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GEOLOGICAL SURVEY

Water Resources Division  
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## NOTES ON WATER-QUALITY RECONNAISSANCE OF PINE MOUNTAIN AREA SESPE CREEK BASIN, VENTURA COUNTY, CALIFORNIA <sup>1/</sup>

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Data attached are the result of two reconnaissance trips made to the Pine Mountain area of Sespe Creek in Ventura County, California, on November 23-24, 1970, and January 20, 1971. The data were gathered to assist in deciding which sampling points should be established as permanent, continuous monitoring points, and to indicate which of the various water-quality parameters would be most useful in evaluating the influence of mining and (or) processing on the affected streams. Samples obtained in November reflect low water (dry season) conditions, and those obtained in January reflect snow-melt runoff.

1. Approved by Director of Geological Survey for release to open file

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sulfate and bicarbonate at high flows; sodium and chloride in contrast are at higher concentrations in the high flow samples. At low flows the waters approach saturation with respect to gypsum and calcite. White crusts were collected at the water line in Potrero John Creek just above the confluence with Sespe Creek at the low flow stage. The white crusts are comprised of calcite ( $\text{CaCO}_3$ ), gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ), detrital quartz ( $\text{SiO}_2$ ), and feldspar. Addition of more calcium or sulfate or both to the water will increase the precipitation of gypsum; unless the pH or carbonate decrease there will also be an increase in the precipitation of calcite if calcium concentrations increase.

X-ray diffraction analyses were performed on whole-rock samples of streambed material, as well as on the clay-size (2-0.5 micron) separates, both untreated and glycolated.

Quartz ( $\text{SiO}_2$ ) is most abundant followed by a potash feldspar ( $\text{KAlSi}_3\text{O}_8$ ) (probably orthoclase) and intermediate plagioclase feldspar ( $\text{Na}_{1-x}\text{Ca}_x\text{Al}_{1+x}\text{Si}_{3-x}\text{O}_8$ ) followed by a small amount of calcite ( $\text{CaCO}_3$ ). No indication of gypsum or anhydrite is found.

The clay minerals are also relatively constant in kind and amount. A kaolinite with fair crystallinity is most abundant followed by illite (fine-grained muscovite) and montmorillonite. The montmorillonite is all in the Ca-Mg saturated state, a state characterized by large clay floccules, good soil tilth, and good permeability. Conversion of this montmorillonite to the Na-K form by ion-exchange in water of a different composition could alter all of these characteristics,

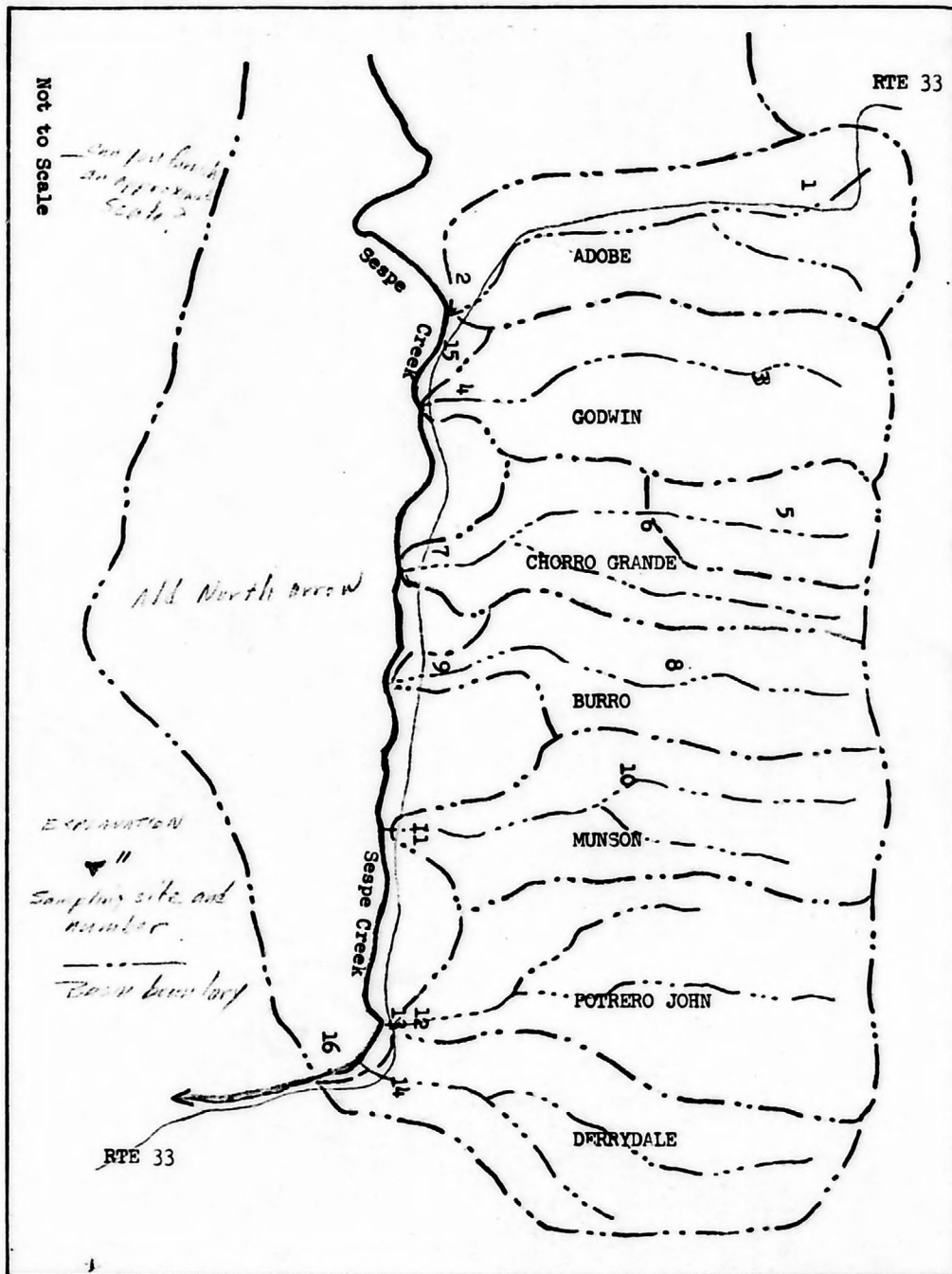
Because of the seasonal variations in the discharge of the Sespe Creek tributaries and the impassibility of the U.S. Gypsum access road during winter, the samples could not be collected at the same locations both times. Sampling sites (1, 3, 5, 6, 8, and 10) were located in the headwater area of tributaries where there was flow during November 23-24, 1970. During the January sampling trip, these sites were inaccessible; therefore, the samples were collected near the mouth of each tributary. Actual locations are indicated on the enclosed map and also listed on the water-quality tabulation.

The results of the analyses show the local water is of a calcium bicarbonate-sulfate type. All samples showed appreciable boron and detectable fluoride. The waters are more dilute in terms of calcium,

perhaps to the detriment of the system. The moderate amount of montmorillonite present in these bed material samples indicates the probable abundance of montmorillonite in the suspended load. Minor amounts of vermiculite or mixed-layer montmorillonite minerals may be present in a few samples. In the Adobe Canyon and Godwin Canyon samples, montmorillonite is more abundant than either kaolinite or illite.

*check in table*

Sketch Map of Pine Mountain Watershed, Ventura County, California



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## Chemical and Sediment Analyses of Pine Mountain Tract in Sespe Creek Watershed, Ventura County, California

Location number	Stream	Flow (cfs)	Date of collection	Water temperature (°C)	Results in parts per million (ppm) (mg/l)																	Specific conductance (micromhos at 25°C)	pH (field)	Analyzing laboratory and sample number				
					Silica (SiO <sub>2</sub> )	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Carbonate (CO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids		Phosphate (PO <sub>4</sub> )	Suspended sediment (mg/L)				Percent sodium			
																		Calculated (Sum of determined constituents)	Residue on evaporation at 180°C									
U.S. Public Health Service drinking-water standards (1962)						0.3																						
1	Adobe Creek; spring on Walters Place (NE1/4sec 1, T6N, R24W)	0.003	Nov. 23, '70	10	21		230	65	57	1.8	368	1.6	550	13	0.6	0.1	3.2			0.1	4			1540	7.79	SIC 048026		
2	Adobe Creek; near confluence with Sespe (NE1/4sec 13, T6N, R24W)	2.9	Jan 20, '71	10	20		170	37	85	3.0	306	1.8	480	12	0.6	0.2	3.2			0.10	424			1370	8.08	SIC 048039		
3	Godwin Creek; spring upstream from property access road (M1d1/4sec 5, T6N, R23W)	0.013	Nov 24, '70	11	22		150	76	41	3.2	337	2.4	500	5.5	0.0	0.2	--			--	8			1200	8.14	SIC 048030		
4	Godwin Creek; at highway #33 crossing (NW1/4sec 20, T6N, R23W)	2.5	Jan 20, '71	14	16		130	28	58	2.1	237	3.2	290	13	0.7	0.0	4.1			0.10	83			1010	8.40	SIC 048037		
5	Chorro Grande Creek; upstream from property access road (M1d1/4sec 9, T6N, R23W)	0.18	Nov 23, '70	13	19		140	49	26	2.2	259	3.5	370	3.1	0.3	--	1.1			0.1	7			928	8.39	SIC 054004		
6	Chorro Grande Creek; at Oak Camp (NW1/4sec 16, T6N, R23W)	0.11	Nov 24, '70	7	23		180	72	40	2.3	322	3.0	490	4.0	0.4	0.1	1.5			--	3			977	8.30	SIC 048029		
7	Chorro Grande Creek; at highway #33 (SW1/4sec 21, T6N, R23W)	2.6	Jan 20, '71	14	18		140	46	37	1.8	262	3.8	320	6.0	0.6	0.1	1.8			0.15	8			1080	8.44	SIC 048036		

## Chemical and Sediment Analyses of Fine Mountain Tract in Sespe Creek Watershed, Ventura County, California

Location number	Stream	Flow (cfs)	Date of collection	Water temperature (°C)	Results in parts per million (X1000) (mg/l)														Specific conductance (micromhos at 25°C)	pH (field)	Analyzing laboratory and sample number				
					Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO <sub>3</sub> )	Carbonate (CO <sub>3</sub> )	Sulfate (SO <sub>4</sub> )	Chloride (Cl)	Fluoride (F)	Nitrate (NO <sub>3</sub> )	Boron (B)	Dissolved solids					Phosphate (PO <sub>4</sub> )	Suspended sediment (mg/l)	Percent sodium	
																	Calculated (Sum of determined constituents)	Residue on evaporation at 180°C							
U.S. Public Health Service drinking-water standards (1962)						0.3						250	250		45		500	500							
8	Burro Creek; spring near access road (NW 1/4sec15,T6N,R23W)	0.003	Nov 23, '70	12	25		390	120	95	3.1	556	1.6	1100	18.	0.6	0.0	3.8			0.05	36		2490	7.65	SIC 048028
9	Burro Creek; at highway #33 crossing (SW 1/4sec22,T6N,R23W)	1.2	Jan 20, '71	13	19		170	56	54	2.0	306	4.3	460	8.0	0.3	0.2	2.8			6.10	9		1310	8.41	SIC 048035
10	Munson Creek; spring near access road (NE 1/4sec15,T6N,R23W)	0.10	Nov 23, '70	15	20		180	47	28	2.4	270	0.17	400	3.5	0.4	0.1	1.1			0.2	2		1160	7.04	SIC 048027
11	Munson Creek; at highway #33 crossing (SW 1/4sec23,T6N,R23W)	1.3	Jan 20, '71	12	18		140	36	46	1.8	275	2.1	280	14.	0.5	0.1	1.8			0.05	8		1050	8.18	SIC 048034
12	Potrero John Creek; at highway #33	0.24	Nov 24, '70	7	21		250	89	22	2.9	281	1.0	760	12.	0.6	0.1	--			--	1		1630	8.27	SIC 048024
13	(NE 1/4sec25,T6N,R23W)	3.0	Jan 20, '71	11	16		200	64	30	2.4	189	1.8	520	5.5	0.7	--	1.1			0.10	5		1320	8.25	SIC 054005
14	Derrylale Creek; at highway #33 crossing (NE 1/4sec25,T6N,R23W)	1.9	Jan 20, '71	9	17		170	62	46	2.3	278	3.4	470	9.0	0.2	0.2	2.0			0.10	--		1290	8.40	SIC 048033
15	Sespe Creek; at Cherry Canyon (SE 1/4sec18,T6N,R23W)	36.	Jan 20, '71	13	15		98	26	41	2.3	217	1.9	240	7.0	0.5	0.3	2.1			0.20	157		828	8.24	SIC 048038
16	Sespe Creek; at Wheeler Springs gage (USGS) (SW 1/4sec30,T6N,R23W)	1.1	Nov 24, '70	10	19		190	65	58	2.5	276	2.2	540	19.	0.6	0.1	2.2			0.05	1		1370	8.04	SIC 048025