

Imperative Water Analysis Report

IMPERATIVE
CHEMICAL PARTNERS

SYSTEM IDENTIFICATION

Company: Foundation Energy Management LLC - Hobbs
Location: Blue Quail 2
Sample Source: Wellhead
Account Rep: Mike Gomez

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	1746
Magnesium(as Mg)	364.80
Barium(as Ba)	0.194
Strontium(as Sr)	79.21
Sodium(as Na)	35912
Potassium(as K)	1140
Iron(as Fe)	76.31
Manganese(as Mn)	2.51

ANIONS

Chloride(as Cl)	64000
Sulfate(as SO ₄)	300.00
Dissolved CO ₂ (as CO ₂)	350.00
Bicarbonate(as HCO ₃)	793.00
H ₂ S (as H ₂ S)	205.00
Boron(as B)	24.82

PARAMETERS

Temperature(°F)	77.00
Sample pH	6.50
Conductivity	144666
T.D.S.	103178
Resistivity	6.91
Sp.Gr.(g/mL)	1.07

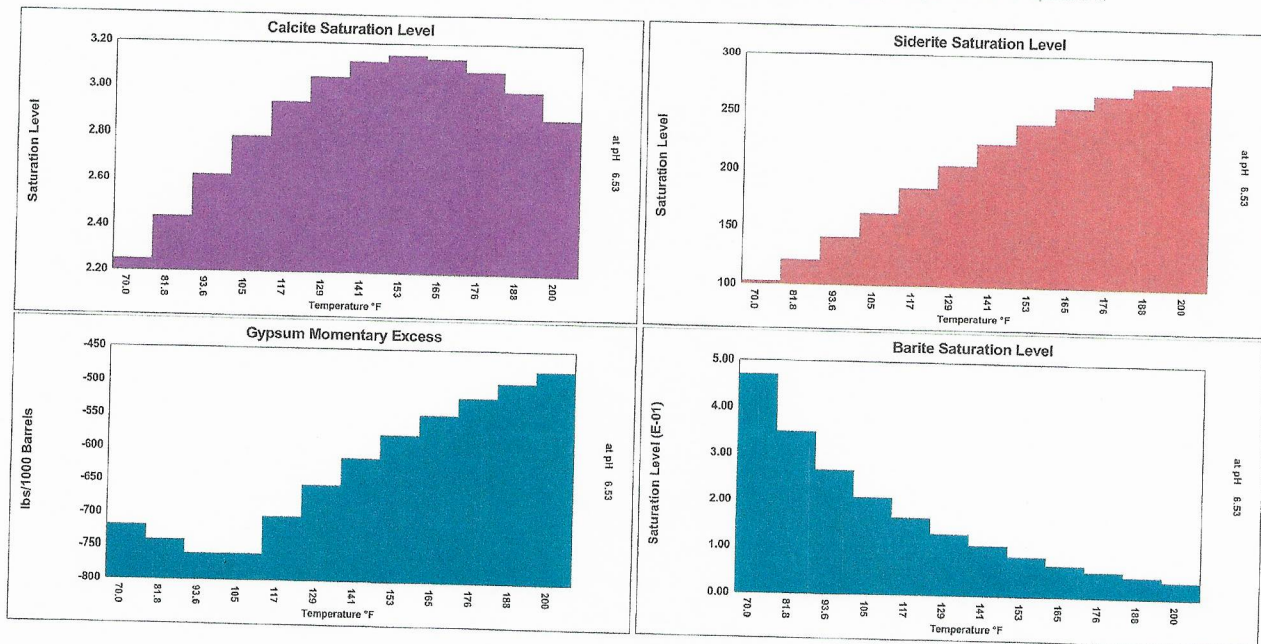
Sample ID#: W-10389

Sample Date: 06-20-2019
Report Date: 06-27-2019

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃		Anhydrite CaSO ₄		Gypsum CaSO ₄ *2H ₂ O		Barite BaSO ₄		Celestite SrSO ₄		Siderite FeCO ₃		Mackawenite FeS		CO ₂ (mpy)	pCO ₂ (atm)
70.00	1.00	2.25	0.102	0.0580	-900.89	0.0876	-718.58	0.470	-0.129	0.124	-145.60	102.49	0.210	553.36	7.36	0.113	0.249
81.82	1.36	2.43	0.108	0.0577	-885.38	0.0823	-742.46	0.348	-0.215	0.120	-146.81	120.85	0.210	486.36	7.24	0.174	0.294
93.64	1.73	2.62	0.113	0.0592	-850.04	0.0783	-760.07	0.265	-0.317	0.119	-146.03	140.89	0.209	432.44	7.13	0.258	0.339
105.45	2.09	2.79	0.116	0.0623	-798.55	0.0765	-759.63	0.208	-0.435	0.120	-144.15	162.01	0.208	387.26	7.00	0.348	0.384
117.27	2.45	2.93	0.118	0.0673	-734.99	0.0816	-704.01	0.166	-0.575	0.120	-142.37	183.44	0.205	345.22	6.88	0.362	0.430
129.09	2.82	3.04	0.117	0.0742	-663.31	0.0866	-655.90	0.133	-0.747	0.120	-141.08	204.27	0.201	304.56	6.74	0.361	0.475
140.91	3.18	3.11	0.115	0.0836	-587.17	0.0913	-614.27	0.107	-0.955	0.119	-140.24	223.52	0.196	265.65	6.61	0.346	0.520
152.73	3.55	3.14	0.112	0.0959	-509.82	0.0957	-578.29	0.0861	-1.21	0.118	-139.85	240.74	0.189	229.47	6.46	0.383	0.565
164.55	3.91	3.13	0.106	0.112	-434.04	0.0999	-547.26	0.0699	-1.51	0.117	-139.86	255.03	0.180	196.16	6.31	0.416	0.611
176.36	4.27	3.08	0.100	0.133	-362.04	0.104	-520.61	0.0569	-1.87	0.115	-140.29	266.25	0.171	166.25	6.16	0.438	0.656
188.18	4.64	2.99	0.0931	0.159	-295.44	0.107	-497.87	0.0466	-2.30	0.113	-141.11	273.98	0.161	139.71	6.00	0.240	0.701
200.00	5.00	2.87	0.0855	0.194	-235.33	0.110	-478.66	0.0383	-2.81	0.111	-142.33	278.34	0.151	116.57	5.83	0.174	0.746
		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels			Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		
Saturation Levels (xSAT) are the index of saturation																	

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.



EXHIBIT

6

tabbles

Imperative Water Analysis Report

SYSTEM IDENTIFICATION

Company: Foundation Energy Management LLC - Hobbs
Location: Blue Quail 3
Sample Source: Wellhead
Account Rep: Mike Gomez

IMPERATIVE
CHEMICAL PARTNERS

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	1566
Magnesium(as Mg)	323.20
Barium(as Ba)	0.181
Strontium(as Sr)	69.83
Sodium(as Na)	36524
Potassium(as K)	990.60
Iron(as Fe)	72.98
Manganese(as Mn)	2.22

ANIONS

Chloride(as Cl)	65000
Sulfate(as SO ₄)	231.00
Dissolved CO ₂ (as CO ₂)	550.00
Bicarbonate(as HCO ₃)	915.00
H ₂ S (as H ₂ S)	171.00
Boron(as B)	22.67

PARAMETERS

Temperature(°F)	77.00
Sample pH	6.46
Conductivity	145217
T.D.S.	104411
Resistivity	6.89
Sp.Gr.(g/mL)	1.08

Sample ID#: W-10387

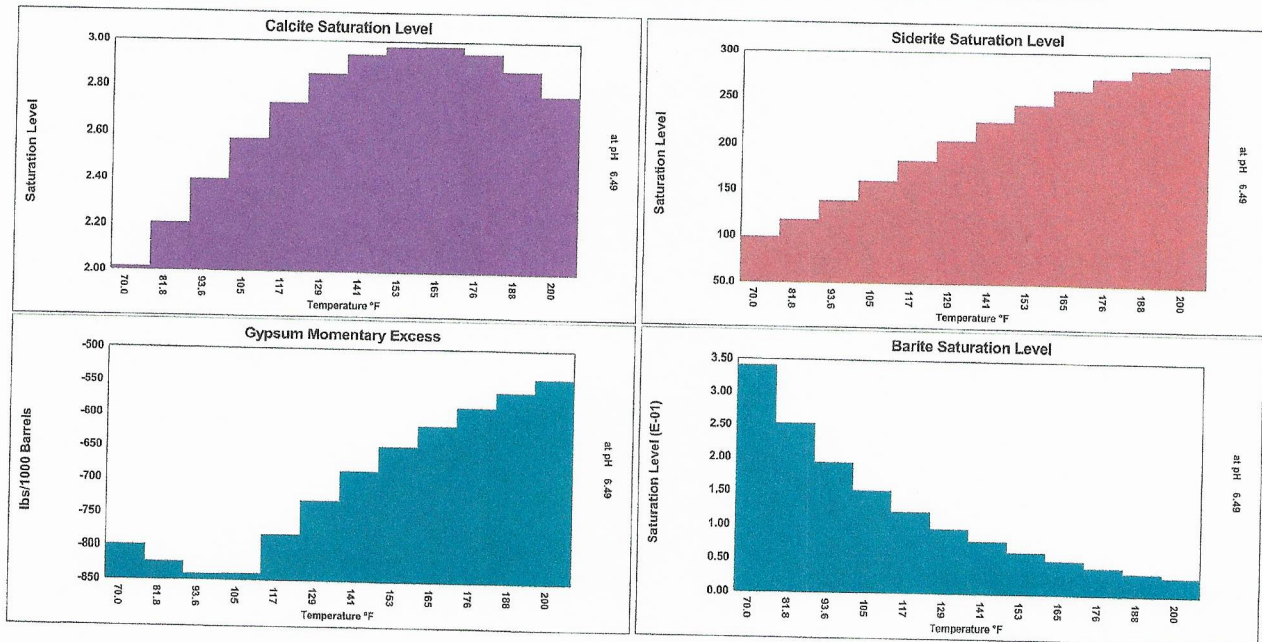
Sample Date: 06-20-2019

Report Date: 06-27-2019

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃	Anhydrite CaSO ₄	Gypsum CaSO ₄ *2H ₂ O	Barite BaSO ₄	Celestite SrSO ₄	Siderite FeCO ₃	Mackawenite FeS	CO ₂ (mpy)	pCO ₂ (atm)							
70.00	1.00	2.02	0.0941	0.0403	-981.76	0.0608	-798.79	0.341	-0.207	0.0846	-161.86	98.39	0.214	374.28	7.04	0.131	0.302
81.82	1.36	2.21	0.103	0.0401	-965.29	0.0572	-823.21	0.252	-0.317	0.0825	-162.79	117.23	0.216	334.05	6.93	0.211	0.357
93.64	1.73	2.40	0.110	0.0412	-928.27	0.0544	-841.09	0.193	-0.447	0.0819	-161.73	137.96	0.218	301.07	6.82	0.310	0.412
105.45	2.09	2.57	0.116	0.0434	-874.46	0.0533	-840.15	0.151	-0.597	0.0822	-159.56	160.06	0.218	272.99	6.70	0.415	0.467
117.27	2.45	2.73	0.120	0.0469	-808.01	0.0569	-781.60	0.121	-0.775	0.0824	-157.51	182.65	0.217	245.99	6.58	0.430	0.522
129.09	2.82	2.85	0.121	0.0518	-732.95	0.0604	-730.80	0.0965	-0.993	0.0823	-155.97	204.86	0.215	219.15	6.45	0.426	0.577
140.91	3.18	2.94	0.120	0.0584	-652.99	0.0637	-686.72	0.0777	-1.26	0.0819	-154.92	225.68	0.210	192.84	6.31	0.408	0.632
152.73	3.55	2.98	0.117	0.0670	-571.48	0.0668	-648.52	0.0627	-1.57	0.0812	-154.32	244.25	0.203	167.68	6.17	0.448	0.687
164.55	3.91	2.98	0.113	0.0782	-491.26	0.0697	-615.49	0.0510	-1.95	0.0803	-154.16	260.21	0.196	144.36	6.03	0.484	0.742
176.36	4.27	2.94	0.107	0.0927	-414.65	0.0725	-587.05	0.0416	-2.41	0.0792	-154.42	272.77	0.186	123.00	5.88	0.507	0.797
188.18	4.64	2.87	0.0997	0.112	-343.38	0.0749	-562.72	0.0340	-2.94	0.0778	-155.10	281.87	0.177	103.90	5.73	0.276	0.852
200.00	5.00	2.77	0.0919	0.136	-278.67	0.0772	-542.12	0.0280	-3.58	0.0763	-156.20	287.20	0.166	87.03	5.57	0.199	0.907
		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels			
Saturation levels (xSAT) are the units of formation volume factor																	

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.



Imperative Water Analysis Report

SYSTEM IDENTIFICATION

IMPERATIVE
CHEMICAL PARTNERS

Company: Foundation Energy Management LLC - Hobbs
Location: Sharbro Federal 1
Sample Source: Wellhead
Account Rep: Mike Gomez

WATER CHEMISTRY

CATIONS

Calcium(as Ca) 19800
Magnesium(as Mg) 3478
Barium(as Ba) 2.24
Strontium(as Sr) 1191
Sodium(as Na) 68713
Potassium(as K) 1849
Iron(as Fe) 19.32
Manganese(as Mn) 6.57

ANIONS

Chloride(as Cl) 175000
Sulfate(as SO₄) 163.00
Dissolved CO₂(as CO₂) 380.00
Bicarbonate(as HCO₃) 73.20
H₂S (as H₂S) 3.40
Boron(as B) 36.44

PARAMETERS

Temperature(°F) 77.00
Sample pH 5.68
Conductivity 485493
T.D.S. 255597
Resistivity 2.06
Sp.Gr.(g/mL) 1.20

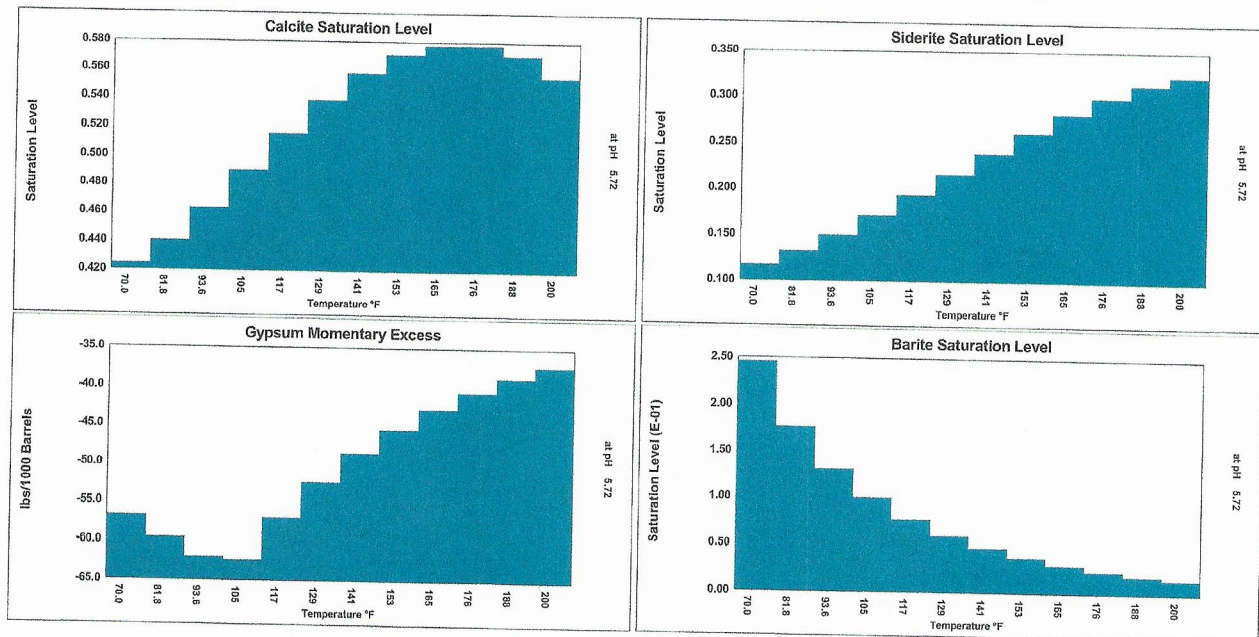
Sample ID#: W-10388

Sample Date: 06-20-2019
Report Date: 06-27-2019

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃	Anhydrite CaSO ₄	Gypsum CaSO ₄ *2H ₂ O	Barite BaSO ₄	Celestite SrSO ₄	Siderite FeCO ₃	Mackawenite FeS	CO ₂ (mpy)	pCO ₂ (atm)							
70.00	1.00	0.424	-0.00166	0.119	-63.59	0.146	-56.78	0.246	-3.13	0.0855	-108.88	0.117	-0.0107	0.0515	-1.01	0.338	0.0523
81.82	1.36	0.441	-0.00148	0.115	-62.49	0.133	-59.71	0.176	-4.40	0.0807	-109.75	0.132	-0.00892	0.0450	-1.15	0.519	0.0618
93.64	1.73	0.463	-0.00132	0.115	-59.50	0.123	-62.02	0.130	-5.76	0.0777	-108.77	0.150	-0.00749	0.0406	-1.28	0.733	0.0713
105.45	2.09	0.489	-0.00118	0.118	-55.05	0.117	-62.43	0.0995	-7.17	0.0757	-106.80	0.171	-0.00633	0.0375	-1.40	0.955	0.0808
117.27	2.45	0.515	-0.00105	0.124	-49.61	0.122	-57.01	0.0771	-8.67	0.0738	-104.98	0.193	-0.00539	0.0347	-1.52	1.02	0.0903
129.09	2.82	0.538	>-0.001	0.133	-43.62	0.126	-52.48	0.0601	-10.32	0.0719	-103.67	0.216	-0.00463	0.0320	-1.64	1.07	0.0998
140.91	3.18	0.557	>-0.001	0.147	-37.47	0.130	-48.69	0.0472	-12.10	0.0698	-102.84	0.240	-0.00400	0.0292	-1.77	1.11	0.109
152.73	3.55	0.570	>-0.001	0.165	-31.47	0.134	-45.51	0.0373	-14.03	0.0677	-102.48	0.262	-0.00349	0.0265	-1.92	1.14	0.119
164.55	3.91	0.577	>-0.001	0.189	-25.83	0.137	-42.86	0.0297	-16.12	0.0656	-102.55	0.282	-0.00307	0.0238	-2.08	1.16	0.128
176.36	4.27	0.577	>-0.001	0.220	-20.71	0.140	-40.65	0.0237	-18.38	0.0635	-103.08	0.300	-0.00274	0.0212	-2.25	1.16	0.138
188.18	4.64	0.570	>-0.001	0.260	-16.18	0.142	-38.83	0.0191	-20.82	0.0613	-104.04	0.314	-0.00247	0.0186	-2.45	0.632	0.147
200.00	5.00	0.555	>-0.001	0.312	-12.26	0.144	-37.35	0.0154	-23.47	0.0591	-105.46	0.324	-0.00226	0.0162	-2.66	0.378	0.157
		Lbs per		Lbs per		Lbs per		Lbs per		Lbs per		Lbs per		Lbs per			
		xSAT		xSAT		xSAT		xSAT		xSAT		xSAT		xSAT			
		1000		1000		1000		1000		1000		1000		1000			
		Barrels		Barrels		Barrels		Barrels		Barrels		Barrels		Barrels			

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.



Imperative Water Analysis Report

SYSTEM IDENTIFICATION

IMPERATIVE
CHEMICAL PARTNERS

Company: Fountain Energy Managment LLC - Hobbs
Location: Sharbro 2
Sample Source: Wellhead
Account Rep: Mike Gomez

WATER CHEMISTRY

CATIONS

Calcium(as Ca) 20580
Magnesium(as Mg) 3733
Barium(as Ba) 3.81
Strontium(as Sr) 1735
Sodium(as Na) 67259
Potassium(as K) 1892
Iron(as Fe) 28.47
Manganese(as Mn) 5.66

ANIONS

Chloride(as Cl) 175000
Sulfate(as SO₄) 0.00
Dissolved CO₂(as CO₂) 880.00
Bicarbonate(as HCO₃) 48.80
H₂S (as H₂S) 1.70
Boron(as B) 38.10

PARAMETERS

Temperature(°F) 77.00
Sample pH 6.04
Conductivity 488654
T.D.S. 255837
Resistivity 2.05
Sp.Gr.(g/mL) 1.20

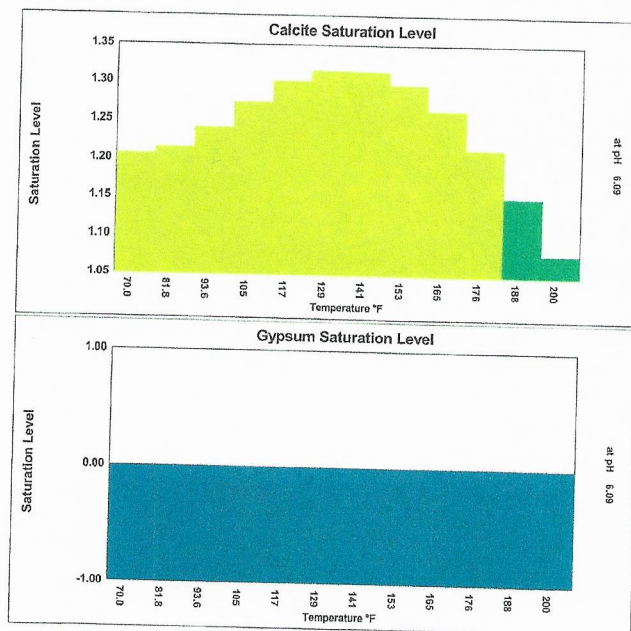
Sample ID#: W-10157

Sample Date: 06-17-2019
Report Date: 06-21-2019

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃	Anhydrite CaSO ₄	Gypsum CaSO ₄ *2H ₂ O	Barite BaSO ₄	Celestite SrSO ₄	Siderite FeCO ₃	Mackawenite FeS	CO ₂ (mpy)	pCO ₂ (atm)
70.00	1.00	1.21 < 0.001	0.00 -68.62	0.00 -63.16	0.00 -7.90	0.00 -87.77	0.462 -0.00443	0.181 -0.367	0.127	0.0264
81.82	1.36	1.21 < 0.001	0.00 -67.15	0.00 -65.46	0.00 -9.23	0.00 -88.02	0.505 -0.00347	0.150 -0.455	0.201	0.0312
93.64	1.73	1.24 < 0.001	0.00 -63.92	0.00 -67.22	0.00 -10.58	0.00 -86.89	0.557 -0.00266	0.128 -0.539	0.285	0.0359
105.45	2.09	1.27 < 0.001	0.00 -59.34	0.00 -67.21	0.00 -11.94	0.00 -85.04	0.617 -0.00199	0.113 -0.620	0.369	0.0407
117.27	2.45	1.30 < 0.001	0.00 -53.85	0.00 -61.71	0.00 -13.37	0.00 -83.34	0.678 -0.00146	0.100 -0.706	0.381	0.0455
129.09	2.82	1.32 < 0.001	0.00 -47.88	0.00 -57.09	0.00 -14.93	0.00 -82.06	0.735 -0.00106	0.0876 -0.802	0.388	0.0503
140.91	3.18	1.31 < 0.001	0.00 -41.78	0.00 -53.20	0.00 -16.62	0.00 -81.19	0.786 > -0.001	0.0762 -0.909	0.390	0.0551
152.73	3.55	1.30 < 0.001	0.00 -35.85	0.00 -49.94	0.00 -18.47	0.00 -80.69	0.828 > -0.001	0.0657 -1.03	0.415	0.0599
164.55	3.91	1.26 < 0.001	0.00 -30.29	0.00 -47.19	0.00 -20.47	0.00 -80.56	0.858 > -0.001	0.0561 -1.16	0.442	0.0647
176.36	4.27	1.21 < 0.001	0.00 -25.25	0.00 -44.90	0.00 -22.65	0.00 -80.80	0.876 > -0.001	0.0473 -1.32	0.463	0.0695
188.18	4.64	1.15 < 0.001	0.00 -20.79	0.00 -43.01	0.00 -25.03	0.00 -81.40	0.881 > -0.001	0.0395 -1.49	0.239	0.0743
200.00	5.00	1.08 < 0.001	0.00 -16.94	0.00 -41.46	0.00 -27.62	0.00 -82.37	0.872 > -0.001	0.0327 -1.68	0.0851	0.0791
		Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels		

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}·{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.



Imperative Water Analysis Report

IMPERATIVE
CHEMICAL PARTNERS

SYSTEM IDENTIFICATION

Company: Foundation Energy Management, LLC Hobbs
Location: Sharbro 3
Sample Source: Wellhead
Account Rep: Mike Gomez

WATER CHEMISTRY

CATIONS

Calcium(as Ca) 20370
Magnesium(as Mg) 3545
Barium(as Ba) 4.70
Strontium(as Sr) 2033
Sodium(as Na) 81430
Potassium(as K) 2493
Iron(as Fe) 20.57
Manganese(as Mn) 5.54

ANIONS

Chloride(as Cl) 180000
Sulfate(as SO₄) 0.00
Dissolved CO₂(as CO₂) 1400
Bicarbonate(as HCO₃) 122.00
H₂S (as H₂S) 5.10
Boron(as B) 37.67

PARAMETERS

Temperature(°F) 77.00
Sample pH 6.78
Conductivity 560448
T.D.S. 270712
Resistivity 1.78
Sp.Gr.(g/mL) 1.21

Sample ID#: W-8532

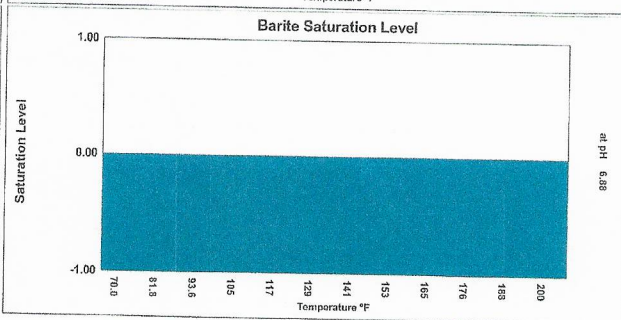
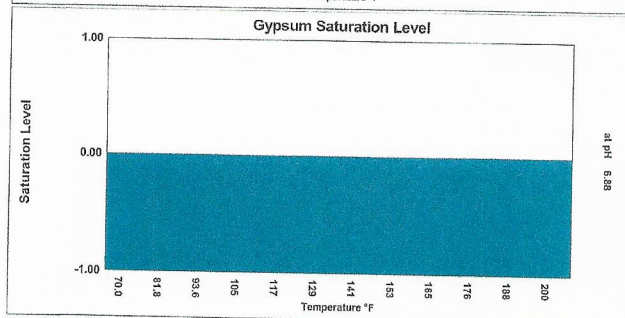
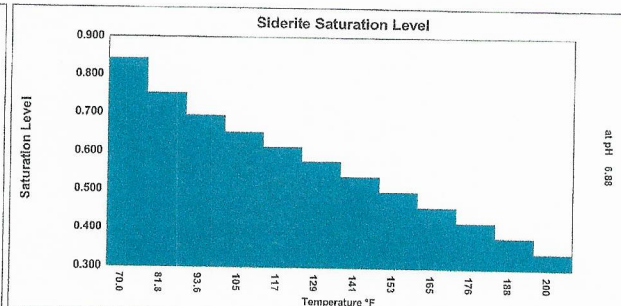
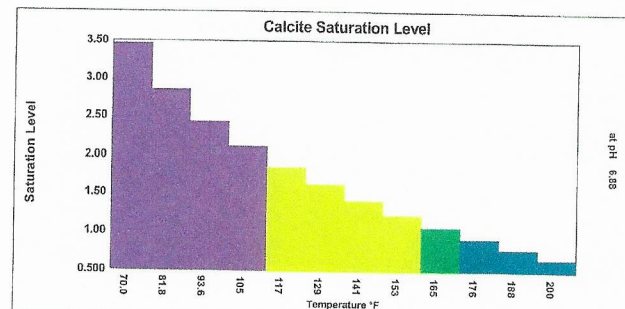
Sample Date: 05-03-2019

Report Date: 05-10-2019

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃	Anhydrite CaSO ₄	Gypsum CaSO ₄ *2H ₂ O	Barite BaSO ₄	Celestite SrSO ₄	Siderite FeCO ₃	Mackawenite FeS	CO ₂ (mpy)	pCO ₂ (atm)
70.00	1.00	3.46	0.00591	0.00	-62.74	0.00	-59.73	0.00	-7.86	0.00
81.82	1.36	2.85	0.00410	0.00	-61.39	0.00	-61.90	0.00	-9.22	0.00
93.64	1.73	2.43	0.00294	0.00	-58.44	0.00	-63.56	0.00	-10.60	0.00
105.45	2.09	2.12	0.00214	0.00	-54.25	0.00	-63.55	0.00	-11.99	0.00
117.27	2.45	1.85	0.00154	0.00	-49.23	0.00	-58.35	0.00	-13.45	0.00
129.09	2.82	1.62	0.00106	0.00	-43.76	0.00	-53.98	0.00	-15.04	0.00
140.91	3.18	1.42	< 0.001	0.00	-38.19	0.00	-50.31	0.00	-16.78	0.00
152.73	3.55	1.23	< 0.001	0.00	-32.77	0.00	-47.22	0.00	-18.67	0.00
164.55	3.91	1.07	< 0.001	0.00	-27.69	0.00	-44.64	0.00	-20.72	0.00
176.36	4.27	0.917	>-0.001	0.00	-23.09	0.00	-42.48	0.00	-22.96	0.00
188.18	4.64	0.784	>-0.001	0.00	-19.01	0.00	-40.69	0.00	-25.40	0.00
200.00	5.00	0.666	>-0.001	0.00	-15.49	0.00	-39.24	0.00	-28.05	0.00
		Lbs per	Lbs per	Lbs per	Lbs per	Lbs per	Lbs per	Lbs per	Lbs per	
		xSAT	xSAT	xSAT	xSAT	xSAT	xSAT	xSAT	xSAT	
		1000	1000	1000	1000	1000	1000	1000	1000	
		Barrels	Barrels	Barrels	Barrels	Barrels	Barrels	Barrels	Barrels	

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.



Imperative Water Analysis Report

IMPERATIVE
CHEMICAL PARTNERS

SYSTEM IDENTIFICATION

Company: Foundation Energy Management, LLC Hobbs
Location: Sharbro 5
Sample Source: Wellhead
Account Rep: Mike Gomez

WATER CHEMISTRY

CATIONS

Calcium(as Ca) 18560
Magnesium(as Mg) 3203
Barium(as Ba) 2.59
Strontium(as Sr) 1220
Sodium(as Na) 77930
Potassium(as K) 2460
Iron(as Fe) 32.62
Manganese(as Mn) 3.97

ANIONS

Chloride(as Cl) 169000
Sulfate(as SO₄) 124.00
Dissolved CO₂(as CO₂) 800.00
Bicarbonate(as HCO₃) 122.00
H₂S (as H₂S) 3.40
Boron(as B) 37.26

PARAMETERS

Temperature(°F) 77.00
Sample pH 6.75
Conductivity 509830
T.D.S. 256017
Resistivity 1.96
Sp.Gr.(g/mL) 1.19

Sample ID#: W-8533

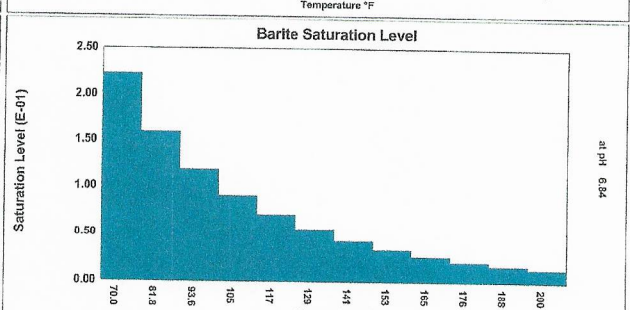
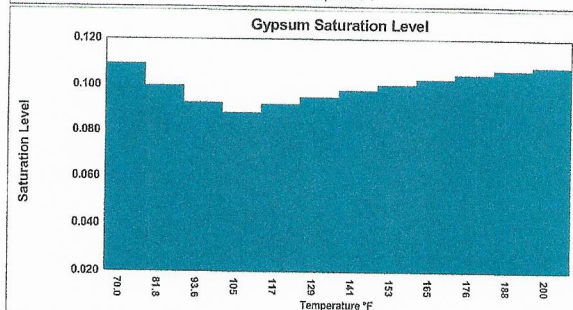
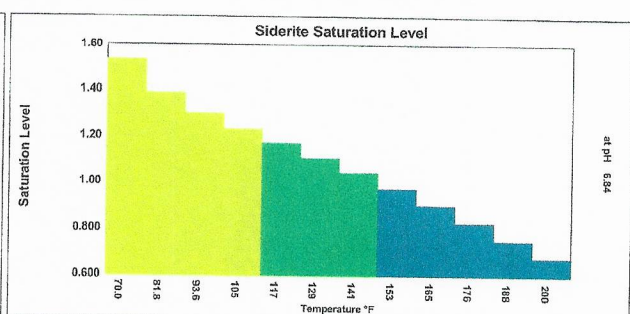
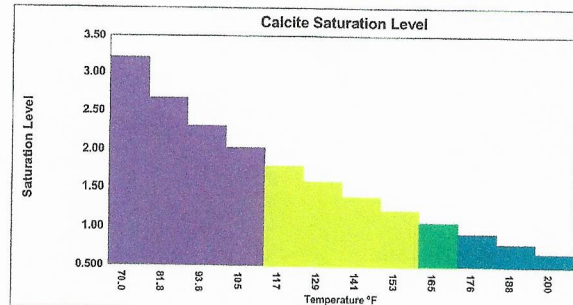
Sample Date: 05-03-2019

Report Date: 05-10-2019

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃	Anhydrite CaSO ₄	Gypsum CaSO ₄ *2H ₂ O	Barite BaSO ₄	Celestite SrSO ₄	Siderite FeCO ₃	Mackawenite FeS	CO ₂ (mpy)	pCO ₂ (atm)							
70.00	1.00	3.19	0.00638	0.0900	-66.84	0.109	-61.04	0.222	-3.68	0.0685	-107.61	1.53	0.00373	7.12	0.475	0.0177	0.0252
81.82	1.36	2.67	0.00447	0.0871	-65.60	0.0999	-63.92	0.159	-5.03	0.0647	-108.36	1.39	0.00231	4.46	0.393	0.0289	0.0298
93.64	1.73	2.30	0.00324	0.0869	-62.45	0.0924	-66.17	0.118	-6.45	0.0623	-107.32	1.30	0.00152	3.01	0.313	0.0152	0.0343
105.45	2.09	2.03	0.00239	0.0892	-57.83	0.0880	-66.48	0.0900	-7.88	0.0607	-105.33	1.23	0.00102	2.13	0.231	0.0206	0.0389
117.27	2.45	1.79	0.00173	0.0939	-52.20	0.0916	-60.79	0.0697	-9.40	0.0592	-103.48	1.17	< 0.001	1.54	0.143	0.0716	0.0435
129.09	2.82	1.58	0.00121	0.101	-46.03	0.0949	-56.03	0.0544	-11.05	0.0576	-102.15	1.11	< 0.001	1.13	0.0435	0.138	0.0481
140.91	3.18	1.39	< 0.001	0.112	-39.70	0.0978	-52.04	0.0427	-12.83	0.0560	-101.29	1.04	< 0.001	0.835	-0.0682	0.190	0.0527
152.73	3.55	1.22	< 0.001	0.125	-33.54	0.100	-48.70	0.0338	-14.76	0.0543	-100.89	0.973	>-0.001	0.619	-0.195	0.256	0.0572
164.55	3.91	1.06	< 0.001	0.144	-27.75	0.103	-45.90	0.0269	-16.83	0.0526	-100.93	0.901	>-0.001	0.460	-0.337	0.320	0.0618
176.36	4.27	0.918	>-0.001	0.167	-22.49	0.105	-43.57	0.0215	-19.08	0.0509	-101.41	0.828	>-0.001	0.343	-0.498	0.358	0.0664
188.18	4.64	0.789	>-0.001	0.198	-17.84	0.107	-41.65	0.0173	-21.50	0.0492	-102.33	0.754	>-0.001	0.255	-0.678	0.191	0.0710
200.00	5.00	0.673	>-0.001	0.237	-13.82	0.108	-40.09	0.0140	-24.13	0.0475	-103.69	0.682	>-0.001	0.190	-0.880	0.131	0.0756
		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels			

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.



Imperative Water Analysis Report

IMPERATIVE
CHEMICAL PARTNERS

SYSTEM IDENTIFICATION

Company: Foundation Energy Management, LLC Hobbs
Location: Sharbro 6
Sample Source: Wellhead
Account Rep: Mike Gomez

WATER CHEMISTRY

CATIONS

Calcium(as Ca) 20130
Magnesium(as Mg) 3575
Barium(as Ba) 2.97
Strontium(as Sr) 1497
Sodium(as Na) 80130
Potassium(as K) 2551
Iron(as Fe) 17.68
Manganese(as Mn) 5.95

ANIONS

Chloride(as Cl) 177000
Sulfate(as SO₄) 60.00
Dissolved CO₂(as CO₂) 850.00
Bicarbonate(as HCO₃) 146.40
H₂S (as H₂S) 5.10
Boron(as B) 35.56

PARAMETERS

Temperature(°F) 77.00
Sample pH 6.72
Conductivity 551680
T.D.S. 266463
Resistivity 1.81
Sp.Gr.(g/mL) 1.20

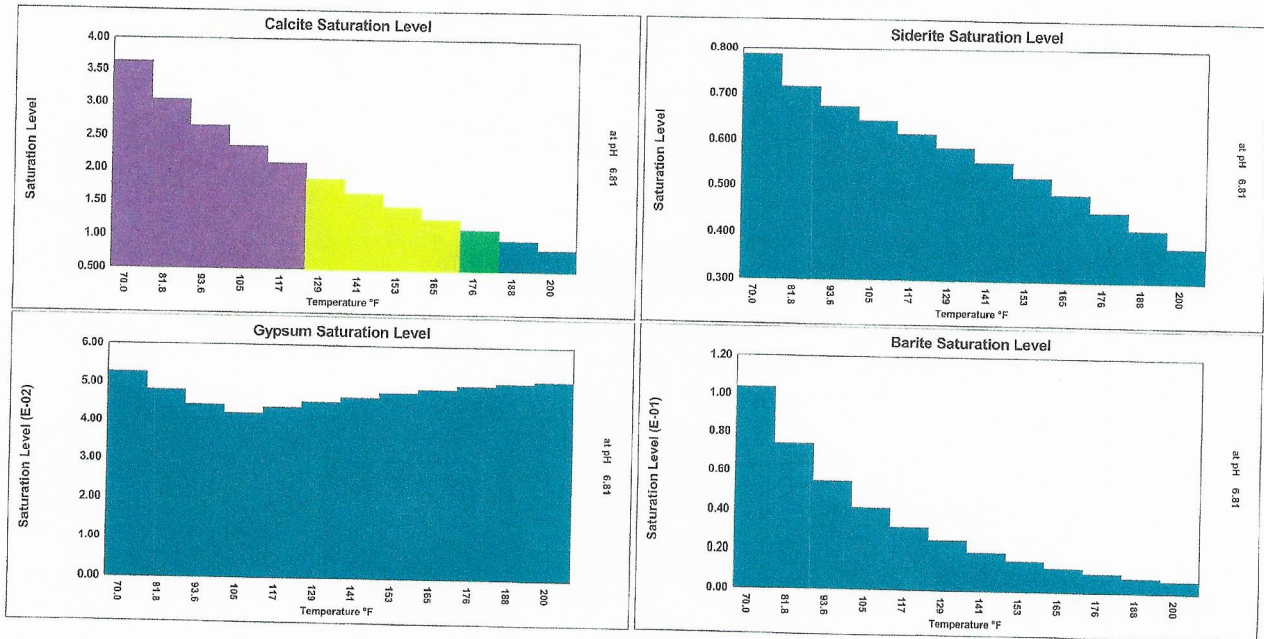
Sample ID#: W-8531

Sample Date: 05-03-2019
Report Date: 05-10-2019

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃		Anhydrite CaSO ₄		Gypsum CaSO ₄ *2H ₂ O		Barite BaSO ₄		Celestite SrSO ₄		Siderite FeCO ₃		Mackawenite FeS		CO ₂ (mpy)	pCO ₂ (atm)
70.00	1.00	3.63	0.00644	0.0441	-60.79	0.0527	-57.12	0.104	-5.89	0.0342	-98.14	0.784	-0.00283	5.11	0.558	0.0303	0.0320
81.82	1.36	3.05	0.00463	0.0426	-59.57	0.0481	-59.49	0.0740	-7.34	0.0322	-98.64	0.715	-0.00317	3.24	0.426	0.0439	0.0378
93.64	1.73	2.65	0.00346	0.0425	-56.71	0.0444	-61.32	0.0547	-8.82	0.0309	-97.55	0.673	-0.00312	2.20	0.302	0.0275	0.0436
105.45	2.09	2.35	0.00264	0.0435	-52.59	0.0422	-61.45	0.0417	-10.28	0.0301	-95.62	0.643	-0.00296	1.57	0.182	0.0294	0.0494
117.27	2.45	2.09	0.00201	0.0457	-47.61	0.0439	-56.32	0.0322	-11.82	0.0293	-93.85	0.615	-0.00280	1.15	0.0590	0.0854	0.0552
129.09	2.82	1.86	0.00150	0.0492	-42.17	0.0453	-52.02	0.0251	-13.48	0.0285	-92.54	0.585	-0.00266	0.849	-0.0726	0.143	0.0610
140.91	3.18	1.64	0.00107	0.0541	-36.61	0.0467	-48.42	0.0197	-15.27	0.0276	-91.68	0.554	-0.00255	0.631	-0.214	0.186	0.0668
152.73	3.55	1.45	< 0.001	0.0607	-31.19	0.0479	-45.39	0.0155	-17.21	0.0268	-91.25	0.520	-0.00246	0.471	-0.367	0.256	0.0726
164.55	3.91	1.27	< 0.001	0.0694	-26.12	0.0489	-42.85	0.0123	-19.30	0.0259	-91.22	0.485	-0.00240	0.353	-0.533	0.329	0.0784
176.36	4.27	1.11	< 0.001	0.0806	-21.51	0.0498	-40.74	0.00984	-21.57	0.0250	-91.60	0.449	-0.00234	0.264	-0.713	0.395	0.0843
188.18	4.64	0.956	>-0.001	0.0953	-17.43	0.0506	-38.99	0.00791	-24.02	0.0241	-92.38	0.411	-0.00230	0.198	-0.910	0.224	0.0901
200.00	5.00	0.822	>-0.001	0.114	-13.90	0.0512	-37.57	0.00639	-26.69	0.0232	-93.59	0.374	-0.00227	0.149	-1.13	0.153	0.0959
		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels			
Saturation Levels (xSAT) are the amount of mineral that will precipitate from a solution at a given temperature and pressure.																	

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.



Imperative Water Analysis Report

IMPERATIVE
CHEMICAL PARTNERS

SYSTEM IDENTIFICATION

Company: Foundation Energy Management, LLC-Hobbs
Location: Sharbro 4
Sample Source: Wellhead
Account Rep: Mike Gomez

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	12830
Magnesium(as Mg)	2250
Barium(as Ba)	1.06
Strontium(as Sr)	622.90
Sodium(as Na)	79196
Potassium(as K)	2262
Iron(as Fe)	22.82
Manganese(as Mn)	2.78

ANIONS

Chloride(as Cl)	157000
Sulfate(as SO ₄)	174.00
Dissolved CO ₂ (as CO ₂)	700.00
Bicarbonate(as HCO ₃)	122.00
H ₂ S (as H ₂ S)	1.70
Boron(as B)	37.21

PARAMETERS

Temperature(°F)	77.00
Sample pH	6.64
Conductivity	445273
T.D.S.	240116
Resistivity	2.25
Sp.Gr.(g/mL)	1.18

Sample ID#: W-8534

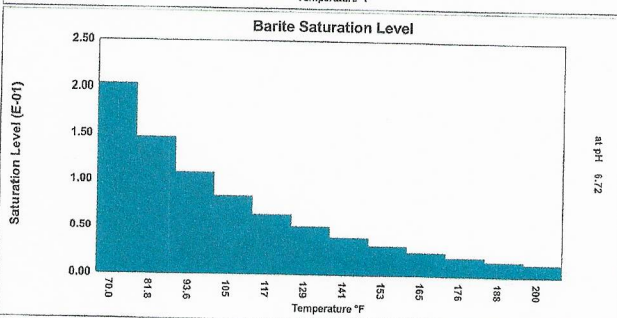
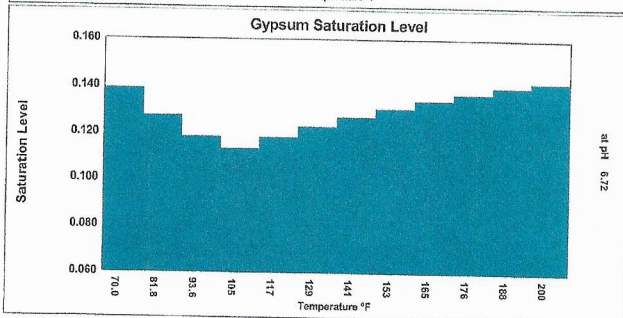
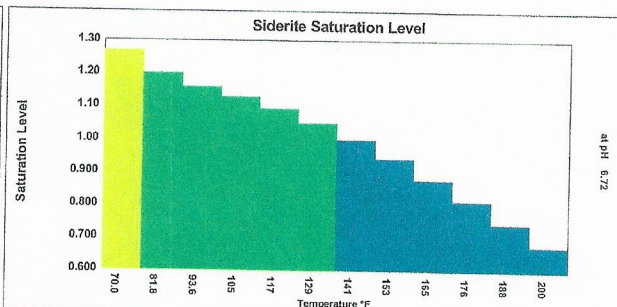
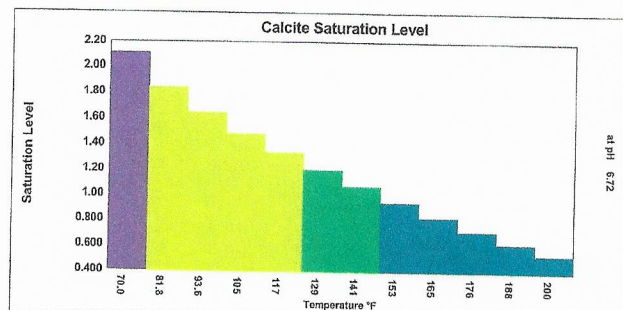
Sample Date: 05-03-2019

Report Date: 05-10-2019

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃		Anhydrite CaSO ₄		Gypsum CaSO ₄ *2H ₂ O		Barite BaSO ₄		Celestite SrSO ₄		Siderite FeCO ₃		Mackawenite FeS		CO ₂ (mpy)	pCO ₂ (atm)
70.00	1.00	2.11	0.00563	0.112	-107.19	0.139	-94.93	0.203	-2.20	0.0780	-156.54	1.26	0.00259	1.73	0.0989	0.0130	0.0306
81.82	1.36	1.84	0.00392	0.109	-105.23	0.127	-99.63	0.146	-3.13	0.0740	-157.61	1.20	0.00164	1.15	0.0277	0.0472	0.0361
93.64	1.73	1.64	0.00279	0.109	-100.13	0.118	-103.32	0.109	-4.19	0.0715	-156.35	1.16	0.00112	0.809	-0.0468	0.0939	0.0417
105.45	2.09	1.48	0.00196	0.112	-92.61	0.113	-103.88	0.0834	-5.33	0.0700	-153.82	1.13	< 0.001	0.593	-0.126	0.166	0.0472
117.27	2.45	1.34	0.00128	0.118	-83.44	0.118	-94.83	0.0648	-6.60	0.0685	-151.47	1.09	< 0.001	0.442	-0.214	0.216	0.0528
129.09	2.82	1.20	< 0.001	0.128	-73.37	0.123	-87.25	0.0507	-8.02	0.0669	-149.76	1.05	< 0.001	0.330	-0.314	0.262	0.0583
140.91	3.18	1.07	< 0.001	0.142	-63.04	0.127	-80.91	0.0400	-9.60	0.0653	-148.67	0.998	> -0.001	0.248	-0.428	0.303	0.0639
152.73	3.55	0.942	> -0.001	0.159	-52.96	0.131	-75.59	0.0317	-11.34	0.0635	-148.17	0.941	> -0.001	0.187	-0.557	0.360	0.0694
164.55	3.91	0.826	> -0.001	0.183	-43.50	0.134	-71.14	0.0253	-13.25	0.0616	-148.23	0.878	> -0.001	0.140	-0.702	0.401	0.0750
176.36	4.27	0.719	> -0.001	0.213	-34.90	0.137	-67.43	0.0202	-15.34	0.0597	-148.86	0.812	> -0.001	0.105	-0.865	0.428	0.0806
188.18	4.64	0.622	-0.00114	0.253	-27.29	0.140	-64.37	0.0163	-17.61	0.0578	-150.05	0.744	> -0.001	0.0793	-1.05	0.225	0.0861
200.00	5.00	0.533	-0.00138	0.304	-20.70	0.142	-61.88	0.0132	-20.08	0.0559	-151.82	0.676	> -0.001	0.0595	-1.25	0.151	0.0917
		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels			Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. $\{Ca\}\{CO_3\}/K_{sp}$. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.



Imperative Water Analysis Report

IMPERATIVE
CHEMICAL PARTNERS

SYSTEM IDENTIFICATION

Company: Foundation Energy Management, LLC Hobbs
Location: Sharbro 8
Sample Source: Wellhead
Account Rep: Mike Gomez

WATER CHEMISTRY

CATIONS

Calcium(as Ca) 22150
Magnesium(as Mg) 3786
Barium(as Ba) 1.33
Strontium(as Sr) 821.00
Sodium(as Na) 76639
Potassium(as K) 2487
Iron(as Fe) 13.55
Manganese(as Mn) 7.97

ANIONS

Chloride(as Cl) 175000
Sulfate(as SO₄) 147.00
Dissolved CO₂(as CO₂) 850.00
Bicarbonate(as HCO₃) 73.20
H₂S (as H₂S) 5.10
Boron(as B) 49.57

PARAMETERS

Temperature(°F) 77.00
Sample pH 6.64
Conductivity 544270
T.D.S. 263591
Resistivity 1.84
Sp.Gr.(g/mL) 1.20

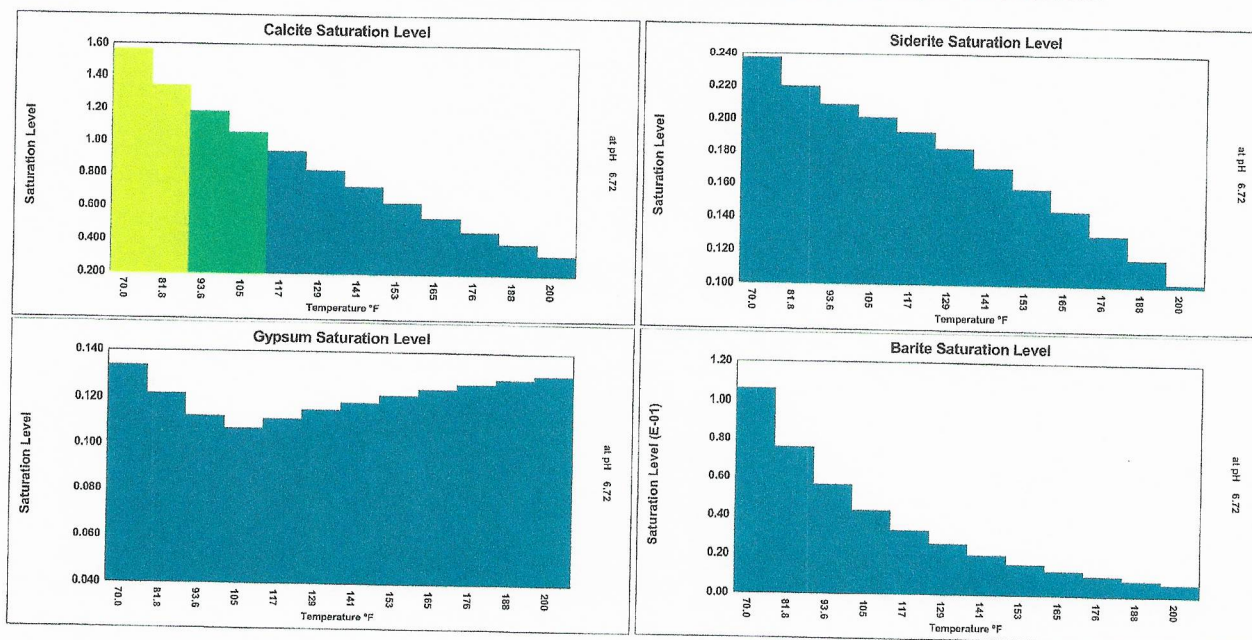
Sample ID#: W-8530

Sample Date: 05-03-2019
Report Date: 05-10-2019

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃		Anhydrite CaSO ₄		Gypsum CaSO ₄ *2H ₂ O		Barite BaSO ₄		Celestite SrSO ₄		Siderite FeCO ₃		Mackawenite FeS		CO ₂ (mpy)	pCO ₂ (atm)
70.00	1.00	1.57	0.00128	0.111	-51.95	0.133	-47.62	0.106	-4.50	0.0429	-153.69	0.237	-0.0132	2.91	0.362	0.0233	0.0184
81.82	1.36	1.34	< 0.001	0.107	-51.04	0.122	-50.01	0.0759	-5.87	0.0404	-154.51	0.220	-0.0114	1.89	0.228	0.0319	0.0217
93.64	1.73	1.18	< 0.001	0.107	-48.60	0.112	-51.90	0.0561	-7.31	0.0389	-153.07	0.209	-0.00993	1.31	0.101	0.0902	0.0250
105.45	2.09	1.05	< 0.001	0.109	-44.98	0.107	-52.21	0.0428	-8.77	0.0378	-150.40	0.201	-0.00870	0.945	-0.0224	0.181	0.0284
117.27	2.45	0.937	>-0.001	0.115	-40.56	0.111	-47.71	0.0331	-10.33	0.0369	-147.94	0.192	-0.00770	0.693	-0.152	0.212	0.0317
129.09	2.82	0.827	>-0.001	0.124	-35.70	0.115	-43.95	0.0258	-12.01	0.0359	-146.14	0.182	-0.00689	0.511	-0.293	0.228	0.0350
140.91	3.18	0.725	>-0.001	0.136	-30.71	0.119	-40.80	0.0202	-13.83	0.0348	-144.96	0.171	-0.00623	0.377	-0.447	0.237	0.0384
152.73	3.55	0.628	>-0.001	0.153	-25.84	0.122	-38.16	0.0160	-15.80	0.0337	-144.39	0.158	-0.00569	0.278	-0.616	0.272	0.0417
164.55	3.91	0.539	>-0.001	0.175	-21.27	0.124	-35.95	0.0127	-17.92	0.0326	-144.39	0.144	-0.00524	0.204	-0.802	0.304	0.0451
176.36	4.27	0.457	>-0.001	0.204	-17.12	0.127	-34.12	0.0102	-20.22	0.0315	-144.97	0.130	-0.00486	0.150	-1.01	0.326	0.0484
188.18	4.64	0.384	>-0.001	0.241	-13.44	0.129	-32.61	0.00816	-22.71	0.0304	-146.13	0.116	-0.00455	0.110	-1.24	0.170	0.0517
200.00	5.00	0.319	>-0.001	0.288	-10.26	0.130	-31.39	0.00659	-25.41	0.0293	-147.88	0.102	-0.00429	0.0799	-1.49	0.113	0.0551
		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels			

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.



Imperative Water Analysis Report

IMPERATIVE
CHEMICAL PARTNERS

SYSTEM IDENTIFICATION

Company: Foundation Energy Management LLC - Hobbs
Location: Sharbro 10
Sample Source: Wellhead
Account Rep: Mike Gomez

WATER CHEMISTRY

CATIONS

Calcium(as Ca) 16890
Magnesium(as Mg) 2928
Barium(as Ba) 1.89
Strontium(as Sr) 996.70
Sodium(as Na) 72095
Potassium(as K) 1512
Iron(as Fe) 15.05
Manganese(as Mn) 5.49

ANIONS

Chloride(as Cl) 174000
Sulfate(as SO₄) 151.00
Dissolved CO₂(as CO₂) 480.00
Bicarbonate(as HCO₃) 97.60
H₂S (as H₂S) 3.40
Boron(as B) 31.89

PARAMETERS

Temperature(°F) 77.00
Sample pH 5.56
Conductivity 472474
T.D.S. 253742
Resistivity 2.12
Sp.Gr.(g/mL) 1.20

Sample ID#: W-10386

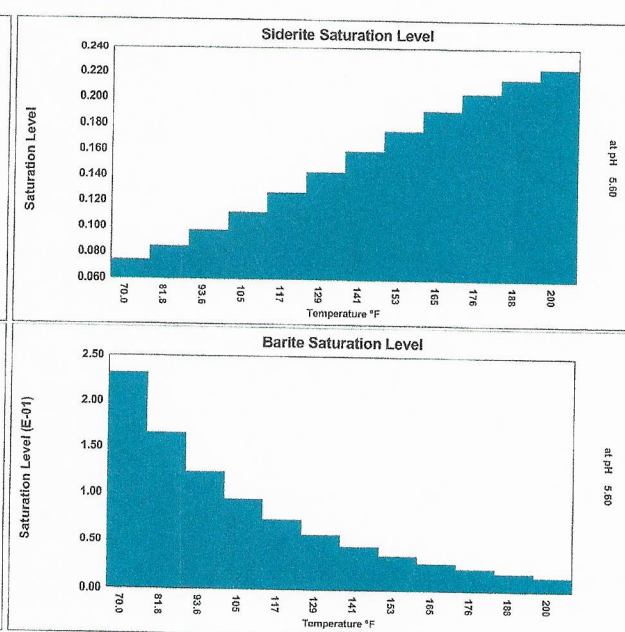
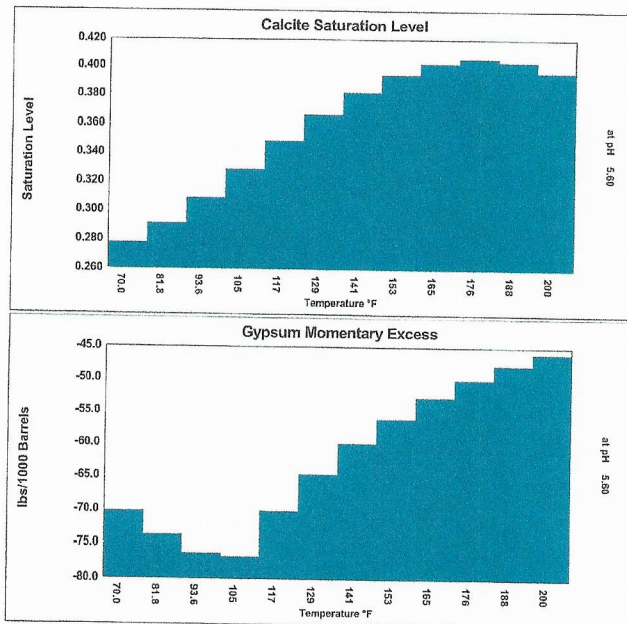
Sample Date: 06-20-2019

Report Date: 06-27-2019

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃		Anhydrite CaSO ₄		Gypsum CaSO ₄ *2H ₂ O		Barite BaSO ₄		Celestite SrSO ₄		Siderite FeCO ₃		Mackawenite FeS		CO ₂ (mpy)	pCO ₂ (atm)
70.00	1.00	0.277	-0.00257	0.106	-78.36	0.130	-70.25	0.231	-2.97	0.0795	-122.65	0.0741	-0.0143	0.0237	-1.37	0.472	0.0739
81.82	1.36	0.291	-0.00232	0.103	-76.94	0.119	-73.71	0.166	-4.18	0.0752	-123.55	0.0843	-0.0120	0.0210	-1.53	0.720	0.0873
93.64	1.73	0.308	-0.00210	0.103	-73.24	0.110	-76.43	0.123	-5.48	0.0725	-122.45	0.0967	-0.0101	0.0192	-1.67	1.01	0.101
105.45	2.09	0.328	-0.00191	0.105	-67.78	0.105	-76.85	0.0938	-6.84	0.0707	-120.27	0.111	-0.00865	0.0180	-1.80	1.31	0.114
117.27	2.45	0.348	-0.00174	0.111	-61.12	0.110	-70.21	0.0728	-8.30	0.0691	-118.25	0.127	-0.00743	0.0168	-1.93	1.42	0.128
129.09	2.82	0.366	-0.00161	0.120	-53.80	0.114	-64.65	0.0569	-9.90	0.0674	-116.79	0.143	-0.00644	0.0157	-2.07	1.50	0.141
140.91	3.18	0.382	-0.00149	0.132	-46.29	0.117	-60.00	0.0447	-11.64	0.0656	-115.86	0.159	-0.00563	0.0145	-2.21	1.57	0.154
152.73	3.55	0.394	-0.00140	0.149	-38.96	0.121	-56.10	0.0354	-13.54	0.0637	-115.43	0.175	-0.00496	0.0133	-2.37	1.61	0.168
164.55	3.91	0.402	-0.00134	0.170	-32.09	0.124	-52.84	0.0282	-15.59	0.0617	-115.49	0.191	-0.00441	0.0121	-2.54	1.65	0.181
176.36	4.27	0.405	-0.00129	0.198	-25.84	0.126	-50.12	0.0226	-17.81	0.0598	-116.03	0.204	-0.00396	0.0108	-2.73	1.65	0.195
188.18	4.64	0.403	-0.00126	0.235	-20.31	0.128	-47.88	0.0182	-20.21	0.0578	-117.06	0.215	-0.00359	0.00962	-2.93	0.936	0.208
200.00	5.00	0.396	-0.00125	0.282	-15.52	0.130	-46.05	0.0147	-22.82	0.0558	-118.58	0.224	-0.00330	0.00845	-3.16	0.624	0.222
		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels		Lbs per xSAT 1000 Barrels			

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.



C108-Item VII #5
Disposal Zone Formation Water Analysis
Tomcat 15 Federal #2
Delaware Bell Canyon Zone

North Permian Basin Region
P.O. Box 740
Sundown, TX 79372-0740
(806) 229-8121
Lab Team Leader - Sheila Hernandez
(432) 495-7240

Water Analysis Report by Baker Petrolite

Company:	DEVON ENERGY CORPORATION	Sales RDT:	44212
Region:	PERMIAN BASIN	Account Manager:	WAYNE PETERSON (505) 910-9389
Area:	ARTESIA, NM	Sample #:	437125
Lease/Platform:	TOM CAT '15' FEDERAL	Analysis ID #:	82330
Entity (or well #):	2	Analysis Cost:	\$80.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary		Analysis of Sample 437125 @ 75 °F					
Sampling Date:	05/16/08	Anions	mg/l	meq/l	Cations	mg/l	meq/l
Analysis Date:	05/27/08	Chloride:	105918.0	2987.56	Sodium:	51117.9	2223.5
Analyst:	KIMBERLY POOLE	Bicarbonate:	73.0	1.2	Magnesium:	2020.0	166.17
TDS (mg/l or g/m3):	172866.9	Carbonate:	0.0	0.	Calcium:	11404.0	569.06
Density (g/cm3, tonne/m3):	1.121	Sulfate:	618.0	12.87	Strontium:	631.0	14.4
Anion/Cation Ratio:	1	Phosphate:			Barium:	11.0	0.16
		Borate:			Iron:	64.0	2.31
		Silicate:			Potassium:	993.0	25.4
Carbon Dioxide:	350 PPM	Hydrogen Sulfide:		0 PPM	Aluminum:		
Oxygen:		pH at time of sampling:		6	Chromium:		
Comments:		pH at time of analysis:			Copper:		
		pH used in Calculation:		6	Lead:		
					Manganese:	17.000	0.62
					Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO ₃		Gypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄		CO ₂ Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	-0.42	0.00	-0.27	0.00	-0.26	0.00	0.17	70.26	1.51	5.63	0.46
100	0	-0.33	0.00	-0.33	0.00	-0.26	0.00	0.15	63.44	1.32	5.63	0.57
120	0	-0.25	0.00	-0.38	0.00	-0.23	0.00	0.15	61.37	1.16	5.34	0.67
140	0	-0.15	0.00	-0.42	0.00	-0.17	0.00	0.15	62.85	1.01	5.34	0.77

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 five scales.
Note 3: The reported CO₂ pressure is actually the calculated CO₂ fugacity. It is usually nearly the same as the CO₂ partial pressure.