

Water Analysis Report

Production Company: **URSA RESOURCES GROUP II LLC-EBUS**
Well Name: **TOMPKINS 21B-08-07-95,GARFIELD**
Sample Point: **SEPARATOR**
Sample Date: **8/20/2018**
Sample ID: **WA-374173**

Sales Rep: **Lance Erdmann**
Lab Tech: **Gary Peterson**

Scaling potential predicted using ScaleSoftPitzer from
Brine Chemistry Consortium (Rice University)

Sample Specifics		Analysis @ Properties in Sample Specifics			
		Cations	mg/L	Anions	mg/L
Test Date:	8/27/2018	Sodium (Na):	8429.42	Chloride (Cl):	10000.00
System Temperature 1 (°F):	220	Potassium (K):	41.90	Sulfate (SO4):	4.00
System Pressure 1 (psig):	2200	Magnesium (Mg):	33.60	Bicarbonate (HCO3):	6344.00
System Temperature 2 (°F):	65	Calcium (Ca):	252.00	Carbonate (CO3):	
System Pressure 2 (psig):	15	Strontium (Sr):	40.40	Hydroxide(HO):	
Calculated Density (g/ml):	1.0151	Barium (Ba):	71.90	Acetic Acid (CH3COO)	
pH:	7.10	Iron (Fe):	29.60	Propionic Acid (C2H5COO)	
Calculated TDS (mg/L):	25277.31	Zinc (Zn):	0.17	Butanoic Acid (C3H7COO)	
CO2 in Gas (%):		Lead (Pb):	0.03	Isobutyric Acid ((CH3)2CHCOO)	
Dissolved CO2 (mg/L):	1386.00	Ammonia NH3:		Fluoride (F):	
H2S in Gas (%):		Manganese (Mn):	0.34	Bromine (Br):	
H2S in Water (mg/L):	2.50	Aluminum (Al):	0.11	Silica (SiO2):	29.95
Tot. SuspendedSolids(mg/L):		Lithium (Li):	1.79	Calcium Carbonate (CaCO3):	
Corrosivity(LanglierSat.Indx)	0.00	Boron (B):	1.93	Phosphates (PO4):	118.62
Alkalinity:		Silicon (Si):	14.00	Oxygen (O2):	

Notes:

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
65.00	15.00	1.22	196.70	0.85	2.89	2.94	2.31	2.50	21.45	0.00	0.00	0.00	0.00	0.00	0.00	8.53	0.09
82.00	258.00	1.19	194.61	0.67	2.63	2.76	2.31	2.56	21.46	0.00	0.00	0.00	0.00	0.00	0.00	8.14	0.09
99.00	500.00	1.25	197.44	0.51	2.30	2.69	2.31	2.67	21.48	0.00	0.00	0.00	0.00	0.00	0.00	7.86	0.09
117.00	743.00	1.31	200.43	0.38	1.93	2.64	2.31	2.79	21.49	0.00	0.00	0.00	0.00	0.00	0.00	7.62	0.09
134.00	986.00	1.38	203.44	0.27	1.52	2.62	2.31	2.91	21.50	0.00	0.00	0.00	0.00	0.00	0.00	7.41	0.09
151.00	1229.00	1.47	206.33	0.18	1.11	2.61	2.31	3.02	21.50	0.00	0.00	0.00	0.00	0.00	0.00	7.22	0.09
168.00	1472.00	1.56	209.00	0.11	0.70	2.63	2.31	3.13	21.51	0.00	0.00	0.00	0.00	0.00	0.00	7.06	0.09
186.00	1714.00	1.66	211.38	0.05	0.33	2.66	2.31	3.23	21.51	0.00	0.00	0.00	0.00	0.00	0.00	6.92	0.09
203.00	1957.00	1.77	213.41	0.00	0.00	2.71	2.31	3.33	21.51	0.00	0.00	0.00	0.00	0.00	0.00	6.79	0.09
220.00	2200.00	1.88	215.11	0.00	0.00	2.77	2.31	3.43	21.52	0.00	0.00	0.00	0.00	0.00	0.00	6.69	0.09

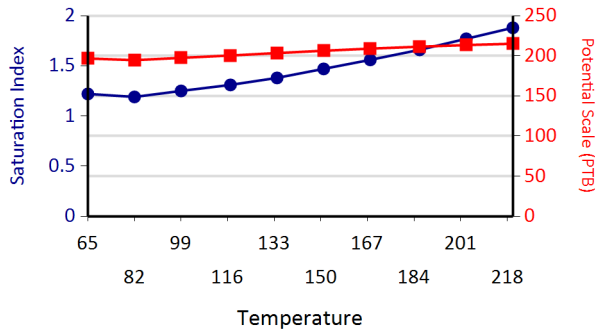
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Temp (°F)	PSI	Hemihydrate CaSO ₄ •0.5H ₂ O		Anhydrate CaSO ₄		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
65.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.25	0.01	0.00	0.00	0.00	0.00	3.93	21.32
82.00	258.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.63	0.01	0.00	0.00	0.00	0.00	4.05	21.45
99.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.14	0.01	0.00	0.00	0.00	0.00	4.63	22.00
117.00	743.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.71	0.01	0.00	0.00	0.00	0.00	5.23	22.38
134.00	986.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.01	0.00	0.00	0.00	0.00	5.87	22.62
151.00	1229.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.02	7.98	0.01	0.00	0.00	0.00	0.00	6.53	22.78
168.00	1472.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.06	7.68	0.01	0.00	0.00	0.00	0.00	7.20	22.88
186.00	1714.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.08	7.40	0.01	0.00	0.00	0.00	0.00	7.88	22.94
203.00	1957.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.09	7.16	0.01	0.88	19.93	0.34	9.44	8.57	22.97
220.00	2200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82	0.10	6.94	0.01	1.78	35.06	0.88	20.68	9.26	22.99

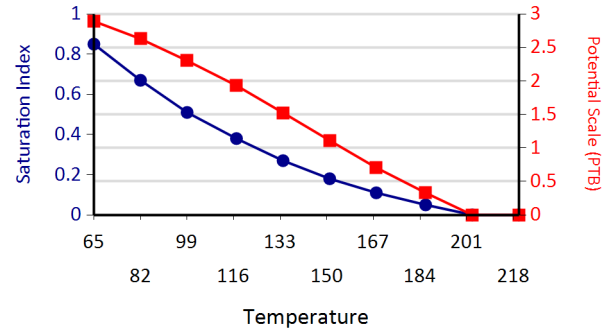
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Lead Sulfide Fe Silicate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Mg Silicate Ca Mg Silicate Fe Silicate

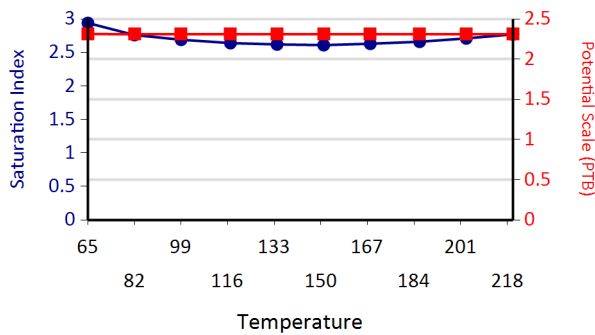
Calcium Carbonate



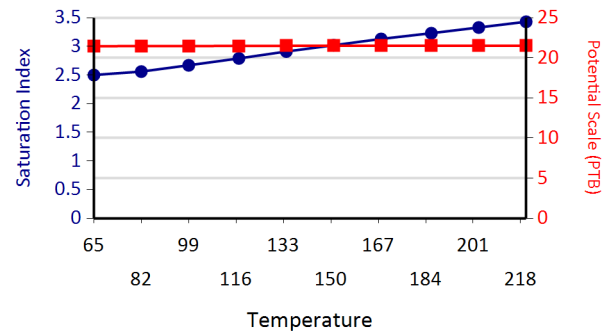
Barium Sulfate



Iron Sulfide

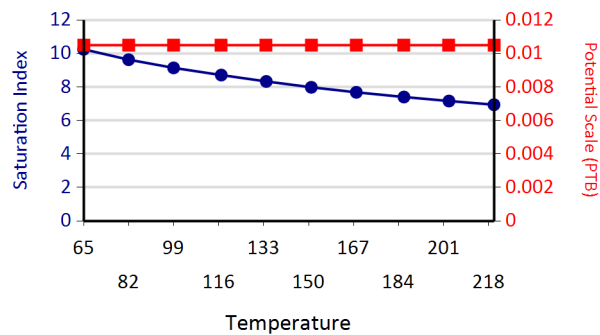


Iron Carbonate

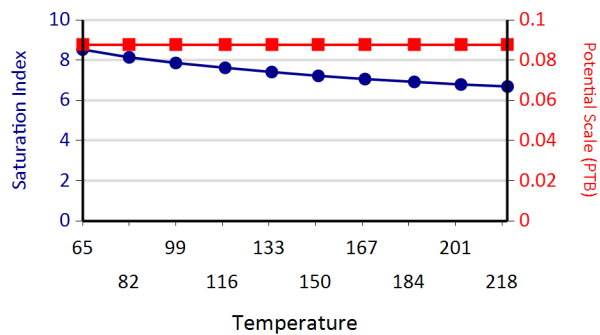


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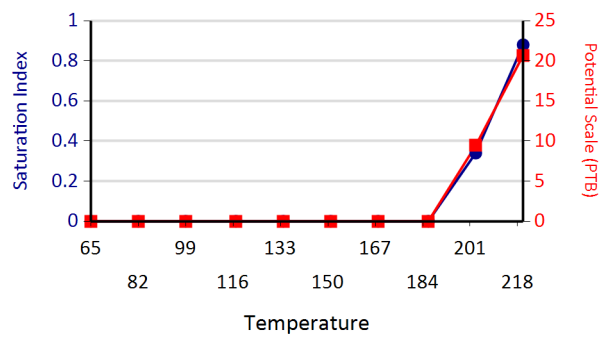
Lead Sulfide



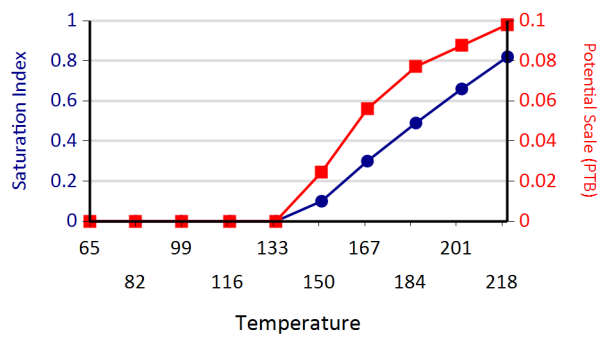
Zinc Sulfide



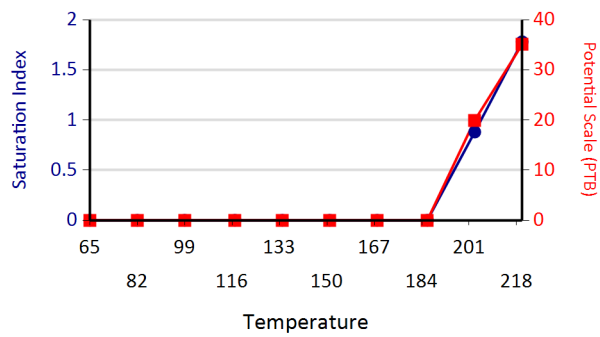
Ca Mg Silicate



Zinc Carbonate



Mg Silicate



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