



**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

WILMARTH SWD 1  
FLOWLINE

Report Date: 01-22-2016    Sampled: 01-13-2016  
Sample #: 3076                      at 0000  
  
Sample ID: 117386

**SATURATION LEVEL**

Calcite (CaCO <sub>3</sub> )	0.00381
Aragonite (CaCO <sub>3</sub> )	0.00336
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> )	0.00101
Anhydrite (CaSO <sub>4</sub> )	0.423
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	0.554
Barite (BaSO <sub>4</sub> )	0.183
Celestite (SrSO <sub>4</sub> )	0.126
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> )	< 0.001
Halite (NaCl)	0.263
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> )	-0.00494
Aragonite (CaCO <sub>3</sub> )	-0.00560
Witherite (BaCO <sub>3</sub> )	-27.05
Strontianite (SrCO <sub>3</sub> )	-0.485
Calcium oxalate (CaC <sub>2</sub> O <sub>4</sub> )	-0.00208
Magnesite (MgCO <sub>3</sub> )	-0.0158
Anhydrite (CaSO <sub>4</sub> )	-61.51
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	-41.23
Barite (BaSO <sub>4</sub> )	-0.534
Celestite (SrSO <sub>4</sub> )	-192.22
Fluorite (CaF <sub>2</sub> )	-1.41
Calcium phosphate	>-0.001
Hydroxyapatite	-223.04
Silica (SiO <sub>2</sub> )	-21.52
Brucite (Mg(OH) <sub>2</sub> )	< 0.001
Magnesium silicate	-75.18
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> )	-0.117
Halite (NaCl)	-64785
Thenardite (Na <sub>2</sub> SO <sub>4</sub> )	-88560
Iron sulfide (FeS)	-2.19

**SIMPLE INDICES**

Langelier	-1.58
Ryznar	8.57
Puckorius	8.66
Larson-Skold Index	52119
Stiff Davis Index	-1.60
Oddo-Tomson	-2.63

**BOUND IONS**

Calcium	14330
Barium	0.204
Carbonate	0.00959
Phosphate	0.00
Sulfate	625.00

**TOTAL**

**FREE**

14196
0.204
< 0.001
0.00
91.91

**OPERATING CONDITIONS**

Temperature (°F)	58.00
Time(secs)	0.00

# DownHole SAT™ Water Analysis Report



JACAM LABORATORIES

## SYSTEM IDENTIFICATION

LINN OPERATING  
WILMARTH SWD 1  
MICHAEL BELLOWY  
FLOWLINE  
SUMNER KS

Sample ID#: 3076  
ID: 117386  
Report Date: 01-22-2016  
Sample Date: 01-13-2016  
at 0000

## WATER CHEMISTRY

### CATIONS

Calcium(as Ca)	14330
Magnesium(as Mg)	3482
Barium(as Ba)	0.204
Strontium(as Sr)	284.30
Sodium(as Na)	67611
Potassium(as K)	734.30
Lithium(as Li)	10.61
Iron(as Fe)	2.07
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)	1.67
Lead(as Pb)	0.00

### ANIONS

Chloride(as Cl)	157200
Sulfate(as SO <sub>4</sub> )	625.00
Bromine(as Br)	0.00
Dissolved CO <sub>2</sub> (as CO <sub>2</sub> )	115.00
Bicarbonate(as HCO <sub>3</sub> )	6.10
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)	9.06

### PARAMETERS

Temperature(°F)	58.00
T.D.S.	231722
Conductivity:	431971
Sample pH	5.42
Resistivity:	2.31

## 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)
		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		
50.00	0.00	0.00324	-0.00528	0.452	-57.03	0.599	-35.69	0.241	-0.378	0.137	-183.77	< 0.001	-0.132	< 0.001	-2.16	0.0699	0.00249
65.45	0.00	0.00437	-0.00466	0.403	-64.15	0.517	-45.95	0.144	-0.709	0.118	-197.28	< 0.001	-0.106	< 0.001	-2.19	0.255	0.00249
80.91	0.00	0.00565	-0.00416	0.381	-65.13	0.456	-54.30	0.0920	-1.17	0.108	-201.53	< 0.001	-0.0859	< 0.001	-2.23	0.0880	0.00249
96.36	0.00	0.00706	-0.00377	0.380	-60.98	0.411	-60.77	0.0621	-1.77	0.103	-200.73	< 0.001	-0.0710	< 0.001	-2.27	0.115	0.00249
111.82	0.00	0.00857	-0.00345	0.396	-53.18	0.405	-58.22	0.0438	-2.52	0.0989	-197.90	< 0.001	-0.0595	< 0.001	-2.31	0.127	0.00249
127.27	0.00	0.0102	-0.00320	0.431	-43.27	0.422	-50.80	0.0315	-3.50	0.0952	-195.95	< 0.001	-0.0507	< 0.001	-2.36	0.121	0.00249
142.73	0.00	0.0120	-0.00299	0.487	-32.61	0.438	-45.04	0.0228	-4.74	0.0913	-195.09	< 0.001	-0.0437	< 0.001	-2.41	0.112	0.00249
158.18	0.00	0.0140	-0.00283	0.569	-22.26	0.451	-40.58	0.0168	-6.29	0.0873	-195.25	0.00118	-0.0382	< 0.001	-2.46	0.102	0.00249
173.64	0.00	0.0159	-0.00270	0.686	-12.87	0.461	-37.12	0.0124	-8.19	0.0833	-196.42	0.00146	-0.0339	< 0.001	-2.52	0.0926	0.00249
189.09	0.00	0.0178	-0.00261	0.850	-4.78	0.470	-34.48	0.00931	-10.47	0.0794	-198.59	0.00176	-0.0304	< 0.001	-2.58	0.0395	0.00249
204.55	0.00	0.0195	-0.00254	1.08	1.90	0.476	-32.50	0.00704	-13.15	0.0755	-201.78	0.00208	-0.0276	< 0.001	-2.65	0.0115	0.00249
220.00	0.171	0.0207	-0.00259	1.39	7.38	0.477	-32.35	0.00534	-16.44	0.0712	-210.79	0.00237	-0.0262	< 0.001	-2.76	0.00	0.00292

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO<sub>3</sub>}/K<sub>sp</sub>. 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.

