

FULCRUM ENERGY  
MITCHELL DABNEY  
JACKSON COGRIZZLY 0881 4-1H36  
WELLHEADReport Date: 02-08-2024  
Sample #: 6661Sampled: 02-02-2024 at 0000  
Sample ID: 356017**CATIONS**

Calcium (as Ca)	228.54
Magnesium (as Mg)	29.01
Barium (as Ba)	50.04
Strontium (as Sr)	34.77
Sodium (as Na)	15464
Potassium (as K)	37.89
Lithium (as Li)	2.12
Ammonia (as NH <sub>3</sub> )	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	12.11
Manganese (as Mn)	0.190
Zinc (as Zn)	0.100
Lead (as Pb)	0.00

**ANIONS**

Chloride (as Cl)	24100
Sulfate (as SO <sub>4</sub> )	50.00
Bromine (as Br)	0.00
Dissolved CO <sub>2</sub> (as CO <sub>2</sub> )	130.00
Bicarbonate (as HCO <sub>3</sub> )	536.80
Carbonate (as CO <sub>3</sub> )	0.00
Oxalic acid (as C <sub>2</sub> O <sub>4</sub> )	0.00
Silica (as SiO <sub>2</sub> )	0.00
Phosphate(as PO <sub>4</sub> )	0.00
H <sub>2</sub> S (as H <sub>2</sub> S)	5.78
Fluoride (as F)	0.00
Nitrate (as NO <sub>3</sub> )	0.00
Boron (as B)	10.99

**PARAMETERS**

Calculated T.D.S.	41377
Molar Conductivity	49759
Resistivity	20.10
Sp.Gr.(g/mL)	1.024
Pressure(atm)	1.00
pCO <sub>2</sub> (atm)	0.0418
pH <sub>2</sub> S(atm)	0.00360
Temperature (°F)	70.00
pH	6.95

**BOUND IONS**

	<b>TOTAL</b>	<b>FREE</b>
Calcium	234.02	227.97
Barium	51.24	51.24
Carbonate	3.31	0.565
Phosphate	0.00	0.00
Sulfate	51.20	40.20

**CORROSION RATE PREDICTION**

CO <sub>2</sub> - H <sub>2</sub> S Rate(mpy)	0.0395
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**COMMENTS**

JACKSON CO

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

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Calcite (CaCO <sub>3</sub> )	0.62
Aragonite (CaCO <sub>3</sub> )	0.58
Witherite (BaCO <sub>3</sub> )	0.05
Strontianite (SrCO <sub>3</sub> )	0.30
Calcium oxalate (CaC <sub>2</sub> O <sub>4</sub> )	0.00
Magnesite (MgCO <sub>3</sub> )	0.06
Anhydrite (CaSO <sub>4</sub> )	0.00
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	0.00
Barite (BaSO <sub>4</sub> )	59.32
Celestite (SrSO <sub>4</sub> )	0.03
Fluorite (CaF <sub>2</sub> )	0.00
Calcium phosphate	0.00
Hydroxyapatite	0.00
Silica (SiO <sub>2</sub> )	0.00
Brucite (Mg(OH) <sub>2</sub> )	< 0.001
Magnesium silicate	0.00
Iron hydroxide (Fe(OH) <sub>3</sub> )	0.00
Strengite (FePO <sub>4</sub> *2H <sub>2</sub> O)	0.00
Siderite (FeCO <sub>3</sub> )	48.85
Halite (NaCl)	0.01
Thenardite (Na <sub>2</sub> SO <sub>4</sub> )	0.00
Iron sulfide (FeS)	19.77

**SIMPLE INDICES**

Langelier	-0.109
Ryznar	7.17
Puckorius	5.70
Larson-Skold Index	76.89
Stiff Davis Index	-0.684
Oddo-Tomson	-0.807

**FREE ION MOMENTARY EXCESS (ppm)**

Calcite (CaCO <sub>3</sub> )	-0.572
Aragonite (CaCO <sub>3</sub> )	-0.668
Witherite (BaCO <sub>3</sub> )	-24.49
Strontianite (SrCO <sub>3</sub> )	-3.04
Calcium oxalate (CaC <sub>2</sub> O <sub>4</sub> )	-0.719
Magnesite (MgCO <sub>3</sub> )	-10.39
Anhydrite (CaSO <sub>4</sub> )	-3847
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	-3317
Barite (BaSO <sub>4</sub> )	79.28
Celestite (SrSO <sub>4</sub> )	-392.90
Fluorite (CaF <sub>2</sub> )	-46.49
Calcium phosphate	>-0.001
Hydroxyapatite	-928.75
Silica (SiO <sub>2</sub> )	-102.15
Brucite (Mg(OH) <sub>2</sub> )	-6.03
Magnesium silicate	-286.99
Iron hydroxide (Fe(OH) <sub>3</sub> )	< 0.001
Strengite (FePO <sub>4</sub> *2H <sub>2</sub> O)	>-0.001
Siderite (FeCO <sub>3</sub> )	1.07
Halite (NaCl)	-488523
Thenardite (Na <sub>2</sub> SO <sub>4</sub> )	-187596
Iron sulfide (FeS)	2.88

**CARBONATE PRECIPITATION POTENTIAL (ppm)**

Calcite (CaCO <sub>3</sub> )	-9.12
Aragonite (CaCO <sub>3</sub> )	-14.02
Witherite (BaCO <sub>3</sub> )	-99.81
Strontianite (SrCO <sub>3</sub> )	-29.92
Magnesite (MgCO <sub>3</sub> )	-119.46
Siderite (FeCO <sub>3</sub> )	22.07

**OPERATING CONDITIONS**

Temperature (°F)	70.00
Time(secs)	0.00



## SYSTEM IDENTIFICATION

FULCRUM ENERGY  
GRIZZLY 0881 4-1H36  
MITCHELL DABNEY  
WELLHEAD  
JACKSON CO

Sample ID#: 6661  
ID 356017

Sample Date: 02-02-2024 at 0000  
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## WATER CHEMISTRY

## CATIONS

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## ANIONS

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Fluoride(as F)	0.00
Nitrate(as NO <sub>3</sub> )	0.00
Boron(as B)	10.99

## PARAMETERS

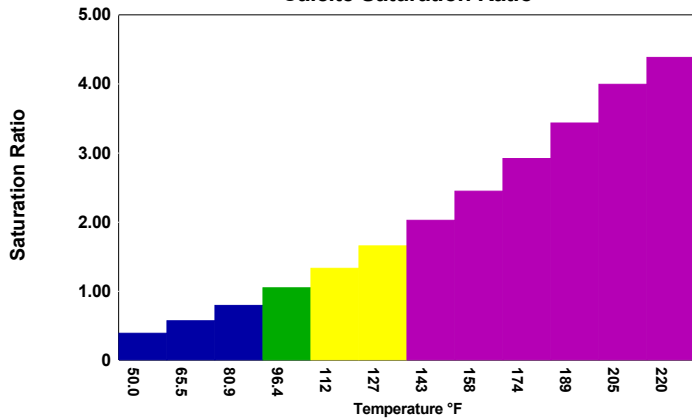
Temperature(°F)	70.00	Sample pH	6.95
Conductivity	49759	Sp.Gr.(g/mL)	1.024
Resistivity	20.10	T.D.S.	41377

## SCALE AND CORROSION POTENTIAL

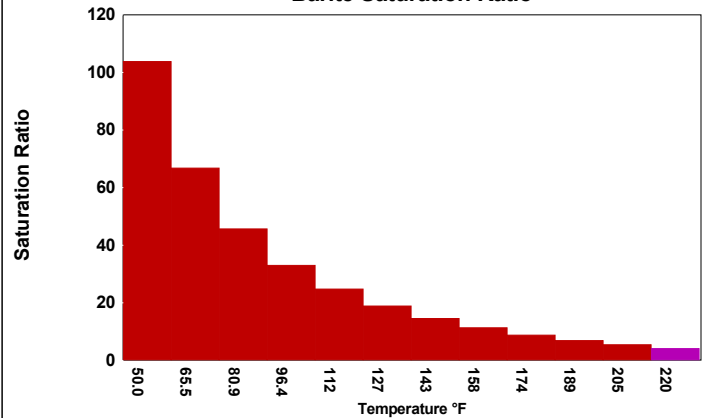
Temp. (°F)	Press. (atm)	Calcite CaCO <sub>3</sub>		Anhydrite CaSO <sub>4</sub>		Gypsum CaSO <sub>4</sub> *2H <sub>2</sub> O		Barite BaSO <sub>4</sub>		Celestite SrSO <sub>4</sub>		Siderite FeCO <sub>3</sub>		Mackinawite FeS		CO <sub>2</sub> (mpy)	pCO <sub>2</sub> (atm)
50.00	1.000	0.390	-1.08	0.00257	-3799	0.00441	-3182	103.73	82.33	0.0285	-377.40	26.37	0.777	97.82	4.43	0.0382	0.0418
65.45	1.000	0.572	-0.667	0.00245	-3854	0.00407	-3291	66.73	80.03	0.0264	-391.66	43.53	1.02	82.97	4.35	0.0715	0.0418
80.91	1.000	0.794	-0.284	0.00247	-3792	0.00383	-3367	45.61	77.41	0.0259	-392.31	67.47	1.27	70.03	4.25	0.0505	0.0418
96.36	1.000	1.05	0.0655	0.00262	-3633	0.00367	-3411	32.90	74.64	0.0263	-385.71	98.80	1.52	59.08	4.14	0.0662	0.0418
111.82	1.000	1.33	0.382	0.00291	-3398	0.00384	-3291	24.77	71.79	0.0270	-376.35	137.94	1.76	50.00	4.02	0.0694	0.0418
127.27	1.000	1.65	0.694	0.00335	-3110	0.00425	-3080	18.88	68.70	0.0276	-368.51	187.85	2.02	42.65	3.89	0.0582	0.0418
142.73	1.000	2.03	1.01	0.00399	-2792	0.00464	-2900	14.51	65.37	0.0280	-362.43	250.33	2.30	36.60	3.74	0.0472	0.0418
158.18	1.000	2.45	1.34	0.00490	-2462	0.00502	-2747	11.24	61.78	0.0283	-357.97	326.53	2.61	31.50	3.58	0.0491	0.0418
173.64	1.000	2.92	1.68	0.00618	-2134	0.00538	-2618	8.76	57.94	0.0283	-355.05	416.86	2.94	27.13	3.40	0.0508	0.0418
189.09	1.000	3.43	2.03	0.00798	-1821	0.00572	-2509	6.88	53.81	0.0283	-353.58	520.49	3.31	23.30	3.20	0.0256	0.0418
204.55	1.000	3.99	2.41	0.0105	-1531	0.00602	-2419	5.43	49.38	0.0280	-353.54	634.90	3.71	19.89	2.97	0.0215	0.0418
220.00	18.207	4.38	2.82	0.0134	-1316	0.00597	-2422	4.08	43.58	0.0262	-367.74	738.11	4.23	296.30	3.04	0.131	0.760
		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}{CO<sub>3</sub>}/K<sub>sp</sub>. pCO<sub>2</sub> (atm) is the partial pressure of CO<sub>2</sub> in the gas phase.  
mg/L scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.

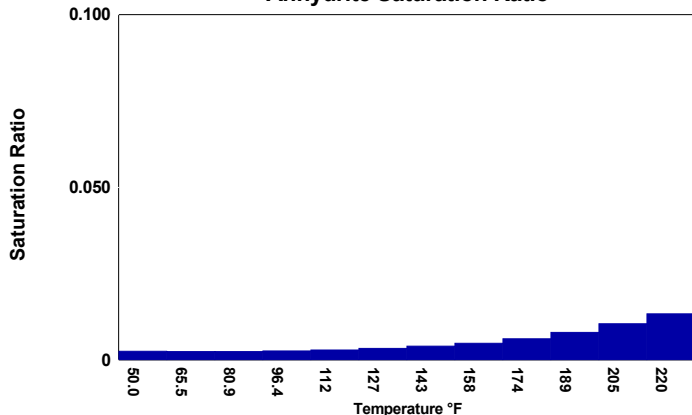
Calcite Saturation Ratio



Barite Saturation Ratio



Anhydrite Saturation Ratio



Gypsum Saturation Ratio

