TABLE 1, GSA DATA REPOSITORY

Bein, Amos, and Dutton, A. R., Origin, distribution, and movement of brine in the Permian Basin (USA): a model for displacement of connate brine Manuscript No. 20101B-Z

Anadarko Basin (including Dalhart Basin)

I.D	Unit	Long	Lat	Depth ft	Temp °C	TDS	Ca	Mg	Na	K	Sr	Cl	SO_4	HCO_3	Br	$\delta^{18}O$ ‰	δD ‰	SIh	SIg	SIa	T	S
						mg/L																
HT601	B	101.20	35.71	3161	38.2	160201	5550	2000	54600	490	100	94800	2200	268	193	-2.5	-34.3	-1.4	-0.1	-0.3	1	n
HD601	B	101.25	36.15	3404	39.5	137990	1970	870	50300	540	37	79700	4320	182	71	-6.9	-52.2	-1.2	-0.2	-0.4	1	n
SH601	B	101.69	36.27	2944	36.8	152898	1890	750	55800	530	45	87700	5880	223	80	-5.7	-53.7	-1.1	-0.1	-0.3	1	n
RO602	B	101.08	35.63	3111	37.6	165497	7480	2360	54500	500	158	98100	1800	326	273	-0.4	-26.2	-1.0	-0.0	-0.2	4	n
HP602	C	100.52	35.64	11820	90.7	201757	16100	1640	59000	900	870	122500	4	239	504	1.3	-14.4	-0.9	-2.7	-2.2	2	n
HP603	C	100.19	35.06	7322	63.2	102030	3810	730	34100	360	680	61100	210	670	370	2.4	-9.7	-1.6	-1.3	-1.2	3	n
OC602	C	100.98	36.37	6475	58.7	109607	2890	780	37900	300	1230	65600	105	364	438	2.0	-19.1	-1.5	-1.7	-1.7	3	n
OC603	C	100.85	36.07	7214	62.6	85312	3320	850	27500	680	810	51300	14	575	263	1.7	-17.6	-1.8	-2.5	-2.4	3	n
SH602	C	101.76	36.27	5442	51.8	189562	6500	1840	64500	490	320	115000	670	117	125	-1.4	-35.0	-0.9	-0.6	-0.6	4	n
SH603	C	101.67	36.17	5312	51.2	215264	10800	2490	68600	410	1350	131000	85	163	366	0.5	-22.2	-0.7	-1.3	-1.3	4	n
SH604	C	101.75	36.27	4844	48.5	230292	14100	2500	70100	470	1570	141000	9	139	404	1.5	-18.5	-0.6	-2.1	-2.1	2	n
HR601	C	102.43	35.97	6390	57.5	130860	760	736	49300	540	24	70000	9250	192	58	-7.8	-64.6	-1.3	-0.4	-0.4	1	n
PO601	C	102.08	35.50	8828	73.2	185216	9390	1480	55400	680	7480	110000	17	383	386	2.4	-19.2	-1.0	-2.2	-1.9	2	n
WH601	D	100.19	35.37	16065	117.0	205726	15700	1820	59700	2000	790	125000	4	172	540	6.4	-13.5	-0.8	-2.7	-1.8	2	n
OC605	D	101.75	36.16	9040	73.7	220351	19300	2540	60500	1500	700	135000	240	115	456	0.1	-18.8	-0.8	-0.8	-0.5	2	n

Palo Duro Basin (including Hardeman Basin)

I.D	Unit	Long	Lat	Depth ft	Temp °C	TDS	Ca	Mg	Na	K	Sr	Cl	SO_4	HCO_3	Br	$\delta^{18}O$ ‰	δD ‰	SIh	SIg	SIa	T	S
						mg/L																
OL4	DS	102.38	35.44	723	23.0	67589	1560	388	23850	32	23	36120	5610		6			-1.9	0.0	-0.4	1	a
SW10	DS	101.75	34.66	1157	25.6	293954	1731	4040	110700	1293	32	170400	5700		58	-7.0	-50.0	-0.2	0.0	-0.2	1	a
DN6	DS	100.83	35.09	762	23.1	94844	1860	480	33000	30	28	54700	4725		21	-7.2	-52.0	-1.6	0.0	-0.4	1	a
DS10	A'	102.46	35.07	1690	29.0	315185	19570	16220	76050	1230	522	200200	513		880	1.4	-15.0	-0.1	0.1	-0.0	2	b
DS8	A	102.46	35.07	2594	34.6	384159	87780	17400	21270	3700	2180	250200	34	415	1180	4.6	-26.0	-0.2	-0.4	-0.2	2	c
SW4	A	101.68	34.52	2918	36.8	336134	47130	8110	68150	3300	1010	207300	187	147	800	3.3	-17.0	-0.1	-0.1	-0.1	2	c
DN5	B	100.87	35.08	3172	37.8	142015	6760	2490	43450	418	113	86300	2010	144	330	0.7	-23.0	-1.2	-0.0	-0.2	2	d
DS7	B	102.46	35.07	5825	54.3	215254	8390	2160	72470	589	150	129770	1373	205	147	-3.8	-33.0	-0.7	-0.2	-0.1	1	d
OL11	B	102.40	35.41	4818	48.1	225607	5960	1320	78400	369	100	138000	1220	131	107	-5.1	-46.0	-0.6	-0.3	-0.3	1	d
OL12	B	102.40	35.41	4514	46.4	216789	6020	1600	76100	380	90	131000	1320	161	118	-5.1	-42.0	-0.7	-0.3	-0.3	1	d
SW0	B	102.68	34.60	5470	52.1	199091	6680	1990	63300	420	131	124000	2000		570	1.9	-16.0	-0.8	-0.1	-0.1	2	b
SW2	B	101.68	34.52	5603	52.7	176877	6780	1290	61700	314	250	105000	977	113	453	1.9	-15.0	-1.0	-0.4	-0.4	3	d
SW3	B	101.68	34.52	5470	52.1	200065	6240	1820	69300	339	110	120000	1650	94	512	2.2	-23.0	-0.8	-0.2	-0.2	3	d
DN4	C	100.87	35.08	4258	44.7	221700	18300	2180	63400	332	563	136000	336	78	511	-0.2	-18.0	-0.7	-0.4	-0.5	2	d
DS1	C	102.46	35.07	8168	68.4	245936	15700	2110	77930	620	440	148500	440	35	161	-2.9	-23.0	-0.6	-0.5	-0.3	4	d
DS2	C	102.46	35.07	8122	68.1	245590	15400	2130	78230	610	420	148100	487	69	144	-2.4	-29.0	-0.6	-0.5	-0.2	4	d
DS3	C	102.46	35.07	8040	67.6	243699	15050	2180	77300	636	410	147420	492	71	140	-2.4	-28.0	-0.6	-0.5	-0.2	4	d
DS4	C	102.46	35.07	7890	66.7	256089	17120	2560	77670	578	451	156900	519	21	270	-2.4	-28.0	-0.5	-0.4	-0.1	4	d
DS5	C	102.46	35.07	7707	65.6	290248	19330	3020	87580	551	571	178500	378	43	275	-2.0	-22.0	-0.3	-0.4	-0.1	4	d
DS6	C	102.46	35.07	7300	63.1	246362	12790	2560	78460	530	363	150800	631	73	155	-2.7	-34.0	-0.5	-0.4	-0.2	4	d
DS9	C	102.46	35.07	7600	65.2	238130	14500	1570	76800	690	300	143600	520		150	-4.0	-36.0	-0.6	-0.5	-0.3	1	d
OL13	C	102.40	35.41	6526	58.3	204287	8620	1220	68800	650	195	124000	720		82	-6.5	-45.0	-0.8	-0.5	-0.4	1	d
SW1	C	101.68	34.52	7140	62.3	243844	11950	1550	76350	197	1380	151500	81	31	805	2.5	-13.0	-0.6	-1.3	-1.1	2	d
HM601	C	99.71	34.34	5860	54.2	246677	22300	3000	65000	1100	1290	153000	191	182	614	1.7	-9.9	-0.6	-0.7	-0.6	2	n
DN1	D	100.87	35.08	4716	47.3	227082	22900	2600	60200	459	660	139000	169	560	534	-1.7	-27.0	-0.7	-0.7	-0.7	2	d
DN2	D	100.87	35.08	4604	46.6	223300	21600	2810	64000	420	710	133000	230	40	490	0.2	-14.0	-0.7	-0.6	-0.6	2	d
DN3	D	100.87	35.08	4500	45.9	216524	19400	2316	61000	337	574	132000	237	106	554	-0.6	-18.0	-0.7	-0.6	-0.6	2	d
HM602	D	99.64	34.35	8645	71.3	240206	20300	2520	68500	1200	820	146000	225	96	545	0.3	-22.4	-0.6	-0.8	-0.5	2	n
HM603	D	99.60	34.12	8000	67.3	220030	17800	2550	62600	940	620	134600	343	86	491	-0.6	-4.0	-0.7	-0.6	-0.4	2	n

TABLE 1, GSA DATA REPOSITORY

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Midland Basin

I.D	Unit	Long	Lat	Depth ft	Temp °C	TDS	Ca	Mg	Na	K	Sr	Cl	SO_4	HCO_3	Br	$\delta^{18}O$ ‰	δD ‰	SIh	SIg	SIa	T	S
						mg/L																
KG701	A'	100.18	33.47	110	21.0	307000	2400	12000	97000	1500		190000	2900	100	1100			-0.0	-0.0	-0.2	2	e
KG702	A'	100.12	33.48	65	21.0	222274	2100	15000	60000	1200		140000	3000	54	920			-0.6	-0.2	-0.5	2	e
ST701	A'	100.26	33.28	100	21.0	315598	24000	9100	82000	716		195000	3730	18	1034			-0.1	1.1	0.9	2	e
BO701	A'			1500	21.0	256389	6100	28100	49300			171000	512	27	1350			-0.4	-0.4	-0.7	2	e
KG703	A'			80	21.0	204253	3400	7200	60000	1300		130000	1300	193	860	-0.3		-0.7	-0.3	-0.7	2	e
YO601	A	102.94	33.01	5000	49.0	74117	2870	680	24800	660	89	41400	2480	1034	104	-3.8	-36.6	-1.9	-0.2	-0.3	1	n
LU601	A	101.91	33.67	5241	51.0	267402	30700	5570	61800	2800	760	164200	285	57	1230	4.1	-23.8	-0.5	-0.3	-0.3	2	n
HK601	A	102.17	33.80	6562	58.6	82968	3760	930	26400	640	78	47500	2680	872	108	-5.6	-45.6	-1.8	-0.1	-0.1	1	n
CO601	A	102.99	33.61	4802	48.2	254630	23900	10200	55200	4400	600	158300	390	460	1180	2.3	3.8	-0.6	-0.3	-0.3	2	n
HK602	A	102.28	33.46	6300	56.9	244481	11400	1970	79900	890	970	147800	177	144	1230	6.0	-19.5	-0.6	-1.0	-0.9	3	n
HK603	A	102.34	33.55	6282	57.2	315376	40300	8210	65700	4330	1320	193000	118	498	1900	6.2	-19.2	-0.2	-0.6	-0.3	2	n
YO605	A	103.02	33.10	5187	50.7	80134	7820	1250	21300	630	101	47400	1380	125	128	-0.6	-25.9	-1.9	-0.1	-0.2	2	n
BO602	A	101.29	32.88	4780	47.6	157544	4770	1420	55500	570	692	93400	315	239	638	3.0	-8.9	-1.1	-1.0	-1.1	3	n
DA603	A	101.91	32.71	7730	65.7	173564	3130	1100	63500	560	1110	103000	113	249	802	5.3	-23.2	-1.0	-1.8	-1.6	3	n
YO602	B	102.88	33.16	8200	68.5	75438	2590	740	25700	500	77	42600	3000	57	174	1.5	-18.8	-1.9	-0.3	-0.1	3	n
YO603	B	103.05	33.34	8000	67.3	121329	7310	1250	38300	140	250	72400	1130	114	435	5.6	-10.7	-1.4	-0.4	-0.2	3	n
DK601	B	100.71	33.41	4370	45.1	127148	5190	1490	42900	190	170	75400	1370	86	352	0.7	-13.6	-1.3	-0.3	-0.4	4	n
TR601	B	102.48	33.22	9937	79.2	236850	4750	1230	82300	2600	190	143200	960	230	1390	4.0	-24.3	-0.6	-0.7	-0.3	3	n
MT601	B	100.82	33.89	4120	43.6	151101	8320	2540	47300	970	200	89700	1270	421	380	-0.7	-29.2	-1.1	-0.2	-0.3	4	n
BO603	C	101.33	32.91	8132	68.1	168981	8030	1650	56600	470	578	100500	462	278	413	2.3	-16.9	-1.0	-0.8	-0.6	3	n
HA601	C	101.76	33.89	7950	67.1	220001	10600	2360	72600	250	1350	132000	124	70	647	1.5	-18.8	-0.7	-1.3	-1.0	4	n
DA601	C	101.79	32.70	9000	73.4	174124	6770	1690	60200	560	710	103000	405	144	645	5.3	-21.2	-1.0	-1.0	-0.7	3	n
FO601	C	100.05	33.96	3822	41.8	138742	8300	1830	43800	430	280	82900	764	86	352	-1.0	-17.6	-1.2	-0.4	-0.6	4	n
KT601	C	100.98	33.08	7267	63.2	117140	5920	1510	38000	460	260	69700	912	86	292	-1.2	-25.2	-1.4	-0.5	-0.4	4	n
KT602	C	100.99	33.39	5906	54.5	136694	7600	1540	44200	290	410	81700	180	374	400	0.7	-18.7	-1.3	-1.1	-1.1	4	n
KG601	C	100.12	33.54	5344	51.1	176496	10200	2420	55200	580	370	106300	740	115	571	2.3	-15.1	-1.0	-0.4	-0.4	2	n
LY602	C	101.77	33.33	9100	74.0	218951	8620	1950	75500	500	996	131000	152	182	51	5.2	-17.1	-0.7	-1.3	-1.0	1	n
KT604	C	101.01	33.01	7554	64.6	72129	2280	738	25000	540	104	40300	1850	297	1020	-4.0	-46.1	-1.9	-0.5	-0.4	1	n
BO601	D	101.51	32.68	9290	75.2	46507	1890	430	15100	390	52	25900	1910	804	31	-7.9	-63.1	-2.3	-0.4	-0.2	1	n
KG602	D	100.12	33.54	5378	51.4	117400	7280	1430	35800	590	330	70900	744	67	259	-1.7	-27.3	-1.4	-0.5	-0.5	4	n
YO604	D	102.90	33.16	11000	85.6	65537	2780	510	22000	500	81	37100	1870	670	26	-7.8	-62.4	-2.0	-0.4	-0.1	1	n
DA602	D	101.80	32.90	10381	81.9	47675	1610	430	15900	420	47	26300	2080	862	26	-7.5	-59.6	-2.3	-0.5	-0.2	1	n
KT603	D	100.98	33.08	7600	64.8	56775	2130	570	18800	520	63	32400	2200	48	44	-6.7	-53.8	-2.1	-0.3	-0.3	1	n
TR602	D	102.50	33.10	12850	97.0	45066	1970	390	14500	400	57	25200	1800	718	31	-8.1	-64.8	-2.3	-0.4	-0.1	1	n
LY601	D	102.05	33.20	11241	87.1	65332	2380	590	21800	680	81	37200	1970	593	38	-3.0	-52.8	-2.0	-0.5	-0.1	1	n

Units:
DS-salt dissolution zone
A-evaporite confining system, carbonates
A'-evaorite confining system, non-carbonates
B-upper deep basin aquifer, Wolfcampian section
C-middle deep basin aquifer, Pennsylvanian section
D-lower deep basin aquifer, pre-Pennsyvanian section

T-brine types:
1-freshwater derived Na-Cl brines
2-connate halite Ca-Cl brines
3-connate gypsum Ca-Cl brines
4-mixed Na-Cl and C-Cl brines

S-Sources:
a-Dutton (1987)
b-Kosanke & others (1985)
c-Dutton & Orr (1986)
d-Fisher & Kreitler (1987)
e-Richter & Kreitler (1986)
n-new, this study