



Pacific Coast Area Laboratory
3901 Fanucchi Way E,
Shafter, California 93263

REPORT DATE: 2/10/2016

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER: CAERUS OIL & GAS
DISTRICT: FOUR CORNERS
AREA/LEASE: PUCKETT
SAMPLE POINT NAME: H2-797 SWD
SITE TYPE: WELL SITES
SAMPLE POINT DESCRIPTION: SWABBED FLUID/WORKOVER

ACCOUNT REP: SEAN HIGGINS
SAMPLE ID: 201606004452
SAMPLE DATE: 1/27/2016
ANALYSIS DATE: 2/10/2016
ANALYST: ER/IL

CAERUS OIL & GAS, PUCKETT, H2-797 SWD

FIELD DATA			ANALYSIS OF SAMPLE											
			ANIONS:		mg/L		meq/L		CATIONS:		mg/L		meq/L	
Initial Temperature (°F):	250		Chloride (Cl ⁻):	6452.9	182.0	Sodium (Na ⁺):	842.0	36.6						
Final Temperature (°F):	80		Sulfate (SO ₄ ²⁻):	622.9	13.0	Potassium (K ⁺):	5022.8	128.5						
Initial Pressure (psi):	100		Borate (H ₃ BO ₃):	ND		Magnesium (Mg ²⁺):	8.5	0.7						
Final Pressure (psi):	15		Fluoride (F ⁻):	ND		Calcium (Ca ²⁺):	381.8	19.1						
			Bromide (Br ⁻):	ND		Strontium (Sr ²⁺):	7.0	0.2						
pH:			Nitrite (NO ₂ ⁻):	ND		Barium (Ba ²⁺):	1.3	0.0						
pH at time of sampling:	9.9		Nitrate (NO ₃ ⁻):	ND		Iron (Fe ²⁺):	685.1	24.5						
			Phosphate (PO ₄ ³⁻):	10.8	0.3	Manganese (Mn ²⁺):	9.5	0.3						
			Silica (SiO ₂):	42.6		Lead (Pb ²⁺):	ND							
						Zinc (Zn ²⁺):	3.3	0.1						
ALKALINITY BY TITRATION:			mg/L		meq/L									
Bicarbonate (HCO ₃ ⁻):	48.8	0.8												
Carbonate (CO ₃ ²⁻):	ND													
Hydroxide (OH ⁻):	ND													
			ORGANIC ACIDS:		mg/L		meq/L							
aqueous CO ₂ (ppm):	0.0		Formic Acid:	ND										
aqueous H ₂ S (ppm):	1.5		Acetic Acid:	ND										
aqueous O ₂ (ppb):	ND		Propionic Acid:	ND										
			Butyric Acid:	ND										
			Valeric Acid:	ND										
Calculated TDS (mg/L):	14097													
Density/Specific Gravity (g/cm ³):	1.0068													
Measured Specific Gravity	ND													
Conductivity (mmhos):	20.4													
Resistivity:	ND													
MCF/D:	No Data													
BOPD:	No Data													
BWPD:	No Data													
			Anion/Cation Ratio:		0.93		ND = Not Determined							

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

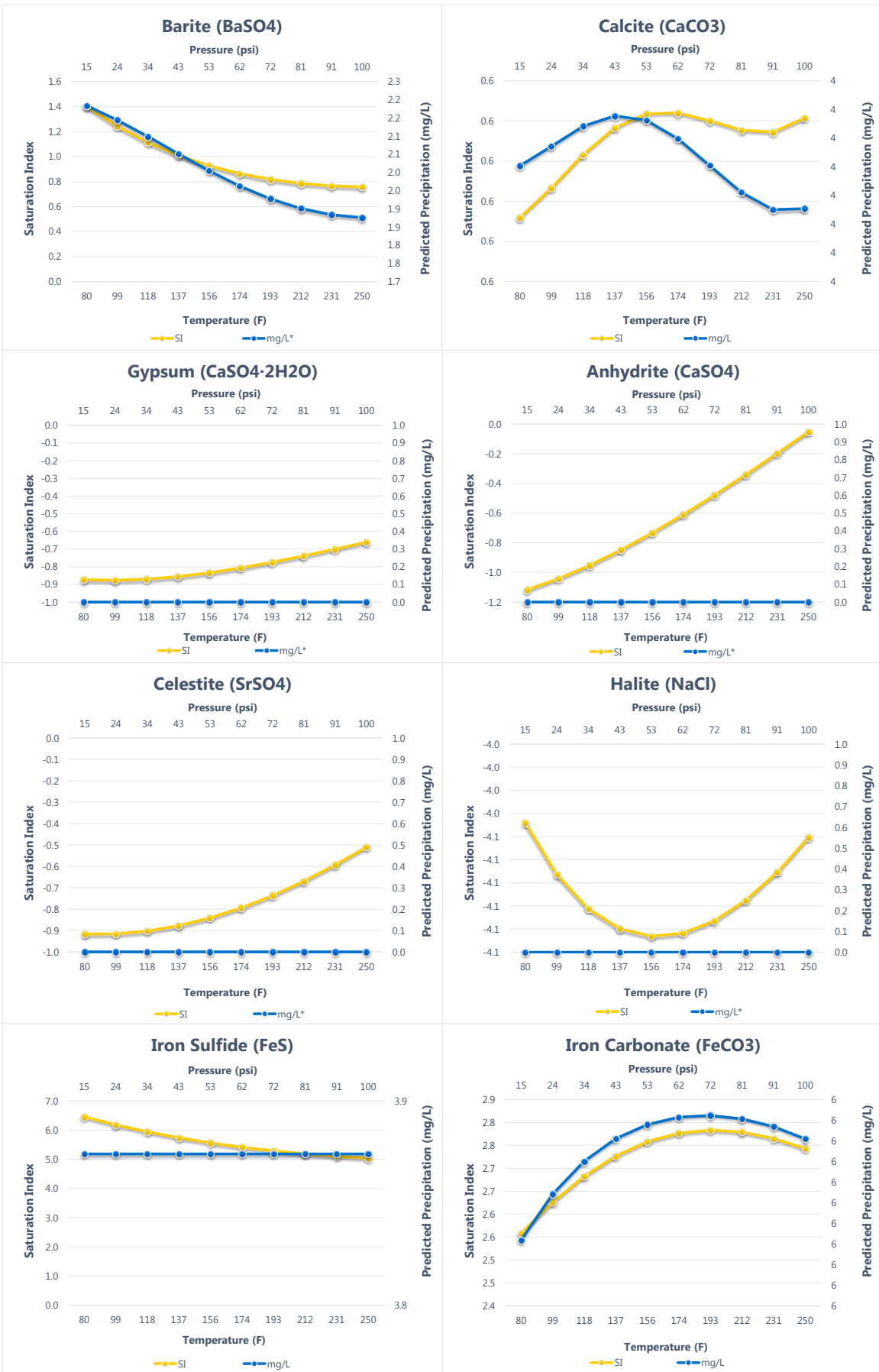
Conditions		Barite (BaSO ₄)		Calcite (CaCO ₃)		Gypsum (CaSO ₄ ·2H ₂ O)		Anhydrite (CaSO ₄)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	1.40	0.764	0.58	1.250	-0.87	0.000	-1.12	0.000
99°F	24 psi	1.24	0.750	0.58	1.252	-0.88	0.000	-1.04	0.000
118°F	34 psi	1.11	0.734	0.59	1.254	-0.87	0.000	-0.95	0.000
137°F	43 psi	1.01	0.718	0.59	1.256	-0.86	0.000	-0.85	0.000
156°F	53 psi	0.93	0.702	0.59	1.255	-0.83	0.000	-0.73	0.000
174°F	62 psi	0.86	0.687	0.59	1.253	-0.81	0.000	-0.61	0.000
193°F	72 psi	0.82	0.675	0.59	1.250	-0.77	0.000	-0.48	0.000
212°F	81 psi	0.79	0.665	0.59	1.246	-0.74	0.000	-0.34	0.000
231°F	91 psi	0.77	0.659	0.59	1.244	-0.70	0.000	-0.20	0.000
250°F	100 psi	0.76	0.656	0.59	1.244	-0.66	0.000	-0.05	0.000

Conditions		Celestite (SrSO ₄)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate (FeCO ₃)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	-0.92	0.000	-4.04	0.000	6.46	1.356	2.56	1.969
99°F	24 psi	-0.92	0.000	-4.07	0.000	6.18	1.356	2.63	1.970
118°F	34 psi	-0.90	0.000	-4.08	0.000	5.95	1.356	2.68	1.971
137°F	43 psi	-0.88	0.000	-4.09	0.000	5.74	1.356	2.73	1.971
156°F	53 psi	-0.84	0.000	-4.09	0.000	5.56	1.356	2.76	1.971
174°F	62 psi	-0.79	0.000	-4.09	0.000	5.42	1.356	2.78	1.971
193°F	72 psi	-0.74	0.000	-4.09	0.000	5.29	1.356	2.78	1.971
212°F	81 psi	-0.67	0.000	-4.08	0.000	5.19	1.356	2.78	1.971
231°F	91 psi	-0.59	0.000	-4.07	0.000	5.10	1.356	2.77	1.971
250°F	100 psi	-0.51	0.000	-4.05	0.000	5.04	1.356	2.74	1.971

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered
 Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.
 Note 3: Saturation Index predictions on this sheet use pH and alkalinity; %CO₂ is not included in the calculations.



Comments:



SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.