KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

1294601

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, Inc.
Address 1: 600 TRAVIS STE 5100
Address 2:
City: HOUSTON State: TX Zip: 77002 + 3018
Contact Person: Shawn Hildreth
Phone: (281) 840-4234
Lease Name: EUBANK (LUCAS C)
Well Number: 1

API No.: 15-081-10110-00-01
Permit No: D09921.0
Reporting Year: 2015
(January 1 to December 31)

(Q/Q/Q/Q) NW - NW - SE Sec. 21 Twp. 28 S. R. 34 ☐ E ☑ W
1980 feet from ☐ N / ☑ S Line of Section
1980 feet from ☑ E / ☐ W Line of Section
County: Haskell

I. Injection Fluid:

Type *(Pick one)*: ☐ Fresh Water ☐ Treated Brine ☑ Untreated Brine ☐ Water/Brine
Source: ☑ Produced Water ☐ Other *(Attach list)*
Quality: Total Dissolved Solids: 182742 mg/l Specific Gravity: 1.13 Additives:
(Attach water analysis, if available)

II. Well Data:

Maximum Authorized Injection Pressure: 150 psi Injection Zone: GLORIETTA
Maximum Authorized Injection Rate: 2000 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	14750	0	0		31
February	14490	0	0		28
March	12250	0	0		31
April	11840	0	0		30
May	210	0	0		31
June	3250	0	0		30
July	11060	0	0		31
August	6580	0	0		31
September	9360	0	0		30
October	15500	0	0		31
November	17030	0	0		30
December	15500	0	0		31
TOTAL	131820		0		

Submitted Electronically

JACAM LABORATORIES

DownHole R_X

WATER CHEMISTRY

LINN OPERATING
MICHAEL BELLOMY
HASKELL KS

LUCAS SWD
FLOWLINE

Report Date: 01-26-2016
Sample #: 3076

Sampled: 01-18-2016
at 0000

Sample ID: 117608

CATIONS		ANIONS	
Calcium (as Ca)	7418	Chloride (as Cl)	119800
Magnesium (as Mg)	2238	Sulfate (as SO_4)	1475
Barium (as Ba)	0.836	Bromine (as Br)	0.00
Strontium (as Sr)	152.60	Dissolved CO_2 (as CO_2)	180.00
Sodium (as Na)	57892	Bicarbonate (as HCO_3)	42.70
Potassium (as K)	536.90	Carbonate (as CO_3)	0.00
Lithium (as Li)	10.36	Oxalic acid (as C_2O_4)	0.00
Ammonia (as NH_3)	0.00	Silica (as SiO_2)	0.00
Aluminum (as Al)	0.00	Phosphate(as PO_4)	0.00
Iron (as Fe)	4.75	H_2S (as H_2S)	0.500
Manganese (as Mn)	0.0120	Fluoride (as F)	0.00
Zinc (as Zn)	1.49	Nitrate (as NO_3)	0.00
Lead (as Pb)	0.00	Boron (as B)	17.21

PARAMETERS

Calculated T.D.S.	182742
Molar Conductivity	297668
Resistivity	3.36
Sp.Gr.(g/mL)	1.13
Pressure(atm)	1.00
pCO_2(atm)	0.00680
pH_2S(atm)	< 0.001
Temperature (^oF)	43.00
pH	6.47

COMMENTS

HASKELL KS

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

JACAM LABORATORIES

DownHole R_X

DEPOSITION POTENTIAL INDICATORS

LINN OPERATING
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HASKELL KS

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FLOWLINE

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SATURATION LEVEL	
Calcite ($CaCO_3$)	0.141
Aragonite ($CaCO_3$)	0.126
Witherite ($BaCO_3$)	< 0.001
Strontianite ($SrCO_3$)	0.00457
Calcium oxalate (CaC_2O_4)	0.00
Magnesite ($MgCO_3$)	0.0355
Anhydrite ($CaSO_4$)	0.819
Gypsum ($CaSO_4*2H_2O$)	1.17
Barite ($BaSO_4$)	6.87
Celestite ($SrSO_4$)	0.436
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 ($FeCO_3$)	0.0407
Halite (NaCl)	0.148
Thenardite ($Na2SO_4$)	< 0.001
Iron sulfide (FeS)	0.0335

MOMENTARY EXCESS (Lbs/1000 Barrels)	
Calcite ($CaCO_3$)	-0.0140
Aragonite ($CaCO_3$)	-0.0160
Witherite ($BaCO_3$)	-23.23
Strontianite ($SrCO_3$)	-0.733
Calcium oxalate (CaC_2O_4)	-0.00579
Magnesite ($MgCO_3$)	-0.0527
Anhydrite ($CaSO_4$)	-45.37
Gypsum ($CaSO_4*2H_2O$)	34.42
Barite ($BaSO_4$)	0.423
Celestite ($SrSO_4$)	-85.57
Fluorite (CaF_2)	-2.30
Calcium phosphate	>-0.001
Hydroxyapatite	-241.57
Silica (SiO_2)	-18.76
Brucite ($Mg(OH)_2$)	< 0.001
Magnesium silicate	-76.12
Iron hydroxide ($Fe(OH)_3$)	< 0.001
Strengite ($FePO_4*2H_2O$)	>-0.001
Siderite ($FeCO_3$)	-0.0616
Halite (NaCl)	-90395
Thenardite ($Na2SO_4$)	-85428
Iron sulfide (FeS)	-0.459

SIMPLE INDICES	
Langelier	-0.280
Ryznar	7.03
Puckorius	6.87
Larson-Skold Index	5673
Stiff Davis Index	-0.566
Oddo-Tomson	-1.43

BOUND IONS	TOTAL	FREE
Calcium	7418	7177
Barium	0.836	0.836
Carbonate	0.318	0.00396
Phosphate	0.00	0.00
Sulfate	1475	429.54

OPERATING CONDITIONS

Temperature (^oF)	43.00
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
LUCAS SWD
MICHAEL BELLOMY
FLOWLINE
HASKELL KS

Sample ID#: 3076
ID: 117608
Report Date: 01-26-2016
Sample Date: 01-18-2016
at 0000

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	7418
Magnesium(as Mg)	2238
Barium(as Ba)	0.836
Strontium(as Sr)	152.60
Sodium(as Na)	57892
Potassium(as K)	536.90
Lithium(as Li)	10.36
Iron(as Fe)	4.75
Field Iron(as Fe)	0.00
Ammonia(as NH_3)	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	0.0120
Zinc(as Zn)	1.49
Lead(as Pb)	0.00
Sample pH	6.47
Conductivity:	297668

ANIONS

Chloride(as Cl)	119800
Sulfate(as SO_4)	1475
Bromine(as Br)	0.00
Dissolved CO_2(as CO_2)	180.00
Bicarbonate(as HCO_3)	42.70
Carbonate(as CO_3)	0.00
Silica(as SiO_2)	0.00
Phosphate(as PO_4)	0.00
H_2S (as H_2S)	0.500
Fluoride(as F)	0.00
Nitrate(as NO_3)	0.00
Boron(as B)	17.21

PARAMETERS

Temperature(°F)	43.00
T.D.S.	182742
Resistivity:	3.36

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	0.165	-0.0128	0.766	-60.66	1.09	19.41	5.36	0.403	0.397	-96.70	0.0503	-0.0544	0.198	-0.357	0.0542	0.00680
65.45	0.00	0.225	-0.0105	0.692	-82.51	0.955	-10.09	3.25	0.342	0.346	-112.70	0.0770	-0.0418	0.179	-0.376	0.106	0.00680
80.91	0.00	0.293	-0.00858	0.661	-88.76	0.851	-34.56	2.09	0.258	0.321	-120.36	0.112	-0.0323	0.159	-0.396	0.0467	0.00680
96.36	0.00	0.364	-0.00698	0.665	-81.97	0.774	-54.15	1.43	0.148	0.307	-123.26	0.154	-0.0252	0.140	-0.418	0.0611	0.00680
111.82	0.00	0.433	-0.00570	0.700	-65.76	0.769	-52.29	1.02	0.00817	0.299	-124.01	0.202	-0.0198	0.123	-0.440	0.0641	0.00680
127.27	0.00	0.500	-0.00465	0.769	-43.94	0.810	-38.72	0.736	-0.177	0.290	-125.23	0.255	-0.0156	0.108	-0.463	0.0538	0.00680
142.73	0.00	0.558	-0.00385	0.875	-19.90	0.846	-28.59	0.538	-0.423	0.280	-127.10	0.310	-0.0124	0.0947	-0.486	0.0435	0.00680
158.18	0.00	0.599	-0.00330	1.03	3.76	0.877	-21.01	0.398	-0.746	0.270	-129.58	0.362	-0.0100	0.0834	-0.510	0.0448	0.00680
173.64	0.00	0.617	-0.00301	1.25	25.35	0.904	-15.37	0.297	-1.16	0.259	-132.64	0.402	-0.00832	0.0734	-0.535	0.0459	0.00680
189.09	0.00	0.609	-0.00297	1.55	43.95	0.925	-11.24	0.224	-1.70	0.248	-136.30	0.427	-0.00717	0.0644	-0.561	0.0230	0.00680
204.55	0.00	0.577	-0.00313	1.98	59.35	0.942	-8.25	0.170	-2.39	0.237	-140.54	0.432	-0.00647	0.0563	-0.588	0.0192	0.00680
220.00	0.171	0.513	-0.00366	2.56	73.07	0.946	-7.62	0.129	-3.28	0.224	-148.40	0.409	-0.00641	0.0552	-0.617	0.0261	0.00796
		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.