

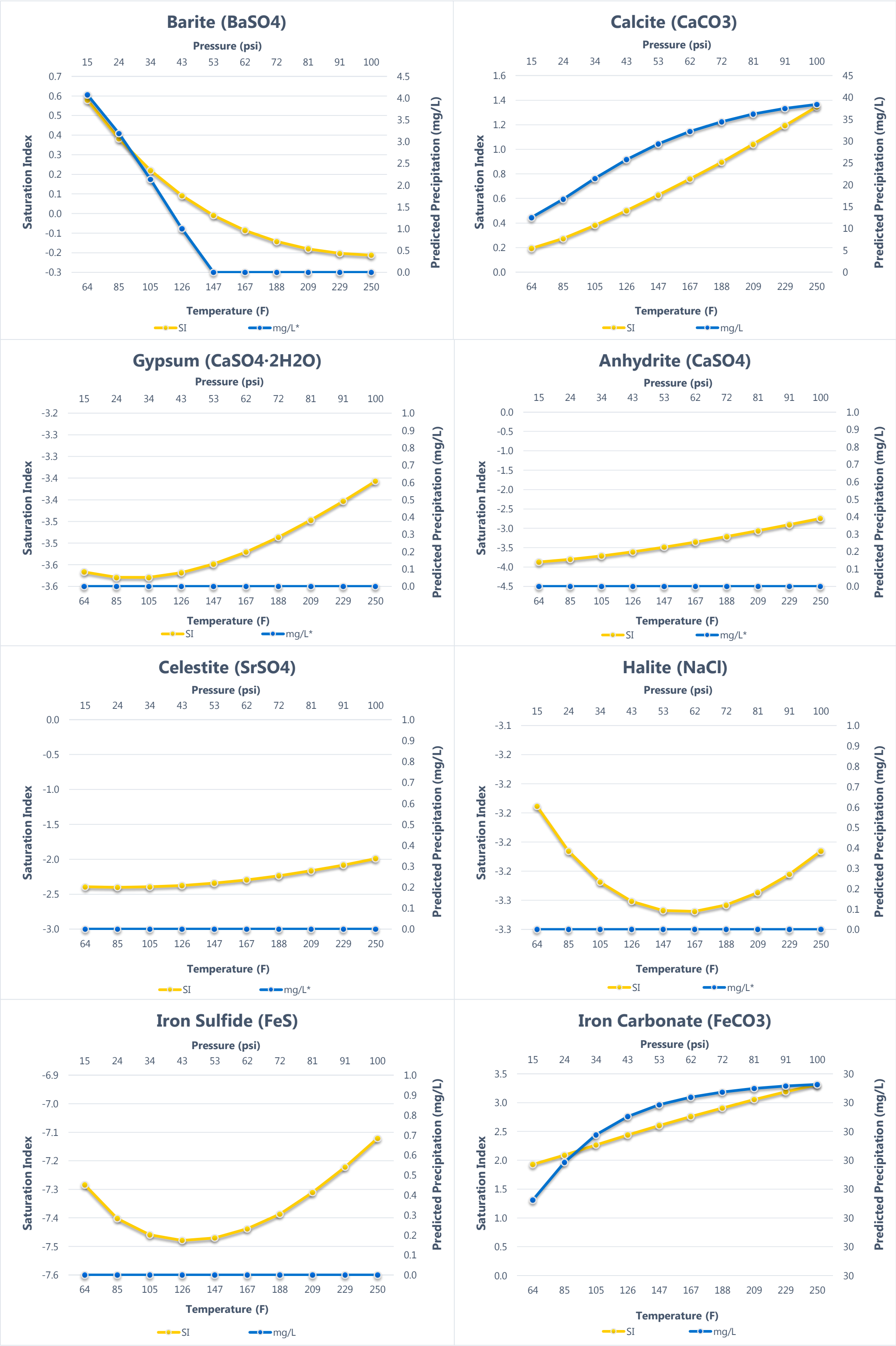
CUSTOMER:	MUSTANG ENERGY	ACCOUNT REP:	JUSTIN L CORNELL
DISTRICT:	WESTERN DIVIDE	SAMPLE ID:	201612003303
AREA/LEASE:	WAMSUTTER	SAMPLE DATE:	3/5/2016
SAMPLE POINT NAME	FEDERAL 5-35 WELL	ANALYSIS DATE:	3/24/2016
SITE TYPE:	WELL SITES	ANALYST:	BAS
SAMPLE POINT DESCRIPTION:	EXTERNAL TUBING		

FIELD DATA			ANALYSIS OF SAMPLE				
		ANIONS:	mg/L	meq/L	CATIONS:	mg/L	meq/L
Initial Temperature (°F):	250	Chloride (Cl ⁻):	6795.0	191.7	Sodium (Na ⁺):	5271.7	229.4
Final Temperature (°F):	64	Sulfate (SO ₄ ²⁻):	23.8	0.5	Potassium (K ⁺):	297.3	7.6
Initial Pressure (psi):	100	Borate (H ₃ BO ₃):	37.2	0.6	Magnesium (Mg ²⁺):	17.0	1.4
Final Pressure (psi):	15	Fluoride (F ⁻):	ND		Calcium (Ca ²⁺):	16.2	0.8
		Bromide (Br ⁻):	ND		Strontium (Sr ²⁺):	5.4	0.1
pH:		Nitrite (NO ₂ ⁻):	ND		Barium (Ba ²⁺):	3.4	0.0
pH at time of sampling:	7.8	Nitrate (NO ₃ ⁻):	ND		Iron (Fe ²⁺):	14.6	0.5
		Phosphate (PO ₄ ³⁻):	233.2	7.5	Manganese (Mn ²⁺):	0.1	0.0
		Silica (SiO ₂):	ND		Lead (Pb ²⁺):	ND	
					Zinc (Zn ²⁺):	0.5	0.0
ALKALINITY BY TITRATION:		mg/L	meq/L				
Bicarbonate (HCO ₃ ⁻):	1476.0	24.2			Aluminum (Al ³⁺):	ND	
Carbonate (CO ₃ ²⁻):	ND				Chromium (Cr ³⁺):	ND	
Hydroxide (OH ⁻):	ND				Cobalt (Co ²⁺):	ND	
					Copper (Cu ²⁺):	ND	
aqueous CO ₂ (ppm):	ND	Formic Acid:	ND		Molybdenum (Mo ²⁺):	ND	
aqueous H ₂ S (ppm):	0.0	Acetic Acid:	ND		Nickel (Ni ²⁺):	ND	
aqueous O ₂ (ppb):	ND	Propionic Acid:	ND		Tin (Sn ²⁺):	ND	
		Butyric Acid:	ND		Titanium (Ti ²⁺):	ND	
Calculated TDS (mg/L):	14191	Valeric Acid:	ND		Vanadium (V ²⁺):	ND	
Density/Specific Gravity (g/cm ³):	1.0070				Zirconium (Zr ²⁺):	ND	
Measured Specific Gravity	ND						
Conductivity (mmhos):	21.0				Total Hardness:	119	N/A
Resistivity:	ND						
MCF/D:	No Data						
BOPD:	No Data						
BWPD:	No Data	Anion/Cation Ratio:		0.94	ND = Not Determined		

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)
64°F	15 psi	0.58	1.428	0.19	4.386	-3.57	0.000	-3.87	0.000
85°F	24 psi	0.38	1.116	0.27	5.845	-3.58	0.000	-3.80	0.000
105°F	34 psi	0.22	0.747	0.38	7.512	-3.58	0.000	-3.71	0.000
126°F	43 psi	0.09	0.350	0.50	9.019	-3.57	0.000	-3.61	0.000
147°F	53 psi	-0.01	0.000	0.63	10.273	-3.55	0.000	-3.49	0.000
167°F	62 psi	-0.09	0.000	0.76	11.274	-3.52	0.000	-3.36	0.000
188°F	72 psi	-0.14	0.000	0.89	12.049	-3.49	0.000	-3.22	0.000
209°F	81 psi	-0.18	0.000	1.04	12.667	-3.45	0.000	-3.07	0.000
229°F	91 psi	-0.20	0.000	1.19	13.118	-3.40	0.000	-2.91	0.000
250°F	100 psi	-0.21	0.000	1.35	13.442	-3.36	0.000	-2.75	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)
64°F	15 psi	-2.39	0.000	-3.20	0.000	-7.28	0.000	1.93	10.452
85°F	24 psi	-2.40	0.000	-3.23	0.000	-7.40	0.000	2.09	10.497
105°F	34 psi	-2.40	0.000	-3.25	0.000	-7.46	0.000	2.26	10.531
126°F	43 psi	-2.37	0.000	-3.26	0.000	-7.48	0.000	2.44	10.553
147°F	53 psi	-2.34	0.000	-3.27	0.000	-7.47	0.000	2.60	10.567
167°F	62 psi	-2.29	0.000	-3.27	0.000	-7.44	0.000	2.76	10.577
188°F	72 psi	-2.24	0.000	-3.26	0.000	-7.39	0.000	2.91	10.583
209°F	81 psi	-2.16	0.000	-3.25	0.000	-7.31	0.000	3.05	10.587
229°F	91 psi	-2.08	0.000	-3.24	0.000	-7.22	0.000	3.19	10.590
250°F	100 psi	-1.99	0.000	-3.23	0.000	-7.12	0.000	3.31	10.592

 **EESI** 
Energy & Environmental Systems Institute
ScaleSoftPitzer™
SSP2010



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