

FULCRUM ENERGY
MITCHELL DABNEY
JACKSON CO

PETERS 0780 10-13H12
WELLHEAD

Report Date: 02-08-2024 Sampled: 02-02-2024 at 0000
Sample #: 6661 Sample ID: 356004

CATIONS

Calcium (as Ca)	533.53
Magnesium (as Mg)	58.52
Barium (as Ba)	103.10
Strontium (as Sr)	75.02
Sodium (as Na)	19058
Potassium (as K)	41.43
Lithium (as Li)	2.90
Ammonia (as NH ₃)	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	20.31
Manganese (as Mn)	0.210
Zinc (as Zn)	0.0820
Lead (as Pb)	0.00

ANIONS

Chloride (as Cl)	30300
Sulfate (as SO ₄)	0.00
Bromine (as Br)	0.00
Dissolved CO ₂ (as CO ₂)	130.00
Bicarbonate (as HCO ₃)	683.20
Carbonate (as CO ₃)	0.00
Oxalic acid (as C ₂ O ₄)	0.00
Silica (as SiO ₂)	0.00
Phosphate(as PO ₄)	0.00
H ₂ S (as H ₂ S)	2.89
Fluoride (as F)	0.00
Nitrate (as NO ₃)	0.00
Boron (as B)	13.68

PARAMETERS

Calculated T.D.S.	52313
Molar Conductivity	60149
Resistivity	16.63
Sp.Gr.(g/mL)	1.032
Pressure(atm)	1.00
pCO ₂ (atm)	0.0862
pH ₂ S(atm)	0.00181
Temperature (°F)	70.00
pH	6.68

BOUND IONS

	TOTAL	FREE
Calcium	550.60	536.13
Barium	106.40	106.40
Carbonate	3.20	0.389
Phosphate	0.00	0.00
Sulfate	0.00	0.00

CORROSION RATE PREDICTION

CO ₂ - H ₂ S Rate(mpy)	0.0628
--	--------

COMMENTS

JACKSON CO

Jacam Catalyst
1656 Ave Q Building 8, Sterling, KS 67579

FULCRUM ENERGY
 MITCHELL DABNEY
 JACKSON CO

PETERS 0780 10-13H12
 WELLHEAD

Report Date: 02-08-2024 Sampled: 02-02-2024 at 0000
 Sample #: 6661 Sample ID: 356004

SATURATION RATIO as IAP/Ksp

Calcite (CaCO ₃)	0.93
Aragonite (CaCO ₃)	0.88
Witherite (BaCO ₃)	0.06
Strontianite (SrCO ₃)	0.38
Calcium oxalate (CaC ₂ O ₄)	0.00
Magnesite (MgCO ₃)	0.09
Anhydrite (CaSO ₄)	0.00
Gypsum (CaSO ₄ *2H ₂ O)	0.00
Barite (BaSO ₄)	0.00
Celestite (SrSO ₄)	0.00
Fluorite (CaF ₂)	0.00
Calcium phosphate	0.00
Hydroxyapatite	0.00
Silica (SiO ₂)	0.00
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	0.00
Iron hydroxide (Fe(OH) ₃)	59.46
Strengite (FePO ₄ *2H ₂ O)	0.00
Siderite (FeCO ₃)	49.70
Halite (NaCl)	0.01
Thenardite (Na ₂ SO ₄)	0.00
Iron sulfide (FeS)	5.67

FREE ION MOMENTARY EXCESS (ppm)

Calcite (CaCO ₃)	-0.0481
Aragonite (CaCO ₃)	-0.0923
Witherite (BaCO ₃)	-16.52
Strontianite (SrCO ₃)	-1.50
Calcium oxalate (CaC ₂ O ₄)	-0.331
Magnesite (MgCO ₃)	-5.70
Anhydrite (CaSO ₄)	-3655
Gypsum (CaSO ₄ *2H ₂ O)	-3093
Barite (BaSO ₄)	-0.945
Celestite (SrSO ₄)	-437.01
Fluorite (CaF ₂)	-32.35
Calcium phosphate	>-0.001
Hydroxyapatite	-957.01
Silica (SiO ₂)	-100.51
Brucite (Mg(OH) ₂)	-4.43
Magnesium silicate	-290.78
Iron hydroxide (Fe(OH) ₃)	< 0.001
Strengite (FePO ₄ *2H ₂ O)	>-0.001
Siderite (FeCO ₃)	0.736
Halite (NaCl)	-481233
Thenardite (Na ₂ SO ₄)	-196612
Iron sulfide (FeS)	0.990

SIMPLE INDICES

Langelier	0.0915
Ryznar	6.50
Puckorius	4.61
Larson-Skold Index	76.12
Stiff Davis Index	-0.563
Oddo-Tomson	-0.701

CARBONATE PRECIPITATION POTENTIAL (ppm)

Calcite (CaCO ₃)	65.61
Aragonite (CaCO ₃)	56.82
Witherite (BaCO ₃)	-160.33
Strontianite (SrCO ₃)	-27.83
Magnesite (MgCO ₃)	-188.76
Siderite (FeCO ₃)	37.79

OPERATING CONDITIONS

Temperature (°F)	70.00
Time(secs)	0.00



SYSTEM IDENTIFICATION

FULCRUM ENERGY
 PETERS 0780 10-13H12
 MITCHELL DABNEY
 WELLHEAD
 JACKSON CO

Sample ID#: 6661
 ID 356004

Sample Date: 02-02-2024 at 0000
 Report Date: 02-08-2024

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	533.53
Magnesium(as Mg)	58.52
Barium(as Ba)	103.10
Strontium(as Sr)	75.02
Sodium(as Na)	19058
Potassium(as K)	41.43
Lithium(as Li)	2.90
Iron(as Fe)	20.31
Ammonia(as NH ₃)	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	0.210
Zinc(as Zn)	0.0820
Lead(as Pb)	0.00

ANIONS

Chloride(as Cl)	30300
Sulfate(as SO ₄)	0.00
Bromine(as Br)	0.00
Dissolved CO ₂ (as CO ₂)	130.00
Bicarbonate(as HCO ₃)	683.20
Carbonate(as CO ₃)	0.00
Silica(as SiO ₂)	0.00
Phosphate(as PO ₄)	0.00
H ₂ S (as H ₂ S)	2.89
Fluoride(as F)	0.00
Nitrate(as NO ₃)	0.00
Boron(as B)	13.68

PARAMETERS

Temperature(°F)	70.00	Sample pH	6.68
Conductivity	60149	Sp.Gr.(g/mL)	1.032
Resistivity	16.63	T.D.S.	52313

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃		Anhydrite CaSO ₄		Gypsum CaSO ₄ *2H ₂ O		Barite BaSO ₄		Celestite SrSO ₄		Siderite FeCO ₃		Mackinawite FeS		CO ₂ (mpy)	pCO ₂ (atm)
50.00	1.000	0.539	-0.375	0.00	-3600	0.00	-2948	0.00	-0.553	0.00	-420.82	24.66	0.491	26.38	4.86	0.0503	0.0862
65.45	1.000	0.801	-0.141	0.00	-3660	0.00	-3064	0.00	-0.844	0.00	-435.77	41.29	0.654	23.41	4.48	0.0942	0.0862
80.91	1.000	1.12	0.0808	0.00	-3601	0.00	-3146	0.00	-1.21	0.00	-436.14	64.65	0.825	20.53	4.10	0.0804	0.0862
96.36	1.000	1.49	0.288	0.00	-3440	0.00	-3196	0.00	-1.65	0.00	-428.73	95.35	0.994	17.88	3.72	0.105	0.0862
111.82	1.000	1.90	0.478	0.00	-3201	0.00	-3076	0.00	-2.16	0.00	-418.40	133.81	1.16	15.53	3.37	0.110	0.0862
127.27	1.000	2.37	0.670	0.00	-2908	0.00	-2861	0.00	-2.78	0.00	-409.77	183.16	1.33	13.55	3.07	0.0926	0.0862
142.73	1.000	2.91	0.871	0.00	-2584	0.00	-2679	0.00	-3.55	0.00	-403.10	245.49	1.53	11.87	2.82	0.0750	0.0862
158.18	1.000	3.52	1.08	0.00	-2248	0.00	-2526	0.00	-4.51	0.00	-398.27	322.43	1.74	10.42	2.59	0.0781	0.0862
173.64	1.000	4.21	1.31	0.00	-1918	0.00	-2397	0.00	-5.69	0.00	-395.16	415.27	1.98	9.15	2.39	0.0809	0.0862
189.09	1.000	4.96	1.54	0.00	-1605	0.00	-2289	0.00	-7.13	0.00	-393.72	525.03	2.23	8.03	2.21	0.0408	0.0862
204.55	1.000	5.78	1.80	0.00	-1318	0.00	-2201	0.00	-8.88	0.00	-393.92	649.96	2.51	7.00	2.04	0.0342	0.0862
220.00	18.207	6.36	2.10	0.00	-1110	0.00	-2210	0.00	-11.65	0.00	-410.01	768.82	2.88	106.61	5.00	0.209	1.57
		xSAT	mg/L	xSAT	mg/L	xSAT	mg/L	xSAT	mg/L	xSAT	mg/L	xSAT	mg/L	xSAT	mg/L		

Saturation Ratios (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase. mg/L scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.

