



DownHole SAT Rx

FORMATION WATER CHEMISTRY INPUT

Mull Drilling
Koch 11-7 #1 SWD
Wellhead

Pro-Stim Chemicals
Paul Dwyer

Report Date: 05-08-2015 Sampled: 04-25-2015
Sample #: 71 at 1200

CATIONS

Calcium (as Ca)	6400
Magnesium (as Mg)	850.00
Barium (as Ba)	0.00
Strontium (as Sr)	0.00
Sodium (as Na)	46157
Potassium (as K)	0.00
Lithium (as Li)	0.00
Ammonia (as NH ₃)	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	44.00
Manganese (as Mn)	3.25
Zinc (as Zn)	0.00
Lead (as Pb)	0.00

ANIONS

Chloride (as Cl)	85000
Sulfate (as SO ₄)	400.00
Bromine (as Br)	0.00
Dissolved CO ₂ (as CO ₂)	239.51
Bicarbonate (as HCO ₃)	320.00
Carbonate (as CO ₃)	0.00
Oxalic acid (as C ₂ O ₄)	0.00
Silica (as SiO ₂)	0.00
Phosphate(as PO ₄)	0.00
H ₂ S (as H ₂ S)	0.00
Fluoride (as F)	0.00
Nitrate (as NO ₃)	0.00
Boron (as B)	0.00

PARAMETERS

Calculated T.D.S.	135985
Molar Conductivity	203471
Resistivity	4.91
Sp.Gr.(g/mL)	1.09
Pressure(atm)	1.00
pCO ₂ (atm)	0.128
pH ₂ S(atm)	0.00
Temperature (°F)	74.00
pH	5.81

COMMENTS Prepared by SGB Solutions

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



DownHole SAT Rx

FORMATION WATER DEPOSITION POTENTIAL INDICATORS

Mull Drilling
Koch 11-7 #1 SWD
Wellhead

Pro-Stim Chemicals
Paul Dwyer

Report Date: 05-08-2015 Sampled: 04-25-2015
Sample #: 71 at 1200

SATURATION LEVEL

Calcite (CaCO ₃)	0.467
Aragonite (CaCO ₃)	0.408
Witherite (BaCO ₃)	0.00
Strontianite (SrCO ₃)	0.00
Calcium oxalate (CaC ₂ O ₄)	0.00
Magnesite (MgCO ₃)	0.0646
Anhydrite (CaSO ₄)	0.192
Gypsum (CaSO ₄ *2H ₂ O)	0.272
Barite (BaSO ₄)	0.00
Celestite (SrSO ₄)	0.00
Fluorite (CaF ₂)	0.00
Calcium phosphate	0.00
Hydroxyapatite	0.00
Silica (SiO ₂)	0.00
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	0.00
Iron hydroxide (Fe(OH) ₃)	1.03
Strengite (FePO ₄ *2H ₂ O)	0.00
Siderite (FeCO ₃)	2.53
Halite (NaCl)	0.0657
Thenardite (Na ₂ SO ₄)	< 0.001
Iron sulfide (FeS)	0.00

FREE ION MOMENTARY EXCESS (ppm)

Calcite (CaCO ₃)	-0.0278
Aragonite (CaCO ₃)	-0.0354
Witherite (BaCO ₃)	-73.77
Strontianite (SrCO ₃)	-23.81
Calcium oxalate (CaC ₂ O ₄)	-0.0258
Magnesite (MgCO ₃)	-0.297
Anhydrite (CaSO ₄)	-791.06
Gypsum (CaSO ₄ *2H ₂ O)	-575.37
Barite (BaSO ₄)	-1.20
Celestite (SrSO ₄)	-622.15
Fluorite (CaF ₂)	-8.91
Calcium phosphate	>-0.001
Hydroxyapatite	-922.04
Silica (SiO ₂)	-92.18
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	-281.08
Iron hydroxide (Fe(OH) ₃)	< 0.001
Strengite (FePO ₄ *2H ₂ O)	>-0.001
Siderite (FeCO ₃)	0.0171
Halite (NaCl)	-361565
Thenardite (Na ₂ SO ₄)	-235367
Iron sulfide (FeS)	-1.27

SIMPLE INDICES

Langelier	0.0844
Ryznar	5.64
Puckorius	3.47
Larson-Skold Index	498.80
Stiff Davis Index	-0.443
Oddo-Tomson	-1.05

BOUND IONS

BOUND IONS	TOTAL	FREE
Calcium	6400	6283
Barium	0.00	0.00
Carbonate	1.09	0.0146
Phosphate	0.00	0.00
Sulfate	400.00	138.45

OPERATING CONDITIONS

Temperature (°F)	74.00
Time(mins)	3.00