



# DownHole SAT(tm)

## FORMATION WATER CHEMISTRY INPUT

POG Resources  
Juice  
Wellhead

Pro-Stim Chemicals  
Paul Dwyer & Ryan Uhland

Report Date: 03-06-2018      Sampled: 02-28-2018 at 1711  
Sample #: 2947                      Sample ID: WBaten

### CATIONS

Calcium (as Ca)	2960
Magnesium (as Mg)	219.00
Barium (as Ba)	0.00
Strontium (as Sr)	0.00
Sodium (as Na)	39997
Potassium (as K)	0.00
Lithium (as Li)	0.00
Ammonia (as NH <sub>3</sub> )	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	11.50
Manganese (as Mn)	0.290
Zinc (as Zn)	0.00
Lead (as Pb)	0.00

### ANIONS

Chloride (as Cl)	66000
Sulfate (as SO <sub>4</sub> )	2200
Bromine (as Br)	0.00
Dissolved CO <sub>2</sub> (as CO <sub>2</sub> )	130.00
Bicarbonate (as HCO <sub>3</sub> )	300.00
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)	0.00
Fluoride (as F)	0.00
Nitrate (as NO <sub>3</sub> )	0.00
Boron (as B)	0.00

### PARAMETERS

Calculated T.D.S.	109529
Molar Conductivity	156531
Resistivity	6.39
Sp.Gr.(g/mL)	1.07
Pressure(psia)	14.70
pCO <sub>2</sub> (psia)	0.00744
pH <sub>2</sub> S(atm)	0.00
Temperature (°F)	74.00
pH	7.45

### CORROSION RATE PREDICTION

CO <sub>2</sub> - H <sub>2</sub> S Rate(mpy)	0.00437
--	---------

**COMMENTS** All anions & cations are in mg/l

**FRENCH CREEK SOFTWARE, INC.**  
**1220 VALLEY FORGE ROAD, SUITE 21, VALLEY FORGE, PA 19460**



# DownHole SAT(tm)

## FORMATION WATER DEPOSITION POTENTIAL INDICATORS

POG Resources  
Juice  
Wellhead

Pro-Stim Chemicals  
Paul Dwyer & Ryan Uhland

Report Date: 03-06-2018      Sampled: 02-28-2018 at 1711  
Sample #: 2947                      Sample ID: WBaten

### SATURATION LEVEL

Calcite (CaCO <sub>3</sub> )	9.16
Aragonite (CaCO <sub>3</sub> )	8.52
Witherite (BaCO <sub>3</sub> )	0.00
Strontianite (SrCO <sub>3</sub> )	0.00
Calcium oxalate (CaC <sub>2</sub> O <sub>4</sub> )	0.00
Magnesite (MgCO <sub>3</sub> )	0.659
Anhydrite (CaSO <sub>4</sub> )	0.645
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	0.949
Barite (BaSO <sub>4</sub> )	0.00
Celestite (SrSO <sub>4</sub> )	0.00
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> )	753.70
Strengite (FePO <sub>4</sub> *2H <sub>2</sub> O)	0.00
Siderite (FeCO <sub>3</sub> )	35.87
Halite (NaCl)	0.0408
Thenardite (Na <sub>2</sub> SO <sub>4</sub> )	< 0.001
Iron sulfide (FeS)	0.00

### FREE ION MOMENTARY EXCESS (ppm)

Calcite (CaCO <sub>3</sub> )	1.10
Aragonite (CaCO <sub>3</sub> )	1.09
Witherite (BaCO <sub>3</sub> )	-67.76
Strontianite (SrCO <sub>3</sub> )	-21.42
Calcium oxalate (CaC <sub>2</sub> O <sub>4</sub> )	-0.0665
Magnesite (MgCO <sub>3</sub> )	-0.535
Anhydrite (CaSO <sub>4</sub> )	-702.43
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	-82.95
Barite (BaSO <sub>4</sub> )	-0.121
Celestite (SrSO <sub>4</sub> )	-193.38
Fluorite (CaF <sub>2</sub> )	-14.40
Calcium phosphate	>-0.001
Hydroxyapatite	-969.21
Silica (SiO <sub>2</sub> )	-96.28
Brucite (Mg(OH) <sub>2</sub> )	0.0226
Magnesium silicate	-291.04
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> )	1.38
Halite (NaCl)	-405997
Thenardite (Na <sub>2</sub> SO <sub>4</sub> )	-224980
Iron sulfide (FeS)	-0.109

### SIMPLE INDICES

Langelier	1.35
Ryznar	4.76
Puckorius	4.18
Larson-Skold Index	373.32
Stiff Davis Index	0.675
Oddo-Tomson	0.271

### BOUND IONS

Calcium	2960	2715
Barium	0.00	0.00
Carbonate	29.28	0.738
Phosphate	0.00	0.00
Sulfate	2200	1123

### OPERATING CONDITIONS

Temperature (°F)	74.00
Time(mins)	3.00