

March 11 1997

Permian Treating Chemicals

WATER ANALYSIS REPORT

SAMPLE

Oil Co. : Harvey E. Yates
Lease : PMS 8 Fed.
Well No. : # 1
Salesman :

Sample Loc. :
Date Analyzed: 17-February-1997
Date Sampled :

ANALYSIS

1. pH 7.510
2. Specific Gravity 60/60 F. 1.090
3. CaCO₃ Saturation Index @ 80 F. +1.596
@ 140 F. +2.486

Dissolved Gasses MG/L EQ. WT. *MEQ/L

4. Hydrogen Sulfide Present
5. Carbon Dioxide Not Determined
6. Dissolved Oxygen Not Determined

Cations

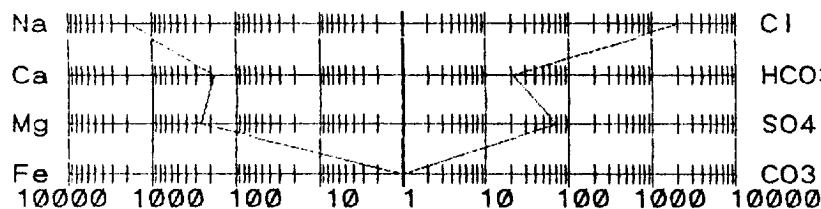
7. Calcium (Ca⁺⁺) 3,591 / 20.1 = 178.66
8. Magnesium (Mg⁺⁺) 3,131 / 12.2 = 256.64
9. Sodium (Na⁺) (Calculated) 40,636 / 23.0 = 1,766.78
10. Barium (Ba⁺⁺) Not Determined

Anions

11. Hydroxyl (OH⁻) 0 / 17.0 = 0.00
12. Carbonate (CO₃⁼) 0 / 30.0 = 0.00
13. Bicarbonate (HCO₃⁻) 1,259 / 61.1 = 20.61
14. Sulfate (SO₄⁼) 3,300 / 48.8 = 67.62
15. Chloride (Cl⁻) 74,983 / 35.5 = 2,112.20
16. Total Dissolved Solids 126,900
17. Total Iron (Fe) 5 / 18.2 = 0.25
18. Total Hardness As CaCO₃ 21,860
19. Resistivity @ 75 F. (Calculated) 0.060 /cm.

LOGARITHMIC WATER PATTERN

*meq/L.



PROBABLE MINERAL COMPOSITION

COMPOUND EQ. WT. X *meq/L = mg/L.

Na	Cl	Ca(HCO ₃) ₂	81.04	20.61	1,670
Ca	HCO ₃	CaSO ₄	68.07	67.62	4,603
Mg	SO ₄	CaCl ₂	55.50	90.43	5,019
Fe	CO ₃	Mg(HCO ₃) ₂	73.17	0.00	0
		MgSO ₄	60.19	0.00	0
		MgCl ₂	47.62	256.64	12,221
		NaHCO ₃	84.00	0.00	0
		NaSO ₄	71.03	0.00	0
		NaCl	58.46	1,765.13	103,189

*Milli Equivalents per Liter

This water is mildly corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts, and the presence of H₂S in solution.

Calcium Sulfate Solubility Profile

