

Complete Water Analysis Report SSP v.8

Customer:	MID CON ENERGY OPERATING	Sample Point Name	HARKER RANCH 14-1
District:	Kansas	Sample ID:	201513000566
Sales Rep:	Scott A Wellbrock	Sample Date:	2/20/2015
Lease:	HARKER RANCH	Log Out Date:	3/4/2015
Site Type:	Well Sites	Analyst:	Amanda L Akin
Sample Point Description:	NOT PROVIDED		

MID CON ENERGY OPERATING, HARKER RANCH, HARKER RANCH 14-1

Field Data			Analysis of Sample					
			Anions:	mg/L	meq/L	Cations:	mg/L	meq/L
Initial Temperature (°F):	250		Chloride (Cl ⁻):	110927.0	3129.1	Sodium (Na ⁺):	63225.3	2751.3
Final Temperature (°F):	85		Sulfate (SO ₄ ²⁻):	3700.0	77.0	Potassium (K ⁺):	158.0	4.0
Initial Pressure (psi):	100		Borate (H ₃ BO ₃):	44.0	0.7	Magnesium (Mg ²⁺):	318.2	26.2
Final Pressure (psi):	15		Fluoride (F ⁻):	ND		Calcium (Ca ²⁺):	1213.4	60.6
			Bromide (Br ⁻):	ND		Strontium (Sr ²⁺):	42.3	1.0
pH:			Nitrite (NO ₂ ⁻):	ND		Barium (Ba ²⁺):	0.0	0.0
pH at time of sampling:	6.8		Nitrate (NO ₃ ⁻):	ND		Iron (Fe ²⁺):	0.0	0.0
			Phosphate (PO ₄ ³⁻):	0.0	0.0	Manganese (Mn ²⁺):	0.0	0.0
			Silica (SiO ₂):	ND		Lead (Pb ²⁺):	ND	
						Zinc (Zn ²⁺):	0.0	0.0
Alkalinity by Titration:			mg/L	meq/L				
Bicarbonate (HCO ₃ ⁻):	335.0	5.5				Aluminum (Al ³⁺):	ND	
Carbonate (CO ₃ ²⁻):	ND					Chromium (Cr ³⁺):	ND	
Hydroxide (OH ⁻):	ND					Cobalt (Co ²⁺):	ND	
			Organic Acids:	mg/L	meq/L	Copper (Cu ²⁺):	ND	
aqueous CO ₂ (ppm):	148.0		Formic Acid:	ND		Molybdenum (Mo ²⁺):	ND	
aqueous H ₂ S (ppm):	ND		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):	179963		Valeric Acid:	ND		Vanadium (V ²⁺):	ND	
Density/Specific Gravity (g/cm ³):	1.1092					Zirconium (Zr ²⁺):	ND	
Measured Density/Specific Gravity	1.1266							
Conductivity (mmhos):	ND					Total Hardness:	4393	N/A
Resistivity:	ND							
MCF/D:	No Data							
BOPD:	No Data							
BWPD:	No Data							
			Anion/Cation Ratio:	1.13		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)
85°F	15 psi		0.000	0.87	50.097	-0.29	0.000	-0.42	0.000
103°F	24 psi		0.000	0.92	52.544	-0.29	0.000	-0.34	0.000
122°F	34 psi		0.000	1.00	55.846	-0.29	0.000	-0.25	0.000
140°F	43 psi		0.000	1.08	59.136	-0.30	0.000	-0.17	0.000
158°F	53 psi		0.000	1.16	62.196	-0.31	0.000	-0.09	0.000
177°F	62 psi		0.000	1.23	64.982	-0.31	0.000	0.00	0.000
195°F	72 psi		0.000	1.30	67.505	-0.32	0.000	0.09	154.126
213°F	81 psi		0.000	1.38	69.978	-0.33	0.000	0.18	298.974
232°F	91 psi		0.000	1.45	72.347	-0.34	0.000	0.27	430.171
250°F	100 psi		0.000	1.53	74.487	-0.35	0.000	0.36	547.520

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)
85°F	15 psi	-0.01	0.000	-0.86	0.000	0	0.000		0.000
103°F	24 psi	-0.01	0.000	-0.87	0.000	0	0.000		0.000
122°F	34 psi	-0.01	0.000	-0.88	0.000	0	0.000		0.000
140°F	43 psi	-0.02	0.000	-0.88	0.000	0	0.000		0.000
158°F	53 psi	-0.02	0.000	-0.89	0.000	0	0.000		0.000
177°F	62 psi	-0.03	0.000	-0.89	0.000	0	0.000		0.000
195°F	72 psi	-0.03	0.000	-0.90	0.000	0	0.000		0.000
213°F	81 psi	-0.02	0.000	-0.90	0.000	0	0.000		0.000
232°F	91 psi	-0.01	0.000	-0.90	0.000	0	0.000		0.000
250°F	100 psi	0.00	0.000	-0.91	0.000	0	0.000		0.000

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: _____

