KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

Form U3C
June 2015
Form must be Typed
Form must be completed on a per well basis

ANNUAL REPORT OF PRESSURE MONITORING, FLUID INJECTION AND ENHANCED RECOVERY

Complete all blanks - add pages if needed. Copy to be retained for five (5) years after filing date.

OPERATOR: License # 33999
Name: Linn Operating, LLC
Address 1: 600 TRAVIS STE 1400
Address 2:
City: HOUSTON State: TX Zip: 77002 + 3018
Contact Person: Daniel Busch
Phone: (281) 840-4234
Lease Name: BECKER
Well Number: 1

API No.: 15-175-00488-00-01
Permit No: D27455.0
Reporting Year: 2017
(January 1 to December 31)

NE (Q/Q/Q/Q) - SW - SW - SW Sec. 25 Twp. 31 S. R. 33 ☐ E ☑ W
2770 feet from ☐ N / ☑ S Line of Section
2487 feet from ☑ E / ☐ W Line of Section
County: Seward

I. Injection Fluid:

Type *(Pick one)*: ☐ Fresh Water ☐ Treated Brine ☑ Untreated Brine ☐ Water/Brine
Source: ☑ Produced Water ☐ Other *(Attach list)*
Quality: Total Dissolved Solids: _____ mg/l Specific Gravity: _____ Additives: _____
(Attach water analysis, if available)

II. Well Data:

Maximum Authorized Injection Pressure: _____ psi Injection Zone: Glorietta
Maximum Authorized Injection Rate: _____ barrels per day
Total Number of Enhanced Recovery Injection Wells Covered by this Permit: _____ *(Include TA's)*

III.

Month:	Total Fluid Injected BBL	Maximum Fluid Pressure	Total Gas Injected MCF	Maximum Gas Pressure	# Days of Injection
January	1178	0	0		31
February	1064	0	0		28
March	1178	0	0		31
April	1140	0	0		30
May	1178	0	0		31
June	1140	0	0		30
July	1178	0	0		31
August	0		0		
September	0		0		
October	0		0		
November	0		0		
December	0		0		
TOTAL	8056		0		

Submitted Electronically

JACAM LABORATORIES

DownHole R_x

WATER CHEMISTRY

LINN OPERATING
JASON URWIN
SEWARD KS

BECKER D SWDW 1
STOCK TANK

Report Date: 03-08-2017
Sample #: 3076

Sampled: 03-08-2017
at 0000

Sample ID: 147887

CATIONS		ANIONS	
Calcium (as Ca)	9230	Chloride (as Cl)	126600
Magnesium (as Mg)	3519	Sulfate (as SO_4)	1575
Barium (as Ba)	0.204	Bromine (as Br)	0.00
Strontium (as Sr)	237.30	Dissolved CO_2 (as CO_2)	140.00
Sodium (as Na)	57171	Bicarbonate (as HCO_3)	35.00
Potassium (as K)	771.40	Carbonate (as CO_3)	0.00
Lithium (as Li)	15.27	Oxalic acid (as C_2O_4)	0.00
Ammonia (as NH_3)	0.00	Silica (as SiO_2)	0.00
Aluminum (as Al)	1.12	Phosphate(as PO_4)	0.00
Iron (as Fe)	0.0510	H_2S (as H_2S)	5.00
Manganese (as Mn)	0.0120	Fluoride (as F)	0.00
Zinc (as Zn)	0.0820	Nitrate (as NO_3)	0.00
Lead (as Pb)	0.00	Boron (as B)	25.55

PARAMETERS

Calculated T.D.S.	191880
Molar Conductivity	316526
Resistivity	3.16
Sp.Gr.(g/mL)	1.14
Pressure(atm)	1.00
pCO_2(atm)	< 0.001
pH_2S(atm)	0.00347
Temperature (^oF)	60.00
pH	7.50

COMMENTS

SEWARD KS

JACAM LABORATORIES
205 S. Broadway · P.O. Box 96 · Sterling, KS 67579-0096

JACAM LABORATORIES

DownHole R_x

DEPOSITION POTENTIAL INDICATORS

LINN OPERATING
JASON URWIN
SEWARD KS

BECKER D SWDW 1
STOCK TANK

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SATURATION LEVEL	
Calcite ($CaCO_3$)	0.845
Aragonite ($CaCO_3$)	0.745
Witherite ($BaCO_3$)	< 0.001
Strontianite ($SrCO_3$)	0.0237
Calcium oxalate (CaC_2O_4)	0.00
Magnesite ($MgCO_3$)	0.327
Anhydrite ($CaSO_4$)	0.791
Gypsum ($CaSO_4*2H_2O$)	1.10
Barite ($BaSO_4$)	0.750
Celestite ($SrSO_4$)	0.448
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 ($Fe(OH)_3$)	< 0.001
Strengite ($FePO_4*2H_2O$)	0.00
Siderite ($FeCO_3$)	0.00216
Halite (NaCl)	0.150
Thenardite ($Na2SO_4$)	< 0.001
Iron sulfide (FeS)	0.115

MOMENTARY EXCESS (Lbs/1000 Barrels)	
Calcite ($CaCO_3$)	-0.00164
Aragonite ($CaCO_3$)	-0.00305
Witherite ($BaCO_3$)	-26.48
Strontianite ($SrCO_3$)	-0.540
Calcium oxalate (CaC_2O_4)	-0.00452
Magnesite ($MgCO_3$)	-0.0155
Anhydrite ($CaSO_4$)	-43.28
Gypsum ($CaSO_4*2H_2O$)	16.62
Barite ($BaSO_4$)	-0.0403
Celestite ($SrSO_4$)	-97.23
Fluorite (CaF_2)	-2.12
Calcium phosphate	>-0.001
Hydroxyapatite	-259.82
Silica (SiO_2)	-24.13
Brucite ($Mg(OH)_2$)	0.00472
Magnesium silicate	-83.11
Iron hydroxide ($Fe(OH)_3$)	< 0.001
Strengite ($FePO_4*2H_2O$)	>-0.001
Siderite ($FeCO_3$)	-0.395
Halite (NaCl)	-91029
Thenardite ($Na2SO_4$)	-86755
Iron sulfide (FeS)	-0.0316

SIMPLE INDICES	
Langelier	0.767
Ryznar	5.97
Puckorius	7.22
Larson-Skold Index	12518
Stiff Davis Index	0.505
Oddo-Tomson	-0.383

BOUND IONS	TOTAL	FREE
Calcium	9230	8972
Barium	0.204	0.204
Carbonate	2.18	0.0154
Phosphate	0.00	0.00
Sulfate	1575	338.69

OPERATING CONDITIONS

Temperature (^oF)	60.00
Time(secs)	0.00

JACAM LABORATORIES
205 S. Broadway · P.O. Box 96 · Sterling, KS 67579-0096

DownHole SAT™ Water Analysis Report

JACAM LABORATORIES

SYSTEM IDENTIFICATION

LINN OPERATING
BECKER D SWDW 1
JASON URWIN
STOCK TANK
SEWARD KS

Sample ID#: 3076
ID: 147887
Report Date: 03-08-2017
Sample Date: 03-08-2017
at 0000

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	9230
Magnesium(as Mg)	3519
Barium(as Ba)	0.204
Strontium(as Sr)	237.30
Sodium(as Na)	57171
Potassium(as K)	771.40
Lithium(as Li)	15.27
Iron(as Fe)	0.0510
Field Iron(as Fe)	0.00
Ammonia(as NH_3)	0.00
Aluminum(as Al)	1.12
Manganese(as Mn)	0.0120
Zinc(as Zn)	0.0820
Lead(as Pb)	0.00
Sample pH	7.50
Conductivity:	316526

ANIONS

Chloride(as Cl)	126600
Sulfate(as SO_4)	1575
Bromine(as Br)	0.00
Dissolved CO_2(as CO_2)	140.00
Bicarbonate(as HCO_3)	35.00
Carbonate(as CO_3)	0.00
Silica(as SiO_2)	0.00
Phosphate(as PO_4)	0.00
H_2S (as H_2S)	5.00
Fluoride(as F)	0.00
Nitrate(as NO_3)	0.00
Boron(as B)	25.55

PARAMETERS

Temperature(°F)	60.00
T.D.S.	191880
Resistivity:	3.16

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite $CaCO_3$		Anhydrite $CaSO_4$		Gypsum $CaSO_4*2H_2O$		Barite $BaSO_4$		Celestite $SrSO_4$		Siderite $FeCO_3$		Mackawenite FeS		CO_2 (mpy)	pCO_2 (atm)
50.00	0.00	0.716	-0.00326	0.858	-28.60	1.21	34.47	1.05	0.00614	0.498	-84.07	0.00170	-0.430	0.618	-0.00266	0.0228	< 0.001
65.45	0.00	0.912	>-0.001	0.765	-48.95	1.04	7.68	0.630	-0.0709	0.428	-102.43	0.00242	-0.378	0.472	-0.00470	0.0428	< 0.001
80.91	0.00	1.07	< 0.001	0.722	-56.65	0.920	-14.65	0.401	-0.180	0.392	-111.67	0.00317	-0.336	0.367	-0.00709	0.0101	< 0.001
96.36	0.00	1.16	0.00134	0.717	-53.77	0.826	-32.69	0.270	-0.326	0.371	-115.67	0.00379	-0.302	0.290	-0.00981	0.0125	< 0.001
111.82	0.00	1.17	0.00127	0.746	-43.20	0.812	-33.49	0.190	-0.514	0.357	-117.26	0.00418	-0.274	0.232	-0.0129	0.0130	< 0.001
127.27	0.00	1.11	< 0.001	0.810	-28.00	0.845	-24.78	0.136	-0.765	0.342	-119.23	0.00429	-0.251	0.188	-0.0162	0.0114	< 0.001
142.73	0.00	0.995	>-0.001	0.912	-10.82	0.873	-18.43	0.0984	-1.10	0.327	-121.75	0.00416	-0.232	0.153	-0.0198	0.00987	< 0.001
158.18	0.00	0.859	>-0.001	1.06	6.27	0.897	-13.84	0.0720	-1.54	0.312	-124.79	0.00382	-0.216	0.125	-0.0237	0.0103	< 0.001
173.64	0.00	0.719	-0.00165	1.28	21.96	0.916	-10.52	0.0533	-2.12	0.297	-128.33	0.00336	-0.203	0.102	-0.0279	0.0106	< 0.001
189.09	0.00	0.590	-0.00233	1.58	35.54	0.931	-8.15	0.0399	-2.86	0.282	-132.38	0.00285	-0.192	0.0828	-0.0324	0.00536	< 0.001
204.55	0.00	0.477	-0.00290	2.00	46.80	0.942	-6.50	0.0301	-3.80	0.268	-136.96	0.00233	-0.183	0.0662	-0.0373	0.00449	< 0.001
220.00	0.171	0.371	-0.00355	2.58	57.18	0.943	-6.32	0.0228	-5.02	0.253	-145.29	0.00180	-0.179	0.0585	-0.0374	0.00612	< 0.001
		xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels		

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. $\{Ca\}\{CO_3\}/K_{sp}$. pCO_2 (atm) is the partial pressure of CO_2 in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.