UNDERGROUND

INJECTION CONTROL

UIC 2D08701106003

PERMIT RENEWAL

APPLCATION

PEROT LOT 1, WELL 2

API 47-087-01106

APPLICANT:

C.I. MCKOWN & SON, INC.

P.O. BOX 711

9958 CLAY ROAD

NEWTON, WV 25266

CHECKLIST FOR FILING A UIC PERMIT APPLICATION

Please utilize this checklist to ensure you have prepared, completed, and enclosed all required documentation and payment to ensure a timely review of your submittal.

Operator	C.I. McKown & Son, Inc.		
Existing UIC Permit ID Number	2D0871106	UIC Well API Number	047-087-01106

Office of Oil and Gas Office Use Only	
Permit Reviewer	A. Lockwood
Date Received	1/26/18
Administratively Complete Date	
Approved Date	
Permit Issued	

First 10/16/18 Rec'd

Please check the fees and payment included.

Fees		Payment Type	
UIC Permit Fee: $500	✓	Check	✓
Groundwater Protection Plan (GPP) Fee: $50.00	✓	Electronic	
		Other	

Please check the items completed and enclosed.

CK No. 52142
$550.00
10/11/16

- ✓ Checklist
- ✓ UIC-1
  - ✓ Section 1 – Facility Information
  - ✓ Section 2 – Operator Information
  - ✓ Section 3 – Application Information
  - ✓ Section 4 – Applicant/Activity Request and Type
  - ✓ Section 5 – Brief description of the Nature of the Business
  - ✓ CERTIFICATION
- ✓ Section 6 – Construction
  - ✓ Appendix A Injection Well Form
  - ✓ Appendix B Storage Tank Inventory
- ✓ Section 7 – Area of Review
  - ✓ Appendix C Wells Within the Area of Review

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- [x] Appendix D Public Service District Affidavit
- [x] Appendix E Water Sources
- [ ] Appendix F Area Permit Wells
- [x] Section 8 – Geological Data on Injection and Confining Zones
- [x] Section 9 – Operating Requirements / Data
  - [x] Appendix G Wells Serviced by Injection Well
- [x] Section 10 – Monitoring
- [x] Section 11 – Groundwater Protection Plan (GPP)
  - [x] Appendix H Groundwater Protection Plan (GPP)
- [x] Section 12 – Plugging and Abandonment
- [x] Section 13 – Additional Bonding
- [x] Section 14 – Financial Responsibility
  - [x] Appendix I Financial Responsibility
- [x] Section 15 – Site Security Plan
  - [x] Appendix J Site Security for Commercial Wells
- [x] Section 16 – Additional Information
  - [x] Appendix K Other Permit Approvals

NOTE: For all 2D wells an additional bond in the amount of $5,000 is required.

Reviewed by (Print Name): C. I. McKown II

Reviewed by (Sign): President

Date Reviewed: 1-26-18

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UIC-1
(4/25)

WEST VIRGINIA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
601 57th Street, SE
Charleston, WV 25304
(304) 926-0450
www.dep.wv.gov/oil-and-gas

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

UIC PERMIT ID # 2D0871106 API # 047-087-01106 WELL # PEROT LOT #1, WELL #2

Section I. Facility Information

Facility Name: PEROT LOT #1, WELL #2

Address: North side of Otto Road (CR 48) on waters of Clover Run

City: SPENCER State: WV Zip: 25276

County: ROANE Smithfield District

Location description:

1 - 210 BBL WATER TANK AND 2 -100 BBL OIL TANKS WITH A WATER/OIL SEPARATOR ON TOP OF THE 210 BBL TANK. AN ELECTRIC POWERED INJECTION PUMP IS WITHIN THE SECONDARY CONTAINMENT AREA FOR THE TANKS AND IT IS ALL SITUATED ON THE SUBJECT DISPOSAL WELL LOCATION.

Location of well(s) or approximate center of field/project in UTM NAD 83 (meters):
Northing: 4288640.7 Easting: 476536.0
Latitude 38.746462
Longitude -81.271489

Environmental Contact Information:
Name: C.I McKOWN II Title: PRESIDENT
Phone: 3045657318 Email: cimckown@frontier.com

Section 2. Operator Information

Operator Name: C.I. McKOWN & SON, INC.
Operator ID: 307161

Address: P.O. BOX 711
City: NEWTON State: WV Zip: 25266
County: ROANE

Contact Name: C.I McKOWN II Contact Title: PRESIDENT
Contact Phone: 3045657318 Contact Email: cimckown@frontier.com

Section 3. Applicant Information

Ownership Status: ■ PRIVATE ☐ PUBLIC ☐ FEDERAL ☐ STATE
☐ OTHER (explain):

SIC code: ■ 1311 (2D, 2H, 2R) ☐ 1479 (3S) ☐ OTHER (explain):

Section 4. Applicant / Activity Request and Type:

A. Apply for a new UIC Permit: ☐ 2D ☐ 2H ☐ 2R ☐ 3S
B. Reissue existing UIC Permit: ■ 2D ☐ 2H ☐ 2R ☐ 3S
C. Modify existing UIC Permit: ☐ 2D ☐ 2H ☐ 2R ☐ 3S
(Submit only documentation pertaining to the modification request)
2D COMMERCIAL FACILITY: ☐ YES ☒ NO

Section 5. Briefly describe the nature of business and the activities to be conducted:

THE APPLICANT IS AN OIL AND NATURAL GAS PRODUCER THAT OWN/OPERATES WELLS IN CENTRAL WEST VIRGINIA. THE WELL GOVERNED BY THIS UIC PERMIT IS USED FOR THE INJECTION OF CLASS II COMPLIANT FLUIDS GENERATED BY THOSE WELLS.

CERTIFICATION

All permit applications must be signed by a responsible corporate officer for a corporation, by a general partner for a partnership, by the proprietor of a sole proprietorship, or by a principal executive or ranking elected official for a public agency, or a [1]duly authorized representative in accordance with 47CSR13-13.11.b.

A. Name and title of person applying for permit:

Print Name: C.I. McKOWN II

Print Title: PRESIDENT

B. Signature and Date.

I certify under 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.

Signature: P, President

Date: 1-26-18

[1] A person is a duly authorized representative if:

The authorization is made in writing by a person described in subdivision 47CSR13-13.11.a.

The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of the plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility.

The written authorization is submitted to the Director.

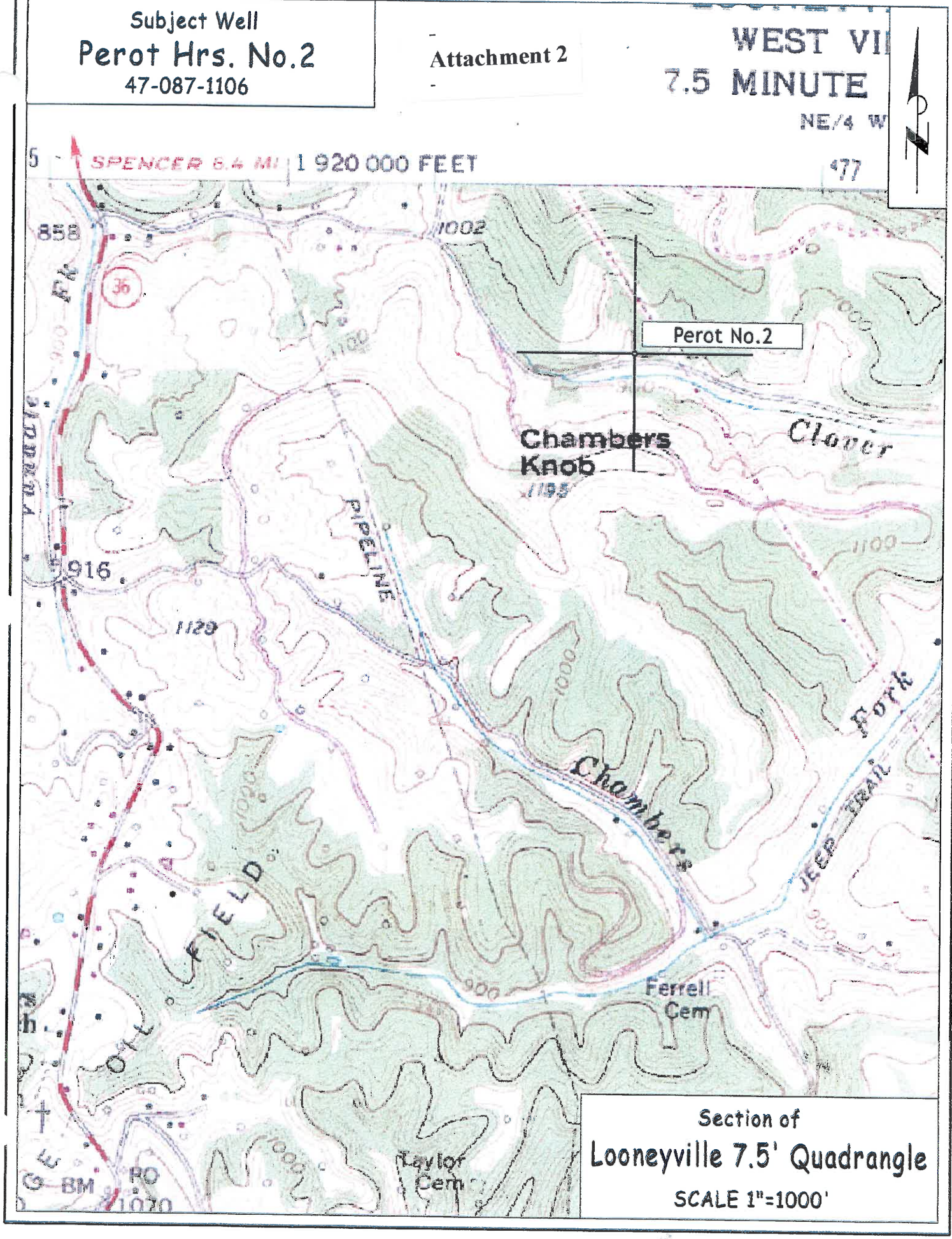
Section 6
Construction

Subject Well

Perot Hrs. No.2

47-087-1106

Attachment 2

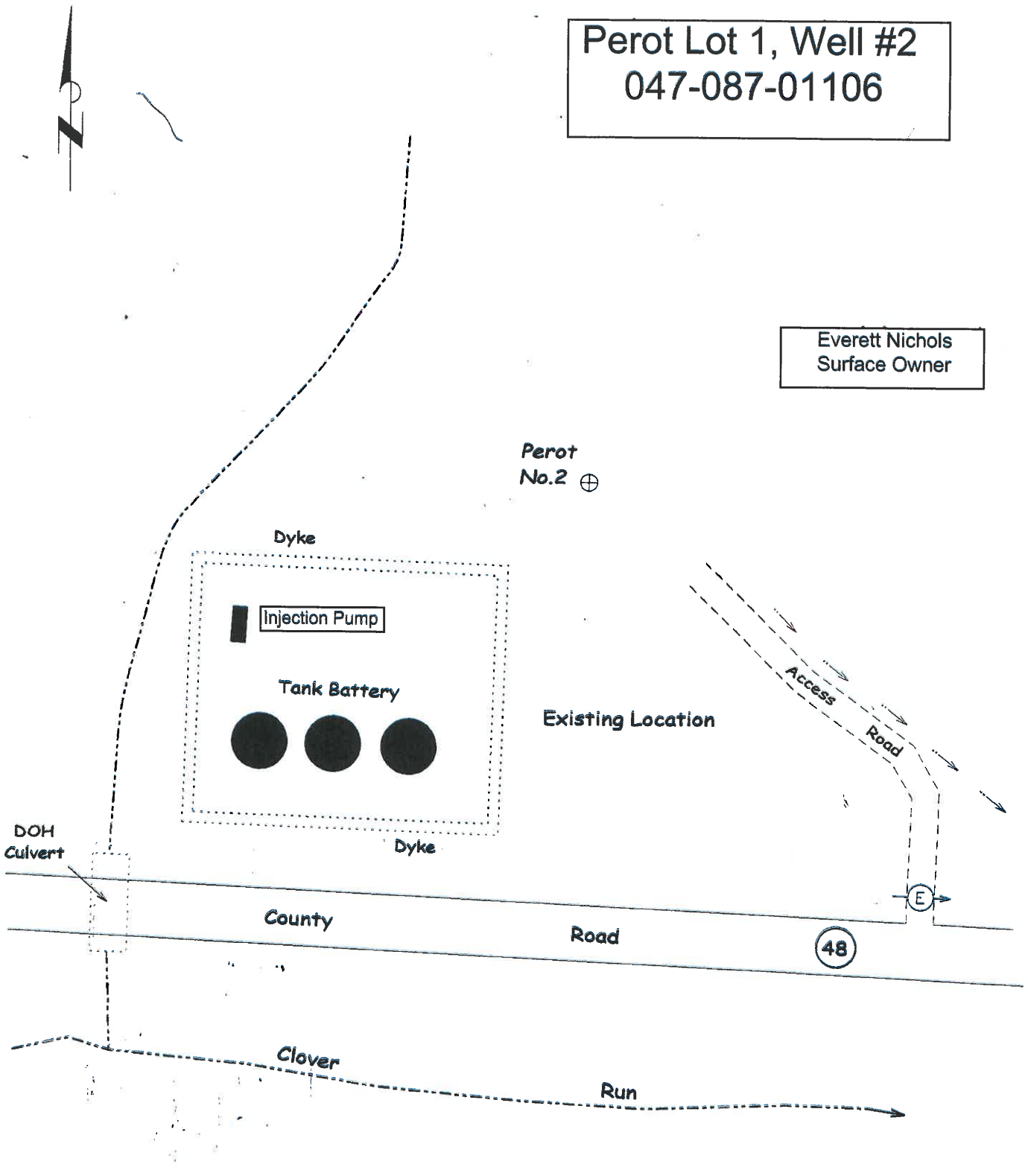


Section of

Looneyville 7.5' Quadrangle

SCALE 1"=1000'

Perot Lot 1, Well #2
047-087-01106



Westerly-most tank is 210 barrels and contains brine.

Middle and easterly-most tanks are 100 barrels each containing crude oil.

Additionally there is a 28 barrel water/oil separator located on top of the 210 barrel brine tank.

E - Existing Culvert

Note: Drawing not to Scale

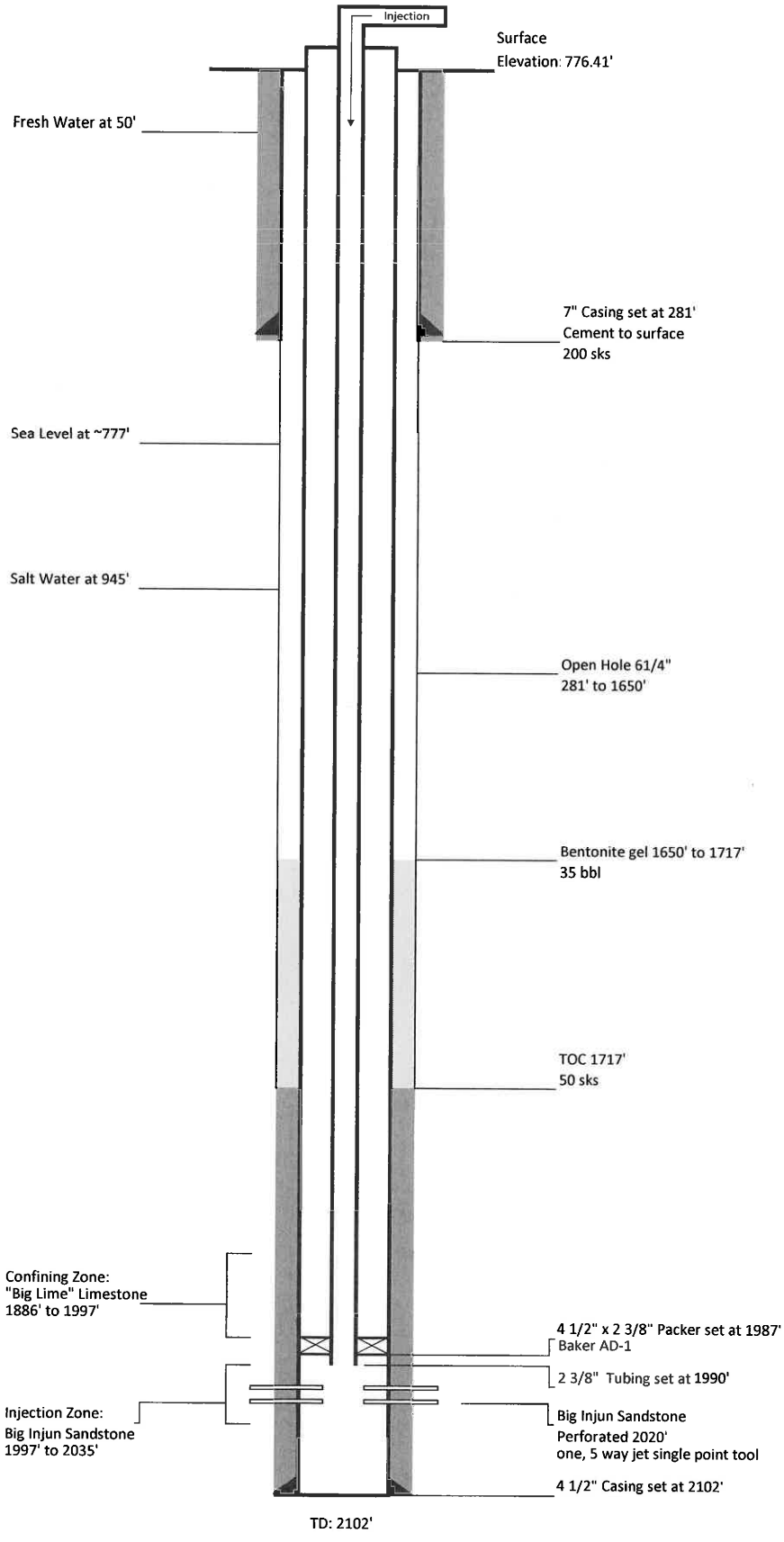
Section 6 – Construction

Perot Lot 1, Well 2 is located on the North side of Otto Road (CR 48) on the waters of Clover Run, Smithfield District, Roane County, West Virginia. Vehicular access is available only via this road and is restricted by a locked gate. The facility consists of two 100 barrel steel crude oil tanks and one 210 barrel steel brine tank with a 28 barrel steel water/oil separator setting atop the larger tank. The tanks are surrounded by an earthen secondary containment structure that exceeds 110% of the volume of the largest tank. Within the secondary containment are the injection pump, piping and control panel (see attached). The pump is controlled by an automatic switch based on the water level within the 210 barrel brine tank. Overpressure of the well is prevented by a regulator on the injection line that circulates water back to the brine tank when the maximum injection pressure is reached.

Water is received into the facility in three ways. Perot Lot 1, Well 3 (047-087-00869) pumps directly to the facility through the water/oil separator. Additionally, Perot Lot 3, Well 3 (047-087-00973) and Perot Lot 4, Well 2 (047-087-01059) pump through their own water/oil separators at different locations. The brine from each flows to a different 210 barrel tank equipped with a transfer pump. Water from this tank is manually pumped to the facility. Finally, produced water is sometimes trucked to the facility from other wells owned by the operator.

The tanks, valves, piping and pump will be routinely inspected and preventative maintenance done as necessary. Spills will be reported within 24 hours to be WVDEP Spill Line and a SPCC Plan is maintained by the operator on the tanks.

C.I. McKown & Son, Inc.
Perot Lot #1 Well #2
API 47-087-01106



APPENDIX A
Injection Well Form

1) GEOLOGIC TARGET FORMATION: BIG INJUN

Depth: 1997 Feet (top) 2035 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2102 Feet

3) Approximate water strata depths: Fresh 50 Feet Salt 945 Feet

4) Approximate coal seam depths: NONE

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 50 psig Source EXISTING WELLS IN FIELD

7) Estimated reservoir fracture pressure 2000 psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour)	5
Injection volume (bbl/day)	120
Injection pressure (psig)	688
Bottom hole pressure (psig)	1800

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:

PRODUCED FLUIDS (S.G. 1.1)

Temperature of injected fluid: (°F) AMBIENT

10) FILTERS (IF ANY)

YES. CANISTER FILTER ON DISCHARGE SIDE OF PUMP.

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

NONE

APPENDIX A (cont.)

12. Casing and Tubing Program

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor							
Fresh Water	7"	USED		17.0	281	281	230 SKS
Coal							
Intermediate 1							
Intermediate 2							
Production	4-1/2"			9.5	2103	2103	50 SKS
Tubing	2-3/8"			4.6	1990	1990	
Liners							

TYPE	Wellbore Diameter	Casing Size	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./sk)	Cement to Surface ? (Y or N)
Conductor							
Fresh Water	13"/10"	7"	0.231" MINIMUM WHEN NEW	1440 PSI MINIMUM WHEN NEW	CLASS A	1.18	Y
Coal							
Intermediate 1							
Intermediate 2							
Production	6.25"	4-1/2"	0.205" MINIMUM WHEN NEW	1990 PSI MINIMUM WHEN NEW	COLUMBIA	1.18	N
Tubing		2-3/8"	0.190" MINIMUM WHEN NEW	3500 PSI MINIMUM WHEN NEW			
Liners							

PACKERS	Packer #1	Packer #2	Packer #3	Packer #4
Kind:	BAKER AD-1			
Sizes:	4-1/2" X 2-3/8"			
Depths Set:	1987			

Form OG-10

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

WELL RECORD

Rotary ☐
Spudder ☐
Cable Tools ☒
Storage ☐

Quadrangle Walton
Permit No. ROA 1106
Oil or Gas Well Oil (KIND)

Company J and B Oil Company
Address 339½ Market Street Spencer, West Virginia
Farm T. Morris Perot Hrs. Acres 49
Location (waters) Clover Run
Well No. 2 Lot 1 Elev. 776.41'
District Smithfield County Roane
The surface of tract is owned in fee by T. Morris Perot Hrs
Address
Mineral rights are owned by T. Morris Perot and Henry Perot Address Philadelphia Pa.
Drilling commenced 8/26/65
Drilling completed 9/27/65
Date Shot From To
With
Open Flow /10ths Water in Inch
/10ths Merc. in Inch
Volume Cu. Ft.
Rock Pressure lbs. hrs.
Oil bbls., 1st 24 hrs.
WELL ACIDIZED (DETAILS) no
WELL FRACTURED (DETAILS) 10/21/64-41,700 Gal Water, 300 Gal X Service, 300 Gal, Mud Acid, 125 lbs J-100, 30 Gal Deterger, 40 Gal Prefle C 50,000lbs Sand
RESULT AFTER TREATMENT (Initial open Flow or bbls.) 10
ROCK PRESSURE AFTER TREATMENT 420 HOURS 24
Fresh Water Feet Salt Water 50 and 945 Feet
Producing Sand Injun Depth 2035

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer none
13			
10			Size of
8¼	1105		
6⅝	1650		Depth set
5 3/16	2105	2105	
4½			
3			Perf. top [redacted]
2			Perf. bottom [redacted]
Liners Used			Perf. top
			Perf. bottom

Attach copy of cementing record.
CASING CEMENTED 4½ SIZE 2105 No. Ft. 9/27/64 Date
Amount of cement used (bags) 50
Name of Service Co. Well Service
COAL WAS ENCOUNTERED AT no FEET INCHES
FEET INCHES FEET INCHES
FEET INCHES FEET INCHES

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Soil			0	9			
Rock	Red		9	25			
Rock	Red		25	50			
Slate			50	54	Water		
Sand			54	60			
Rock	Red		60	70			
Slate	Blue		70	80			
Rock	Red		80	140			
Slate			140	155			
Rock	Red		155	165			
Slate			165	170			
Rock	Red		170	200			
Slate	Green		200	228			
Sand			228	265			
Slate & Shells			265	324			
Sand			324	349			
Slate			349	353			
Sand			353	400			
Slate			400	480			
Rock	Red		480	515			
Slate			515	525			
Sand			525	536			
Sand			536	638			
Rock	Red		638	690			
Slate			690	705			
Rock	Red		705	805			
Slate			805	825			
Rock	Red		825	840			
Slate			840	866			

(over)

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
Sand			866	886			
Slate			886	974	Water 945'		
Sand			974	1081			
Sand			1081	1229			
Slate			1229	1270			
Sand			1270	1315			
Slate			1315	1365			
Sand			1365	1439			
Slate	Black		1439	1470			
Sand			1470	1500			
Slate	Black		1500	1605			
Sand			1605	1696			
Slate			1696	1758			
Sand			1758	1780			
Lime			1780	1792			
Rock	Red		1792	1802			
Sand			1802	1830			
Slate			1830	1840			
Lime			1840	1870			
Pencil Cave			1870	1886			
Lime			1886	1997			
Injun Sand			1997	2004			
Injun Sand			2004	2035			
Slate & Shells			2035	2102			

Date December 30, 1965

APPROVED J and B Oil Company, Owner

By _____ Pres
(Title)

Huggs-Johnston-Withrow, Beckley

TREATMENT REPORT

DWL-494-F PRINTED IN U.S.A.

DOWELL DIVISION OF THE DOW CHEMICAL COMPANY

DATE: 10-21-64

WELL NAME AND NUMBER: PEROT (LOT 1) #2	LOCATION: OTTO	CUSTOMER REPRESENTATIVE: ALLAN BEARD	TREATMENT NUMBER: 1-12-7439
POOL: OTTO	FORMATION: BIG INJUN	JOB DONE DOWN TUBING A ☐ CASING B ☑ ANNULUS C ☐	ALLOWABLE PRESSURE TBG: — CSG: 3500 PSI
COUNTY: RAND	STATE: WEST VIRGINIA	TYPE OF WELL 4 OIL A ☑ GAS B ☑ WATER C ☐ INJ. D ☐	
TYPE OF SERVICE: SLICK WATER - 41,700 GAL.		AGE OF WELL 5 NEW WELL A ☐ REWORK B ☐	TOTAL DEPTH 6: 2096' / CIRC. BHT.: N. AV.
CUST. NAME: J & B OIL COMPANY		CASING SIZE 8: 4½" OD / CASING DEPTH 9: 2089'	TUBING SIZE 10: NONE / TUBING DEPTH 11: —
ADDRESS: 639½ MARKET ST.		LINER SIZE 12: NONE / LINER DEPTH 13: —	PACKER TYPE 14: NONE / PACKER DEPTH 15: —
CITY AND STATE: SPENCER, WEST VIRGINIA		OPEN HOLE 16: NONE / CSG. OR ANRL. VOL. 17: 32.3 BBLS	TBG VOLUME 18: — / STATIC BHT. 19: 70 °F

REMARKS: 125-J-100 5500 gal 20-40
30 DET 300 RMA
40 FRE.C

FOR CONVERSION PURPOSES 24 BBLS EQUALS 1000 GALLONS

ARRIVED ON LOCATION: 0830

PERFORATED INTERVALS

DEPTH	NO. OF HOLES	DEPTH	NO. OF HOLES	DEPTH	NO. OF HOLES
2020	5				

TIME	INJECTION RATE	INJECTION BBLS IN	PRESSURE CSG	SERVICE LIQUID (A)	SERVICE PURPOSE	(B) FLA.—CONC.	(C) PROPPING AGENT OR (D) PLUGGING SERVICE TYPE	SIZE	CONC.	AMOUNT
1030					HOOKED UP	- HOLD	SAFETY	MEETING		
1041	—	0	0	RMA	LOAD					
1044	—	8	—	SLW	TEST LINES	J-100	3.0			
1101	—	34	0	SLW	LOAD					
1103	—	36	1050	SLW	BREAKDOWN					
1104	35.0	60	2000	SLW	MAX. INJECTION					
1105	0.0	0	2000	SLW	FRAC	J-100 3.0	SAND	20-40	0.5	0
1107	36.0	72	1900	"	"	"	"	"	0.75	
1110	36.0	180	1950	"	"	"	"	"	1.0	
1113	37.0	291	1900	"	"	"	"	"	1.25	
1116	37.0	402	1900	"	"	"	"	"	1.5	
1120	37.0	550	1950	"	"	"	"	"	1.5	
1124	36.0	694	2000	"	"	"	"	"	1.5	
1128	34.5	832	2100	"	"	"	"	"	1.5	
1130	33.0	898	2250	"	FLUSH	"	—	—	—	50000#
1132	31.0	948	2500	"	JOB COMPLETE	"	—	—	—	

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JAN 26 2018
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TIME LEFT LOCATION	AVER. LIQUID INJ. RATE	ADJ. INJ. RATE (SOLIDS INC.)
1230	33.99 BPM	35.9 BPM

MAX. PRESSURE	AVER. PRESSURE	SHUT IN PRESSURE IMMEDIATE	SHUT IN PRESSURE 5 MINUTE
2500 PSI	1990 PSI	1800 PSI	1400 PSI

PROPS AND LIQUIDS INJECTED

TYPE	SIZE OR PURPOSE	AMOUNT
SLICKWATER	CARRY SAND	41,700 GAL
SAND	20-40	50000 LBS

DOWELL LOCATION: GLENVILLE

DOWELL ENGINEER: WESTERMAN

(A) NOTE: SEE (AA) FOR SPECIAL ADDITIVES

MA—MUD ACID
X—HCL ACID
APF—ACID PETROFRAC
FA—FRAC ACID
BDA—BREAKDOWN ACID
LO—LEASE OIL
RO—REFINED OIL
DO—DIESEL OIL
KE—KEROSENE
PJ—PETROJEL
PF—PETROFRAC
FW—FRESH WATER
BR—BRINE
WF—WATERFRAC
M41—M41 GEL
ST—STRATAFRAC
VR—VERSENE
SSS—TRIPLE S ACID
SLW—SLICK WATER
SLO—SLICK OIL
MUD—DRILLING MUD
RXI—RETARDED ACID I
RX2—RETARDED ACID II
RX3—RETARDED ACID III

(AA) ADDITIVES IN FLUID (EXCEPT FLA*)
CONC. IS GIVEN IN LBS. OR GALS. PER 1000 GALS. OF TOTAL GALS.

TYPE	TREATED	CONC.
DET	41,700	.72
FRE.C	41,700	.96

(B) CONC. IS GIVEN IN LBS. OR GALS. PER 1000 GALS. OF LIQUID
J97—DOWELL J97
J101—DOWELL J101
J84—DOWELL J84
J98—DOWELL J98
J99—DOWELL J99

J-100	3.0

(C) SIZE IS GIVEN IN MESH RANGE CONC. IS GIVEN IN LBS. PER GALLON OF LIQUID
S—SAND
WS—WALNUT SHELLS
AL—ALUMINUM
NY—NYLON

S-20-40	1.33

(D)
FF—X830 FIXAFRAC
KJ—X820 GEL
DO—GELLED OIL
DW—GELLED WATER
RB—RUBBER BALLS
NCB—NYLON CORE BALLS
PB—PERMEABLE BALLS
MB—MOTH BALLS
RS—ROCK SALT
OS—OYSTER SHELLS

CALL BACK | DATE | CUSTOMER REP. CONTACTED | CUSTOMER CONSIDERED SERVICE ☐ SATISFACTORY ☐ UNSATISFACTORY ☐ UNKNOWN | PROD. BEFORE TREATMENT ☑ NEW TEST TEST ☐ ALLOWABLE ☐ | DAYS | PROD. AFTER TREATMENT TEST ☐ ALLOWABLE ☐

TREATMENT REPORT
DWL-494-F PRINTED IN U.S.A.

DOWELL DIVISION OF THE DOW CHEMICAL COMPANY

DATE: 11-28-1963

WELL NAME AND NUMBER: Perot Lot 3 Well 3
LOCATION: Otto
CUSTOMER REPRESENTATIVE: Allen Beard
TREATMENT NUMBER: 1-12 6052
POOL: Clover
FORMATION: Big Injun
JOB DONE DOWN: TUBING A ☐ CASING B ☒ ANNULUS C ☐
ALLOWABLE PRESSURE: TBG: CSG 3500
COUNTY: Roane
STATE: West Virginia
TYPE OF WELL: OIL A ☒ GAS B ☒ WATER C ☐ INJ. D ☐
TYPE OF SERVICE: 47745 Riverfrac
AGE OF WELL: NEW WELL A ☒ REWORK B ☐
TOTAL DEPTH: 2046
CIRC. BHT.: ?
CUST. NAME: J+B oil Company
CASING SIZE: 4 1/2 | CASING DEPTH: 2018 | TUBING SIZE: — | TUBING DEPTH: —
ADDRESS: 639 1/2 Market St
LINER SIZE: — | LINER DEPTH: — | PACKER TYPE: — | PACKER DEPTH: —
OPEN HOLE: 4 inch | CSG. OR ANRL. VOL.: 33 | TBG VOLUME: — | STATIC BHT.: 70
CITY AND STATE: Spencer, West Virginia

REMARKS: Mix 150# J100 in 1300 BBls water
Leave 151 BBls in Tanks

PERFORATED INTERVALS

DEPTH	NO. OF HOLES	DEPTH	NO. OF HOLES	DEPTH	NO. OF HOLES
OH					
2018					
2046					

FOR CONVERSION PURPOSES 24 BBLS EQUALS 1000 GALLONS

ARRIVED ON LOCATION: 0800 Hook up & Circulate J100 & Detergent

TIME	INJECTION RATE	BBLS IN	PRESSURE Casing		LIQUID (A)	PURPOSE	(B) FLA.—CONC.	(C) PROPPING AGENT OR (D) PLUGGING SERVICE TYPE	SIZE	CONC.	AMOUNT
910					Acid	Spearhead					
915		12			Acid in	Safety Meeting					
925					SLW	Test lines					
930		33			SLW	Breakdown					
931					SLW	Broke 1300					
932	33	66	1400		SLW	~~Rate~~					
933	33	99	1400		SLW	Leak in 4 in Hose Shut Down					
936					SLW	Frac		Sand	2040	1	
941	32	259	1600		SLW	Frac				1 1/4	
946	32	419	1600		SlW					1 1/2	
951	31	574	1650		SlW						
956	31	729	1650		SlW						
1000	30	849	1700		SlW						
1006	30	1029	1700		SlW						
1008	30	1089	1700		SlW						
1010	30	1149	1700		SlW	Sand in Flush					52000
1014			1300			Flush in 60 BBls					
						Shut in					

TIME LEFT LOCATION: 01100
AVER. LIQUID INJ. RATE: 31.5
ADJ. INJ. RATE (SOLIDS INC.): 30.9
MAX. PRESSURE: 1700
AVER. PRESSURE: 1621
SHUT IN PRESSURE: IMMEDIATE 1300 | 15 MINUTE open
DOWELL LOCATION: G. Ienville W.Va
DOWELL ENGINEER: [signature]

PROPS AND LIQUIDS INJECTED

TYPE	SIZE OR PURPOSE	AMOUNT
Sand	2040	52000

(A) NOTE: SEE (AA) FOR SPECIAL ADDITIVES
MA—MUD ACID
X—HCL ACID
APF—ACID PETROFRAC
FA—FRAC ACID
BDA—BREAKDOWN ACID
LO—LEASE OIL
RO—REFINED OIL
DO—DIESEL OIL
KE—KEROSENE
PJ—PETROJEL
PF—PETROFRAC
FW—FRESH WATER
BR—BRINE
WF—WATERFRAC
M41—M41 GEL
ST—STRATAFRAC
VR—VERSENE
SSS—TRIPLE S ACID
SLW—SLICK WATER
SLO—SLICK OIL
MUD—DRILLING MUD
RX1—RETARDED ACID I
RX2—RETARDED ACID II
RX3—RETARDED ACID III
500 XE Spearhead

(AA) ADDITIVES IN FLUID (EXCEPT FLA*)
CONC. IS GIVEN IN LBS. OR GALS. PER 1000 GALS. OF TOTAL GALS. TREATED
TYPE / CONC
Det 47754 .78

(B) CONC. IS GIVEN IN LBS. OR GALS. PER 1000 GALS. OF LIQUID
J97—DOWELL J97
J101—DOWELL J101
J84—DOWELL J84
J98—DOWELL J98
J99—DOWELL J99
J100 56600 2.7

(C) SIZE IS GIVEN IN MESH RANGE CONC. IS GIVEN IN LBS. PER GALLON OF LIQUID
S—SAND
WS—WALNUT SHELLS
AL—ALUMINUM
NY—NYLON
Sand 4158012

(D)
FF—X830 FIXAFRAC
KJ—X820 GEL
DO—GELLED OIL
DW—GELLED WATER
RB—RUBBER BALLS
NCB—NYLON CORE BALLS
PB—PERMEABLE BALLS
MB—MOTH BALLS
RS—ROCK SALT
OS—OYSTER SHELLS

CALL BACK | DATE | CUSTOMER REP. CONTACTED | CUSTOMER CONSIDERED SERVICE ☐ SATISFACTORY ☐ UNSATISFACTORY ☐ UNKNOWN | PROD. BEFORE TREATMENT ☐ TEST ☐ ALLOWABLE | PROD. AFTER TREATMENT DAYS ☐ TEST ☐ ALLOWABLE

CUSTOMER

TREATMENT NUMBER

A

(A) NOTE: SEE (AA) FOR SPECIAL ADDITIVES

MA—MUD
X—HCL ACID
APF—ACID PETROFRAC
FA—FRAC ACID
BDA—BREAKDOWN ACID
LO—LEASE OIL
RO—REFINED OIL
DO—DIESEL OIL
KE—KEROSENE
PJ—PETROJEL
PF—PETROFRAC
FW—FRESH WATER
BR—BRINE
WF—WATERFRAC
M41—M41 GEL
ST—STRATAFRAC
VR—VERSENE
SSS—TRIPLE S ACID
SLW—SLICK WATER
SLO—SLICK OIL
MUD—DRILLING MUD
RX1—RETARDED ACID I
RX2—RETARDED ACID II
RX3—RETARDED ACID III

AA

(AA) ADDITIVES IN FLUID (EXCEPT FLA*)

CONC. IS GIVEN IN LBS. OR GALS. PER 1000 GALS. OF TOTAL GALS.

TYPE	TREATED	CONC.

B

(B) CONC. IS GIVEN IN LBS. OR GALS. PER 1000 GALS. OF LIQUID

J97—DOWELL J97
J101—DOWELL J101
J84—DOWELL J84
J98—DOWELL J98
J99—DOWELL J99

C

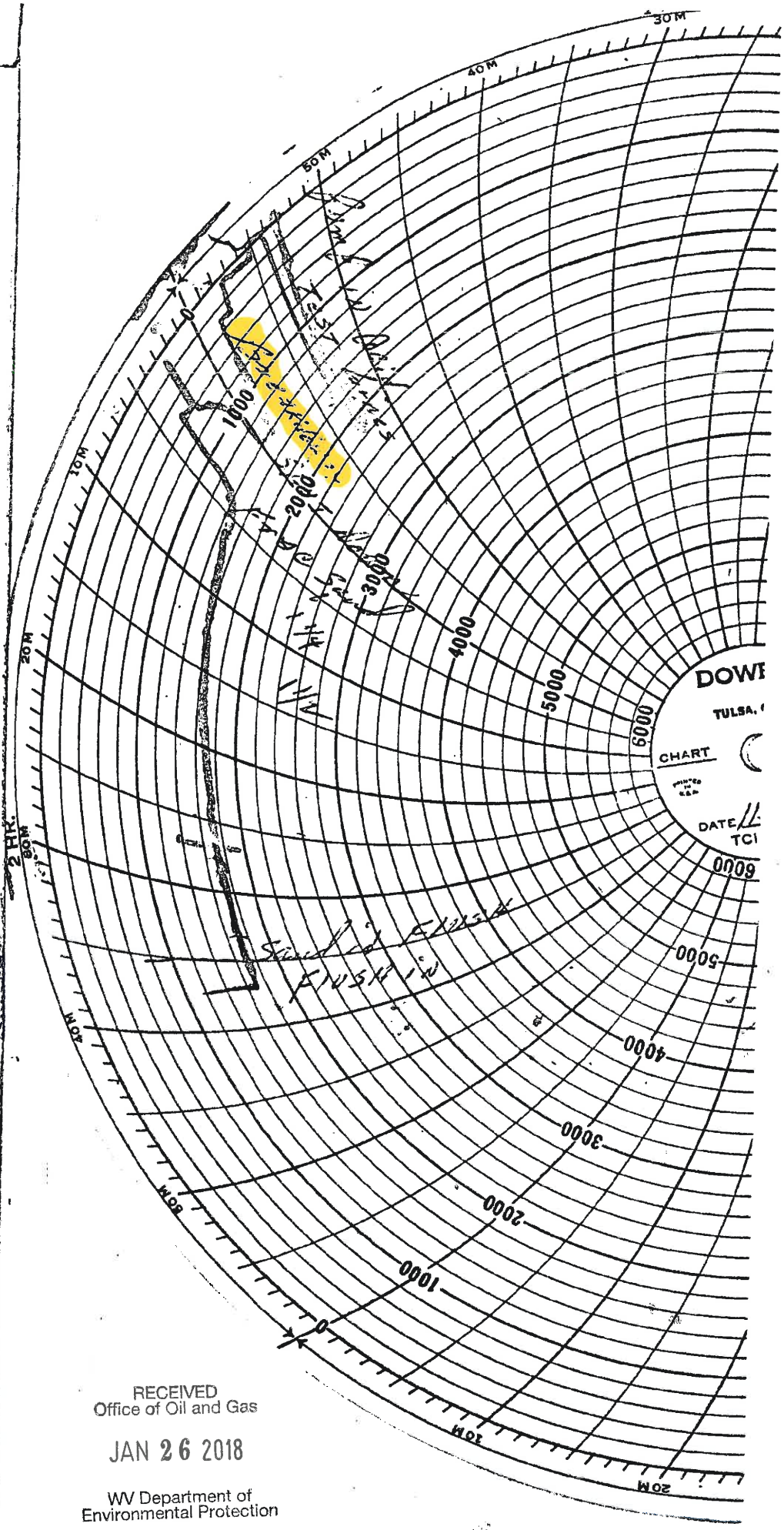
(C) SIZE IS GIVEN IN MESH RANGE CONC. IS GIVEN IN LBS. PER GALLON OF LIQUID

S—SAND
WS—WALNUT SHELLS
AL—ALUMINUM
NY—NYLON

D

(D)

FF—X830 FIXAFRAC
KJ—X820 GEL
DO—GELLED OIL
DW—GELLED WATER
RB—RUBBER BALLS
NCB—NYLON CORE BALLS
PB—PERMEABLE BALLS
MB—MOTH BALLS
RS—ROCK SALT
OS—OYSTER SHELLS



WELL SERVICE, INC.

19TH FLOOR KANAWHA VALLEY BLDG., CHARLESTON 1, W. VA.

DATE [illegible]

TICKET NO. (47)

Company J & B Oil Co. Time called for ____ Time on job 4:05 pm

P. O. - Street ____ Job started 5:00 pm Finished 7:10 pm

City - State Spencer, W. Va. Waiting time None Road Condition OK

Lease Brott Well No. 2 Tractor Used No

County Roane State W. Va. Contractor Self Unit No. 94

SALES SERVICE ENGINEER WORK DATA

It is mutually agreed by both parties involved that WELL SERVICE, INC., equipment No. 44 is leased to Same and will operate under their supervision. Our Engineer, and his crew will, in a competent and cooperative manner, efficiently operate the equipment and with additional assistance, if needed, to be furnished by the lessee. Due to many unknown and variable conditions, of which we have no mutual knowledge or control, it requires WELL SERVICE, INC. not to assume any responsibility toward unsuccessful results or incompletion of the operation.

Sales Service Engineer Thorpe Crew Hicks + Wrenney

Company J & B Oil Co. Supervisor [illegible]

Casing Size 4½" | Tubing Size | Packer Set | Wt. ____ Depth 2165 | Size Open Hole | Total Depth | Bridge Top

Type Operation:

- Casing pressure cement
- Casing Balance cement
- Casing Comb. Gel-cement
- ~~Casing Squeeze cement~~
- Prepare Mud
- Plugging Gel-cement
- Pumping Casing-Tubing
- Formation Cement Squeeze
- Formation Chem. Squeeze
- Killing well mud-water
- Acidizing
- Cement Plug Back

Special Tool Used [illegible]

Materials:

Name Cement

Type Columbia

Sacks 50

Gallons ____

Wt. per gal. ____

Ad-mix 7 Bg. Gel

Other ____

Viscosity ____

Temp. ____

Hole Condition:

Fluid ____

Gas @ ____

Pipe leaking ____

Shoe leaking ____

General Charges:

Job	250.00	Type	Cement job
Xtra Pumping		Hrs.	
Wait on Job		Hrs.	
Mileage		R. T.	
Material	87.00	Name	50 Bgs. Cement
Material		Name	
Material		Name	
Material		Name	
Xtra Unit		Hrs.	
Stand By Unit		Type	
Trans.		Type	
Chemical		Gals.	
Special Plugs		Type	

TOTAL CHARGES 337.00

COMPLETION REPORT

Normal pump pressure 150# Max. 500# Return circulation at surface Yes

Return circulation of materials Yes Gel

General Remarks: Washed hole with fresh water - Run 7 Bg. Gel in Fresh water.
Run Bottom Rubber Plug
Run Top Rubber Plug - Stopped on [illegible]

Acidizing or Chemical Data

Name Formation ____

Character Formation ____

Gas/Oil Volume ____

Rock Pressure ____

Type Acid/Chemical ____

Gallons ____ %

#1 Stage ____ #2 ____

1st Pay ____

2nd Pay ____

Injection Rate ____

CEMENTING SERVICE REPORT

DS-495-P PRINTED IN U.S.A.

DOWELL SCHLUMBERGER INCORPORATED

TREATMENT NUMBER: 2-72 DATE: 4-6-85
STAGE: DS DISTRICT: Glenville

WELL NAME AND NO.: Perrot
LOCATION (LEGAL): Rand Road
FIELD-POOL:
FORMATION:
COUNTY/PARISH: Roane
STATE: W.Va.
API. NO.:

NAME: Big B Drilling
AND
ADDRESS: P.O. Box 20 Sissonville, W.Va.
ZIP CODE

RIG NAME:

WELL DATA:		BOTTOM		TOP
BIT SIZE	CSG/Liner Size	7"	4½" casing inside of 7"	
TOTAL DEPTH	WEIGHT	17#		
☐ ROT ☐ CABLE	FOOTAGE			
MUD TYPE	GRADE			
☐ BHST ☐ BHCT	THREAD	8RD		
MUD DENSITY	LESS FOOTAGE SHOE JOINT(S)			TOTAL
MUD VISC.	Disp. Capacity	6.2 BBL		

NOTE: Include Footage From Ground Level To Head In Disp. Capacity

Float SHOE	TYPE		Stage Tool	TYPE	
	DEPTH			DEPTH	
	TYPE	N/A		TYPE	N/A
	DEPTH			DEPTH	

Head & Plugs	☐ TBG ☐ D.P.	SQUEEZE JOB	
☐ Double	SIZE	TOOL TYPE	
☐ Single	☐ WEIGHT	TOOL DEPTH	
☒ Swage	☐ GRADE	TAIL PIPE: SIZE	DEPTH
☐ Knockoff	☐ THREAD N/A	TUBING VOLUME N/A	Bbls
TOP ☐ R ☐ W	☐ NEW ☐ USED	CASING VOL. BELOW TOOL	Bbls
BOT ☐ R ☐ W	DEPTH	TOTAL	Bbls
		ANNUAL VOLUME	Bbls

SPECIAL INSTRUCTIONS

Cement 7" casing w/ 4½" casing inside of 7". 6.2 BBL volume between 7" and 4"

PRESSURE LIMIT PSI | BUMP PLUG TO PSI
ROTATE RPM | RECIPROCATE FT | No. of Centralizers

JOB SCHEDULED FOR TIME: ASAP DATE: 4-6
ARRIVE ON LOCATION TIME: 1530 DATE: 4-6
LEFT LOCATION TIME: 2000 DATE: 4-6

TIME 0001 to 2400	PRESSURE TBG OR D.P.	PRESSURE CASING	VOLUME PUMPED BBL INCREMENT	VOLUME PUMPED BBL CUM	INJECT RATE	FLUID TYPE	FLUID DENSITY	SERVICE LOG DETAIL
								PRE-JOB SAFETY MEETING
1630			Arrived + Checked location - Hooked up pumper - Wait on Bulk Truck w/ cement					
			Completed Hook up					discussed Job procedures
			2	—	3	H2O	8.32	Pumped H2O
			21	3	3	Cmt	15.6	Mixed + Pumped Cement
			6	24	3	H2O	8.32	Displaced w/ H2O
				30				Shut Down
			Washup Pumper - Racked up Trucks					
2000			Left Location					

REMARKS

SYSTEM CODE	NO. OF SACKS	YIELD CU. FT/SK	COMPOSITION OF CEMENTING SYSTEMS	SLURRY MIXED BBLS	SLURRY MIXED DENSITY
1.	100	1.17	Standard Cement w/ 3% CACL	21	15.6
2.					
3.					
4.					
5.					
6.					

BREAKDOWN FLUID TYPE	VOLUME	DENSITY	PRESSURE MAX. MIN.
☐ HESITATION SQ. ☐ RUNNING SQ.	CIRCULATION LOST	☐ YES ☐ NO	Cement Circulated To Surf. ☐ YES ☐ NO
BREAKDOWN PSI FINAL PSI	DISPLACEMENT VOL. BBLS		TYPE WELL ☐ OIL ☐ GAS ☐ STORAGE ☐ INJECTION
Washed Thru Perfs ☐ YES ☐ NO TO FT	MEASURED DISPLACEMENT ☐ ☐ WIRELINE		
PERFORATIONS	CUSTOMER REPRESENTATIVE		DS SUPERVISOR
TO TO			

DWL-496-N PRINTED IN U.S.A.

DOWELL DIVISION OF DOW CHEMICALS
AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY

TREATMENT NUMBER: 01-73-3831 | DATE: 4/18/83
STAGE | DOWELL DISTRICT: [illegible]

WELL NAME AND NO.: Perrot
LOCATION (LEGAL): Otto Rd
RIG NAME: Jones Service Rig
FIELD-POOL
FORMATION
COUNTY/PARISH: [illegible]dane Co
STATE: WV
API. NO.

NAME: Big "B" Drilling
AND
ADDRESS
ZIP CODE

WELL DATA

				BOTTOM			TOP
BIT SIZE		CSG/LINER SIZE	7"				
TOTAL DEPTH	281	WEIGHT	20#				
☐ ROT ☐ CABLE		FOOTAGE	281				
MUD TYPE		GRADE	used				
☐ BHST ☐ BHCT		THREAD					
MUD DENSITY		LESS FOOTAGE SHOE JOINT(S)					TOTAL
MUD VISC.		DISP. CAPACITY	11				

NOTE: INCLUDE FOOTAGE FROM GROUND LEVEL TO HEAD IN DISP. CAPACITY

			STAGE TOOL	
FLOAT	TYPE		TYPE	
	DEPTH		DEPTH	
SHOE	TYPE	Open ended	TYPE	
	DEPTH	281	DEPTH	

SPECIAL INSTRUCTIONS
Squeeze 7" Casing As
Customer Instructions

HEAD & PLUGS	☐ TBG ☐ D.P.	SQUEEZE JOB
☐ DOUBLE	SIZE	TOOL TYPE
☐ SINGLE	☐ WEIGHT	TOOL DEPTH
☒ SWAGE	☐ GRADE	TAIL PIPE: SIZE DEPTH
☐ KNOCKOFF	☐ THREAD	TUBING VOLUME Bbls
TOP ☐ R ☐ W	☐ NEW ☐ USED	CASING VOL. BELOW TOOL Bbls
BOT ☐ R ☐ W	DEPTH	TOTAL Bbls
		ANNUAL VOLUME Bbls

PRESSURE LIMIT 500 PSI | BUMP PLUG TO ——— PSI
ROTATE RPM | RECIPROCATE FT | NO. OF CENTRALIZERS

JOB SCHEDULED FOR TIME: 1400 DATE: 4/18
ARRIVE ON LOCATION TIME: 1400 DATE: 4/18
LEFT LOCATION TIME: DATE:

TIME 0001 to 2400	PRESSURE TBG OR D.P.	PRESSURE CASING	VOLUME PUMPED BBL INCREMENT	VOLUME PUMPED BBL CUM	INJECT RATE	FLUID TYPE	FLUID DENSITY	SERVICE LOG DETAIL
								PRE-JOB SAFETY MEETING Yes
1400								Arrived on Location Spot Truck & Hookup
								Wait on Swage
1700				8	1	H_2O		Pump H_2O To break Circulation
[illegible]08		250		10	1	Gel		Mix Gel
[illegible]		300		5	1	H_2O		Wash out Tub
[illegible]25		400		23	2	CMT		Mix Cement
[illegible]45		200		6.2	1	H_2O		Displace 6.2 BBLS of H_2O
1900								Shut Down

REMARKS

SYSTEM CODE	NO. OF SACKS	YIELD CU. FT/SK	COMPOSITION OF CEMENTING SYSTEMS	SLURRY MIXED BBLS	SLURRY MIXED DENSITY
1.	100	1.18	Standard Cement 3% CaCl	21	15.6
2.					
3.					
4.					
5.					
6.					

BREAKDOWN FLUID TYPE | VOLUME 21 | DENSITY 15.6 | PRESSURE MAX. 400 MIN: ———
HESITATION SQ. ☐ RUNNING SQ. | CIRCULATION LOST ☐ YES ☒ NO | CEMENT CIRCULATED TO SURF. ☐ YES ☒ NO Bbls
BREAKDOWN PSI | FINAL PSI | DISPLACEMENT VOL. 6.2 Bbls
WASHED THRU PERFS ☐ YES ☐ NO | TO FT | MEASURED DISPLACEMENT ☐ ☐ WIRELINE
TYPE OF WELL: ☐ OIL ☐ GAS ☒ STORAGE ☐ INJECTION ☐ BRINE WATER ☒ WILDCAT
PERFORATIONS TO TO
CUSTOMER REPRESENTATIVE: Ordie Rogers
DOWELL SUPERVISOR

PIPE TALLY

PAGE ___ OF ___

DATE

PIPE RECEIVED FROM: 8-22-90

SIZE OF PIPE

RANGE

CHARGE TO OR SENT TO: Perot Lot 1, Well #2

WELL NO

WEIGHT PER FOOT

CAR INITIAL & NO. OR TRUCK NO.

GRADE

THREAD

MAKE OR KIND OF PIPE: 2.45' AD-1 packer 64 Pcs

LENGTH OF COUPLING

CONDITION

PCS.	FEET		FEET		FEET		FEET		FEET	
1	25	65	31	45	33	30	33	40		
2	31	05	30	35	33	25	33	65		
3	33	20	30	90	33	25				
4	33	10	30	40	33	40				
5	28	25	31	60	32	50				
6	31	55	28	—	33	30				
7	30	05	32	80	33	35				
8	29	75	31	30	33	40				
9	30	80	31	10	33	30				
10	30	55	32	90	33	35				
11	31	—	31	35	33	40				
12	31	30	31	40	33	35				
13	30	55	33	35	33	20				
14	31	60	33	35	33	35				
15	30	95	33	35	33	30				
16	31	80	33	15	33	20				
17	31	10	33	30	33	35				
18	30	80	33	25	33	30				
19	30	65	33	25	33	40				
20	31	25	33	20	33	35				
TOT.	614	95	634	75	665	60	68	05		

TOTALS	PCS.	FT.	IN.
COLUMN 1			Not
COLUMN 2			
8x51 COLUMN 3	8x33		
7830 COLUMN 4	2432		
2033 COLUMN 5	6831		
1.825 TOTAL THIS PAGE	3198 1x78		

1028

1,1829.

TRANSFER NO.

ORDER NO.

Run in order

(1989.33)

Needs Checked OK

The above joints received in good order except as noted

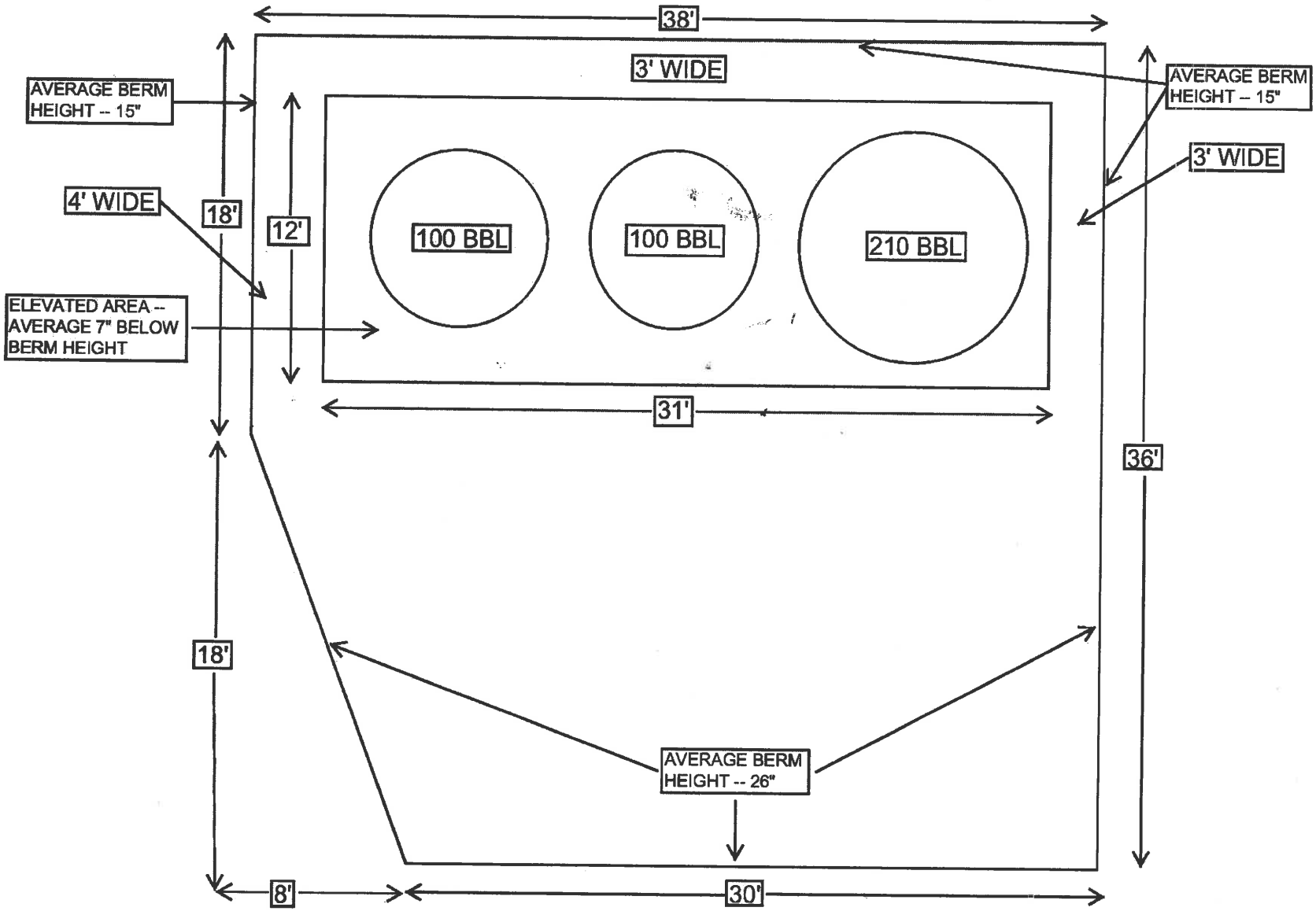
By [signature]

PRINTED IN U.S.A.

KenDEM 71 TULSA 1, OKLAHOMA

APPENDIX B
Storage Tank Inventory

API #	Tank ID	Tank Location (UTM NAD 83 Meters)		Installation Date	Tank Age (Months)	Construction Material (Steel, plastic, etc.)	Capacity (gallons)	Type of Fluid Stored	Volume of Fluid Stored (gallons)	Tank Type Single/Double Wall
		Northing	Easting							
047-087-01106	Perot Lot 1, Well 2	4288638.5	476536.0	AFTER 8/84	Unknown	Steel	8820	BRINE	UP TO 8500	SINGLE
047-087-00869 & 047-087-00890	Perot Lot 3, Wells 1 & 2	4288640.7	476540.4	AFTER 8/84	Unknown	Steel	4200	CRUDE OIL & BRINE	UP TO 4000	SINGLE
047-087-00869 & 047-087-00890	Perot Lot 3, Wells 1 & 2	4288640.7	476539.5	AFTER 8/84	Unknown	Steel	4200	CRUDE OIL & BRINE	UP TO 4000	SINGLE
047-087-01106, 047-087-00869 & 047-087-00890	Perot Lot 1, Well 2 & Lot 3, Wells 1 & 2	4288638.5	476536.0	AFTER 8/84	Unknown	Steel	1176	CRUDE OIL & BRINE	UP TO 1000	SINGLE



PEROT LOT 1, WELL #2

SECONDARY CONTAINMENT

NOT TO SCALE

Secondary Containment Calculations – Perot Lot2, Well #1 (Refer to Sketch)

Estimated volume of containment structure (all measurements from inside berm wall):

Large area behind tanks (below on sketch) volume: ((21' x 38') – ½(8' x18')) x 2.167' = 1573 cubic feet

Shallower area around three sides of elevated area: ((3' x 38') + (4' x 12') + (3' x 12')) x 1.25' = 248 cubic feet

Additionally, as the elevated area is lower than the berm walls, there is additional capacity above the elevated area: (((12' x 31') – (2 x (4.25 x 4.25 x 3.14159))) x 0.583' = 151 cubic feet

(The logic in the last calculation assumes the leaking tank is the largest (210 BBL) and its footprint provides additional capacity. The footprints of the two smaller tanks are deducted. Should one of the smaller tanks leak, the larger footprint would need to be deducted, but it is obvious that it is a non-issue in the calculation as they are less than half the size.)

Total volume: 1573 + 248 + 151 = 1972 cubic feet. 1972 cubic feet/(5.615 cubic feet/BBL) = 351 BBL

Capacity as a percentage of largest tank: 351/210 = 167%

Section 7
Area of Review

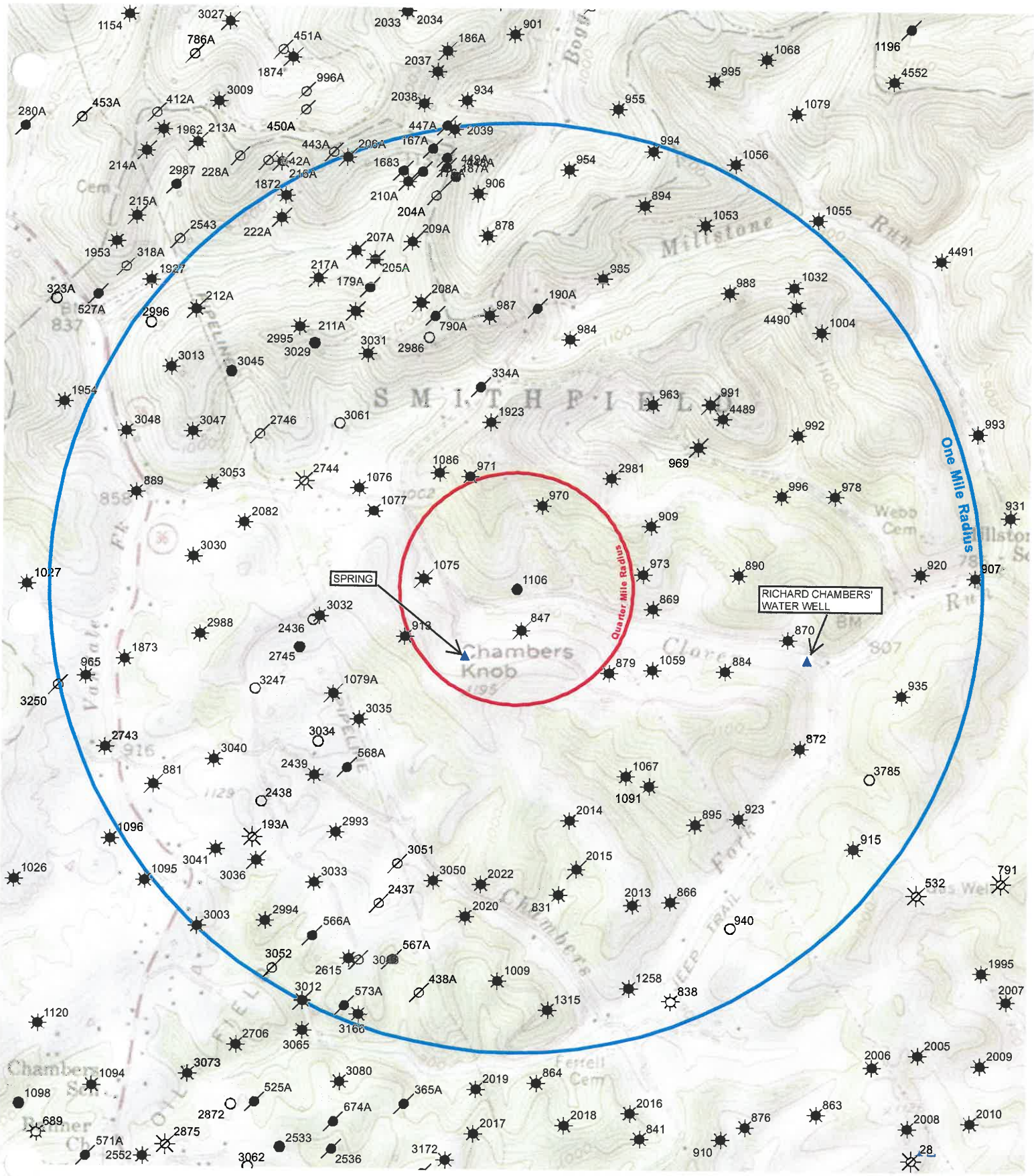
Section 7 – Area of Review

For this well, the Area of Review (AOR) encompassed a circle with a one-fourth mile radius emanating from the wellhead. In conducting the review, three wells that penetrate the injection horizon were identified. Two have been plugged, while the third produces oil and natural gas. Well records and plugging affidavits (where applicable) are attached. No drinking water wells were identified in the AOR, but one spring that is apparently used for livestock was identified. Additionally, we mapped all know wells within a one-mile radius of the wellhead. See maps attached

As part of our review, we contacted Steve Cale of the Clover PSD, the public water supplier for the area where the well is located. He confirmed that they have no water intakes and buy all their water from the Spencer Water Works. Tammy White of the Spencer Water Works informed us their only water intake is from the Charles Fork Lake which is about 4 miles northwest of the subject well.

Since the spring inside the AOR had not been tested in the past, we decided to test a drinking water well outside the AOR that has been tested for prior permit renewals. According to Richard Chambers, the well's owner, it is 60' deep.

Lab results for the spring and Chambers well are attached.

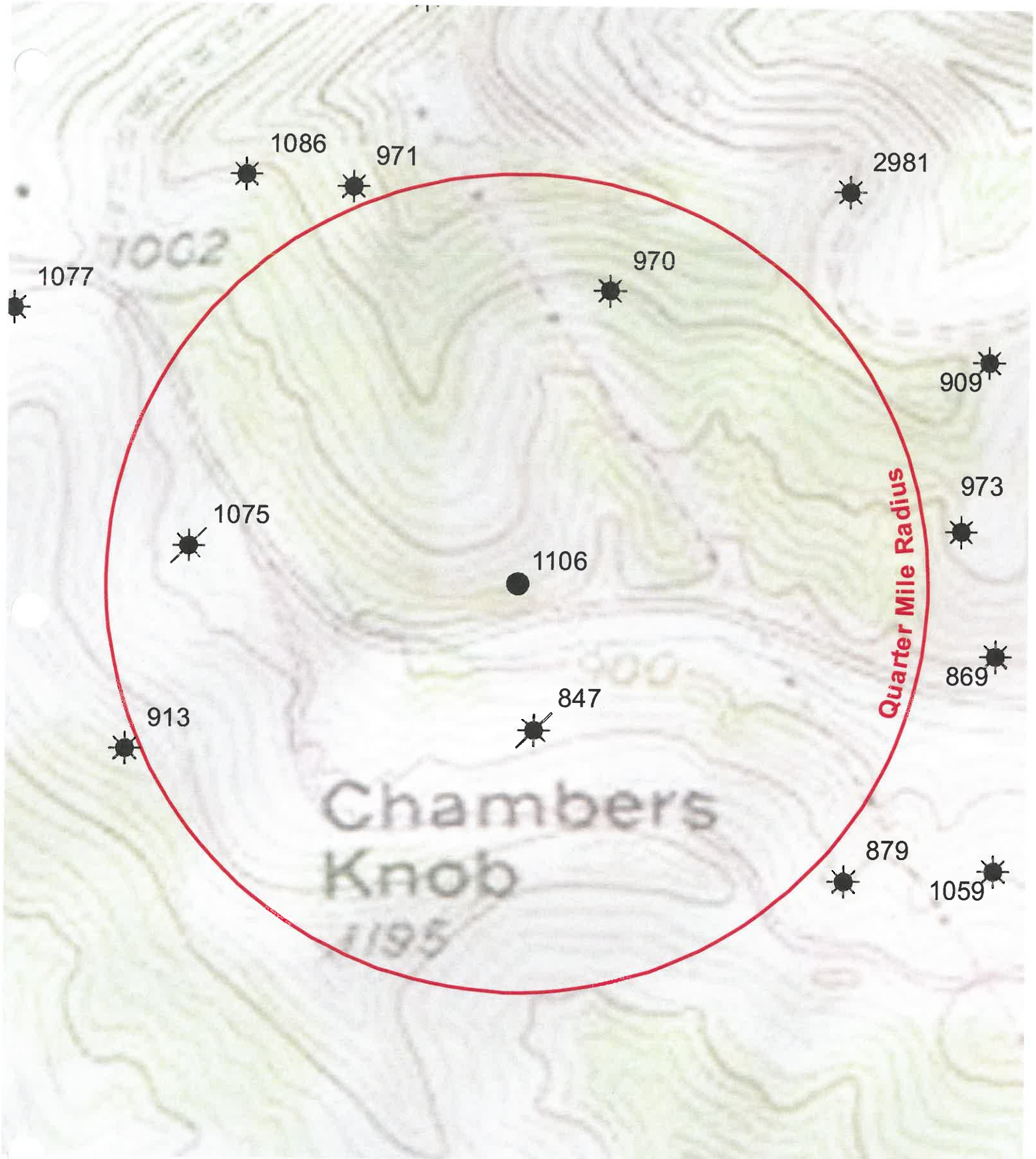


SENECA TECHNOLOGIES
INFORMATION IS POWER

Well locations have been determined based upon information derived from surveyed well plats. Accuracy of well locations is relative to quality of available information.

Well locations displayed in Nad27 UTM Zone 17N.

Map produced on
12/19/2017



SENECA TECHNOLOGIES
INFORMATION IS POWER

GAS
GAS AND OIL
OIL
PLUGGED GAS
PLUGGED GAS AND OIL
PLUGGED OIL
PROPOSED OR OTHER
PLUGGED UNKNOWN
STORAGE
DRY HOLE
PLUGGED DRY HOLE

Feet 0 500 1,000
Miles 0 0.1 0.2

Well locations have been determined based upon information derived from surveyed well plats. Accuracy of well locations is relative to quality of available information.

Well locations displayed in Nad27 UTM Zone 17N.

APPENDIX C

Wells within the Area of Review

API #	Well Type	Well Status (Active, Abandoned, Shut-in, Plugged)	Northing (UTM NAD 83 Meters)	Easting (UTM NAD 83 Meters)	Penetrate Injection Zone (Y or N)	Penetrate Confining Zone (Y or N)	Total Vertical Depth	Surface Elevation
47-087-00847	Oil & Gas	Plugged	4,288,532	476,423	Y	Y	2250	985
47-087-00970	Oil & Gas	Active	4,288,966	476,489	Y	Y	2194	1109
47-087-01075	Oil & Gas	Plugged	4,288,372	476,217	Y	Y	2168	984

Make as many copies as necessary and include page numbers as appropriate.

Form OG-10

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

PLUGGED 9/4/70

Quadrangle _____

Permit No. Roa-847

WELL RECORD

Oil or Gas Well Oil & Gas (KIND)

Company Beard and Seanito,
Address Box 314 Fairfield, Ill.
Farm Frank Chambers Acres 40
Location (waters) Clover Creek
Well No. 1 Elev. 985.00'
District Smithfield County Roane
The surface of tract is owned in fee by
Address
Mineral rights are owned by T. Morris Perot, EST.
Address Baltimore, Md.
Drilling commenced Aug. 22, 1961
Drilling completed Sept. 18, 1961
Date Shot From To
With
Open Flow /10ths Water in Inch
/10ths Merc. in Inch
Volume Cu. Ft.
Rock Pressure 450 EST lbs. 2 hrs.
Oil bbls., 1st 24 hrs.
WELL ACIDIZED
WELL FRACTURED Sept. 30,

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size 16	20'	20'	None Kind of Packer
13			
10			Size of
8¼	1050'	1050'	
6⅝	246'	246'	Depth set
5 3/16 4½"	2250	2250	
3			Perf. top
2			Perf. bottom
Liners Used	246'	246'	Perf. top
			Perf. bottom

CASING CEMENTED 4½ SIZE 600' No. Ft. 10/21/61 Date
used 80 sacks of Cement
Dowell
COAL WAS ENCOUNTERED AT FEET INCHES
FEET INCHES FEET INCHES
FEET INCHES FEET INCHES

RESULT AFTER TREATMENT 15 BBls Oil 250.000 Gas
ROCK PRESSURE AFTER TREATMENT 450
Fresh Water None Feet Salt Water 1770 Feet

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Clay	red	soft	0	15			
Clay	yellow	"	15	32			
Slate	dark	"	32	55			
Sand	light	"	55	120			
Red rock	red		120	132			
Slate			132	145			
Red Rock	red		145	355			
Slate	dark		355	430			
Red Rock	red		430	460			
Sand	light		460	500			
Slate			500	617			
Red Rock	red		617	650			
Slate			650	665			
Sand	light		665	692			
Red Rock			692	696			
Slate	light		696	1040			
Sand			1040	1135			
Slate	dark		1135	1190			
Sand	light		1190	1240			
Slate	dark		1240	1250			
Sand	light		1250	1340			
Slate	dark		1340	1350			

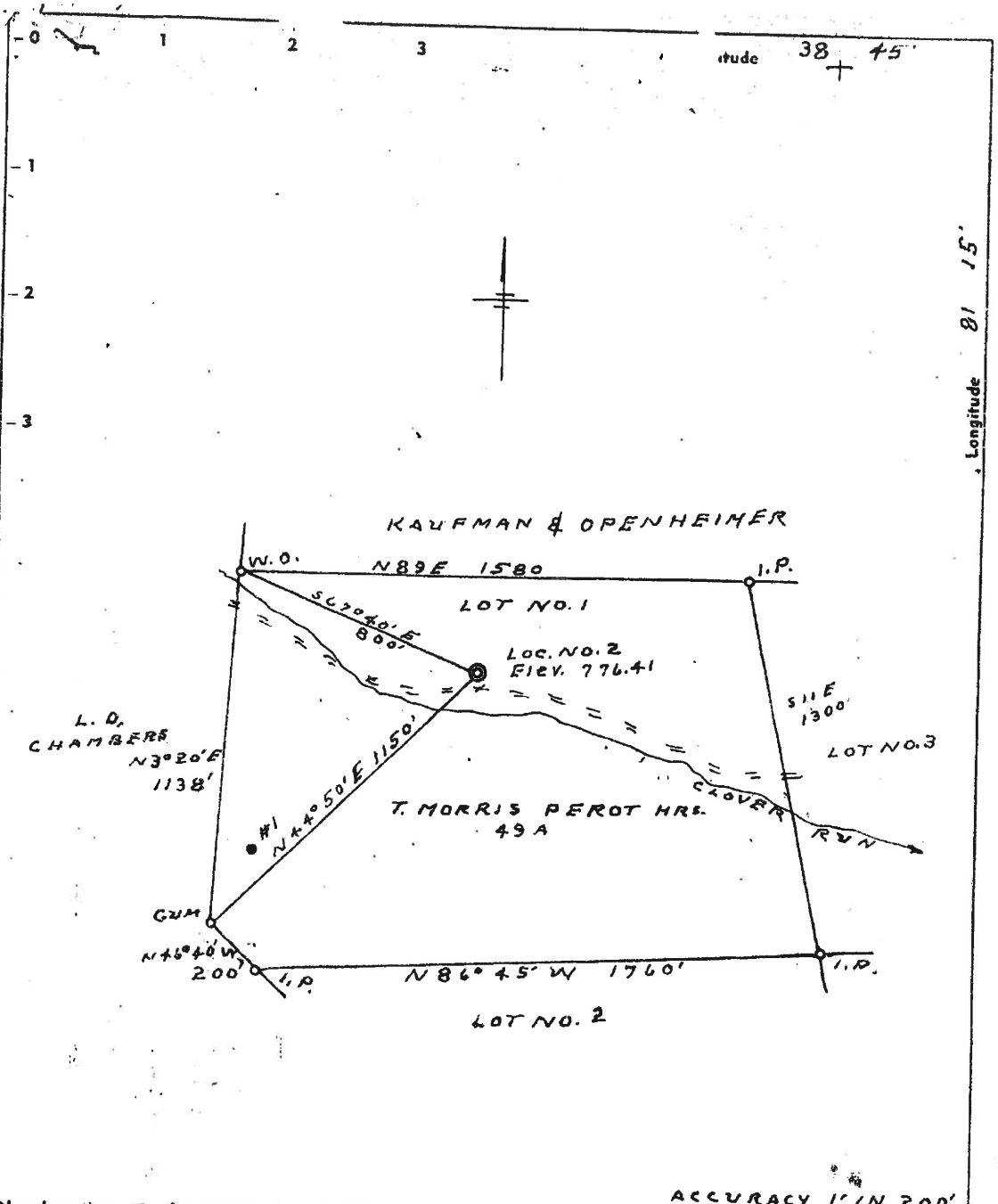
(over)

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
Sand	light		1350	1370			
Slate and Shells			1370	1505			
Sand	light		1505	1560			
Slate & Shells			1560	1580			
Sand			1580	1635			
Slate & Shells			1635	1720			
Salt Sand			1720	1849	Hole fullwater 1770		
Slate			1849	1933			
Red rock	red		1933	1948			
Slate			1948	1976			
Lime	white	hard	1976	1996			
Pencel Cave	black	soft	1996	2010			
Red Rock	red		2010	2015			
Slate			2015	2020			
Big Lime	white	hard	2020	2139			
Kenner Sand	White	hard	2139	2161			
Injun Sand		soft	2161	2181	Oil from 2161 to 2181		
Slate			2161	2250	Gas and Oil		
Total depth			2250				

Date Nov. 3, 19 61

APPROVED Allen Beard & Sinnett, Owner

By Alice Hester
(Title)



ACCURACY 1" IN 200'

New Location . ☒ SOURCE ELEV. FORKS ROAD ROUTE 36 857.00

Drill Deeper . . . . ☐

Redrill . . . . . ☐

Abandonment . . . . . ☐

"I, the undersigned, hereby certify that this map is correct to the best of my knowledge and belief and shows all the information required by paragraph 6 of the rules and regulations of the oil and gas section of the mining laws of West Virginia."

Company J. & B. OIL CO. (INC.)

Address SPENCER, W.VA.

Farm T. MORRIS PEROT HRS.

Tract 1 Acres 49 Lease No.

Well (Farm) No. 2 Serial No.

Elevation (Spirit Level) 776.41

Quadrangle WALTON

County ROANE District SMITHFIELD

Engineer L. F. Dyer

Engineer's Registration No. 804

File No. Drawing No.

Date 7-7-64 Scale 1" = 400'

BLACK BLUEPRINT & SIGN CO.

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION
CHARLESTON

WELL LOCATION MAP

FILE NO.

Denotes location of well on United States Topographic Maps, scale 1 to 62,500, latitude and longitude lines being represented by border lines as shown.

Denotes one inch spaces on border line of original tracing.

DANIELS

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS WELLS DIVISION

RECEIVED
SEP 8 1970
OIL & GAS DIVISION
DEPT. OF MINES

INSPECTOR'S PLUGGING REPORT

Permit No. ROA-647-P Well No. 1

COMPANY J & B Oil Co. Inc ADDRESS 604 Comm Square, Chas. W. Va

FARM T. Morris Peret Heirs DISTRICT Smithfield COUNTY Roane

Filling Material Used Aquagel

Liner	Location	Amount	Packer	Location

PLUGS USED AND DEPTH PLACED			BRIDGES	CASING AND TUBING		
CEMENT-THICKNESS	WOOD-SIZE	LEAD	CONSTRUCTION-LOCATION	RECOVERED	SIZE	LOST
Cement Plug from 2250 to 2130				1820	4½	
Cement Plug from 1060 to 1045						
Cement Plug from 125 to 95						
Cement Plug 20 ft. to surface.						

Drillers' Names

Remarks:

Ready Cementing Co. of Grantsville used in Plugging.

9/4/70 (DATE), I hereby certify I visited the above well on this date.

DISTRICT WELL INSPECTOR

Form OG-10

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

Active

Quadrangle WALTON

Permit No. ROA-970

WELL RECORD

Oil or Gas Well Oil & Gas (KIND)

Company WOLF'S HEAD OIL REFINING COMPANY, INC.
Address P. O. Box 1588, Parkersburg, W. Va.
Farm Wm. Kaufman Acres 800
Location (waters) Slab Camp Run
Well No. W-2 Elev. 1008.71
District Smithfield County Roane
The surface of tract is owned in fee by Frank Chambers
Otto Route Address Spencer, W. Va.
Mineral rights are owned by Alfred M. Oppenheimer II, et al.
300 South Lang Avenue Address Pittsburgh 8, Pa.
Drilling commenced September 14, 1963
Drilling completed October 10, 1963
Date Shot - From - To -
With -
Open Flow 34 /10ths Water in 1/4 Inch
- /10ths Merc. in - Inch
Volume 3,377 Cu. Ft.
Rock Pressure No Test lbs. - hrs.
Oil Show Only bbls., 1st 24 hrs.
WELL ACIDIZED -
WELL FRACTURED October 28, 1963
RESULT AFTER TREATMENT Gas - 37,000 Cu. Ft. Oil - 32 Bbls.
ROCK PRESSURE AFTER TREATMENT 500 Lbs.
Fresh Water SEE BELOW Feet - Salt Water SEE BELOW Feet -

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			
13			Kind of Packer Steel Shoe Float Collar Guide Shoe
10"	535'	535'	Size of 10" OD 4½" OD 4½" OD
8¼"	1017'	NONE	Depth set 2190 2194
6⅝"	2080'	NONE	Perf. top
4½"	2209' 2"	2209' 2"	Perf. bottom
3			Perf. top
2-3/8" Tbg.	2186'	2186'	Perf. bottom
Liners Used			

CASING CEMENTED 4½" SIZE 2194 No. Ft. 10/11/63 Date
COAL WAS ENCOUNTERED AT - FEET - INCHES
- FEET - INCHES - FEET - INCHES
- FEET - INCHES - FEET - INCHES

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Soil			0	14			
Slate			14	35			
Conductor				16			
Sand			35	95			
Slate			95	130			
Red Rock			130	190			
Slate			190	246			
Red Rock			246	305			
Slate			305	347			
Red Rock			347	402			
Slate			402	468			
Sand			468	524			
Black Slate			524	532			
Sand			532	562			
Slate			562	585	Water, Fresh	532- 562	Seep Only
Sand			585	614			
Red Rock			614	625			
Slate			625	650			
Sand			650	694			
Slate			694	701			
Red Rock			701	720			
Slate			720	735			
Red Rock			735	785			
Slate			785	853			
Red Rock			853	900			
Slate			900	916			
Red Rock			916	924			
Slate			924	966			
Red Rock			966	970			

(over)

Formation	Color	Hard or Soft	Top //	Bottom	Oil, Gas or Water	Depth Found	Remarks
Slate			970	1003			
Sand			1003	1112			
					Water, Salt	1003-1015	½ Bailer/Hr.
Slate			1112	1160			
Sand			1160	1443			
Black Slate			1443	1481			
Sand			1481	1576			
Black Slate			1576	1587			
Sand			1587	1635			
Slate & Shale			1635	1746			
Sand			1746	1824			
					Water, Salt	-1790	Hole Full
Slate			1824	1922			
Sand			1922	1941			
Slate			1941	1950			
Little Lime			1950	1972			
Slate			1972	1999			
Big Lime			1999	2115			
					Oil	2052-2060	Show Only
Keener Sand			2115	2128			
Big Injun			2128	2155			
					Gas	2128-2131	54/10-W-½" PM
					Oil & Gas	2131-2152	
Slate			2155	2194			
4½" Casing				2194			
TOTAL DEPTH				2194			

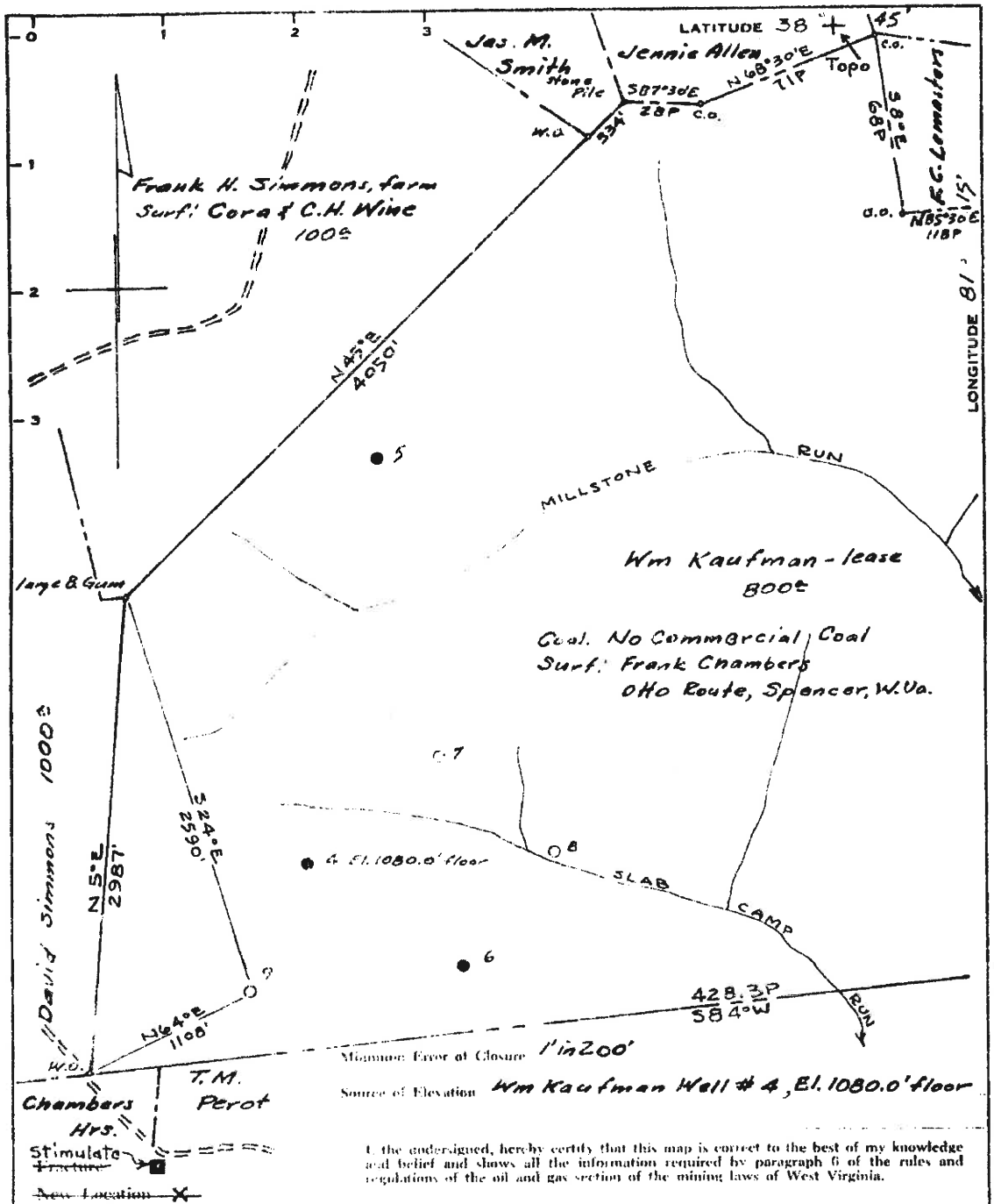
(3M)

Date November 6, 1963

APPROVED WOLF'S HEAD OIL REFINING COMPANY, INC., Owner

By George W. Gilsman

George W. Gilsman, (Title) Agent



Magnetic Error at Closure 1' in 200'

Source of Elevation Wm Kaufman Well # 4, El. 1080.0' floor

I, the undersigned, hereby certify that this map is correct to the best of my knowledge and belief and shows all the information required by paragraph 6 of the rules and regulations of the oil and gas section of the mining laws of West Virginia.

Signed: A.C. Hilbert

Map No. 52 Squares: N S 48 E W 38

Company PENNZOIL COMPANY

Address PARKERSBURG, W.Va.

Farm Wm KAUFMAN

Tract Acres 800 Lease No. 81219

Well Permit No. W-2 Serial No.

Elevation (Spirit Level) 1008.71' ground

Quadrangle WALTON

County ROANE District SMITHFIELD

Engineer A.C. Hilbert

Engineer's Registration No. 2534

File No. 1357 Drawing No.

Date July 30, 1963 Scale 1" = 800'

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION
CHARLESTON

WELL LOCATION MAP

FILE NO. Roa-970

+ Denotes location of well on United States Topographic Maps, scale 1 to 62,500, latitude and longitude lines being represented by border lines as shown.

— Denotes one inch spaces on border line of original tracing.

JBO

Form OG-10

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION 4

PLUGGED
10/26/09

Quadrangle WALTON

Permit No. ROA-1075

WELL RECORD

Oil or Gas Well ______ (KIND)

Company PENNZOIL COMPANY
Address P. O. Box 1588, Parkersburg, W. Va.
Farm Chambers Heirs Acres 363
Location (waters) Clover Run
Well No. 22 Elev. 984.30'
District Smithfield County Roane
The surface of tract is owned in fee by Frank Chambers
Otto Route Address Spencer, W. Va.
Mineral rights are owned by Gabrilla Chambers, et al.
RFD 3, Box 19 Address Spencer, W. Va.
Drilling commenced July 6, 1964
Drilling completed August 10, 1964
Date Shot - From ______ To ______
With ______
Open Flow ______ /10ths Water in ______ Inch
______ /10ths Merc. in ______ Inch
Volume Show Cu. Ft.
Rock Pressure No Test lbs. ______ hrs.
Oil Show bbls., 1st 24 hrs.
WELL ACIDIZED ______

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer Steel Shoe
13			Steel Shoe
10 3/4"O.D.	470'	470'	Float Collar / Guide Shoe
8 5/8"OD	988'	NONE	for 10 3/4"OD / 7"OD
7"O.D.	2010'	271'	4½"OD / 4½"OD
4½"	2182'	2182'	Depth set 470' / 2010'
3			2138' / 2168' / Perf. top
2 3/8"Tbg.	2129'	2129'	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED Gelled Surface to: 10 3/4 SIZE 470 No. Ft. 7/10/64 Date
Gelled 7" 271 8/6/64
Cemented 4½" 2168 8/13/64

COAL WAS ENCOUNTERED AT - FEET ______ INCHES
______ FEET ______ INCHES ______ FEET ______ INCHES
______ FEET ______ INCHES ______ FEET ______ INCHES

WELL FRACTURED 8/20/64 - Used: 940 Bbls. Water, 44,000 # Sand 20-40, 300 Gals. Mud Acid, 200 Lbs. J-98, 400 Bbls. J-84, 25 Gals. Deterger and 40 Gals Fre Flo

RESULT AFTER TREATMENT Gas - 58,000 Cu. Ft.
Oil - 10 Bbls.

ROCK PRESSURE AFTER TREATMENT 250 Lbs.

Fresh Water - Feet ______ Salt Water - Feet ______

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks

SEE BACK OF THIS SHEET FOR FORMATION RECORD

SEP 1964
RECEIVED
West Virginia
Dept. of Mines

RECEIVED
Office of Oil and Gas
JAN 26 2018
WV Department of
Environmental Protection

(over)

Formation	Color	Hard or Soft	Top 4	Bottom	Oil, Gas or Water	Depth Found		Remarks

FORMATION RECORD

KIND	TOP	BOTTOM	STEEL LINE MEAS.	TEST	KIND	TOP	BOTTOM	STEEL LINE MEAS.	TEST
Top Soil	0	13			Slate	1415	1470		
Conductor		13	13		Sand	1470	1522		
Sand	13	75			Slate	1522	1560		
Red Rock	75	87			Sand	1560	1600		
Slate	87	98			Slate	1600	1625		
Red Rock	98	190			Sand	1625	1647		
Slate	190	200			Slate	1647	1690		
Red Rock	200	220			Water	1730	1747		Hole Full
Sand	220	235			Sand	1690	1810		
Red Rock	235	250			Slate	1810	1814		
Slate	250	293			Black Lime	1814	1846		
Red Rock	293	310			Oil	1823	1836		Show
Sand	310	322			Slate	1846	1852		
Slate	322	345			Lime	1852	1865		
Water		357		½ bailer/hr.	Slate	1865	1880		
Sand	345	400			Red Rock	1880	1885		
Slate	400	405			Lime	1885	1911		
Red Rock	405	427			Sand	1911	1922		
Sand	427	465			Slate	1922	1926		
Slate	465	475	470		Lime	1926	1955		
Sand	475	490			Slate	1955	1959		
Slate	490	572			Black Lime	1959	1966		
Sand	572	580			Slate	1966	1970		
Slate	580	595			Big Lime	1970	2089	2010	
Red Rock	595	623			Oil	2064	2104		Show
Slate	623	630			Big Injun	2104	2125		
Sand	630	675			Oil	2104	2123		Show
Red Rock	675	695			Slate	2125	2168		
Slate	695	700			4½" Casing		2168	2168	
Red Rock	700	730							
Sand	730	741			Total Depth		2168	2168	
Red Rock	741	885							
Slate	885	900							
Pink Rock	900	915							
Sand	915	932							
Slate	932	985							
Sand	985	1088	988						
Water		1065		2 bailer					
Slate	1088	1133							
Sand	1133	1175							
Slate	1175	1185							
Sand	1185	1325							
Slate	1325	1385							
Sand	1385	1415							

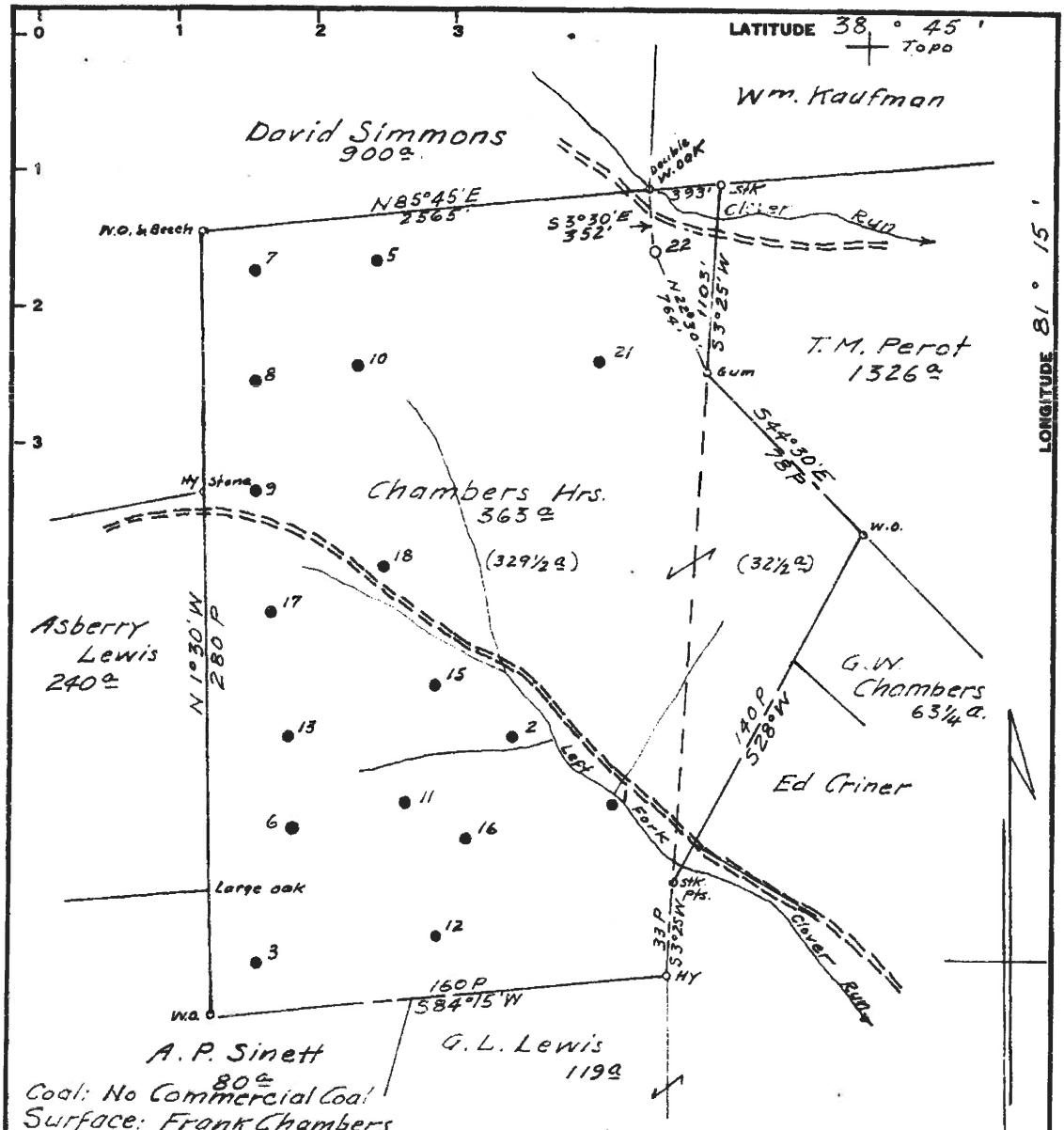
(OVER)

Date August 31, 1964

APPROVED PENNZOIL COMPANY, Owner

By George W. Wilsman, (Title) Manager
Land-Lease Records Department

MATHEWS PRINTING AND LITHOGRAPHING CO



Minimum Error of Closure 1 in 200'

Source of Elevation Chambers Well No. 7 El. 827.4 Ft.

Fracture ☐
New Location ☒
Drill Deeper ☐
Abandonment ☐

I, the undersigned, hereby certify that this map is correct to the best of my knowledge and belief and shows all the information required by paragraph 6 of the rules and regulations of the oil and gas section of the mining laws of West Virginia.

Signed: A.C. Hilbert

Map No. 52 Squares: N S 48 E W 38

Company PENNZOIL COMPANY
Address P.O. Box 1588, Parkersburg, W.Va.
Farm CHAMBERS Hrs.
Tract Acres 363 Lease No. 74937
Well (Farm) No. 22 Serial No.
Elevation (Spirit Level) 984.30 Gr.
Quadrangle WALTON
County ROANE District SMITHFIELD
Engineer A.C. Hilbert
Engineer's Registration No. 2534
File No. 1359 Drawing No.
Date June 5, 1964 Scale 1" = 800'

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION
CHARLESTON

WELL LOCATION MAP

FILE NO. Roane 1075

+ Denotes location of well on United States Topographic Maps, scale 1 to 62,500, latitude and longitude lines being represented by border lines as shown.

— Denotes one inch spaces on border line of original tracing.

K+E IMPERIAL™ TRACING CLOTH 72163

API# 47-087-1075

STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY
DIVISION OF OIL AND GAS

AFFIDAVIT OF PLUGGING AND FILLING WELL

AFFIDAVIT SHOULD BE IN TRIPLICATE, one copy mailed to the Division, one copy to be retained by the Well Operator and the third copy (and extra copies if required) should be mailed to each coal operator at their respective addresses.

Farm name: Chamber Heirs
LOCATION: Elevation: 990'
District: Smithfield
Latitude:
Longitude:

Operator Well No.: No. 22
Quadrangle: Looneyville 7.5'
County: Roane
Deg. ____ Min. ____ Sec. ____
Deg. ____ Min. ____ Sec. ____

Well Type: Oil X Gas ____ WIW ____

Company: East Resources Inc.
P.O. Box 5519
Vienna, WV 26105
Agent: Philip S. Ondrusek
Inspector: Ed Gainer
Permit Issued: 7/22/2009'

Coal Operator or Owner: NA

Coal Operator or Owner: NA

AFFIDAVIT

STATE OF WEST VIRGINIA,
County of Wood ss:
Steve Fields and Richard Moore being first duly sworn according to law depose and say that they are experienced in the work of plugging and filling oil and gas wells and were employed by East Resources Inc., well operator, and participated in the work of plugging and filling the above well, that said work was commenced on the 15th day of October, 2009', and that the well was plugged and filled in the following manner:

TYPE	FROM	TO	PIPE REMOVED	LEFT
Cement	2090'	1990'	10 3/4" 470'	0'
Cement	1650'	1550'	7" 0'	271'
Cement	1150'	1050'	4 1/2" 680'	1468'
Cement	730'	630'		
Cement	520'	420'		
Cement	150'	0'		
6% Gel Between Cement Plugs				

Description of monument: 7" x 5'
and that the work of plugging and filling said well was completed on the 26th day of October 2009'
And further deponents saith not.

Richard D Moore
Steve Fields

Sworn and subscribe before me this 30th day of October, 2009

My commission expires: Oct. 4, 2016

Notary Public

Affidavit reviewed by the Office of Oil and Gas:

Title: Manager

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
S. DIANNE DULANEY
P. O. Box 5519
Vienna, West Virginia 26105
My Commission Expires Oct. 4, 2016

WW-7
5-02

West Virginia Department of Environmental Protection
Office of Oil & Gas

WELL LOCATION FORM: GPS

API: 47- 087 - 1075 -P **WELL NO:** No.22

FARM NAME: Chambers Heirs

RESPONSIBLE PARTY NAME: East Resources, Inc.

COUNTY: Roane **DISTRICT:** Smithfield

QUADRANGLE: Looneyville 7.5'

SURFACE OWNER: Richard Chambers

ROYALTY OWNER: East Resources, Inc. et al.

UTM GPS NORTHING: 4,288,372 (NAD 27)

UTM GPS EASTING: 476,217 (NAD 27) **GPS ELEVATION:** 302 m.

The Responsible Party named above has chosen to submit GPS coordinates in lieu of preparing a new well location plat for a plugging permit on the above well. The Office of Oil & Gas will not accept GPS coordinates that do not meet the following requirements:

1. Datum: NAD 1983, Zone:17 North, Coordinate Units: meters, Altitude: height above mean sea level (MSL) - meters.
2. Accuracy to Datum - 3.05 meters
3. Data Collection Method:

Survey Grade GPS	__	Post Processed Differential	____
		Real-Time Differential	____
Mapping Grade GPS	X	Post Processed Differential	X
		Real-Time Differential	____

RECEIVED
Office of Oil and Gas
JAN 26 2018
WV Department of
Environmental Protection

I the undersigned, hereby certify this data is correct to the best of my knowledge and belief and shows all the information required by law and the regulations issued and prescribed by the Office of Oil and Gas.

Timothy P. Roush — Professional Surveyor

Signature — Title

July 13, 2009

Date

(4/25)

APPENDIX D

Public Service District Affidavit

Underground Injection Control Permit applicants must identify all publically recorded drinking water sources within a one (1) mile radius of the proposed injection well facility. If no drinking water sources are present within this radius a written affidavit shall be supplied by the local Public Service District (PSD) as ample verification.

"I certify under penalty of law that (state name of business)

C.I. MCKOWN & SON, INC.

has verified with the public service district (state name of PSD)

CLOVER PSD

that there are no such publically recorded sources.

, President

(Signature of Authorized Representative)

Sworn and subscribed to before me this 26th day of January, 2018.

Debra L. Kelly, my commission expires April 2, 2019

(Notary Signature)

Debra L. Kelly.

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
DEBRA L. KELLY
C.I. McKOWN & SON, INC.
9965 CLAY ROAD
NEWTON, WV 25266
My commission expires April 2, 2019

RECEIVED
Office of Oil and Gas

JAN 26 2018

WV Department of
Environmental Protection

(4/25)

APPENDIX E
Water Sources

Operator: C.I. MCKOWN& SON, INC. Year 2017 UIC Permit # 2D0871106

		Source # 1	Source # 2	Source #	Source #
Water Source Name		SPRING	CHAMBERS		
Northing		4,288,397	4,288,384		
Easting		476,353	477,480		
Parameter	Units	SEE LAB RESULTS	SEE LAB RESULTS		
TPH - GRO	mg/L				
TPH - DRO	mg/L				
TPH - ORO	mg/L				
BTEX	mg/L				
Chloride	mg/L				
Sodium	mg/L				
Total Dissolved Solids (TDS)	mg/L				
Aluminum	mg/L				
Arsenic	mg/L				
Barium	mg/L				
Iron	mg/L				
Manganese	mg/L				
pH	SU				
Calcium	mg/L				
Sulfate	mg/L				
MBAS	mg/L				
Dissolved Methane	mg/L				
Dissolved Ethane	mg/L				
Dissolved Butane	mg/L				
Dissolved Propane	mg/L				
Bacteria (Total Coliform)	c/100mL				

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: CI McKOWN & SON, INC.

SAMPLE ID: #1 SPRING
UIC RENEWAL

SAMPLED BY: M. KELLY

DATE/TIME SAMPLED:* 12-28-17 0900

DATE/TIME RECEIVED: 12-28-17 1245

LABORATORY ID: CIM 171228-1

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
pH O	6.2	units	SM 22nd 4500 H B	.1	12-29-17 0849	KH
TSS	34 J	mg/L	SM22nd 2540 D	4	12-29-17 1638	MRS/EK
TDS	65 J	mg/L	SM22nd 2540 C	4	12-29-17 1638	MRS/EK
MBAS	.02	mg/L	SM22nd 5540C	.01	12-29-17 2254	SW
SO_4	6.43 J	mg/L	EPA 300.0 Rev 2.1-1993	1.0	01-05-18 1700	DC
Cl^-	1.57	mg/L	EPA 300.0 Rev 2.1-1993	.50	01-05-18 0601	DC
TOC	3.2 J	mg/L	SM22nd 5310B	1.0	01-08-18 1417	LM
Ca	10.7	mg/L	EPA 200.7 Rev 4.4-1994	.10	01-04-18 0512	DB
Na	1.85	mg/L	EPA 200.7 Rev 4.4-1994	.03	01-04-18 0512	DB
As	.0005 J	mg/L	SM22nd 3113 B	.0005	01-04-18 2109	ML
Al	2.72	mg/L	EPA 200.7 Rev 4.4-1994	.02	01-02-18 0554	MM
Mn	.013 J	mg/L	EPA 200.7 Rev 4.4-1994	.002	01-02-18 0554	MM
Fe	2.13	mg/L	EPA 200.7 Rev 4.4-1994	.02	01-02-18 0554	MM
Br	U	mg/L	EPA 300.0 Rev 2.1-1993	.10	01-04-18 1801	DC
Ba	.209	mg/L	EPA 200.7 Rev 4.4-1994	.002	01-04-18 0512	DB
Sr	.088	mg/L	EPA 200.7 Rev 4.4-1994	.001	01-02-18 1404	DB

*Client Provided

**See Attached. The following results meet or exceed requirements and standards set forth by the certifying authority except where noted.

Data Qualifiers

B	Analyte found in reagent blank. Indicates possible reagent or background contamination.
E	Estimated Reported value exceeded calibration range.
J	Reported value is an estimate because concentration is less than reporting limit.
PND	Precision not determined.
R	Sample results rejected because of gross deficiencies in QC or method performance. Re-sampling and/or re-analysis is necessary.
RND	Recovery not determined.
U	Compound was analyzed for, but not detected.
O	Out of holding. Time does not meet 40 CFR 136/141 compliance.
T	This result is not supported by our certification ID.
A	Does not meet 40 CFR 136/141 compliance.
C	Does not meet 47 CSR 32 compliance.

Narrative:

Approved Douglas A Burton

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: CI McKOWN & SON, INC.

SAMPLE ID: #2 CHAMBERS
UIC RENEWAL

SAMPLED BY: M. KELLY

DATE/TIME SAMPLED:* 12-28-17 0930

DATE/TIME RECEIVED: 12-28-17 1245

LABORATORY ID: CIM 171228-2

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
pH O	7.0	units	SM 22nd 4500 H B	.1	12-29-17 0849	KH
TSS	5 J	mg/L	SM22nd 2540 D	4	12-29-17 1638	MRS/EK
TDS	244 J	mg/L	SM22nd 2540 C	4	12-29-17 1638	MRS/EK
MBAS	U	mg/L	SM22nd 5540C	.01	12-29-17 2254	SW
SO_4	8.29 J	mg/L	EPA 300.0 Rev 2.1-1993	1.0	01-05-18 1700	DC
Cl^-	10.4	mg/L	EPA 300.0 Rev 2.1-1993	.50	01-05-18 0601	DC
TOC	3.2 J	mg/L	SM22nd 5310B	1.0	01-08-18 1417	LM
Ca	30.5	mg/L	EPA 200.7 Rev 4.4-1994	.10	01-04-18 0512	DB
Na	50.8	mg/L	EPA 200.7 Rev 4.4-1994	.03	01-04-18 0512	DB
As	.0038	mg/L	SM22nd 3113 B	.0005	01-04-18 2109	ML
Al	U	mg/L	EPA 200.7 Rev 4.4-1994	.02	01-02-18 0554	MM
Mn	.024 J	mg/L	EPA 200.7 Rev 4.4-1994	.002	01-02-18 0554	MM
Fe	.45	mg/L	EPA 200.7 Rev 4.4-1994	.02	01-02-18 0554	MM
Br	.15	mg/L	EPA 300.0 Rev 2.1-1993	.10	01-04-18 1801	DC
Ba	.275	mg/L	EPA 200.7 Rev 4.4-1994	.002	01-04-18 0512	DB
Sr	.520	mg/L	EPA 200.7 Rev 4.4-1994	.001	01-02-18 1404	DB

*Client Provided

**See Attached. The following results meet or exceed requirements and standards set forth by the certifying authority except where noted.

Data Qualifiers

- B Analyte found in reagent blank. Indicates possible reagent or background contamination.
- E Estimated Reported value exceeded calibration range.
- J Reported value is an estimate because concentration is less than reporting limit.
- PND Precision not determined.
- R Sample results rejected because of gross deficiencies in QC or method performance. Re-sampling and/or re-analysis is necessary.
- RND Recovery not determined.
- U Compound was analyzed for, but not detected.
- O Out of holding. Time does not meet 40 CFR 136/141 compliance.
- T This result is not supported by our certification ID.
- A Does not meet 40 CFR 136/141 compliance.
- C Does not meet 47 CSR 32 compliance.

Narrative:

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Office of Oil and Gas

JAN 26 2018

WV Department of
Environmental Protection

Approved [signature]

MAIN OFFICE AND LABORATORY—POST OFFICE BOX 650 • BRIDGEPORT, WEST VIRGINIA 26330 • (304) 623-6549
CHARLESTON FIELD OFFICE—POST OFFICE BOX 8337 • SOUTH CHARLESTON WEST VIRGINIA 25303-0337 • (304) 744-9864

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: CI McKOWN & SON, INC.

SAMPLE ID: #1 SPRING

SAMPLED BY: M. KELLY

LOG NO: W867-17

DATE/TIME SAMPLED: 12-28-17 0900

DATE/TIME RECEIVED: 12-28-17 1245

LABORATORY ID: CIM 171228-1

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
Total Coliform	**PRESENT	P/A (Cfu)	9223 Colilert	1	12-28-17 1320	LM
E Coli	**PRESENT	P/A (Cfu)	9223 Colilert	1	12-28-17 1320	LM

*Client Provided

**See Attached. The following results meet or exceed requirements and standards set forth by the certifying authority except where noted.

Microbiological analysis results will be discarded after 5 years

Method of Analysis from "Standard Methods for the Examination of Water and Wastewater,"

Data Qualifiers

B Analyte found in reagent blank. Indicates possible reagent or background contamination.
E Estimated Reported value exceeded calibration range.
J Reported value is an estimate because concentration is less than reporting limit.
PND Precision not determined.
R Sample results rejected because of gross deficiencies in QC or method performance. Re-sampling and/or re-analysis is necessary.
RND Recovery not determined.
U Compound was analyzed for, but not detected.
O Out of holding. Time does not meet 40 CFR 136/141 compliance.
T This result is not supported by our certification ID.
A Does not meet 40 CFR 136/141 compliance.
C Does not meet 47 CSR 32 compliance.

Narrative:

Approved Dwight A Beard

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: CI McKOWN & SON, INC.

SAMPLE ID: #2 CHAMBERS

SAMPLED BY: M. KELLY

LOG NO: W868-17

DATE/TIME SAMPLED: 12-28-17 0930

DATE/TIME RECEIVED: 12-28-17 1245

LABORATORY ID: CIM 171228-2

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
Total Coliform	ABSENT	P/A (Cfu)	9223 Colilert	1	12-28-17 1320	LM
E Coli	ABSENT	P/A (Cfu)	9223 Colilert	1	12-28-17 1320	LM

*Client Provided

**See Attached. The following results meet or exceed requirements and standards set forth by the certifying authority except where noted.

Microbiological analysis results will be discarded after 5 years

Method of Analysis from "Standard Methods for the Examination of Water and Wastewater,"

Data Qualifiers

B Analyte found in reagent blank. Indicates possible reagent or background contamination.
E Estimated Reported value exceeded calibration range.
J Reported value is an estimate because concentration is less than reporting limit.
PND Precision not determined.
R Sample results rejected because of gross deficiencies in QC or method performance. Re-sampling and/or re-analysis is necessary.
RND Recovery not determined.
U Compound was analyzed for, but not detected.
O Out of holding. Time does not meet 40 CFR 136/141 compliance.
T This result is not supported by our certification ID.
A Does not meet 40 CFR 136/141 compliance.
C Does not meet 47 CSR 32 compliance.

Narrative:

Approved Doyle E. Bennett

CLIENT: CI McKown & Son Inc DATE/TIME RECEIVED: 12-28-17 (1245)

LABORATORY COMMENTS

According to Standard Methods, NO writing CAN be on the sides of the colilert bottle because it MAY result in a false positive. LAB had to transfer your sample to a new bottle which increased the chance for cross contamination. Please do not write on the bottle. Please only write on the lid.

* Client provided ___ Compliant___Non-compliant

**These results meet or exceed requirements and standards set forth by the certifying authority except where noted.

Sample ID	Parameter	Brief Explanation
#1 Spring	Total Coliform	Writing on colilert Bottle

Sample ID	Parameter	Brief Explanation

Sample ID	Parameter	Brief Explanation

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Office of Oil and Gas

JAN 26 2018

WV Department of
Environmental Protection

CHAIN OF CUSTODY RECORD

ENVIRONMENTAL SERVICES

Main Office:
STURM ENVIRONMENTAL SERVICES
BRUSHY FORK ROAD
P.O. BOX 650
BRIDGEPORT, WV 26330
PHONE: 304-623-6549
FAX: 304-623-6552

STURM ENVIRONMENTAL SERVICES
610 D STREET
P.O. BOX 8337
SO. CHARLESTON, WV 25303
PHONE: 304-744-9864
FAX: 304-744-7866

RECEIVED
Office of Oil and Gas
JAN 26 2018
WV Department of Environmental Protection

REPORT TO: Client Name: C.I. McKown & Son, Inc.
Address: P.O. Box 711
City/State/Zip: Newton, WV 25266
Contact Person: Sam McKown
Telephone Number: 304/565-7318 Fax No. 304/565-3804
Email Address: cimckown@frontier.com
Sampler Name: (Print) Michael T. Kelly
Sampler Signature: Michael Kelly
Project Name: PFROST 2017 UIC RENEWAL
Special Reporting: X Email Results ____ Fax Results

BILL TO: Client Name: SAME
Address: ____
City/State/Zip: ____
Contact Person: ____
Telephone Number: ____ Fax No. ____
Email Address: ____
Purchase Order #: ____
TURN AROUND TIME: ____ Standard
____ RUSH (pre-scheduled; surcharges may apply) Please Check One
____ Date Needed

1 DAY	2 DAY	3 DAY

Sample ID / Description	COMPOSITE SAMPLE: START DATE	START TIME	END DATE	END TIME	GRAB SAMPLE: DATE	TIME	PRESERVATIVE: Ice	OTHER	HCl	NaOH	H_2SO_4, Plastic	H_2SO_4, Glass	None	HNO_3	MATRIX: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	ANALYZE FOR: See attached	# of Bottles	Flow (gpm, cfs, mgd) circle one	Field pH	Field Conductivity	Field DO	Field Chlorine (mg/L or ug/L) circle one	Field Temp (°F or C°) circle one
#1 - SPRING					12/28/17	9:00 am	X	X			X		X	X						X	X	12						
#2 - CHAMBER					12/28/17	9:30 am	X	X			X		X	X						X	X	12						
#3 - INJECTATE					12/28/17	10:00	X				X		X	X						X	X	11						

Comments

Records retained for 5 years

Relinquished by:	Date	Time	Received by:	Date	Time
Michael Kelly	12/28/17	1245pm	K. Thebut	12/28/17	1245
Relinquished by:	Date	Time	Received by:	Date	Time

Laboratory Comments:
Temperature Upon Receipt: 0 °C <6
Bottles Preserved? (Y) N

coliert # #1 1054 17 #2 1047 17

REIC

Improving the environment, one client at a time...

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

3029-C Peters Creek Road
Roanoke, VA 24019
TEL: 540.777.1276

1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Wednesday, January 10, 2018

Kim Krehel
STURM ENVIRONMENTAL SERVICES
P O BOX 650
BRIDGEPORT, WV 26330

TEL: (304) 623-6549
FAX: (304) 623-6552

RE: CI McKOWN & SON, INC.
Work Order #: 17123652

Dear Kim Krehel:

REI Consultants, Inc. received 3 sample(s) on 12/29/2017 for the analyses presented in the following report.

Sincerely,

Jimmy Suttle
Project Manager
(304) 250-6234

REI Consultants, Inc. - Case Narrative

WO#: 17123652

Date Reported: 1/10/2018
Original

Client: STURM ENVIRONMENTAL SERVICES

Project: CI McKOWN & SON, INC.

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP and/or VELAP requirements for parameters clearly designated as PA, VA, PA/VA, or VELAP in the column labeled NELAP.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be considered estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, NCDWQ 466, PADEP 68-00839, VADCLS(VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 17123652

Date Reported: 1/10/2018
Original

Client:	STURM ENVIRONMENTAL SERVICES	**Collection Date:**	12/28/2017 9:00:00 AM
Project:	CI McKOWN & SON, INC.	**Date Received:**	12/29/2017
Lab ID:	17123652-01A	**Matrix:**	Liquid
Client Sample ID:	17298 #1 SPRING	**Site ID:**	

Analysis	Result	MDL	PQL	MCL Qual	Units	Prep Date	Date Analyzed	NELAC
SEMI-VOLATILE RANGE ORGANICS				**Method: SW8015C**			**Analyst: YT**	
TPH (Diesel Range: C10 - C28)	ND	0.13	0.25	NA	mg/L	01/02/18 10:02AM	01/03/18 8:17AM	PA/VA
TPH (Oil Range: C22 - C36)	ND	0.13	0.25	NA	mg/L	01/02/18 10:02AM	01/03/18 8:17AM	VA
Surr: o-Terphenyl	77.8	NA	17.6-135	NA	%Rec	01/02/18 10:02AM	01/03/18 8:17AM	

Notes:

Insufficient sample was available to prepare and analyze a matrix spike. Acceptable LCS results demonstrate the accuracy of the analysis.

DISSOLVED GASES				**Method: GC-FID**			**Analyst: YT**	
Methane	ND	5.00	10.0	NA	µg/L		01/08/18 3:45PM	
Ethane	ND	7.50	15.0	NA	µg/L		01/08/18 3:45PM	
Propane	ND	10.0	20.0	NA	µg/L		01/08/18 3:45PM	
Butane	ND	12.5	25.0	NA	µg/L		01/08/18 3:45PM	
VOLATILE RANGE ORGANICS				**Method: SW8015C**			**Analyst: TKC**	
TPH (Gasoline Range: C6 - C10)	ND	0.250	0.500	NA	mg/L	01/02/18 4:07PM	01/04/18 2:35PM	PA/VA
Surr: 2,5-Dibromotoluene	124	NA	53.5-143	NA	%Rec	01/02/18 4:07PM	01/04/18 2:35PM	
VOLATILE ORGANIC COMPOUNDS				**Method: SW8021B**			**Analyst: CB**	
Benzene	ND	0.500	1.00	NA	µg/L	01/02/18 4:07PM	01/08/18 7:52PM	VA
Toluene	ND	0.500	1.00	NA	µg/L	01/02/18 4:07PM	01/08/18 7:52PM	VA
Ethylbenzene	ND	0.500	1.00	NA	µg/L	01/02/18 4:07PM	01/08/18 7:52PM	VA
m,p-Xylene	ND	1.00	2.00	NA	µg/L	01/02/18 4:07PM	01/08/18 7:52PM	VA
o-Xylene	ND	0.500	1.00	NA	µg/L	01/02/18 4:07PM	01/08/18 7:52PM	VA
Surr: 1,1,1-Trifluorotoluene	93.7	NA	57.1-139	NA	%Rec	01/02/18 4:07PM	01/08/18 7:52PM	

REI Consultants, Inc. - Analytical Report

WO#: 17123652

Date Reported: 1/10/2018
Original

Client:	STURM ENVIRONMENTAL SERVICES	**Collection Date:**	12/28/2017 9:30:00 AM
Project:	CI McKOWN & SON, INC.	**Date Received:**	12/29/2017
Lab ID:	17123652-02A	**Matrix:**	Liquid
Client Sample ID:	17299 #2 CHAMBERS	**Site ID:**	

Analysis	Result	MDL	PQL	MCL Qual	Units	Prep Date	Date Analyzed	NELAC
SEMI-VOLATILE RANGE ORGANICS				**Method: SW8015C**			**Analyst: YT**	
TPH (Diesel Range: C10 - C28)	ND	0.13	0.26	NA	mg/L	01/02/18 10:02AM	01/03/18 3:26PM	PA/VA
TPH (Oil Range: C22 - C36)	ND	0.13	0.26	NA	mg/L	01/02/18 10:02AM	01/03/18 3:26PM	VA
Surr: o-Terphenyl	71.6	NA	17.6-135	NA	%Rec	01/02/18 10:02AM	01/03/18 3:26PM	
Notes:								
Insufficient sample was available to prepare and analyze a matrix spike. Acceptable LCS results demonstrate the accuracy of the analysis.								
DISSOLVED GASES				**Method: GC-FID**			**Analyst: YT**	
Methane	ND	5.00	10.0	NA	µg/L		01/08/18 3:50PM	
Ethane	ND	7.50	15.0	NA	µg/L		01/08/18 3:50PM	
Propane	ND	10.0	20.0	NA	µg/L		01/08/18 3:50PM	
Butane	ND	12.5	25.0	NA	µg/L		01/08/18 3:50PM	
VOLATILE RANGE ORGANICS				**Method: SW8015C**			**Analyst: TKC**	
TPH (Gasoline Range: C6 - C10)	ND	0.250	0.500	NA	mg/L	01/02/18 4:07PM	01/04/18 3:07PM	PA/VA
Surr: 2,5-Dibromotoluene	120	NA	53.5-143	NA	%Rec	01/02/18 4:07PM	01/04/18 3:07PM	
VOLATILE ORGANIC COMPOUNDS				**Method: SW8021B**			**Analyst: CB**	
Benzene	ND	0.500	1.00	NA	µg/L	01/02/18 4:07PM	01/08/18 8:24PM	VA
Toluene	ND	0.500	1.00	NA	µg/L	01/02/18 4:07PM	01/08/18 8:24PM	VA
Ethylbenzene	ND	0.500	1.00	NA	µg/L	01/02/18 4:07PM	01/08/18 8:24PM	VA
m,p-Xylene	ND	1.00	2.00	NA	µg/L	01/02/18 4:07PM	01/08/18 8:24PM	VA
o-Xylene	ND	0.500	1.00	NA	µg/L	01/02/18 4:07PM	01/08/18 8:24PM	VA
Surr: 1,1,1-Trifluorotoluene	98.2	NA	57.1-139	NA	%Rec	01/02/18 4:07PM	01/08/18 8:24PM	

REIC
Improving the environment, one client at a time.

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304)255-2500
Website: www.reiclabs.com

Sample Receipt Checklist

McKOWN & SON, INC.

Client Name:	STU001			Work Order Number:	17123652
RCPNo:	1	Date and Time Received:	12/29/2017 5:40:00 PM	Received by:	Randy Moore
Completed By:	Kim Pack		Reviewed By:	Jimmy Suttle	
Completed Date:	12/30/2017 8:20:24 AM		Reviewed Date:	1/2/2018 7:56 AM	

Carrier Name: REIC

1.	Chain of custody present?	Yes [x]	No [ ]	
2.	Chain of custody signed when relinquished and received?	Yes [x]	No [ ]	
3.	Are matrices correctly identified on Chain of custody?	Yes [x]	No [ ]	
4.	Is it clear what analyses were requested?	Yes [x]	No [ ]	
5.	Custody seals intact?	Yes [ ]	No [ ]	Not Present [x]
6.	Samples in proper container type and preservative?	Yes [x]	No [ ]	
7.	Were correct preservatives noted on COC?	Yes [x]	No [ ]	NA [ ]
8.	Sample containers intact?	Yes [x]	No [ ]	
9.	Sufficient sample volume for indicated test?	Yes [x]	No [ ]	
10.	Were container labels complete?	Yes [x]	No [ ]	
11.	All samples received within holding time?	Yes [x]	No [ ]	
12.	Was an attempt made to cool the samples?	Yes [x]	No [ ]	NA [ ]
13.	Sample Temp. taken and recorded upon receipt?	Yes [x]	No [ ]	To 0 °C
14.	Water - Were bubbles absent in VOC vials?	Yes [x]	No [ ]	No Vials [ ]
15.	Are Samples considered acceptable?	Yes [x]	No [ ]	
16.	COC filled out properly?	Yes [x]	No [ ]	

Client Notification/Response

Client Name:	STU001						Work Order Number:	17123652
Comment:								
Client Contacted:	Yes	[ ]	No	[ ]	NA	[x]	Person Contacted:	
Contact Mode:	Phone	[ ]	Fax:	[ ]	Email:	[ ]	In Person: [ ]	
Date Contacted:				Contacted By:				
Regarding:								
Client Instructions:								
Corrective Action:								

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JAN 26 2018
WV Department of
Environmental Protection

DBPix Evaluation

CHAIN OF CUSTODY RECORD

17123652
STURM ENVIRONMENTAL SERVICES
STU001
Jimmy Suttle

REIC
Industrial Consultants, Inc.
CORPORATE HEADQUARTERS:
P.O. Box 286 • 225 Industrial Park Rd. Beaver, WV 25813
800-999-0105 • 304-255-2500 • 304-255-2572/fax • www.reiclabs.com

Client: Sturm Environmental
PO #: 7821
Contact Person: Kim
Phone: 304 623 6549
Quote #:
Fax:
Email:
Address: on file
City:
State:
Zip:
Billing Address (if different):
City:
State:
Zip:
Site ID & State:
Project ID:
Sampler: M. Kelly

MID-OHIO VALLEY Service Center	SHENANDOAH Service Center	ROANOKE Service Center	MORGANTOWN Service Center
101 17th Street Ashland, KY 41101 606-393-5027	1557 Commerce Rd., Ste 201 Verona, VA 24482 540-248-0183	3029 C Peters Creek Rd Roanoke, VA 24019 540-777-1276	16 Commerce Drive Westover, WV 26501 304-241-5861

TURNAROUND TIME: X NORMAL
RUSH TURNAROUND*: 5 DAY | 3 DAY | 2 DAY | 1 DAY
*Rush work needs prior laboratory approval and will incur additional charges
All analytical requests are subject to REIC's Standard Terms and Conditions

Send Results Via: Email | Fax

ANALYSIS & METHOD REQUESTED: TPH-GRO, DRO, ORO; BTEX; Diss " ; " Fe; Butane; Methane; Ethane

SAMPLE ID	No. & Type of Containers	Sampling Date/Time	Matrix	Sample Comp/Grab	TPH-GRO, DRO, ORO	BTEX	Diss "	" Fe	Butane	Methane/Ethane
					0	1	2	0	0	0
17298	1-5 x 1 liter / vials	12-28-17 0900	L	Grab	X	X	X	X	X	X
17299	1 glass liter / vials	0930	|		X	X	X	X	X	X
17300	1 glass liter / vials	1000	|	|	X	X				

ENTER PRESERVATIVE CODE

Preservative Codes:
0. None
1. Hydrochloric Acid
2. Nitric Acid
3. Sulfuric Acid
4. Sodium Thiosulfate
5. Sodium Hydroxide / Sodium Arsenite
6. Sodium Hydroxide
7. Ascorbic Acid
8. Sodium Bisulfate/Methanol
9. Ammonium Chloride
10. Buffer
11. Sodium Sulfite / Hydrochloric Acid

COMMENTS:

CUSTODY SEALS [ ] Y [✓] N

Temperature at arrival: 0 °C ICED? Y ✓ N
Containers provided by: [✓] REIC [ ] Client
Delivered by: [ ] Client [✓] REIC [ ] UPS [ ] FedEx [ ] USPS Other

Relinquished by	Date/Time	Received by	Date/Time
K. Kephel	12-29-17		
Randy L. Moore	12-29-17 1155		
[signature]	12-29-17 1545 →		12-29-17 1540

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Office of Oil and Gas
JAN 26 2018
WV Department of
Environmental Protection

www.ammara.com

ENVIRONMENTAL SERVICES

Main Office:
STURM ENVIRONMENTAL SERVICES
BRUSHY FORK ROAD
P.O. BOX 650
BRIDGEPORT, WV 26330
PHONE: 304-623-6549
FAX: 304-623-6552

STURM ENVIRONMENTAL SERVICES
610 D STREET
P.O. BOX 8337
SO. CHARLESTON, WV 25303
PHONE: 304-744-9864
FAX: 304-744-7866

REPORT TO: Client Name: C.I. McKown + Son, Inc
Address: P.O. Box 711
City/State/Zip: Newton WV 25266
Contact Person: Sam McKown
Telephone Number: 304/565-7318 Fax No. 304/565-3804
Email Address: cimckown@frontier.com
Sampler Name: (Print) Michael J Kelly
Sampler Signature: Michael Kelly
Project Name: PERMIT 2017 UIC RENEWAL
Special Reporting: X Email Results ____ Fax Results

BILL TO: Client Name: SAME
Address: ____
City/State/Zip: ____
Contact Person: ____
Telephone Number: ____ Fax No. ____
Email Address: ____
Purchase Order #: ____
TURN AROUND TIME: ____ Standard
____ RUSH (pre-scheduled; surcharges may apply) Please Check One
Date Needed

1 DAY	2 DAY	3 DAY

Sample ID / Description	COMPOSITE SAMPLE: START DATE	START TIME	END DATE	END TIME	GRAB SAMPLE: DATE	TIME	PRESERVATIVE: Ice	OTHER	HCl	NaOH	H_2SO_4 Plastic	H_2SO_4 Glass	None	HNO_3	MATRIX: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	ANALYZE FOR:	# of Bottles	Flow (gpm, cfs, mgd) circle one	Field pH	Field Conductivity	Field DO	Field Chlorine (mg/L or ug/L) circle one	Field Temp (F° or C°) circle one
#1 - SPRING					12/28/17	9:00 am																1						
#2 - CHAMBERS					12/28/17	9:30 am																1						
#3 - INJECTATE					12/28/17	10:00																1						

RECEIVED
Office of Oil and Gas
JAN 26 2018
WV Department of Environmental Protection

Comments

Records retained for 5 years

Relinquished by:	Date	Time	Received by:	Date	Time
Michael Kelly	12/28/17	12:45 pm	[illegible]	12/29/17	1245
Relinquished by:	Date	Time	Received by:	Date	Time

Laboratory Comments:
Temperature Upon Receipt: 0 °C
Bottles Preserved? Y N

colilert # #1 1654 17 #2 1647 17

Section 8
Geological Data

Section 8 – Geological Data on the Injection and Confining Zone

The subject well and related AOR are situated in the East-West geographic center of the Appalachian Basin in central Roane County, West Virginia. The injection zone is the "Big Injun" sandstone located at the very top of the Pocono Group, while the confining layer is the "Big Lime" formation near the base of the Greenbrier Limestone. Both are within the Mississippian System. (See Stratigraphic Section Attached). The injection horizon is approximately 2000' below the surface at the well location, with the confining layer immediately above it.

As is evidenced by the attached contour maps, there is very little structure in the area and no indicated evidence of significant faulting. Both the injection zone and the confining layer are known to exist throughout the region.

The injection zone has been prolific in the production of oil and natural gas for well over 100 years in the area and, in fact, throughout large regions of the state. In the initial permit application in 1985, the Big Injun was indicated to be 35' thick with a porosity of 21 percent (see log attached). Also, in the initial application, the permeability was determined to be 20 millidarcies. The Big Injun in known to be quite homogeneous throughout the area and, given the records of surrounding wells, it should be a good assumption that that the injection zone is homogeneous throughout the AOR.

Like the injection zone, the confining layer, as evidenced by surrounding wells' data, is essentially homogeneous throughout the area, and thus, the AOR. The Big Lime is actually the trapping mechanism for the hydrocarbons that have been and still are being developed in the Big Injun Sandstone. The productivity of the Big Injun Sandstone in the area serves as perhaps the best evidence of the ability of the Big Lime to act as an adequate confining layer for the injected fluids. In the subject well, the Big Lime is 111' thick and the records of the other wells in the AOR indicate similar thickness. The driller's "Pencil Cave" Shale is immediately atop the Big Lime which serves as a redundant, albeit likely unnecessary, confining layer. Finally, a different operator is developing a secondary-recovery water flooding project immediately south of this well in the same injection horizon further confirming the effectiveness of the confining layer. As mentioned above, there is no evidence of fracturing or faulting of the confining layer(s) within the AOR.

The groundwater inventory revealed one spring used for livestock consumption within the AOR. It along with one drinking water well outside the AOR that had been tested in prior renewals of this permit was tested and the results are attached.

The injectate was also sampled and the results are attached. Inasmuch as much of the water being injected originated in the same formation as it is being reinjected into, no compatibility issues are anticipated.

A search of the West Virginia Geological and Economic Survey revealed no seismic activity has been recorded in Roane County West Virginia since 1824, the year the data begins (See Attached). Given this, the risk of seismic activity from injection activities that are now a fraction of the volumes they were when the well was originally permitted are negligible.

In order to estimate the migration of the injection fluid with time, certain assumptions had to be made. Since the injection formation was a depleted and reasonably a homogeneous oil and natural gas reservoir, it is assumed that the injected fluids move radially – equally in all horizontal directions -- away from the wellbore. In the 1985 permit application the injection zone at the subject well was reported to be 35' thick with a porosity of 21 percent. A review of other wells in the AOR reveals it is reasonable to assume these numbers are consistent throughout the area through which the injected fluids have migrated. In estimating the distance injection fluids have moved from the wellbore, the best available cumulative injection volume was used. In 1985, when disposal began, the Big Injun Sandstone was depleted and, therefore, an estimate of recovered reserves by that time is fifteen percent. Also, the disposed fluids should displace approximately fifteen percent of additional fluid as they move through the formation, thus provided roughly thirty percent pore space to accommodate the injected fluid. Lastly, this estimate does not account for the compressibility of any of the fluids at reservoir conditions. Therefore, the indicated radius from the wellbore the injection fluid has moved, provided all the other assumptions are correct, is a maximum distance, as formation volume factors would decrease the fluid volume and, therefore, shorten the radius.

Based on all these assumptions, the calculated estimated radius the fluid has moved from the wellbore over time are:

1/31/02 – 470'

1/31/07 – 507'

1/31/12 – 544'

9/30/16 – 552'

See Attached.

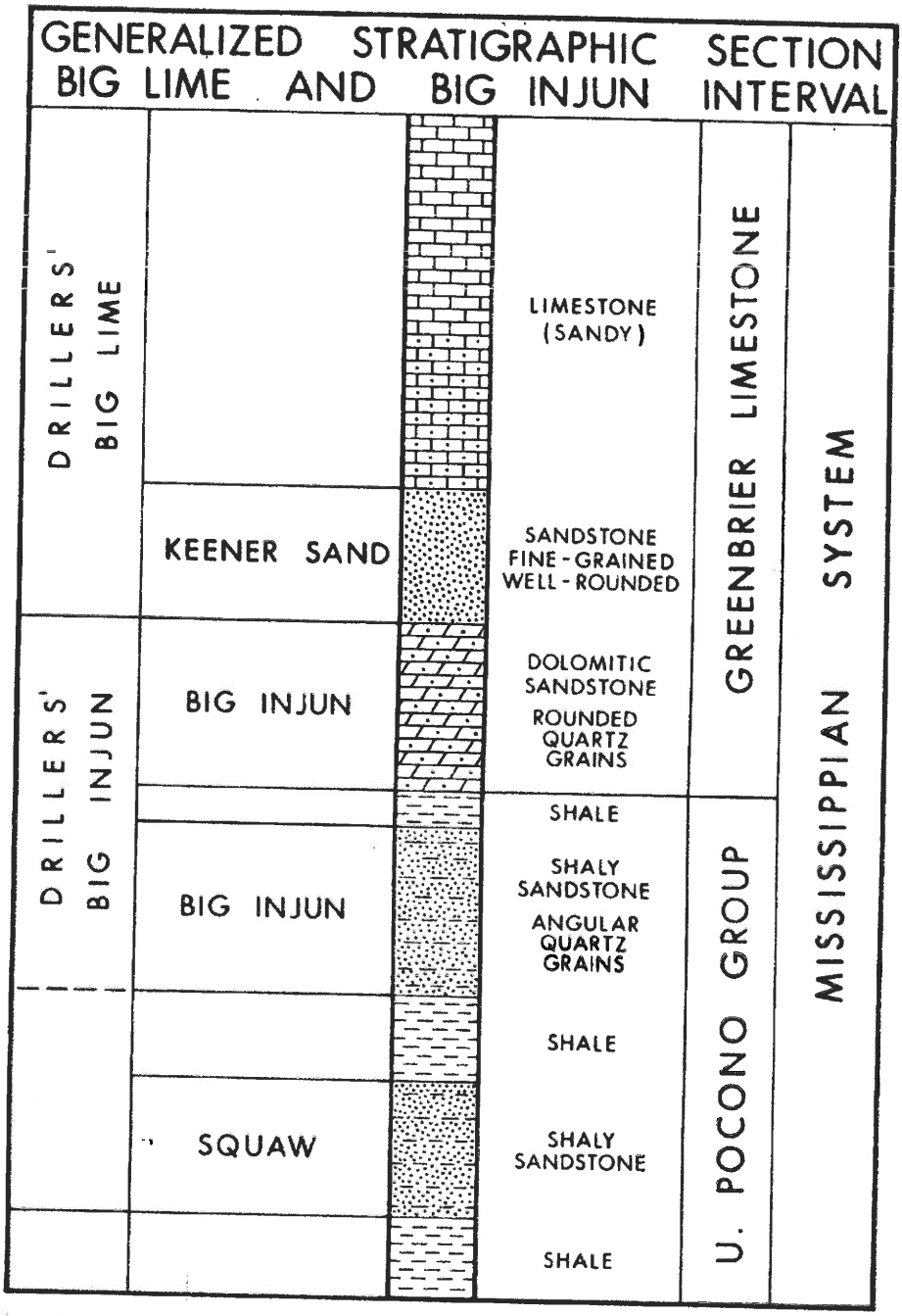


Figure 1. Drillers' Big Injun sandstone.

BULLETIN B-40
WEST VIRGINIA GEOLOGICAL
AND ECONOMIC SURVEY
1986

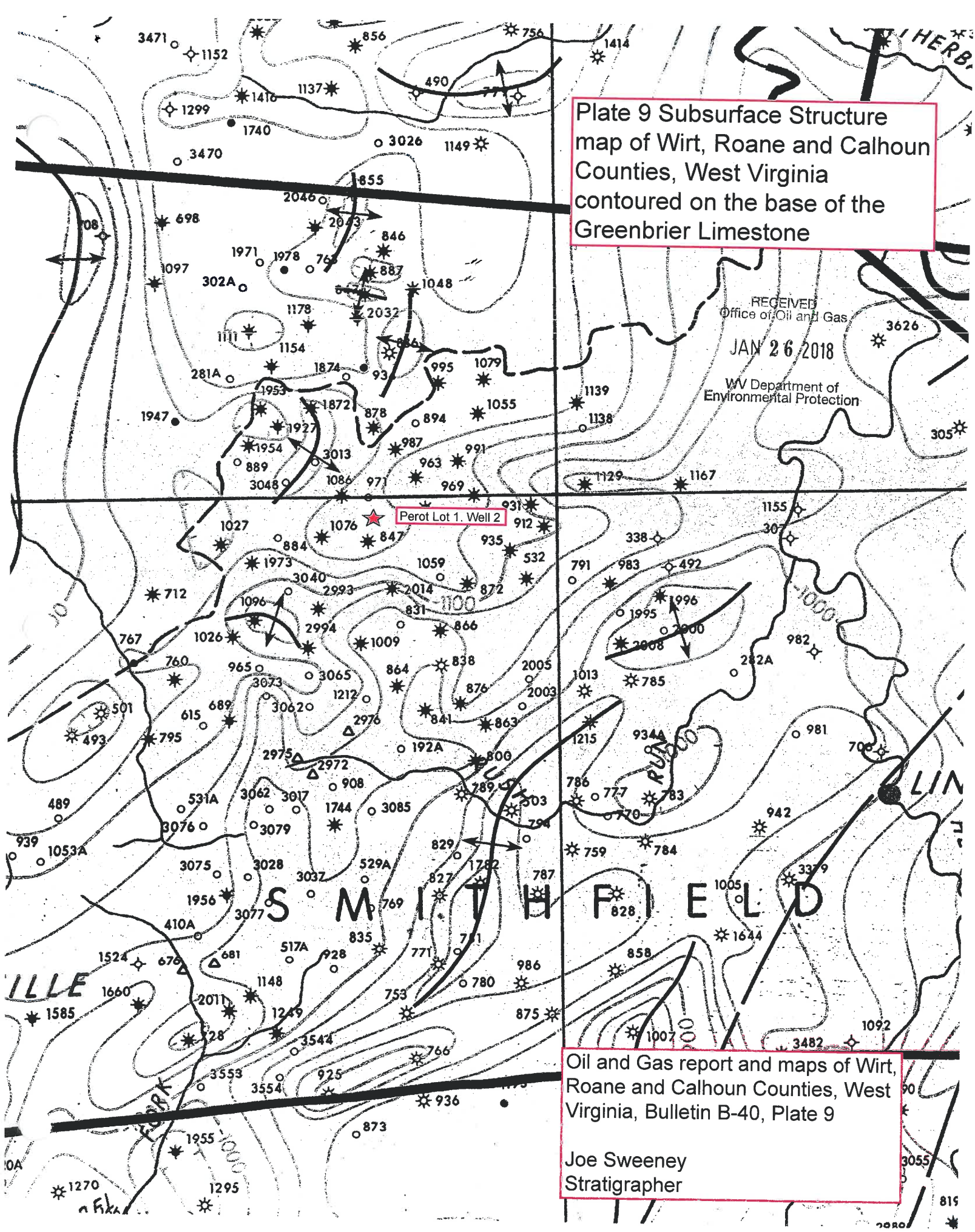
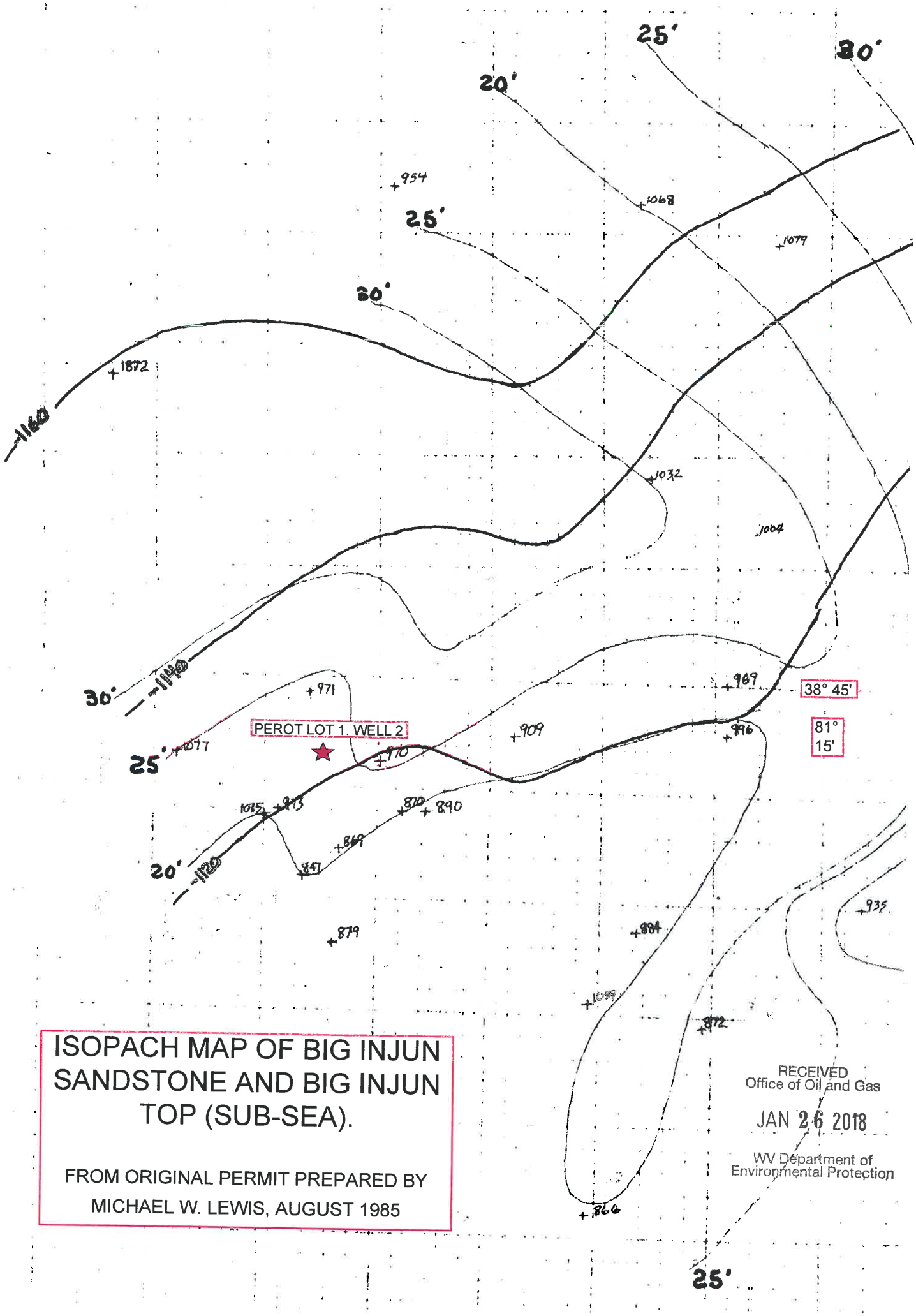


Plate 9 Subsurface Structure map of Wirt, Roane and Calhoun Counties, West Virginia contoured on the base of the Greenbrier Limestone
RECEIVED
Office of Oil and Gas
JAN 26 2018
WV Department of
Environmental Protection
Perot Lot 1, Well 2
S M I T H F I E L D
Oil and Gas report and maps of Wirt, Roane and Calhoun Counties, West Virginia, Bulletin B-40, Plate 9
Joe Sweeney
Stratigrapher



ISOPACH MAP OF BIG INJUN SANDSTONE AND BIG INJUN TOP (SUB-SEA).

FROM ORIGINAL PERMIT PREPARED BY
MICHAEL W. LEWIS, AUGUST 1985

Basin Surveys, Inc.

RADIATION LOG

FILING NO.

COMPANY J & B OIL CO.

WELL PEROT WELL #2 LOT #1

FIELD "

COUNTY ROANE STATE W.VA.

LOCATION: SEC. TWP. RGE.

PERMANENT DATUM F.L. ELEV.

LOG MEASURED FROM F.L.

DRILLING MEASURED FROM F.L.

DATE	9-30-64
RUN NO.	1
TYPE LOG	PERFORATION DEPTH CONTROL
DEPTH – DRILLER	2096
DEPTH – LOGGER	2077.5
BOTTOM LOGGED INTERVAL	2073
TOP LOGGED INTERVAL	1700
TYPE FLUID IN HOLE	WATER
SALINITY PPM CL.	
DENSITY LB./GAL.	
LEVEL	
MAX. REC. TEMP. – DEG. F	
OPR. RIG TIME	2 HRS
RECORDED BY	SULLIVAN
WITNESSED BY	BEARD

ELEVATIONS: KB. DF. GL.

OTHER LOGS

BORE HOLE RECORD

RUN NO.	BIT	FROM	TO

CASING RECORD

SIZE	WGT.	FROM	TO
4.5"	9.5	0	TD

CLARK

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	1	RUN NO.	
MODEL NO.	GCN56X	LOG TYPE	
DIAM.	3.5	TOOL MODEL NO.	
. MODEL NO.	A.P.A.	DIAM.	
YPE	SCINT.	DETECT. MODEL NO.	
ENGTH	3	TYPE	
O N. SOURCE		LENGTH	
		SOURCE MODEL NO.	
		SERIAL NO.	
		SPACING	
		TYPE	
		STRENGTH	

GENERAL	
TRUCK NO.	101
RUCK NO.	
SERIAL NO.	

LOGGING DATA

GENERAL DEPTHS FROM	TO	SPEED FT/MIN	GAMMA RAY T.C. SEC.	SENS. SETTINGS	ZERO LOG DIV.	SCALE API G.R. UNITS	NEUTRON T.C. SEC.	SENS. SETTINGS	ZERO LOG DIV.	SCALE API N. UNITS
073	1700	20	3	110						

NCE LITERATURE:

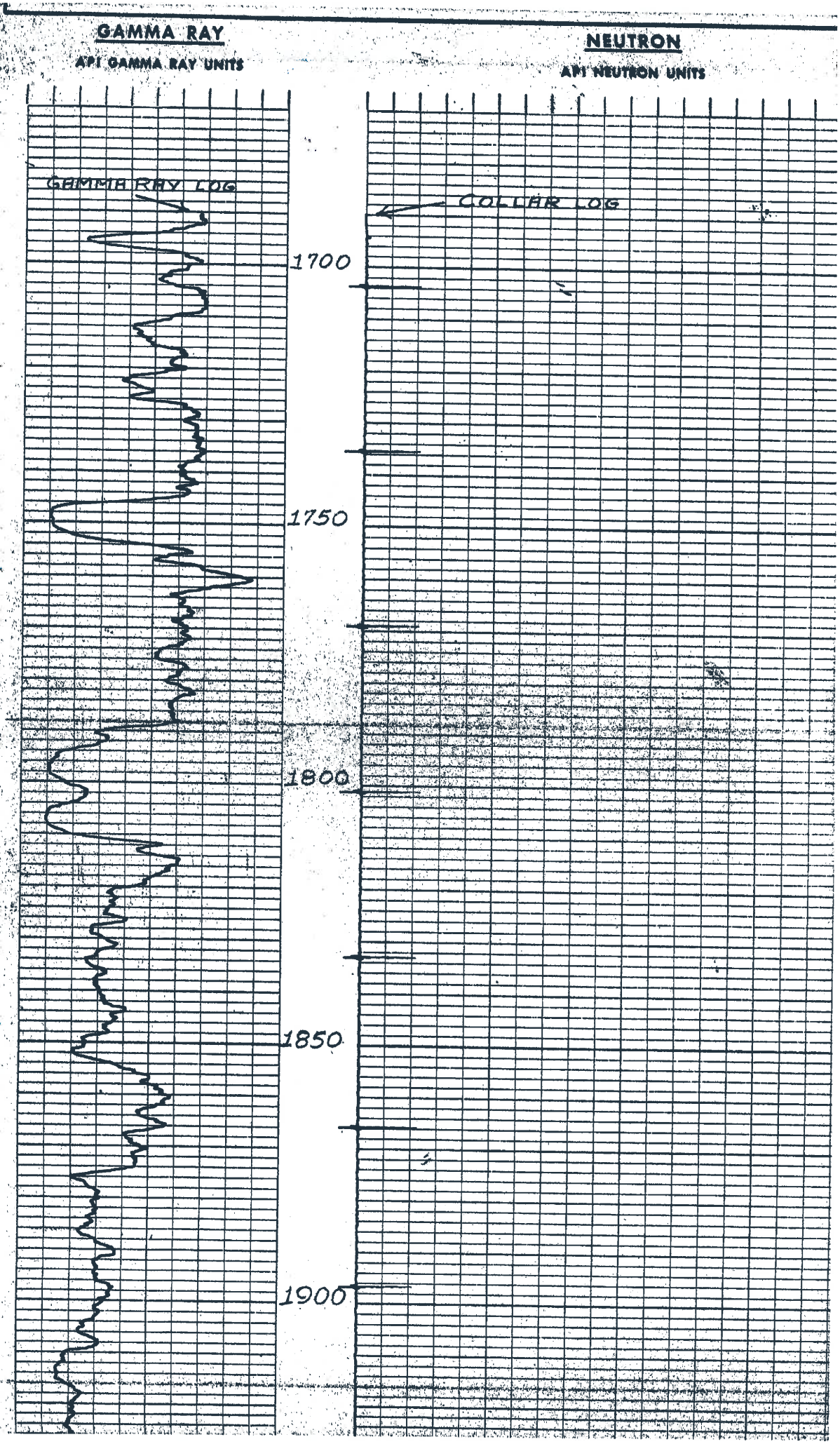
KS:

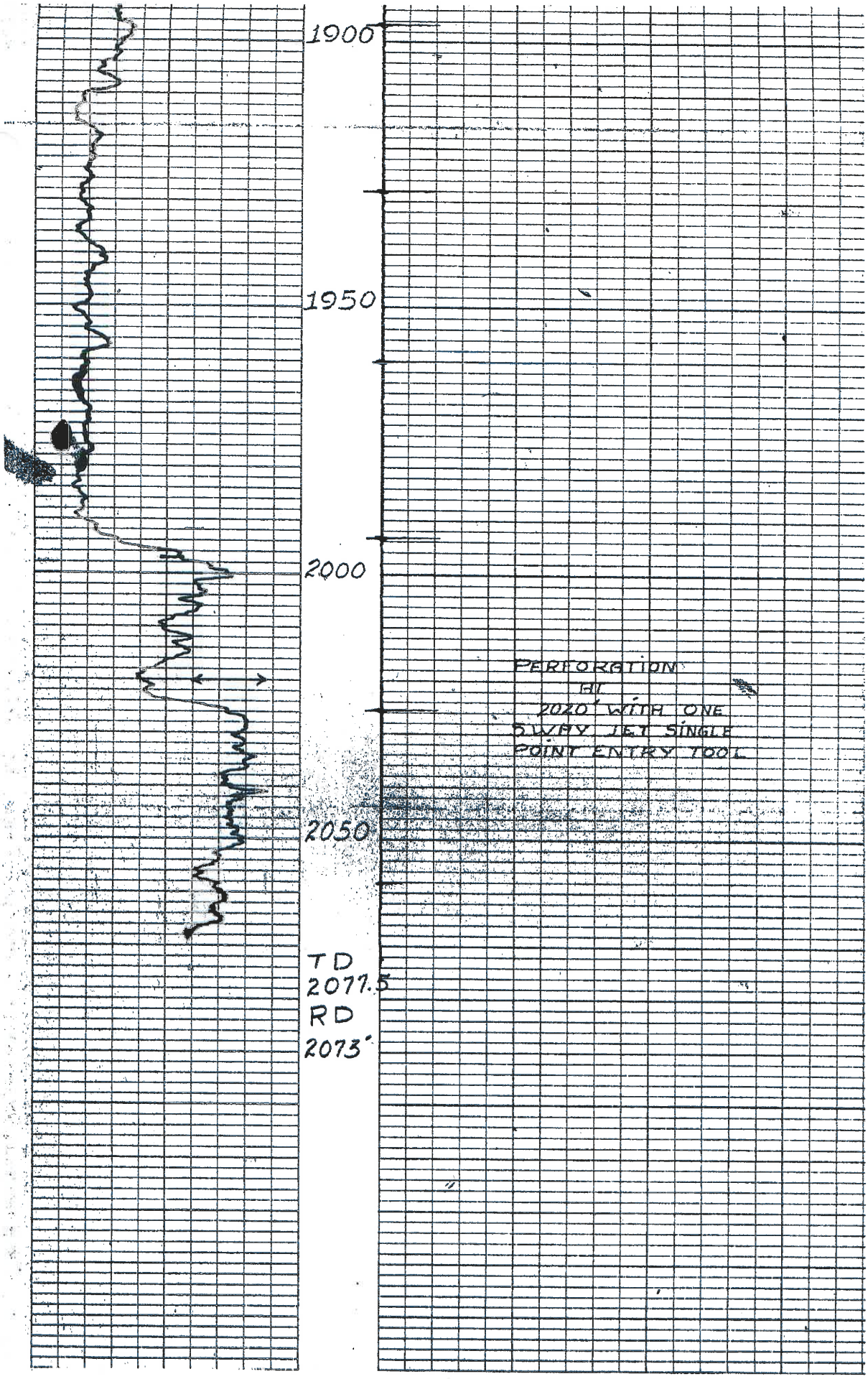
GAMMA RAY

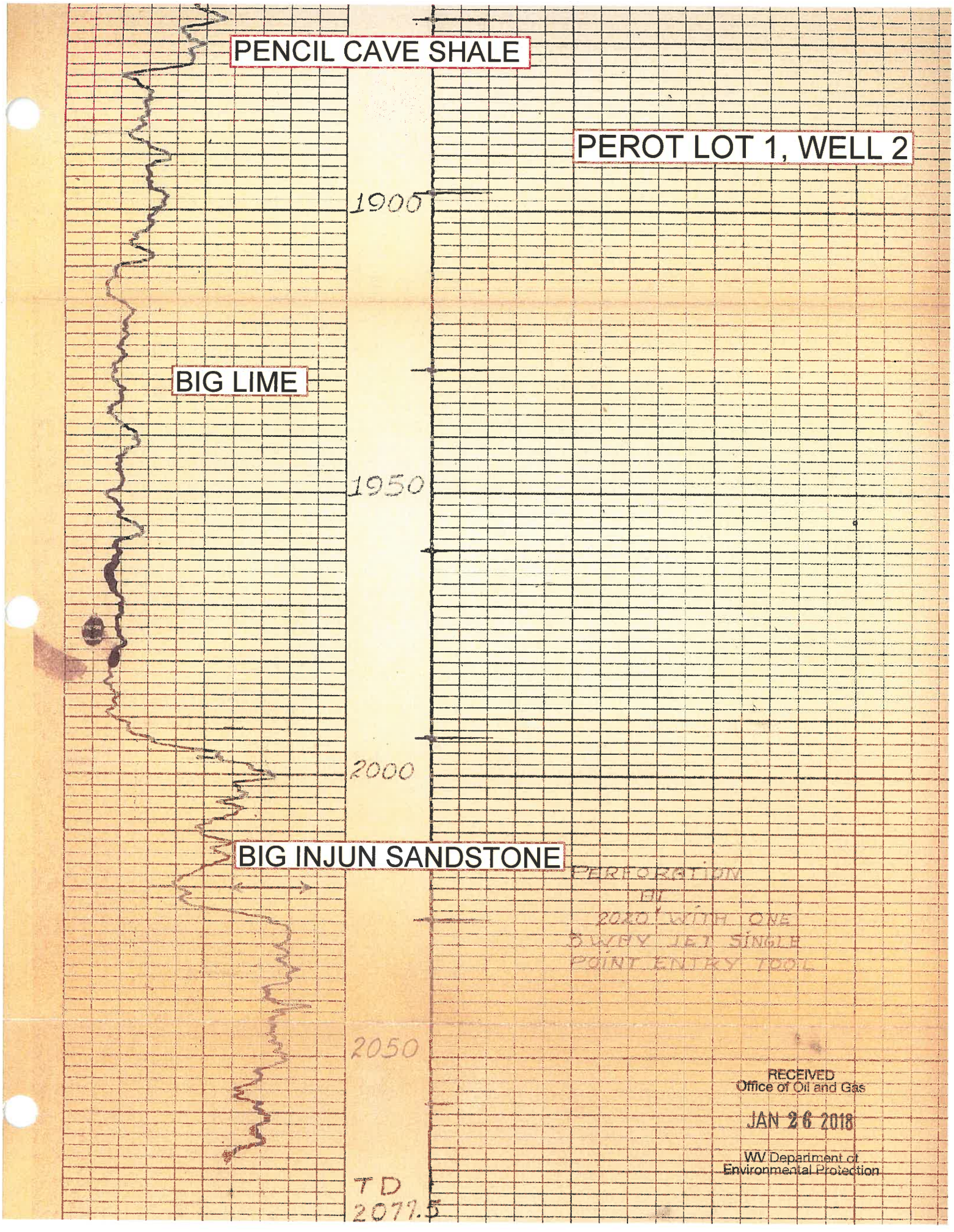
API GAMMA RAY UNITS

NEUTRON

API NEUTRON UNITS


GAMMA RAY
API GAMMA RAY UNITS
NEUTRON
API NEUTRON UNITS
GAMMA RAY LOG
COLLAR LOG
1700
1750
1800
1850
1900

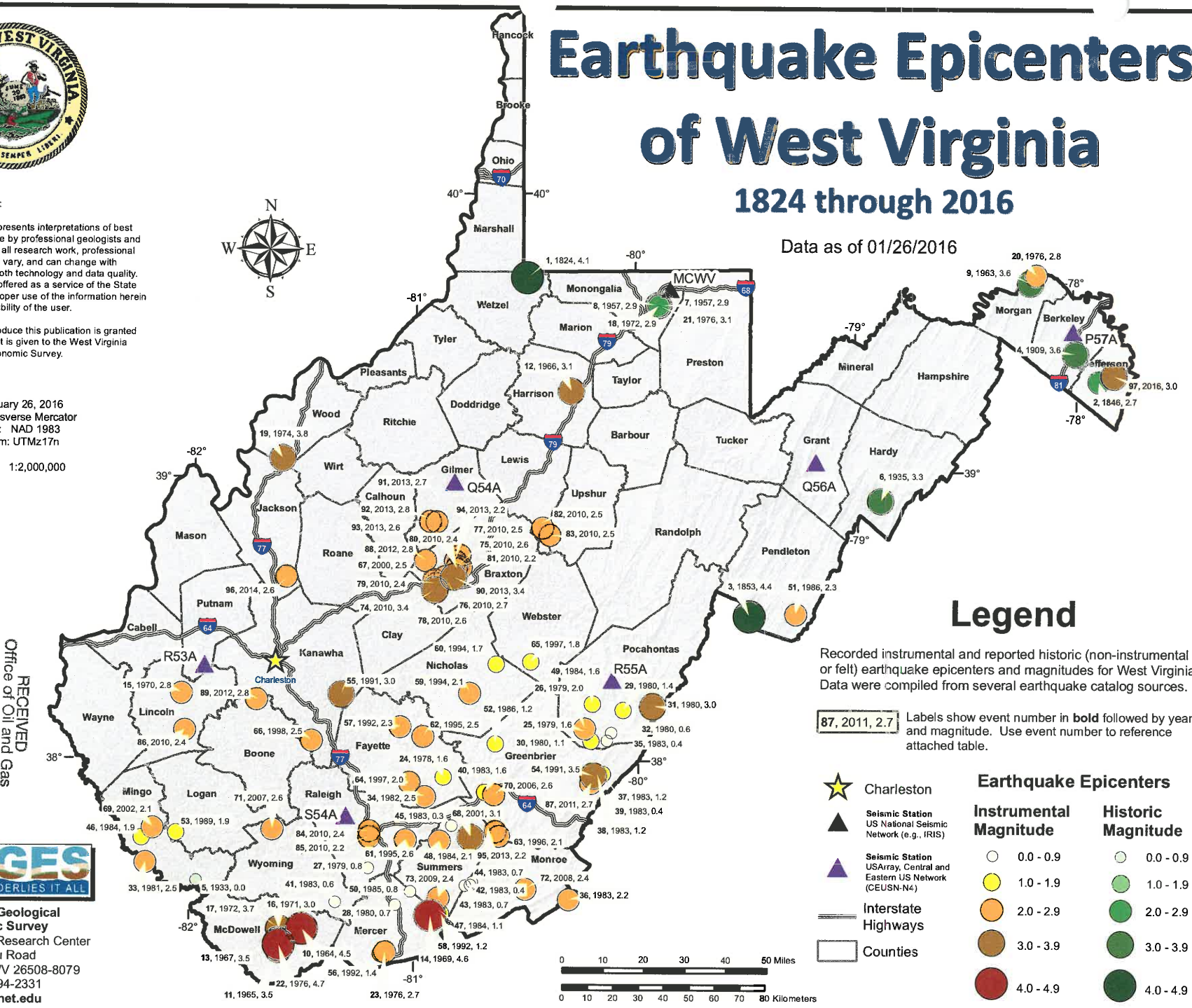

1900
1950
2000
2050
PERFORATION
@
2020' WITH ONE
5 WAY JET SINGLE
POINT ENTRY TOOL
TD
2077.5
RD
2073'



Earthquake Epicenters of West Virginia

1824 through 2016

Data as of 01/26/2016



Legend

Recorded instrumental and reported historic (non-instrumental or felt) earthquake epicenters and magnitudes for West Virginia. Data were compiled from several earthquake catalog sources.

87, 2011, 2.7 Labels show event number in **bold** followed by year and magnitude. Use event number to reference attached table.

- Charleston
- **Seismic Station** US National Seismic Network (e.g., IRIS)
- **Seismic Station** USArray, Central and Eastern US Network (CEUSN-N4)
- Interstate Highways
- Counties

Earthquake Epicenters

Instrumental Magnitude	Historic Magnitude
0.0 - 0.9	0.0 - 0.9
1.0 - 1.9	1.0 - 1.9
2.0 - 2.9	2.0 - 2.9
3.0 - 3.9	3.0 - 3.9
4.0 - 4.9	4.0 - 4.9

Publications Policy:

This publication represents interpretations of best available data made by professional geologists and geographers. As in all research work, professional interpretations may vary, and can change with advancements in both technology and data quality. This publication is offered as a service of the State of West Virginia; proper use of the information herein is the sole responsibility of the user.

Map Date: January 26, 2016
Projection: Transverse Mercator
Horizontal Datum: NAD 1983
Coordinate System: UTMz17n
Map scale for full 8.5" x 11" display: 1:2,000,000

West Virginia Geological and Economic Survey
Mont Chateau Research Center
1 Mont Chateau Road
Morgantown, WV 26508-8079
Phone: (304) 594-2331
www.wvgs.wvnet.edu

Event Num	WVQID	County	UTC Year	UTC Month	UTC Day	UTC HH	UTC MM	UTC SS	Latitude (N)	Longitude (W)	Magnitude	Recorded	MMI	Magnitude Type	Source 1	Source 2	USGS Link
1	18240715160	Wood	1824	7	15	16	20	0.00	39.70000	-80.50000	4.1	Historic	4.0	Mb	VTSO	NCEER	
2	18461019020	Jefferson	1846	10	19	2	0	0.00	39.30000	-77.90000	2.7	Historic	3.0	<NULL>	VTSO	<NULL>	
3	18530502140	Pendleton	1853	5	2	14	20	0.00	38.50000	-79.50000	4.4	Historic	5.5	<NULL>	NCEER	Wheeler I-2737	
4	19090402070	Berkeley	1909	4	2	7	25	0.00	39.40000	-78.00000	3.6	Historic	5.0	Mb	VTSO	Wheeler I-2737	
5	19330615010	Mingo	1933	6	15	1	14	36.80	37.56800	-81.97300	0.0	Historic	0.0	<NULL>	VTSO	<NULL>	
6	19351101080	Hardy	1935	11	1	8	30	0.00	38.90000	-78.90000	3.3	Historic	4.0	<NULL>	VTSO	NCEER	
7	19570307210	Monongalia	1957	3	7	21	5	9.00	39.60000	-79.90000	2.9	Historic	3.0	Mb	VTSO	<NULL>	
8	19570313210	Monongalia	1957	3	13	21	0	41.00	39.60000	-79.90000	2.9	Historic	3.0	Mb	VTSO	<NULL>	
9	19631010000	Morgan	1963	10	10	0	0	0.00	39.65500	-78.19700	3.6	Historic	0.0	<NULL>	Wheeler I-2737	<NULL>	
10	19641125020	McDowell	1964	11	25	2	50	5.00	37.40000	-81.50000	4.5	Instrumental	0.0	Mb	ANSS	<NULL>	
11	19650426150	McDowell	1965	4	26	15	26	19.70	37.32500	-81.60200	3.5	Instrumental	0.0	MbLg	VTSO	NCEER	
12	19660928000	Harrison	1966	9	28	0	0	0.00	39.30000	-80.30000	3.1	Instrumental	4.0	<NULL>	NCEER	<NULL>	
13	19671216120	McDowell	1967	12	16	12	23	33.40	37.36000	-81.60400	3.5	Instrumental	0.0	Mb	VTSO	NCEER	
14	19691120010	Mercer	1969	11	20	1	0	9.30	37.44900	-80.93200	4.6	Instrumental	6.0	MbLg	VTSO	NCEER	
15	19700811060	Lincoln	1970	8	11	6	14	25.50	38.23000	-82.05000	2.8	Instrumental	4.0	MbLg	VTSO	NCEER	
16	19710401050	McDowell	1971	4	1	5	5	11.00	37.40000	-81.60000	3.0	Instrumental	0.0	Mb	NCEER	ANSS	
17	19720109230	McDowell	1972	1	9	23	24	29.00	37.40000	-81.60000	3.7	Instrumental	0.0	MbLg	NCEER	ANSS	
18	19720912150	Monongalia	1972	9	12	15	17	13.70	39.60000	-79.90000	2.9	Historic	3.0	Mb	VTSO	NCEER	
19	19741020150	Wood	1974	10	20	15	13	55.60	39.06000	-81.60900	3.8	Instrumental	5.0	Mb	VTSO	NCEER	Further Info
20	19760130180	Morgan	1976	1	30	18	58	49.80	39.68300	-78.17000	2.8	Instrumental	0.0	Lg	USGS	ANSS	Further Info
21	19760506180	Monongalia	1976	5	6	18	46	8.10	39.60000	-79.90000	3.1	Historic	4.0	Mb	VTSO	NCEER	
22	19760619050	McDowell	1976	6	19	5	54	13.40	37.34400	-81.60200	4.7	Instrumental	5.0	Mb	VTSO	NCEER	Further Info
23	19760703200	Mercer	1976	7	3	20	53	45.80	37.32000	-81.13000	2.7	Instrumental	0.0	MbLg	VTSO	<NULL>	
24	19780814040	Fayette	1978	8	14	4	50	5.40	37.93900	-80.87400	1.6	Instrumental	0.0	Mc	VTSO	ANSS	
25	19790916090	Pocahontas	1979	9	16	9	39	22.60	38.09900	-80.24000	1.6	Instrumental	0.0	Mc	ANSS	<NULL>	
26	19790919000	Pocahontas	1979	9	19	0	45	57.40	38.11000	-80.24300	2.0	Instrumental	0.0	Mc	ANSS	<NULL>	
27	19791031080	Raleigh	1979	10	31	8	32	47.30	37.61700	-81.20700	0.8	Instrumental	0.0	Mc	ANSS	<NULL>	
28	19800410220	Mercer	1980	4	10	22	33	15.70	37.48700	-81.08600	0.7	Instrumental	0.0	Mc	VTSO	ANSS	
29	19800921100	Pocahontas	1980	9	21	10	2	46.30	38.17500	-80.07000	1.4	Instrumental	0.0	Mc	VTSO	ANSS	
30	19801016030	Pocahontas	1980	10	16	3	48	7.60	38.06600	-80.21500	1.1	Instrumental	0.0	Mc	VTSO	ANSS	
31	19801105210	Pocahontas	1980	11	5	21	48	14.20	38.18800	-79.93600	3.0	Instrumental	0.0	ML	ANSS	<NULL>	
32	19801125070	Pocahontas	1980	11	25	7	44	4.00	38.09500	-80.12300	0.6	Instrumental	0.0	Md	VTSO	ANSS	
33	19811130170	Mingo	1981	11	30	17	33	11.00	37.63000	-82.20000	2.5	Instrumental	0.0	Mc	VTSO	ANSS	
34	19820623160	Fayette	1982	6	23	16	17	34.10	37.87000	-80.95700	2.5	Instrumental	0.0	Md	VTSO	ANSS	
35	19830121050	Pocahontas	1983	1	21	5	33	20.40	38.06700	-80.14400	0.4	Instrumental	0.0	Md	VTSO	ANSS	
36	19830526010	Monroe	1983	5	26	1	4	44.80	37.50600	-80.31600	2.2	Instrumental	0.0	Md	VTSO	ANSS	
37	19830610000	Greenbrier	1983	6	10	0	18	40.40	37.94800	-80.16300	1.2	Instrumental	0.0	Md	VTSO	ANSS	
38	19830610001	Greenbrier	1983	6	10	0	24	57.00	37.95100	-80.18900	1.2	Instrumental	0.0	Md	VTSO	ANSS	
39	19830610002	Greenbrier	1983	6	10	0	31	8.30	37.93800	-80.16800	0.4	Instrumental	0.0	Md	VTSO	ANSS	
40	19830720040	Greenbrier	1983	7	20	4	41	40.90	37.88500	-80.69100	1.6	Instrumental	0.0	Md	VTSO	ANSS	
41	19830725030	Wyoming	1983	7	25	3	27	0.20	37.49600	-81.35200	0.6	Instrumental	0.0	Md	VTSO	ANSS	
42	19831113160	Summers	1983	11	13	16	51	6.70	37.55600	-80.77500	0.4	Instrumental	0.0	Md	VTSO	ANSS	
43	19831113170	Monroe	1983	11	13	17	50	50.10	37.55900	-80.75300	0.7	Instrumental	0.0	Md	VTSO	ANSS	
44	19831125160	Monroe	1983	11	25	16	27	47.80	37.56800	-80.74500	0.7	Instrumental	0.0	Md	VTSO	<NULL>	
45	19831223100	Summers	1983	12	23	10	51	21.90	37.76600	-80.83700	0.3	Instrumental	0.0	Md	VTSO	ANSS	
46	19840202050	Mingo	1984	2	2	5	10	19.70	37.71700	-82.21800	1.9	Instrumental	0.0	Md	VTSO	ANSS	
47	19840311040	Summers	1984	3	11	4	1	38.90	37.47400	-80.90000	1.1	Instrumental	0.0	Md	VTSO	ANSS	
48	19841009050	Summers	1984	10	9	5	33	31.50	37.71300	-80.89100	2.1	Instrumental	0.0	Md	VTSO	ANSS	
49	19841221130	Pocahontas	1984	12	21	13	12	21.90	38.19800	-80.20800	1.6	Instrumental	0.0	Md	VTSO	ANSS	
50	19850614070	Mercer	1985	6	14	7	57	10.20	37.53400	-81.02000	0.8	Instrumental	0.0	Md	VTSO	ANSS	
51	19860226210	Pendleton	1986	2	26	21	53	20.80	38.50700	-79.29200	2.3	Instrumental	0.0	Md	VTSO	ANSS	
52	19861220080	Greenbrier	1986	12	20	8	13	12.80	38.05800	-80.64300	1.2	Instrumental	0.0	Md	VTSO	ANSS	
53	19890319100	Logan	1989	3	19	10	7	55.80	37.73500	-82.06400	1.9	Instrumental	0.0	Md	VTSO	ANSS	
54	19910422010	Greenbrier	1991	4	22	1	1	20.20	37.94200	-80.20500	3.5	Instrumental	0.0	Md	VTSO	ANSS	Further Info

Event Num	WVQID	County	UTC Year	UTC Month	UTC Day	UTC HH	UTC MM	UTC SS	Latitude (N)	Longitude (W)	Magnitude	Recorded	MMI	Magnitude Type	Source 1	Source 2	USGS Link
55	19910628180	Kanawha	1991	6	28	18	34	55.50	38.23100	-81.33500	3.0	Instrumental	0.0	Mb	VTSO	ANSS	
56	19920329200	Mercer	1992	3	29	20	16	48.20	37.31400	-81.14900	1.4	Instrumental	0.0	Md	VTSO	ANSS	
57	19920506210	Fayette	1992	5	6	21	20	23.90	38.11800	-81.06900	2.3	Instrumental	0.0	Md	VTSO	ANSS	
58	19921124020	Summers	1992	11	24	2	26	50.70	37.45700	-80.88400	1.2	Instrumental	0.0	Md	VTSO	ANSS	
59	19940204070	Nicholas	1994	2	4	7	40	32.40	38.23600	-80.75900	2.1	Instrumental	0.0	Md	VTSO	ANSS	
60	19940619080	Nicholas	1994	6	19	8	36	41.30	38.33900	-80.64000	1.7	Instrumental	0.0	Md	VTSO	ANSS	
61	19951115100	Raleigh	1995	11	15	10	29	24.80	37.71700	-81.04300	2.6	Instrumental	0.0	Md	VTSO	ANSS	
62	19951228230	Fayette	1995	12	28	23	48	30.40	38.08400	-80.96800	2.5	Instrumental	0.0	Md	VTSO	ANSS	
63	19960811090	Greenbrier	1996	8	11	9	11	21.30	37.73100	-80.62800	2.1	Instrumental	<NULL>	Mc	ANSS	<NULL>	
64	19970222140	Fayette	1997	2	22	14	32	33.10	37.92100	-81.02700	2.0	Instrumental	<NULL>	Mc	ANSS	<NULL>	
65	19970315050	Webster	1997	3	15	5	56	36.40	38.34700	-80.48400	1.8	Instrumental	0.0	Md	VTSO	ANSS	
66	19970315050	Kanawha	1998	10	2	10	1	6.90	38.06800	-81.46600	2.5	Instrumental	0.0	Md	VTSO	ANSS	
67	20001016170	Braxton	2000	10	16	17	56	13.80	38.63600	-80.92000	2.5	Instrumental	0.0	Md	VTSO	ANSS	
68	20011204210	Summers	2001	12	4	21	15	13.90	37.72600	-80.75200	3.1	Instrumental	0.0	Mb	VTSO	ANSS	
69	20020327080	Mingo	2002	3	27	8	25	3.30	37.75300	-82.17100	2.1	Instrumental	0.0	Md	VTSO	ANSS	
70	20060711120	Greenbrier	2006	7	11	12	1	43.10	37.87800	-80.64900	2.6	Instrumental	0.0	Mb	CERI	VTSO	
71	20070830120	Wyoming	2007	8	30	12	52	9.34	37.75300	-81.63600	2.6	Instrumental	0.0	Lg GS	CERI	USGS ENS	Further Info
72	20080129010	Monroe	2008	1	29	1	4	20.70	37.54480	-80.50980	2.4	Instrumental	<NULL>	Md	CERI	ANSS	
73	20090411180	Summers	2009	4	11	18	11	9.07	37.51330	-80.89570	2.4	Instrumental	<NULL>	Md	CERI	ANSS	
74	20100404090	Braxton	2010	4	4	9	19	14.01	38.59900	-80.91617	3.4	Instrumental	0.0	MbLg	CERI	USGS ENS	Further Info
75	20100129010	Braxton	2010	4	29	1	36	22.59	38.68567	-80.81483	2.6	Instrumental	0.0	MbLg	CERI	USGS ENS	Further Info
76	20100429120	Braxton	2010	4	29	12	38	53.43	38.64700	-80.87200	2.7	Instrumental	0.0	MbLg	USGS ENS	CERI	Further Info
77	20100429130	Braxton	2010	4	29	23	26	39.47	38.72200	-80.80300	2.5	Instrumental	0.0	Lg GS	CERI	USGS ENS	Further Info
78	20100507100	Braxton	2010	5	7	10	26	3.47	38.60650	-80.91317	2.6	Instrumental	0.0	MbLg	CERI	USGS ENS	Further Info
79	20100508030	Braxton	2010	5	8	3	3	0.62	38.62300	-80.91133	2.4	Instrumental	0.0	Md	CERI	USGS ENS	Further Info
80	20100724090	Braxton	2010	7	24	9	15	44.13	38.67533	-80.82017	2.4	Instrumental	0.0	Md	CERI	USGS ENS	Further Info
81	20100725030	Braxton	2010	7	25	3	48	70.00	38.67900	-80.79700	2.2	Instrumental	0.0	Md	USGS ENS	LDEO	
82	20100815040	Lewis	2010	8	15	4	38	47.38	38.81833	-80.42983	2.5	Instrumental	0.0	Md	CERI	USGS	Further Info
83	20100821030	Upshur	2010	8	21	3	16	21.99	38.79250	-80.39767	2.5	Instrumental	0.0	Md	USGS ENS	LDEO	Further Info
84	20100826040	Raleigh	2010	8	26	4	22	15.19	37.74833	-81.20467	2.4	Instrumental	0.0	Md	CERI	USGS	
85	20100826041	Raleigh	2010	8	26	4	24	55.39	37.72733	-81.20433	2.2	Instrumental	0.0	Md	CERI	USGS ENS	
86	20100913150	Lincoln	2010	9	13	15	8	46.47	38.10000	-82.03400	2.4	Instrumental	0.0	Md	CERI	ANSS	
87	20110825050	Greenbrier	2011	8	25	5	59	13.76	37.91600	-80.21533	2.7	Instrumental	4.0	Md	CERI	USGS	Further Info
88	20120111190	Braxton	2012	1	10	19	38	58.66	38.70400	-80.95900	2.8	Instrumental	4.0	unk	CERI	USGS	Further Info
89	20120316150	Boone	2012	3	16	15	5	55.00	38.21200	-81.71400	2.8	Instrumental	2.0	MbLg	CERI	USGS NEIC	Further Info
90	20130331140	Braxton	2013	3	31	14	1	24.03	38.64500	-80.83317	3.4	Instrumental	5.0	Mw	CERI	USGS NEIC	Further Info
91	20130720110	Gilmer	2013	7	20	11	38	46.18	38.89567	-80.88700	2.7	Instrumental	<NULL>	MbLg	CERI	USGS ENS	Further Info
92	20130730060	Gilmer	2013	7	30	6	9	4.85	38.83933	-80.90867	2.8	Instrumental	<NULL>	Md	CERI	USGS ENS	Further Info
93	20130816110	Gilmer	2013	8	16	11	2	21.04	38.84150	-80.93867	2.6	Instrumental	3.0	MbLg	CERI	USGS ENS	Further Info
94	20131013090	Braxton	2013	10	13	9	20	58.55	38.70117	-80.82417	2.2	Instrumental	<NULL>	Md	CERI	USGS ENS	Further Info
95	20131019080	Greenbrier	2013	10	19	8	41	57.43	37.74767	-80.64333	2.2	Instrumental	<NULL>	Md	CERI	USGS ENS	Further Info
96	20140606220	Jackson	2014	6	6	22	15	40.79	38.64383	-81.58550	2.6	Instrumental	<NULL>	Md	CERI	USGS ENS	Further Info
97	20160117190	Jefferson	2016	1	17	19	12	49.00	39.319	-77.828	3.0	Instrumental	5.0	Ml	LDEO	USGS ENS	

Data as of **January 26, 2016**. For a more detailed listing, please download the West Virginia Earthquake spreadsheet from WVGES at **http://www.wvgs.wvnet.edu/www/earthquakes/seismic.html**
If you view this map and data as a PDF, you can click any of the blue hyperlinked text to view further information on a web site.
Please note that USGS Links, above, are considered "beta" at the time of this publication and USGS may change destinations, pages, etc. afterward.

Definition of terms on next page.

WVGES
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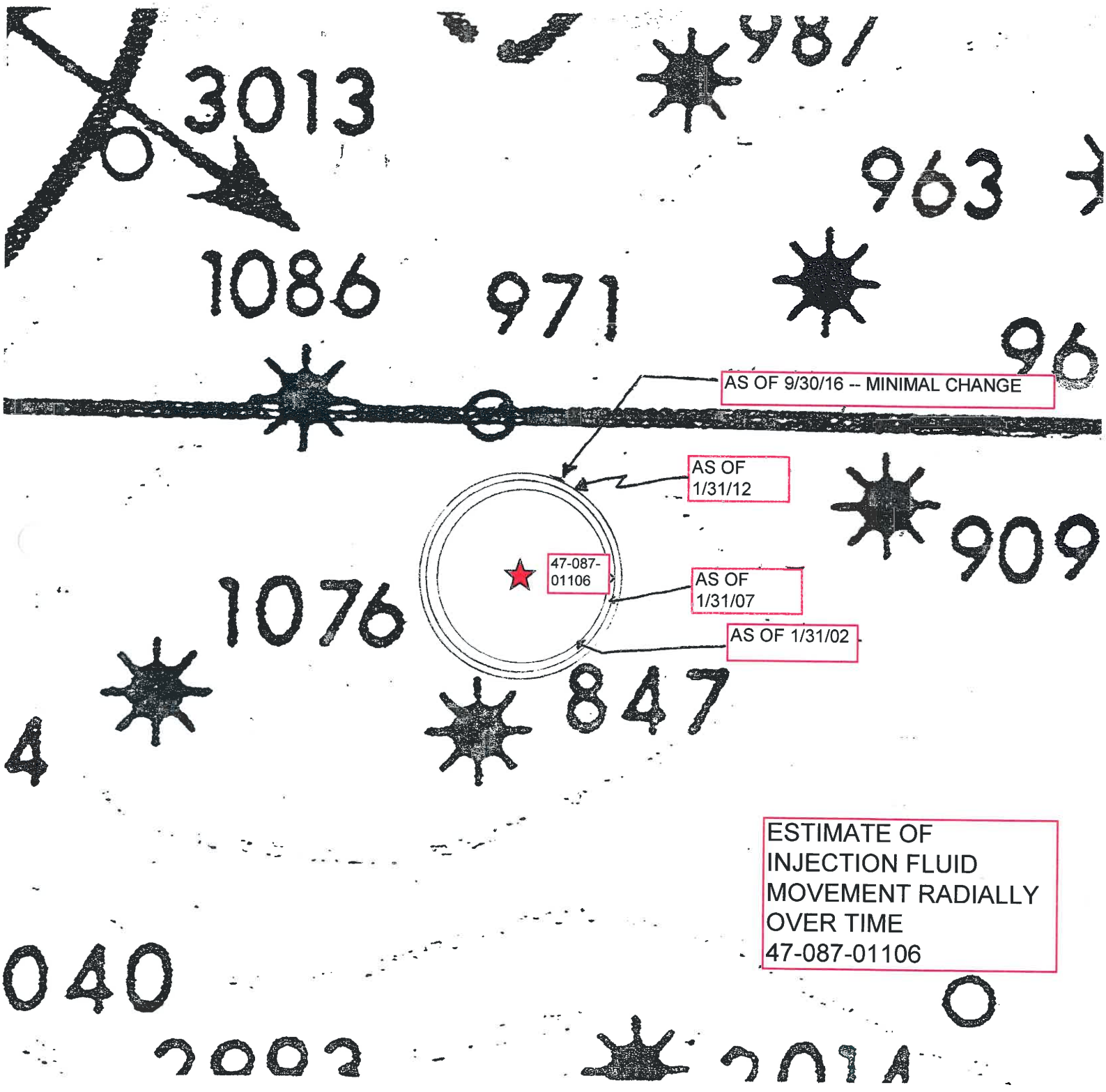

ESTIMATE OF INJECTION FLUID MOVEMENT RADIALLY OVER TIME
47-087-01106

Section 9 – Operating Requirements/Data

Perot Lot 2, Well 1 was a depleted oil and natural gas well originally completed in 1964 (See Attached -- Note mistake on completion report indicating drilled in 1965). The well was drilled through the Big Injun Sand and 2103' of 9.5 lb/ft, 4-1/2" casing run and cemented. In 1985 the well was converted to a disposal well with 281' of 7", 17.0 lb/ft surface casing run and cemented to the surface. A Baker AD-1 Tension Packer was then run on 1990' of 2-3/8", 4.6 lb/ft tubing and set in order to establish mechanical integrity.

The well was originally and remains permitted for a maximum injection rate of 10 BBL/HR. Following a step-rate test, the maximum injection pressure was increased to 688 psig. Although the well is permitted for 10 BBL/HR, the injection rate is far lower than that (well less than 1 BBL/HR) due to the injection pressure limitation. When in operation, the well typically injects at the maximum permitted pressure which is controlled by a regulator that circulates water back to the tank to prevent over-pressurization. Note the frac reports attached for the subject well and a nearby well in the field indicating breakdown pressures far in excess of 688 psig, 1050 psig and 1300 psig respectively.

See Appendix G for wells that may be sources of fluids to be disposed of in the subject well.

The injectate has been sampled and tested. Please see the results attached.

There are no chemical additives to the injection fluid.

Injection fluid fills the 4-1/2" x 2-3/8" annulus and the surface pressure is zero. This serves to support that mechanical integrity is being maintained and prevents the possibility of migration of injection fluids to USDWs. Additionally, the 7" x 4-1/2" annulus maintains zero pressure as well.

As required, Mechanical Integrity Tests are conducted every five years or following any well work that could compromise mechanical integrity. In the interim, any evidence that mechanical integrity is not being maintained will be followed by the well immediately being shut-in and injection operations ceased.

In the event of the cessation of injection, the fluids will be trucked to a commercial facility for disposal.

Section 9
Operating Requirements

APPENDIX G

WELLS SERVICED BY
047-087-01106

API NUMBER	WELL OWNER	PRODUCING FORMATION
047-007-00961	C.I. McKOWN & SON, INC.	BIG INJUN
047-007-00546	C.I. McKOWN & SON, INC.	BIG INJUN
047-007-00910	C.I. McKOWN & SON, INC.	BIG INJUN
047-007-00545	C.I. McKOWN & SON, INC.	BIG INJUN
047-007-00911	C.I. McKOWN & SON, INC.	BIG INJUN
047-007-00950	C.I. McKOWN & SON, INC.	BIG INJUN
047-007-00508	C.I. McKOWN & SON, INC.	BIG INJUN
047-007-01619	C.I. McKOWN & SON, INC.	BIG INJUN
047-007-00563	C.I. McKOWN & SON, INC.	BIG INJUN
047-013-02937(2745)	POCONO ENERGY CORP	BIG INJUN
047-013-02746	POCONO ENERGY CORP	BIG INJUN
047-013-02747	POCONO ENERGY CORP	BIG INJUN
047-013-02748	POCONO ENERGY CORP	BIG INJUN
047-013-02451	POCONO ENERGY CORP	BIG INJUN
047-013-01607	POCONO ENERGY CORP	BIG INJUN
047-013-03022	POCONO ENERGY CORP	BIG INJUN
047-013-02902	POCONO ENERGY CORP	BIG INJUN
047-013-01557	POCONO ENERGY CORP	BIG INJUN
047-013-02731	POCONO ENERGY CORP	BIG INJUN
047-013-02749	POCONO ENERGY CORP	BIG INJUN
047-013-02750	POCONO ENERGY CORP	BIG INJUN
047-013-02751	POCONO ENERGY CORP	BIG INJUN
047-013-02752	POCONO ENERGY CORP	BIG INJUN
047-013-02753	POCONO ENERGY CORP	BIG INJUN
047-013-02757	POCONO ENERGY CORP	BIG INJUN
047-013-02184	POCONO ENERGY CORP	BIG INJUN
047-013-02758	POCONO ENERGY CORP	BIG INJUN
047-013-02759	POCONO ENERGY CORP	BIG INJUN
047-013-02760	POCONO ENERGY CORP	BIG INJUN
047-013-02761	POCONO ENERGY CORP	BIG INJUN
047-013-02185	POCONO ENERGY CORP	BIG INJUN
047-013-02763	POCONO ENERGY CORP	BIG INJUN
047-013-02892	POCONO ENERGY CORP	BIG INJUN
047-013-02764	POCONO ENERGY CORP	BIG INJUN
047-013-02467	POCONO ENERGY CORP	BIG INJUN
047-013-02768	POCONO ENERGY CORP	BIG INJUN

047-013-02770	POCONO ENERGY CORP	BIG INJUN
047-013-02771	POCONO ENERGY CORP	BIG INJUN
047-013-02772	POCONO ENERGY CORP	BIG INJUN
047-013-02835	POCONO ENERGY CORP	BIG INJUN
047-013-02837	POCONO ENERGY CORP	BIG INJUN
047-013-02838	POCONO ENERGY CORP	BIG INJUN
047-013-02806	POCONO ENERGY CORP	BIG INJUN
047-013-02807	POCONO ENERGY CORP	BIG INJUN
047-013-02809	POCONO ENERGY CORP	BIG INJUN
047-013-02810	POCONO ENERGY CORP	BIG INJUN
047-013-02812	POCONO ENERGY CORP	BIG INJUN
047-013-02813	POCONO ENERGY CORP	BIG INJUN
047-013-02928	POCONO ENERGY CORP	BIG INJUN
047-013-01550	POCONO ENERGY CORP	BIG INJUN
047-013-01609	POCONO ENERGY CORP	BIG INJUN
047-013-00945	POCONO ENERGY CORP	BIG INJUN
047-013-01608	POCONO ENERGY CORP	BIG INJUN
047-013-01730	POCONO ENERGY CORP	BIG INJUN
047-013-02895	POCONO ENERGY CORP	BIG INJUN
047-013-02896	POCONO ENERGY CORP	BIG INJUN
047-013-02823	POCONO ENERGY CORP	BIG INJUN
047-013-02824	POCONO ENERGY CORP	BIG INJUN
047-013-02953	POCONO ENERGY CORP	BIG INJUN
047-013-02907	POCONO ENERGY CORP	BIG INJUN
047-013-02454	POCONO ENERGY CORP	BIG INJUN
047-013-02901	POCONO ENERGY CORP	BIG INJUN
047-013-02908	POCONO ENERGY CORP	BIG INJUN
047-013-01750	POCONO ENERGY CORP	BIG INJUN
047-013-01824	POCONO ENERGY CORP	BIG INJUN
047-013-01843	POCONO ENERGY CORP	BIG INJUN
047-013-01855	POCONO ENERGY CORP	BIG INJUN
047-013-01901	POCONO ENERGY CORP	BIG INJUN
047-013-01902	POCONO ENERGY CORP	BIG INJUN
047-013-02826	POCONO ENERGY CORP	BIG INJUN
047-013-02828	POCONO ENERGY CORP	BIG INJUN
047-013-01512	POCONO ENERGY CORP	BIG INJUN
047-013-01549	POCONO ENERGY CORP	BIG INJUN
047-013-01642	POCONO ENERGY CORP	BIG INJUN
047-013-01654	POCONO ENERGY CORP	BIG INJUN
047-013-01686	POCONO ENERGY CORP	BIG INJUN
047-013-01781	POCONO ENERGY CORP	BIG INJUN
047-013-02201	POCONO ENERGY CORP	BIG INJUN
047-013-02539	C. I. McKOWN & SON, INC.	DEVONIAN SHALE

047-013-02542	C. I. McKOWN & SON, INC.	DEVONIAN SHALE
047-013-03423	C. I. McKOWN & SON, INC.	DEVONIAN SHALE
047-013-02551	C. I. McKOWN & SON, INC.	DEVONIAN SHALE
047-013-02567	C. I. McKOWN & SON, INC.	DEVONIAN SHALE
047-013-02556	C. I. McKOWN & SON, INC.	DEVONIAN SHALE
047-013-04125	C. I. McKOWN & SON, INC.	DEVONIAN SHALE
047-013-01936	C. I. McKOWN & SON, INC.	BIG INJUN
047-013-04108	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	DEVONIAN SHALE
047-013-02744	POCONO ENERGY CORP	BIG INJUN
047-015-00866	C. I. McKOWN & SON, INC.	BIG INJUN
047-015-00134	C. I. McKOWN & SON, INC.	BIG INJUN
047-021-01545	POCONO ENERGY CORP	BIG INJUN
047-021-05342	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-021-05370	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	DEVONIAN SHALE
047-021-01313	POCONO ENERGY CORP	BIG INJUN
047-021-01312	POCONO ENERGY CORP	BIG INJUN
047-021-02030	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-021-02108	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-021-02157	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-021-01927	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-021-01938	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-021-01950	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-021-02376	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-035-00984	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	ORISKANY
047-035-01013	PETRO HOLDINGS INC./KOINK ENERGY CORP	ORISKANY
047-035-01254	C. I. McKOWN & SON, INC.	BEREA
047-035-03010	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-035-01063	PETRO HOLDINGS INC./KOINK ENERGY CORP	ORISKANY
047-039-03282	C. I. McKOWN & SON, INC.	WEIR
047-039-03283	C. I. McKOWN & SON, INC.	WEIR
047-039-02689	C. I. McKOWN & SON, INC.	BEREA
047-039-02723	C. I. McKOWN & SON, INC.	BEREA
047-039-02726	C. I. McKOWN & SON, INC.	BEREA
047-039-02807	C. I. McKOWN & SON, INC.	BEREA
047-039-03511	C. I. McKOWN & SON, INC.	BEREA
047-039-01016	C. I. McKOWN & SON, INC.	BEREA

047-039-03315	C. I. McKOWN & SON, INC.	WEIR
047-039-03322	C. I. McKOWN & SON, INC.	BIG INJUN/SQUAW
047-039-03326	C. I. McKOWN & SON, INC.	WEIR
047-039-03328	C. I. McKOWN & SON, INC.	WEIR
047-039-03329	C. I. McKOWN & SON, INC.	WEIR
047-039-03330	C. I. McKOWN & SON, INC.	WEIR
047-039-03333	C. I. McKOWN & SON, INC.	WEIR
047-039-03334	C. I. McKOWN & SON, INC.	WEIR
047-039-03235	C. I. McKOWN & SON, INC.	WEIR
047-039-03236	C. I. McKOWN & SON, INC.	WEIR
047-039-03237	C. I. McKOWN & SON, INC.	WEIR
047-039-03238	C. I. McKOWN & SON, INC.	WEIR
047-039-03240	C. I. McKOWN & SON, INC.	WEIR
047-039-04988	C. I. McKOWN & SON, INC.	WEIR
047-039-03232	C. I. McKOWN & SON, INC.	BIG INJUN
047-039-03244	C. I. McKOWN & SON, INC.	WEIR
047-039-03247	C. I. McKOWN & SON, INC.	WEIR
047-039-03248	C. I. McKOWN & SON, INC.	WEIR
047-039-03249	C. I. McKOWN & SON, INC.	WEIR
047-039-03250	C. I. McKOWN & SON, INC.	WEIR
047-039-03251	C. I. McKOWN & SON, INC.	WEIR
047-039-06341	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	WEIR
047-039-06357	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	WEIR
047-039-06368	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	WEIR
047-039-03260	C. I. McKOWN & SON, INC.	WEIR
047-039-03449	C. I. McKOWN & SON, INC.	WEIR
047-039-03267	C. I. McKOWN & SON, INC.	WEIR
047-039-06367	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	WEIR
047-039-03268	C. I. McKOWN & SON, INC.	WEIR
047-039-03269	C. I. McKOWN & SON, INC.	WEIR
047-039-06355	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	WEIR
047-039-06356	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	WEIR
047-039-03275	C. I. McKOWN & SON, INC.	WEIR
047-039-03276	C. I. McKOWN & SON, INC.	WEIR
047-039-03277	C. I. McKOWN & SON, INC.	WEIR
047-039-03278	C. I. McKOWN & SON, INC.	WEIR
047-039-03279	C. I. McKOWN & SON, INC.	WEIR
047-039-03227	C. I. McKOWN & SON, INC.	WEIR
047-039-03228	C. I. McKOWN & SON, INC.	WEIR
047-039-03229	C. I. McKOWN & SON, INC.	WEIR

047-039-03230	C. I. McKOWN & SON, INC.	WEIR
047-073-01743	MURPHYTOWN/HAMMETT OIL CO.	DEVONIAN SHALE
047-073-01840	MURPHYTOWN/HAMMETT OIL CO.	DEVONIAN SHALE
047-073-01744	MURPHYTOWN/HAMMETT OIL CO.	MAXTON/BIG INJUN/SQUAW/WEIR
047-085-05008	RITCHIE GAS CO.	BIG INJUN
047-085-02370	RITCHIE GAS CO.	BIG INJUN
047-085-04514	RITCHIE GAS CO.	BIG INJUN
047-085-04515	RITCHIE GAS CO.	BIG INJUN
047-085-04516	RITCHIE GAS CO.	BIG INJUN
047-085-05009	RITCHIE GAS CO.	BIG INJUN
047-085-04637	MURPHYTOWN/HAMMETT OIL CO.	BIG INJUN
047-085-0006F	MURPHYTOWN/HAMMETT OIL CO.	BIG INJUN
047-085-04670	MURPHYTOWN/HAMMETT OIL CO.	BIG INJUN
047-085-03644	MURPHYTOWN/HAMMETT OIL CO.	BIG INJUN
047-085-03660	MURPHYTOWN/HAMMETT OIL CO.	BIG INJUN
047-085-03674	MURPHYTOWN/HAMMETT OIL CO.	BIG INJUN
047-085-03682	MURPHYTOWN/HAMMETT OIL CO.	BIG INJUN
047-085-03683	MURPHYTOWN/HAMMETT OIL CO.	BIG INJUN
047-085-06780	MURPHYTOWN/HAMMETT OIL CO.	DEVONIAN SHALE
047-085-03622	MURPHYTOWN/HAMMETT OIL CO.	DEVONIAN SHALE
047-085-03659	MURPHYTOWN/HAMMETT OIL CO.	BIG INJUN
047-085-03661	MURPHYTOWN/HAMMETT OIL CO.	BIG INJUN
047-085-04933	RITCHIE GAS CO.	BIG INJUN
047-085-03201	RITCHIE GAS CO.	BIG INJUN
047-085-03222	RITCHIE GAS CO.	BIG INJUN
047-085-06975	MURPHYTOWN/HAMMETT OIL CO.	DEVONIAN SHALE
047-085-03230	RITCHIE GAS CO.	BIG INJUN
047-085-03244	RITCHIE GAS CO.	BIG INJUN
047-085-04996	RITCHIE GAS CO.	BIG INJUN
047-085-06976	MURPHYTOWN/HAMMETT OIL CO.	DEVONIAN SHALE
047-085-04934	RITCHIE GAS CO.	BIG INJUN
047-085-04935	RITCHIE GAS CO.	BIG INJUN
047-085-03257	RITCHIE GAS CO.	BIG INJUN
047-085-04902	RITCHIE GAS CO.	BIG INJUN

047-087-04146	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	DEVONIAN SHALE
047-087-03155	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-01809	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-087-01815	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-087-01823	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-087-01829	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-087-01834	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-087-04604	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-087-04603	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-087-03383-R	C. I. McKOWN & SON, INC.	DEVONIAN SHALE
047-087-01299	C. I. McKOWN & SON, INC.	BIG LIME
047-087-00934	C. I. McKOWN & SON, INC.	BIG LIME
047-087-02037	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-02038	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-02039	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-04028	C. I. McKOWN & SON, INC.	BEREA
047-087-01929	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-01017	C. I. McKOWN & SON, INC.	BEREA
047-087-01057	C. I. McKOWN & SON, INC.	BEREA
047-087-01819	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-087-01832	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-087-01842	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-087-03926	TEMPEST/KIMCO	BIG INJUN
047-087-04448	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-087-04469	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-087-04449	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-087-04450	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-087-02021	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-02023	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-00869	C. I. McKOWN & SON, INC.	BIG LIME/BIG INJUN
047-087-00890	C. I. McKOWN & SON, INC.	BIG LIME/BIG INJUN
047-087-00973	C. I. McKOWN & SON, INC.	BIG LIME/BIG INJUN
047-087-00884	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-01059	C. I. McKOWN & SON, INC.	BIG LIME/BIG INJUN
047-087-00870	C. I. McKOWN & SON, INC.	BIG LIME/BIG INJUN

047-087-00907	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-04451	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-087-04452	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-087-01852	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-087-01192	C. I. McKOWN & SON, INC.	BEREA
047-087-00886	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-00901	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-02030	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-02031	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-02032	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-02033	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-02034	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-02040	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-02781	C. I. McKOWN & SON, INC.	BIG INJUN
047-087-01814	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-087-01818	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BEREA
047-087-03378	C. I. McKOWN & SON, INC.	DEVONIAN SHALE
047-087-03379	C.I. McKOWN & SON, INC.	DEVONIAN SHALE
047-087-03408	C.I. McKOWN & SON, INC.	DEVONIAN SHALE
047-087-01113	C.I. McKOWN & SON, INC.	BIG INJUN
047-087-01123	C.I. McKOWN & SON, INC.	BIG INJUN
047-087-01273	C.I. McKOWN & SON, INC.	BIG INJUN
047-087-01274	C.I. McKOWN & SON, INC.	BIG INJUN
047-087-03507	C.I. McKOWN & SON, INC.	DEVONIAN SHALE
047-087-03376	C.I. McKOWN & SON, INC.	BIG INJUN
047-087-00878	C.I. McKOWN & SON, INC.	BIG INJUN
047-087-00906	C.I. McKOWN & SON, INC.	BIG INJUN
047-087-00954	C.I. McKOWN & SON, INC.	BIG INJUN
047-087-00955	C.I. McKOWN & SON, INC.	BIG INJUN
047-087-03499	C.I. McKOWN & SON, INC.	DEVONIAN SHALE
047-087-03309	C.I. McKOWN & SON, INC.	BIG INJUN
047-087-03310	C.I. McKOWN & SON, INC.	BIG INJUN
047-105-01177	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01040	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01000	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01010	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01001	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01062	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01028	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01063	GENESIS ENERGY CORP	DEVONIAN SHALE

047-105-01064	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01043	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01029	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01088	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01089	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01068	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01118	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01065	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01066	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-00760	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-00835	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-00852	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-00549	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01364	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	DEVONIAN SHALE
047-105-00318	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-105-00026	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-105-00058DD	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-105-00270	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-105-00316	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-105-00829	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-105-01356	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	DEVONIAN SHALE
047-105-01358	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	DEVONIAN SHALE
047-105-00272	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	BIG INJUN
047-105-01327	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	DEVONIAN SHALE
047-105-01191	GENESIS ENERGY CORP	DEVONIAN SHALE
047-105-01360	PETRO HOLDINGS INC./TEMPEST ENERGY CORP	DEVONIAN SHALE
047-107-00722	MURPHYTOWN/HAMMETT OIL CO.	BEREA
047-107-00194F	MURPHYTOWN/HAMMETT OIL CO.	COW RUN
047-107-00584	MURPHYTOWN/HAMMETT OIL CO.	COW RUN

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: CI McKOWN & SON, INC.

SAMPLE ID: #3 INJECTATE
UIC RENEWAL

SAMPLED BY: M. KELLY

DATE/TIME SAMPLED:* 12-28-17 1000

DATE/TIME RECEIVED: 12-28-17 1245

LABORATORY ID: CIM 171228-3

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
pH O	5.7	units	SM 22nd 4500 H B	.1	12-29-17 0849	KH
SPEC GRAV	1.12135	CALC	Calculation		01-03-18 2153	SW
TSS	50	mg/L	SM22nd 2540 D	4	12-29-17 1638	MRS/EK
TDS	173830	mg/L	SM22nd 2540 C	4	12-29-17 1638	MRS/EK
SO_4	658.	mg/L	EPA 300.0 Rev 2.1-1993	1.0	01-05-18 1700	DC
Cl^-	109000.	mg/L	EPA 300.0 Rev 2.1-1993	.50	01-05-18 0601	DC
TOC	34.9	mg/L	SM22nd 5310B	1.0	01-08-18 1417	LM
Ca	14250.	mg/L	EPA 200.7 Rev 4.4-1994	.10	01-04-18 0512	DB
Ia	49910.	mg/L	EPA 200.7 Rev 4.4-1994	.03	01-04-18 0512	DB
As	U	mg/L	SM22nd 3113 B	.0005	01-04-18 2109	ML
Al	U	mg/L	EPA 200.7 Rev 4.4-1994	.02	01-02-18 0554	MM
Mn	.868	mg/L	EPA 200.7 Rev 4.4-1994	.002	01-02-18 0554	MM
Fe	31.6	mg/L	EPA 200.7 Rev 4.4-1994	.02	01-02-18 0554	MM
Br	640.	mg/L	EPA 300.0 Rev 2.1-1993	.10	01-04-18 1801	DC
Ba	1103.	mg/L	EPA 200.7 Rev 4.4-1994	.002	01-04-18 0512	DB
Sr	591.	mg/L	EPA 200.7 Rev 4.4-1994	.001	01-02-18 1404	DB

*Client Provided

**See Attached. The following results meet or exceed requirements and standards set forth by the certifying authority except where noted.

Data Qualifiers

B	Analyte found in reagent blank. Indicates possible reagent or background contamination.
E	Estimated Reported value exceeded calibration range.
J	Reported value is an estimate because concentration is less than reporting limit.
PND	Precision not determined.
R	Sample results rejected because of gross deficiencies in QC or method performance. Re-sampling and/or re-analysis is necessary.
RND	Recovery not determined.
U	Compound was analyzed for, but not detected.
O	Out of holding. Time does not meet 40 CFR 136/141 compliance.
T	This result is not supported by our certification ID.
A	Does not meet 40 CFR 136/141 compliance.
C	Does not meet 47 CSR 32 compliance.

Narrative:

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Office of Oil and Gas

JAN 26 2018

WV Department of
Environmental Protection

Approved Douglas A Burton

MAIN OFFICE AND LABORATORY—POST OFFICE BOX 650 • BRIDGEPORT, WEST VIRGINIA 26330 • (304) 623-6549
CHARLESTON FIELD OFFICE—POST OFFICE BOX 8337 • SOUTH CHARLESTON, WEST VIRGINIA 25303-0337 • (304) 744-9864

CHAIN OF CUSTODY RECORD

ENVIRONMENTAL SERVICES

Main Office:
STURM ENVIRONMENTAL SERVICES
BRUSHY FORK ROAD
P.O. BOX 650
BRIDGEPORT, WV 26330
PHONE: 304-623-6549
FAX: 304-623-6552

STURM ENVIRONMENTAL SERVICES
610 D STREET
P.O. BOX 8337
SO. CHARLESTON, WV 25303
PHONE: 304-744-9864
FAX: 304-744-7866

REPORT TO: Client Name: C.I. MCKOWN & SON INC
Address: P.O. BOX 711
City/State/Zip: NEWTON WV 25266
Contact Person: SAM MCKOWN
Telephone Number: 304/565-7318 Fax No. 304/565-3804
Email Address: CIMCKOWN@FRONTIER.COM
Sampler Name: (Print) Michael J Kelly
Sampler Signature: Michael Kelly
Project Name: PEROT 2017 UIC RENEWAL
Special Reporting: X Email Results ____ Fax Results

BILL TO: Client Name: SAME
Address: ____
City/State/Zip: ____
Contact Person: ____
Telephone Number: ____ Fax No. ____
Email Address: ____
Purchase Order #: ____
TURN AROUND TIME: ____ Standard
____ RUSH (pre-scheduled; surcharges may apply) *Please Check One*
____ Date Needed

1 DAY	2 DAY	3 DAY

Sample ID / Description	COMPOSITE SAMPLE: START DATE	START TIME	END DATE	END TIME	GRAB SAMPLE: DATE	TIME	PRESERVATIVE: Ice	OTHER	HCl	NaOH	H_2SO_4 Plastic	H_2SO_4 Glass	None	HNO_3	MATRIX: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	ANALYZE FOR: See attached	# of Bottles	Flow (gpm, cfs, mgd) circle one	Field pH	Field Conductivity	Field DO	Field Chlorine (mg/L or ug/L) circle one	Field Temp (F° or C°) circle one
#1 - SPRING					12/28/17	9:00 am	X	X			X		X	X						X	X	12						
#2 - CHAMBERS					12/28/17	9:30 am	X	X			X		X	X						X	X	12						
#3 - INJECTATE					12/28/17	10:00	X				X		X	X						X	X	11						

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JAN 26 2018
WV Department of Environmental Protection

Comments

Records retained for 5 years

Relinquished by:	Date	Time	Received by:	Date	Time
M J Kelly	12/28/17	12:45pm	K. Khalil	12/28/17	1245
Relinquished by:	Date	Time	Received by:	Date	Time

Laboratory Comments:
Temperature Upon Receipt: 0 <6
Bottles Preserved? Y N
colilert # #1 1054 17 #2 1047 17

REIC

Improving the environment, one client at a time...

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

3029-C Peters Creek Road
Roanoke, VA 24019
TEL: 540.777.1276

1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Wednesday, January 10, 2018

Kim Krehel
STURM ENVIRONMENTAL SERVICES
P O BOX 650
BRIDGEPORT, WV 26330

TEL: (304) 623-6549
FAX: (304) 623-6552

RE: CI McKOWN & SON, INC.
Work Order #: 17123652

Dear Kim Krehel:

REI Consultants, Inc. received 3 sample(s) on 12/29/2017 for the analyses presented in the following report.

Sincerely,

Jimmy Suttle
Project Manager
(304) 250-6234

REI Consultants, Inc. - Case Narrative

WO#: 17123652

Date Reported: 1/10/2018
Original

Client: STURM ENVIRONMENTAL SERVICES

Project: CI McKOWN & SON, INC.

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP and/or VELAP requirements for parameters clearly designated as PA, VA, PA/VA, or VELAP in the column labeled NELAP.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be considered estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, NCDWQ 466, PADEP 68-00839, VADCLS(VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 17123652

Date Reported: 1/10/2018
Original

Client:	STURM ENVIRONMENTAL SERVICES	**Collection Date:**	12/28/2017 10:00:00 AM
Project:	CI McKOWN & SON, INC.	**Date Received:**	12/29/2017
Lab ID:	17123652-03A	**Matrix:**	Liquid
Client Sample ID:	17300 #3 INJECTATE	**Site ID:**	

Analysis	Result	MDL	PQL	MCL Qual	Units	Prep Date	Date Analyzed	NELAC
SEMI-VOLATILE RANGE ORGANICS				**Method: SW8015C**			**Analyst: YT**	
TPH (Diesel Range: C10 - C28)	2.19	0.12	0.23	NA	mg/L	01/02/18 10:02AM	01/03/18 9:55AM	PA/VA
TPH (Oil Range: C22 - C36)	1.11	0.12	0.23	NA	mg/L	01/02/18 10:02AM	01/03/18 9:55AM	VA
Surr: o-Terphenyl	63.9	NA	17.6-135	NA	%Rec	01/02/18 10:02AM	01/03/18 9:55AM	

Notes:

Insufficient sample was available to prepare and analyze a matrix spike. Acceptable LCS results demonstrate the accuracy of the analysis.

VOLATILE RANGE ORGANICS				**Method: SW8015C**			**Analyst: TKC**	
TPH (Gasoline Range: C6 - C10)	5.33	0.250	0.500	NA	mg/L	01/02/18 4:07PM	01/04/18 3:38PM	PA/VA
Surr: 2,5-Dibromotoluene	123	NA	53.5-143	NA	%Rec	01/02/18 4:07PM	01/04/18 3:38PM	
VOLATILE ORGANIC COMPOUNDS				**Method: SW8021B**			**Analyst: CB**	
Benzene	324	5.00	10.0	NA	µg/L	01/02/18 4:07PM	01/08/18 8:55PM	VA
Toluene	222	5.00	10.0	NA	µg/L	01/02/18 4:07PM	01/08/18 8:55PM	VA
Ethylbenzene	14.2	5.00	10.0	NA	µg/L	01/02/18 4:07PM	01/08/18 8:55PM	VA
m,p-Xylene	123	10.0	20.0	NA	µg/L	01/02/18 4:07PM	01/08/18 8:55PM	VA
o-Xylene	51.2	5.00	10.0	NA	µg/L	01/02/18 4:07PM	01/08/18 8:55PM	VA
Surr: 1,1,1-Trifluorotoluene	111	NA	57.1-139	NA	%Rec	01/02/18 4:07PM	01/08/18 8:55PM	

REIC
Improving the environment, one client at a time...

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304)255-2500
Website: www.reiclabs.com

Sample Receipt Checklist

McKOWN & SON, INC.

Client Name:	STU001			Work Order Number:	17123652
RCPNo:	1	Date and Time Received:	12/29/2017 5:40:00 PM	Received by:	Randy Moore
Completed By:	Kim Pack		Reviewed By:	Jimmy Suttle	
Completed Date:	12/30/2017 8:20:24 AM		Reviewed Date:	1/2/2018 7:56 AM	

Carrier Name: REIC

1.	Chain of custody present?	Yes [x]	No [ ]	
2.	Chain of custody signed when relinquished and received?	Yes [x]	No [ ]	
3.	Are matrices correctly identified on Chain of custody?	Yes [x]	No [ ]	
4.	Is it clear what analyses were requested?	Yes [x]	No [ ]	
5.	Custody seals intact?	Yes [ ]	No [ ]	Not Present [x]
6.	Samples in proper container type and preservative?	Yes [x]	No [ ]	
7.	Were correct preservatives noted on COC?	Yes [x]	No [ ]	NA [ ]
8.	Sample containers intact?	Yes [x]	No [ ]	
9.	Sufficient sample volume for indicated test?	Yes [x]	No [ ]	
10.	Were container labels complete?	Yes [x]	No [ ]	
11.	All samples received within holding time?	Yes [x]	No [ ]	
12.	Was an attempt made to cool the samples?	Yes [x]	No [ ]	NA [ ]
13.	Sample Temp. taken and recorded upon receipt?	Yes [x]	No [ ]	To 0 °C
14.	Water - Were bubbles absent in VOC vials?	Yes [x]	No [ ]	No Vials [ ]
15.	Are Samples considered acceptable?	Yes [x]	No [ ]	
16.	COC filled out properly?	Yes [x]	No [ ]	

Client Notification/Response

Client Name:	STU001					Work Order Number:	17123652	
Comment:								
Client Contacted:	Yes	[ ]	No	[ ]	NA	[x]	Person Contacted:	
Contact Mode:	Phone	[ ]	Fax:	[ ]	Email:	[ ]	In Person: [ ]	
Date Contacted:				Contacted By:				
Regarding:								
Client Instructions:								
Corrective Action:								

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Office of Oil and Gas
JAN 26 2018
WV Department of
Environmental Protection

CHAIN OF CUSTODY RECORD

17123652
STURM ENVIRONMENTAL SERVICES
STU001
Jimmy Suttle

REIC
Industrial Consultants, Inc.
CORPORATE HEADQUARTERS:
P.O. Box 286 • 225 Industrial Park Rd. Beaver, WV 25813
800-999-0105 • 304-255-2500 • 304-255-2572 fax • www.reiclabs.com

Client: Sturm Environmental
Contact Person: Lm
QUOTE #
Address: on file
Billing Address, if different
Site ID & State
PO #: 7821
Phone: 304 623 6549
Fax
Email
City / State / Zip
Project ID
Sampler: M. Kelly

MID-OHIO VALLEY Service Center	SHENANDOAH Service Center	ROANOKE Service Center	MORGANTOWN Service Center
101 17th Street, Ashland, KY 41101, 606-393-5027	1557 Commerce Rd., Ste 201, Verona, VA 24482, 540-248-0183	3029 C Peters Creek Rd, Roanoke, VA 24019, 540-777-1276	16 Commerce Drive, Westover, WV 26501, 304-241-5861

TURNAROUND TIME: X NORMAL
RUSH TURNAROUND*: 5 DAY | 3 DAY | 2 DAY | 1 DAY
*Rush work needs prior laboratory approval and will incur additional charges
All analytical requests are subject to REIC's Standard Terms and Conditions

Send Results Via: Email / Fax

ANALYSIS & METHOD REQUESTED: TPH-GRO, DRO, ORO; BTEX; Diss. Metals; Bar/Iron; Surfactant; Methane/Ethane

SAMPLE ID	No. & Type of Containers	Sampling Date/Time	Matrix	Sample Comp/Grab	TPH-GRO, DRO, ORO	BTEX	Diss. Metals	Bar/Iron	Surfactant	Methane/Ethane		
ENTER PRESERVATIVE CODE					0	1	3	0	0	0		
17298	1-5 glass 1 liter, 4 vials	12-28-17 0900	L	Grab	X	X	X	X	X	X		
17299	1-glass 1 liter, 2 vials	0930	|	|	X	X	X	X	X	X		
17300	1 glass liter, 2 vials	| 1000	|	|	X	X						

Preservative Codes: 0 None; 1 Hydrochloric Acid; 2 Nitric Acid; 3 Sulfuric Acid; 4 Sodium Thiosulfate; 5 Sodium Hydroxide/Zinc Acetate; 6 Sodium Hydroxide; 7 Ascorbic Acid; 8 Sodium Bisulfate/Methanol; 9 Ammonium Chloride; 10 Ch. Buffer; 11 Sodium Sulfite/Hydrochloric Acid

COMMENTS:

CUSTODY SEALS [ ] Y [✓] N

Temperature at arrival: 0 °C ICED? Y ✓ N
Containers provided by: [✓] REIC [ ] Client
Delivered by: [ ] Client [✓] REIC [ ] UPS [ ] FedEx [ ] USPS Other

Relinquished by	Date/Time	Received by	Date/Time
K. Kyhel	12-27-17	Randy L. Moore	12-28-17 1155
[signature]	12-29-17 1545		12-29-17 1340

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Office of Oil and Gas
JAN 26 2018
WV Department of Environmental Protection

ENVIRONMENTAL SERVICES

Main Office:
STURM ENVIRONMENTAL SERVICES
BRUSHY FORK ROAD
P.O. BOX 650
BRIDGEPORT, WV 26330
PHONE: 304-623-6549
FAX: 304-623-6552

STURM ENVIRONMENTAL SERVICES
610 D STREET
P.O. BOX 8337
SO. CHARLESTON, WV 25303
PHONE: 304-744-9864
FAX: 304-744-7866

REPORT TO: Client Name: C.I. McKOWN + SON, INC
Address: P.O. BOX 71
City/State/Zip: NEWTON, WV 25266
Contact Person: SAM McKOWN
Telephone Number: 304/565-7318 Fax No. 304/565-3804
Email Address: cimckown@frontier.com
Sampler Name: (Print) Michael J Kelly
Sampler Signature: Michael Kelly
Project Name: PERMIT 2001 UIC RENEWAL
Special Reporting: [X] Email Results [ ] Fax Results

BILL TO: Client Name: SAME
Address:
City/State/Zip:
Contact Person:
Telephone Number: Fax No.
Email Address:
Purchase Order #:
TURN AROUND TIME: ___ Standard
___ RUSH (pre-scheduled; surcharges may apply) *Please Check One*
___ Date Needed

1 DAY [ ] 2 DAY [ ] 3 DAY [ ]

Sample ID / Description	Composite Sample: START DATE	START TIME	END DATE	END TIME	Grab Sample: DATE	TIME	Preservative: Ice	OTHER	HCl	NaOH	H_2SO_4, Plastic	H_2SO_4, Glass	None	HNO_3	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	ANALYZE FOR:	# of Bottles	Flow (gpm, cfs, mgd) circle one	Field pH	Field Conductivity	Field DO	Field Chlorine (mg/L or ug/L) circle one	Field Temp (F° or C°) circle one
#1 - SPRING					12/28/17	9:00am																12						
#2 - CHAMBERS					12/28/17	9:30am																12						
#3 - INJECTATE					12/28/17	10:02																11						

Comments

Records retained for 5 years

Relinquished by:	Date	Time	Received by:	Date	Time
Mike Kelly	12/28/17	12:45pm	K Kulul	12/28/17	1245
Relinquished by:	Date	Time	Received by:	Date	Time

Laboratory Comments:
Temperature Upon Receipt: <6
Bottles Preserved? (Y) N
collier #: #1 1054 17 #2 1047 17

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

January 24, 2018

Ms. Laurie Hiles
Sturm Environmental Services
P.O. Box 650
Bridgeport, WV 26330

RE: Project: UIC renewal
Pace Project No.: 30240078
CI MCKOWN & SON, INC.

Dear Ms. Hiles:
Enclosed are the analytical results for sample(s) received by the laboratory on January 04, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Samantha Bayura

Samantha Bayura
samantha.bayura@pacelabs.com
(724)850-5622
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: UIC renewal CI MCKOWN & SON, INC.
Pace Project No.: 30240078

Pennsylvania Certification IDs
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: UIC renewal CI MCKOWN & SON, INC.
Pace Project No.: 30240078 #3 INJECTATE

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30240078001	17012	Water	12/28/17 10:00	01/04/18 10:20

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: UIC renewal CI MCKOWN & SON, INC.
Pace Project No.: 30240078 #3 INJECTATE

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30240078001	17012	EPA 900.0	NJV	2
		EPA 903.1	KAC	1
		EPA 904.0	VAL	1

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: UIC renewal CI MCKOWN & SON, INC.
Pace Project No.: 30240078 #3 INJECTATE

Method: EPA 900.0
Description: 900.0 Gross Alpha/Beta
Client: Sturm Environmental Sevices
Date: January 24, 2018

General Information:
1 sample was analyzed for EPA 900.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project:	UIC renewal	CI MCKOWN & SON, INC.
Pace Project No.:	30240078	#3 INJECTATE

Method: EPA 903.1
Description: 903.1 Radium 226
Client: Sturm Environmental Sevices
Date: January 24, 2018

General Information:
1 sample was analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: UIC renewal CI MCKOWN & SON, INC.
Pace Project No.: 30240078 #3 INJECTATE

Method: EPA 904.0
Description: 904.0 Radium 228
Client: Sturm Environmental Sevices
Date: January 24, 2018

General Information:
1 sample was analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: UIC renewal CI MCKOWN & SON, INC.
Pace Project No.: 30240078 #3 INJECTATE

Sample: 17012 Lab ID: 30240078001 Collected: 12/28/17 10:00 Received: 01/04/18 10:20 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Collection date and time not listed on sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	234 ± 522 (1,002) C:NA T:NA	pCi/L	01/09/18 18:49	12587-46-1	
Gross Beta	EPA 900.0	820 ± 563 (952) C:NA T:NA	pCi/L	01/09/18 18:49	12587-47-2	
Radium-226	EPA 903.1	285 ± 44.3 (9.44) C:NA T:92%	pCi/L	01/22/18 19:47	13982-63-3	
Radium-228	EPA 904.0	356 ± 84.9 (4.56) C:85% T:87%	pCi/L	01/23/18 16:27	15262-20-1	

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: UIC renewal CI MCKOWN & SON, INC.
Pace Project No.: 30240078 #3 INJECTATE

QC Batch: 285226 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30240078001

METHOD BLANK: 1399110 Matrix: Water
Associated Lab Samples: 30240078001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.339 ± 0.472 (0.787) C:NA T:90%	pCi/L	01/22/18 19:17	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: UIC renewal CI MCKOWN & SON, INC.
Pace Project No.: 30240078 #3 INJECTATE

QC Batch: 285299 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30240078001

METHOD BLANK: 1399288 Matrix: Water
Associated Lab Samples: 30240078001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.523 ± 0.309 (0.566) C:83% T:91%	pCi/L	01/23/18 13:13	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: UIC renewal CI MCKOWN & SON, INC.
Pace Project No.: 30240078 #3 INJECTATE

QC Batch: 284284 Analysis Method: EPA 900.0
QC Batch Method: EPA 900.0 Analysis Description: 900.0 Gross Alpha/Beta
Associated Lab Samples: 30240078001

METHOD BLANK: 1395045 Matrix: Water
Associated Lab Samples: 30240078001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	0.061 ± 0.312 (0.779) C:NA T:NA	pCi/L	01/09/18 18:48	
Gross Beta	0.600 ± 0.610 (1.26) C:NA T:NA	pCi/L	01/09/18 18:48	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: UIC renewal CI MCKOWN & SON, INC.
Pace Project No.: 30240078 #3 INJECTATE

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

30240078

Section A Required Client Information:

Company: Stum Environmental
Address: P.O. Box 650
Bridgeport WV 26330
Email To: kkrehel@stumenvironmental.com
Phone: 304-623-6549 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: mhupp@stumenvironmental.com
Copy To:
Purchase Order No.: 7823
Project Name: UIC renewal
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

Page: of 1

1756239

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER

Site Location STATE: WV

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JAN 26 2018
WV Department of Environmental Protection

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / , -) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Gross Alpha/Beta	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	17012	WT	G			1/4/18	1000		3			X							X	X	X	N	001
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

WO#: 30240078

30240078

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
We will upload data	K. Krehel/Stum Environmental	1/3/18	PM		1/4/18	1620	N/A	N	N	Y
	Mailed									

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: M. Kelly

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: STURM Project # 30240078

Courier: ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____ Label ZH

Tracking #: 1Z78127103774194 71 LIMS Login ZKM

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals Intact: ☐ yes ☐ no

Thermometer Used N/A Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp — °C Correction Factor: — °C Final Temp: — °C

Temp should be above freezing to 6°C

Date and initials of person examining contents: ZH 1/4/18

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out.	✓			2.
Chain of Custody Relinquished.	✓			3.
Sampler Name & Signature on COC.		✓		4.
Sample Labels match COC. -Includes date/time/ID Matrix: WT		✓		5. no date/time on samples.
Samples Arrived within Hold Time.	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume.	✓			9.
Correct Containers Used: -Pace Containers Used:	✓	✓		10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. All containers needing preservation are found to be in compliance with EPA recommendation.	✓ ✓			16. PH<2
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed ZH Date/time of preservation; Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed ZH Date: 1/4/18

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

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JAN 26 2018
WV Department of
Environmental Protection

☐ A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ENVIRONMENTAL SERVICES

Main Office:
STURM ENVIRONMENTAL SERVICES
BRUSHY FORK ROAD
P.O. BOX 650
BRIDGEPORT, WV 26330
PHONE: 304-623-6549
FAX: 304-623-6552

STURM ENVIRONMENTAL SERVICES
610 D STREET
P.O. BOX 6337
SO. CHARLESTON, WV 25303
PHONE: 304-744-9864
FAX: 304-744-7866

REPORT TO: Client Name: C.I. McKown & Son, Inc
Address: P.O. Box 711
City/State/Zip: Newton WV 25266
Contact Person: Sam McKown
Telephone Number: 304/565-7318 Fax No. 304/565-3804
Email Address: cimckown@frontier.com
Sampler Name: (Print) Michael J Kelly
Sampler Signature: Michael J Kelly
Project Name: PERMIT 2017 UIC RENEWAL
Special Reporting: [X] Email Results [ ] Fax Results

BILL TO: Client Name: SAME
Address:
City/State/Zip:
Contact Person:
Telephone Number: Fax No.
Email Address:
Purchase Order #:

TURN AROUND TIME: ___ Standard
___ RUSH (pre-scheduled; surcharges may apply) Please Check One
Date Needed

1 DAY	2 DAY	3 DAY

Sample ID / Description	COMPOSITE SAMPLE START DATE	COMPOSITE SAMPLE START TIME	COMPOSITE SAMPLE END DATE	COMPOSITE SAMPLE END TIME	GRAB SAMPLE DATE	GRAB SAMPLE TIME	PRESERVATIVE Ice	PRESERVATIVE OTHER	PRESERVATIVE HCl	PRESERVATIVE NaOH	PRESERVATIVE H_2SO_4 Plastic	PRESERVATIVE H_2SO_4 Glass	PRESERVATIVE None	PRESERVATIVE HNO_3	MATRIX Groundwater	MATRIX Wastewater	MATRIX Drinking Water	MATRIX Sludge	MATRIX Soil	MATRIX Other (specify):	ANALYZE FOR:	# of Bottles	Flow (gpm, cfs, mgd) circle one	Field pH	Field Conductivity	Field DO	Field Chlorine (mg/L or mg/L) circle one	Field Temp (F° or C°) circle one
#1 - SPRING					12/28/17	9:00 am																12						
#2 - CHAMBER					12/28/17	9:30 am																12						
#3 - INJECTATE					12/28/17	10:00																11						

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JAN 26 2018
WV Department of
Environmental Protection

Comments

Records retained for 5 years

Relinquished by:	Date	Time	Received by:	Date	Time
Michael Kelly	12/28/17	12:45pm	K. Kuhl	12/28/17	1245
Relinquished by:	Date	Time	Received by:	Date	Time

Laboratory Comments:
Temperature Upon Receipt: 0 < 6
Bottles Preserved? Y N
coiliert # #1 1:54 17 #2 1:47 17

Section 10
Monitoring

Section 10 – Monitoring

All injection parameters shall be recorded on weekdays by the well-tender who is responsible for this well. It is currently not operated on weekends. The well -tender shall log the injection pressure, annulus pressure and injection volume. Additionally, as part of his standard job requirements, he shall confirm the integrity of all tanks, piping and equipment as well as that of the secondary containment structure. As required by the WVDEP, Office of Oil and Gas, monthly WR-40 forms will be filed based upon this information. When fluids are hauled to the site, a manifest shall be filled out recording the date; volume and type of fluid off-loaded; the well name, number and API number(s) of the source of the fluid; and the name of the truck driver.

Records of all this information shall be maintained at the offices of C.I. McKown & Son, Inc.

Section 11

Groundwater Protection Plan

Section 11 – Groundwater Protection Plan (GPP)

See Appendix H

APPENDIX H

GROUNDWATER PROTECTION PLAN

Facility Name: PEROT LOT #1, WELL #2

County: ROANE

Facility Location:

Postal Service Address:	OTTO ROAD		
SPENCER, WV 25276			
Latitude :	38.74614	Longitude:	81.27001

Contact Information:

Person:	C.I. McKOWN II
Phone Number:	3045657318
E-mail Address:	cimckown@frontier.com

Date: 10-8-16

1. A list of all operations that may contaminate the groundwater.

LEAK FROM A TANK, PUMP, INJECTION LINE OR WELLHEAD.

2. A description of procedures and facilities used to protect groundwater quality from the list of potential contaminant sources above.

SECONDARY CONTAINMENT AROUND TANKS, PUMP AND PART OF THE INJECTION LINE.

REMAINDER OF INJECTION LINE AND WELLHEAD ROUTINELY INSPECTED.

3. List procedures to be used when designing and adding new equipment or operations.

THERE ARE NO PLANS TO INSTALL ANY NEW EQUIPMENT AT THIS SITE.

4. Summarize all activities at your facility that are already regulated for groundwater protection.

THIS FACILITY IS CURRENTLY REGULATED BY THE EXISTING UIC PERMIT.

5. Discuss any existing groundwater quality data for your facility or an adjacent property.

THIS SITE IS IN A REMOTE AREA AND THERE ARE FEW DRINKING WATER SOURCES NEAR IT. NO GROUNDWATER QUALITY ISSUES ARE KNOWN TO EXIST.

6. Provide a statement that no waste material will be used for deicing or fill material on the property unless allowed by another rule.

NO WASTE MATERIAL WILL BE USED FOR DEICING OR FILL MATERIAL.

7. Describe the groundwater protection instruction and training to be provided to the employees. Job procedures shall provide direction on how to prevent groundwater contamination.

THE WELL TENDER FOR THIS FACILITY HAS BEEN INSTRUCTED TO ROUTINELY INSPECT THE TANKS, SECONDARY CONTAINMENT STRUCTURE, PUMP, INJECTION LINE AND WELLHEAD TO ASSURE THE CONDITION OF EACH IS ADEQUATE.

8. Include provisions for inspections of all GPP elements and equipment. Inspections must be made quarterly at a minimum.

TANKS, SECONDARY CONTAINMENT STRUCTURE, PUMP, INJECTION LINE AND WELLHEAD WILL BE INSPECTED AT LEAST EVERY 90 DAYS.

Signature: [signature] & President

Date: 1-26-18

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JAN 26 2018

WV Department of
Environmental Protection

Section 12
Plugging & Abandonment

Section 12 – Plugging and Abandonment – Additional Information

Once the well reaches a point where injection is no longer feasible or mechanical integrity cannot be proven or maintained, it will be plugged and abandoned in accordance with all WVDEP plugging and abandonment regulations in effect at the time.

A plugging rig will be moved on-site, the 2-3/8" x 4-1/2" packer will be released and the 2-3/8" tubing and packer pulled. Tubing will be run back in the hole to a point 50' below the bottom perforation and bentonite gel will be spotted to a point where the 4-1/2" casing is known to be free. A cement plug will then be run to a point at least 50' above the top perforation and displaced with bentonite gel. The free point of the 4-1/2" casing will then be determined, the casing will be cut at the free point and picked up. The tubing will then be run back to a point 50' below the cut. Sufficient bentonite gel will be run to fill the hole to the base of the 7" casing, a 100' cement plug spotted and displaced with bentonite gel. The tubing and 4-1/2" casing will then be pulled and the tubing run back to 50' below the bottom of the 7" casing, bentonite gel sufficient to fill the hole to within 100' of the surface run, a 100' cement plug spotted and displaced with gel. The tubing will be pulled up to 100', the well cemented to the surface and a permanent monument erected. Finally, a WR-38 will be submitted to the WVDEP Office of Oil and Gas detailing the plugging operation.

Section 13
Additional Bonding

Section 13 – Additional Bonding

C.I. McKown & Son, Inc. has posted an additional $5000 bond as required for Class 2D Wells. See Attached.

OP-8B
Page 1 of 4
(1/12)

COPY

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

IRREVOCABLE LETTER OF CREDIT BONDING COMMITMENT

FROM: C. I. McKown & Son, Inc.
P.O. Box 711
Newton, WV 25266 (the "Operator")

TO: Chief, Office of Oil and Gas
Department of Environmental Protection
State of West Virginia,
or the Authorized Representative Thereof (the "Chief")

RE: Letter of Credit Bonding Commitment:

☑ For $5000 Single Well Bond Under §22-6
Operator's Well Number Perot Lot 1 Well 2
API Well Number 47 - 087 - 01106

☐ For $50,000 Single Well Bond Under §22-6A
Operator's Well Number _____
API Well Number 47 - _____ - _____

☐ For all (Blanket) Well Work Activities and/or Operations Covered by **West Virginia Code 22-6-26**

☐ For all (Blanket) Well Work Activities and/or Operations Covered by **West Virginia Code 22-6A-15**

LETTER OF CREDIT NUMBER 125

EFFECTIVE DATE: February 10, 2012

RECEIVED
Office of Oil and Gas
JAN 26 2018
WV Department of
Environmental Protection

Dear Chief:

Pursuant to West Virginia Code 22-6 and 22-6A et seq., the undersigned Operator (the "Operator") has made or intends to make application to the Chief for a well work permit(s), or intends to become transferee operator of (a) well(s), or intends to replace an existing bond(s) with a Letter of Credit as provided by West Virginia Code 22-6-26 and 22-6A-15.

The Operator understands that in order to obtain issuance of any permit for well work, or to become lawful transferee of any well, the Operator must first provide performance bonding pursuant to West Virginia Code 22-6-26 and 22-6A-15. Accordingly, the purpose of this Letter of Credit Bonding Commitment is to provide letter of credit collateral bonding in a form acceptable to the Chief.

The Operator states and agrees as follows:

1. Attached hereto is an Irrevocable Letter of Credit (the "Letter of Credit") executed on Form OP-8B-LC which has been issued by a bank or banking institution within the definition of West Virginia Code 31A-1-2(b) or otherwise authorized under the law to engage in banking transactions in West Virginia (the "Bank").

2. The Letter of Credit has a specific expiration date which coincides with the end of a calendar quarter (the "Expiration Date"). As provided under the terms of the Letter of Credit, the Expiration Date may hereafter be extended, either automatically from year to year, or from time to time by written notice from the Bank to the Chief in the form of Exhibit 1 attached to the Letter of Credit [Form OP-8B-LC] specifying the date to which the Letter of Credit is to be extended.

3. **The Operator shall be solely responsible for insuring that any notice(s) which are necessary in order to extend the Expiration Date are received by the Chief at least thirty days prior to the last specified Expiration Date;** and, the Operator shall be solely responsible for insuring that any notice(s) which are necessary in order to notify the Chief that the Bank has elected not to extend an automatically renewable Letter of Credit are received by the Chief at least 60 days prior to the last specified Expiration Date.

4. In the event of a Default as defined in paragraph 6 below, the Operator understands that the Chief will immediately attempt to notify the Operator by Certified Mail of such Default and of the Chief's intention to submit the sight draft under the Letter of Credit to the Bank for payment. The Operator further understands and agrees that regardless of whether or not the Operator is provided such notice, the Chief may submit the sight draft under the Letter of Credit to the Bank for payment following a Default unless alternative arrangements satisfactory to the Chief which eliminate the grounds of the Default are made by the Operator within twenty days following the occurrence of the Default.

5. In the event of a Default and the collection by the Chief of funds under the Letter of Credit, the Operator acknowledges and agrees that such funds may be applied by the Chief in the manner and for the purposes described in paragraph 7 below.

6. "Default", as used herein shall mean either of the following events:

(a) Default for Failure to Extend: Failure by the Operator to exercise the option of replacing the Letter of Credit as provided by West Virginia Code 22-6-26 or 22-6A-15 and failure by the Bank to notify the Chief that the Letter of Credit shall be extended for an additional term at least thirty days prior to the then applicable Expiration Date; or failure by the Bank to notify the Chief that the Bank has elected not to extend an automatically renewable Letter of Credit at least 60 days prior to the then applicable Expiration Date; or

(b) Default By the Operator For Failure to Comply with Applicable Laws, Rules and Regulations.

7. In the event of a Default, the Chief is authorized to draw on the Bank the amount of ☑ $5,000, ☐ $50,000 or ☐ $250,000 **(check one)** upon the Chief's presentation of the draft in the form set forth in Exhibit "2", attached to the applicable Irrevocable Letter of Credit, as follows:

(a) In the event of a Default For Failure to Extend, and for no other reason, the Chief shall apply the funds received under the Letter of Credit to serve as cash collateral bonding pursuant to West Virginia Code 22-6-26(d)and 22-6-26(e) or 22-6A-15(d) and 22-6A-15(e). In the event of any such conversion to cash collateral bonding, the funds shall be invested in the West Virginia Consolidated Investment Fund and the interest thereon shall be paid in accordance with the "Request to Invest" form attached hereto and incorporated herein as Appendix A.

(b) In the event of a Default Constituting Bond Forfeiture For Failure to Comply with Applicable Laws, Rules and Regulations, **the Chief shall proceed with, and the Bank shall comply with, the forfeiture provisions set forth by West Virginia Code 22-6-26 or 22-6A-15. The funds received shall be deposited into the oil and gas reclamation fund and the operator must post a replacement bond.**

8. This Letter of Credit Bonding Commitment shall continue in full force and effect until and shall terminate when the Operator has obtained bond release from the Chief or, in accordance with West Virginia Code 22-6-26 or 22-6A-15 and in a form acceptable to the Chief, has substituted for this Letter of Credit Bonding Commitment and Letter of Credit (i) corporate surety bonding, (ii) cash collateral bonding, or (iii) alternative letter of credit collateral bonding.

IN WITNESS WHEREOF, the Operator, on behalf of itself, its successors, agents and assigns, hereby executes this Letter of Credit Bonding Commitment.

OPERATOR:

C. I. McKown & Son, Inc.
(Type or Print)

BY: _____
(Signature)

ITS: President
(Title)

DATE: February 10, 2012

(Corporate Seal)

FEIN: 55-0675892

Approved this _____ day of _____, 20 12, as to sufficiency of form and manner of execution.

By: _____

Attorney General

OP-8B
Page 4 of 4
(1/12)

TO LETTER OF CREDIT BONDING COMMITMENT

In the event funds are collected by the Chief under the Letter of Credit pursuant to the Letter of Credit Bonding Commitment, the Chief may convert those funds to cash collateral bonding as provided for in West Virginia Code 22-6-26 and/or 22-6A-15 and may invest such funds in the West Virginia Consolidated Investment Fund (the "Fund"), with the interest thereon payable annually in January to the Operator or its designee as specified below:

Operator must choose one of the following options:

☑ Check made payable to:

Operator C. I. McKown & Son, Inc.
Address P.O. Box 711
Newton, WV 25266

OR;

☐ Wire transfer to bank (complete all information below):

Bank Name_____
Bank ABA Number_____
Name on Bank Account_____
Bank Account Number_____

The principal amount placed in the Fund shall be subject to the Treasurer of State's rules, regulations and applicable fees and shall be distributed back to the Operator at such time when bond release has been obtained from the Chief or upon the substitution of alternative bonding acceptable to the Chief.

Operator C. I. McKown & Son, Inc.

By: [signature] (Signature)

Its: C.I. McKown, II, President (Typed Name and Title)

Date: February 10, 2012

Fein: 55-0675892

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use of your personal information, please contact DEP's Chief Privacy Officer at depprivacyoffier@wv.gov.

IRREVOCABLE LETTER OF CREDIT

ISSUING BANK (the "Bank"): First Neighborhood Bank
Address: P.O. Box 1049
Spencer, WV 25276
BANK'S FEIN: 55-0282083

CUSTOMER (the "Operator"): C. I. McKown & Son, Inc.
Address: P.O.Box 711
Newton, WV 25266

BENEFICIARY: The State of West Virginia, Through Its Representative, Chief, Office of Oil and Gas, Department of Environmental Protection, State of West Virginia or the Authorized Representative Thereof (the "Chief").

AMOUNT:

☑ For $5000 Single Well Bond Under West Virginia Code §22-6
Operator's Well Number PEROT LOT 1 WELL 2
API Well Number 47 - 087 - 01106

☐ For $50,000 Single Well Bond Under West Virginia Code §22-6A
Operator's Well Number _____
API Well Number 47 - _____ - _____

☐ For all (Blanket) Well Work Activities and/or Operations Covered by **West Virginia Code §22-6-26**

☐ For all (Blanket) Well Work Activities and/or Operations Covered by **West Virginia Code §22-6A-15**

LETTER OF CREDIT EFFECTIVE DATE: February 10, 2012

LETTER OF CREDIT EXPIRATION DATE: March 31, 2017
(Must be no less than five-year increments)

(Must coincide with the end of a calendar quarter, i.e., March 31, June 30, September 30, or December 31.)

IRREVOCABLE LETTER OF CREDIT NO: 125

The Bank, a bank or banking institution as defined in West Virginia Code Section 31A-1-2(b) or otherwise authorized under the law to engage in banking transactions in West Virginia hereby opens an Irrevocable Letter of Credit (the "Letter of Credit") in favor of the State of West Virginia for the account of the Operator. This Letter of Credit shall be effective from the Effective Date above unless the Expiration Date is extended as provided herein, in which case it shall expire on the expiration date as so extended.

At any time during regular business hours of the Bank from and after the Effective Date and continuing through the Expiration Date, the Chief is authorized to draw on the Bank an amount not **exceeding** ☑ **$5,000,** ☐ **$50,000 or** ☐ **$250,000** (check one) upon the Chief's presentation to the Bank of the draft in the form of Exhibit 2 attached hereto drawn on the Bank at sight and bearing the number of this Letter of Credit.

The Expiration Date of this Letter of Credit will be extended in the following manner:

(_____) By written notice from the Bank provided in the form of Exhibit 1 hereto and received by the Chief at least thirty days prior to the Expiration Date stated above or the Expiration Date as last extended by previous written notice(s) hereunder.

OR;

(X) Automatic ***five year period*** for a total of up to 1 additional ***five-year periods*** from and after the Expiration Date stated above, unless the Bank notifies the Chief in writing at least sixty days prior to the then current Expiration Date that the Bank has elected not to extend the Letter of Credit beyond such Expiration Date for such additional period.

The Bank will give prompt notice to the Operator and to the Chief of any notice received or action filed: (1) alleging the insolvency or bankruptcy of the Bank; or (2) alleging any violation of regulatory requirements which could result in suspension or revocation of the Bank's charter or license to do business.

Sworn to and executed by the Bank this 10th day of Feb., 2012.

Bank: First Neighborhood Bank

By: Jeanette Atkinson
(Signature)

Its: Executive Vice President
President or Vice-President

Raised Bank Seal

State of West Virginia

County of Roane to wit:

Subscribed and sworn to before the undersigned authority by Jeanette Atkinson, as Executive Vice President of the First Neighborhood Bank (Bank), this 10th day of February, 2012.

My Commission expires Sept 1 2013.

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
[illegible]
[illegible] ROAD
[illegible] 25276
My Commission Expires September 1, 2013

(Notary Seal)

Notary Public

Approved this _____ day of _____, 20____, as to sufficiency of form and manner of execution.

By: _____
Attorney General

EXHIBIT 1
TO LETTER OF CREDIT

NOTICE TO EXTENSION OF THE EXPIRATION DATE
OF LETTER OF CREDIT NO. _____

TO: Chief, State of West Virginia
Office of Oil and Gas
Department of Environmental Protection

RE: Extension of the Expiration Date of the
Letter of Credit No. _____
API No. 47-087 - 01106 (if single letter of credit)
issued by the Undersigned Bank

Dear Chief:

This is to advise that the Expiration Date of the above referenced Letter of Credit is hereby extended to the _____ day of _____, 20_____, (date must coincide with the end of a calendar quarter ***and must be extended in five year increments***), which shall be the Expiration Date of the Letter of Credit for all purposes.

Very truly yours,

Bank Name: _____

FEIN: _____

RAISED BANK SEAL

By: _____
(President or Vice-President)

Approved this _____ day of _____, 20_____, as to sufficiency of form and manner of execution.

By: _____
Attorney General

_____
Operator Name

_____
Street/P. O. Box

_____
City State Zip

EXHIBIT 2
TO LETTER OF CREDIT

SIGHT DRAFT

_____
(Date)

_____
(Place)

TO ISSUING BANK: _____
_____
_____

FOR VALUE RECEIVED

Pay to Demand to the Chief of the Office of Oil and Gas, Department of Environmental Protection, West Virginia Bureau of Environment $_____ Dollars.

Charge to the Account of _____
(Customer/Operator)

Irrevocable Letter of Credit No. _____.

BENEFICIARY: The State of West Virginia

By: _____
Chief, Office of Oil and Gas
Department of Environmental Protection

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use of your personal information, please contact DEP's Chief Privacy Officer at depprivacyoffier@wv.gov.

Section 14 – Financial Responsibility

C.I. McKown & Son, Inc. has posted a $50,000 blanket bond with the WVDEP Office of Oil and Gas in the form of an Irrevocable Letter of Credit (ID #5) issued by the First Neighborhood Bank of Spencer, WV. This bond covers the well governed by this UIC Permit and could be used to Plug and Abandon it in the event the applicant was unable to do so. See Appendix I

Section 14
Financial Responsibility

(4/25)

APPENDIX I

Requirement for Financial Responsibility to Plug/Abandon an Injection Well

To: WV Department of Environmental Protection
Office of Oil and Gas
601 57th Street, SE
Charleston, West Virginia 25304-2345
ATTN: Underground Injection Control Program

From: C.I. McKOWN & SON, INC.
P.O. BOX 711
NEWTON, WV 25266

Date: 1/26/18

Subject: Underground Injection Control (UIC) Permit Application
2D0871106
Requirement for Financial Responsibility

I, C.I. McKOWN, II, PRESIDENT, verify in accordance with 47CSR13-13.7.g., that I will maintain financial responsibility and resources to close, plug, and abandon underground injection wells(s) in a manner prescribed by the Chief of the Office of Oil and Gas.

Name: C.I. McKOWN, II, PRESIDENT

Signature: [signature], President

Date: 1-26-18

RECEIVED
Office of Oil and Gas
JAN 26 2018
WV Department of
Environmental Protection

Section 15
Site Security Plan

Section 15 – Site Security Plan

Not applicable as this is not a commercial facility. Access to the facility is, however, gated and locked to prevent unauthorized entrance.

Section 16
Additional Information

APPENDIX K

Identify permit or construction approvals received or applied for under the following programs:

Permit/approvals	ID Number
Hazardous Waste Management Program under RCRA	N/A
NPDES Program	N/A
Prevention of Significant Deterioration (PSD)	N/A
Nonattainment Program	N/A
Dredge or Fill	N/A
NPDES/NPDES – Stormwater	N/A
WVDEP – Office of Waste Management (OWM) – Solid Waste Facility	N/A
WVDEP – OWM – RCRA (Hazardous Waste TSD or Transporter)	N/A
WVDEP – OWM – UST	N/A
CERCLA – Superfund	N/A
WV Voluntary Remediation – Brownfields	N/A
FIFRA – Federal Insecticide, Fungicide and Rodenticide Act	N/A
Well Head Protection Program (WHPP)	N/A
Underground Injection Control (UIC)	2D0871106
Toxic Substances Control Act (TSCA)	N/A
Best Management Plans	N/A
Management of Used Oil	RECYCLED AS NEEDED
Other Relevant Permits (Specify):	
AST ACT	TANKS REGISTERED WITH DWWR
	044-00000592
	044-00000593
	044-00000594