

EDWARDS UNDERGROUND WATER DISTRICT

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BULLETIN 7

CHEMICAL ANALYSES OF WATER FROM OBSERVATION WELLS IN THE EDWARDS AND ASSOCIATED LIMESTONES, SAN ANTONIO AREA, TEXAS, 1964

Compiled by
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Prepared in cooperation with the Geological Survey,
United States Department of the Interior,
the Texas Water Commission, and
the City of San Antonio

MARCH 1965

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A program to resample observation wells tapping a zone of transition between water of good quality and saline water in the Edwards and associated limestones was begun in 1959. The chemical analyses of the resampling program are being used to detect possible encroachment of saline water into the fresh-water areas as the head in the aquifer changes. Those analyses compiled through 1963 were published by the Edwards Underground Water District (Garza, 1962, 1964), and this report presents the chemical analyses compiled during 1964. This program is part of a more extensive hydrologic investigation carried on by the U.S. Geological Survey in cooperation with the Edwards Underground Water District, the Texas Water Commission, and the city of San Antonio.

Listed in this report are chemical analyses from 80 wells which usually are sampled twice a year, but some of the wells are sampled only once throughout the year because their use is limited.

The water samples were analyzed in the laboratory of the U.S. Geological Survey in Austin, Tex., for specific conductance, pH, chloride, sulfate, bicarbonate, and hardness. A more complete analysis was made for one of the samples for each well, and these analyses are on file in the offices of the Geological Survey in Austin and San Antonio. Locations of wells and other data pertaining to the resampling program may be found in reports listed below.

REFERENCES

- Garza, Sergio, 1962a, Recharge, discharge, and changes in groundwater storage in the Edwards and associated limestones, San Antonio area, Texas. A progress report on studies, 1955-59: Texas Water Commission Bull. 6201.
- _____, 1962b, Chemical analyses of water from observation wells in the Edwards and associated limestones, San Antonio area, Texas: Edwards Underground Water District Bull. 1.
- _____, 1964, Chemical analyses of water from observation wells in the Edwards and associated limestones, San Antonio area, Texas: Edwards Underground Water District Bull. 4.

Chemical analyses of water from observation wells and springs in the San Antonio area, Texas
(Analyses are in parts per million, except specific conductance and pH)

Well	Owner	Depth of well (ft)	Date of collection	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Dis- solved solids	Hard- ness as CaCO ₃	Specific conduct- ance (Micromhos at 25°C)	pH	Tem- pera- ture (°F)
<u>Kinney County</u>											
M-10	Wardlaw Bros.	750	Mar. 26, 1964	194	216	8.9	--	366	723	7.7	--
M-12	do	1,200	Aug. 28, 1964	204	1,600	9.4	--	1,830	2,520	6.8	83
M-14	F. Beidler	618	Mar. 25, 1964	268	92	10	--	284	617	7.5	80
			Aug. 28, 1964	280	72	11	--	268	578	8.0	--
N-5	Wardlaw Bros.	756	Mar. 25, 1964	264	95	12	--	272	626	7.4	84
			Aug. 27, 1964	266	102	22	--	260	667	7.8	--
U-14	V. L. Condry	1,390	Mar. 26, 1964	176	1,740	7.4	--	1,930	2,630	6.6	92
V-7	Las Moras	Spring	Mar. 10, 1964	240	6.6	9.7	--	218	429	7.3	72
V-28	L. Langston	1,320	Mar. 25, 1964	176	1,580	6.9	--	1,780	2,450	6.8	92
			Aug. 28, 1964	188	1,530	8.2	--	1,730	2,410	6.7	89
V-29	R. Dodd	930	Mar. 25, 1964	218	552	6.7	--	735	1,240	7.4	--
			Aug. 28, 1964	230	438	8.1	--	636	1,090	7.3	--
X-5	A. Harrison	514	Mar. 26, 1964	--	1,080	27	--	--	--	--	--
			Aug. 28, 1964	222	1,260	24	--	1,480	2,210	7.5	80

Chemical analyses of water from observation wells and springs in the San Antonio area, Texas-Continued

Well	Owner	Depth of well (ft)	Date of collection	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Dis- solved solids	Hard- ness as CaCO ₃	Specific conduct- ance (Micromhos at 25°C)	pH	Tem- pera- ture (°F)
Y-16	A. Schubach	285	Apr. 10, 1964	454	123	77	--	530	1,100	6.7	78
			Aug. 28, 1964	456	123	77	--	524	1,100	6.8	77
Y-17	do	370	Apr. 10, 1964	478	80	78	--	435	1,070	6.8	78
			Aug. 28, 1964	414	60	66	--	342	886	7.1	77
<u>Uvalde County</u>											
H-4-57	Knowlton Dairy	980	Apr. 10, 1964	302	29	37	--	306	652	6.9	75
H-4-64	F. Turner										
	(H. Martin)	842	Aug. 28, 1964	506	159	105	--	392	1,320	7.5	78
H-5-72	B. Turner	350	Mar. 12, 1964	326	202	48	--	436	972	7.0	77
H-5-163	U.S. Fish & Wildlife	600	Mar. 12, 1964	294	88	140	--	462	1,050	7.0	74
			Aug. 31, 1964	296	100	148	--	476	1,090	6.9	73
H-5-240	W. Painter	562	Mar. 12, 1964	280	398	96	--	678	1,370	6.9	76
H-5-284	J. Garner	400	May 7, 1964	300	39	34	--	300	634	7.0	77

Chemical analyses of water from observation wells and springs in the San Antonio area, Texas-Continued

Well	Owner	Depth of well (ft)	Date of collection	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Dis- solved solids	Hard- ness as CaCO ₃	Specific conduct- ance (Micromhos at 25°C)	pH	Tem- pera- ture (°F)
H-6-25	B. Turner	1,410	Mar. 24, 1964	322	904	420	--	875	3,140	7.0	93
H-6-74	C.S. Hunter	1,075	Mar. 12, 1964	252	216	84	--	375	1,000	7.0	90
			Aug. 28, 1964	248	191	79	--	354	970	7.3	83
H-6-82	F. Kincaid	1,524	Aug. 27, 1964	156	356	155	--	508	1,340	7.5	88
H-8-69	J.R. Farr	602	Apr. 30, 1964	242	332	265	--	590	1,770	7.1	89
I-7-15	T.M. Woodley	2,575	Mar. 12, 1964	224	116	28	--	332	661	7.2	99
			Aug. 27, 1964	228	114	28	--	316	650	7.5	98
<u>Medina County</u>											
I-5-55	G.E. Farley	2,000	Mar. 23, 1964	232	15	28	--	204	470	7.2	--
			Aug. 27, 1964	246	16	26	--	220	486	7.5	76
I-5-74	E. Hood	2,260	July 23, 1964	254	12	20	--	232	486	7.0	74
J-4-143	H. Kelso	2,765	May 14, 1964	234	42	18	--	228	494	7.4	93
			Aug. 31, 1964	238	33	22	--	222	490	7.1	93

Chemical analyses of water from observation wells and springs in the San Antonio area, Texas-Continued

Well	Owner	Depth of well (ft)	Date of collection	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Dis- solved solids	Hard- ness as CaCO ₃	Specific conduct- ance (Micromhos at 25°C)	pH	Tem- per- ture (°F)
<u>Atascosa County</u>											
3	C.W. Mask	2,507	June 24, 1964	244	83	35	--	290	631	7.5	91
			Aug. 21, 1964	240	81	34	--	278	618	7.3	90
4	Gidley-Bush	2,656	June 24, 1964	236	720	350	--	1,050	2,450	6.8	106
5	City of Lytle	2,379	Mar. 4, 1964	226	194	40	--	394	818	7.5	98
			Aug. 21, 1964	228	189	41	--	382	807	7.4	101
<u>Bexar County</u>											
155	Southern Henke Ice Co.	1,300	Apr. 7, 1964	246	59	34	--	272	600	7.2	83
277	City of San Antonio	977	Sept. 1, 1964	248	24	14	--	230	468	7.4	--
284	do	1,582	Mar. 13, 1964	236	27	15	--	250	458	7.9	82
296	do	1,318	Apr. 8, 1964	244	27	14	--	230	476	7.1	80
F-249	H. Hoffrichter	804	Mar. 5, 1964	196	248	320	--	460	1,750	7.7	77
			Sept. 3, 1964	218	242	310	--	465	1,730	7.3	75

Chemical analyses of water from observation wells and springs in the San Antonio area, Texas-Continued

Well	Owner	Depth of well (ft)	Date of collection	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Dis- solved solids	Hard- ness as CaCO ₃	Specific conduct- ance (Micromhos at 25°C)	pH	Tem- pera- ture (°F)
G-7	Converse Water Co.	684	Mar. 5, 1964	243	37	22	--	240	517	7.4	80
			Aug. 21, 1964	244	38	24	--	240	509	7.9	80
G-33	A.H. Scott	750	Mar. 8, 1964	210	378	785	--	595	3,340	7.1	--
			Aug. 25, 1964	256	458	820	--	730	3,580	7.6	--
G-63	Kneupper Water Co.	576	Mar. 5, 1964	244	41	42	--	254	586	7.6	80
			Sept. 3, 1964	244	41	44	--	252	584	7.7	79
I-205	E. Persyn	1,672	Apr. 10, 1964	224	366	168	--	625	1,470	6.9	90
			Aug. 21, 1964	228	383	186	--	620	1,530	7.3	89
I-206	Patio Foods, Inc.	1,400	Mar. 10, 1964	248	39	16	--	252	505	7.4	82
			Sept. 3, 1964	248	37	16	--	244	496	7.2	80
J-40	E. Ackerman	900	Mar. 10, 1964	240	250	168	--	450	1,320	7.7	--
			Aug. 28, 1964	160	192	182	--	420	1,310	7.8	--
J-50	San Antonio Hot Wells	1,878	Apr. 7, 1964	282	1,980	910	--	2,560	5,440	7.0	103
J-78	V.E. Berry	840	June 4, 1964	--	29	16	--	--	--	--	79

Chemical analyses of water from observation wells and springs in the San Antonio area, Texas-Continued

Well	Owner	Depth of well (ft)	Date of collection	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Dis- solved solids	Hard- ness as CaCO ₃	Specific conduct- ance (Micromhos at 25°C)	pH	Tem- per- ture (°F)
J-87	City of San Antonio	1,185	June 4, 1964	--	26	15	--	--	--	--	80
			Aug. 20, 1964	248	26	14	--	226	479	7.1	80
J-90	Holt Machinery	2,179	Feb. 27, 1964	272	2,000	920	--	2,520	5,550	7.2	108
			Sept. 1, 1964	280	1,930	930	--	2,510	5,400	7.1	108
J-91	A.L. Wilson	800	Mar. 4, 1964	236	130	67	--	314	818	7.4	82
			Sept. 1, 1964	246	130	66	--	316	805	7.9	81
J-93	A. Brucks	775	Mar. 26, 1964	244	41	23	--	248	529	7.2	--
			Aug. 21, 1964	246	40	23	--	242	510	8.0	--
J-104	A.L. Wilson	1,100	July 13, 1964	248	488	390	1,500	744	2,310	7.0	--
K-2	R. Schirmer	854	Apr. 21, 1964	302	1,870	1,650	--	2,340	7,510	6.8	85
			Aug. 21, 1964	326	1,800	1,640	--	2,300	7,530	6.9	91
M-44	R. Aeervoet	2,226	June 2, 1964	266	1,730	760	--	2,180	4,700	6.8	103
			Aug. 21, 1964	276	1,660	760	--	2,180	4,710	7.2	103
M-45	A.H. Grothues	2,300	Apr. 10, 1964	238	118	47	--	320	740	6.9	95
			Aug. 20, 1964	232	174	75	--	376	899	7.1	97

Chemical analyses of water from observation wells and springs in the San Antonio area, Texas-Continued

Well	Owner	Depth of well (ft)	Date of collection	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Dis- solved solids	as CaCO ₃	Specific conduct- ance (Micromhos at 25°C)	pH	Tem- pera- ture (°F)
M-47	K.L. Haggard	1,950	Mar. 4, 1964	232	212	92	--	422	1,020	7.8	94
			Sept. 3, 1964	232	197	89	--	420	975	7.1	93
M-48	A. Ballard	2,190	Apr. 10, 1964	226	250	109	--	475	1,120	6.8	96
			Sept. 3, 1964	228	208	89	--	430	986	7.0	95
N-6	C. Verstuyft	1,532	Aug. 21, 1964	250	29	16	--	234	482	7.3	80
N-7	Paul Persyn	1,830	Apr. 21, 1964	290	40	37	--	218	638	7.2	84
			Aug. 21, 1964	296	40	42	--	210	653	7.4	83
N-118	L. Knowlton	1,856	Apr. 22, 1964	238	108	45	--	320	713	7.2	91
			Aug. 20, 1964	244	92	37	--	290	646	7.4	92
N-119	F. Vargas	1,660	Mar. 4, 1964	196	932	430	--	1,250	3,040	7.4	86
			Sept. 3, 1964	260	888	430	--	1,240	2,900	7.1	85
N-121	E. M. Baker	2,274	Apr. 8, 1964	260	918	468	--	1,320	3,110	6.9	102
			Aug. 21, 1964	230	818	388	--	1,160	2,650	7.0	102
Guadalupe County											
D-18	C.L. Worthy	370	Mar. 11, 1964	242	89	57	--	306	712	7.6	--
			Aug. 21, 1964	248	88	55	--	286	706	7.0	75

Chemical analyses of water from observation wells and springs in the San Antonio area, Texas-Continued

Well	Owner	Depth of well (ft)	Date of collection	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Dis-solved solids	Hard-ness as CaCO ₃	Specific conduct-ance (Micromhos at 25°C)	pH	Tem-perature (°F)
D-56	City of Cibolo	506	Mar. 26, 1964	260	664	625	--	960	3,270	6.9	78
D-67	W. Kramer	565	Mar. 5, 1964	282	330	302	--	605	1,910	7.4	74
			Sept. 3, 1964	274	626	590	--	965	3,150	6.8	73
<u>Comal County</u>											
F-75	U.S. Gypsum	209	Apr. 9, 1964	286	25	12	--	264	518	7.3	73
			Aug. 18, 1964	294	21	12	--	268	--	7.6	73
G-50	City of New Braunfels (Comal Springs) Spring		Mar. 5, 1964	279	23	13	--	258	512	7.5	74
			Aug. 18, 1964	278	24	12	--	252	503	7.3	74
G-67	W. Sippel	502	Mar. 5, 1964	266	61	62	--	268	702	7.7	74
			Oct. 19, 1964	246	60	55	--	240	632	8.5	72
G-83	C. Hernandez	345	Sept. 9, 1964	--	692	518	--	--	3,100	--	--
G-84	H.C. Nelson	272	Mar. 11, 1964	356	202	160	--	532	1,350	7.6	73
			Aug. 18, 1964	380	209	166	--	556	1,390	7.0	73
G-86	H. Soechting	168	Mar. 24, 1964	294	25	15	--	274	543	7.5	--
			Sept. 4, 1964	296	24	13	--	272	530	7.3	72

Chemical analyses of water from observation wells and springs in the San Antonio area, Texas-Continued

Well	Owner	Depth of well (ft)	Date of collection	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Dis- solved solids	Hard- ness as CaCO ₃	Specific conduct- ance (Micromhos at 25°C)	pH	Tem- pera- ture (°F)
H-6	A.W. Feick	700	Mar. 5, 1964	276	44	53	--	270	664	7.7	75
			Sept. 4, 1964	288	53	53	--	280	677	7.1	72
H-20	W. Schaeffer	300	Mar. 5, 1964	280	32	23	--	258	549	7.9	73
			Aug. 18, 1964	282	30	23	--	252	548	7.2	73
H-49	E. Feick	515	Mar. 12, 1964	352	538	610	--	935	3,170	7.4	--
			Aug. 23, 1964	320	540	600	--	892	3,080	7.0	--
H-52	P. Hansmann	380	Mar. 11, 1964	264	45	28	--	264	592	7.4	70
			Sept. 4, 1964	266	40	26	--	264	556	7.2	--
<u>Hays County</u>											
E-70	H.K. Wilbern	450	Aug. 17, 1964	314	362	230	--	475	1,790	7.4	--
E-76	City of Buda	390	Mar. 6, 1964	324	29	9.7	--	302	571	7.6	72
			Sept. 4, 1964	326	28	9.1	--	302	561	7.3	70
E-80	D.A. Dacy	492	Mar. 15, 1964	302	272	215	--	400	1,610	7.3	--
			Aug. 18, 1964	304	252	213	--	380	1,580	7.3	--
F-7	R.M. Turner	665	Mar. 15, 1964	292	284	194	--	356	1,560	7.6	72
			Sept. 18, 1964	294	290	190	--	364	1,550	7.9	72

Chemical analysis of water from observation wells and springs in the San Antonio area, Texas-Continued

Well	Owner	Depth of well (ft)	Date of collection	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Dis-solved solids	Hard-ness as CaCO ₃	Specific conduct-ance (Micromhos at 25°C)	pH	Tem-perature (°F)
F-22	A.H. Whitten	502	Mar. 15, 1964	302	348	325	--	426	2,080	7.4	77
			Aug. 17, 1964	300	340	318	--	416	2,040	7.6	--
H-19	City of Kyle	600	Aug. 17, 1964	290	131	13	--	342	696	7.3	--
H-25	Hillview Dairy	600	Mar. 12, 1964	274	514	665	--	750	3,230	7.9	72
			Aug. 17, 1964	284	522	710	--	770	3,380	7.4	--
H-59	W.N. Goforth	Spring	Mar. 6, 1964	310	22	16	--	285	561	7.5	72
			Aug. 17, 1964	258	31	32	--	248	540	7.5	--
H-66	A.B. Rogers Estate (San Marcos Springs) Spring		Mar. 6, 1964	316	22	16	--	290	574	7.6	71
			Aug. 17, 1964	312	23	16	--	284	558	7.6	--
H-84	J.B. Netherland	250	Mar. 24, 1964	324	34	26	--	314	638	7.4	72
			Aug. 17, 1964	320	35	27	--	306	635	7.1	--
K-5	E. Jackson	200	Mar. 24, 1964	334	298	252	--	635	1,720	8.0	73
			Sept. 17, 1964	292	284	246	--	580	1,680	6.7	68