



**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 # \_\_\_\_\_  
Name: \_\_\_\_\_  
Address 1: \_\_\_\_\_  
Address 2: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ + \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Phone: ( \_\_\_\_\_ ) \_\_\_\_\_  
Lease Name: \_\_\_\_\_  
Well Number: \_\_\_\_\_

API No.: \_\_\_\_\_  
Permit No.: \_\_\_\_\_  
Reporting Year: \_\_\_\_\_  
(January 1 to December 31)  
\_\_\_\_ - \_\_\_\_ - \_\_\_\_ - \_\_\_\_ Sec. \_\_\_\_ Twp. \_\_\_\_ S. R. \_\_\_\_  E  W  
(a/a/a/a)  
\_\_\_\_\_ feet from  N /  S Line of Section  
\_\_\_\_\_ feet from  E /  W Line of Section  
County: \_\_\_\_\_

**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: \_\_\_\_\_  
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	_____	_____	_____	_____	_____
	February	_____	_____	_____	_____	_____
	March	_____	_____	_____	_____	_____
	April	_____	_____	_____	_____	_____
	May	_____	_____	_____	_____	_____
	June	_____	_____	_____	_____	_____
	July	_____	_____	_____	_____	_____
	August	_____	_____	_____	_____	_____
	September	_____	_____	_____	_____	_____
	October	_____	_____	_____	_____	_____
	November	_____	_____	_____	_____	_____
	December	_____	_____	_____	_____	_____
	<b>TOTAL</b>	_____	_____	_____	_____	_____



LINN OPERATING  
MICHAEL BELLOMY  
SUMNER KS

CLAGGETT SWD  
FLOWLINE

Report Date: 01-22-2016      Sampled: 01-13-2016  
Sample #: 3076                                  at 0000  
  
Sample ID: 117390

**CATIONS**

Calcium (as Ca)                         12720  
Magnesium (as Mg)                    3037  
Barium (as Ba)                         0.204  
Strontium (as Sr)                     258.40  
Sodium (as Na)                         65877  
Potassium (as K)                      631.50  
Lithium (as Li)                         10.53  
Ammonia (as NH<sub>3</sub>)                     0.00  
Aluminum (as Al)                      0.00  
Iron (as Fe)                             7.82  
Manganese (as Mn)                    0.0120  
Zinc (as Zn)                            0.997  
Lead (as Pb)                            0.00

**ANIONS**

Chloride (as Cl)                       149600  
Sulfate (as SO<sub>4</sub>)                     625.00  
Bromine (as Br)                        0.00  
Dissolved CO<sub>2</sub> (as CO<sub>2</sub>)            125.00  
Bicarbonate (as HCO<sub>3</sub>)             12.20  
Carbonate (as CO<sub>3</sub>)                   0.00  
Oxalic acid (as C<sub>2</sub>O<sub>4</sub>)               0.00  
Silica (as SiO<sub>2</sub>)                       0.00  
Phosphate(as PO<sub>4</sub>)                   0.00  
H<sub>2</sub>S (as H<sub>2</sub>S)                         0.500  
Fluoride (as F)                        0.00  
Nitrate (as NO<sub>3</sub>)                     0.00  
Boron (as B)                            2.67

**PARAMETERS**

Calculated T.D.S.                     221554  
Molar Conductivity                    398291  
Resistivity                             2.51  
Sp.Gr.(g/mL)                         1.16  
Pressure(atm)                         1.00  
pCO<sub>2</sub>(atm)                            0.00498  
pH<sub>2</sub>S(atm)                            < 0.001  
Temperature (°F)                     45.00  
pH                                        5.40

**COMMENTS**

SUMNER KS



LINN OPERATING  
MICHAEL BELLOMY  
SUMNER KS

Report Date: 01-22-2016 Sampled: 01-13-2016  
Sample #: 3076 at 0000

Sample ID: 117390

**SATURATION LEVEL**

Calcite (CaCO <sub>3</sub> )	0.00531
Aragonite (CaCO <sub>3</sub> )	0.00474
Witherite (BaCO <sub>3</sub> )	< 0.001
Strontianite (SrCO <sub>3</sub> )	< 0.001
Calcium oxalate (CaC <sub>2</sub> O <sub>4</sub> )	0.00
Magnesite (MgCO <sub>3</sub> )	0.00118
Anhydrite (CaSO <sub>4</sub> )	0.453
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	0.612
Barite (BaSO <sub>4</sub> )	0.348
Celestite (SrSO <sub>4</sub> )	0.160
Fluorite (CaF <sub>2</sub> )	0.00
Calcium phosphate	0.00
Hydroxyapatite	0.00
Silica (SiO <sub>2</sub> )	0.00
Brucite (Mg(OH) <sub>2</sub> )	< 0.001
Magnesium silicate	0.00
Iron hydroxide (Fe(OH) <sub>3</sub> )	< 0.001
Strengite (FePO <sub>4</sub> *2H <sub>2</sub> O)	0.00
Siderite (FeCO <sub>3</sub> )	0.00104
Halite (NaCl)	0.241
Thenardite (Na <sub>2</sub> SO <sub>4</sub> )	< 0.001
Iron sulfide (FeS)	< 0.001

**MOMENTARY EXCESS (Lbs/1000 Barrels)**

Calcite (CaCO <sub>3</sub> )	-0.00691
Aragonite (CaCO <sub>3</sub> )	-0.00774
Witherite (BaCO <sub>3</sub> )	-24.84
Strontianite (SrCO <sub>3</sub> )	-0.485
Calcium oxalate (CaC <sub>2</sub> O <sub>4</sub> )	-0.00252
Magnesite (MgCO <sub>3</sub> )	-0.0264
Anhydrite (CaSO <sub>4</sub> )	-67.61
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	-40.21
Barite (BaSO <sub>4</sub> )	-0.225
Celestite (SrSO <sub>4</sub> )	-172.11
Fluorite (CaF <sub>2</sub> )	-1.51
Calcium phosphate	>-0.001
Hydroxyapatite	-216.36
Silica (SiO <sub>2</sub> )	-18.11
Brucite (Mg(OH) <sub>2</sub> )	< 0.001
Magnesium silicate	-71.52
Iron hydroxide (Fe(OH) <sub>3</sub> )	< 0.001
Strengite (FePO <sub>4</sub> *2H <sub>2</sub> O)	>-0.001
Siderite (FeCO <sub>3</sub> )	-0.0408
Halite (NaCl)	-68381
Thenardite (Na <sub>2</sub> SO <sub>4</sub> )	-88290
Iron sulfide (FeS)	-2.00

**SIMPLE INDICES**

Langelier	-1.52
Ryznar	8.44
Puckorius	8.05
Larson-Skold Index	24717
Stiff Davis Index	-1.61
Oddo-Tomson	-2.61

**BOUND IONS**

Calcium	12720	12586
Barium	0.204	0.204
Carbonate	0.0111	< 0.001
Phosphate	0.00	0.00
Sulfate	625.00	114.34

**TOTAL****FREE****OPERATING CONDITIONS**

Temperature (°F)	45.00
Time(secs)	0.00

# DownHole SAT™ Water Analysis Report



JACAM LABORATORIES

## SYSTEM IDENTIFICATION

LINN OPERATING  
CLAGGETT SWD  
MICHAEL BELLOWY  
FLOWLINE  
SUMNER KS

Sample ID#: 3076  
ID: 117390  
Report Date: 01-22-2016  
Sample Date: 01-13-2016  
at 0000

## WATER CHEMISTRY

### CATIONS

Calcium(as Ca)	12720
Magnesium(as Mg)	3037
Barium(as Ba)	0.204
Strontium(as Sr)	258.40
Sodium(as Na)	65877
Potassium(as K)	631.50
Lithium(as Li)	10.53
Iron(as Fe)	7.82
Field Iron(as Fe)	0.00
Ammonia(as NH <sub>3</sub> )	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	0.0120
Zinc(as Zn)	0.997
Lead(as Pb)	0.00

### ANIONS

Chloride(as Cl)	149600
Sulfate(as SO <sub>4</sub> )	625.00
Bromine(as Br)	0.00
Dissolved CO <sub>2</sub> (as CO <sub>2</sub> )	125.00
Bicarbonate(as HCO <sub>3</sub> )	12.20
Carbonate(as CO <sub>3</sub> )	0.00
Silica(as SiO <sub>2</sub> )	0.00
Phosphate(as PO <sub>4</sub> )	0.00
H <sub>2</sub> S (as H <sub>2</sub> S)	0.500
Fluoride(as F)	0.00
Nitrate(as NO <sub>3</sub> )	0.00
Boron(as B)	2.67

### PARAMETERS

Temperature(°F)	45.00
T.D.S.	221554
Conductivity:	398291
Sample pH	5.40
Resistivity:	2.51

## SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO <sub>3</sub>		Anhydrite CaSO <sub>4</sub>		Gypsum CaSO <sub>4</sub> *2H <sub>2</sub> O		Barite BaSO <sub>4</sub>		Celestite SrSO <sub>4</sub>		Siderite FeCO <sub>3</sub>		Mackawenite FeS		CO <sub>2</sub> (mpy)	pCO <sub>2</sub> (atm)
50.00	0.00	0.00590	-0.00661	0.431	-71.94	0.582	-44.54	0.291	-0.293	0.150	-179.34	0.00120	-0.0376	0.00290	-2.00	0.0920	0.00498
65.45	0.00	0.00794	-0.00583	0.386	-80.19	0.504	-56.43	0.175	-0.565	0.130	-192.93	0.00181	-0.0297	0.00286	-2.04	0.337	0.00498
80.91	0.00	0.0103	-0.00520	0.367	-81.02	0.446	-66.06	0.112	-0.945	0.120	-197.33	0.00262	-0.0238	0.00279	-2.08	0.139	0.00498
96.36	0.00	0.0130	-0.00470	0.367	-75.71	0.403	-73.54	0.0759	-1.44	0.114	-196.73	0.00364	-0.0195	0.00269	-2.12	0.182	0.00498
111.82	0.00	0.0158	-0.00430	0.384	-65.99	0.398	-70.27	0.0538	-2.06	0.110	-194.09	0.00488	-0.0162	0.00256	-2.17	0.201	0.00498
127.27	0.00	0.0189	-0.00398	0.419	-53.75	0.417	-61.23	0.0387	-2.87	0.106	-192.30	0.00641	-0.0137	0.00245	-2.22	0.193	0.00498
142.73	0.00	0.0223	-0.00372	0.474	-40.65	0.434	-54.21	0.0282	-3.92	0.102	-191.56	0.00825	-0.0118	0.00235	-2.27	0.179	0.00498
158.18	0.00	0.0259	-0.00351	0.556	-27.92	0.447	-48.74	0.0207	-5.24	0.0981	-191.82	0.0104	-0.0102	0.00226	-2.33	0.164	0.00498
173.64	0.00	0.0296	-0.00334	0.671	-16.39	0.459	-44.51	0.0154	-6.88	0.0938	-193.04	0.0129	-0.00901	0.00217	-2.40	0.148	0.00498
189.09	0.00	0.0332	-0.00322	0.833	-6.47	0.468	-41.25	0.0116	-8.88	0.0895	-195.23	0.0157	-0.00804	0.00208	-2.47	0.0637	0.00498
204.55	0.00	0.0366	-0.00313	1.06	1.74	0.475	-38.81	0.00877	-11.26	0.0853	-198.40	0.0185	-0.00728	0.00199	-2.55	0.0206	0.00498
220.00	0.171	0.0389	-0.00318	1.37	8.41	0.477	-38.58	0.00666	-14.23	0.0806	-207.18	0.0212	-0.00688	0.00213	-2.66	0.00	0.00583
		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<sub>3</sub>}/K<sub>sp}. pCO<sub>2</sub> (atm) is the partial pressure of CO<sub>2</sub> in the gas phase. Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.</sub>

