter C of the Texas Administrative Code, retail public water suppliers providing water service to 3,300 or more connections must submit revisions to existing drought contingency plans to the executive director not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. Any new or revised plans must be submitted to the executive director within 90 days of adoption by the community water system. Any new retail public water suppliers providing water service to 3,300 or more connections shall prepare and adopt a drought contingency plan within 180 days of commencement of operation, and submit the plan to the executive director within 90 days of adoption. If you are a retail supplier, but serve less than 3,300 connections, you are still required to develop and implement a plan, but you do not need to submit the plan unless specifically requested by TCEQ. If you provide retail supply in addition to wholesale supply, you will also need to develop a retail drought contingency plan. Please see the Northeast Texas Region's guidance for retail drought contingency plans.

The _____(water provider) understands that water conservation is a viable strategy for protecting water resources both now and in the future, and that adequate planning for times of drought or emergency is a necessary part of conservation. The purpose of this plan is to prepare for the possibility of a drought or emergency situation where water is in short supply. This plan will help to ensure that _____(water supplier) and its wholesale customers use water wisely and efficiently during periods of drought.

Though not specifically required by rule, it is helpful to the reader if you summarize your water supply and distribution systems in the introduction. This will familiarize users of the Plan with your system, and help them to make sense of the actions that you intend to take. In addition, discussing your water system here will assist those who update the plan in five years, because they will know exactly what the system looked like when the plan was created.

The _____(water supplier) utilizes groundwater /surface water from _____(source). Supply is secured by a (water right, water supply contract, etc.) through the year _____. Our customers include _____, and their current contracted amounts are _____. Our storage and distribution systems consist of _____.

Coordination with the North East Texas Regional Water Planning Group

The drought contingency plan must document coordination with the regional water planning groups for the service area of the wholesale public water supplier to ensure consistency with the appropriate approved regional water plans. – 30 TAC Chapter 288

A copy of this adopted plan will be submitted to the NETRWPG via its administrator, Mr. Walt Sears, Northeast Texas Municipal Water District, P. O. Box 955, Hughes Springs, Texas 75656. Proof of submittal is attached hereto as Figure ___.

Informing the Public/Requesting Input

According to 30 TAC Chapter 288, Subchapter B.a.1, "Preparation of the plan shall include provisions to actively inform the public and to affirmatively provide opportunity for user input in the preparation of the plan and for informing wholesale customers about the plan. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the public and providing written notice to the public concerning the proposed plan and meeting."

The _____(water supplier) gave the public and its wholesale customers an opportunity to provide input into this plan by _____(public notice, public hearing, letter requesting comments, etc.). Public comments included _____.

Efforts to inform wholesale customers and the public about each stage of the plan, and when stages are implemented or rescinded, will be through _____ (certified letter, newspaper articles, radio announcements, website announcements, etc.).

Authorization/Applicability

The _____ (mayor, president, city administrator, etc.) is hereby authorized to monitor weather conditions as well as water supply and demand conditions and to implement the Drought Contingency Plan as appropriate.

The _____(City Council, Board of Directors, etc.) authorizes the Plan by a _____(resolution, ordinance), which has been included in this Plan.

Coordination with the Texas Commission on Environmental Quality

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According to 30 TAC Chapter 288, Subchapter C, "Wholesale public water suppliers shall submit a drought contingency plan meeting the requirements of Subchapter B of this chapter to the executive director not later than May 1, 2005, after adoption of the drought contingency plan by the governing body of the water supplier. Thereafter, the wholesale public water suppliers shall submit the next revision of the plan not later than May 1, 2009, and every five years after that date to coincide with the regional water planning group. Any new or revised plans must be submitted to the executive director within 90 days of adoption by the governing body of the wholesale public water supplier."

This plan was submitted to the executive director of the Texas Commission of Environmental Quality on _____(date).

Send your plan to the following address: TCEQ, Resource Protection Team, Mail Code 160, P.O. Box 13087, Austin, TX 78711-3087 for regular and certified mail, or 12100 Park 35 Circle, Austin, TX 78753 for express carrier deliveries (U.S. Post Office Express Mail, FedEx, UPS, etc.).

For questions to the TCEQ, see the website at www.tceq.state.tx.us, or call: 512/239-4691.

Coordination with Wholesale Water Supplier

This section only applies if you purchase supply from a wholesale provider. If you have a contract or agreement with a water provider, then complete this section. If you have your own water rights or otherwise own your supply, this section does not apply.

This plan has been created with our water provider, _____'s drought contingency plan in mind. We have included _____'s (water provider) requirements within our plan and have created this plan to compliment _____'s (water provider) plan. _____(water provider) has been provided a copy of this plan.

Plan Definitions

For the purposes of this Plan**,** the following definitions, taken from TCEQ guidance, shall apply:

Aesthetic water use: water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

Commercial and institutional water use: water use which is integral to the operations of commercial and non-profit establishments and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

Customer: any person, company, or organization using water supplied by _____ (name of water supplier).

Domestic water use: water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

Even number address: street addresses, box numbers, or rural postal route numbers ending in 0, 2, 4, 6, or 8 and locations without addresses.

Industrial water use: the use of water in processes designed to convert materials of lower value into forms having greater usability and value.

Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, rights-of-way and medians.

Non-essential water use: water uses that are not essential nor required for the protection of public, health, safety, and welfare, including:

(a) irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this Plan;
(b) use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;
(c) use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;
(d) use of water to wash down buildings or structures for purposes other than immediate fire protection;
(e) flushing gutters or permitting water to run or accumulate in any gutter or street;

(f) use of water to fill, refill, or add to any indoor or outdoor swimming pools or jacuzzi-type pools;
(g) use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;
(h) failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and
(i) use of water from hydrants for construction purposes or any other purposes other than fire fighting.

Odd numbered address: street addresses, box numbers, or rural postal route numbers ending in 1, 3, 5, 7, or 9.

RESPONSE TO A DROUGHT EVENT

In this portion of the plan, it will need to be determined whether a water constraint will more likely be caused by a shortage in water supply or by constraints in the storage and distribution system. Associated goals and water management measures should correspond to the type of constraint expected. For example, if insufficient storage is determined to be the most likely cause of water shortage during a drought, then an emergency back-up supply source would not solve the problem; reduced use during peak hours (banning lawn watering, etc.) would more likely solve the problem by giving storage tanks a better opportunity to refill.

The drought contingency plan should be designed for a drought condition at least as severe as the drought of record according to TCEQ rules. Since the drought of record in Texas occurred in the 1950's, few systems will have water use records still available to plan by. Therefore, the NETRWPG suggests using the most recent drought for the State, which occurred in 2011. If your system does not have records for 2011, use the time period in your records when your system was the most strained by dry weather conditions.

The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record. – 30 TAC Chapter 288

The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable. – 30 TAC Chapter 288

A minimum of three drought stages is required in this plan. During each stage, it will need to be determined what will trigger initiation, what the water use reduction target goal is, what water management strategies will be put into place, and, finally, what will terminate the stage. Keep in mind that a supplier who is also a customer of its wholesale provider must comply with its provider's Drought Contingency Plan. Do not develop stages or management strategies that are in conflict with your water provider's DCP. Also note that the NETRWPG has developed water

management strategies for all providers who are projected to have a water shortage within the planning period (50 years). You should review the latest version of the Regional Water Plan to determine if you have had strategies prepared for you.

Include an opening paragraph in this section that describes what information should be monitored in order to initiate the stages, and a rationale of why you chose the triggering criteria that you chose.

The drought contingency plan must include a provision in every wholesale water contract entered into or renewed after adoption of the plan, including contract extensions, that in case of a shortage of water resulting from drought, the water to be distributed shall be divided in accordance with Texas Water Code, §11.039. – 30 TAC Chapter 288

Texas Water Code, §11.039 states, "DISTRIBUTION OF WATER DURING SHORTAGE. (a) If a shortage of water in a water supply not covered by a water conservation plan prepared in compliance with Texas Natural Resource Conservation Commission or Texas Water Development Board rules results from drought, accident, or other cause, the water to be distributed shall be divided among all customers pro rata, according to the amount each may be entitled to, so that preference is given to no one and everyone suffers alike. (b) If a shortage of water in a water supply covered by a water conservation plan prepared in compliance with Texas Natural Resource Conservation Commission or Texas Water Development Board rules results from drought, accident, or other cause, the person, association of persons, or corporation owning or controlling the water shall divide the water to be distributed among all customers pro rata, according to: (1) the amount of water to which each customer may be entitled; or (2) the amount of water to which each customer may be entitled, less the amount of water the customer would have saved if the customer had operated its water system in compliance with the water conservation plan.(c) Nothing in Subsection (a) or (b) precludes the person, association of persons, or corporation owning or controlling the water from supplying water to a person who has a prior vested right to the water under the laws of this state.

Stage 1 – Mild Water Shortage

Initiation: The _____(name of water supplier) will consider that a mild water shortage exists when_____ (i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by*** _____ (entity's water provider) if applicable**.**

Target Goal: When a mild water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 1 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage I is rescinded by*** _____ (entity's water provider) if applicable***.***

Water Management Strategies: During Stage 1, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Request voluntary water conservation from all customers
- Recommend that customers initiate Stage 1 of their Drought Contingency Plans
- Reduce operating procedures that use water (i.e. flushing of mains) as appropriate

<u>Stage 2 – Moderate Water Shortage</u>

Initiation: The _____(water supplier) will consider that a moderate water shortage exists when_____(i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by _____ (entity's water provider)*** if applicable.

Target Goal: When a moderate water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 2 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage 2 is rescinded by***

_____ (entity's water provider) if applicable. ***Upon termination of Stage 2, Stage 1 becomes operative.***

Water Management Strategies: During Stage 2, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Recommend that customers initiate Stage 2 of their Drought Contingency Plans, which should, at a minimum, contain lawn watering restrictions
- Modify reservoir operations if applicable
- Initiate strong public awareness campaign in service area to warn of impending shortages

Stage 3 – Severe Water Shortage

Initiation: The _____(water supplier) will consider that a severe water shortage exists when_____(i.e. water levels in the reservoir reach_____; average daily water use reaches ___% of capacity for three consecutive days; water level in elevated storage tank is at or below ____ for more than 12 hours, etc.)***, or when requested by _____*** (entity's water provider) if applicable***.***

Target Goal: When a severe water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 3 shall be rescinded when _____ (i.e. water levels in the reservoir rise above ___ for 7 consecutive days; average daily water use falls below ___% of capacity for three consecutive days; storage facilities return to normal levels for 24 consecutive hours, etc.)***, or when Stage 3 is rescinded by*** _____ (entity's water provider) if applicable***. Upon termination of Stage 3, Stage 2 becomes operative.***

Water Management Strategies: During Stage 3, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Recommend that customers initiate Stage 3 of their Drought Contingency Plans, which, at a minimum, must include a ban on lawn watering
- Begin pro rata water allocation (Pro rata curtailment of water deliveries to or diversions by wholesale water customers must be considered in a wholesale DCP according to 30 TAC Chapter 288, Subchapter B. Rules for pro rata curtailment are provided in Texas Water Code, §11.039.)
- Implement water rate surcharges (i.e. a set charge for any use above average monthly use)
- Implement price adjustments (i.e. increase the price per 1,000 gallons of water used above the average monthly use)
- Utilize alternate or emergency water sources

Stage 4 – Emergency Water Shortage

This Stage could apply in the instance of a major water line break, a contamination of the water supply source, or other urgent water system conditions. Most likely, this stage would be initiated by decision of the authorized plan implementer (Mayor, President, Manager, etc.)

Initiation: The _____(water supplier) will consider that an emergency water shortage exists when_____ (i.e. the water main at the water treatment plant bursts or is otherwise significantly damaged; the reservoir is contaminated by oil spill; etc.,)***, or when requested by _____*** (entity's water provider) if applicable.

Target Goal: When an emergency water shortage exists, the _____(water supplier) will implement water management strategies in an attempt to reduce daily water use to _____ (i.e. 2 MGD; ___% of average daily water use, etc.) Please note that this goal must be quantifiable. Goals established in this section are not enforceable.

Termination: Stage 4 shall be rescinded when _____ (i.e. the main at the water treatment plant is restored and storage tanks have been allowed to refill; analysis of the source water indicates that supply is safe to use; etc.), ***or when Stage 4 is rescinded by*** _____(entity's water provider) if applicable.

Water Management Strategies: During Stage 4, we will take the following steps to reduce water use:_____.

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following: (A) pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and (B) utilization of alternative water sources with the prior approval of the executive director as appropriate, e.g. interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.). – 30 TAC Chapter 288

- Utilize alternative or emergency water supplies (i.e. tying into a neighboring water system, etc. This may require approval by the TCEQ Executive Director)
- Modify reservoir operations
- Strategies listed in Stage 3

PLAN EXECUTION

Public Involvement

This section should discuss the ways in which the supplier will inform its wholesale customers about the initiation and termination of drought stages, as well as management strategies that customers are expected to follow. Public involvement can be in the form of special public hearings, articles and notices in the local newspaper, radio announcements, announcements on local television stations, notices in billing statements, etc.

The _____ (water provider) will keep its customers apprised of initiation of the drought contingency plan, and changes in stages, by means of _____.

Enforcement

The _____ (Mayor, City Manager, President, etc.), or his/her designee, is responsible for monitoring weather conditions and water supplies, and determining when to initiate and terminate stages of the DCP.

The drought contingency plan must include procedures for the enforcement of any mandatory water use restrictions including specification of penalties (e.g., liquidated damages, water rate surcharges, discontinuation of service) for violations of such restrictions. – 30 TAC Chapter 288, Subchapter B.a.10.

The _____ (governing body) has adopted this plan through _____ (ordinance, resolution), and has made it an official _____ (city, Corporation, etc.) policy. The _____ (ordinance, resolution, etc.) is attached hereto as Figure ___.

Provision for responding to wholesale provider restrictions

Any water supplier that receives all or a portion of its water supply from another water supplier shall consult with that supplier and shall include in the drought contingency plan appropriate provisions for responding to reductions in that water supply. – 30 TAC Chapter 288

If you have a wholesale provider, then add this section. If you own your own supply, please skip this section.

As stated in each water shortage stage, we intend to comply with all requirements of our wholesale provider's drought contingency plan. This plan is as stringent as our provider's plan, and in some cases may be more so.

Notification of TCEQ on mandatory provisions

A wholesale or retail water supplier shall notify the executive director within five business days of the implementation of any mandatory provisions of the drought contingency plan. – 30 TAC Chapter 288

The Executive Director at TCEQ shall be notified with 5 business days if any mandatory provisions of this plan are implemented. The Executive Director can be reached at 512-239-3900.

Variance procedures

The drought contingency plan must include procedures for granting variances to the plan. – 30 TAC Chapter 288

The _____ (authorized representative) may, in writing, grant temporary variance for existing water uses otherwise prohibited under this Plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire protection for the public or the customer requesting such variance and if one or more of the following conditions are met:

(a) Compliance with this Plan cannot be technically accomplished during the duration of the water supply shortage or other condition for which the Plan is in effect.

(b) Alternative methods can be implemented which will achieve the same level of reduction in water use.

Customers requesting an exemption from the provisions of this Plan shall file a petition for variance with the _____ (water supplier) within 5 days after the Plan or a particular drought response stage has been invoked. All petitions for variances shall be reviewed by the _____ (authorized representative), and shall include the following:

(a) Name and address of the petitioner(s).
(b) Purpose of water use.
(c) Specific provision(s) of the Plan from which the petitioner is requesting relief.
(d) Detailed statement as to how the specific provision of the Plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this Ordinance.
(e) Description of the relief requested.
(f) Period of time for which the variance is sought.
(g) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this Plan and the compliance date.
(h) Other pertinent information.

Variances granted by the _____ (water supplier) shall be subject to the following conditions, unless waived or modified:

(a) Variances granted shall include a timetable for compliance.
(b) Variances granted shall expire when the Plan is no longer in effect, unless the petitioner has failed to meet specified requirements.

No variance shall be retroactive or otherwise justify any violation of this Plan occurring prior to the issuance of the variance.

5-year updates

The retail public water supplier shall review and update, as appropriate, the drought contingency plan, at least every five years, based on new or updated information, such as the adoption or revision of the regional water plan. – 30 TAC Chapter 288

This plan shall be re-evaluated and updated every five years based on updated information; especially the latest adopted NETRWPG Regional Water Plan.

7.3.2 MODEL DROUGHT CONTINGENCY PLAN – INDUSTRIAL USER (MANUFACTURING AND STEAM ELECTRIC POWER)

RESPONSE TO A DROUGHT EVENT

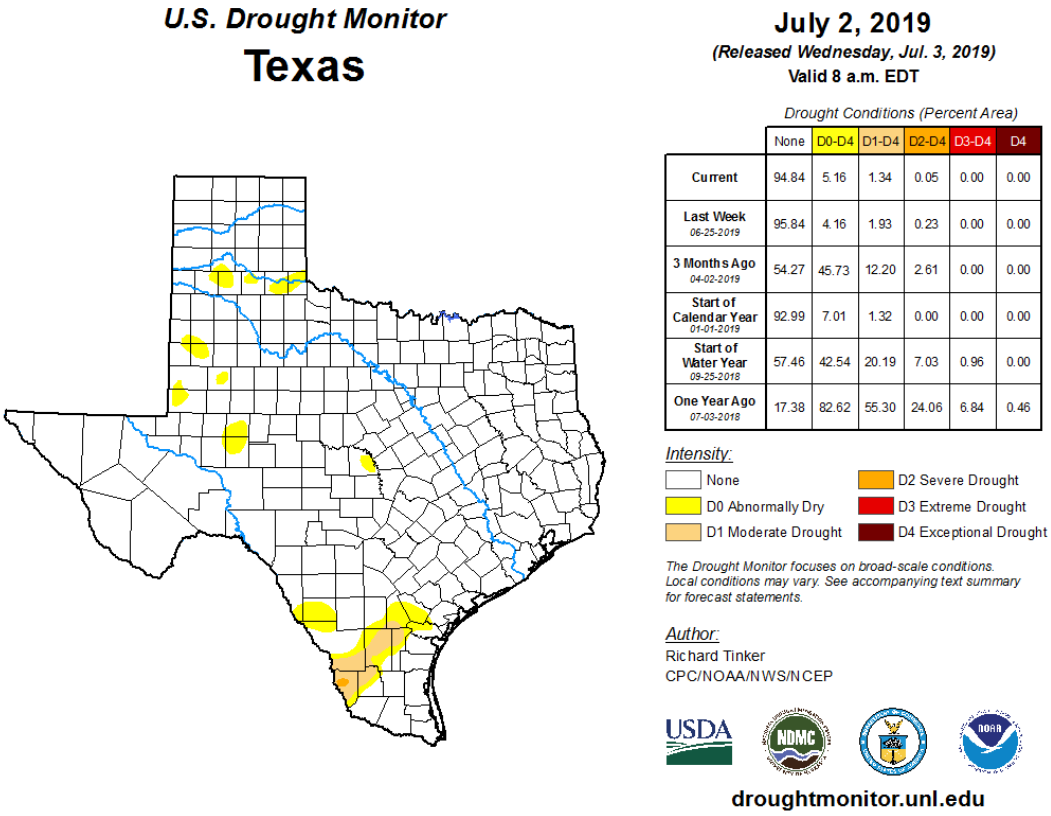
The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record. – 30 TAC Chapter 288

The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable. – 30 TAC Chapter 288

This model DCP is intended to follow the regional recommendations for industrial users, which includes manufacturing and steam electric power. This recommendation is to monitor drought intensity using the U.S. Drought Monitor website. Drought intensity is updated weekly with a map of Texas shaded with the applicable drought condition.

Category	Description	Possible Impacts	Palmer Drought Index	USGS Weekly Streamflow (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	-1.0 to -1.9	21-30
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested	-2.0 to -2.9	11-20
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions	-4.0 to -4.9	3-5
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0-2

Go to https://droughtmonitor.unl.edu/Maps/MapArchive.aspx
Select “current” “state” and “Texas” from the drop-down menus.



Once the specific drought intensity is determined using the map, the industrial user is encouraged to voluntarily follow the drought responses recommended by the nearest public water supplier(s) or this plan.

Stage 1 – Mild Water Shortage

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive.

- Request voluntary water conservation from all customers

Stage 2 – Moderate Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D1 - moderate drought.

Termination: Stage 2 shall be rescinded when the local weekly drought category is D0 - abnormally dry.

Water Management Strategies: During Stage 2, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage.

- Request ten percent water conservation

Stage 3 – Severe Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D2 - severe drought.

Termination: Stage 3 shall be rescinded when the local weekly drought category is D1 – moderate drought.

Water Management Strategies: During Stage 3, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive. When determining strategies, remember the type of constraint you expect on your system and plan accordingly.

- Request twenty percent water conservation
- Utilize alternate or emergency water sources

Stage 4 – Emergency Water Shortage

Initiation: The groundwater user will consider that a moderate water shortage exists when the local drought stage shown on the weekly Texas map is category D3 - extreme drought.

Termination: Stage 4 shall be rescinded when the local weekly drought category is D2 – severe drought.

Water Management Strategies: During Stage 4, we will follow the drought restrictions of local public water supplier(s).

The following are examples of strategies that are commonly used during this stage. These are not mandatory, only suggestive.

- Request thirty percent water conservation
- Utilize alternative or emergency water supplies (i.e. tying into a neighboring water system, etc.

The following worksheet content is from TCEQ industrial conservation plan guidance, and is included For guidance.

WATER USE AND CONSERVATION PRACTICES

Water Use in Industrial Processes

Production Use	*% Groundwater*	*% Surface Water*	*% Saline Water*	*% Treated Water*	*Water Use (in acre-ft)*
Cooling, condensing, & refrigeration					
Processing, washing, transport					
Boiler feed					
Incorporated into product					
Other					

Facility Use	*% Groundwater*	*% Surface Water*	*% Saline Water*	*% Treated Water*	*Water Use (in acre-ft)*
Cooling tower(s)					
Pond(s)					
Once through					
Sanitary & drinking water					
Irrigation & dust control					

1. Was fresh water recirculated at this facility? ☐ Yes ☐ No

2. Provide a detailed description of how the water will be utilized in the industrial process.

3. Estimate the quantity of water consumed in production processes and is therefore unavailable for reuse, discharge, or other means of disposal.

4. Monthly water consumption for previous year (in acre-feet).

Month	*Diversion Amount*	*% of Water Returned (If Any)*	*Monthly Consumption*
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Totals			

5. Projected monthly water consumption for next year (in acre-feet).

Month	*Diversion Amount*	*% of Water Returned (If Any)*	*Monthly Consumption*
January			
February			
March			
April			
May			
June			

July			
August			
September			
October			
November			
December			
Totals			

Specific and Quantified Conservation Goal

Water conservation goals for the industrial sector are generally established either for (1) the amount of water recycled, (2) the amount of water reused, or (3) the amount of water not lost or consumed, and therefore is available for return flow.

6. Water conservation goal (water use efficiency measure)

   Type of goal(s):
   - % reused water
   - % of water not consumed and therefore returned
   - Other (specify)

7. Provide specific, quantified 5-year and 10-year targets for water savings and the basis for development of such goals for this water use/facility.

   Quantified 5-year and 10-year targets for water savings:

   a. 5-year goal:

   b. 10-year goal:

8. Describe the device(s) and/or method(s) used to measure and account for the amount of water diverted from the supply source, and verify the accuracy is within plus or minus 5%.

9. Provide a description of the leak-detection and repair, and water-loss accounting measures used.

10. Describe the application of state-of-the-art equipment and/or process modifications used to improve water use efficiency.

11. Describe any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal or goals of the water conservation plan:

Appendix C8 – Chapter 8:

UNIQUE STREAM SEGMENTS, RESERVOIR SITES, AND LEGISLATIVE RECOMMENDATIONS

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APPENDIX C8

The 2011 Regional Water Plan reports of Ecologically Unique Stream Segments are included herein for use in the 2021 Regional Water Plan.

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Description for Designation of Pecan Bayou as an Ecologically Unique Stream Segment

Pecan Bayou originates two miles south of Woodland in northwestern Red River County, flows generally east forty miles to join the Red River approximately one mile west of the Bowie County line (Texas Historical Association, 2009). The site, including bottomland forest, encompasses approximately 613,462 acres (fig.1). It represents one of the largest undammed watersheds in northeast Texas; and supports multiple large examples of mature bottomland hardwood forest, and rare and endangered species (Zwartjes, et al, 2000).

1) **Biological function**: Extensive bottomland hardwood forest supporting multiple occurrences of rare plant life, including:
   - Arkansas meadowrue (*Thalictrum arkansanum* G2QS1) (Sanders, 1994)
   - Southern lady's slipper orchid (*Cypripedium kentuckiense* G3S1) (Sanders, 1994)
   - Old growth Shortleaf Pine-Oak forest (*Pinus echinata-Quercus sp*. G4S4) (Sanders, 1994)
   - Water oak-Willow oak association (*Quercus nigra-Q. phellos* G4S3) (Sanders, 1994)

2) **Hydrologic function**: Represents one of the largest undammed watersheds in northeast Texas, natural hydrologic regime is assumed intact. Flood attenuation, flow stabilization and impacts on groundwater recharge have not been quantified.
3) **Riparian conservation areas:** No public conservation areas however significant private conservation area[1].
4) **High water quality/exceptional aquatic life**: Insufficient data
5) **Threatened and endangered species**:
   - American Burying Beetle (*Nicrophorus americanus* G2 Federally listed Endangered) (Godwin, 2005)
   - Black Bear (*Ursus americanus* G5 State Threatened, ssp. *luteolus* Federally listed Threatened) (Garner, personal communication, 2007)
   - Timber Rattlesnake (*Crotalus horridus* G4 State Threatened)

[1]The Nature Conservancy, Texas Chapter, owns 1334 acres within a 6,960-acre site protecting examples of the preceding conservation elements although they are extensive within the watershed. The preserve, Lennox Woods, is located approximately 1.5 miles south of the community of Negley. The land protects an approximate 2.6 mile segment of Pecan Bayou.

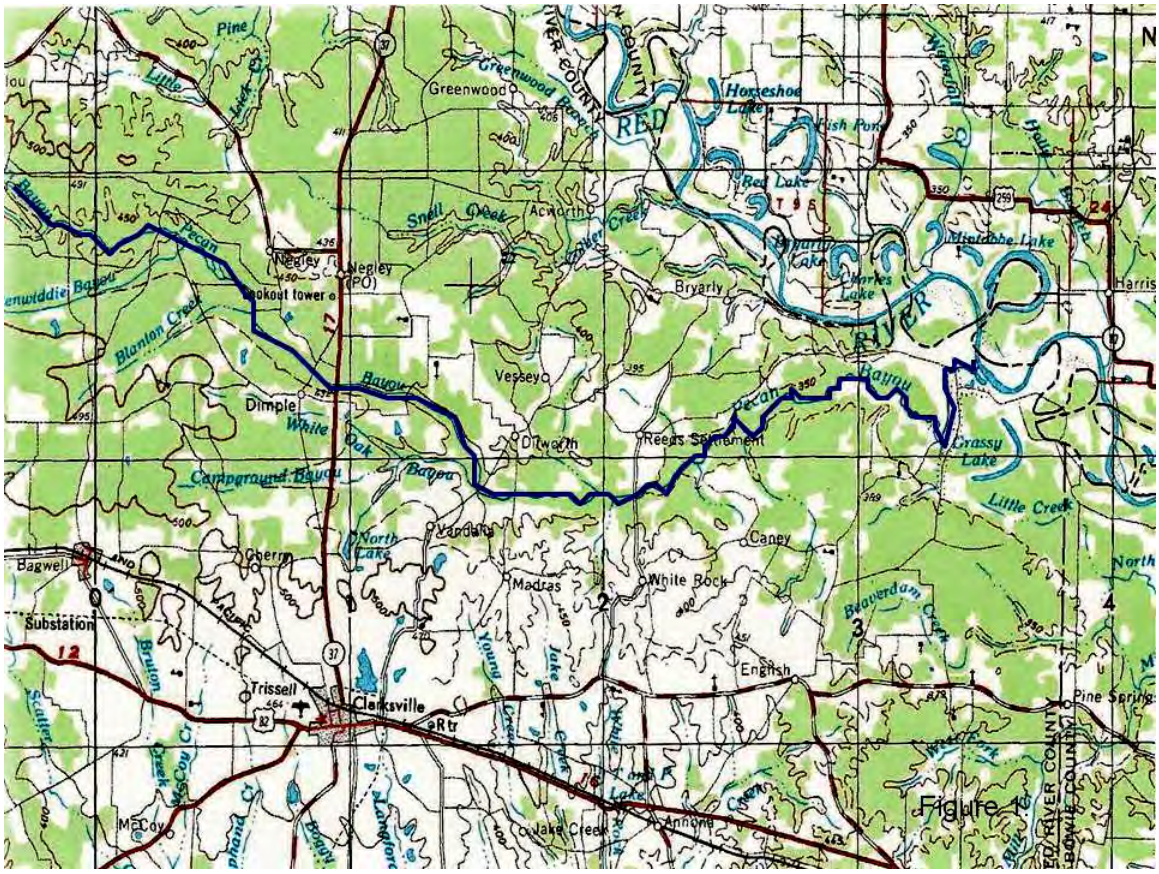
Garner, Nathan. 2007. Personal communication regarding black bear presence within the Pecan Bayou area.

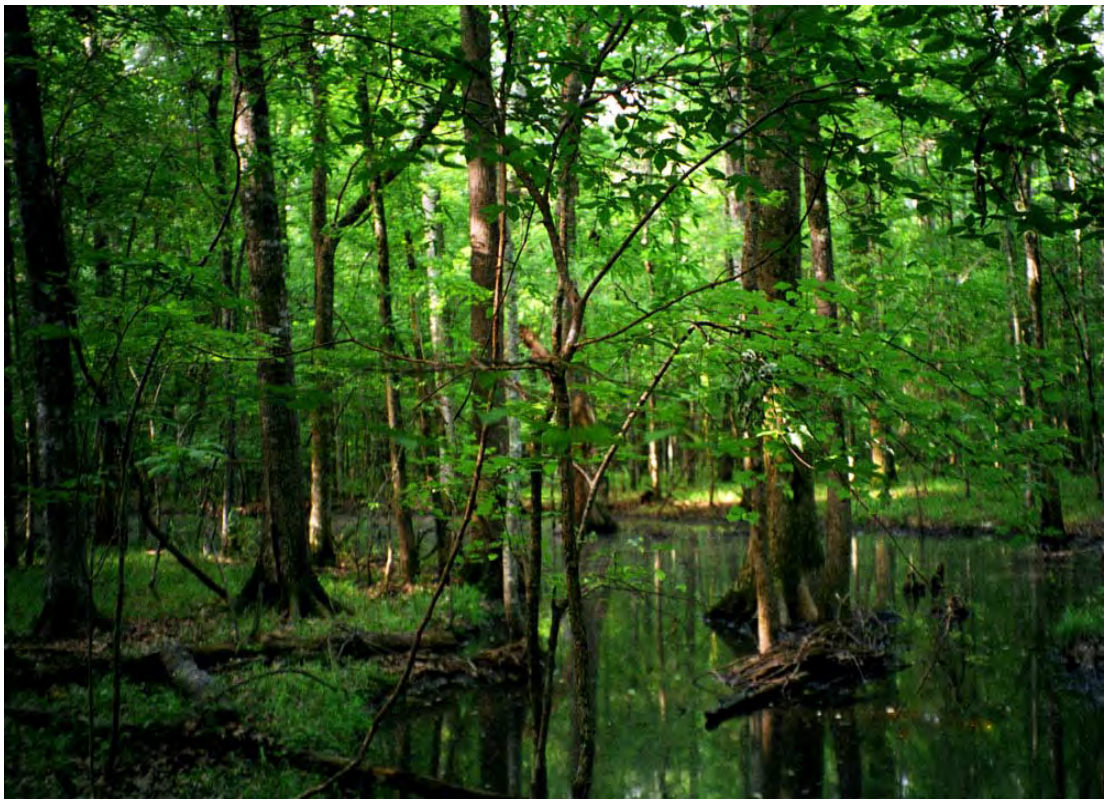
Godwin, Will 2005. Internal report to The Nature Conservancy

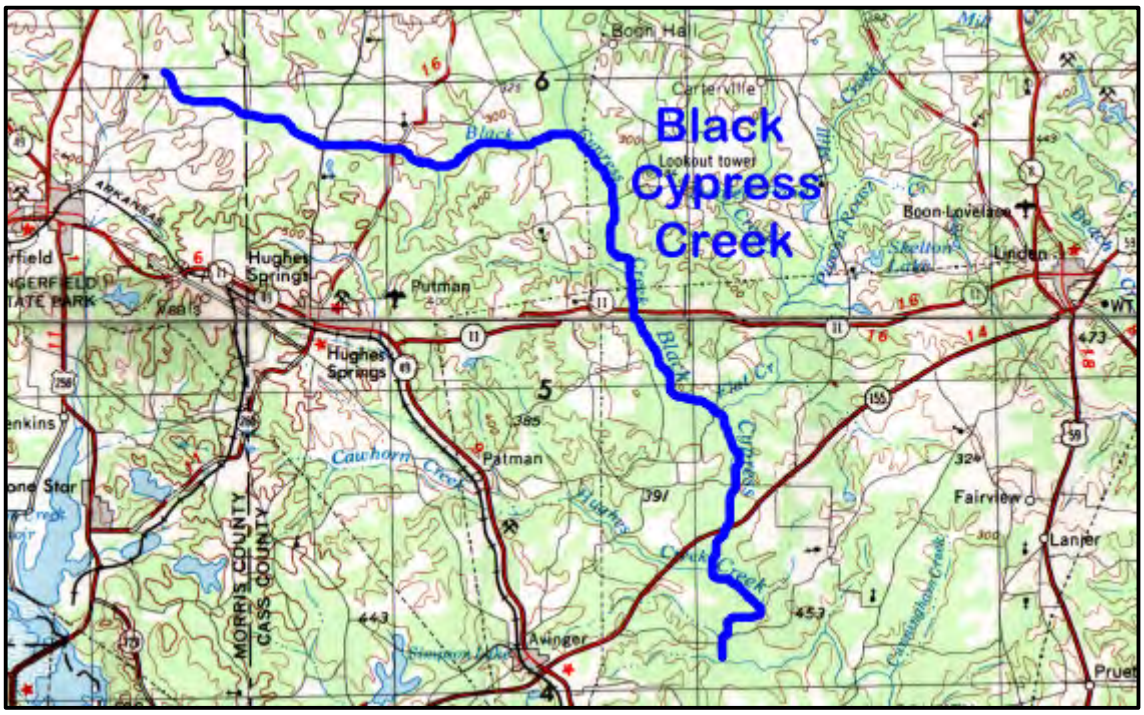
Handbook of Texas Online, s.v. “,” http://www.tshaonline.org/handbook/online/articles/PP/rhp4.html

Sanders. R.W. 1994. Vegetational Survey: Lennox Woods Preserve, Red River County, Texas. Unpublished report prepared for The Nature Conservancy of Texas. Botanical Research Institute of Texas. Ft. Worth, Texas

Zwartjes, Michelle, Eidson, James and Kristen Terpening, 2000. Conservation Plan for the Pecan Bayou Megasite. Report to The Nature Conservancy, Texas Chapter.







Adapted from USGS Tyler, Texas. Original Scale 1: 250,000.

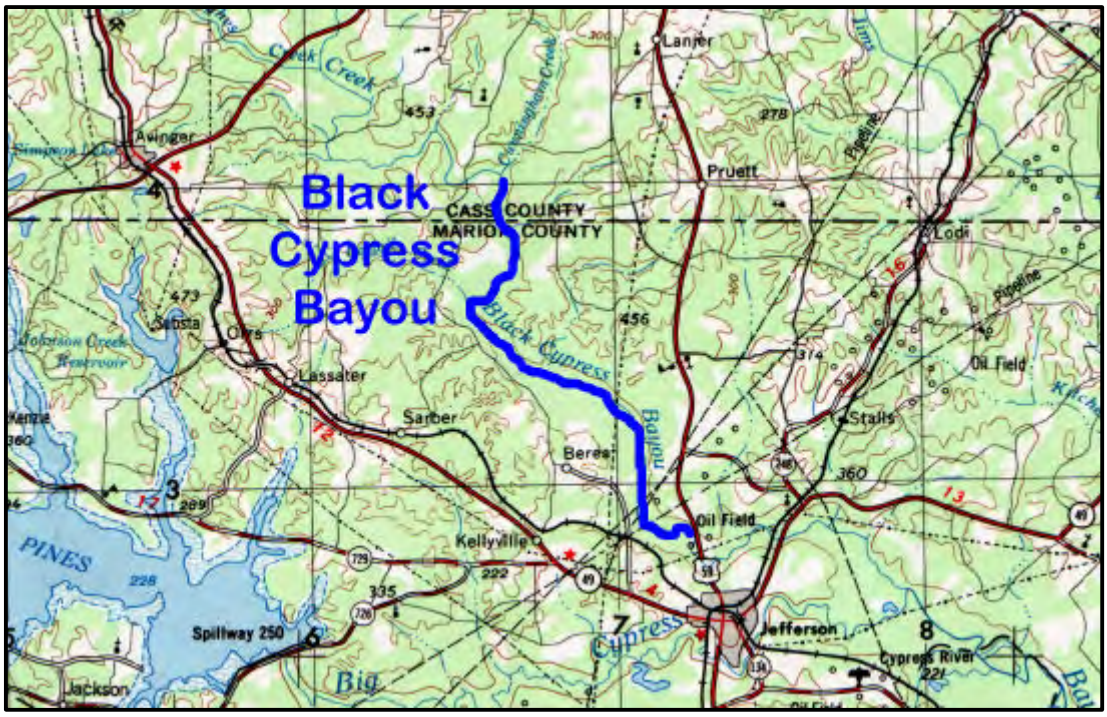
Figure 6. Map Location of Black Cypress Creek

Figure 7. Black Cypress Creek east of CR 1617

Black Cypress Creek

Black Cypress Creek begins northeast of Daingerfield in eastern Morris County and flows southeasterly about 20 miles where it becomes Black Cypress Bayou east of Avinger in southern Cass County. It has a very favorable hydrologic regime, as there are no reservoirs upstream, thus the creek floods frequently and has numerous tributaries and sloughs. The stream channel meanders extensively over a substrate that is comprised predominately of clay and decaying organic matter (Bayer et al., 1992). The lower portion of the creek is within a 12,800-acre area identified by the USFWS as containing priority bottomland hardwood. This area is very diverse with a mix of high quality water oak, willow oak, overcup oak, and red oak mixed with sweetgum, black gum, river birch, ironwood, and mayhaw, as well as several significant cypress stands (USFWS, 1985). This habitat has high species value to white-tail deer, American alligators, furbearers, squirrels, waterfowl, turkeys, raptors, colonial waterbirds, and other migratory birds (USFWS, 1985). Abundant vegetation also provides instream cover in the form of woody debris and overhanging vegetation that helps the creek support a diverse assemblage of fish and benthic macroinvertebrates. Fish species collected from Black Cypress Creek in August of 1989 include several shiner species, pugnose minnow, bullhead minnow, tadpole madtom, pirate perch, western mosquitofish, flier, largemouth bass, several darter species (slough, cypress, redfin, dusky), and several sunfish species (Bayer et al., 1992). The candidate segment is from the confluence with Black Cypress Bayou east of Avinger in South Cass County upstream to its headwaters located four miles northeast of Daingerfield in eastern Morris County.

(1) Biological Function- priority bottomland hardwood habitat displays significant overall habitat value (USFWS, 1985).
(2) Hydrologic Function- bottomland hardwood forest and associated wetlands perform valuable hydrologic function relating to water quality.
(3) Riparian Conservation Area- none identified.
(4) High Water Quality/Exceptional Aquatic Life/High Aesthetic Value- designated as a South Central Plains Ecoregion Stream by the TPWD River Studies Program due to diversity of benthic macroinvertebrates and fish (Bayer et al., 1992; Linam et al., in review).
(5) Threatened or Endangered Species/Unique Communities- none identified.



Adapted from USGS Tyler, Texas. Original Scale 1: 250,000.

Figure 8. Map Location of Black Cypress Bayou

Figure 9. Black Cypress Bayou south of CC Bridge Road

Black Cypress Bayou

Black Cypress Bayou begins at the confluence with Black Cypress Creek east of Avinger in southern Cass County and flows southeasterly about 20 miles where it empties into Big Cypress Bayou in Marion County. The upper reach of the bayou is within the same 12,800-acre area of priority bottomland hardwoods as Black Cypress Creek, thus it supports the same diverse mix of oak, sweetgum, black gum, river birch, ironwood, mayhaw, and cypress. Also like Black Cypress Creek, the bayou has high species value to white-tail deer, waterfowl, furbearers, American alligators, squirrels, turkeys, raptors, colonial waterbirds, and other migratory birds (USFWS, 1985). This section of the bayou, like much of the Big Cypress Bayou Basin, is within the target recovery area set by the TPWD for the state threatened paddlefish (Pitman, 1992). The candidate segment is from the confluence with Big Cypress Bayou in south central Marion County upstream to the confluence with Black Cypress Creek east of Avinger in south Cass County.

(1) Biological Function- priority bottomland hardwood forest displays significant overall habitat value (USFWS, 1985).
(2) Hydrologic Function- bottomland forest and associated wetlands provide valuable hydrologic function relating to water quality.
(3) Riparian Conservation Area- none identified.
(4) High Water Quality/Exceptional Aquatic Life/High Aesthetic Value- insufficient data to evaluate criteria.
(5) Threatened or Endangered Species/Unique Communities- significant due to presence of state threatened paddlefish (TPWD, 1998b).

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Memorandum

To: Jim Eidson

From: John Dugdale

Date: December 28, 2009

Subject: Legal Aspects of Recommendations by Regional Water Planning Groups to Designate Texas Stream Segment Designations as Having Unique Ecological Values and of Potentially-Associated Impacts of Such Designation

You have posed several questions regarding the impact of a Regional Water Planning Group's recommendation, ultimately to the Texas Water Development Board, to designate, in an adopted regional water plan, river and stream segments as having unique ecological values.

Background:

The statutory authority for the Texas Legislature to designate a river or stream segment of unique ecological value is Texas Water Code, Sections 16.051(e) and (f)[1] (emphasis added - full

[1] Sec. 16.051. STATE WATER PLAN: DROUGHT, CONSERVATION, DEVELOPMENT, AND MANAGEMENT; EFFECT OF PLAN. (a) Not later than January 5, 2002, and before the end of each successive five-year period after that date, the board shall prepare, develop, formulate, and adopt a comprehensive state water plan that incorporates the regional water plans approved under Section 16.053. 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.
(b) The state water plan, as formally adopted by the board, shall be a guide to state water policy. The commission shall take the plan into consideration in matters coming before it.
(c) The board by rule shall define and designate river basins and watersheds.
(d) The board, in coordination with the commission, the Department of Agriculture, and the Parks and Wildlife Department, shall adopt by rule guidance principles for the state water plan which reflect the public interest of the entire state. When adopting guidance principles, due consideration shall be given to the construction and improvement of surface water resources and the application of principles that result in voluntary redistribution of water resources. The board shall review and update the guidance principles, with input from the commission, the Department of Agriculture, and the Parks and Wildlife Department, as necessary but at least every five years to coincide with the five-year cycle for adoption of a new water plan as described in Subsection (a).
(e) On adoption the board shall deliver the state water plan to the governor, the lieutenant governor, and the speaker of the house of representatives and present the plan for review to the appropriate legislative committees. The plan shall include legislative recommendations that the board believes are needed and desirable to facilitate more voluntary water transfers. The plan shall identify river and stream segments of unique ecological value and sites of unique value for the construction of reservoirs that the board recommends for protection under this section.
(f) The legislature may designate a river or stream segment of unique ecological value. This designation solely means that a state agency or political subdivision of the state may not finance the actual construction of a reservoir in a specific river or stream segment designated by the legislature under this subsection.

text of Section 16.051 included in Footnote 1 for context). The Legislature has delegated the authority for the designation of such stream segments to Regional Water Planning Groups; the regulations that define how a Regional Water Planning Group is to make such a recommendation to the Texas Water Development Board are found at 31 TAC § 357.8, Ecologically Unique River and Stream Segments[2] (emphasis added).

(g) The legislature may designate a site of unique value for the construction of a reservoir. A state agency or political subdivision of the state may not obtain a fee title or an easement that would significantly prevent the construction of a reservoir on a site designated by the legislature under this subsection.
(g-1) Notwithstanding any other provisions of law, a site is considered to be a designated site of unique value for the construction of a reservoir if the site is recommended for designation in the 2007 state water plan adopted by the board and in effect on May 1, 2007. The designation of a unique reservoir site under this subsection terminates on September 1, 2015, unless there is an affirmative vote by a proposed project sponsor to make expenditures necessary in order to construct or file applications for permits required in connection with the construction of the reservoir under federal or state law.
(h) The board, the commission, or the Parks and Wildlife Department or a political subdivision affected by an action taken in violation of Subsection (f) or (g) may bring a cause of action to remedy or prevent the violation. A cause of action brought under this subsection must be filed in a district court in Travis County or in the county in which the action is proposed or occurring.
(i) For purposes of this section, the acquisition of fee title or an easement by a political subdivision for the purpose of providing retail public utility service to property in the reservoir site or allowing an owner of property in the reservoir site to improve or develop the property may not be considered a significant impairment that prevents the construction of a reservoir site under Subsection (g). A fee title or easement acquired under this subsection may not be considered the basis for preventing the future acquisition of land needed to construct a reservoir on a designated site.

[2] 31 TAC § 357.8(a): Regional Water Planning Groups may include in adopted regional water plans recommendations for all or parts of river and stream segments of unique ecological value located within the regional water planning area by preparing a recommendation package consisting of a physical description giving the location of the stream segment, maps, and photographs of the stream segment and a site characterization of the stream segment documented by supporting literature and data. The recommendation package shall address each of the criteria for designation of river and stream segments of ecological value found in subsection (b) of this section. The regional water planning group shall forward the recommendation package to the Texas Parks and Wildlife Department and allow the Texas Parks and Wildlife Department 30 days for its written evaluation of the recommendation. The adopted regional water plan shall include, if available, Texas Parks and Wildlife Department's written evaluation of each river and stream segment recommended as a river or stream segment of unique ecological value.
(b) A regional water planning group may recommend a river or stream segment as being of unique ecological value based upon the following criteria:
(1) biological function--stream segments which display significant overall habitat value including both quantity and quality considering the degree of biodiversity, age, and uniqueness observed and including terrestrial, wetland, aquatic, or estuarine habitats;
(2) hydrologic function--stream segments which are fringed by habitats that perform valuable hydrologic functions relating to water quality, flood attenuation, flow stabilization, or groundwater recharge and discharge;
(3) riparian conservation areas--stream segments which are fringed by significant areas in public ownership including state and federal refuges, wildlife management areas, preserves, parks, mitigation areas, or other areas held by governmental organizations for conservation purposes, or stream segments which are fringed by other areas managed for conservation purposes under a governmentally approved conservation plan;
(4) high water quality/exceptional aquatic life/high aesthetic value--stream segments and spring resources that are significant due to unique or critical habitats and exceptional aquatic life uses dependent on or associated with high water quality; or

The three questions your posed are:

1. What impact may the mere designation as an ecologically unique stream segment pursuant to TX Water Code § 16.051(f) have on the riparian rights of a landowner whose property is adjacent to a stream segment designated as such by the Legislature?

2. Could subsequent legislation that, unlike the current scheme, imposes restrictions on the development and usage rights of such a landowner, retroactively impact a pre-existing ecologically unique stream segment designation?

3. Is there a link between the designation of a stream segment an ecologically unique stream segment and value and the potential designation of that stream segment as a Wild and Scenic River pursuant to the Wild and Scenic Rivers Act (the "Act"), 16 U.S.C. § 1271 *et seq*.

Responses:

1. No impact - please note that this response presupposes only that the State Water Board has adopted the designation in the State Water Plan. *See* TX Water Code § 16.051(b):

   TX Water Code § 16.051(f) unambiguously states:

   > The legislature may designate a river or stream segment of unique ecological value. This designation solely means that a state agency or political subdivision of the state may not finance the actual construction of a reservoir in a specific river or stream segment designated by the legislature under this subsection.

   Notwithstanding the response stated *supra*, the legislative history for the companion provision of TX Water Code § 16.051(g), which relates to the designation of a site having unique attributes to the construction of a reservoir, The Bill Analysis of SB 3 indicates that the Legislature considered for the interference with private landowners' property rights in violation of Section 17 of the Texas Constitution:

---

(5) threatened or endangered species/unique communities--sites along streams where water development projects would have significant detrimental effects on state or federally listed threatened and endangered species, and sites along streams significant due to the presence of unique, exemplary, or unusually extensive natural communities.
(c) For every river and stream segment that has been designated as a unique river or stream segment by the legislature, during a session that ends not less than one year before the required date of submittal of an adopted regional water plan to the board, or recommended as a unique river or stream segment in the regional water plan, the regional water planning group shall assess the impact of the regional water plan on these segments. The assessment shall be a quantitative analysis of the impact of the plan on the flows important to the river or stream segment, as determined by the regional water planning group, comparing current conditions to conditions with implementation of all recommended water management strategies. The assessment shall also describe the impact of the plan on the unique features cited in the region's recommendation of that segment.

> A cause of action could be bought under certain circumstances. Before bringing a cause of action against a state agency or other political subdivision that had taken an action preventing the construction of a reservoir on a designated reservoir site, a political subdivision would have to file a letter of intent to construct a reservoir on the site affected by the action and offer to pay each owner of real property in the reservoir site an encumbrance. An owner of real property could reject the encumbrance The payment would have to be paid annually until the property was either acquired for the reservoir or no longer in the reservoir site. The amount would have to be at least 2.5 times the total ad valorem taxes imposed in the preceding year…
>
> Reservoir designation. CSSB 3 needlessly would cloud the title of landowners within a designated reservoir site, because the threat of a future reservoir negatively would affect their property value. Supporters of reservoir designation point out that many of these reservoirs may never be built. However, the cloud would remain on the title to property in a designated site from the moment the bill [for the reservoir designation] was enacted. It would be unfair to make this designation without providing immediate funds to offset the loss in value that landowners would see. Without such compensation, the state in effect would be taking private property rights without compensation.

2. No:

   Pursuant to Article 1, Section 16, of the Texas Constitution, the Texas Legislature may not enact an *ex post facto* or retroactive law.

   In addition, pursuant to Article 1, Section 17, of the Texas Constitution, "no person's property shall be taken, damaged, or destroyed for or applied to public use without adequate compensation being made, unless by the consent of such person…"

   However, there is no constitutional prohibition against a change in law that could void an existing riparian landuse scheme and impose new restrictions (which new restrictions, of course, could be subject to challenge).

3. Possibly.

   Pursuant to Section 2(a)(ii) of the Act, 16 U.S.C. § 1272(a)(ii), a condition precedent for the Secretary of the Interior to designate, through a notice and comment rulemaking, a river or stream as a Wild and Scenic River, the Secretary must receive such a request from the governor of the state or states where the river or stream is located.[3]

[3] In pertinent part, Section 2(a)(ii) of the Act states: [The national and scenic rivers system shall comprise rivers]… that are designated as wild, scenic or recreational rivers by or pursuant to an act of the legislature

> Among the determinations the Department of Interior ("DOI") must make in that process is whether there are sufficient local, state, and federal mechanisms already in place to protect the river or stream in question, and whether the state in question has the ability to implement those mechanisms.
>
> Thus, the designation by the Texas Legislature, pursuant to TX Water Code TX Water Code § 16.051(e), of a river or stream as an ecologically unique stream segment would be a condition precedent for such a river or stream's candidacy for designation as a Wild and Scenic River. That segment's designation by the Texas Legislation would necessarily follow the recommendation of a regional water planning group in a regional water plan to nominate that segment as a unique river or stream segment. *See* 31 TAC § 357.8.

Finally, we had also discussed potential concerns of individual liability exposure of members of regional planning groups for acts conducted in their capacity as a member of such a group.

TX Water Code § 16.053(m) - (o) provide the following:

> (m) A cause of action does not accrue against a regional water planning group, a representative who serves on the regional water planning group, or an employee of a political subdivision that contracts with the regional water planning group under Subsection (l) for an act or omission in the course and scope of the person's work relating to the regional water planning group.
>
> (n) A regional water planning group, a representative who serves on the regional water planning group, or an employee of a political subdivision that contracts with the regional water planning group under Subsection (l) is not liable for damages that may arise from an act or omission in the course and scope of the person's work relating to the regional water planning group.
>
> (o) The attorney general, on request, shall represent a regional water planning group, a representative who serves on the regional water planning group, or an employee of a political subdivision that contracts with the regional water planning group under Subsection (l) in a suit arising from an act or omission relating to the regional water planning group.

Please do not hesitate to call me to discuss this memorandum.

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of the State or States through which they flow, that are to be permanently administered as weld, scenic, or recreational rivers by an agency or political subdivision of the State or States concerned, that are found by the Secretary of the Interior, upon application of the Governor of the State or the Governors of the States concerned, or a person or persons thereunto duly appointed by him or them, to meet the criteria established in this Act and such critical supplementary thereto as he may prescribe, and that are approved by him for inclusion in the system.

cc: David Bezanson, TNC

Appendix C9 – Chapter 9:

INFRASTRUCTURE FINANCING

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APPENDIX C9

Results from Infrastructure Financing analyses will be included in the Final 2021 Region D Plan.

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Appendix C10 – Chapter 10:

ADOPTION OF PLAN AND PUBLIC PARTICIPATION

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APPENDIX C10

Comments made at the public hearing and by reviewers will be included herein for the purposes of the Final 2021 Region D Plan.

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Appendix C11 – Chapter 11:

IMPLEMENTATION AND COMPARISON TO PREVIOUS REGIONAL WATER PLAN

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APPENDIX C11

Results of the Implementation Survey will be included herein for the purposes of the Final 2021 Region D Plan.

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Region D Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
BOWIE COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	3,501	3,501	0.0%	3,535	3,535	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	2,379	1,584	-33.4%	2,304	800	-65.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
BOWIE COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	981	7,161	630.0%	981	7,161	630.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	6,221	10,373	66.7%	5,121	10,373	102.6%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	5,240	4,134	-21.1%	4,140	4,134	-0.1%
BOWIE COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,156	1,156	0.0%	720	720	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,156	1,825	57.9%	720	1,136	57.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	669	100.0%	0	416	100.0%
BOWIE COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	35	35	0.0%	35	35	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,579	1,611	2.0%	2,286	2,047	-10.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	1,544	1,579	2.3%	2,251	2,014	-10.5%
BOWIE COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	187	66	-64.7%	187	66	-64.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	17,374	12,850	-26.0%	17,399	15,058	-13.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	17,187	12,784	-25.6%	17,216	14,992	-12.9%
CAMP COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	432	432	0.0%	478	478	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	136	173	27.2%	48	120	150.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
CAMP COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	952	952	0.0%	952	952	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	952	4,914	416.2%	952	4,914	416.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	3,962	100.0%	0	3,962	100.0%
CAMP COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	47	102	117.0%	58	102	75.9%
PROJECTED DEMAND TOTAL (acre-feet per year)	46	35	-23.9%	58	52	-10.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
CAMP COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	23	23	0.0%	23	23	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	12	12	0.0%	7	7	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
CAMP COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,762	2,814	1.9%	2,792	2,814	0.8%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,539	1,480	-3.8%	2,194	2,091	-4.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	226	0	-100.0%
CASS COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,766	638	-76.9%	3,073	638	-79.2%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,589	1,087	-31.6%	1,410	846	-40.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	449	100.0%	0	208	100.0%

*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Data Comparison to 2016 RWP report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG county and category level, calculated surpluses are updated to zero so that only the WUGs with needs in the decade are included with the Needs totals.

Region D Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
CASS COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	839	839	0.0%	841	841	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	715	2,657	271.6%	715	2,657	271.6%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	1,818	100.0%	0	1,816	100.0%
CASS COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	120,051	32,774	-72.7%	88,056	32,845	-62.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	115,199	32,723	-71.6%	150,883	32,799	-78.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	115	0	-100.0%	62,827	0	-100.0%
CASS COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	839	839	0.0%	952	952	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	39	39	0.0%	20	20	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
CASS COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,974	4,250	42.9%	2,920	4,438	52.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,882	2,415	28.3%	1,766	2,502	41.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	47	100.0%	0	38	100.0%
DELTA COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,148	194	-83.1%	1,022	175	-82.9%
PROJECTED DEMAND TOTAL (acre-feet per year)	207	82	-60.4%	210	73	-65.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
DELTA COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	4,601	9,163	99.2%	4,530	9,203	103.2%
PROJECTED DEMAND TOTAL (acre-feet per year)	2,775	2,396	-13.7%	2,626	2,396	-8.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
DELTA COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	373	279	-25.2%	373	291	-22.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	373	541	45.0%	373	541	45.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	262	100.0%	0	250	100.0%
DELTA COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,807	1,119	-38.1%	1,668	1,116	-33.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	457	591	29.3%	442	580	31.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	6	100.0%	0	15	100.0%
FRANKLIN COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	197	197	0.0%	232	215	-7.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	153	98	-35.9%	170	109	-35.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
FRANKLIN COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	300	314	4.7%	300	314	4.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	26	103	296.2%	26	103	296.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
FRANKLIN COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,046	1,046	0.0%	1,046	1,046	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,036	2,850	175.1%	1,036	2,850	175.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	1,804	100.0%	0	1,804	100.0%

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Region D Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
FRANKLIN COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	0	7	100.0%	0	7	100.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	0	5	100.0%	0	7	100.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
FRANKLIN COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,040	1,040	0.0%	954	954	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	5	5	0.0%	2	2	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
FRANKLIN COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	4,981	6,871	37.9%	4,605	5,575	21.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,298	1,333	2.7%	1,367	1,404	2.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
GREGG COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,288	1,320	2.5%	1,682	2,503	48.8%
PROJECTED DEMAND TOTAL (acre-feet per year)	718	595	-17.1%	1,075	900	-16.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
GREGG COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	182	192	5.5%	182	192	5.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	24	40	66.7%	24	40	66.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
GREGG COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	215	215	0.0%	215	215	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	215	210	-2.3%	215	210	-2.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
GREGG COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	6,846	1,572	-77.0%	6,848	1,574	-77.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	4,251	1,233	-71.0%	6,542	1,517	-76.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
GREGG COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	70	263	275.7%	116	174	50.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	274	274	0.0%	180	180	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	204	11	-94.6%	64	6	-90.6%
GREGG COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	42,961	52,959	23.3%	49,154	64,679	31.6%
PROJECTED DEMAND TOTAL (acre-feet per year)	30,079	30,191	0.4%	46,786	46,965	0.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	11	100.0%
GREGG COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,242	2,242	0.0%	2,242	2,242	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	978	940	-3.9%	2,094	940	-55.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
HARRISON COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	4,200	3,750	-10.7%	4,845	4,395	-9.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	3,176	1,438	-54.7%	4,397	1,878	-57.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%

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	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
HARRISON COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	212	169	-20.3%	212	169	-20.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	445	701	57.5%	445	701	57.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	233	532	128.3%	233	532	128.3%
HARRISON COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	964	964	0.0%	1,313	1,313	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	856	636	-25.7%	1,097	815	-25.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
HARRISON COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	40,956	108,372	164.6%	40,956	107,894	163.4%
PROJECTED DEMAND TOTAL (acre-feet per year)	95,100	24,736	-74.0%	140,534	27,940	-80.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	55,006	0	-100.0%	100,394	0	-100.0%
HARRISON COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	865	792	-8.4%	953	880	-7.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	2,498	2,498	0.0%	855	855	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	1,633	1,706	4.5%	18	129	616.7%
HARRISON COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	15,424	22,164	43.7%	10,450	22,127	111.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	7,493	9,425	25.8%	10,658	13,564	27.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	6	174	2800.0%	849	1,113	31.1%
HARRISON COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	24,161	26,508	9.7%	24,161	26,508	9.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	19,838	21,112	6.4%	46,625	21,112	-54.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	22,464	0	-100.0%
HOPKINS COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,705	1,342	-21.3%	1,585	1,230	-22.4%
PROJECTED DEMAND TOTAL (acre-feet per year)	824	177	-78.5%	844	123	-85.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
HOPKINS COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	143	144	0.7%	143	144	0.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	2,269	4,769	110.2%	2,269	4,769	110.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	2,126	4,627	117.6%	2,126	4,627	117.6%
HOPKINS COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	4,854	4,854	0.0%	4,856	4,856	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	4,236	5,498	29.8%	4,236	5,498	29.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	1,068	100.0%	0	1,219	100.0%
HOPKINS COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,741	1,741	0.0%	2,275	2,275	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,741	944	-45.8%	2,275	968	-57.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
HOPKINS COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	804	804	0.0%	938	938	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,031	1,031	0.0%	1,577	1,577	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	227	227	0.0%	639	639	0.0%

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	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
HOPKINS COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	21,309	8,753	-58.9%	19,611	8,719	-55.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	4,670	5,389	15.4%	6,022	6,855	13.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	20	100.0%	255	254	-0.4%
HUNT COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,517	1,652	-34.4%	5,340	3,012	-43.6%
PROJECTED DEMAND TOTAL (acre-feet per year)	2,282	790	-65.4%	12,893	6,846	-46.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	7,554	3,834	-49.2%
HUNT COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	108	125	15.7%	108	125	15.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	254	355	39.8%	254	355	39.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	146	230	57.5%	146	230	57.5%
HUNT COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,150	1,146	-0.3%	1,150	1,147	-0.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,141	1,095	-4.0%	1,141	1,095	-4.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	2	100.0%	0	1	100.0%
HUNT COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,386	1,102	-20.5%	2,525	1,941	-23.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	705	555	-21.3%	1,312	672	-48.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
HUNT COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	55	55	0.0%	50	50	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	128	128	0.0%	47	47	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	73	73	0.0%	0	0	0.0%
HUNT COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	14,704	14,082	-4.2%	24,455	21,216	-13.2%
PROJECTED DEMAND TOTAL (acre-feet per year)	15,288	16,768	9.7%	41,507	45,799	10.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	3,362	3,433	2.1%	18,892	24,868	31.6%
HUNT COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	351	373	6.3%	351	373	6.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	12,436	373	-97.0%	28,564	373	-98.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	12,085	0	-100.0%	28,213	0	-100.0%
LAMAR COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	351	275	-21.7%	342	280	-18.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	418	479	14.6%	458	524	14.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	67	204	204.5%	116	244	110.3%
LAMAR COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,633	8,658	228.8%	2,320	8,658	273.2%
PROJECTED DEMAND TOTAL (acre-feet per year)	20,945	10,126	-51.7%	20,622	10,126	-50.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	18,312	1,468	-92.0%	18,302	1,468	-92.0%
LAMAR COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	3,258	1,624	-50.2%	3,253	1,624	-50.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	2,800	1,469	-47.5%	2,800	1,469	-47.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	617	100.0%	0	617	100.0%

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LAMAR COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	5,961	5,961	0.0%	7,475	7,475	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	6,427	5,026	-21.8%	8,338	5,137	-38.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	565	0	-100.0%	951	0	-100.0%
LAMAR COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	37,835	37,631	-0.5%	36,295	36,064	-0.6%
PROJECTED DEMAND TOTAL (acre-feet per year)	5,976	5,959	-0.3%	6,208	6,195	-0.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
LAMAR COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	8,961	8,961	0.0%	8,961	8,961	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	8,503	5,511	-35.2%	19,529	5,511	-71.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	10,568	0	-100.0%
MARION COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,766	1,757	-0.5%	1,766	1,757	-0.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	545	99	-81.8%	545	61	-88.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
MARION COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	0	321	100.0%	0	321	100.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	0	12	100.0%	0	12	100.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
MARION COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	411	411	0.0%	411	411	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	411	188	-54.3%	411	188	-54.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
MARION COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	72	0	-100.0%	95	0	-100.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	72	0	-100.0%	95	0	-100.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
MARION COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	116	116	0.0%	128	128	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	489	489	0.0%	393	393	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	373	373	0.0%	265	265	0.0%
MARION COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,708	2,960	73.3%	1,708	2,960	73.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	423	950	124.6%	395	949	140.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	15	100.0%	0	56	100.0%
MARION COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,852	4,257	129.9%	3,967	6,247	57.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,852	4,257	129.9%	3,967	4,257	7.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
MORRIS COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	540	540	0.0%	540	540	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	445	352	-20.9%	458	371	-19.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%

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Region D Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
MORRIS COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	0	70	100.0%	0	70	100.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	0	11	100.0%	0	11	100.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
MORRIS COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	626	626	0.0%	626	626	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	618	1,605	159.7%	618	1,605	159.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	979	100.0%	0	979	100.0%
MORRIS COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	134,943	121,906	-9.7%	128,105	115,068	-10.2%
PROJECTED DEMAND TOTAL (acre-feet per year)	95,931	25,738	-73.2%	130,868	25,743	-80.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	2,763	0	-100.0%
MORRIS COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	3,025	3,191	5.5%	2,995	3,197	6.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,307	1,383	5.8%	1,356	1,426	5.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	164	26	-84.1%	170	20	-88.2%
MORRIS COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	820	820	0.0%	820	820	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	43	50	16.3%	91	50	-45.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
RAINS COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	711	393	-44.7%	727	409	-43.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	587	74	-87.4%	608	61	-90.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
RAINS COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	55	211	283.6%	55	211	283.6%
PROJECTED DEMAND TOTAL (acre-feet per year)	38	65	71.1%	38	65	71.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
RAINS COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	506	506	0.0%	506	506	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	506	428	-15.4%	506	428	-15.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
RAINS COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	5	12	140.0%	5	12	140.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	3	12	300.0%	3	12	300.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
RAINS COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,022	2,656	31.4%	3,178	3,041	-4.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,170	2,000	70.9%	1,221	2,103	72.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	1	100.0%	0	65	100.0%
RED RIVER COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	332	159	-52.1%	324	161	-50.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	238	159	-33.2%	6	8	33.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%

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Region D Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
RED RIVER COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	780	2,523	223.5%	770	2,523	227.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	5,156	3,867	-25.0%	4,895	3,867	-21.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	4,376	2,154	-50.8%	4,125	2,154	-47.8%
RED RIVER COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,687	1,527	-9.5%	1,687	1,527	-9.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,484	1,532	3.2%	1,484	1,532	3.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	184	100.0%	0	184	100.0%
RED RIVER COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	9	8,527	94644.4%	2	8,520	425900.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	9	3	-66.7%	11	3	-72.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	9	0	-100.0%
RED RIVER COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	4	4	0.0%	3	3	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	4	4	0.0%	3	3	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
RED RIVER COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,905	1,730	-9.2%	1,001	1,717	71.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,237	1,407	13.7%	1,271	1,384	8.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	237	100.0%	591	219	-62.9%
RED RIVER COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	8,510	0	-100.0%	9,290	0	-100.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	489	0	-100.0%	1,048	0	-100.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
SMITH COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,912	567	-80.5%	4,500	1,239	-72.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,371	544	-60.3%	2,300	1,216	-47.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
SMITH COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	370	324	-12.4%	475	324	-31.8%
PROJECTED DEMAND TOTAL (acre-feet per year)	370	324	-12.4%	475	324	-31.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
SMITH COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	468	514	9.8%	468	514	9.8%
PROJECTED DEMAND TOTAL (acre-feet per year)	468	514	9.8%	468	514	9.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
SMITH COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	0	4	100.0%	0	5	100.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	300	4	-98.7%	442	5	-98.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	300	0	-100.0%	442	0	-100.0%
SMITH COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	320	448	40.0%	452	697	54.2%
PROJECTED DEMAND TOTAL (acre-feet per year)	287	287	0.0%	497	497	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	45	0	-100.0%

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Region D Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
SMITH COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	7,376	8,304	12.6%	9,508	10,274	8.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	6,106	6,657	9.0%	11,947	12,448	4.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	146	65	-55.5%	2,802	2,526	-9.9%
SMITH COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	12	0	-100.0%	27	0	-100.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	12	0	-100.0%	27	0	-100.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
TITUS COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,573	1,573	0.0%	1,882	992	-47.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	497	474	-4.6%	829	790	-4.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
TITUS COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,077	1,468	36.3%	1,077	1,468	36.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,000	1,053	5.3%	1,000	1,053	5.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
TITUS COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,008	1,008	0.0%	942	942	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	930	2,947	216.9%	930	2,947	216.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	1,939	100.0%	0	2,005	100.0%
TITUS COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	5,392	5,392	0.0%	5,816	2,461	-57.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	8,995	4,063	-54.8%	11,256	4,155	-63.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	3,603	0	-100.0%	5,440	1,694	-68.9%
TITUS COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	4,553	4,560	0.2%	4,659	4,666	0.2%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,644	1,644	0.0%	2,392	2,392	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
TITUS COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	6,966	19,550	180.6%	7,185	18,528	157.9%
PROJECTED DEMAND TOTAL (acre-feet per year)	5,508	5,488	-0.4%	9,017	8,985	-0.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	1,396	0	-100.0%	2,229	0	-100.0%
TITUS COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	31,865	31,865	0.0%	29,148	28,848	-1.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	52,423	61,931	18.1%	120,703	61,931	-48.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	20,558	30,066	46.2%	91,555	33,083	-63.9%
UPSHUR COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,919	1,908	-0.6%	2,050	2,135	4.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,498	735	-50.9%	1,855	911	-50.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
UPSHUR COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	272	713	162.1%	272	713	162.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	185	170	-8.1%	185	170	-8.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%

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Region D Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
UPSHUR COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,511	1,511	0.0%	1,511	1,511	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,358	1,651	21.6%	1,358	1,651	21.6%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	140	100.0%	0	140	100.0%
UPSHUR COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	6	6	0.0%	6	6	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	272	69	-74.6%	382	76	-80.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	266	63	-76.3%	376	70	-81.4%
UPSHUR COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1	484	48300.0%	1	438	43700.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	379	379	0.0%	333	333	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	378	0	-100.0%	332	0	-100.0%
UPSHUR COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	7,002	7,919	13.1%	7,003	7,890	12.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	3,598	4,253	18.2%	4,467	5,278	18.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	291	206	-29.2%
VAN ZANDT COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	4,458	3,530	-20.8%	5,144	3,911	-24.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	2,780	1,421	-48.9%	3,422	1,698	-50.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
VAN ZANDT COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	107	457	327.1%	107	432	303.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	437	500	14.4%	437	500	14.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	330	43	-87.0%	330	68	-79.4%
VAN ZANDT COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,928	2,928	0.0%	2,923	2,923	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	2,172	1,889	-13.0%	2,172	1,889	-13.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
VAN ZANDT COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	523	264	-49.5%	641	253	-60.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	681	506	-25.7%	928	757	-18.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	158	242	53.2%	287	504	75.6%
VAN ZANDT COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,146	3,316	54.5%	2,984	4,154	39.2%
PROJECTED DEMAND TOTAL (acre-feet per year)	300	300	0.0%	470	470	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
VAN ZANDT COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	7,241	7,933	9.6%	9,853	8,584	-12.9%
PROJECTED DEMAND TOTAL (acre-feet per year)	3,958	5,249	32.6%	5,033	6,682	32.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	13	29	123.1%	199	340	70.9%
WOOD COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	4,413	4,413	0.0%	4,461	4,461	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	477	288	-39.6%	515	222	-56.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%

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Region D Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
WOOD COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	940	1,374	46.2%	940	1,374	46.2%
PROJECTED DEMAND TOTAL (acre-feet per year)	721	489	-32.2%	721	489	-32.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
WOOD COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,092	2,198	5.1%	2,092	2,198	5.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,810	3,224	78.1%	1,810	3,224	78.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	1,098	100.0%	0	1,098	100.0%
WOOD COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,502	1,502	0.0%	1,502	1,502	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	759	2,532	233.6%	1,004	3,085	207.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	1,030	100.0%	0	1,583	100.0%
WOOD COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	309	309	0.0%	328	328	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	25	25	0.0%	19	19	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
WOOD COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	7,850	9,710	23.7%	8,493	9,974	17.4%
PROJECTED DEMAND TOTAL (acre-feet per year)	4,627	4,871	5.3%	4,729	5,035	6.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
REGION D						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	674,967	677,852	0.4%	660,854	692,969	4.9%
PROJECTED DEMAND TOTAL (acre-feet per year)	634,172	401,419	-36.7%	956,972	479,321	-49.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	150,192	80,590	-46.3%	410,695	116,700	-71.6%

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Region D Source Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
BOWIE COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	13,430	15,086	12.3%	12,297	14,213	15.6%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	3,591	10,066	180.3%	3,345	9,820	193.6%
CAMP COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	7,583	8,356	10.2%	7,583	8,200	8.1%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	535	535	0.0%	725	725	0.0%
CASS COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	42,726	56,532	32.3%	42,726	56,135	31.4%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	846	854	0.9%	847	855	0.9%
DELTA COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	937	631	-32.7%	937	631	-32.7%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	4,801	9,444	96.7%	4,762	9,445	98.3%
FRANKLIN COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	9,514	9,816	3.2%	9,514	9,816	3.2%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	1,155	1,159	0.3%	1,145	1,159	1.2%
GREGG COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	15,222	15,025	-1.3%	15,222	15,025	-1.3%
REUSE AVAILABILITY TOTAL (acre-feet per year	6,161	6,161	0.0%	6,161	6,161	0.0%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	3,774	15,333	306.3%	3,776	15,333	306.1%
HARRISON COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	19,210	21,106	9.9%	19,012	20,899	9.9%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	28,478	105,031	268.8%	28,623	105,176	267.5%
HOPKINS COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	4,598	11,481	149.7%	4,598	11,157	142.6%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	3,110	3,089	-0.7%	2,589	2,568	-0.8%
HUNT COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	7,185	4,774	-33.6%	7,185	6,333	-11.9%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	1,148	1,165	1.5%	1,149	1,166	1.5%
LAMAR COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	5,470	583	-89.3%	5,470	583	-89.3%
REUSE AVAILABILITY TOTAL (acre-feet per year	12	12	0.0%	12	12	0.0%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	1,633	10,232	526.6%	1,633	10,232	526.6%
MARION COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	17,626	18,133	2.9%	17,626	17,997	2.1%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	148	1,072	624.3%	148	1,072	624.3%
MORRIS COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	12,268	12,037	-1.9%	12,095	11,930	-1.4%
REUSE AVAILABILITY TOTAL (acre-feet per year	72,086	72,086	0.0%	65,248	65,248	0.0%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	492	481	-2.2%	497	486	-2.2%
RAINS COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	1,704	1,840	8.0%	1,584	1,746	10.2%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	730	886	21.4%	730	886	21.4%
RED RIVER COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	3,479	4,949	42.3%	3,479	4,946	42.2%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	10,675	12,427	16.4%	11,445	12,427	8.6%
RESERVOIR* COUNTY						
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	1,211,304	1,220,004	0.7%	1,006,609	1,117,950	11.1%

* Since reservoir sources can exist across multiple counties, the county field value, 'reservoir' is applied to all reservoir sources.

Region D Source Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
SMITH COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	38,239	41,589	8.8%	38,215	41,083	7.5%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	994	994	0.0%	994	994	0.0%
TITUS COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	10,459	10,197	-2.5%	9,776	10,176	4.1%
REUSE AVAILABILITY TOTAL (acre-feet per year	160	160	0.0%	160	160	0.0%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	1,644	2,029	23.4%	1,644	2,029	23.4%
UPSHUR COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	32,685	34,522	5.6%	32,504	34,276	5.5%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	1,359	1,556	14.5%	1,359	1,556	14.5%
VAN ZANDT COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	14,097	15,259	8.2%	13,865	14,862	7.2%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	4,183	4,498	7.5%	4,591	4,906	6.9%
WOOD COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	31,651	31,503	-0.5%	31,423	31,283	-0.4%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	2,765	3,199	15.7%	2,765	3,199	15.7%
REGION D						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year	288,083	313,419	8.8%	285,111	311,291	9.2%
REUSE AVAILABILITY TOTAL (acre-feet per year	78,419	78,419	0.0%	71,581	71,581	0.0%
SURFACE WATERAVAILABILITY TOTAL (acre-feet per year	1,283,365	1,404,054	9.4%	1,079,376	1,301,984	20.6%

* Since reservoir sources can exist across multiple counties, the county field value, ‘reservoir’ is applied to all reservoir sources.