Inspection Report For Well: UT20736 - 04640

U.S. Environmental Protection Agency
Underground Injection Control Program, 8ENF-T
999 18th Street, Suite 300, Denver, CO 80202-2466

This form was printed on 9/24/2013

INSPECTOR(S): Lead: Roberts, Sarah — Date: ~~10~~ 12/ 14/2013

Others: Ajayi, Christopher — Time: 11:15 am / pm

OPERATOR (only if different): _____

REPRESENTATIVE(S): Chad Stevenson

PRE-INSPECTION REVIEW

Petroglyph Operating Company, Inc

Well Name:	Ute Tribal 15-12		
Well Type:	Enhanced Recovery (2R)		
Operating Status:	AC (ACTIVE) as of 12/31/2002		
Oil Field:	Antelope Creek (Duchesne)		
Location:	NESE S15 T5S R3W		
Indian Country:	X, Uintah and Ouray		
Last Inspection:	8/28/2012	***Allowable Inj Pressure:***	1900 /
Last MIT:	Pass 12/28/2011	***Annulus Pressure From Last MIT:***	1050

BLACK = POSSIBLE VIOLATION GREY = DATA MISSING

INSPECTION TYPE: **(Select One)**

- [ ] Construction / Workover
- [ ] Plugging
- [ ] Post-Closure
- [ ] Response to Complaint
- [x] Routine
- [ ] Witness MIT
- [ ] Other

OBSERVED VALUES:

Tubing Gauge:	[x] Yes [ ] No	Pressure: U: 1810 / L: ____ psig Gauge Range: Sealed psig	Gauge Owner:	[ ] EPA [x] Operator
Annulus Gauge:	[x] Yes [ ] No	Pressure: 0 psig Gauge Range: open psig	Gauge Owner:	[x] EPA [ ] Operator
Bradenhead Gauge:	[ ] Yes [ ] No	Pressure: ____ psig Gauge Range: ____ psig	Gauge Owner:	[ ] EPA [ ] Operator
Pump Gauge:	[ ] Yes [ ] No	Pressure: ____ psig Gauge Range: ____ psig	Gauge Owner:	[ ] EPA [ ] Operator

Operating Status: (Select One)
- [x] Active
- [ ] Being Reworked
- [ ] Not Injecting
- [ ] Production
- [ ] Plugged and Abandoned
- [ ] Under Construction

ICIS Entered
Date 12/20/13
Initials DS

GREEN	BLUE	
	1	

See page 2 for photos, comments, and site conditions.

UI Entered
Date 12/17/13
Initial SC

Inspection Report For Well: UT20736 - 04640 (PAGE 2)

PHOTOGRAPHS: ☐ Yes ☒ No List of photos taken: _____

Comments and site conditions observed during inspection: _____

GPS: GPS File ID: _____

Signature of EPA Inspector(s): _____ _____ _____

☐ Data Entry ☐ Compliance Staff ☐ Hard Copy Filing

NOTICE OF INSPECTION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII, 999 18TH STREET - SUITE 500
DENVER, COLORADO 80202-2405

Date: 12/16/13
Hour: 8:00a

Notice of inspection is hereby given according to Section 1445(b) of the Safe Drinking Water Act (42 U.S.C. §300f et seq.).

Firm Name: Petroglyph Operating, Inc.

Firm Address: Roosevelt, UT, Antelope Creek Oil Field

REASON FOR INSPECTION:

For the purpose of inspecting records, files, papers, processes, controls and facilities, and obtaining samples to determine whether the person subject to an applicable underground injection control program has acted or is acting in compliance with the Safe Drinking Water Act and any applicable condition of permit or rule authorization.

SECTION 1445(b) of the SAFE DRINKING WATER ACT is quoted below:

Section 1445(b)(1): Except as provided in Paragraph (2), the Administrator, or representatives of the Administrator duly designated by him, upon presenting appropriate credentials, and a written notice to any supplier of water or other person subject to (a), or person subject (A) a national primary drinking water regulation prescribed under Section 1412(B) an applicable Underground Injection Control Program, or (C) any requirement to monitor an unregulated contaminant pursuant to subsection (a), or person in charge of any of the property of such supplier or other person referred to in clause (A), (B), or (C), is authorized to enter any establishment, ... facility, or other property of such supplier or other person in order to determine whether such supplier or other person has acted or is acting in compliance with this title, including for this purpose, inspection, at reasonable times, of records, files, papers, processes, controls, and facilities, or in order to test any feature of a public water system, including its raw water source. The Administrator or the Comptroller General (or any representative designated by either) shall have access for the purpose of audit and examination to any records, reports, or information of a grantee which are required to be maintained under subsection (a) or which are pertinent to any financial assistance under this title.

Sarah Roberts
Inspector's Name & Title (Print)

Inspector's Signature

EPA R8 3560-1 (8-89)

Original - Regional Office Copy
Yellow Copy - Operator Copy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
999 18TH STREET - SUITE 300
DENVER, CO 80202-2466
http://www.epa.gov/region08

OCT 3 2002

Ref: 8P-W-GW

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Mat Corser
Petroleum Engineer
Petroglyph Operating Company, Inc.
P.O. Box 607
Roosevelt, UT 84066

RE: **Authorization to Continue Injection**
Ute Tribal #15-12
EPA Area Permit No. UT2736-00000
EPA Well Permit No. UT04640
Duchesne County, Utah

Dear Mr. Corser:

Thank you for submitting to the Region VIII Ground Water Program office of the Environmental Protection Agency (EPA) the results from the May 22, 2002, radioactive tracer survey (RATS) used to demonstrate Part II (External) Mechanical Integrity (MI) test on the Ute Tribal #15-12 injection well. A limited injection period was authorized to allow for stabilization of the injection formation pressure prior to demonstrating Part II (External) Mechanical Integrity.

The results of the RATS have been reviewed and the EPA has determined that the test adequately demonstrated Part II (External) MI, no significant fluid movement through vertical channels adjacent to the injection well bore, at the tested pressure of 1900 psi. Therefore, EPA hereby approves this demonstration of Part II (External) MI and authorizes continued injection into the Ute Tribal #15-12 under the terms and conditions of EPA UIC Area Permit UT20736-00000 and the authorization for Additional Well UT2736-04640 issued under this Area Permit.

The authorized maximum allowable injection pressure (MAIP) for this well is 1900 psig.

Printed on Recycled Paper

You may apply for a higher MAIP at a later date. The application should be accompanied by the interpreted results from a step rate or other EPA-approved test that measure the formation fracture pressure and fracture gradient at this location. A copy of EPA guidelines for running and interpreting a step rate test are included with this letter. Should the test result in approval of a higher MAIP, a new Part II (External) MI demonstration also may be required to show no significant fluid movement through vertical channels adjacent to the injection well bore at the higher pressure. Please note that prior to any test using an injection pressure greater than the present MAIP, you must first receive written authorization from the Director.

As of this approval, responsibility for Permit compliance and enforcement is transferred to the Region VIII UIC Technical Enforcement Program office. Therefore, please direct all future notification, reporting, monitoring and compliance correspondence to the following address, referencing your well name and UIC Permit number on all correspondence regarding this well.

If you have any questions in regard to the above action, please contact Chuck Tinsley at 800.227.8917 Ext.6266 or Dan Jackson at 800.227.8917 Ext.6155.

Results from temperature log or other Part II MI test should be mailed directly to the Compliance Officer, Al Craver, who will then take over routine matters involving well forms and reports.

Sincerely,

D. Edwin Hogle
Director
Ground Water Program

enclosure: Step-Rate Test Procedure

cc: Mr. D. Floyd Wopsock, Chairman
Uintah & Ouray Business Council
Ute Indian Tribe

Ms. Elaine Willie
Environmental Coordinator
Ute Indian Tribe

Mr. Gil Hunt
State of Utah Natural Resources
Division of Oil, Gas, and Mining

Mr. Jerry Kenczka
Bureau of Land management
Vernal District Office

Mr. Nathan Wiser, 8ENF-T
USEPA

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to: 10/2/02 CW 4573C

Mr. Mat Corser
Petroleum Engineer
Petroglyph Operating Co., Inc.
P.O. Box 607
Roosevelt, UT 84066

UT2736-04640 (UTE TRIBAL #15-12)
8P-W-GW OCT -3 2002 B

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☒ Addressee

B. Received by (Printed Name) C. Date of Delivery 10-18-02

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

(rec'd LC)
OCT 25 2002

3. Service Type
XX Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7001 0320 0005 9387 5466

PS Form 3811, August 2001 Domestic Return Receipt 102595-01-M-2509

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

OFFICIAL USE

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here
OCT 3 2002

Sent To Mr. Mat Corser
Petroleum Engineer
Street, Apt. No., or PO Box No. Petroglyph Operating Co., Inc.
City, State, ZIP+4 P.O. Box 607
Roosevelt, UT 84066

7001 0320 0005 9387 5466

PS Form 3800, January 2001 See Reverse for Instructions

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
999 18TH STREET - SUITE 300
DENVER, CO 80202-2466
http://www.epa.gov/region08

OCT 3 2002

CONCURRENCE COPY

Ref: 8P-W-GW

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RETURN RECEIPT REQUESTED

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Petroleum Engineer
Petroglyph Operating Company, Inc.
P.O. Box 607
Roosevelt, UT 84066

RE: **Authorization to Continue Injection**
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EPA Well Permit No. UT04640
Duchesne County, Utah

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Concur

The authorized maximum allowable injection pressure (MAIP) for this well is 1900 psig.

CEWilliams 8P-W-GW 9/30/02

8P-NI-GW DJackson 10/1/02

8P-W-GW 10/01/02 L. Clutts
mailed 10/3/02 L. Clutts

[illegible] 10/2/02

Printed on Recycled Paper

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D. Edwin Hogle
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Mr. Gil Hunt
State of Utah Natural Resources
Division of Oil, Gas, and Mining

Mr. Jerry Kenczka
Bureau of Land management
Vernal District Office

Mr. Nathan Wiser, 8ENF-T
USEPA

OMB No. 2040-0042 Approval Expires 11/30/2014

EPA

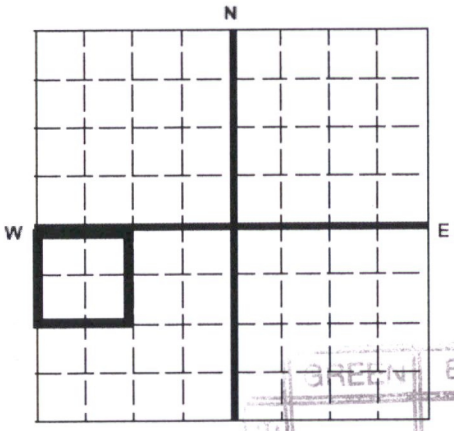
United States Environmental Protection Agency
Washington, DC 20460

ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee
Petroglyph Operating Company, Inc. 2258
P.O. Box 7608
Boise, Idaho 83709

Name and Address of Surface Owner
Ute Indian Tribe
P.O. Box 70
Ft. Duchesne, Utah, 84026

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Utah	Duchesne	UT2736-04640

Surface Location Description
___ 1/4 of ___ 1/4 of NW 1/4 of SW 1/4 of Section 15 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 3300 ft. frm (N/S) N Line of quarter section
and 520 ft. from (E/W) W Line of quarter section.

U2 Entered
Date 3/30/17
Initial DB

WELL ACTIVITY
- [ ] Brine Disposal
- [X] Enhanced Recovery
- [ ] Hydrocarbon Storage

TYPE OF PERMIT
- [ ] Individual
- [X] Area

Number of Wells 111

Lease Name Ute Indian Tribe Well Number UTE TRIBAL 15-12

GREEN BLUE CBI
TAB 2

MONTH	YEAR	INJECTION PRESSURE AVERAGE PSIG	INJECTION PRESSURE MAXIMUM PSIG	TOTAL VOLUME INJECTED BBL	TOTAL VOLUME INJECTED MCF	TUBING – CASING ANNULUS PRESSURE (OPTIONAL MONITORING) MINIMUM PSIG	TUBING – CASING ANNULUS PRESSURE (OPTIONAL MONITORING) MAXIMUM PSIG
January	16	1812	1846	184		0	0
February	16	1847	1871	198		0	0
March	16	1837	1860	112		0	0
April	16	1565	1805	293		0	0
May	16	1852	1861	763		0	0
June	16	1846	1868	555		0	0
July	16	1821	1848	512		0	0
August	16	1820	1839	523		0	0
September	16	1787	1800	404		0	0
October	16	1840	1845	605		0	0
November	16	1791	1830	330		0	0
December	16	1801	1825	432		0	0

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Chad Stevenson, Water Facilities Supervisor		03/21/2017

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

multi-chem®
A HALLIBURTON SERVICE

Units of Measurement: **Standard**

Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 15-12, DUCHESNE**	Lab Tech:	**Kaitlyn Natelli**
Sample Point:	**Well Head**		
Sample Date:	**1/6/2017**		
Sample ID:	**WA-345294**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics

Test Date:	1/25/2017
System Temperature 1 (°F):	300
System Pressure 1 (psig):	2000
System Temperature 2 (°F):	130
System Pressure 2 (psig):	50
Calculated Density (g/ml):	1.0045
pH:	8.30
Calculated TDS (mg/L):	10398.33
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	0.00
Tot. SuspendedSolids(mg/L):	
Corrosivity(LanglierSat.Indx)	0.00
Alkalinity:	

Analysis @ Properties in Sample Specifics

Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	3627.47	Chloride (Cl):	4500.00
Potassium (K):	25.60	Sulfate (SO_4):	1.00
Magnesium (Mg):	12.20	Bicarbonate (HCO_3):	2135.00
Calcium (Ca):	31.77	Carbonate (CO_3):	
Strontium (Sr):	4.58	Hydroxide(HO):	
Barium (Ba):	20.12	Acetic Acid (CH_3COO)	
Iron (Fe):	13.21	Propionic Acid (C_2H_5COO)	
Zinc (Zn):	1.07	Butanoic Acid (C_3H_7COO)	
Lead (Pb):	0.00	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Ammonia NH_3:		Fluoride (F):	
Manganese (Mn):	0.17	Bromine (Br):	
Aluminum (Al):	0.39	Silica (SiO_2):	26.14
Lithium (Li):	3.27	Calcium Carbonate ($CaCO_3$):	
Boron (B):	4.83	Phosphates (PO_4):	4.94
Silicon (Si):	12.22	Oxygen (O_2):	

Notes:

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
130.00	50.00	1.38	25.66	0.00	0.00	0.00	0.00	3.12	9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
149.00	267.00	1.44	25.93	0.00	0.00	0.00	0.00	3.21	9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
168.00	483.00	1.51	26.27	0.00	0.00	0.00	0.00	3.30	9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
187.00	700.00	1.59	26.57	0.00	0.00	0.00	0.00	3.40	9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
206.00	917.00	1.69	26.84	0.00	0.00	0.00	0.00	3.48	9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
224.00	1133.00	1.79	27.07	0.00	0.00	0.00	0.00	3.57	9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
243.00	1350.00	1.90	27.25	0.00	0.00	0.00	0.00	3.65	9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
262.00	1567.00	2.01	27.39	0.00	0.00	0.00	0.00	3.72	9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
281.00	1783.00	2.13	27.50	0.00	0.00	0.00	0.00	3.79	9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	2000.00	2.25	27.58	0.00	0.00	0.00	0.00	3.85	9.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

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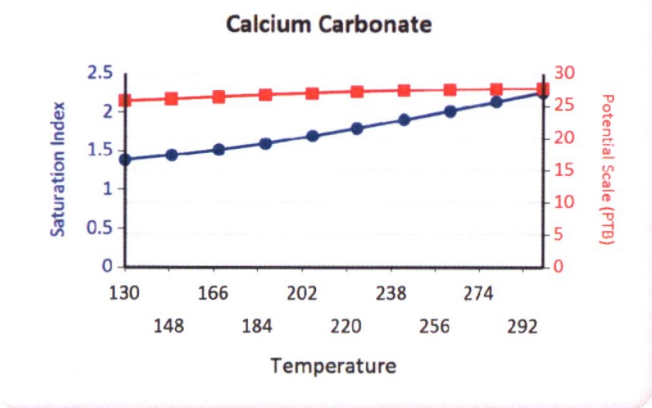
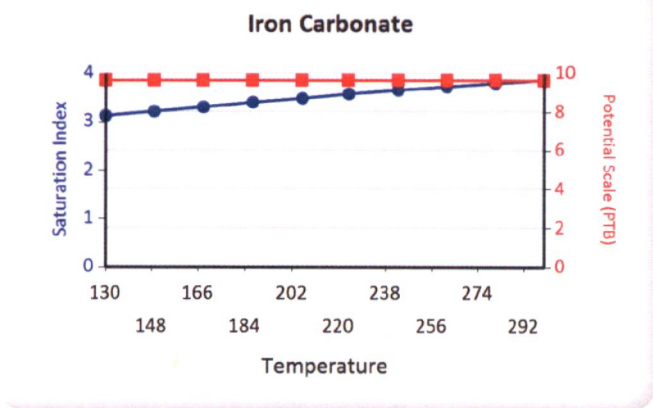
Water Analysis Report

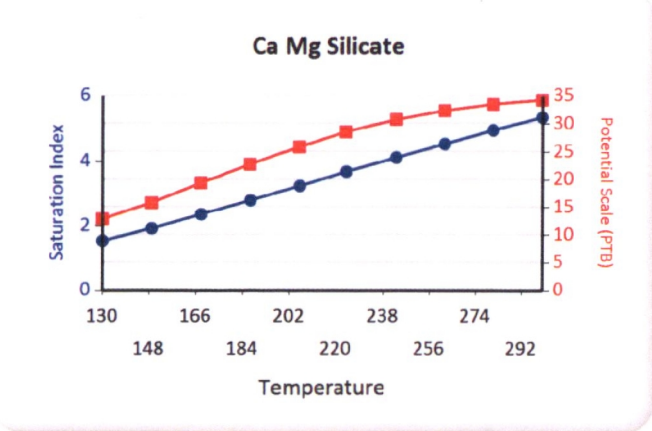
		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
130.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	1.62	0.70	0.00	0.00	2.86	15.86	1.52	12.79	10.99	10.27
149.00	267.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82	0.71	0.00	0.00	3.59	18.55	1.91	15.77	11.43	10.27
168.00	483.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02	0.71	0.00	0.00	4.38	20.90	2.35	19.29	11.94	10.27
187.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19	0.72	0.00	0.00	5.15	22.44	2.79	22.71	12.47	10.27
206.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00	2.35	0.72	0.00	0.00	5.92	23.35	3.23	25.83	13.01	10.27
224.00	1133.00	0.00	0.00	0.00	0.00	0.00	0.00	2.49	0.72	0.00	0.00	6.67	23.85	3.67	28.52	13.56	10.27
243.00	1350.00	0.00	0.00	0.00	0.00	0.00	0.00	2.62	0.72	0.00	0.00	7.41	24.10	4.10	30.68	14.10	10.27
262.00	1567.00	0.00	0.00	0.00	0.00	0.00	0.00	2.73	0.72	0.00	0.00	8.13	24.23	4.52	32.30	14.64	10.27
281.00	1783.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83	0.72	0.00	0.00	8.82	24.30	4.94	33.43	15.17	10.27
300.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	2.90	0.72	0.00	0.00	9.49	24.34	5.34	34.18	15.68	10.27

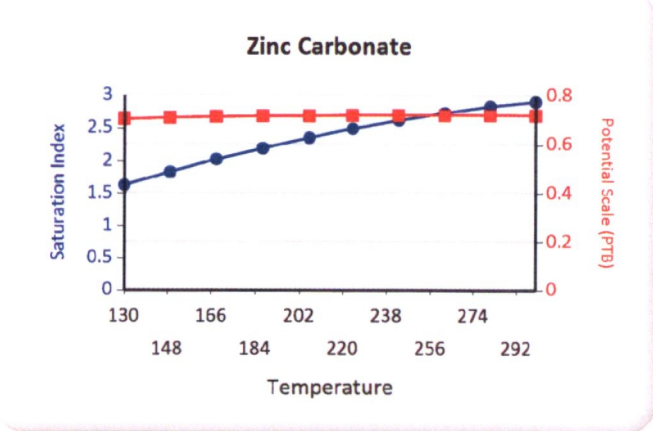
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Iron Carbonate Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

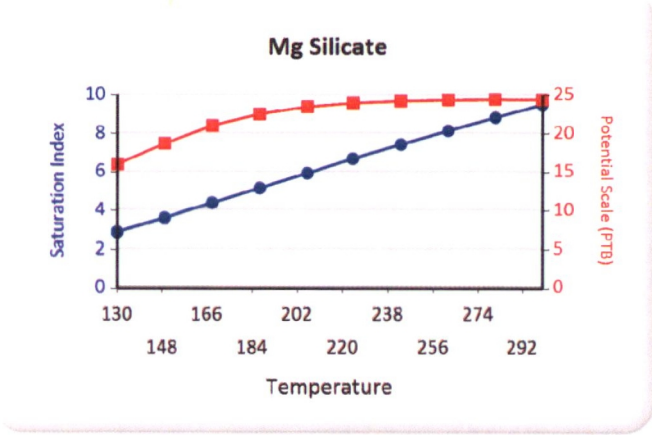
These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Iron Carbonate Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

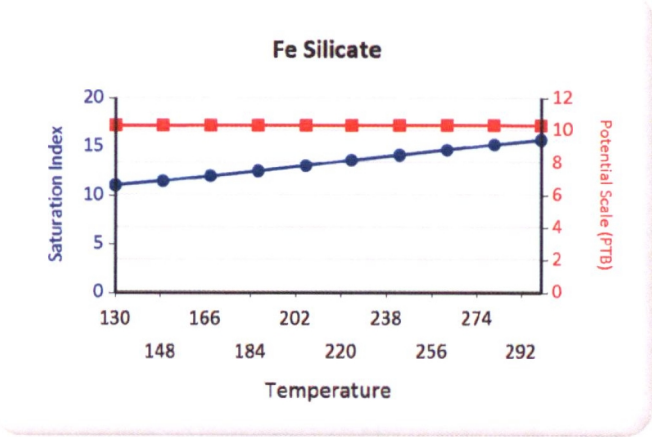









Mg Silicate
Saturation Index
Potential Scale (PTB)
Temperature
0
2
4
6
8
10
0
5
10
15
20
25
130
148
166
184
202
220
238
256
274
292


Fe Silicate
Saturation Index
Potential Scale (PTB)
Temperature
0
5
10
15
20
0
2
4
6
8
10
12
130
148
166
184
202
220
238
256
274
292

PETROGLYPH EXECUTIVE OFFICES

RECEIVED
JAN 11 2017
Office of Enforcement, Compliance
and Environmental Justice (Water)

January 4, 2017

Gary Wang or Don Breffle
Underground Injection Control Enforcement
U.S. Environmental Protection Agency
Mail Code: 8ENF-UFO
US EPA Region 8
1595 Wyncoop Street
Denver, CO 80202-1129

RE: 5-year Mechanical Integrity Tests
(Ute Tribal 07-15, 15-12, 19-16, 20-14, 29-04)

Mr. Wang/ Mr. Breffle:

Please find enclosed 5-year Mechanical Integrity Tests for the following wells:

- Ute Tribal 07-15 UT20736-07414
- Ute Tribal 15-12 UT20736-04640
- Ute Tribal 19-16 UT20736-07113
- Ute Tribal 20-14 UT20736-04540
- Ute Tribal 29-04 UT20736-06482

If any questions, please reach me at (208) 685-9711.

Best Regards,

Nicole Colby
Manager, Land & Regulatory Compliance

U2 Entered
Date 1/11/17
Initial DJ

TAB	GREEN	BLUE	CBI
		2	

Mechanical Integrity Test
Tubing/Casing Annulus Pressure Test

U.S. Environmental Protection Agency
Underground Injection Control Program
1595 Wynkoop Street, Denver, CO 80202

EPA Witness: _____ Date: 12 / 22 / 16
Test conducted by: CHAD STEVENSON
Others present: _____

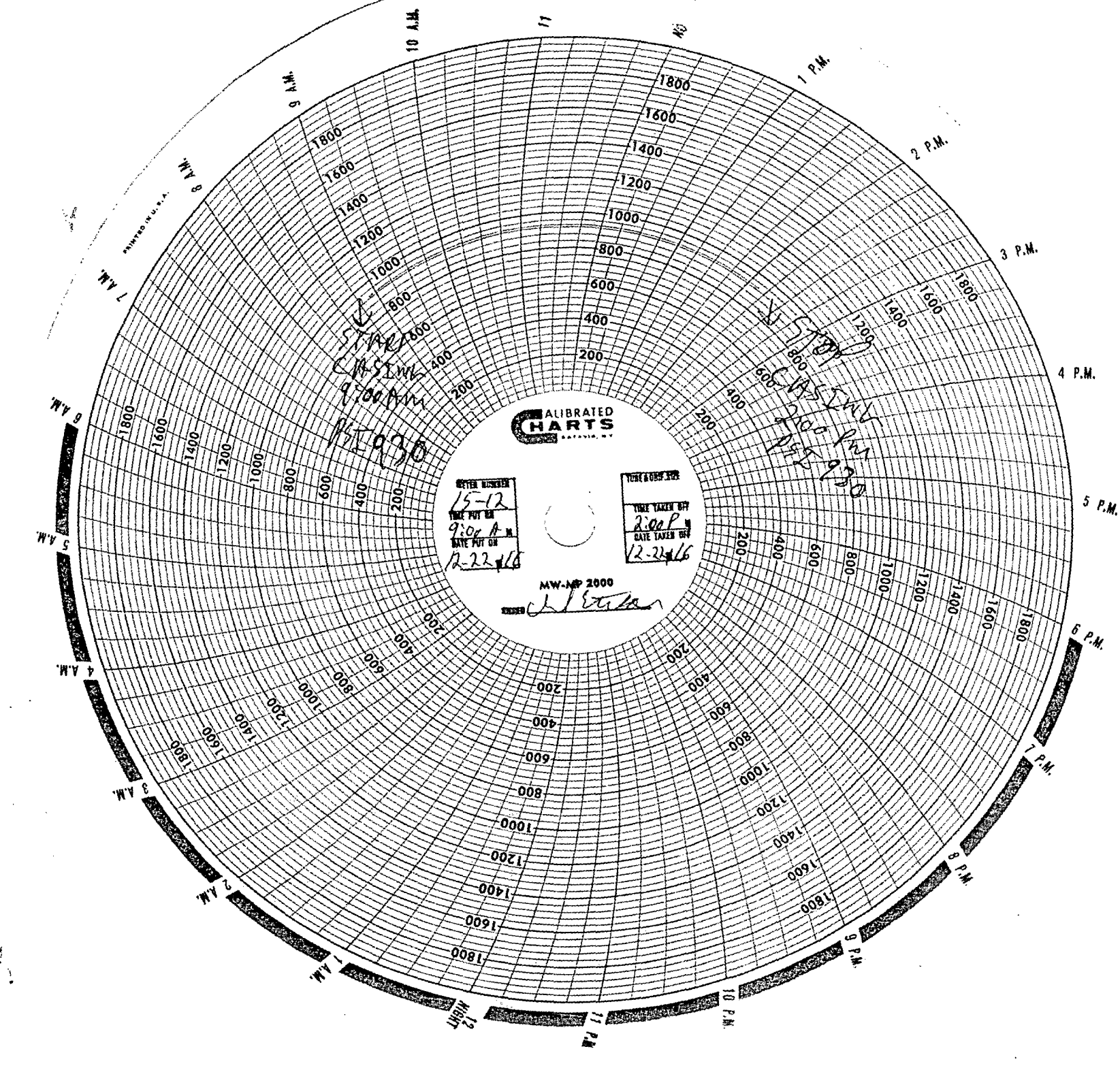
Well Name: 15-12 Type: ER SWD **Status:** AC TA UC
Field: ANTELOPE CREEK
Location: 15-12 Sec: ____ T ____ N / S R ____ E / W County: DUCHESNE State: UT
Operator: PETROGLYPH ENERGY
Last MIT: / / **Maximum Allowable Pressure:** _____ **PSIG**

Regularly scheduled test? [X] Yes [ ] No
Initial test for permit? [ ] Yes [ ] No
Test after well rework? [ ] Yes [ ] No

Well injecting during test? If Yes, rate: 16 **bpd**
Pre-test annulus pressure: _____ **psig**

MIT DATA TABLE	*Test #1*	*Test #2*	*Test #3*
TUBING		***PRESSURE RECORD***	
Initial Pressure	1797 psig	psig	psig
End of test pressure	1797 psig	psig	psig
CASING / TUBING ANNULUS		***PRESSURE RECORD***	
0 minutes	930 psig	psig	psig
5 minutes	930 psig	psig	psig
10 minutes	930 psig	psig	psig
15 minutes	930 psig	psig	psig
20 minutes	930 psig	psig	psig
25 minutes	930 psig	psig	psig
30 minutes	930 psig	psig	psig
5 HOURS *minutes*	930 psig	psig	psig
_____ *minutes*	psig	psig	psig
RESULT	[ ] Pass [ ] Fail	[ ] Pass [ ] Fail	[ ] Pass [ ] Fail

Does the annulus pressure build back up after the test ? If Yes, _____ **psig.**



CALIBRATED CHARTS
MW-MP 2000
METER NUMBER
15-12
TIME PUT ON
9:00 A M
DATE PUT ON
12-22-16
TUBE & ORIF. SIZE
TIME TAKEN OFF
2:00 P M
DATE TAKEN OFF
12-22-16
START CASING 9:00 AM PSI 930
STOP CASING 2:00 PM PSI 930

OMB No. 2040-0042 Approval Expires 11/30/2014

EPA

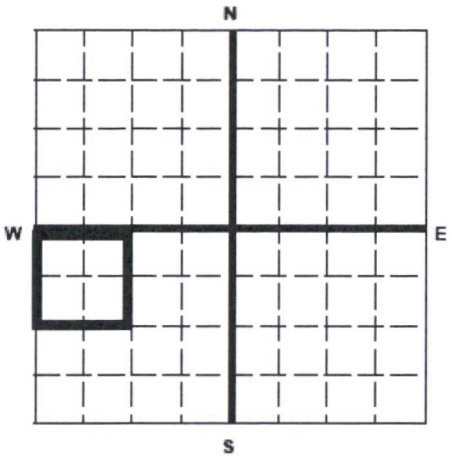
United States Environmental Protection Agency
Washington, DC 20460

ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee
Petroglyph Operating Company, Inc. 2258
P.O. Box 7608
Boise, Idaho 83709

Name and Address of Surface Owner
Ute Indian Tribe
P.O. Box 70
Ft. Duchesne, Utah, 84026

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Utah	Duchesne	UT2736-~~04434~~ 04640

Surface Location Description
___ 1/4 of ___ 1/4 of NW 1/4 of SW 1/4 of Section 15 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 3300 ft. frm (N/S) N Line of quarter section
and 520 ft. from (E/W) W Line of quarter section.

U2 Entered
Date 3/1/16
Initial DB

WELL ACTIVITY	TYPE OF PERMIT
[ ] Brine Disposal	[ ] Individual
[X] Enhanced Recovery	[X] Area
[ ] Hydrocarbon Storage	Number of Wells 111

Lease Name Ute Indian Tribe Well Number UTE TRIBAL 15-12

		INJECTION PRESSURE		TOTAL VOLUME INJECTED		TUBING – CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	15	1711	1796	300		0	0
February	15	1802	1810	435		0	0
March	15	1840	1864	572		0	0
April	15	1856	1872	570		0	0
May	15	1857	1864	481		0	0
June	15	1728	1866	341		0	0
July	15	1802	1871	452		0	0
August	15	1839	1842	319		0	0
September	15	1640	1875	173		0	0
October	15	1857	1868	328		0	0
November	15	1856	1867	278		0	0
December	15	1847	1855	186		0	0

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Chad Stevenson, Water Facilities Supervisor		02/08/2016

TAB	GREEN	BLUE	CBI
		2	

EPA Form 7520-11 (Rev. 12-11)

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

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Units of Measurement: **Standard**

Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 15-12, DUCHESNE**	Lab Tech:	**Michele Pike**
Sample Point:	**Well Head**		
Sample Date:	**1/6/2016**		
Sample ID:	**WA-327677**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics

Test Date:	1/13/2016
System Temperature 1 (°F):	60
System Pressure 1 (psig):	2000
System Temperature 2 (°F):	180
System Pressure 2 (psig):	50
Calculated Density (g/ml):	1.0071
pH:	8.50
Calculated TDS (mg/L):	14164.13
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	0.00
Tot. SuspendedSolids(mg/L):	
Corrosivity(LanglierSat.Indx)	0.00
Alkalinity:	

Analysis @ Properties in Sample Specifics

Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	4969.55	Chloride (Cl):	6500.00
Potassium (K):	29.58	Sulfate (SO_4):	40.00
Magnesium (Mg):	22.83	Bicarbonate (HCO_3):	2440.00
Calcium (Ca):	67.08	Carbonate (CO_3):	
Strontium (Sr):	5.79	Acetic Acid (CH_3COO)	
Barium (Ba):	16.95	Propionic Acid (C_2H_5COO)	
Iron (Fe):	36.93	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	9.76	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.83	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.25	Silica (SiO_2):	24.58
Aluminum (Al):	0.03	Calcium Carbonate ($CaCO_3$):	
Lithium (Li):	1.82	Phosphates (PO_4):	8.04
Boron (B):	4.52	Oxygen (O_2):	
Silicon (Si):	11.49		

Notes:

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180.00	50.00	2.07	57.49	0.79	7.97	0.00	0.00	3.98	26.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
167.00	267.00	1.99	57.13	0.82	8.09	0.00	0.00	3.89	26.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153.00	483.00	1.92	56.81	0.86	8.24	0.00	0.00	3.80	26.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140.00	700.00	1.86	56.46	0.90	8.42	0.00	0.00	3.71	26.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
127.00	917.00	1.80	56.08	0.96	8.61	0.00	0.00	3.62	26.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113.00	1133.00	1.75	55.67	1.03	8.82	0.00	0.00	3.53	26.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	1350.00	1.70	55.24	1.11	9.03	0.00	0.00	3.44	26.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87.00	1567.00	1.65	54.80	1.20	9.23	0.00	0.00	3.36	26.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73.00	1783.00	1.62	54.37	1.32	9.42	0.00	0.00	3.27	26.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.00	2000.00	1.58	53.94	1.45	9.59	0.00	0.00	3.18	26.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

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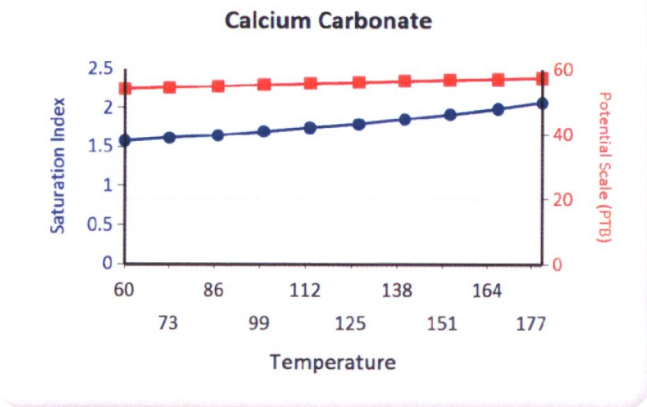
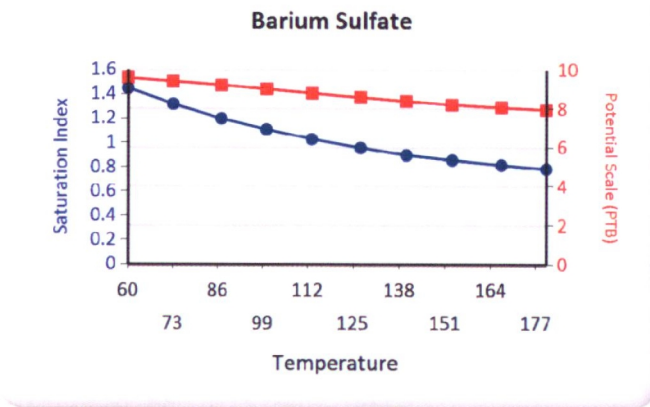
Water Analysis Report

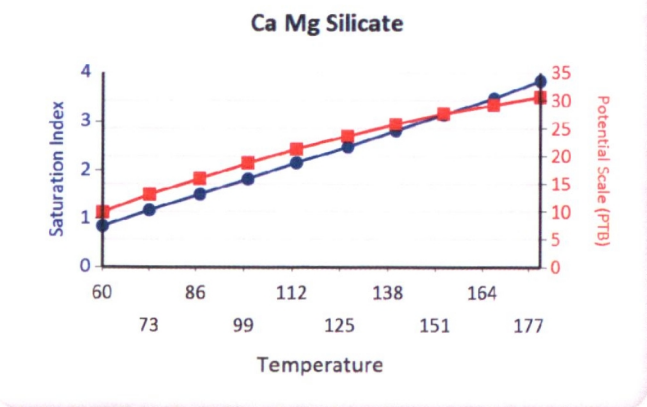
		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	3.24	6.56	0.00	0.00	6.63	42.67	3.83	30.74	14.51	28.72
167.00	267.00	0.00	0.00	0.00	0.00	0.00	0.00	3.09	6.56	0.00	0.00	6.01	40.71	3.47	29.24	14.06	28.72
153.00	483.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95	6.55	0.00	0.00	5.43	38.60	3.14	27.69	13.66	28.72
140.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	2.79	6.55	0.00	0.00	4.85	36.03	2.81	25.83	13.27	28.72
127.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00	2.63	6.55	0.00	0.00	4.26	33.03	2.48	23.71	12.88	28.71
113.00	1133.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45	6.54	0.00	0.00	3.67	29.66	2.15	21.36	12.50	28.71
100.00	1350.00	0.00	0.00	0.00	0.00	0.00	0.00	2.26	6.52	0.00	0.00	3.08	25.93	1.82	18.81	12.13	28.70
87.00	1567.00	0.00	0.00	0.00	0.00	0.00	0.00	2.07	6.50	0.00	0.00	2.48	21.82	1.50	16.06	11.76	28.69
73.00	1783.00	0.00	0.00	0.00	0.00	0.00	0.00	1.86	6.46	0.00	0.00	1.87	17.31	1.17	13.12	11.40	28.68
60.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63	6.40	0.00	0.00	1.25	12.31	0.84	9.94	11.04	28.67

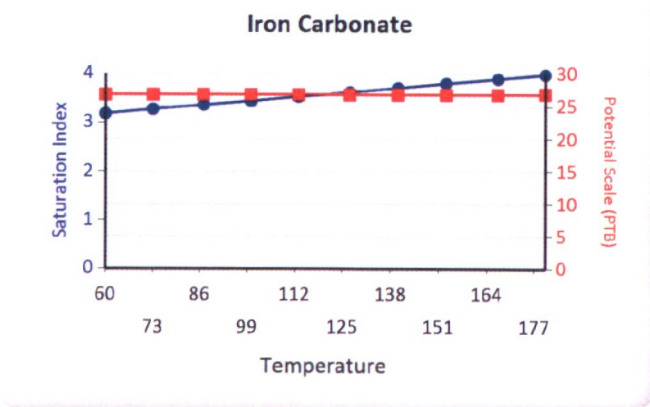
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Carbonate Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

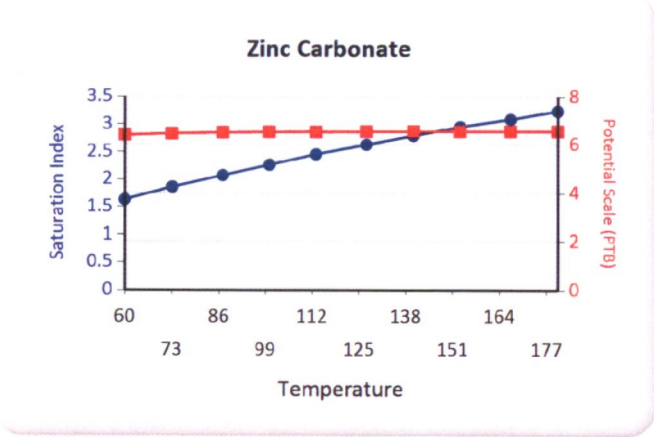
These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Carbonate Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

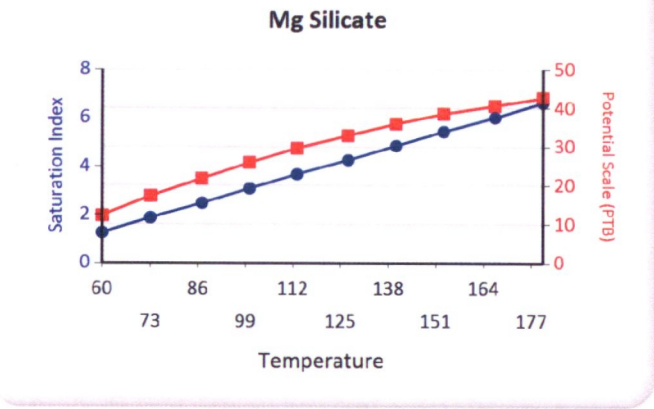


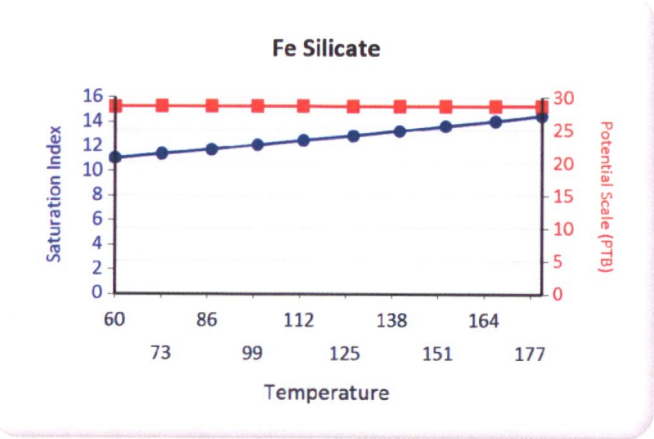







Zinc Carbonate
Saturation Index
Potential Scale (PTB)
Temperature
3.5
3
2.5
2
1.5
1
0.5
0
8
6
4
2
0
60
86
112
138
164
73
99
125
151
177


Mg Silicate
Saturation Index
Potential Scale (PTB)
Temperature
8
6
4
2
0
50
40
30
20
10
0
60
86
112
138
164
73
99
125
151
177


Fe Silicate
Saturation Index
Potential Scale (PTB)
Temperature
16
14
12
10
8
6
4
2
0
30
25
20
15
10
5
0
60
86
112
138
164
73
99
125
151
177

OMB No. 2040-0042 Approval Expires 12/31/2011

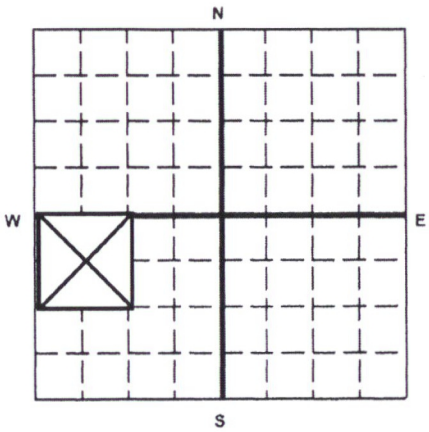
EPA

United States Environmental Protection Agency
Washington, DC 20460

ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee	Name and Address of Surface Owner
Petroglyph Operating Company, Inc. 2258 P.O. Box 7608 Boise, Idaho 83709	Ute Indian Tribe P.O. Box 70 Ft. Duchesne, Utah 84026

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Utah	Duchesne	UT2736-04640

Surface Location Description

___ 1/4 of ___ 1/4 of NW 1/4 of SW 1/4 of Section 15 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 3300 ft. frm (N/S) N Line of quarter section and 520 ft. from (E/W) W Line of quarter section.

WELL ACTIVITY
- [ ] Brine Disposal
- [X] Enhanced Recovery
- [ ] Hydrocarbon Storage

TYPE OF PERMIT
- [ ] Individual
- [X] Area

Number of Wells 111

Lease Name Ute Indian Tribe Well Number UTE TRIBAL 15-12

		INJECTION PRESSURE		TOTAL VOLUME INJECTED		TUBING -- CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	14	1801	1818	825		0	0
February	14	1845	1853	938		0	0
March	14	1848	1846	932		0	0
April	14	1854	1857	931		0	0
May	14	1847	1849	1025		0	0
June	14	1821	1835	1096		0	0
July	14	1804	1871	1170		0	0
August	14	1846	1862	1303		0	0
September	14	1814	1846	846		0	0
October	14	1822	1853	631		0	0
November	14	1835	1859	800		0	0
December	14	1850	1864	713		0	0

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Chad Stevenson, Water Facilities Supervisor		2/10/2015

EPA Form 7520-11 (Rev. 12-08)

U2 Entered
Date 3/20/05
Initial GW

	GREEN	BLUE	CBI
TAB		2	

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

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A HALLIBURTON SERVICE

Units of Measurement: **Standard**

Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 15-12, DUCHESNE**	Lab Tech:	**Gary Winegar**
Sample Point:	**WELLHEAD**		
Sample Date:	**1/7/2015**		
Sample ID:	**WA-298196**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	1/21/2015
System Temperature 1 (°F):	160
System Pressure 1 (psig):	1300
System Temperature 2 (°F):	80
System Pressure 2 (psig):	15
Calculated Density (g/ml):	0.9990
pH:	7.50
Calculated TDS (mg/L):	2671.33
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	5.00

Analysis @ Properties in Sample Specifics			
Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	489.86	Chloride (Cl):	1000.00
Potassium (K):	11.72	Sulfate (SO_4):	467.00
Magnesium (Mg):	63.39	Bicarbonate (HCO_3):	488.00
Calcium (Ca):	113.63	Carbonate (CO_3):	
Strontium (Sr):	3.58	Acetic Acid (CH_3COO)	
Barium (Ba):	1.19	Propionic Acid (C_2H_5COO)	
Iron (Fe):	5.63	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	2.40	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.02	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.09	Silica (SiO_2):	24.82

Notes:
B=1.43 Al=0 Li=.4

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	0.60	22.85	1.78	0.70	2.75	3.08	1.09	3.69	0.00	0.00	0.00	0.00	0.00	0.00	10.66	1.25
88.00	157.00	0.55	20.46	1.69	0.69	2.61	3.08	1.07	3.67	0.00	0.00	0.00	0.00	0.00	0.00	10.41	1.25
97.00	300.00	0.58	21.86	1.62	0.69	2.57	3.07	1.13	3.73	0.00	0.00	0.00	0.00	0.00	0.00	10.28	1.25
106.00	443.00	0.61	23.39	1.55	0.69	2.55	3.07	1.20	3.78	0.00	0.00	0.00	0.00	0.00	0.00	10.15	1.25
115.00	585.00	0.65	25.05	1.48	0.69	2.53	3.07	1.26	3.82	0.00	0.00	0.00	0.00	0.00	0.00	10.03	1.25
124.00	728.00	0.69	26.82	1.43	0.68	2.52	3.07	1.32	3.86	0.00	0.00	0.00	0.00	0.00	0.00	9.92	1.25
133.00	871.00	0.73	28.70	1.37	0.68	2.51	3.07	1.39	3.89	0.00	0.00	0.00	0.00	0.00	0.00	9.82	1.25
142.00	1014.00	0.77	30.69	1.33	0.68	2.52	3.07	1.45	3.92	0.00	0.00	0.00	0.00	0.00	0.00	9.73	1.25
151.00	1157.00	0.82	32.77	1.29	0.67	2.53	3.07	1.51	3.94	0.00	0.00	0.00	0.00	0.00	0.00	9.64	1.25
160.00	1300.00	0.87	34.94	1.25	0.67	2.54	3.07	1.58	3.96	0.00	0.00	0.00	0.00	0.00	0.00	9.56	1.25

		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.46	10.85	0.01	0.00	0.00	0.00	0.00	3.06	3.59
88.00	157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.60	10.50	0.01	0.00	0.00	0.00	0.00	2.87	3.47
97.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.87	10.25	0.01	0.00	0.00	0.00	0.00	3.18	3.65
106.00	443.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	1.06	10.02	0.01	0.00	0.00	0.00	0.00	3.51	3.80
115.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	1.20	9.81	0.01	0.00	0.00	0.00	0.00	3.85	3.92
124.00	728.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74	1.30	9.61	0.01	0.00	0.00	0.00	0.00	4.20	4.03
133.00	871.00	0.00	0.00	0.00	0.00	0.00	0.00	0.87	1.38	9.42	0.01	0.31	1.41	0.00	0.00	4.57	4.11
142.00	1014.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	1.43	9.24	0.01	0.82	3.87	0.00	0.00	4.94	4.18
151.00	1157.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	1.48	9.08	0.01	1.34	6.59	0.00	0.00	5.32	4.23
160.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	1.21	1.51	8.92	0.01	1.86	9.50	0.29	1.41	5.71	4.27

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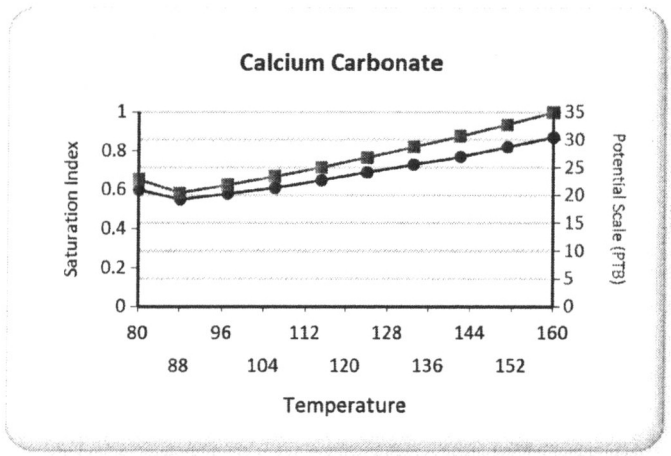
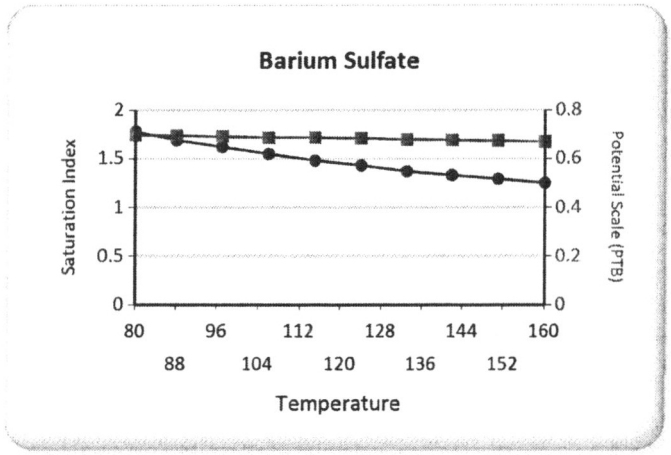
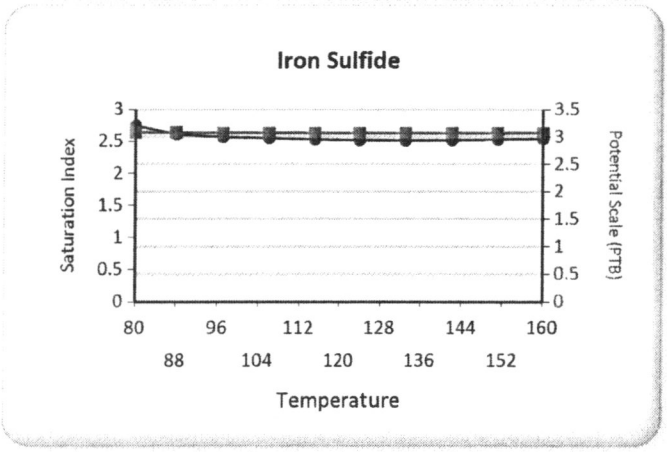
Water Analysis Report

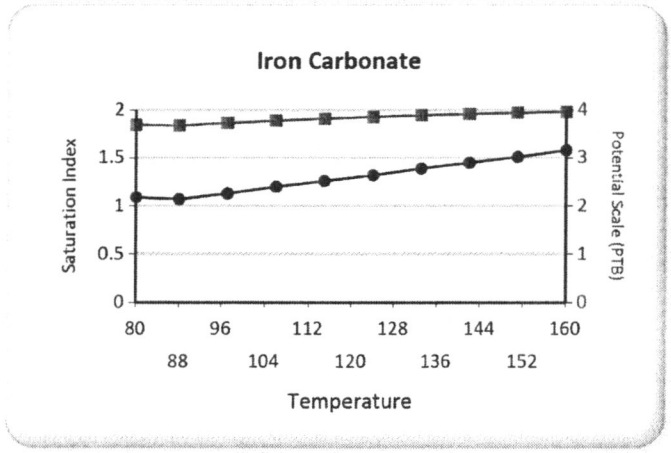
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Fe Silicate

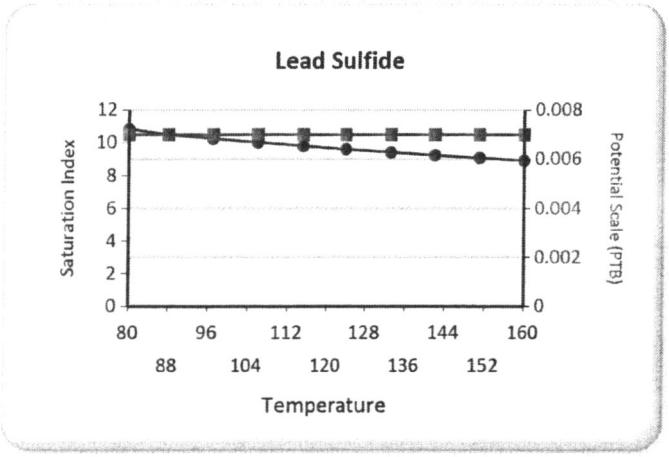
These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Mg Silicate Ca Mg Silicate Fe Silicate

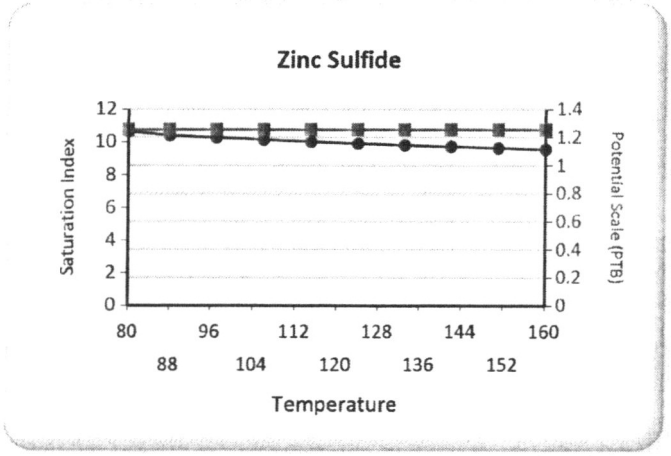












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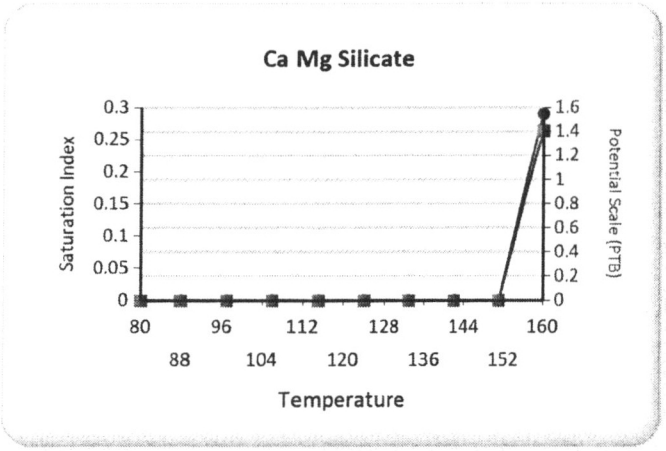
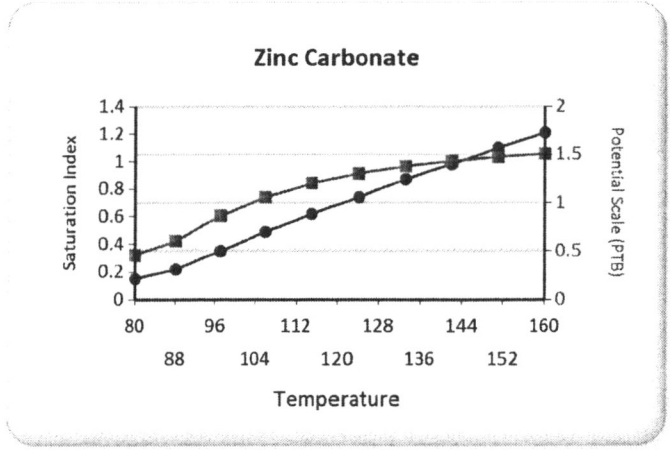
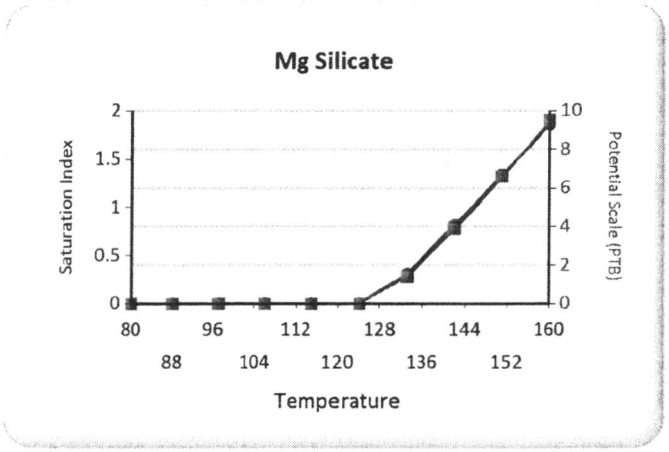
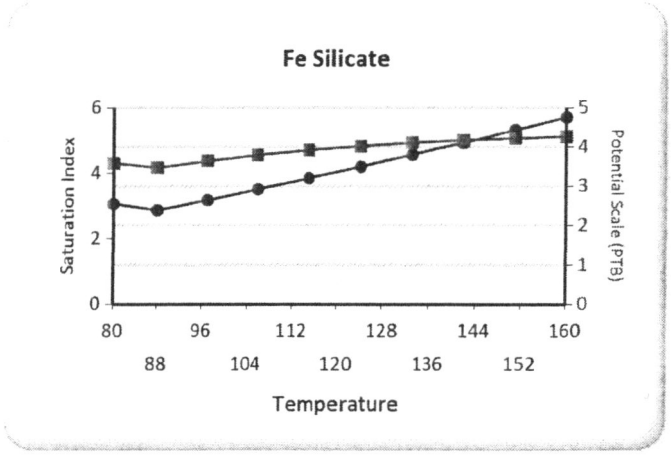








OMB No. 2040-0042 Approval Expires 12/31/2011

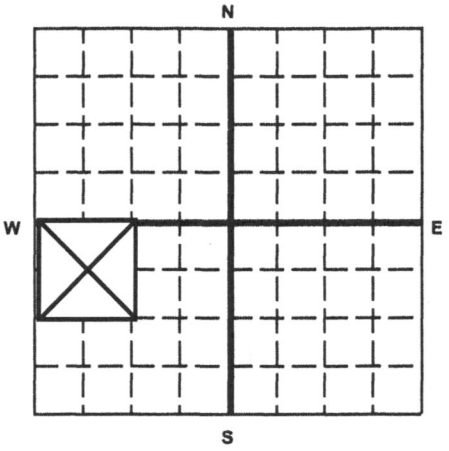
EPA

United States Environmental Protection Agency
Washington, DC 20460

ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee	Name and Address of Surface Owner
Petroglyph Operating Company, Inc. 2258 P.O. Box 7608 Boise, Idaho 83709	Ute Indian Tribe P.O. Box 70 Ft. Duchesne, Utah 84026

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Utah	Duchesne	UT2736-04640

Surface Location Description

___ 1/4 of ___ 1/4 of NW 1/4 of SW 1/4 of Section 15 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 3300 ft. frm (N/S) N Line of quarter section and 520 ft. from (E/W) W Line of quarter section.

WELL ACTIVITY
- [ ] Brine Disposal
- [x] Enhanced Recovery
- [ ] Hydrocarbon Storage

TYPE OF PERMIT
- [ ] Individual
- [x] Area

Number of Wells 111

Lease Name Ute Indian Tribe Well Number UTE TRIBAL 15-12

MONTH	YEAR	INJECTION PRESSURE AVERAGE PSIG	INJECTION PRESSURE MAXIMUM PSIG	TOTAL VOLUME INJECTED BBL	TOTAL VOLUME INJECTED MCF	TUBING -- CASING ANNULUS PRESSURE (OPTIONAL MONITORING) MINIMUM PSIG	TUBING -- CASING ANNULUS PRESSURE (OPTIONAL MONITORING) MAXIMUM PSIG
January	13	1799	1846	338		0	0
February	13	1811	1864	332		0	0
March	13	1850	1857	525		0	0
April	13	1856	1860	562		0	0
May	13	1853	1867	487		0	0
June	13	1831	1852	337		0	0
July	13	1823	1849	440		0	0
August	13	1843	1848	338		0	0
September	13	1855	1869	594		0	0
October	13	1853	1872	716		0	0
November	13	1837	1868	898		0	0
December	13	1820	1836	686		0	0

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Chad Stevenson, Water Facilities Supervisor	[signature]	2/11/2014

EPA Form 7520-11 (Rev. 12-08)

TAB 2 ODI

U2 Entered
Date 3/8/14
Initial 83

Multi-Chem Analytical Laboratory
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Units of Measurement: **Standard**

Water Analysis Report

Production Company: **PETROGLYPH ENERGY INC**
Well Name: **UTE TRIBAL 15-12 INJ**
Sample Point: **Wellhead**
Sample Date: **1/8/2014**
Sample ID: **WA-263383**

Sales Rep: **James Patry**
Lab Tech: **Gary Winegar**

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	1/15/2014
System Temperature 1 (°F):	180
System Pressure 1 (psig):	1300
System Temperature 2 (°F):	60
System Pressure 2 (psig):	15
Calculated Density (g/ml):	1.004
pH:	8.50
Calculated TDS (mg/L):	11466.54
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	0.00

Analysis @ Properties in Sample Specifics			
Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	2475.00	Chloride (Cl):	7000.00
Potassium (K):	72.00	Sulfate (SO_4):	19.00
Magnesium (Mg):	20.00	Bicarbonate (HCO_3):	1756.80
Calcium (Ca):	52.00	Carbonate (CO_3):	
Strontium (Sr):	6.00	Acetic Acid (CH_3COO)	
Barium (Ba):	14.00	Propionic Acid (C_2H_5COO)	
Iron (Fe):	28.00	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	0.03	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.00	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.17	Silica (SiO_2):	23.54

Notes:
B=5 Al=.04 Li=1.3

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
60.00	14.00	1.64	42.25	1.28	7.52	0.00	0.00	3.14	20.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73.00	157.00	1.64	42.22	1.13	7.22	0.00	0.00	3.20	20.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86.00	300.00	1.66	42.42	1.00	6.89	0.00	0.00	3.27	20.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	443.00	1.69	42.65	0.89	6.53	0.00	0.00	3.34	20.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113.00	585.00	1.72	42.89	0.79	6.15	0.00	0.00	3.40	20.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126.00	728.00	1.75	43.14	0.71	5.78	0.00	0.00	3.47	20.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140.00	871.00	1.79	43.39	0.63	5.42	0.00	0.00	3.53	20.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153.00	1014.00	1.83	43.64	0.57	5.08	0.00	0.00	3.60	20.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166.00	1157.00	1.88	43.87	0.52	4.77	0.00	0.00	3.66	20.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.00	1300.00	1.93	44.09	0.48	4.50	0.00	0.00	3.72	20.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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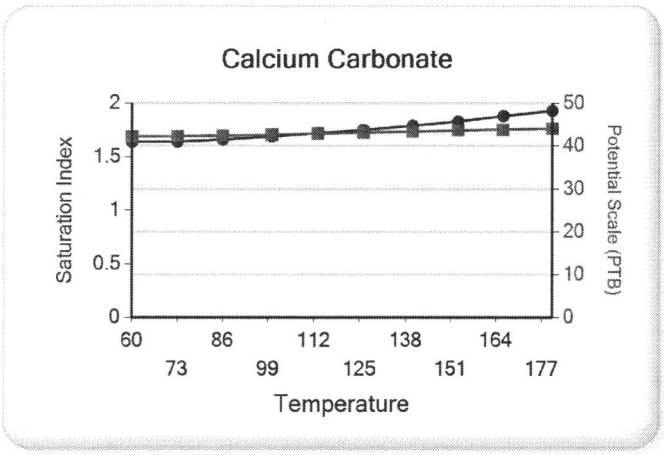
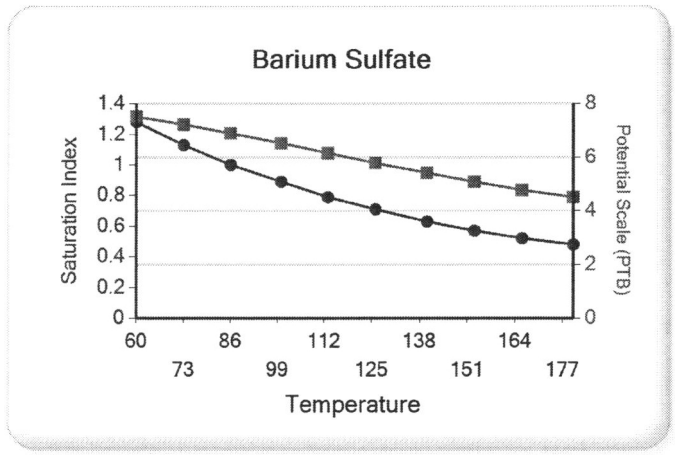
Water Analysis Report

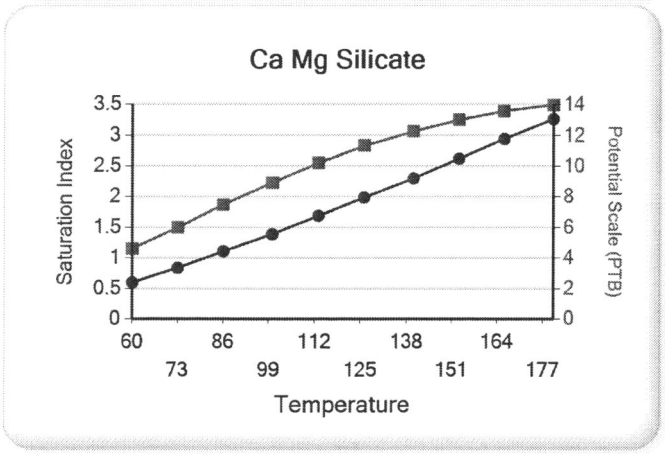
		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
60.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	8.62	0.60	4.61	10.71	21.67
73.00	157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69	11.31	0.84	5.99	10.92	21.68
86.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	14.17	1.11	7.50	11.20	21.70
100.00	443.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.76	16.87	1.39	8.91	11.50	21.72
113.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.32	19.37	1.69	10.19	11.82	21.73
126.00	728.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	3.88	21.63	1.99	11.31	12.16	21.75
140.00	871.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.01	0.00	0.00	4.45	23.61	2.30	12.25	12.52	21.76
153.00	1014.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.01	0.00	0.00	5.01	25.26	2.62	12.99	12.89	21.76
166.00	1157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.01	0.00	0.00	5.58	26.53	2.94	13.56	13.26	21.77
180.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.02	0.00	0.00	6.14	27.40	3.26	13.97	13.64	21.77

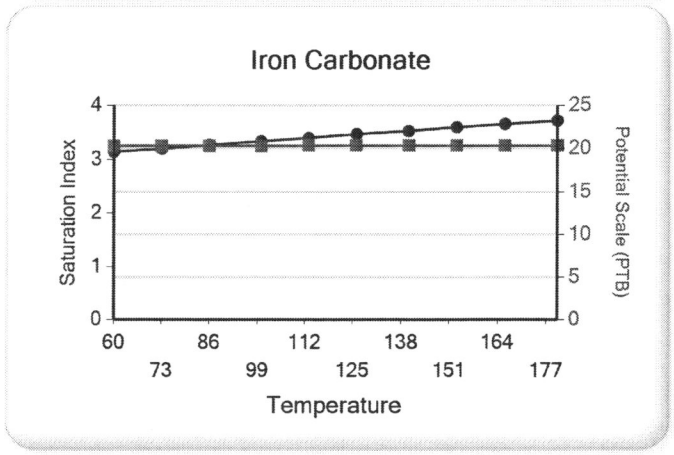
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

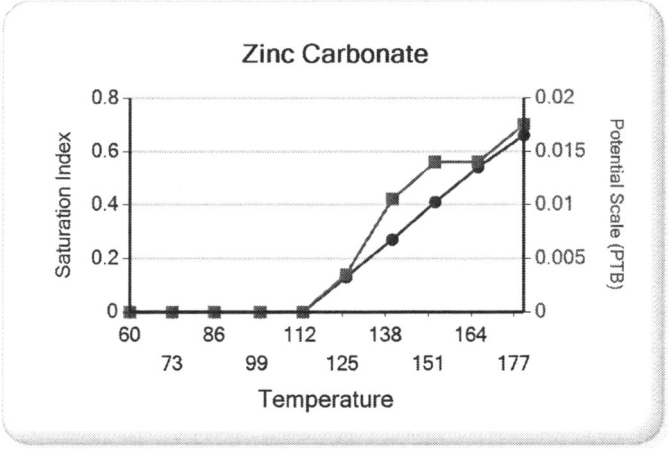
These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Carbonate Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

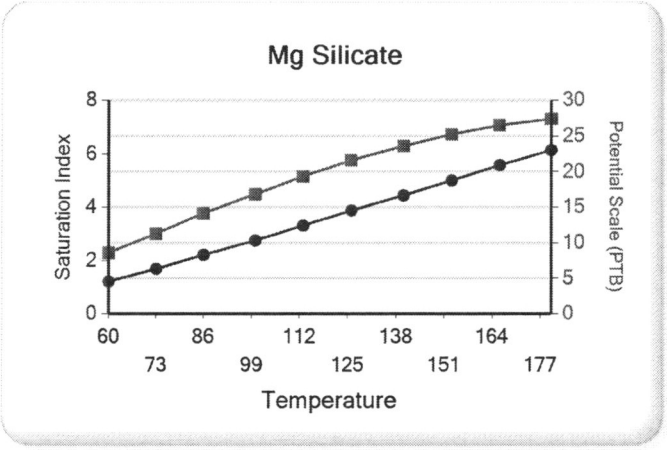


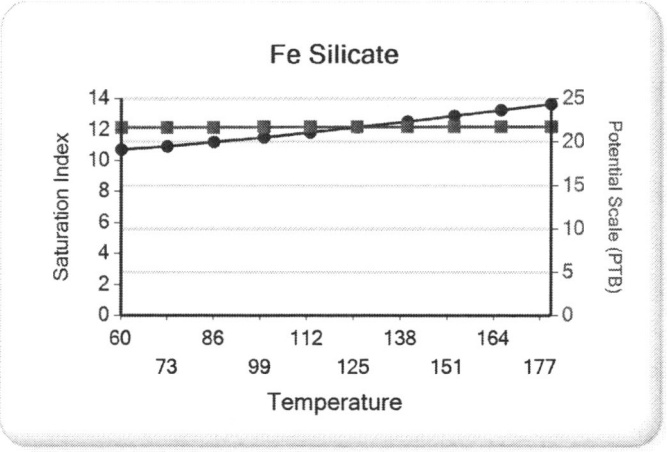







Zinc Carbonate
Saturation Index
Potential Scale (PTB)
0.8
0.6
0.4
0.2
0
0.02
0.015
0.01
0.005
0
60
86
112
138
164
73
99
125
151
177
Temperature


Mg Silicate
Saturation Index
Potential Scale (PTB)
8
6
4
2
0
30
25
20
15
10
5
0
60
86
112
138
164
73
99
125
151
177
Temperature


Fe Silicate
Saturation Index
Potential Scale (PTB)
14
12
10
8
6
4
2
0
25
20
15
10
5
0
60
86
112
138
164
73
99
125
151
177
Temperature