

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 # _____
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
JEFF SULLIVAN
HAMILTON KS

HCU 2231 E SWD
HOLDING TANK

Report Date: 01-02-2019 Sampled: 12-14-2018
Sample #: 3076 at 0000

Sample ID: 208786

CATIONS

Calcium (as Ca)	6248
Magnesium (as Mg)	1877
Barium (as Ba)	0.244
Strontium (as Sr)	146.50
Sodium (as Na)	66973
Potassium (as K)	534.90
Lithium (as Li)	7.79
Ammonia (as NH ₃)	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	49.25
Manganese (as Mn)	1.64
Zinc (as Zn)	0.261
Lead (as Pb)	0.00

ANIONS

Chloride (as Cl)	133800
Sulfate (as SO ₄)	1800
Bromine (as Br)	0.00
Dissolved CO ₂ (as CO ₂)	185.00
Bicarbonate (as HCO ₃)	42.70
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)	5.00
Fluoride (as F)	0.00
Nitrate (as NO ₃)	0.00
Boron (as B)	10.09

PARAMETERS

Calculated T.D.S.	202285
Molar Conductivity	339533
Resistivity	2.95
Sp.Gr.(g/mL)	1.14
Pressure(atm)	1.00
pCO ₂ (atm)	0.00540
pH ₂ S(atm)	0.00348
Temperature (°F)	55.50
pH	6.61

COMMENTS

HAMILTON KS



LINN OPERATING
JEFF SULLIVAN
HAMILTON KS

HCU 2231 E SWD
HOLDING TANK

Report Date: 01-02-2019 Sampled: 12-14-2018
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SATURATION LEVEL

Calcite (CaCO ₃)	0.208
Aragonite (CaCO ₃)	0.184
Witherite (BaCO ₃)	< 0.001
Strontianite (SrCO ₃)	0.00567
Calcium oxalate (CaC ₂ O ₄)	0.00
Magnesite (MgCO ₃)	0.0609
Anhydrite (CaSO ₄)	0.826
Gypsum (CaSO ₄ *2H ₂ O)	1.13
Barite (BaSO ₄)	1.56
Celestite (SrSO ₄)	0.432
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)	0.734
Halite (NaCl)	0.191
Thenardite (Na ₂ SO ₄)	< 0.001
Iron sulfide (FeS)	6.74

MOMENTARY EXCESS (Lbs/1000 Barrels)

Calcite (CaCO ₃)	-0.0127
Aragonite (CaCO ₃)	-0.0148
Witherite (BaCO ₃)	-25.71
Strontianite (SrCO ₃)	-0.854
Calcium oxalate (CaC ₂ O ₄)	-0.00653
Magnesite (MgCO ₃)	-0.0434
Anhydrite (CaSO ₄)	-51.19
Gypsum (CaSO ₄ *2H ₂ O)	32.95
Barite (BaSO ₄)	0.0517
Celestite (SrSO ₄)	-89.56
Fluorite (CaF ₂)	-2.51
Calcium phosphate	>-0.001
Hydroxyapatite	-249.45
Silica (SiO ₂)	-21.92
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	-80.58
Iron hydroxide (Fe(OH) ₃)	< 0.001
Strengite (FePO ₄ *2H ₂ O)	>-0.001
Siderite (FeCO ₃)	-0.00140
Halite (NaCl)	-82246
Thenardite (Na ₂ SO ₄)	-86234
Iron sulfide (FeS)	0.438

SIMPLE INDICES

Langelier	-0.0622
Ryznar	6.73
Puckorius	6.77
Larson-Skold Index	6877
Stiff Davis Index	-0.320
Oddo-Tomson	-1.21

BOUND IONS

Calcium	6248	5984
Barium	0.244	0.244
Carbonate	0.869	0.00574
Phosphate	0.00	0.00
Sulfate	1800	514.53

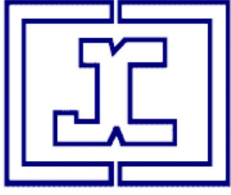
TOTAL

FREE

OPERATING CONDITIONS

Temperature (°F)	55.50
Time(secs)	0.00

DownHole SAT™ Water Analysis Report



JACAM LABORATORIES

SYSTEM IDENTIFICATION

LINN OPERATING
HCU 2231 E SWD
JEFF SULLIVAN
HOLDING TANK
HAMILTON KS

Sample ID#: 3076
ID: 208786
Report Date: 01-02-2019
Sample Date: 12-14-2018
at 0000

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	6248
Magnesium(as Mg)	1877
Barium(as Ba)	0.244
Strontium(as Sr)	146.50
Sodium(as Na)	66973
Potassium(as K)	534.90
Lithium(as Li)	7.79
Iron(as Fe)	49.25
Field Iron(as Fe)	175.00
Ammonia(as NH ₃)	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	1.64
Zinc(as Zn)	0.261
Lead(as Pb)	0.00

ANIONS

Chloride(as Cl)	133800
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Bromine(as Br)	0.00
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Fluoride(as F)	0.00
Nitrate(as NO ₃)	0.00
Boron(as B)	10.09

PARAMETERS

Temperature(°F)	55.50
T.D.S.	202285
Conductivity:	339533
Sample pH	6.61
Resistivity:	2.95

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	0.186	-0.0137	0.862	-39.92	1.19	46.10	1.87	0.0674	0.457	-82.57	0.627	-0.00214	33.82	2.41	0.0292	0.00540
65.45	0.00	0.252	-0.0111	0.780	-65.63	1.04	11.07	1.14	0.0175	0.399	-98.87	0.955	>-0.001	29.80	2.22	0.0547	0.00540
80.91	0.00	0.324	-0.00895	0.748	-73.83	0.933	-18.07	0.735	-0.0521	0.371	-107.03	1.37	0.00134	25.93	2.02	0.0177	0.00540
96.36	0.00	0.395	-0.00725	0.754	-67.38	0.850	-41.49	0.502	-0.143	0.356	-110.45	1.85	0.00252	22.38	1.82	0.0146	0.00540
111.82	0.00	0.456	-0.00597	0.795	-50.29	0.847	-40.12	0.358	-0.259	0.347	-111.72	2.35	0.00333	19.25	1.65	0.00593	0.00540
127.27	0.00	0.504	-0.00504	0.874	-26.77	0.893	-25.16	0.259	-0.412	0.337	-113.44	2.84	0.00384	16.64	1.50	0.0157	0.00540
142.73	0.00	0.531	-0.00447	0.997	-0.602	0.935	-14.05	0.190	-0.614	0.326	-115.80	3.26	0.00405	14.42	1.38	0.0127	0.00540
158.18	0.00	0.531	-0.00422	1.18	25.31	0.971	-5.80	0.141	-0.880	0.315	-118.74	3.53	0.00397	12.53	1.27	0.0133	0.00540
173.64	0.00	0.506	-0.00425	1.43	49.05	1.00	0.286	0.105	-1.23	0.302	-122.24	3.63	0.00365	10.88	1.17	0.0137	0.00540
189.09	0.00	0.461	-0.00447	1.78	69.59	1.03	4.74	0.0792	-1.67	0.290	-126.30	3.55	0.00318	9.44	1.08	0.00691	0.00540
204.55	0.00	0.405	-0.00480	2.28	86.62	1.05	7.93	0.0603	-2.23	0.277	-130.93	3.32	0.00264	8.16	0.998	0.00579	0.00540
220.00	0.171	0.335	-0.00545	2.94	102.21	1.05	8.70	0.0457	-2.98	0.262	-139.05	2.92	0.00209	7.89	1.08	0.00789	0.00632
		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}{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.

