



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	_____	_____	_____	_____	_____
	TOTAL	_____	_____	_____	_____	_____

LINN OPERATING
MICHAEL BELLOMY
SEWARD KSMICHAELS SWD
FLOWLINEReport Date: 01-26-2016 Sampled: 01-19-2016
Sample #: 3076 at 0000Sample ID: 117612

CATIONS

Calcium (as Ca)	9175
Magnesium (as Mg)	2604
Barium (as Ba)	0.888
Strontium (as Sr)	194.30
Sodium (as Na)	55903
Potassium (as K)	573.70
Lithium (as Li)	10.40
Ammonia (as NH ₃)	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	1.24
Manganese (as Mn)	0.0120
Zinc (as Zn)	1.15
Lead (as Pb)	0.00

ANIONS

Chloride (as Cl)	121200
Sulfate (as SO ₄)	1125
Bromine (as Br)	0.00
Dissolved CO ₂ (as CO ₂)	155.00
Bicarbonate (as HCO ₃)	36.60
Carbonate (as CO ₃)	0.00
Oxalic acid (as C ₂ O ₄)	0.00
Silica (as SiO ₂)	0.00
Phosphate(as PO ₄)	0.00
H ₂ S (as H ₂ S)	0.500
Fluoride (as F)	0.00
Nitrate (as NO ₃)	0.00
Boron (as B)	12.39

PARAMETERS

Calculated T.D.S.	184080
Molar Conductivity	300117
Resistivity	3.33
Sp.Gr.(g/mL)	1.13
Pressure(atm)	1.00
pCO ₂ (atm)	0.00871
pH ₂ S(atm)	< 0.001
Temperature (°F)	47.00
pH	6.17

COMMENTSSEWARD KS



LINN OPERATING
MICHAEL BELLOMY
SEWARD KS

MICHAELS SWD
FLOWLINE

Report Date: 01-26-2016 Sampled: 01-19-2016
Sample #: 3076 at 0000

Sample ID: 117612

SATURATION LEVEL

Calcite (CaCO ₃)	0.0782
Aragonite (CaCO ₃)	0.0697
Witherite (BaCO ₃)	< 0.001
Strontianite (SrCO ₃)	0.00233
Calcium oxalate (CaC ₂ O ₄)	0.00
Magnesite (MgCO ₃)	0.0195
Anhydrite (CaSO ₄)	0.669
Gypsum (CaSO ₄ *2H ₂ O)	0.957
Barite (BaSO ₄)	4.15
Celestite (SrSO ₄)	0.344
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 ₂ O)	0.00
Siderite (FeCO ₃)	0.00471
Halite (NaCl)	0.144
Thenardite (Na ₂ SO ₄)	< 0.001
Iron sulfide (FeS)	0.00264

MOMENTARY EXCESS (Lbs/1000 Barrels)

Calcite (CaCO ₃)	-0.0114
Aragonite (CaCO ₃)	-0.0130
Witherite (BaCO ₃)	-24.13
Strontianite (SrCO ₃)	-0.609
Calcium oxalate (CaC ₂ O ₄)	-0.00460
Magnesite (MgCO ₃)	-0.0412
Anhydrite (CaSO ₄)	-68.14
Gypsum (CaSO ₄ *2H ₂ O)	-7.13
Barite (BaSO ₄)	0.399
Celestite (SrSO ₄)	-114.77
Fluorite (CaF ₂)	-2.07
Calcium phosphate	>-0.001
Hydroxyapatite	-245.97
Silica (SiO ₂)	-20.04
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	-77.73
Iron hydroxide (Fe(OH) ₃)	< 0.001
Strengite (FePO ₄ *2H ₂ O)	>-0.001
Siderite (FeCO ₃)	-0.194
Halite (NaCl)	-91507
Thenardite (Na ₂ SO ₄)	-86093
Iron sulfide (FeS)	-0.872

SIMPLE INDICES

Langelier	-0.499
Ryznar	7.17
Puckorius	6.80
Larson-Skold Index	6580
Stiff Davis Index	-0.787
Oddo-Tomson	-1.65

BOUND IONS

Calcium	9175	8969
Barium	0.888	0.888
Carbonate	0.154	0.00167
Phosphate	0.00	0.00
Sulfate	1125	284.48

TOTAL

FREE

OPERATING CONDITIONS

Temperature (°F)	47.00
Time(secs)	0.00

DownHole SAT™ Water Analysis Report



JACAM LABORATORIES

SYSTEM IDENTIFICATION

LINN OPERATING
 MICHAELS SWD
 MICHAEL BELLOWY
 FLOWLINE
 SEWARD KS

Sample ID#: 3076
 ID: 117612
 Report Date: 01-26-2016
 Sample Date: 01-19-2016
 at 0000

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	9175
Magnesium(as Mg)	2604
Barium(as Ba)	0.888
Strontium(as Sr)	194.30
Sodium(as Na)	55903
Potassium(as K)	573.70
Lithium(as Li)	10.40
Iron(as Fe)	1.24
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)	1.15
Lead(as Pb)	0.00

ANIONS

Chloride(as Cl)	121200
Sulfate(as SO ₄)	1125
Bromine(as Br)	0.00
Dissolved CO ₂ (as CO ₂)	155.00
Bicarbonate(as HCO ₃)	36.60
Carbonate(as CO ₃)	0.00
Silica(as SiO ₂)	0.00
Phosphate(as PO ₄)	0.00
H ₂ S (as H ₂ S)	0.500
Fluoride(as F)	0.00
Nitrate(as NO ₃)	0.00
Boron(as B)	12.39

PARAMETERS

Temperature(°F)	47.00
Sample pH	6.17
T.D.S.	184080
Conductivity:	300117
Resistivity:	3.33

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)
50.00	0.00	0.0834	-0.0111	0.651	-72.82	0.929	-11.89	3.74	0.385	0.332	-119.25	0.00514	-0.186	0.0149	-0.822	0.0718	0.00871
65.45	0.00	0.113	-0.00946	0.586	-89.14	0.808	-34.06	2.26	0.293	0.288	-134.95	0.00784	-0.151	0.0140	-0.837	0.188	0.00871
80.91	0.00	0.148	-0.00813	0.558	-93.01	0.719	-52.35	1.45	0.163	0.267	-141.83	0.0114	-0.124	0.0130	-0.853	0.0897	0.00871
96.36	0.00	0.185	-0.00704	0.560	-86.50	0.652	-66.85	0.986	-0.00726	0.255	-143.76	0.0158	-0.103	0.0118	-0.871	0.117	0.00871
111.82	0.00	0.224	-0.00614	0.588	-72.52	0.647	-64.28	0.702	-0.223	0.247	-143.52	0.0211	-0.0867	0.0107	-0.892	0.124	0.00871
127.27	0.00	0.265	-0.00539	0.644	-54.16	0.679	-52.46	0.507	-0.509	0.240	-143.84	0.0273	-0.0738	0.00972	-0.913	0.106	0.00871
142.73	0.00	0.306	-0.00477	0.732	-34.15	0.708	-43.49	0.370	-0.888	0.231	-144.91	0.0345	-0.0635	0.00883	-0.935	0.0876	0.00871
158.18	0.00	0.345	-0.00426	0.859	-14.56	0.732	-36.68	0.273	-1.38	0.222	-146.68	0.0421	-0.0554	0.00801	-0.959	0.0836	0.00871
173.64	0.00	0.377	-0.00387	1.04	3.26	0.753	-31.52	0.203	-2.02	0.213	-149.12	0.0498	-0.0488	0.00725	-0.985	0.0795	0.00871
189.09	0.00	0.398	-0.00361	1.29	18.59	0.770	-27.68	0.153	-2.84	0.204	-152.25	0.0568	-0.0437	0.00654	-1.01	0.0369	0.00871
204.55	0.00	0.407	-0.00347	1.65	31.27	0.783	-24.85	0.116	-3.88	0.195	-156.08	0.0622	-0.0396	0.00587	-1.04	0.0290	0.00871
220.00	0.171	0.392	-0.00361	2.13	42.23	0.786	-24.37	0.0882	-5.22	0.184	-164.06	0.0643	-0.0376	0.00590	-1.08	0.0389	0.0102

	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
50.00							
65.45							
80.91							
96.36							
111.82							
127.27							
142.73							
158.18							
173.64							
189.09							
204.55							
220.00							

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.

