GEOLOGICAL SURVEY LIBRARY
4(200) T67r no. 320

Table 2 CHEMICAL ANALYSES OF GROUND WATER FROM WELLS, SPRINGS, AND MINES IN THE MORRISON FORMATION 1/

Location and number 3/ 4/ 5/	Source and date of collection	Silica (SiO_2)	Iron (Fe) (in solution)	Iron (Fe) (total)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K) and Manganese (Mn) 6/	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Uranium (U) 7/	Vanadium (V) 8/	Copper (Cu) 8/	Lead (Pb) 8/	Selenium (Se)	Sum-ppm (residue on evaporation at 180° C.)	Sum-tons/acre ft.	Calcium, magnesium	Noncarbonate	Specific conductance (Micromhos at 25° C.)	Percent sodium 9/	Laboratory pH	Remarks
		Parts per million																		Dissolved solids		Hardness 2/ as $CaCO_3$					
Samples from the Brushy Basin shale member																											
50/18W-9D1 6402 4/51	Maverick mines area; spring. 4/9/51	15	0.01	10/ --	41	36	123	9.6	11/ 509	63	24	0.7	3.3	0.03	0.05	0.09	0.00	0.00	0.05	566	0.77	250	0	908	50	8.1	Basal conglomerate of Brushy Basin. Yield <1 g.p.m. 12/ Temp. 54° F.
49/17W-6D1 6322 3/51	Blue Mesa; spring. 3/31/51	9.6	0.07	0.18	5.8	12	847	11.0	13/ 1,900	296	55	2.6	3.8	0.40	0.06	0.30	0.05	0.00	14/ <0.05	2,180	2.96	64	0	3,200	96	9.4	Brushy Basin sandstone. Yield <1 g.p.m. Temp. 43° F. Field pH 9.
47/17W-27A1 6317	Long Park area; dug well. 3/23/51	15	0.03	0.07	97	104	318	16.0	354	798	171	0.7	0.2	0.06	--	--	--	--	--	1,690	2.30	670	380	2,360	50	8.0	Brushy Basin sandstone. Temp. 38° F. Field pH 6-7.
44/18W-33C1 6318	Joe Davis Canyon; spring. 3/24/51	9.9	0.04	--	41	13	350	8.8	528	435	61	1.0	0.3	0.07	--	--	--	--	--	1,190	1.62	156	0	1,730	82	8.1	Brushy Basin sandy shale. Field pH 7. Temp. 42° F.
43/19W-32C1 6319 1/51	Bishop Canyon; Strawberry Spring. 3/24/51	16	0.05	--	88	34	203	4.4	506	212	113	0.3	0.1	0.09	0.02	0.12	0.00	0.00	<0.05	920	1.25	360	0	1,420	55	7.9	Basal conglomerate of Brushy Basin. Field pH 7. Temp. 43° F.
42/18W-6A1 6320	Spud Patch, dug well. 3/24/51	20	0.07	--	98	103	118	6.6	554	158	198	0.3	14.0	0.03	--	--	--	--	--	989	1.35	668	214	1,610	27	7.7	Quaternary alluvium derived from Brushy Basin shale member(?). Field pH 7.
Samples from the Salt Wash sandstone member																											
50/17W-19D1 3812 B-2	Outlaw Mesa; dug well. 11/15/49	23	0.10	0.16	84	88	65	7.6	620	105	64	0.7	0.2	0.04	0.0	<0.1	0.06	0.03	0.00	743	1.01	572	64	1,230	20	7.5	"Ore-bearing sandstone," 30 feet down dip from mined ore body. Sediment analyzed 15/.
50/18W-9A1 3811 B-4 16/ B-17 17/	Maverick mines area, Matchless mine; sump. 11/16/49 7/29/50	18/ 22	0.07	99	524	389	58	--	479	2,310	165	0.9	19/	20/	18.0 0.82	95.0 11.8	0.01 0.00	0.03 0.00	12.50 3.13	3,700	5.03	2,910	2,510	4,410	4	6.8	Seep from mineralized sandstone. B-4 sediment analyzed 15/.
50/18W-9C1 3810 B-3	Maverick mines area; spring. 11/16/49	15	0.05	0.12	56	50	129	13.0	483	119	69	0.6	0.9	0.08	0.1	<0.1	0.03	0.17	0.00	690	0.94	345	0	1,100	44	8.0	"Ore-bearing sandstone(?)." Sediment analyzed 15/.
50/18W-11C1 4536 B-5	Calamity Mesa; spring. 4/18/50	16	0.03	0.04	62	57	33	4.8	408	65	40	0.5	4.7	0.06	0.3	<0.1	0.00	0.00	0.00	484	0.66	389	54	820	15	7.5	Base of "ore-bearing sandstone." Yield 1 g.p.m. Temp. 50° F.
50/18W-12C1 3813 B-1	Outlaw Mesa; spring. 11/16/49	20	0.05	0.06	82	49	32	4.2	417	59	36	0.5	5.6	0.02	0.2	<0.1	0.07	0.06	0.00	494	0.67	406	64	807	14	7.7	"Ore-bearing sandstone" 100 feet down dip from mined ore body. Sediment analyzed 15/.
50/18W-12D1 4537 B-6	Outlaw Mesa, Ronnie No. 1 mine; underground spring. 4/19/50	13	0.03	--	62	35	11	3.0	344	23	14	0.3	4.1	0.04	0.0	0.1	0.00	0.00	0.00	335	0.46	298	16	584	7	7.9	Top of "ore-bearing sandstone." Yield 100 g.p.d. 21/ Temp. 50° F.
49/17W-6B1 6321 2/51	Blue Mesa; spring. 3/31/51	11	0.02	--	30	37	68	8.0	22/ 391	32	18	0.4	4.1	0.03	0.02	0.16	0.00	0.00	<0.05	401	0.55	227	0	669	38	8.1	"Ore-bearing sandstone," 2,000 feet down dip from nearest known ore body. Yield <1 g.p.m. Field pH 6 23/.
47/17W-15B1 4686 B-8	Long Park area; spring. 5/28/50	12	0.07	0.19	50	67	92	8.7	425	192	33	0.2	1.2	0.02	0.6	<0.1	0.00	0.00	0.00	666	0.91	400	52	1,030	33	7.9	Base of "ore-bearing sandstone." Yield 84 g.p.d. Temp. 52° F.
47/17W-27D1 4685 B-7	Long Park, Long Park No. 10 mine; ore chute. 5/28/50	13	0.82	1.24	62	33	17	3.2	245	77	18	0.4	15.0	0.00	0.3	1.2	0.00	0.00	0.00	360	0.49	290	89	576	11	7.7	"Ore-bearing sandstone." Yield <25 g.p.d. Temp. 53-1/2° F.
47/17W-29A1 4687 B-10	Long Park, Henry Clay mine; underground spring. 5/27/50	14	0.09	0.15	86	43	19	5.9	406	43	34	0.3	6.1	0.01	0.2	<0.1	0.00	0.00	0.00	451	0.61	392	59	740	9	7.7	Mineralized sandstone. Yield 120 g.p.d. Temp. 45-1/2° F
47/17W-29A2 4688 B-9	Long Park, Henry Clay mine, sump. 5/27/50	10	0.11	0.26	59	43	20	6.1	317	48	37	0.3	6.2	0.02	0.6	<0.1	0.00	0.00	0.00	386	0.52	324	64	655	12	7.7	Mine sump.
43/18W-29C1 4733 B-11	Spud Patch, May Day mine; sump. 6/26/50	17	0.04	--	64	16	27	4.8	226	42	30	0.4	1.7	0.04	<0.1	<0.1	0.00	0.33	0.00	314	0.43	226	40	523	20	7.7	Mineralized sandstone. Temp. 44° F. Field pH 6.
37/21E-10B1 4735 B-13	Blanding mines area, East Bank mine, sump. 6/24/50	13	0.11	0.25	116	114	179	10.0	460	631	91	0.4	1.9	--	8.7	22.8	0.00	0.00	0.00	1,400	1.90	758	364	1,990	34	7.4	Mine sump. Temp. 47° F. Field pH 7.
36/21E-26B1 4734 B-12	Blanding mines area; AEC diamond-drill hole No. BA-6. 6/24/50	13	0.02	--	77	53	128	6.4	378	353	27	0.2	0.2	0.00	<0.1	0.1	0.00	0.00	0.00	844	1.15	410	100	1,250	40	7.7	"Ore-bearing sandstone." Yield 15 g.p.m. Temp. 56° F. Field pH 6.5
28/23E-3A1 4779 B-16	Yellow Circle mine area; spring. 6/28/50	12	0.03	--	38	59	10	4.6	24/ 351	28	24	0.4	5.4	0.02	0.2	<0.1	0.00	0.50	0.00	361	0.49	338	38	647	6	8.3	Mineralized sandstone. Yield 50 g.p.d. Temp. 58° F.
23/22E-6B1 4777 B-15	Yellow Cat mines area, Telluride No. 18 mine; sump. 6/29/50	11	0.20	--	89	20	129	6.1	202	388	13	0.4	2.6	0.04	0.8	<0.1	0.00	0.04	1.00	759	1.03	304	138	1,100	47	7.9	Mineralized sandstone. Yield 300 g.p.d. Temp. 50° F.
22/22E-33A1 4778 B-14	Yellow Cat mines area, Cactus Rat mine, 20 foot adit. 6/29/50	10	0.03	--	101	15	343	3.4	205	806	47	0.3	5.8	0.02	0.2	<0.1	0.00	0.02	7.87	1,430	1.94	314	146	2,030	70	7.9	"Ore-bearing sandstone," 50 feet below mineralized sandstone. Temp. 50° F. Field pH 6.5-7.
Threshold of detection for the ions.		--	--	--	--	--	--	--	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.05								

1/ Analyses for U, V, Cu, Pb, Se, and of sediment by George J. Petretic or Lewis F. Rader, Jr., U. S. Geological Survey. Analyses for other constituents by E. L. Singleton, W. M. Webster, and E. F. Williams, U. S. Geological Survey.

2/ Noncarbonate hardness or "permanent" hardness refers to hardness exceeding the equivalence with carbonate and bicarbonate. The two hardnesses are, by common practice, expressed as "Hardness as $CaCO_3$".

3/ Field number (example: 50/17W-19D), U. S. Geological Survey, indicating township (50), range (17 west), section (19), and quarter section (A, B, C, or D lettered counter-clockwise from the NE 1/4).

4/ Salt Lake City Laboratory number (example: 3812), U. S. Geological Survey.

5/ Denver Laboratory number (example: B-2 or 1/51), U. S. Geological Survey.

6/ 0.29 ppm manganese detected in sample, 42/18W-6A1. Other samples 0.00 ppm.

7/ Method of determination: Fluorimetric.

8/ Method of determination: Colorimetric.

9/ Percent sodium is obtained by dividing the milligram equivalents of sodium by total milligram equivalents of cations and multiplying by 100.

10/ -- - not determined.

11/ Includes 8 ppm CO_3.

12/ g.p.m. - gallons per minute.

13/ Includes 311 ppm CO_3.

14/ < Less than.

15/

Lab. No.	Precipitate (ppm)	UO_3	V_2O_5	Fe_2O_3*	CaO**	K_2O**
		(Percent)				
B-1	5.4	0.05	1.7	4.9	1.0	1.4
B-2	2.2	0.11	1.4	9.4	5.6	2.5
B-3	7.7	0.1	1.8	1.7	0.2	0.5
B-4	39.5	6.4	14.4	3.9	0.2	1.3

* Method of determination: Colorimetric.
** Method of determination: Flame photometric.

16/ Sample collected from sludge pit in drift. Water contaminated by drill sludge. Source: Underground seep from face of ore.

17/ Sample collected from flooded winze. Water uncontaminated by drill sludge. Source: Underground seep from face of ore.

18/ On addition of HCl, yellow color developed, but faded after standing.

19/ Deep-blue color developed on addition of phenodisulphonic acid to evaporated sample. Color disappears with addition of H_2O_2. Deep yellow developed with NH_4OH.

20/ Unable to determine (B) green-yellow color.

21/ g.p.d. - gallons per day.

22/ Contains 14 ppm CO_3.

23/ All field pH determined by "Hydrion" paper.

24/ Contains 7 ppm CO_3.

Compiled by David A. Phoenix