VIKING ENERGY CORPORATION

December 23, 2015

Mr. Gene Smith, Assistant Chief of Permitting

West Virginia Department of Environmental Protection

Office of Oil and Gas

601 57th Street, SE

Charleston, WV 25304

RE: Permit Renewal for the Columbia Gas 20320 (Wallace Unit #1) Class IID Commercial Disposal Well, UIC2D0392210

Dear Mr. Smith:

Please find enclosed the required original UIC permit application package for the Permit Renewal of the Class IID injection well, Columbia Gas 20320 (Wallace Unit #1), which includes a check for $550 for the application fee and groundwater protection plan (GPP).

If you have any questions regarding this matter, please feel free to contact me at (304) 983-1161.

Sincerely,

Eric Pinkerton, Operations Manager

Viking Energy Corporation

8113 Sissonville Drive, P.O. Box 13366

Sissonville, West Virginia 25320

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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	Viking Energy Corporation		
Existing UIC Permit ID Number	UIC2D0392210	UIC Well API Number	47-039-02210

Office of Oil and Gas Office Use Only	
Permit Reviewer	
Date Received	
Administratively Complete Date	
Approved Date	
Permit Issued	

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.

- ✓ 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

- [x] Appendix D Public Service District Affidavit
- [x] Appendix E Water Sources
- [x] 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): Eric Pinkerton, Owner

Reviewed by (Sign): Eric Pinkerton

Date Reviewed: 12-23-15

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Section 1-5

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 # UIC2D0392210 API # 47-039-02210 WELL # Columbia Gas 20320 (Wallace Unit #1well)

Section 1. Facility Information

Facility Name: Tuppers Creek Disposal Facility

Address: 8113 Sissonville Drive, P.O. Box 13366

City: Sissonville State: WV Zip: 25320

County: Kanawha

Location description:

I-77 N exit at 111 (Tuppers Creek exit). Turn left off the exit and travel 0.2 miles. Turn left onto Old Tuppers Creek Road. Travel 0.1 miles and the Tuppers Creek Facility is on the left.

Location of well(s) or approximate center of field/project in UTM NAD 83 (meters):

Northing: 4257197.96 Easting: 443183.55

Environmental Contact Information:

Name: Eric Pinkerton Title: Operations Manager

Phone: (304) 988-1161 Email: epinkerton@vikingwell.com

Section 2. Operator Information

Operator Name: Viking Energy Corporation

Operator ID: 305942

Address: 8113 Sissonville Drive, P.O. Box 13366

City: Sissonville State: WV Zip: 25320

County: Kanawha

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Contact Name: Eric Pinkerton Contact Title: Operations Manager

Contact Phone: (304) 988-1161 Contact Email: epinkerton@vikingwell.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:

Viking Energy Corporation is an independent oil and gas operator with a commercial Class IID injection well to dispose of oil and gas fluid wastes associated with the drilling, completion, stimulation, and production of oil and natural gas in the area. The commercial Class IID injection well is the Columbia Gas 20320 (Wallace Unit #1) well, located in Kanawha County, West Virginia.

Oil and gas fluid wastes are hauled into the 20320 Disposal Facility with brine trucks, unloaded at the facility into surface facility brine storage tanks and then fluid wastes are pumped from the tanks into the injection pump through the injection pipeline into the Columbia Gas 20320 injection well through the open-hole completion in the Newburg at depths of 5,557 to 5,574 feet for disposal. Prior to injection the raw injectate is filtered through a 100 micron system, then through oil/water separation then through 25 micron filtration and finally through 10 micron filtration.

AV 1/1

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: Eric Pinkerton

Print Title: Operations Manager

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: Eric Pinkerton

Date: 12-23-15

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[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

APPENDIX A
Injection Well Form

1) GEOLOGIC TARGET FORMATION Newburg sandstone

Depth 5,557 Feet (top) 5,574 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 5585 Feet

3) Approximate water strata depths: Fresh 113 Feet Salt 950 Feet

4) Approximate coal seam depths: 400 feet. There was strip mining of coal on the surface in the area in the 1940s.

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

6) Virgin reservoir pressure in target formation 2125 psi psig Source Well completion record

7) Estimated reservoir fracture pressure 4,410 psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 38 (actual injection rates for November of 2015)

Injection volume (bbl/day) 309 (actual injection rates for November of 2015)

Injection pressure (psig) 1,870 (average injection pressure for November of 2015)

Bottom hole pressure (psig) Calculated bottom hole pressure is 4,276

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

The Columbia Gas 20320 (Wallace Unit #1) saltwater disposal well injects oil and gas fluid wastes including production brine, flow back from hydraulic frac jobs, pipeline fluids, and pit water. The only additives to the injectate are water treatment bactericide (MB-7104), scale inhibitor (HP-9280), and CS-3108 corrosion inhibitor (see attached SDS sheets in Section 9).

Temperature of injected fluid: (°F) Typically 60 degrees, but varies based on seasonal weather.

10) FILTERS (IF ANY)

Filters used at the Tuppers Creek injection facility include 100 and 25 micron bag filters and 10 micron cartridge filters. Attached are the specifications for the filters used at the Tuppers Creek injection facility.

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

Viking Energy Corporation does not use cathodic protection, but the tanks are grounded. A corrosion inhibitor is added to the injection stream and the pipeline from the injection pump to the injection well is within the Tuppers Creek facility and the pipeline is pressure tested at least once every five years (see attached test).

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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	20"	New	J-55	Unknown	15	15'	Cemented to surface
Fresh Water	13-3/8"	New	H-40	48	241	241'	Cemented to surface
Coal	8-5/8"	New	J-55	24	1738	1,738'	Cemented to surface
Intermediate 1	NA						
Intermediate 2	NA						
Production	5-1/2"	New	N-80	17	5514'	5,514'	Calculated fill-up is 1150'
Tubing	2-3/8"	New	J-55	4.6	N/A	5,462'	Set on Baker Lokset packer at 5,459'
Liners							

TYPE	Wellbore Diameter	Casing Size	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./sk)	Cement to Surface ? (Y or N)
Conductor	24"	20"	Unknown		Class A	1.18	Y
Fresh Water	17.5"	13-3/8"	.66	1730	Class A w/3% CaCl	1.18	Y
Coal	11"	8-5/8"	.472	2950	Litepoz & Class A	1.18 to 1.27	Y
Intermediate 1							
Intermediate 2							
Production	7-7/8"	5-1/2"	.608	7740	Class A	1.18	N
Tubing		2-3/8"			Not cemented		
Liners							

PACKERS	Packer #1	Packer #2	Packer #3	Packer #4
Kind:	Baker Lokset			
Sizes:	2-3/8" x 5-1/2"			
Depths Set:	5,459'			

Section 6 – Construction:

1. Attached is an aerial map and schematic depicting the Tuppers Creek Class IID surface facility location. The surface facility consists of the wellhead, filters, and treatment system, and tank battery facility which is includes one – 56,400 gallon double walled, steel tank, two – 10,500 gallon single walled, steel tanks, one – 4,200 gallon single walled, steel tank, and a poured concrete secondary containment system. The dimensions of the secondary containment system is 38.5' X 20.5' with 24" walls. The floor is 14" thick concrete with 5/8" rebar and a 20 mil plastic liner covers the lower middle of the base inside the concrete (see SPCC plan for more details).
2. Attached are two detailed wellbore schematics (one showing original completion and the second one showing current configuration of the injection well) of the existing Columbia Gas 20320 (Wallace Unit #1) injection well as it has been drilled and completed.
3. Appendix A and B are included.
4. On June 8, 2015, Viking Energy performed a squeeze cement job on the production casing on the Columbia Gas 20320 (Wallace Unit #1) well using 100 sacks of Type I cement (see attached documents). The squeeze job was successful and on June 17, 2015 Viking Energy ran in new 2-3/8" tubing and Baker Lokset packer to 5,564 feet and performed a mechanical integrity test (MIT) on the 5-1/2" x 2-3/8" annular space to demonstrate the integrity of the Columbia Gas 20320 (Wallace Unit #1) injection well. The well was pressure tested to 3,067 psi and held pressure for 30 minutes. Mechanical integrity was demonstrated and the MIT was witnessed by Terry Urbin and Zach Stevinson of the WV DEP, Office of Oil and Gas (documents are attached).

SEE ADDENDA

5. A copy of the gamma ray-compensated density open-hole log across the Newburg sandstone for this well is attached. This well was originally completed as an oil and gas well and later converted to Class II injection. This well was drilled and completed in 1968 by Pennzoil Company and attached is a copy of the original well completion record. An analysis of the injection zone of the Columbia Gas 20320 (Wallace Unit #1) indicates the Newburg sandstone occurred from depths of 5,557 to 5,574 feet. A geological analysis of the Newburg shows porosity ranging from 2 to 12 percent and is 17 feet thick in the Columbia Gas 20320 (Wallace Unit #1) well. The best porosity development is in the top of the sandstone unit from 5,556 to 5,560 feet. Based upon historical data, the permeability of the Newburg is estimated at between 12 and 16 millidarcies.

11. Construction of the injection well surface facility- including type of thickness of the liner, number of tanks, Size of tanks, and dimensions of the secondary containment of the injection facility surface site.

Answer: The facility consists of all fenced and gated area. There are 6 security cameras with one being high resolution to get license pointing out at unloading area. The entire facility is graveled. The unloading area consists of 14" thick concrete reservoir that is slope to center with a 100bbl catch basin. The dyke area has 3 ft. of crusher run with plastic 20ml plastic sheeting and another 18" of crusher run setting on top. The base of the dyke is 14" thick. ¾" rebar spaced 1' by cross section was used for strength. The tanks set on rebar that is cross sectioned by 6". The Dyke walls are 24"high; with 24"high u-rebar connected 2' apart. There are 2 2" drain valves in the back of dyke. (2) 250 bbl. and (1) 100bbl are inside the dyke. The tanks are not connected. 1 250bbl tank is not in use. Dyke dimensions are 38.5ft x20.5ftx2ft. Plans are to heighten the walls of the dyke to allow proper use in the near future. There is (1) 1,350bbl double Walled tank on site. It was cleaned sandblasted and painted with non-corrosive epoxy paint June 2015. All buildings are metal structured.

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Eric Pinkerton

From: Eric Pinkerton
Sent: Tuesday, June 14, 2016 2:45 PM
To: 'Eva.M.Thompson@wv.gov'
Subject: Emailing - WR-35%20-Well%20Record%20Completion%20Report%20Form%20%288-13%29.pdf
Attachments: WR-35%20-Well%20Record%20Completion%20Report%20Form%20%288-13%29.pdf

SUBSTITUTE FOR PARAGRAPH 4, SECTION 6

1. On June 8, 2015, Due to being able to circulate through the 5 ½ on the 5 ½ X 2 3/8 annulus, Viking Energy performed a squeeze cement job on the production casing on the Columbia Gas 20320 (Wallace Unit #1) well using 100 sacks of Type I cement (see attached documents). A drillable cement plug was set at 4460 ft. 100 sacks were squeezed through 5 ½ at existing TOC followed by a wiper plug to 4380 ft. (calculated TOC is now 3740 ft.) The cement left in the pipe and the plug were drilled out.The squeeze job was successful and on June 17, 2015 Viking Energy ran in new 2-3/8" tubing and Baker Lokset packer to 5,564 feet and performed a mechanical integrity test (MIT) on the 5-1/2" x 2-3/8" annular space to demonstrate the integrity of the Columbia Gas 20320 (Wallace Unit #1) injection well. The well was pressure tested to 3,067 psi and held pressure for 30 minutes. Mechanical integrity was demonstrated and the MIT was witnessed by Terry Urbin and Zach Stevinson of the WV DEP, Office of Oil and Gas (documents are attached).

Eric Pinkerton
Viking Energy Corp.
304-988-1161

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AL 7/1

WR-35
Rev. 8/23/13

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47- 039 - 2210 County Kanawha District UNION
Quad POCATALICO Pad Name Wallace Field/Pool Name Disposal
Farm name Wallace Well Number 2D0392210
Operator (as registered with the OOG) Viking Energy Corp.
Address 8113 Sissonville Dr. City Sissonville State WV Zip 25312

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4257[illegible] 197.96 Easting 443176.[illegible] 83.55
Landing Point of Curve Northing 4257[illegible] " " Easting 443176.[illegible] " "
Bottom Hole Northing 4257[illegible] " " Easting 443176.[illegible] " "

Elevation (ft) 647.16 GL Type of Well □New ■ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal □ Horizontal 6A ■ Vertical Depth Type ■ Deep □ Shallow

Type of Operation □ Convert □ Deepen □ Drill □ Plug Back □ Redrilling ■ Rework □ Stimulate

Well Type ■ Brine Disposal □ CBM □ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other INJECTION

Type of Completion □ Single □ Multiple Fluids Produced ■ Brine □Gas □ NGL □ Oil □ Other REWORK
Drilled with □ Cable □ Rotary

Drilling Media Surface hole □ Air □ Mud □Fresh Water Intermediate hole □ Air □ Mud □ Fresh Water □ Brine
Production hole □ Air □ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
N/A

Date permit issued 6/02/2015 Date drilling commenced N/A Date drilling ceased N/A
Date completion activities began 6/8/2015 Date completion activities ceased 6/8/15
Verbal plugging (Y/N) N Date permission granted 6/7/2015 Granted by TERRY URBAN

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft N/A Open mine(s) (Y/N) depths NO
Salt water depth(s) ft 1190 Void(s) encountered (Y/N) depths NO
Coal depth(s) ft N/A Cavern(s) encountered (Y/N) depths NO
Is coal being mined in area (Y/N) NO

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Reviewed by:

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API 47- 039 - 2210 Farm name Wallace Well number 2D0392210

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	15'	NEW	UNKNOWN		CEMENT TO SURFACE
Surface	17.5"	13 3/8"	241'	NEW	H-40/48LBS		CEMENT TO SURFACE
Coal	11"	8 5/8'	1738'	NEW	J-55/24LBS		CEMENT TO SERFACE
Intermediate 1	N/A						
Intermediate 2	N/A						
Intermediate 3	N/A						
Production	N/A	5 1/2"	5514'	NEW	N80/17LBS		CALCULATED FILL UP TO 1150'
Tubing	N/A	2 3/8"	5,462'	NEW	J-55/4.6LBS	N/A	SET ON BAKER LOKSET PACKER AT 5,459'
Packer type and depth set	BAKER LOKSET 2 3/8" X5 1/2" SET AT 5,459'						

Comment Details

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	TO SURFACE	N/A	1.18	N/A	SURFACE	12
Surface	CLASS A W/3% CaCl	TO SURFACE	NN/A	1.18	N/A	SURFACE	12
Coal	LITPOZ & CLASS A	TO SURFACE	N/A	1.18 TO 1.27	N/A	TO SURFACE	12
Intermediate 1	CLASS A	5.20	12.4	1.18	118.00	N/A	24
Intermediate 2							
Intermediate 3							
Production							
Tubing							

Drillers TD (ft) 5,586' Loggers TD (ft) 5,586'
Deepest formation penetrated NEWBURG Plug back to (ft)
Plug back procedure

Kick off depth (ft)

Check all wireline logs run ☐ caliper ☐ density ☐ deviated/directional ☐ induction
☐ neutron ☐ resistivity ■ gamma ray ☐ temperature ☐sonic

Well cored ☐ Yes ■ No Conventional Sidewall Were cuttings collected ☐ Yes ■ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING N/A

WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ■ Yes ☐ No DETAILS

WERE TRACERS USED ☐ Yes ■ No TYPE OF TRACER(S) USED

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API 47- 039 - 2210 Farm name Wallace Well number 2D0392210

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
N/A	N/A	N/A	N/A	N/A	N/A

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Please insert additional pages as applicable.

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API 47- 039 - 2210 Farm name Wallace Well number 2D0392210

PRODUCING FORMATION(S)	DEPTHS	
N/A	N/A TVD	N/A MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ☐ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY ☐ Estimated ☐ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		

Please insert additional pages as applicable.

Drilling Contractor _____
Address _____ City _____ State _____ Zip _____

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company UNIVERSAL WELL SERVICES, INC
Address 14 SEWER PLANT ROAD City BUCKHANNON State WV Zip 26201

Stimulating Company _____
Address _____ City _____ State _____ Zip _____
Please insert additional pages as applicable.

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Completed by ERIC Telephone 304-988-1161
Signature _____ Title VP Date 6/02/2016

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Discharge Monitoring Report
Oil and Gas General Permit

Company Name: VIKING ENERGY CORP
API No: 2D0392210 County: KANAWHA
District: UNION Well No: 2D0392210
Farm Name: WALLACE
Discharge Date/s From:(MMDDYY) 6/07615 To: (MMDDYY) 6/06/15
Discharge Times. From: 8AM-4PM To: 8AM-4PM
Total Volume to be Disposed from this facility (gallons): 10500
Disposal Option(s) Utilized (write volumes in gallons):

(1) Land Application: _____ (Include a topographical map of the Area.)
(2) UIC: 2D0392210 Permit No. 2D0392210
(3) Offsite Disposal: _____ Site Location: WALLACE
(4) Reuse: _____ Alternate Permit Number: _____
(5) Centralized Facility: _____ Permit No. _____
(6) Other method: _____ (Include an explanation)

Follow Instructions below to determine your treatment category:
Optional Pretreatment test: _____ Cl- mg/l _____ DO mg/l

1. Do you have permission to use expedited treatment from the Director or his representative? (Y/N) N If yes, who? _____ and place a four (4) on line 7. If not go to line 2
2. Was Frac Fluid or flowback put into the pit? (Y/N) N If yes, go to line 5. If not, go to line 3.
3. Do you have a chloride value pretreatment (see above)? (Y/N) N If yes, go to line 4 If not, go to line 5.
4. Is the Chloride level less than 5000 mg/l? (Y/N) Y If yes, then enter a one (1) on line 7.
5. Do you have a pretreatment value for DO? (See above) (Y/N) N If yes, go to line 6 If not, enter a three (3) in line 7.
6. Is the DO level greater than 2.5 mg/l?(Y/N) _____ If yes, enter a two (2) on line 7. If not, enter a three (3) on line 7.
7. 1 is the category of your pit. Use the Appropriate section.
8. Comments on Pit condition: NO PIT, 250 BBL FRESH WATER IN TANK WAS USED IN THE WELL WELL IS UIC WELL 2D0392210 THEREFORE WATER STAYED IN WELL

Name of Principal Exec. Officer: ERIC PINKERTON
Title of Officer: VP
Date Completed: 6/7/2015

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the 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.

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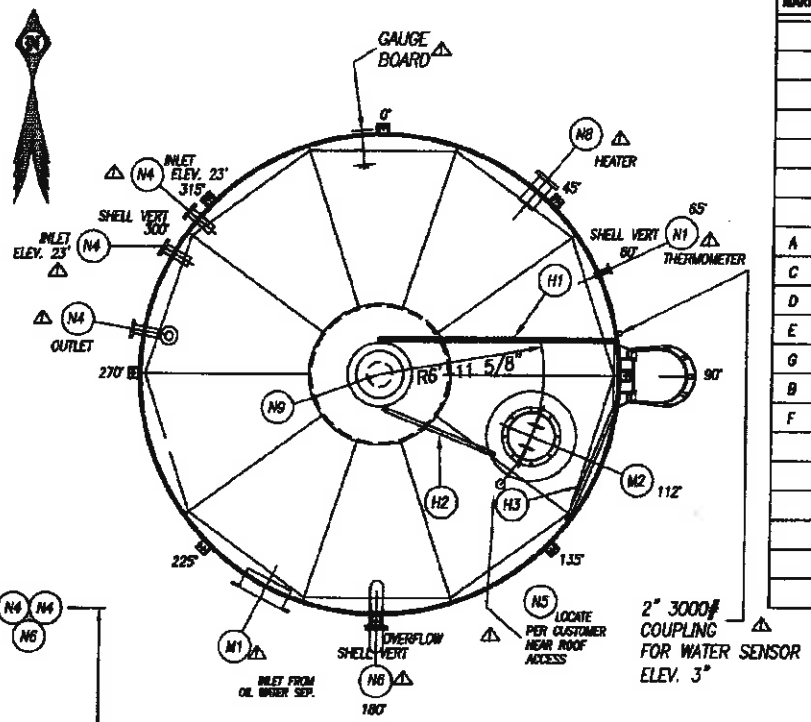
Signature of a Principal Exec. Officer or Authorized agent.


Gate 2
Truck Unloading Area
Dyke
Area
150bbl Tank
Filter Housing
Pump House
Gate 1
Filter housing
Cooler Building
Wash House
UIC 5D0982210 Well
Parking
Lot
Gate 3
Gate 4
Google earth

TANK DATA:

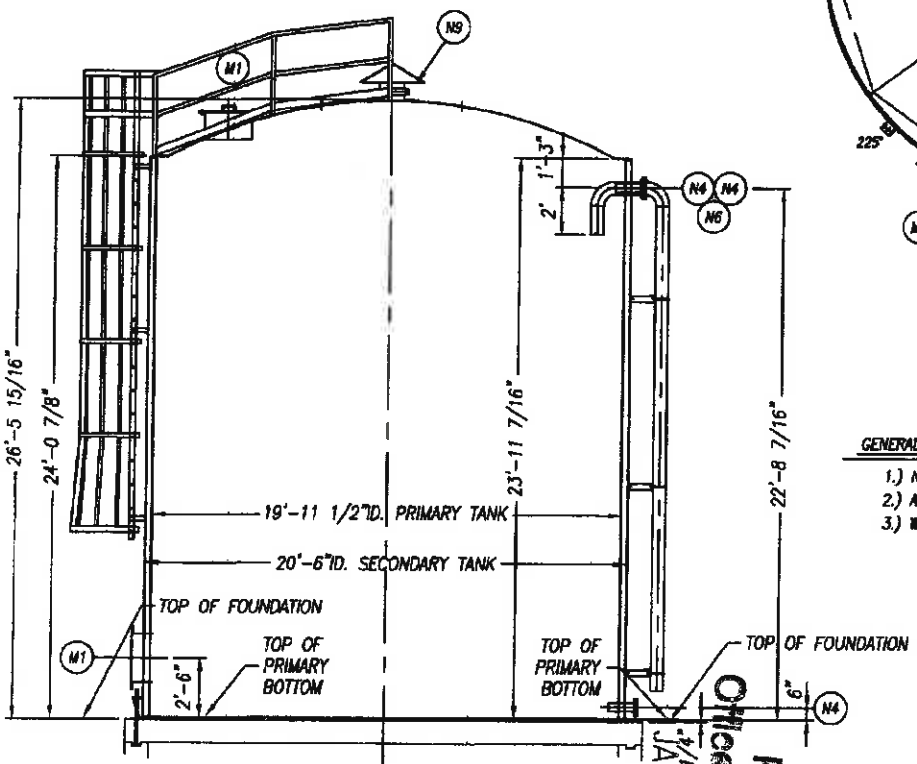
CONTENTS: WASTE WATER
CAPACITY: 56,440 gals.
WEIGHT: 43,640# (EMPTY)
SP.GR.: 1.0 @ 60° F.
TEMP: AMBIENT (DESIGN)
(OPER.)
PRESSURE: ATMOSPHERIC
LOADS: 25 psf. (ROOF)
100 mph. (WIND)
ZONE 1 (SIESMIC)
INSUL.: SHELL – ROOF – N/A
PAINTING: INTERIOR – SURFACE PREP. – PER SPEC.
– PAINTING – AMERON 395
PAINT SYSTEM
EXTERIOR – SURFACE PREP. – PER SPEC.
– PAINTING – AMERON POLURETHANE
PAINT SYSTEM

ARC TABLE	
DEGREES	ARC O.S.SEC.SHELL
22.5°	4'-0 3/8"
45°	8'-0 13/16"
60°	10'-9 1/16"
90°	16'-1 5/8"
112°	20'-0 15/16"
135°	24'-2 3/8"
180°	32'-3 3/16"
225°	40'-4"
270°	48'-4 13/16"
300°	53'-9 5/16"
315°	56'-5 5/8"
360°	64'-6 3/8"



PLAN VIEW

MARK	ITEM	QTY.	DESCRIPTION	ELEV.	DWG.#
	B	1	PRIMARY BOTTOM LAYOUT	– –	1024–1
		1	SECONDARY BOTTOM LAYOUT		1024–1A
	AC	8	ANCHOR CHAIRS	– –	1024–1B
	S	1	PRIMARY SHELL LAYOUT	– –	1024–2
		1	SECONDARY SHELL LAYOUT		1024–2A
	NM	1	NAMEPLATE/NAMEPLATE BRACKET	– –	1024–2B
	R	1	ROOF LAYOUT	– –	1024–3
A	M1	1	24"ø SHELL MANWAY	30"	1024–4
C	N8	1	8"ø SHELL NOZZLE	1'–4 5/8"	1024–5
D	N6	1	6"ø SHELL NOZZLE	AS SHOWN	1024–6
E	N4	3	4"ø SHELL NOZZLE	AS SHOWN	1024–7
G	N1	1	1 1/2"ø SHELL NOZZLE	1'–10"	1024–8
B	M2	1	24"ø ROOF MANWAY	– –	1024–9
F	N9	1	12"ø ROOF NOZZLE	– –	1024–10
	CL	1	CAGED LADDER	– –	1024–11
	H	1	ROOF HANDRAILS	– –	1024–12
	GB	1	S & J GAUGE BOARD	NOT SHOWN	– –
	AL	1	8' ALUMINUM LADDER	NOT SHOWN	– –
	N5	1	4"ø ROOF NOZZLE	– –	1024–8A
	N3	1	2"ø SHELL COUPLING		



ELEVATION

GENERAL NOTES:

1.) NOZZLE LOCATIONS/ELEVATIONS ARE TO BE VERIFIED BY THE CUSTOMER.
2.) ALL WORK WILL BE PER CUSTOMER AND MFG. SPECIFICATIONS.
3.) WATER FOR THE HYDRO–TEST TO BE SUPPLIED, CONNECTED, AND DISPOSED OF BY CUSTOMER.

NO.	DESCRIPTION	BY	DATE
1	AS BUILT– MOVED ALL NOZZLE TO PROPER POSIOINS ON TANK	DLW	2–2–2001

REVISIONS

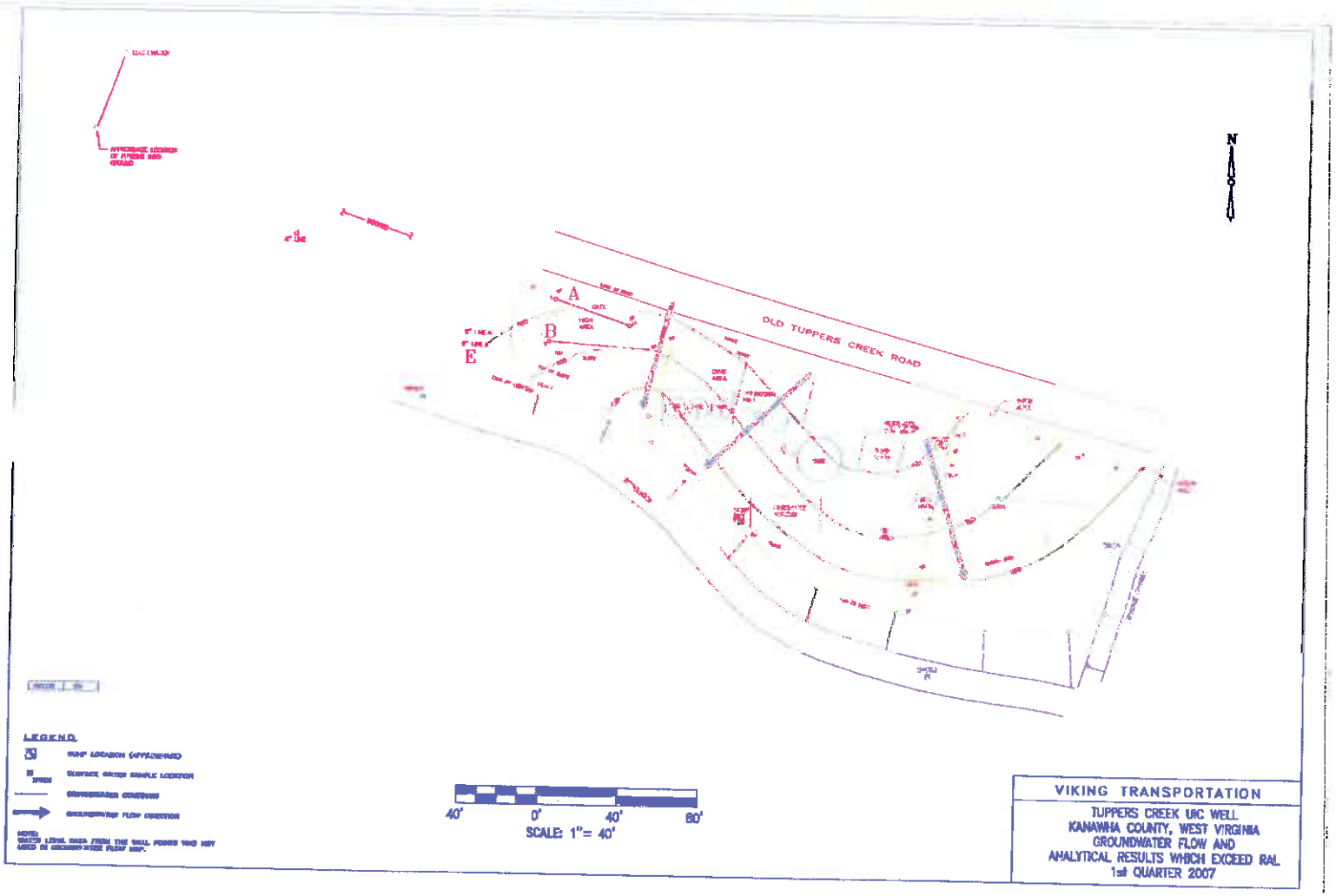
CUSTOMER IDENTIFICATION
PURCHASE ORDER NO. COLUMBIA, GAS
CHARLESTON, WV.
I.T.S.: ORDER NO. 1084

INTERNATIONAL TANK SERVICE INC.
LIMA, OHIO

ORIENTATION
20'–6 1/2"ø x 24'h. UMBRELLA ROOF TANK

DETAILER	CHECKER	APPROVED	SCALE	DATE
BRS	SG		NONE	7–17–2000

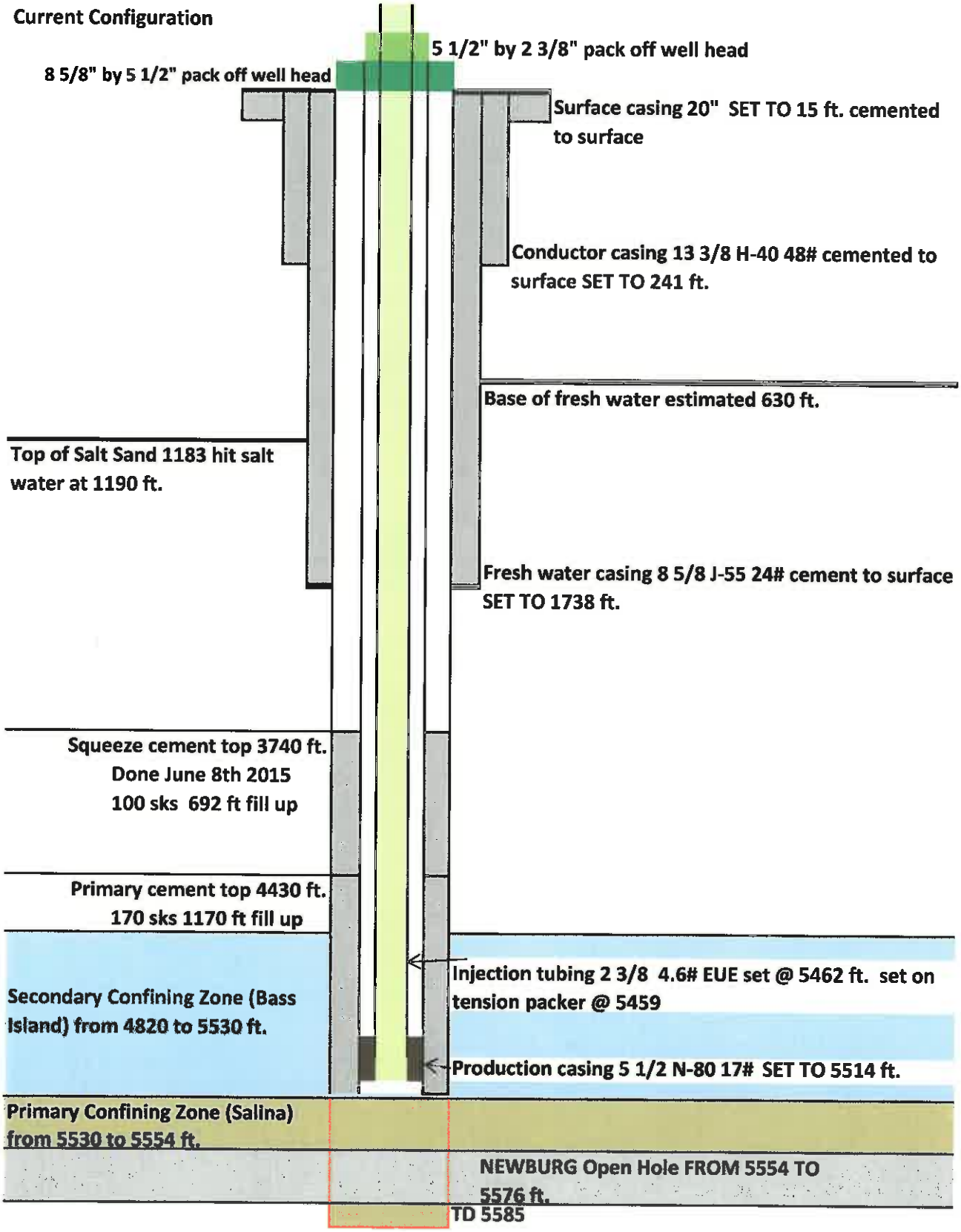
DRAWING NUMBER 1084–6 REV. 1

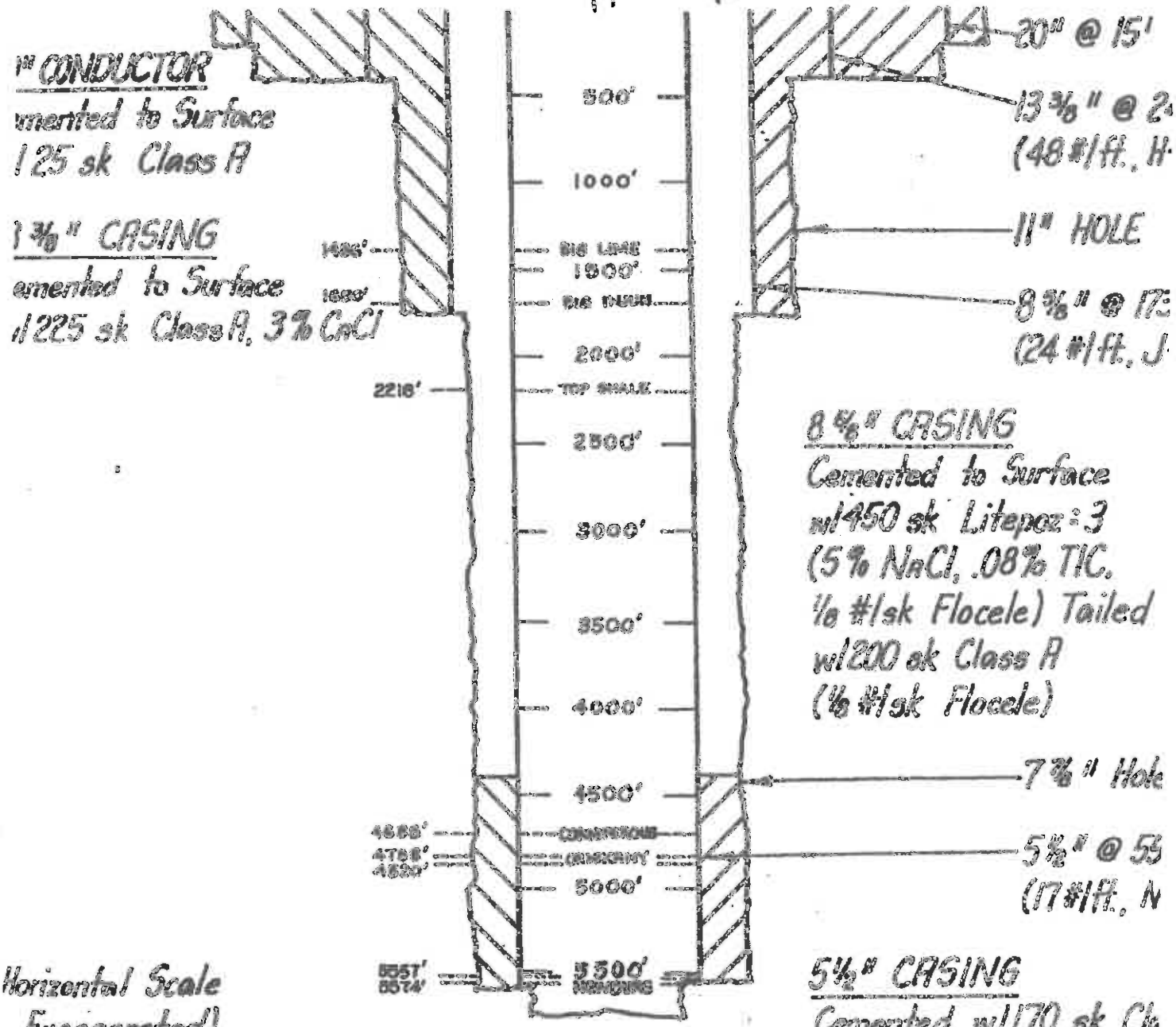


Well No. 20320
047-039-02210
Kanawha County, WV

VIKING ENERGY INC.

Current Configuration





WELL DIAGRAM
WELL 20320
Permit No. KAN-2210

APPENDIX A
Injection Well Form

1) GEOLOGIC TARGET FORMATION Newburg sandstone

Depth 5,557 Feet (top) 5,574 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 5585 Feet

3) Approximate water strata depths: Fresh 113 Feet Salt 950 Feet

4) Approximate coal seam depths: 400 feet. There was strip mining of coal on the surface in the area in the 1940s.

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

6) Virgin reservoir pressure in target formation 2125 psi psig Source Well completion record

7) Estimated reservoir fracture pressure 4,410 psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 38 (actual injection rates for November of 2015)

Injection volume (bbl/day) 309 (actual injection rates for November of 2015)

Injection pressure (psig) 1,870 (average injection pressure for November of 2015)

Bottom hole pressure (psig) Calculated bottom hole pressure is 4,276

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

The Columbia Gas 20320 (Wallace Unit #1) saltwater disposal well injects oil and gas fluid wastes including production brine, flow back from hydraulic frac jobs, pipeline fluids, and pit water. The only additives to the injectate are water treatment bactericide (MB-7104), scale inhibitor (HP-9280), and CS-3108 corrosion inhibitor (see attached SDS sheets in Section 9).

Temperature of injected fluid: (°F) Typically 60 degrees, but varies based on seasonal weather.

10) FILTERS (IF ANY)

Filters used at the Tuppers Creek injection facility include 100 and 25 micron bag filters and 10 micron cartridge filters. Attached are the specifications for the filters used at the Tuppers Creek injection facility.

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

Viking Energy Corporation does not use cathodic protection, but the tanks are grounded. A corrosion inhibitor is added to the injection stream and the pipeline from the injection pump to the injection well is within the Tuppers Creek facility and the pipeline is pressure tested at least once every five years (see attached test).

Received
Office of Oil & Gas
JAN 04 2016

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	20"	New	J-55	Unknown	15	15'	Cemented to surface
Fresh Water	13-3/8"	New	H-40	48	241	241'	Cemented to surface
Coal	8-5/8"	New	J-55	24	1738	1,738'	Cemented to surface
Intermediate 1	NA						
Intermediate 2	NA						
Production	5-1/2"	New	N-80	17	5514'	5,514'	Calculated fill-up is 1150'
Tubing	2-3/8"	New	J-55	4.6	N/A	5,462'	Set on Baker Lokset packer at 5,459'
Liners							

TYPE	Wellbore Diameter	Casing Size	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./sk)	Cement to Surface ? (Y or N)
Conductor	24"	20"	Unknown		Class A	1.18	Y
Fresh Water	17.5"	13-3/8"	.66	1730	Class A w/3% CaCl	1.18	Y
Coal	11"	8-5/8"	.472	2950	Litepoz & Class A	1.18 to 1.27	Y
Intermediate 1							
Intermediate 2							
Production	7-7/8"	5-1/2"	.608	7740	Class A	1.18	N
Tubing		2-3/8"			Not cemented		
Liners							

PACKERS	Packer #1	Packer #2	Packer #3	Packer #4
Kind:	Baker Lokset			
Sizes:	2-3/8" x 5-1/2"			
Depths Set:	5,459'			

39-2210

McCullough

BOND CEMENT AND OR SONIC SEISMOGRAM LOG

GAMMA RAY

FILING NO.

PERMIT #KAN-2210

COMPANY COLUMBIA GAS TRANS.

WELL DISPOSAL WELL #20320

FIELD WALLACE UNIT NO.1

COUNTY KANAWHA STATE WV

LOCATION

DISTRICT: UNION
QUADRANGLE: CHARLESTON

SEC. TWP. RGE.

OTHER SERVICES

ELEVATIONS:
KB
DF
GL 661

PERMANENT DATUM	G.L. ELEV 661'
LOG MEASURED FROM	G.L.
DRILLING MEASURED FROM	G.L.
DATE	6/10/87
RUN NO.	ONE
TYPE LOG	GAMMA RAY CEMENT BOND SS
DEPTH-DRILLER	5584
DEPTH-LOGGER	5414
BOTTOM LOGGED INTERVAL	5410
TOP LOGGED INTERVAL	SURFACE
TYPE FLUID IN HOLE	WATER
SALINITY PPM CL.	
DENSITY LB./GAL.	9#/GAL
LEVEL	FULL
MAX. REC. TEMP. DEG. F.	
OPR. RIG TIME	3 HRS.
RECORDED BY	B. HAGGERTY
WITNESSED BY	MR. FORAKER
DISTRICT	CHARLESTON

RUN NO.	BORE HOLE RECORD BIT	FROM	TO	CASING RECORD SIZE	WGT	FROM	TO
				13 3/8		SURF.	243
				8 3/8		SURF.	1738
				5 1/2		SURF.	5514

FOLD HERE

THIS HEADING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE OF 23.

LOGGING AND EQUIPMENT DATA (BOND CEMENT LOG)

DATE RECORDED	6/10/87	TOOL MODEL NO. 5568-10
TIME STARTED	9:00 AM	DIAMETER 2"
TIME FINISHED	12:00 PM	LENGTH 4'
LOGGED INTERVAL	5410 - SURFACE	
LOGGED CEMENT TOP	4430'	

CEMENTING DATA

	1	2	SQUEEZE NO. 1	SQUEEZE NO. 2	SQUEEZE NO. 3
DATE AND HOUR SET					
SETTING TIME (HRS.)					
TYPE CEMENT					
SACKS USED					
PRECEDING FLUID					
% ADDITIVE					
% RETARDER					
SLURRY WEIGHT					
BREAKDOWN PRESSURE					
SURFACE MAX. PRESS.					
BOTTOM MAX. PRESS.					

GAMMA RAY

RUN NO	ONE
TOOL MODEL NO	5547-0-0
DIAM	1 3/4
DETECT MODEL NO.	SCINT
TYPE	3"
LENGTH	
DIST TO N SOURCE	

NEUTRON

RUN NO	
LOG TYPE	
TOOL MODEL NO	
DIAM	
DETECT MODEL NO	
TYPE	
LENGTH	
SOURCE MODEL NO	
SERIAL NO	
SPACING	
TYPE	
STRENGTH	

GENERAL

HOIST TRUCK NO.	84173
INST TRUCK NO.	84173
TOOL SERIAL NO	
LOG TICKET NO.	77579

LOGGING DATA

GENERAL

RUN NO.	DEPTHS FROM	TO	SPEED FT/MIN	T.C. SEC
ONE	5410	0	30	2

GAMMA RAY

RUN NO.	ZERO DIV L OF H	API GR UNITS PER LOG DIV	SENS SETTINGS
ONE	0	21	R5X1 D200 G300

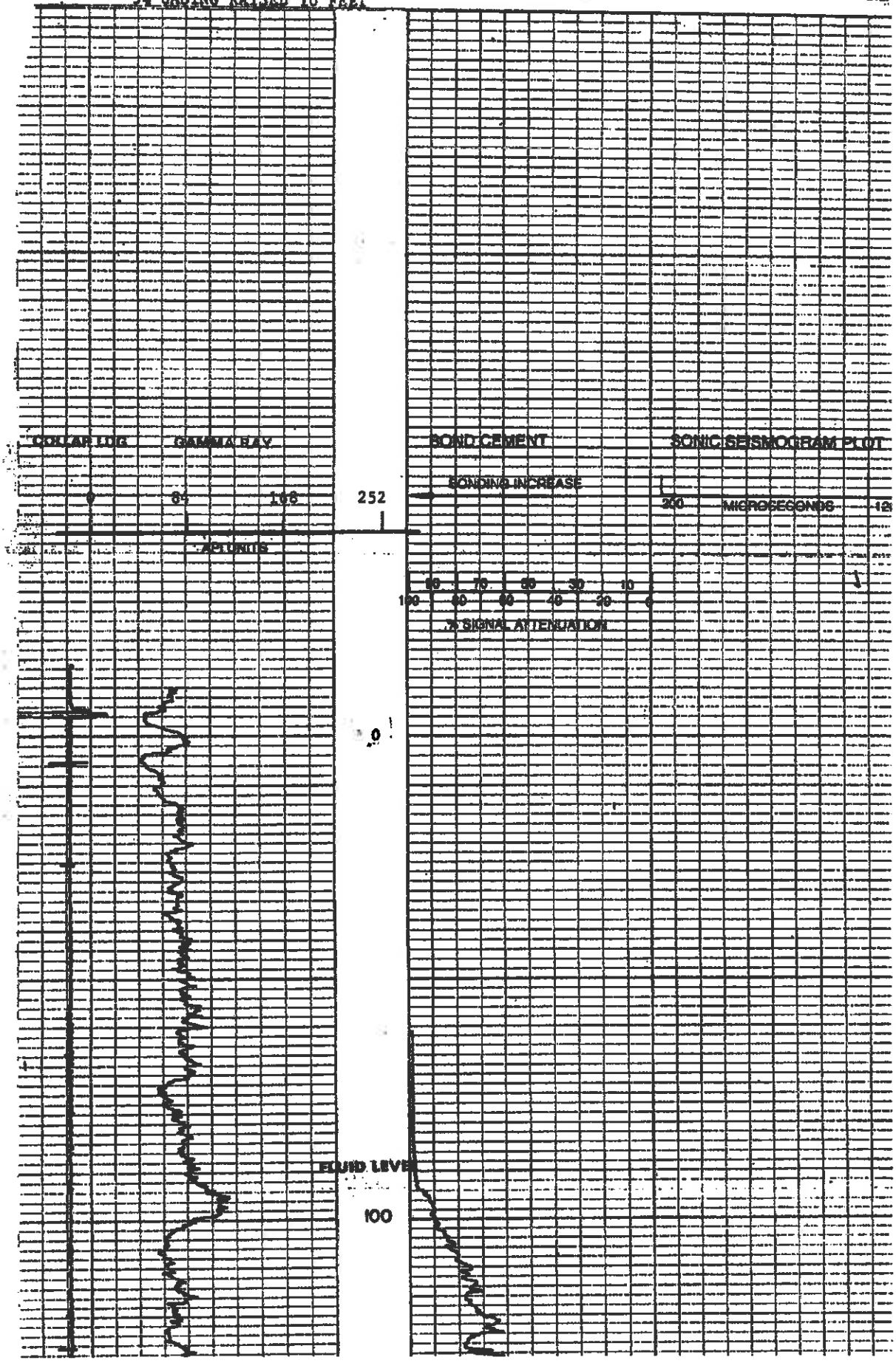
NEUTRON

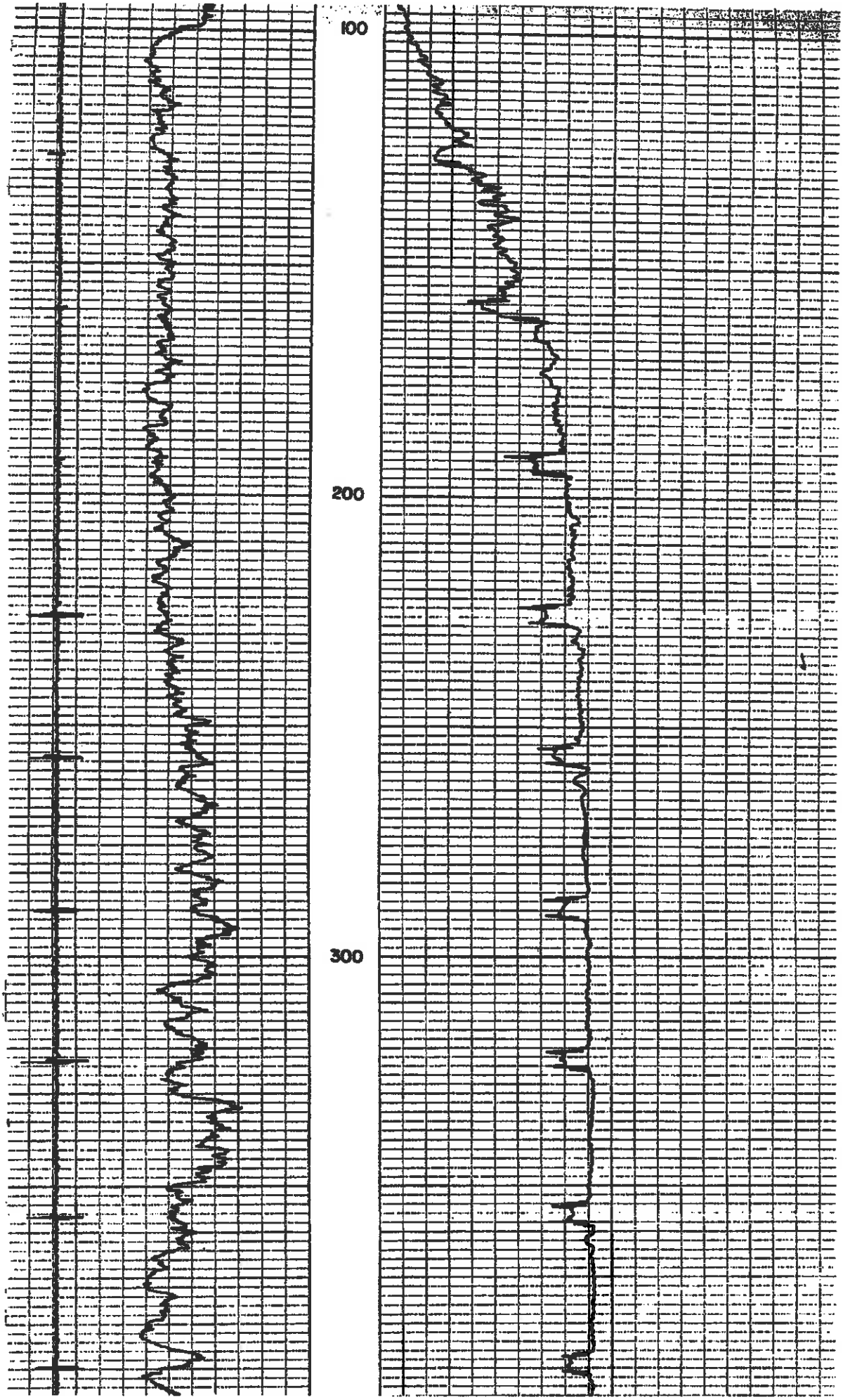
RUN NO.	ZERO DIV L OF R	API N UNITS PER LOG DIV	SENS SETTINGS

REMARKS PLUG SET AT APPROX. 5436.
5½ CASING RAISED 10 FEET

	FROM	TO									
ONE	5410	0	30	2	R5X1 D200 G300						

REMARKS: PLUG SET AT APPROX. 5436
5½ CASING RAISED 10 FEET

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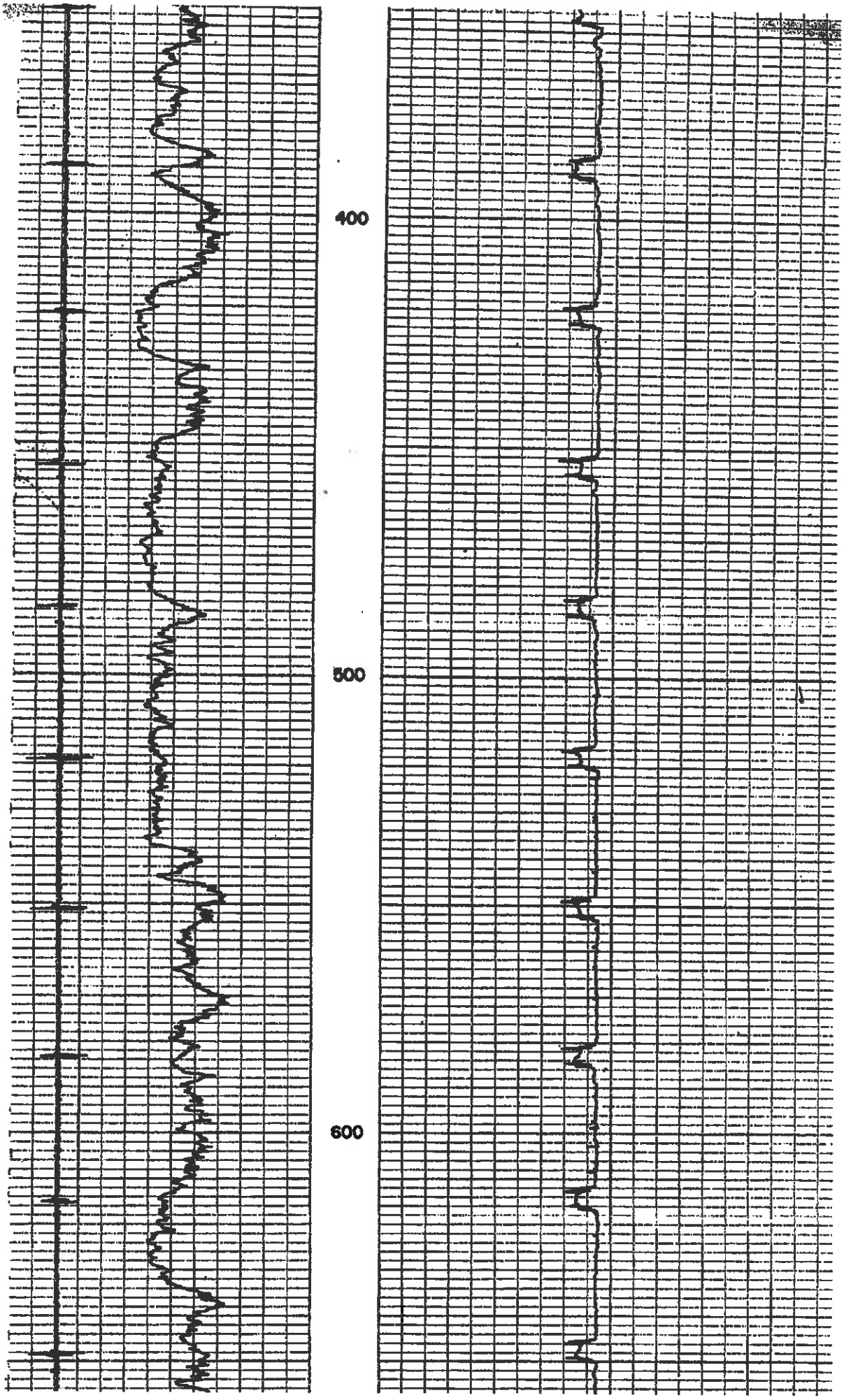
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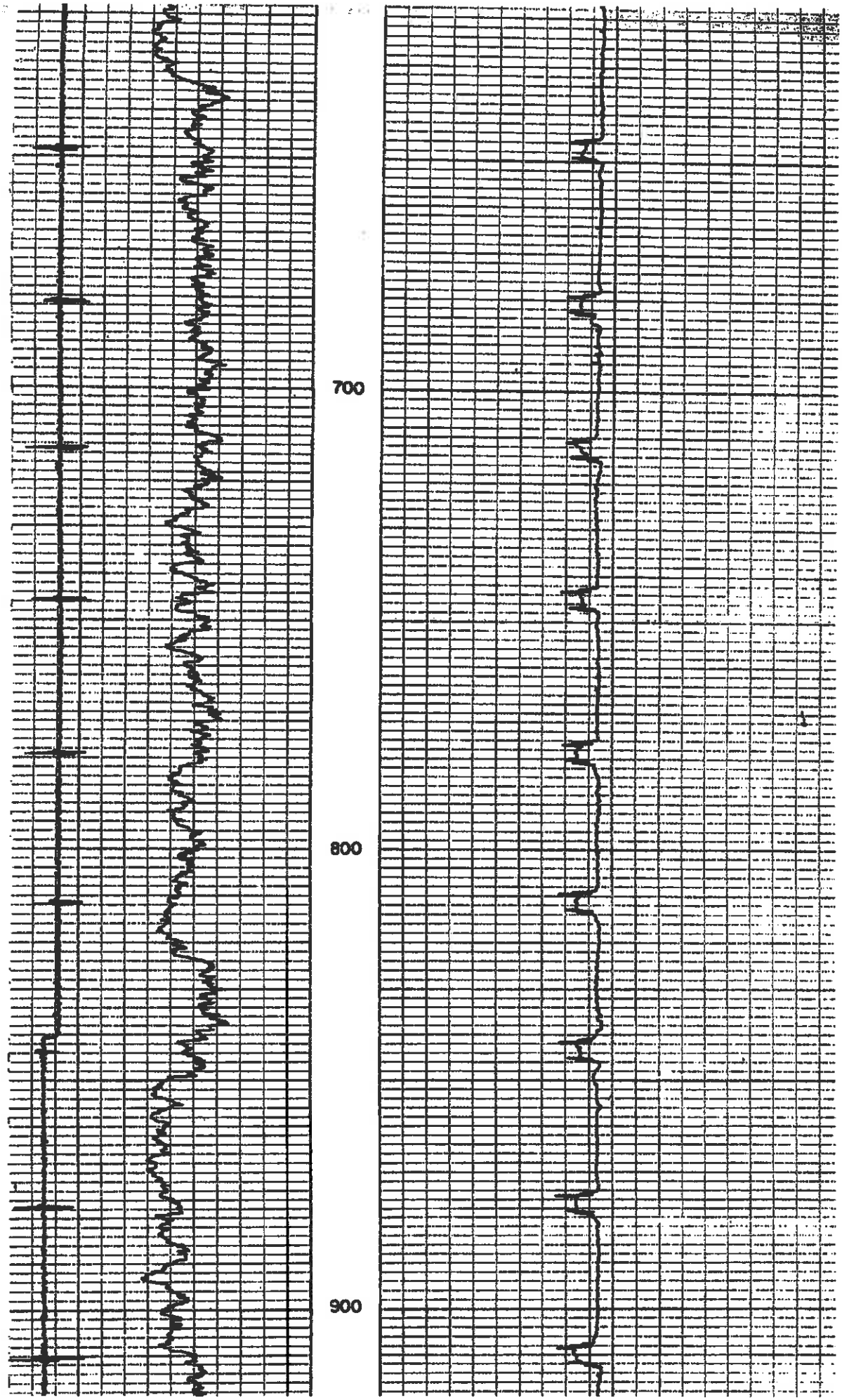
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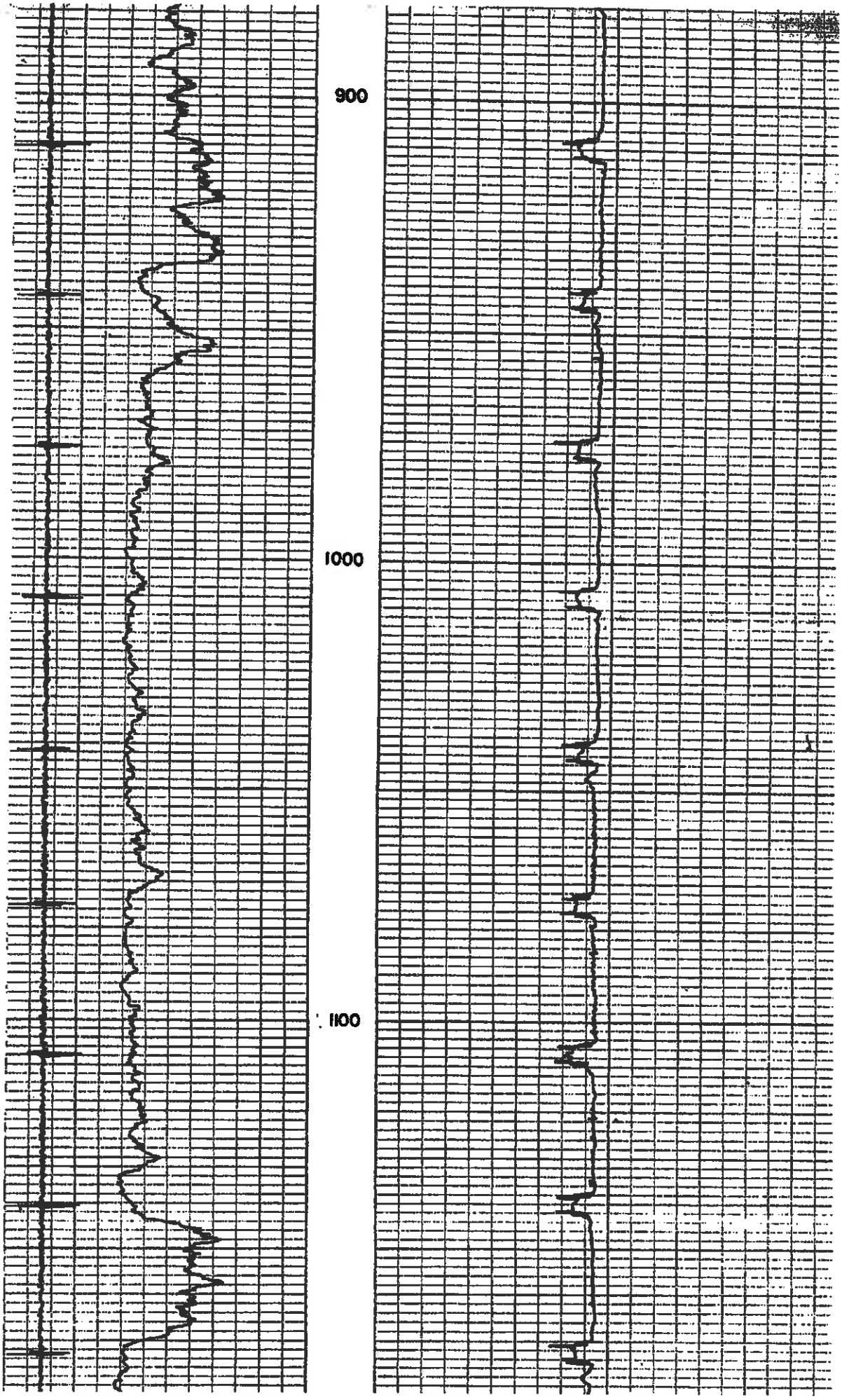
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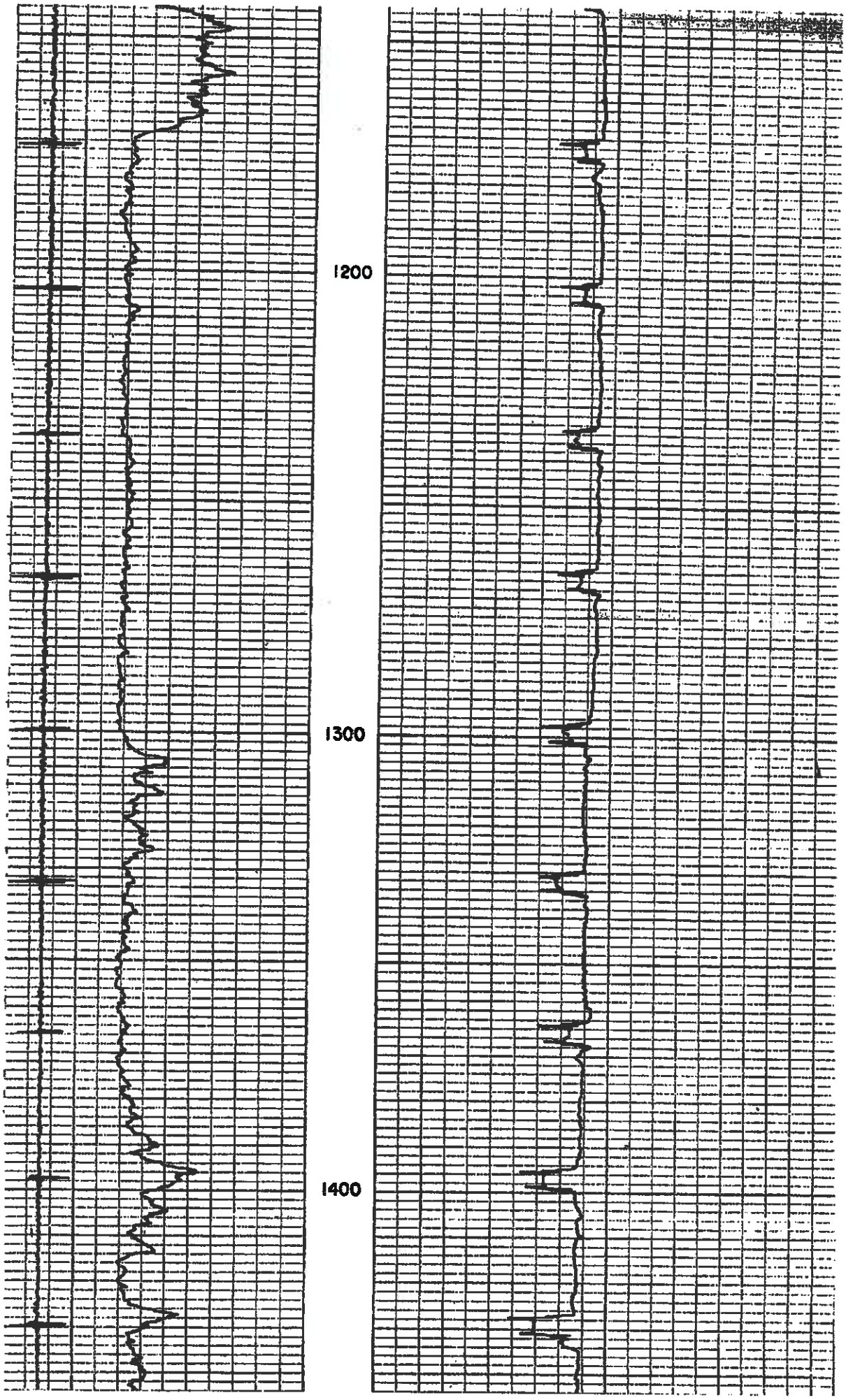
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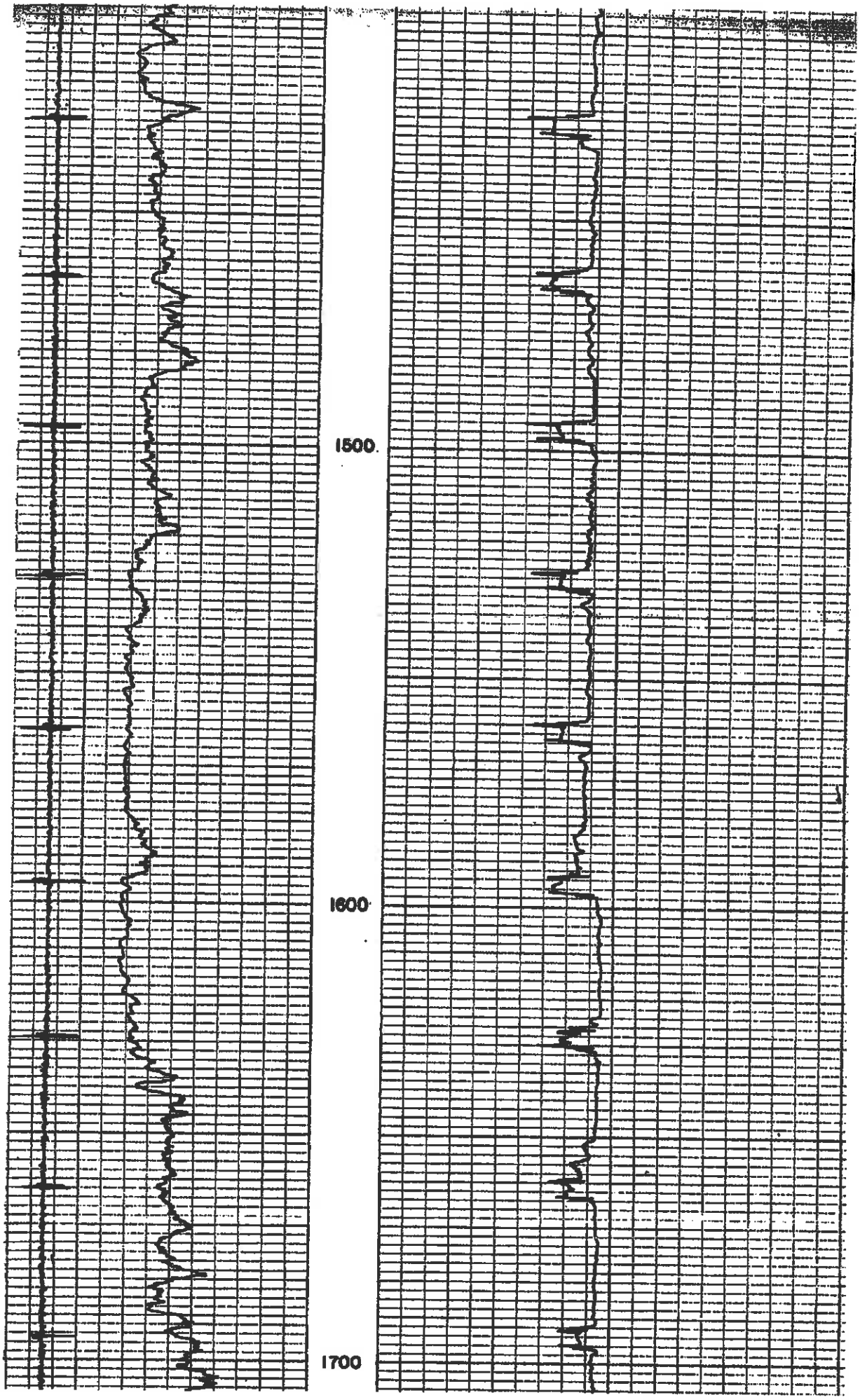
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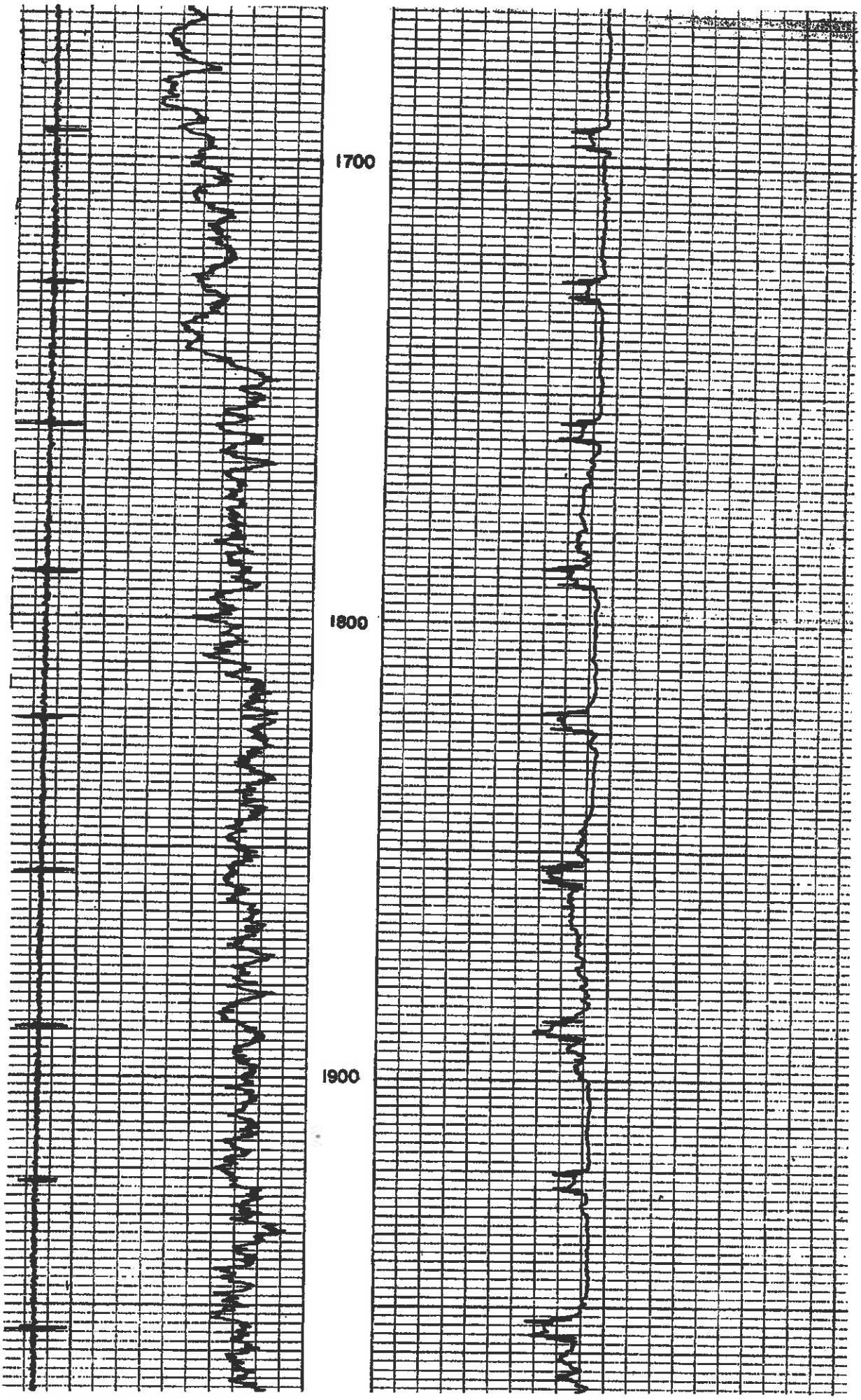
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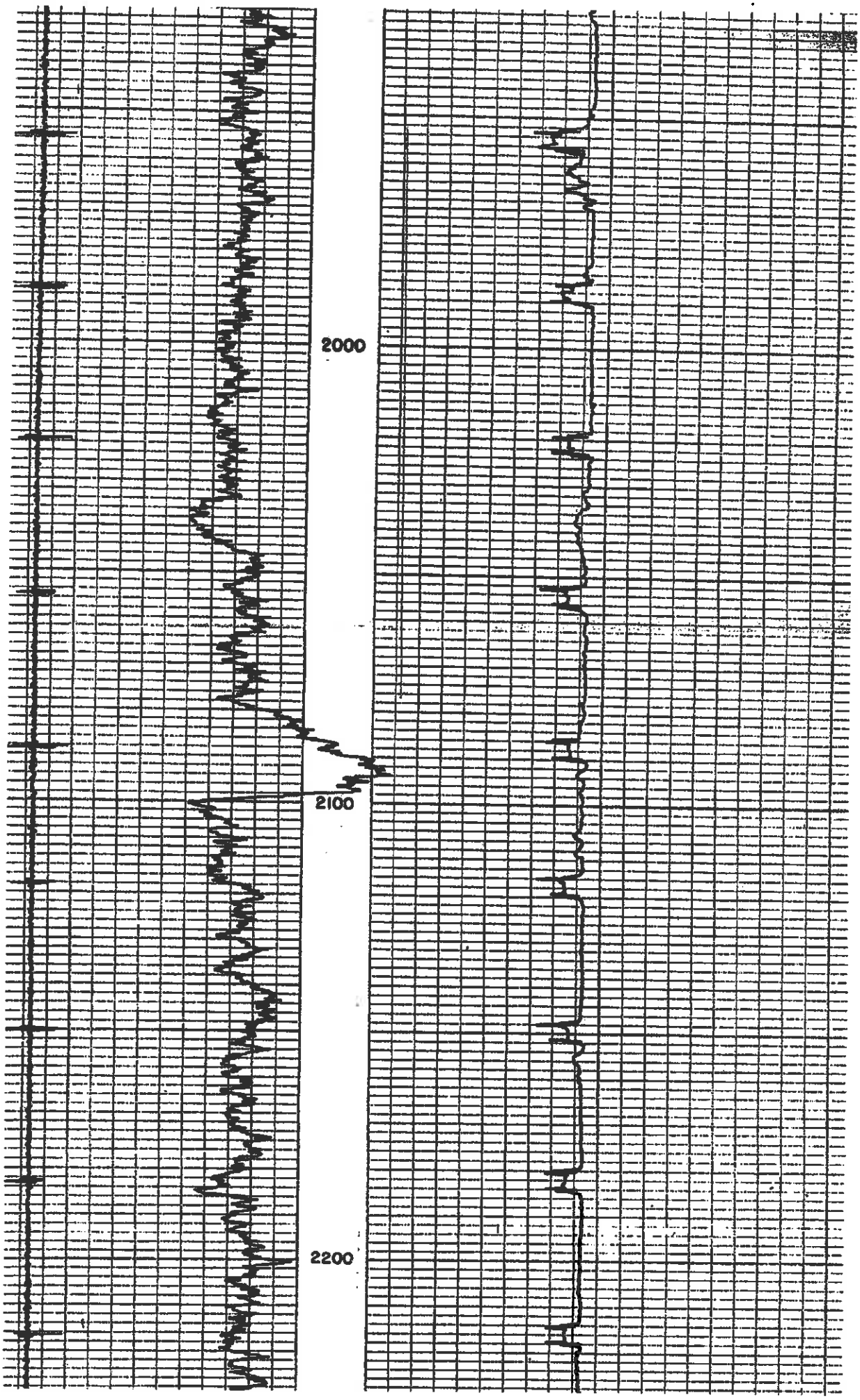
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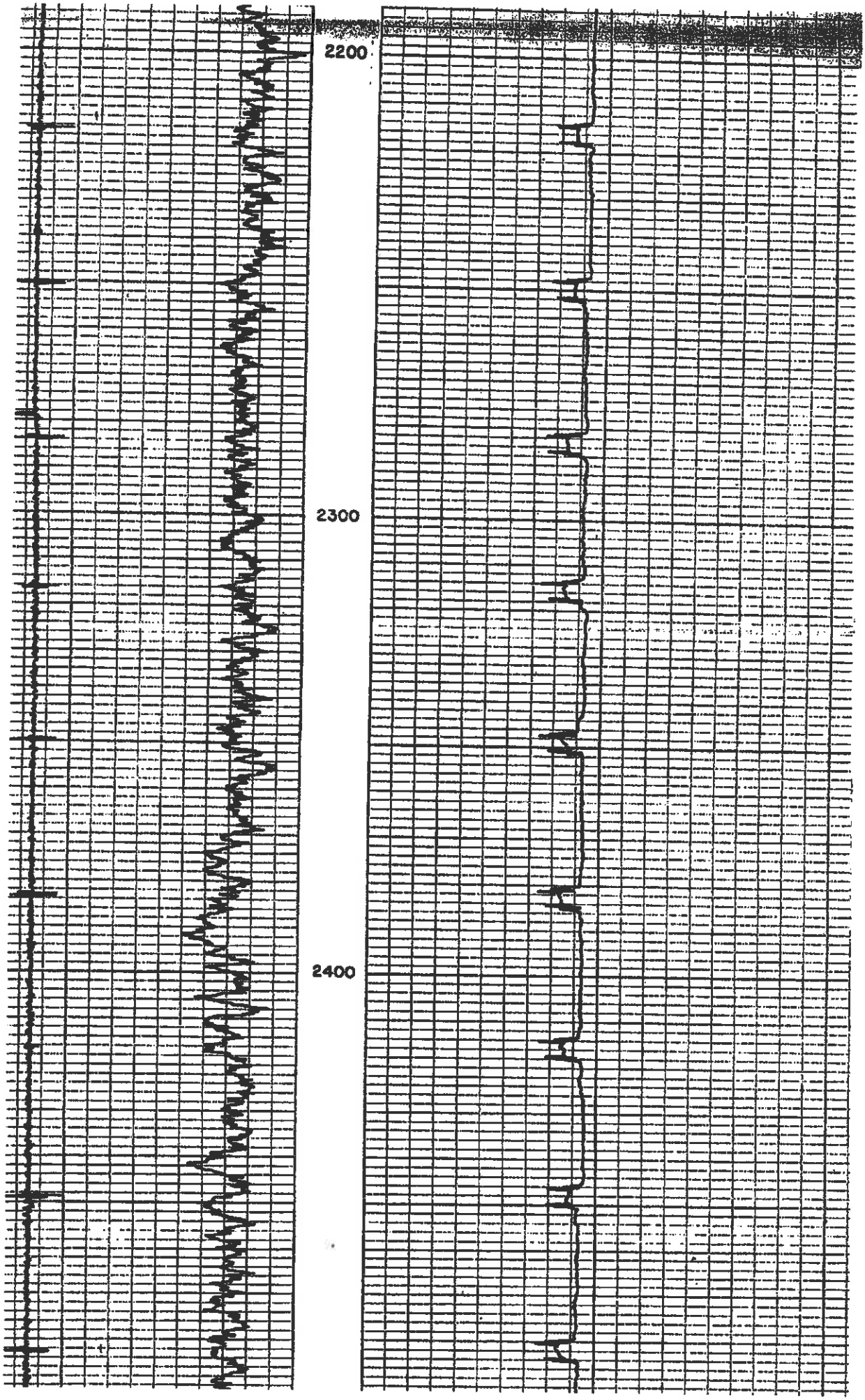
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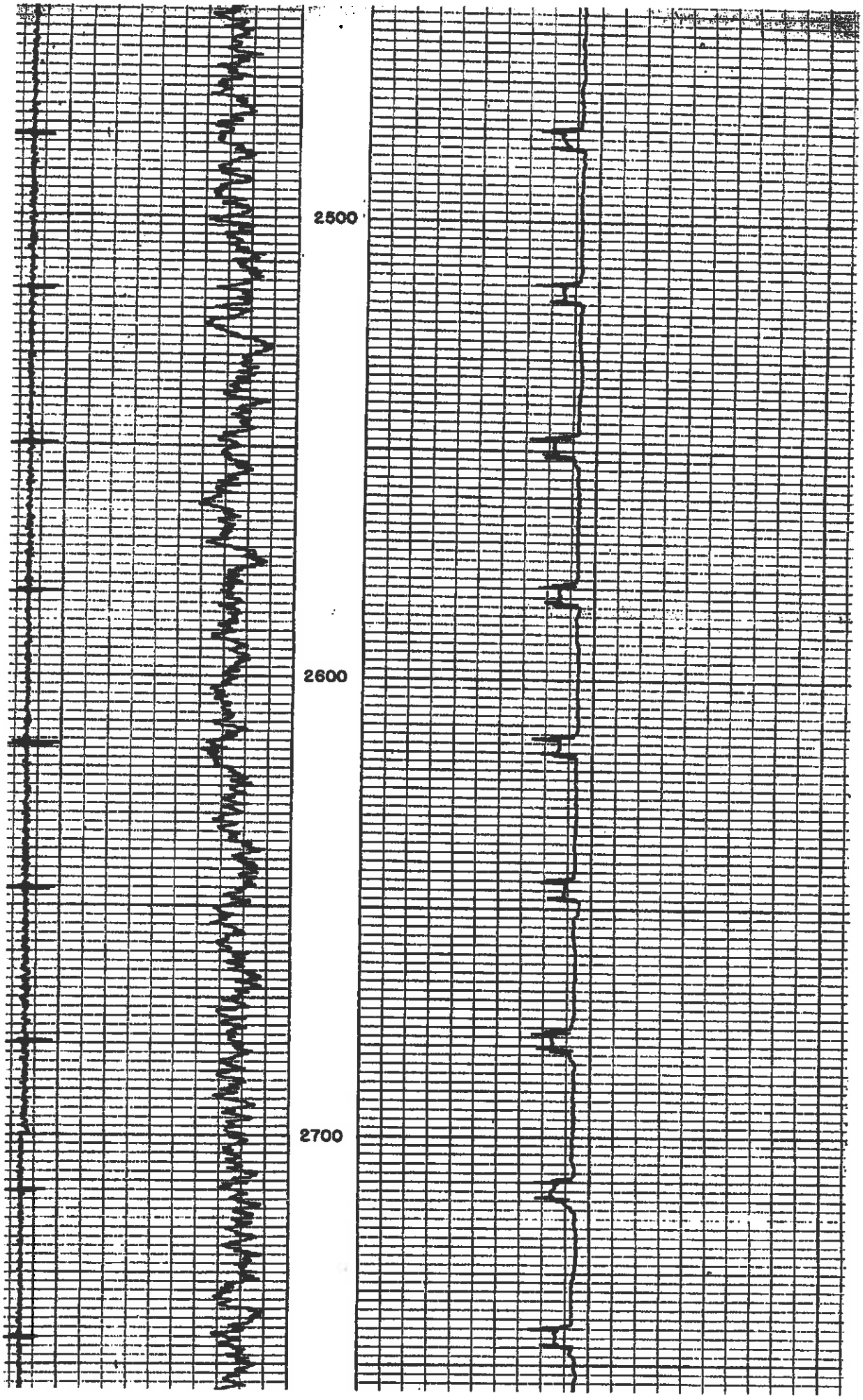
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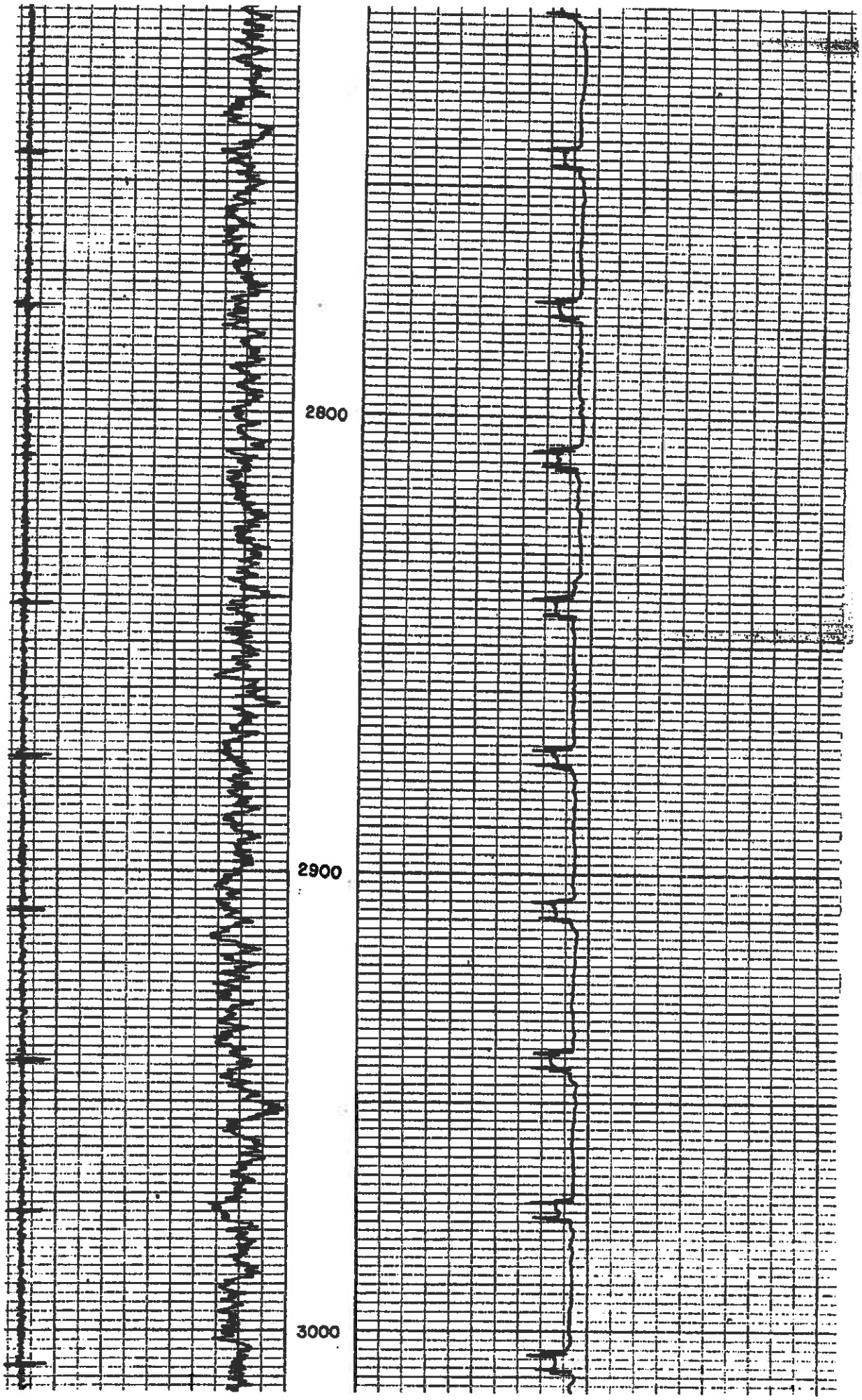
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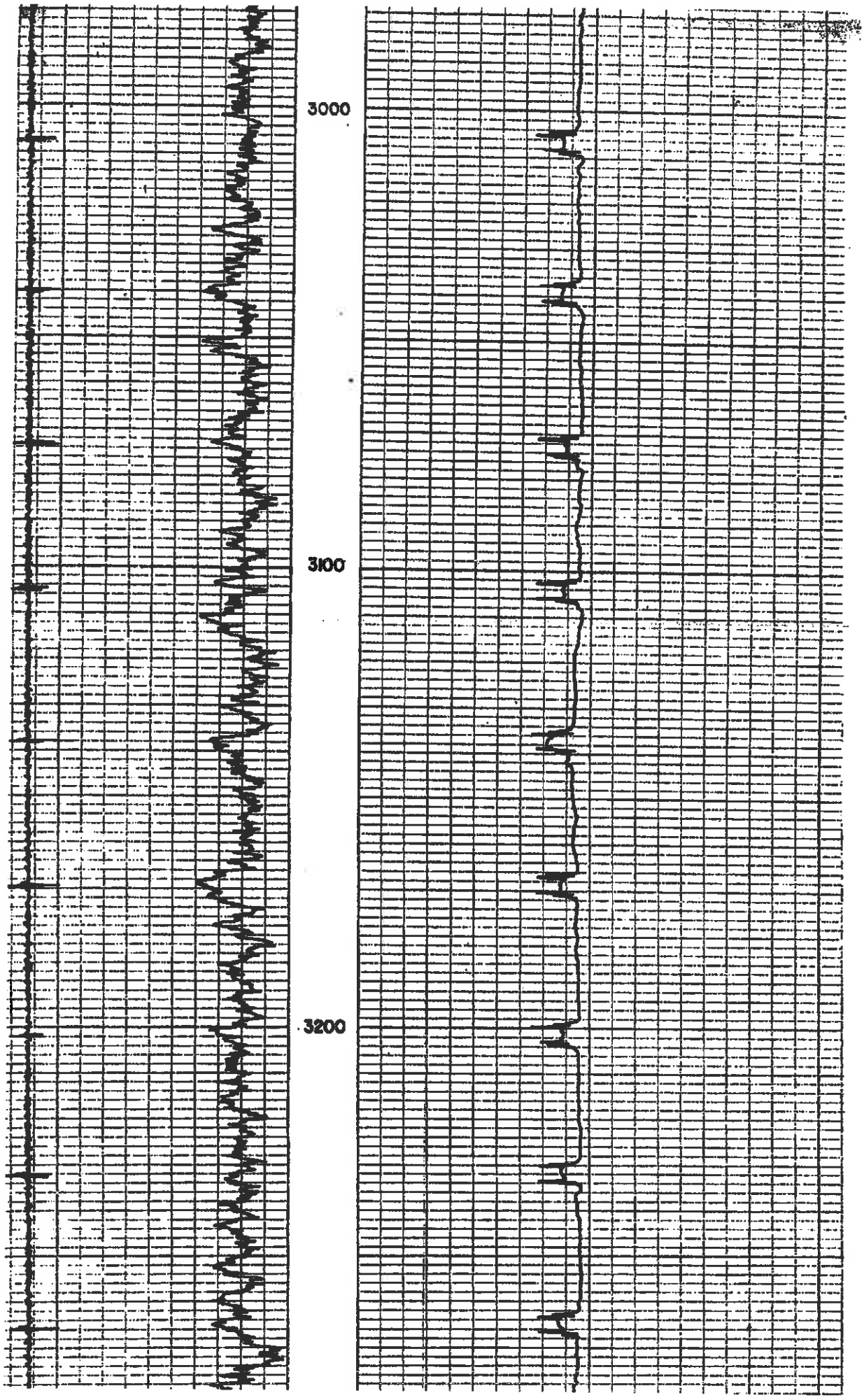
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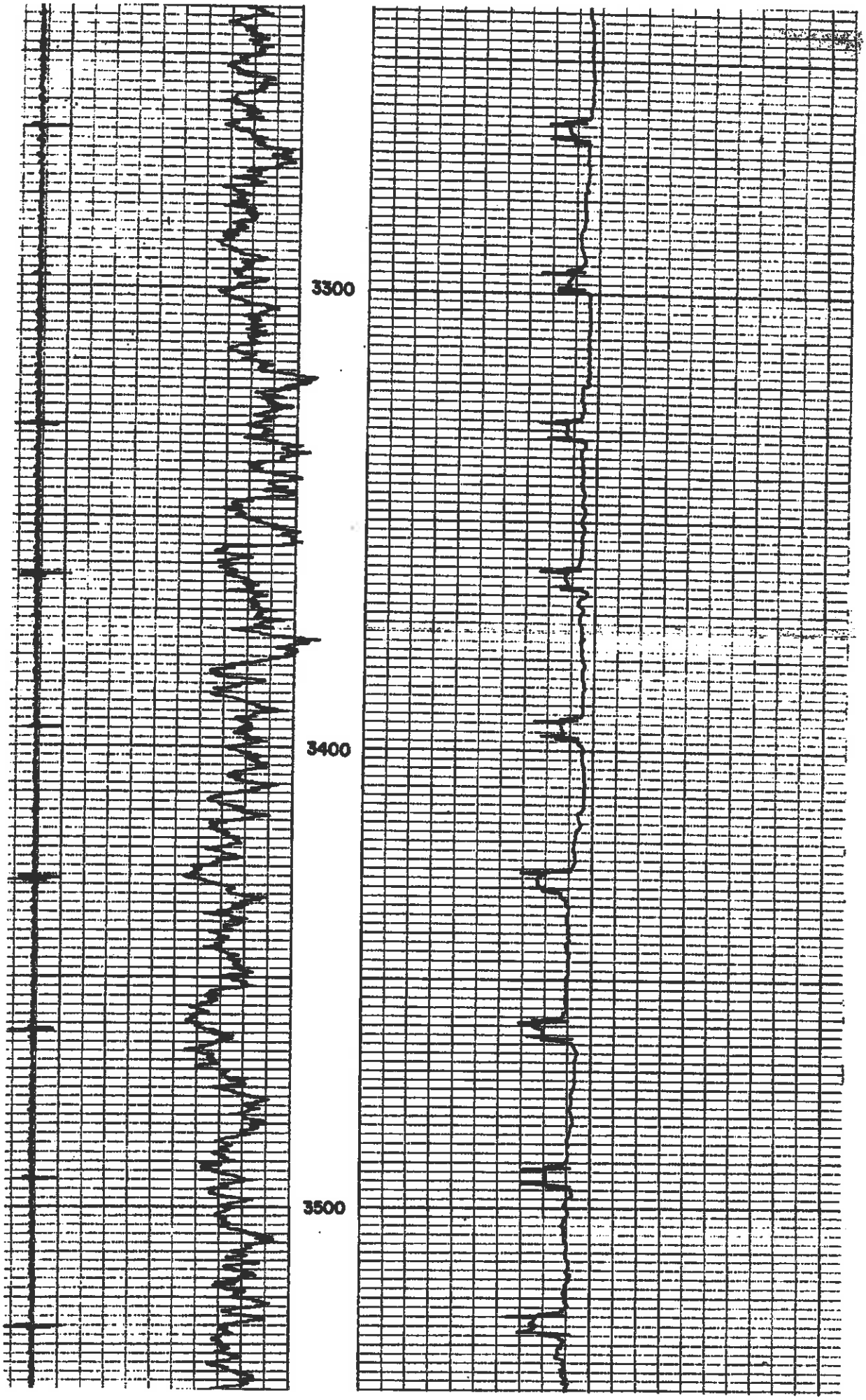
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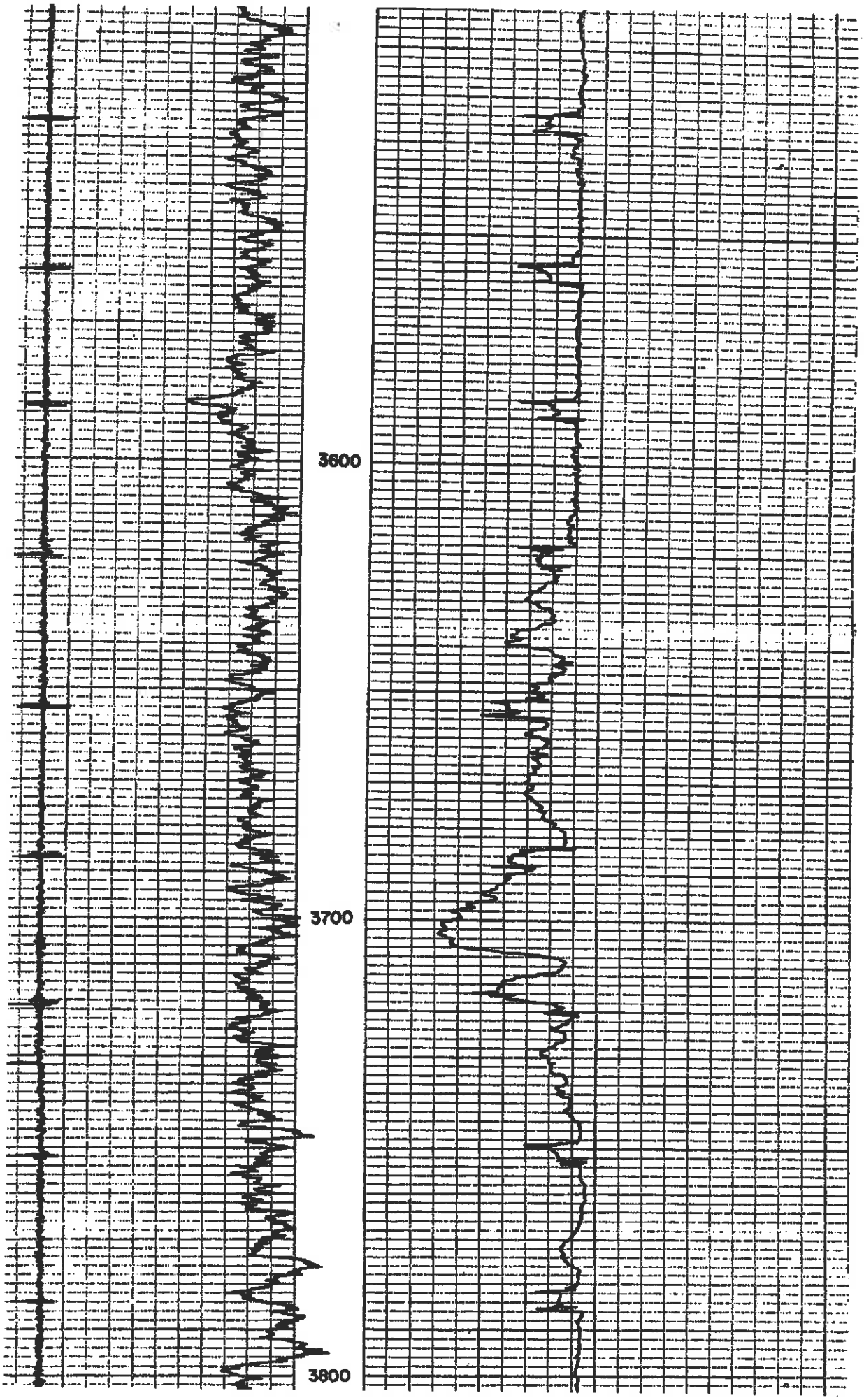
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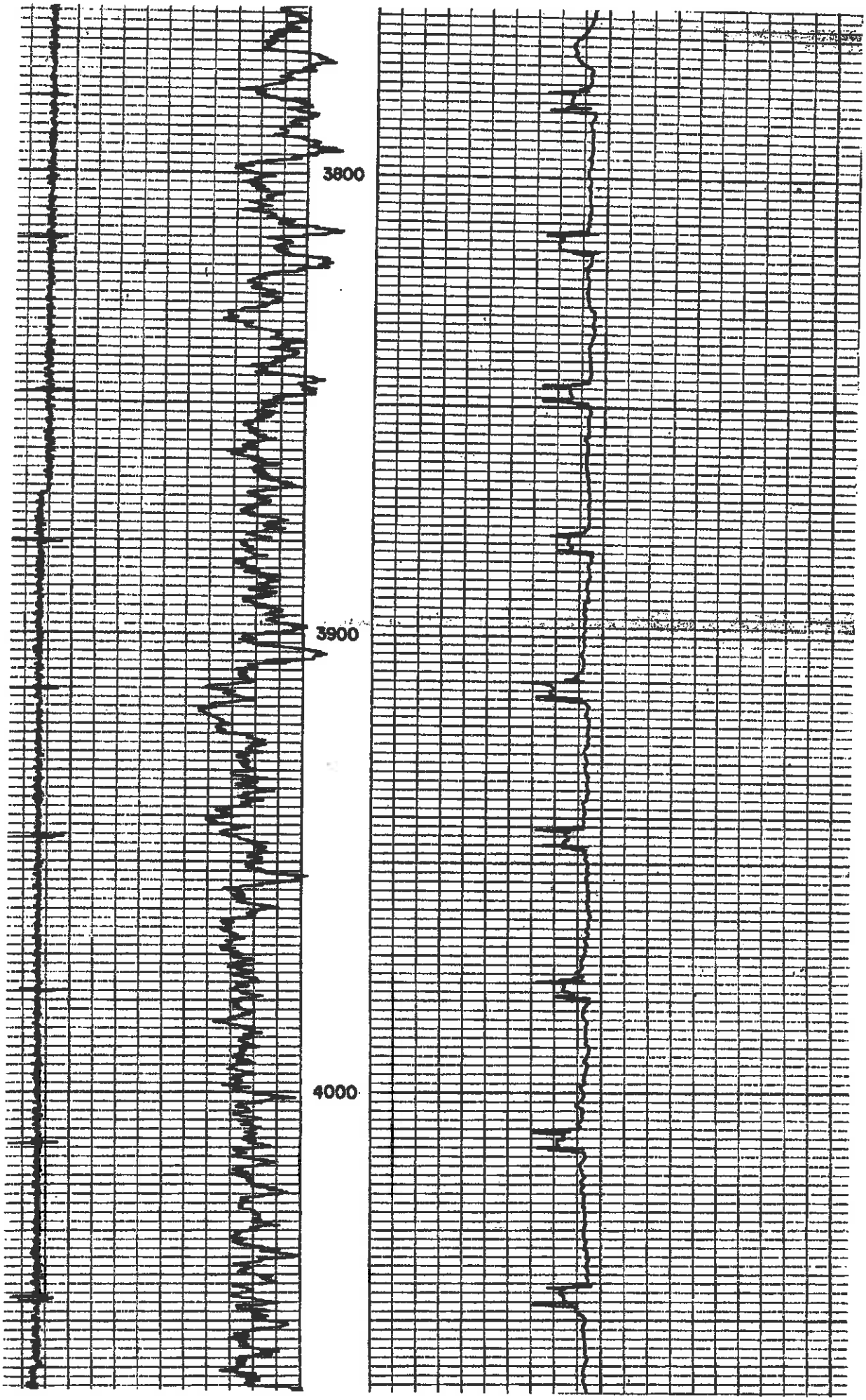
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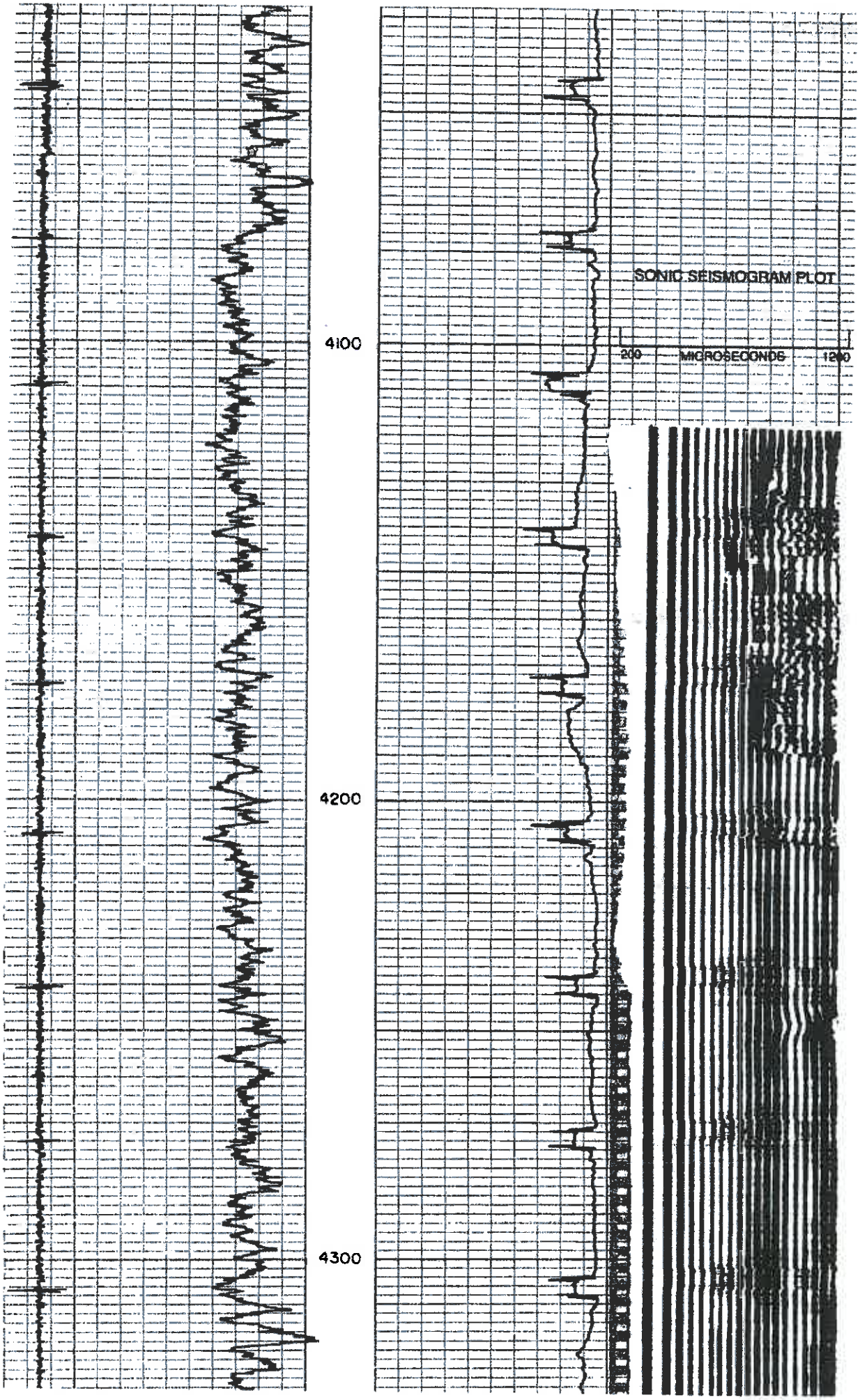
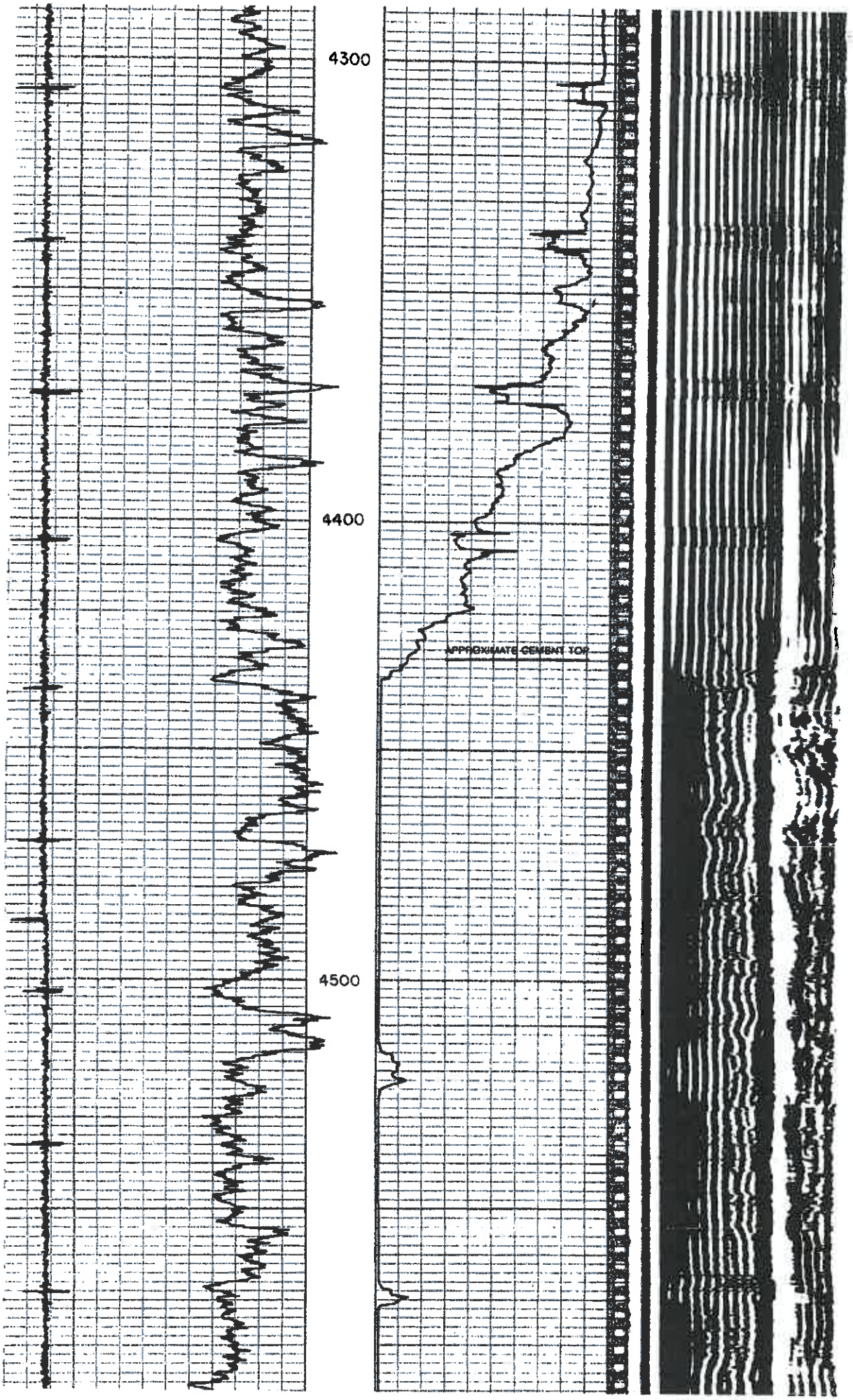

4100
4200
4300
SONIC SEISMOGRAM PLOT
200
MICROSECONDS
1200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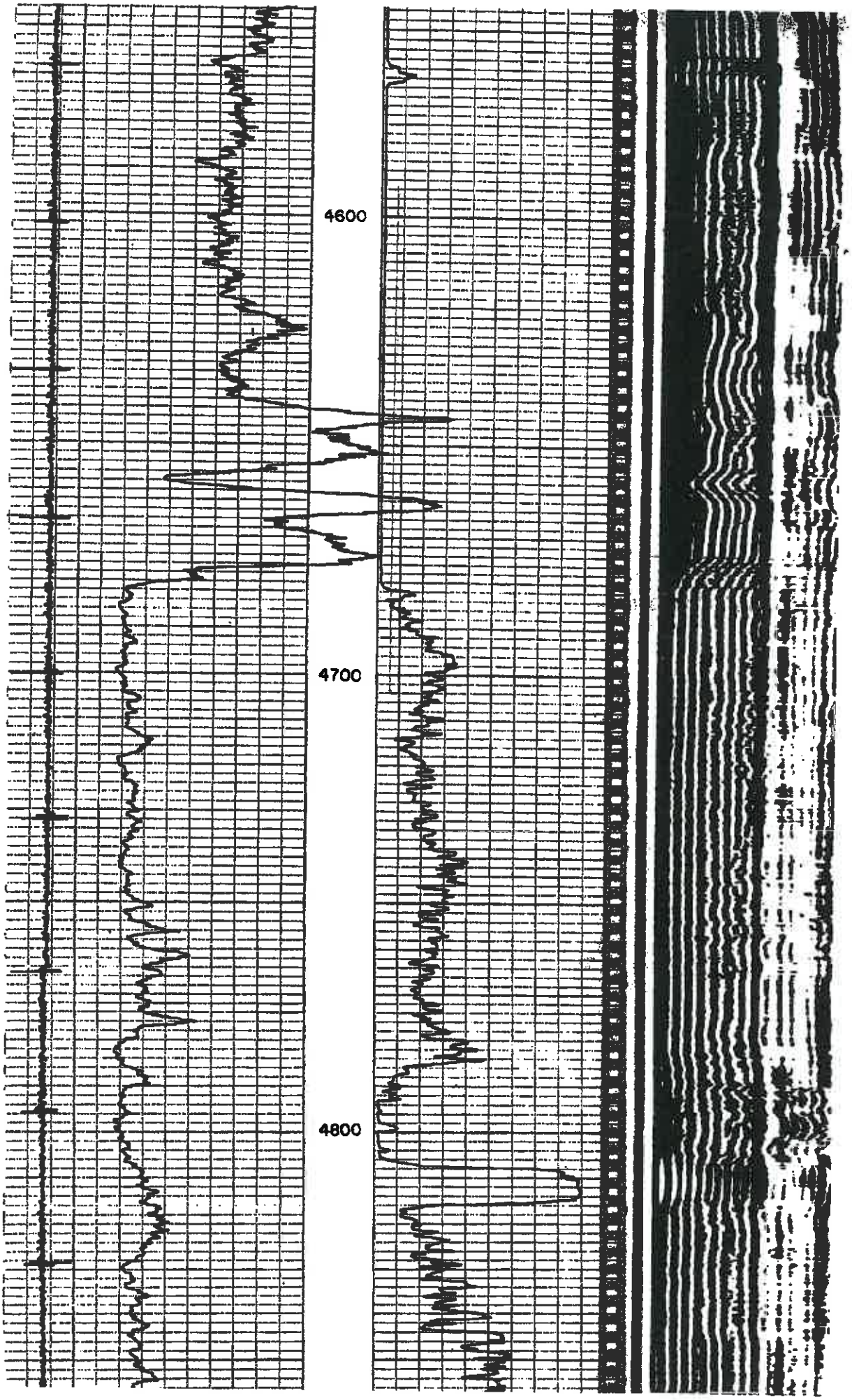
APPROXIMATE CEMENT TOP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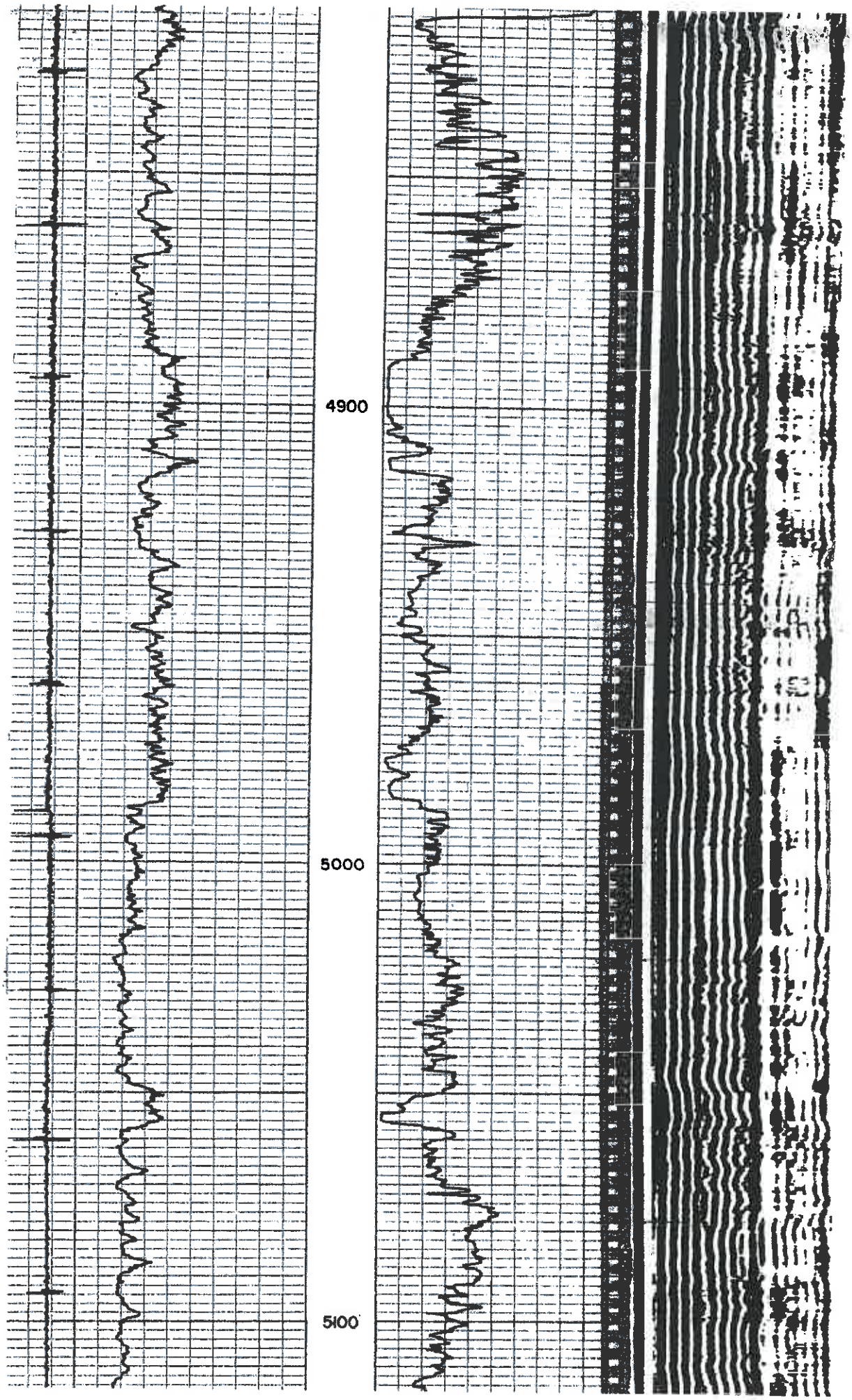
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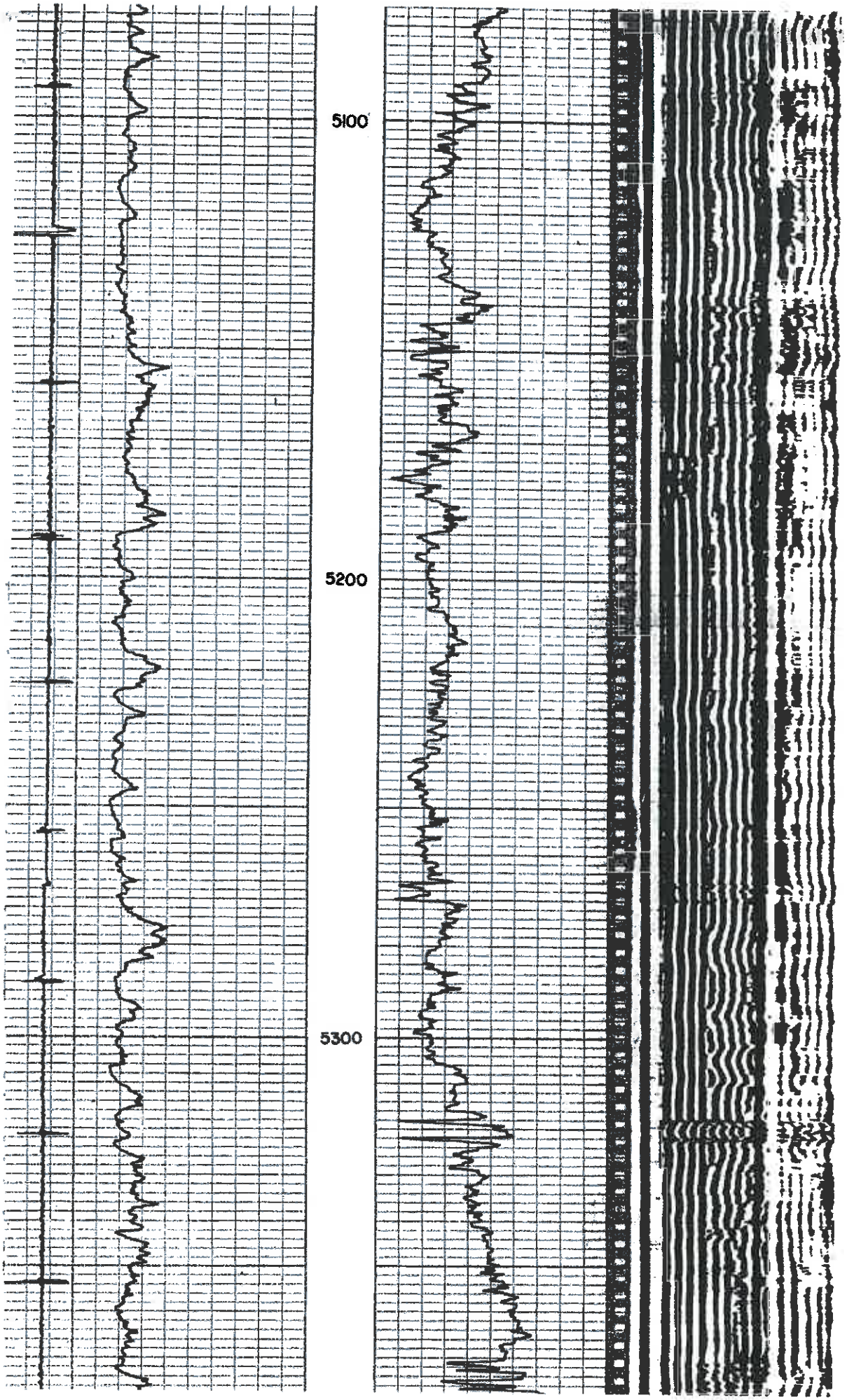
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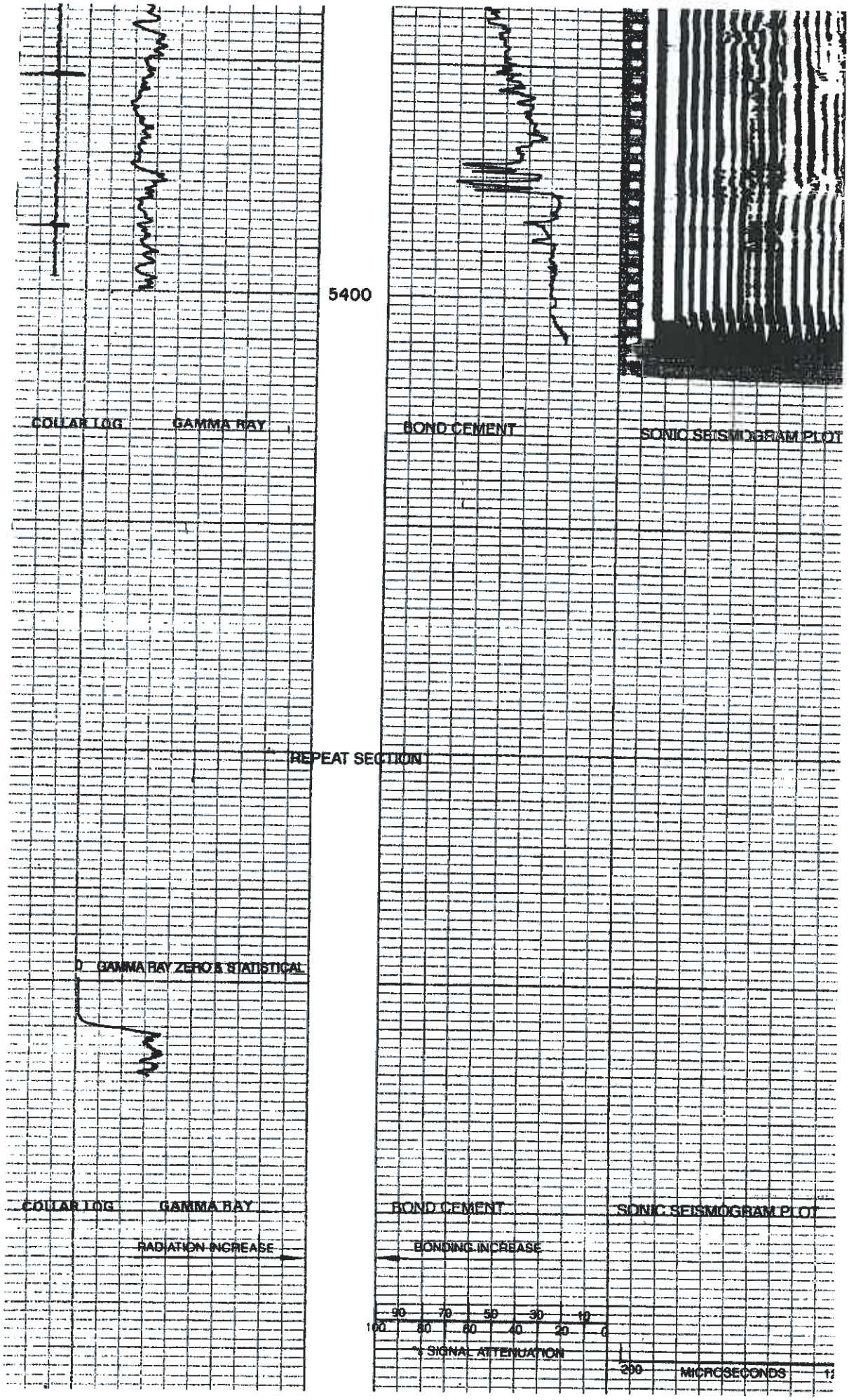
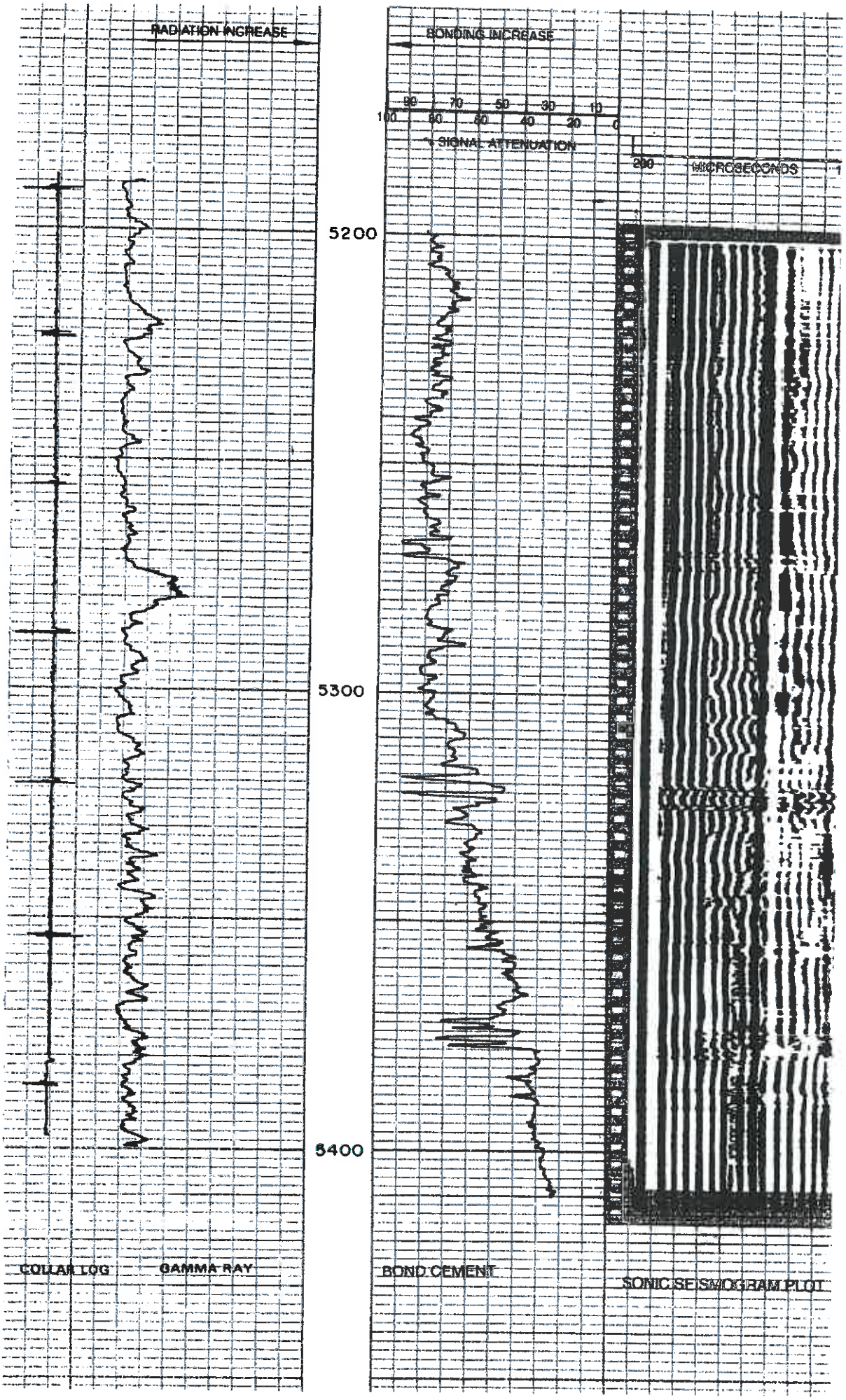

5400
COLLAR LOG
GAMMA RAY
BOND CEMENT
SONIC SEISMOGRAM PLOT
REPEAT SECTION
GAMMA RAY ZERO & STATISTICAL
COLLAR LOG
GAMMA RAY
RADIATION INCREASE
BOND CEMENT
BONDING INCREASE
SONIC SEISMOGRAM PLOT
90 70 50 30 10
100 80 60 40 20 0
% SIGNAL ATTENUATION
200
MICROSECONDS

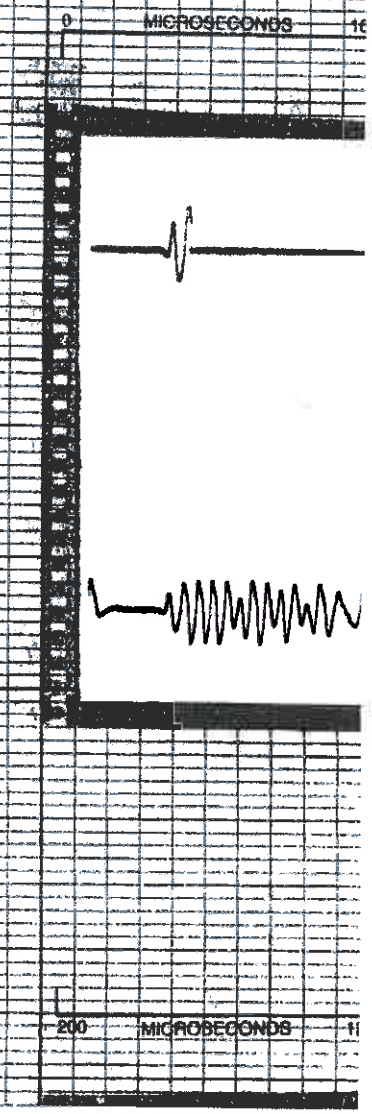

RADIATION INCREASE
BONDING INCREASE
90 70 50 30 10
100 80 60 40 20 0
% SIGNAL ATTENUATION
200 MICROSECONDS
5200
5300
5400
COLLAR LOG
GAMMA RAY
BOND CEMENT
SONIC SEISMOGRAM PLOT

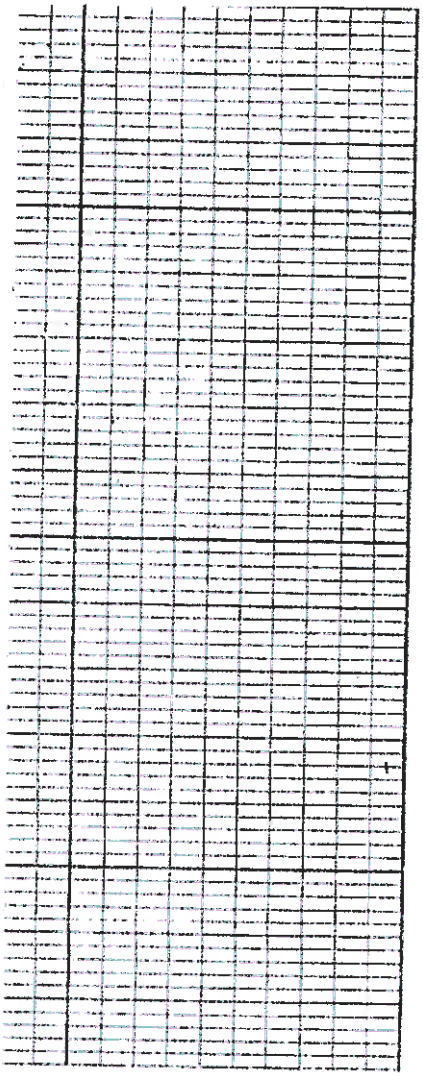
COLLAR LOG GAMMA RAY

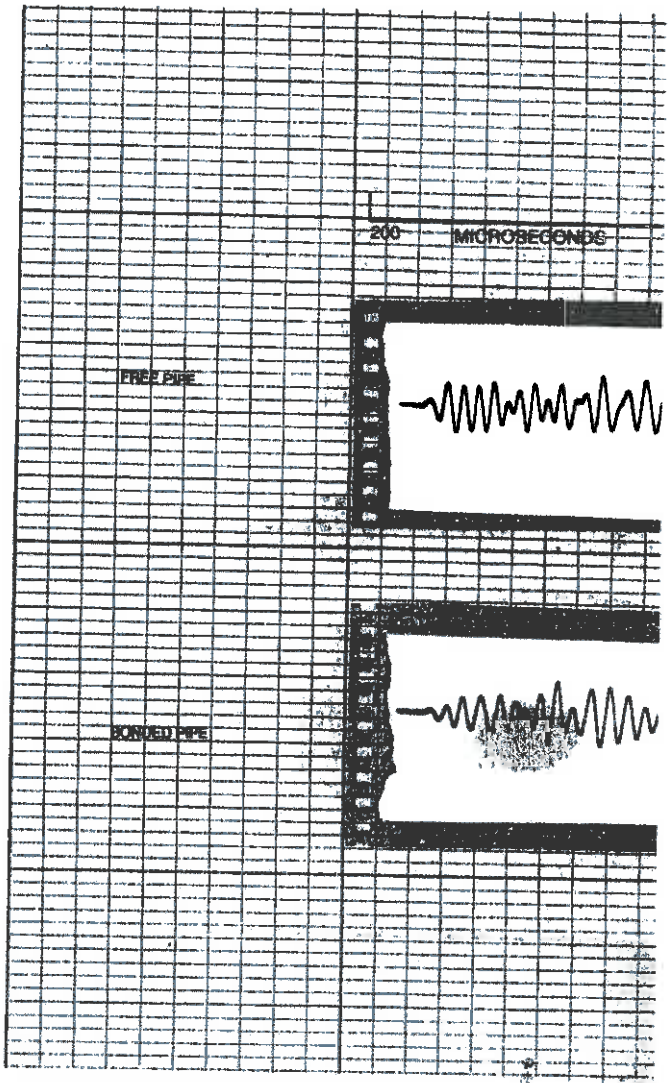
BOND CEMENT

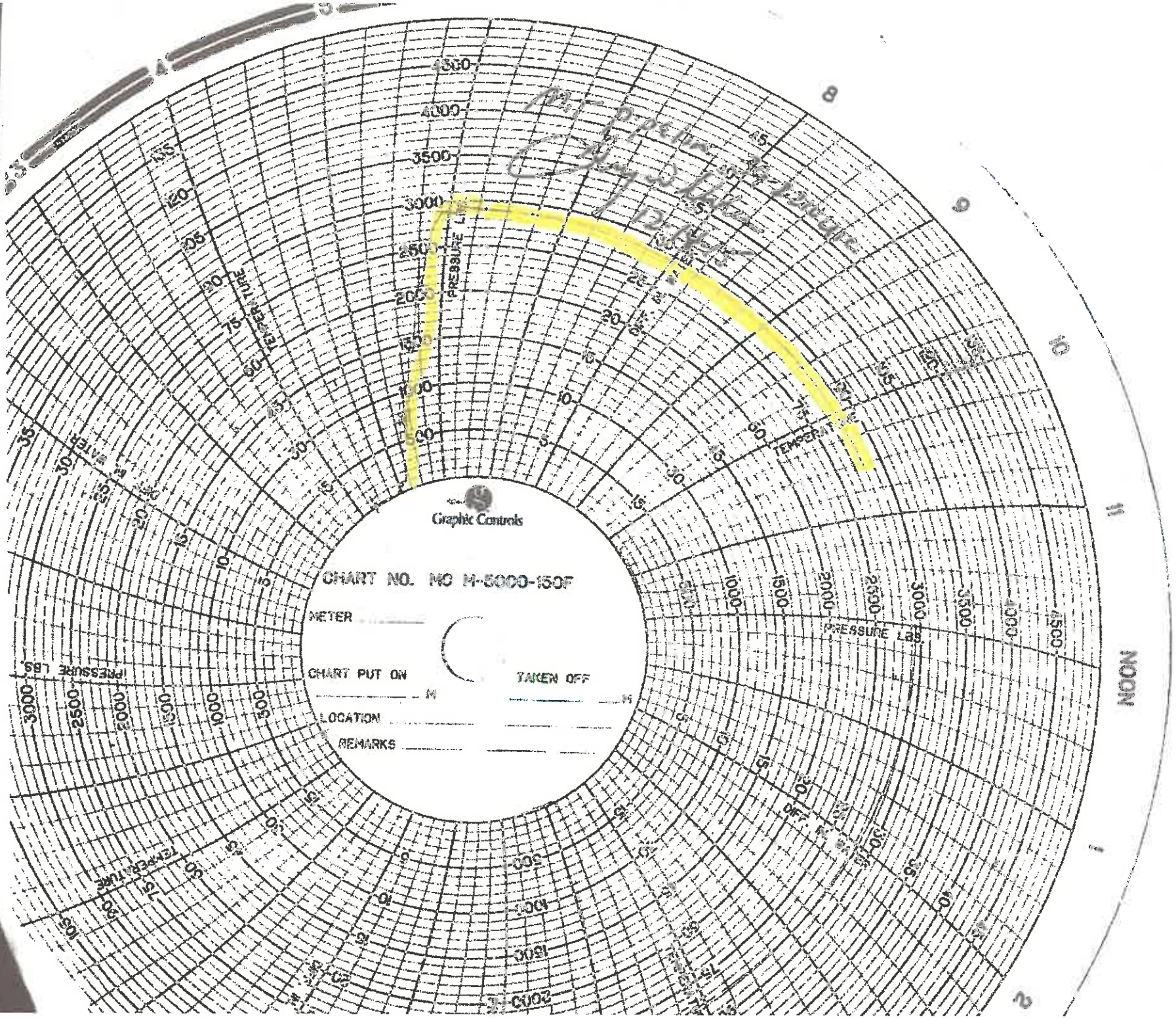
SONIC SEISMOGRAM PLOT

SCOPE PICTURES

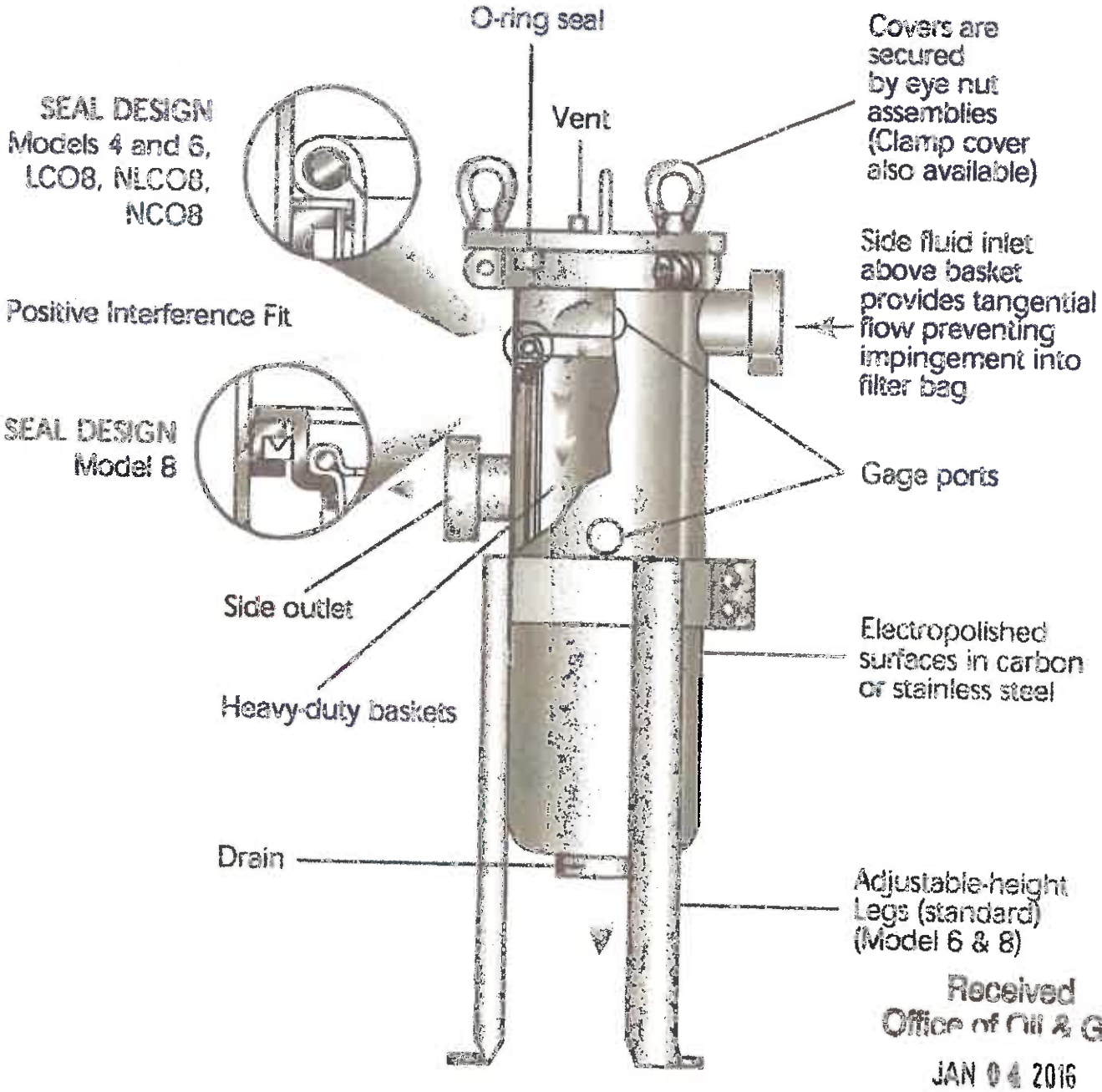





200
MICROSECONDS
FREE PIPE
BONDED PIPE



Single-Bag Filter Features



Typical Filter

Model 8 Basket Strainer and Bag Filters

Strainers or bag filters: Your choice!

Model 8 strainer/filter housings are made in 2 sizes and 2 pressure ratings, and can serve as basket strainers (for particle retention down to 74 micron size) or as bag filters (for particle retention down to 1 micron size). In all cases, covers are easily removed, without tools, and the basket or bag is easily cleaned or replaced.

Features

- NSF 61 listed
- Low pressure drops
- Permanently piped housings
- Covers are O-ring sealed
- Carbon steel, or stainless steel (304 or 316) construction for housings
- All housings are electropolished to resist adhesion of dirt and scale
- Easy to clean!
- Adjustable-height legs, standard
- Large-area, heavy-duty baskets
- O-ring seals: Buna N, EPR, Viton®, Teflon®
- ASME code stamp available
- Two pressure ratings: 150 and 300
- Duplex units are available
- Pipe sizes 3/4 thru 6-inch, NPT or flanged
- Two basket depths: 15 or 30 inches (nominal)

Options

- Sanitary construction
- Different outlet connections
- Higher pressure ratings
- Extra-length legs
- Heat jacketing
- Adapters for holding filter cartridges.
- Liquid displacers for easier servicing
- Can be fitted with an adapter to hold cartridge filter elements

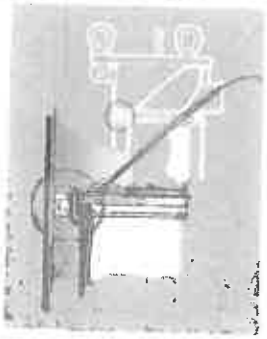
Choosing A Basket Strainer Or Bag Filter

Choose between straining (removing particles down to 74 micron size) or filtering a fluid (removing particles down to 1 micron). This will direct you in selecting the correct basket when ordering.

Dual Stage Straining/Filter
All Rosedale Model 8 housings can be supplied with a second, inner basket, which is supported on the top flange of the regular basket. Both baskets can be strainers (with or without wire mesh linings) or both can be baskets for filter bags. They can also be mixed: one a strainer basket, the other a bag basket. Dual-stage action will increase strainer or filter life and reduce servicing needs.

Operation

Unfiltered liquid enters the housing above the bag or basket and flows through. Solids are contained inside the bag or basket, where they are easily removed when the unit is serviced.



A basket bail is pushed down by the closed cover to hold the basket against a positive stop in the housing. A radial seal prevents bypass of unfiltered liquid.

Pressure Drop Data

Basket strainers and bag filters are usually selected so that the pressure drop does not exceed 2 psi, when they are clean. Higher pressure drops may be tolerated, when contaminant loading is low. Bag change occurs at 15 psid.

The pressure drop data is accurate for all housings with strainer or filter bag baskets. When filter bags are added, total pressure drop becomes the sum of the pressure drop as determined by the steps below.

Follow these easy steps:

1. Using the desired pipe size and approximate flow rate, determine the basic pressure drop from the appropriate graph.
2. Multiply the pressure drop obtained in step 1 by the viscosity correction factor found in the accompanying table. This is the adjusted (clean) pressure drop for all baskets without filter bags.
3. Add the pressure drop for the bag.

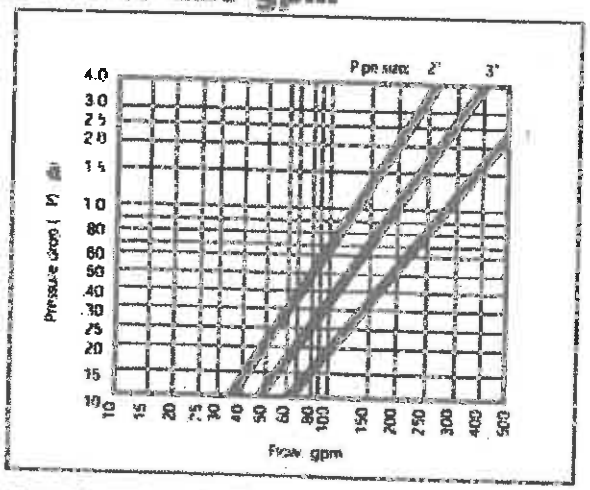
Note: Filter bags are specified separately. See page 134.

Basket Data

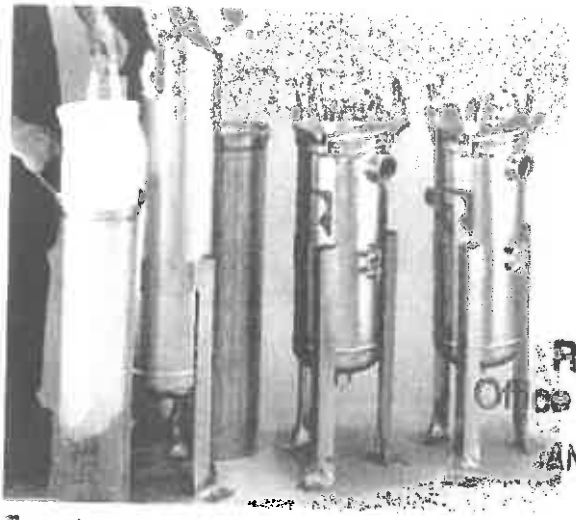
Depth Nominal (inches)	Diameter (inches)	Surface Area (sq. ft.)	Volume (cu. in.)	Bag Size No.
15	6.7	2.3	500	1
30	6.7	4.4	1000	2

	Viscosity, cps								
	1 (H2O)	50	100	200	400	600	800	1000	2000
1/8 unlined baskets	.65	.85	1.00	1.10	1.20	1.40	1.50	1.60	1.80
40-mesh lined	.73	.95	1.20	1.40	1.50	1.80	1.90	2.00	2.30
60-mesh lined	.77	1.00	1.30	1.60	1.75	2.10	2.20	2.30	2.80
80-mesh lined	.93	1.20	1.50	1.90	2.10	2.40	2.60	2.80	3.50
100-mesh lined	1.00	1.30	1.60	2.20	2.40	2.70	3.00	3.30	4.40
200-mesh lined	1.30	1.70	2.10	3.00	3.40	3.80	4.40	5.00	6.60

Model 8–For flow rates to 220 gpm*



*Based on housing only. Fluid viscosity, filter bag used, and expected dirt loading should be considered when sizing a filter.



Eyenut covers with filter bag and basket.

Dimensions (IN)

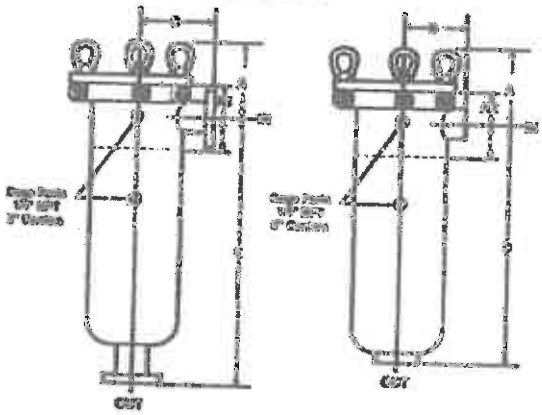
Outlet Styles

Flanged (150 lb. ANSI) | Threaded (NPT)

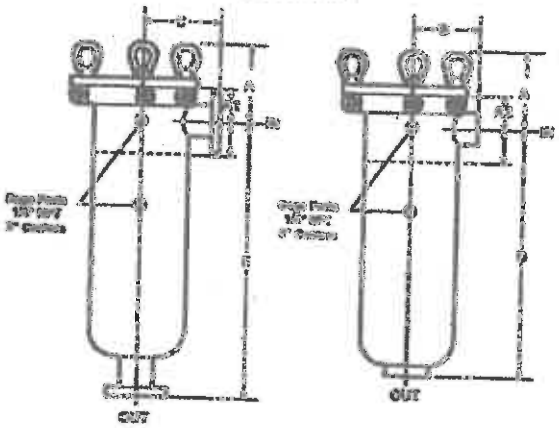
Outlet Styles

Flanged (300 lb. ANSI) | Threaded (NPT)

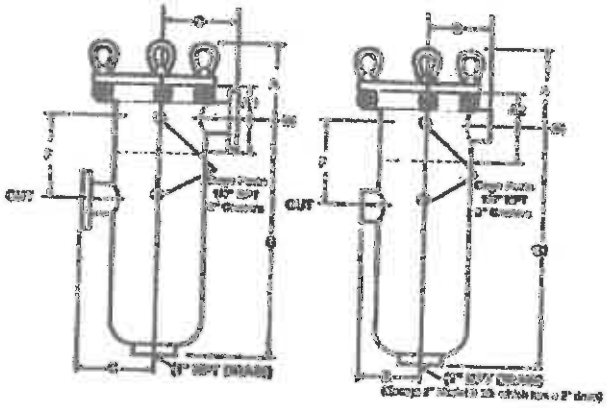
STYLE 1



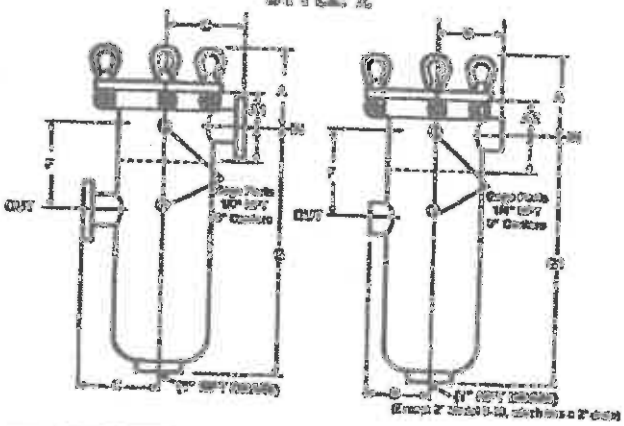
STYLE 1



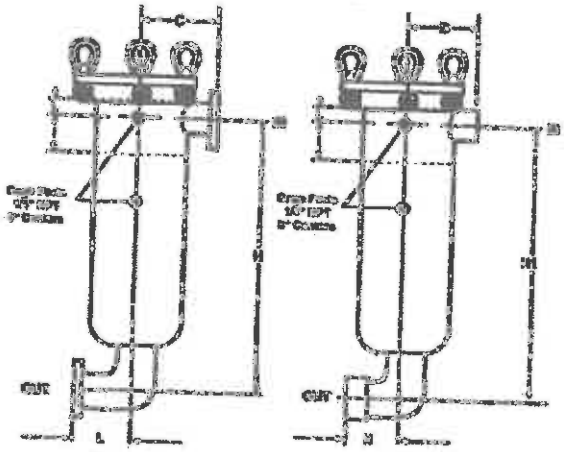
STYLE 2



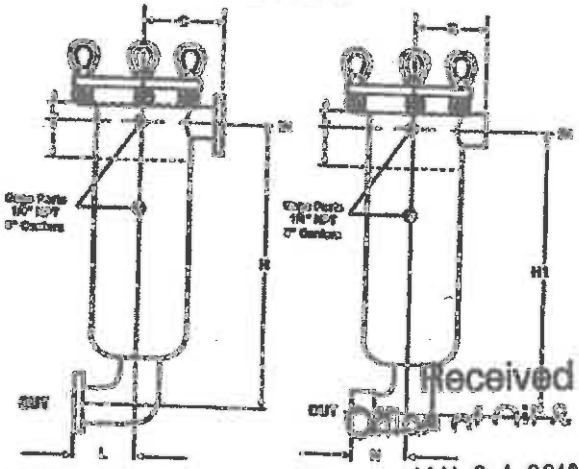
STYLE 2



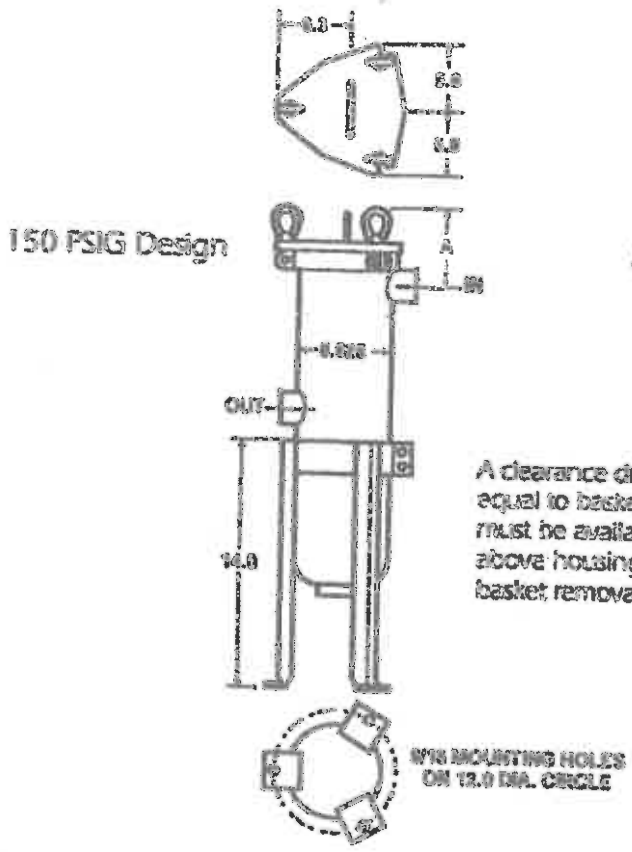
STYLE 3



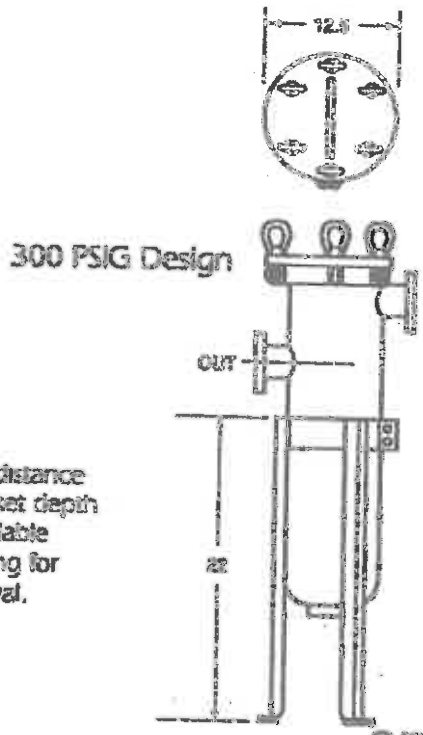
STYLE 3



Cover Types



A clearance distance equal to basket depth must be available above housing for basket removal.



Dimensions (IN) 150 PSIG Design

Model	Pipe Size	A	A1	A2	B	C	D	E	F	G/G1	H/H1	I	J	K	L
8-15	2	9.1	5.4	2.9	5.9	7.5	20.6	23.4	8.0	20.9	22.8	3.25	5.0	4.06	4.25
	3	9.1	5.4	3.7	6.8	7.5	21.3	23.4	8.0	20.9	24.3	3.25	7.25	6.12	4.25
	4	9.1	5.4	5.0	6.8	8.6	21.3	23.9	8.0	20.9	25.6	3.25	9.0	7.75	4.25
	6	9.4	5.6	5.9	7.1	8.6	23.6	27.1	9.0	23.4	30.9	4.12	12.5	11.0	4.5
8-30	2	9.1	5.4	2.9	5.9	7.5	35.6	38.4	8.0	35.9	37.8	3.25	5.0	4.06	4.25
	3	9.1	5.4	3.7	6.8	7.5	36.3	38.4	8.0	35.9	39.3	3.25	7.25	6.12	4.25
	4	9.1	5.4	5.0	6.8	8.6	36.3	38.9	8.0	35.9	40.6	3.25	9.0	7.75	4.25
	6	9.4	5.6	5.9	7.1	8.6	38.6	42.1	9.0	38.4	45.9	4.12	12.5	11.0	4.5

Dimensions (IN) 300 PSIG Design

Model	Pipe Size	A	A1/A2	B	C	D	E	F	G/G1	H/H1	I	J	K	L
8-15	2	9.5	5.4	5.9	7.5	20.6	23.4	8.0	20.9	22.8	3.25	5.0	4.06	4.25
	3	9.5	5.4	6.8	8.6	21.3	23.4	8.0	20.9	24.3	3.25	7.25	6.12	4.25
	4	9.5	5.4	6.8	8.6	21.3	23.9	8.0	20.9	25.6	3.25	9.0	7.75	4.25
	6	9.6	5.6	7.1	8.6	23.6	27.1	9.0	23.4	30.9	4.12	12.5	11.0	4.5
8-30	2	9.5	5.4	5.9	7.5	35.6	38.4	8.0	35.9	37.8	3.25	5.0	4.06	4.25
	3	9.5	5.4	6.8	7.5	36.3	38.4	8.0	35.9	39.3	3.25	7.25	6.12	4.25
	4	9.5	5.4	6.8	8.6	36.3	38.9	8.0	35.9	40.6	3.25	9.0	7.75	4.25
	6	9.6	5.6	7.1	8.6	38.6	42.1	9.0	38.4	45.9	4.12	12.5	11.0	4.5

How To Order

Build an ordering code as shown in the example

Example: 8-15-3P-1-150-C-B-S-M-200-D-C-2M 50

HOUSING | OPTIONS | OPTIONAL INNER BASKET

MODEL NO.
8 = 8

HOUSING SIZE
15 inch = 15
30 inch = 30

PIPE SIZE, NPT and FLANGED[1]
3/4-in. female NPT = 3/4P
1-in. female NPT = 1P
1-1/4-in. female NPT = 1-1/4P
1-1/2-in. female NPT = 1-1/2P
2-in. female NPT = 2P
3-in. female NPT = 3P
3/4-in. 150 class ANSI flange = 3/4F
1-in. 150 class ANSI flange = 1F
1-1/4-in. 150 class ANSI flange = 1-1/4F
1-1/2-in. 150 class ANSI flange = 1-1/2F
2-in. 150 class ANSI flange = 2F
3-in. 150 class ANSI flange = 3F
4-in. 150 class ANSI flange = 4F
6-in. 150 class ANSI flange = 6F

OUTLET STYLE
Bottom = 1
Side = 2
Bottom elbow = 3

PRESSURE RATING[2]
150 psi (NPT or flanged) = 150
300 psi (NPT or flanged) = 300

HOUSING MATERIAL
Carbon steel = C
304 stainless steel = S
316 stainless steel = S316

COVER SEAL
Buna N = B
Ethylene Propylene = E
Viton® Fluoroelastomer = V
Teflon® Encapsulated Viton® = TEV
Teflon® (solid white) (6 Bolt Cover) = TSW[5]

BASKET SEAL
Seal required = S

FOR MODEL 8 ONLY

OPTIONAL INNER BASKET MEDIA SIZE No symbol if type 2B basket was selected

Perforation diameter (for type 2P baskets)
1/4, 3/16, 9/64, 3/32, 1/16

Mesh sizes (for type 2M and 2BM baskets) 20, 30, 40, 50, 60, 70, 80, 100, 150, 200

OPTIONAL INNER BASKET TYPE
2B = Filter bag basket, 9/64 perforations[3]
2P = Strainer basket, perforated metal
2BM = Filter bag basket, perforated, mesh lined[3]
2M = Strainer basket, perforated, mesh lined

ASME CODE STAMP
C = Code
NSF = NSF 61 Meet

DISPLACER
D = Displacer

BASKET, MEDIA SIZE No symbol if type B basket was selected
Perforation diameter (for type P baskets)
1/4, 3/16, 9/64, 3/32, 1/16

Mesh sizes (for type M and BM baskets)
20, 30, 40, 50, 60, 70, 80, 100, 150, 200

BASKET TYPE
B = Filter bag basket, 9/64 perforations[3]
P = Strainer basket, perforated metal
BM = Filter bag basket, perforated, mesh lined[3]
M = Strainer basket, perforated, mesh lined
HWM = Filter bag basket, heavy wire mesh[3]

NOTE:
1. Flanges provided with the housing match the pressure rating of the vessel. Housings rated 150 psi have 150 class flanges. Housings rated 300 psi have 300 class flanges. ANSI B16.5 Pressure-Temperature rating tables determine flange class for ASME code housings. Consult factory.
2. Higher pressure ratings available. Consult factory.
3. Filter bags are specified separately. See page 131.
4. 150 psi units has 150 class flanges. 300 psi unit has 300 class flanges.
5. 300 psi design only.

(4/25)

APPENDIX B
Storage Tank Inventory

API #	Tank ID	Tank Location (UTM NAD 83 Meters)		Installation Date	Tank Ags (Months)	Construction Material (Steel, plastic, etc.)	Capacity (gallons)	Type of Fluid Stored	Volume of Fluid Stored (gallons)	Tank Type Single/Double Wall
		Northing	Easting							
NA	Large Tank	4257210.32	443176.92	2000	540	Steel	56,440	Production brine, flow back, pipeline fluids, and pit water	55,000	Double Wall
NA	100 bbl.	4257219.31	443161.54	05/2011	55	Steel	4,200	Production brine, flow back, pipeline fluids, and pit water	4,000	Single Wall
NA	1st - 280 bbl.	4257216.54	443161.52	06/2014	18	Steel	10,500	Production brine, flow back, pipeline fluids, and pit water	9,500	Single Wall
NA	2nd - 280 bbl.	4257218.81	443153.51	06/2014	18	Steel	10,500	Production brine, flow back, pipeline fluids, and pit water	9,500	Single Wall

FIELD TICKET

Job Header

NABORS COMPLETION & PRODUCTION SERVICES CO.
PO BOX 975682
DALLAS
TX 75397-5682

Ticket # [redacted]
Stage # 2

Customer: VIKING ENERGY CORP
Customer Short Code: VIKING ENERGY
Cust Address: 3113 SISSONVILLE DR
PO BOX 13366
SISSONVILLE,WV,25320,U.S.A.
Well/Lease: [redacted]
State/County: WV/KANAWHA
Customer Rep: [redacted]

Rig #: S0038
Date: [redacted]
Day: 1

Details of Operations

Ticket From Time : [redacted] (HHMM) Ticket To Time : [redacted] (HHMM)

From	To	Time	Code	Description
07:00	09:00	2 hrs 0 mins	F.02	TRAVEL TIME
09:00	09:15	0 hrs 15 mins	E.01	SAFETY MEETING
09:15	09:30	0 hrs 15 mins	A.04	RIG / EQUIPMENT UP
09:30	11:30	2 hrs 0 mins	C.99	OTHER
11:30	12:00	0 hrs 30 mins	A.05	RIG / EQUIPMENT DOWN
12:00	14:00	2 hrs 0 mins	F.02	TRAVEL TIME

Operation Hours : 7 hrs 0 mins
Other Hours : 0 hrs 0 mins
Total Hours : 7 hrs 0 mins

Type of Operation

OTHER

Safety Meeting

From Time	To Time	Meeting Topic	Notes
09:00	09:15	BP-Body Placement and Position for Tasks	

Weather

Temp: 85 °F
Wind: 0MPH
Weather Conditions : Normal

Ticket Services

Service Id	Service Description	Billing Qty	UOM	Std. Price	Disc%	Price	Amount	EDI1	EDI2	EDI3
702101000	Service Charge CH - per job	1.00	Each	[redacted]	52	[redacted]	[redacted]			
702000001	Mileage DOT Units CH - per unit, per mile, one way	100.00	Per Unit Per One-Way Mile	[redacted]	52	[redacted]	[redacted]			
702000002	Mileage non-DOT Units CH - per unit, per mile, one way	100.00	Per Unit Per One-Way Mile	[redacted]	52	[redacted]	[redacted]			
758265510	COMPOSITE FRAC PLUG 5-1/2, 1 ID EACH	1.00	Each	[redacted]	[redacted]	[redacted]	[redacted]			
702990090	FP, BP, PACKER SETTING CHARGE (3000 FT MIN) - DEPTH OF SET	4,460.00	Feet	[redacted]	52	[redacted]	[redacted]			
702140600	GR-CCL-CBL, Depth Chrg (3000 ft min) - per total feet depth	5,475.00	Feet	[redacted]	52	[redacted]	[redacted]			
702120600	GR-CCL-CBL, Operation Chrg (3000 ft min) -per foot	3,000.00	Feet	[redacted]	52	[redacted]	[redacted]			
758101040	Setting Plug Items (Charge & Igniter) - each	1.00	Each	[redacted]	52	[redacted]	[redacted]			
702990080	Mast Truck - each	1.00	Each	[redacted]	52	[redacted]	[redacted]			
758101111	3.5% FUEL SURCHARGE	1.00	Each	[redacted]	0	[redacted]				

Daily Estimated Total : [redacted]

Comments

☐ [X Acknowledge] CUSTOMER REPRESENTATIVE REPRESENT AND WARRANTS THAT HE/SHE IS AUTHORIZED TO ENTER INTO THIS AGREEMENT ON BEHALF OF CUSTOMER AND ACCEPTS ALL TERMS AND CONDITIONS BETWEEN CUSTOMER AND NABORS (the "Company"). For standard terms and conditions (WHICH INCLUDES INDEMNITY LANGUAGE THAT ALLOCATED RISKS RELATED TO THE SERVICES DESCRIBED ON THIS TICKET), please click here. Pricing and extensions, if shown on the ticket, are subject to verification and correction at time of invoicing.

Received
Office of Oil & Gas
JAN 04 2016

Richards
Energy Services LLC

Phone 304-345 - 0655
Fax 304-345 - 0657

Invoice #:
2910
Invoice Date:
June 19, 2015

Sold To:
Viking Energy Corporation
PO Box 13366
Sissonville, WV 25360

ATTN: Shane Pinkerton

Customer ID	Customer PO/AFE	Payment Terms
Viking Energy	Wallace #1 INJ	Net 30 days
		Due Date

Quantity		Description	Price	Extension
		Greg Lawson & Merl Richards		
4.25	Hrs	Work up rework program; request quotes, follow progress on work over.		N/C
2	Hrs	Work up squeeze and moving ahead program; work with state to get permit; schedule equip for squeeze		N/C
		Talk to state about work over process and convince to give permit		N/C
1.0	Day 6/8/15	Perform squeeze job	[redacted]	[redacted]
		Subtotal		[redacted]
		Sales Tax		
		Total Invoice Amount		[redacted]
		Payment /Credit Applied		
		INVOICE TOTAL		[redacted]

Check/Credit No: _____

Please Remit to: Richards Energy Services LLC
1120 Kanawha Blvd E. Lower Concourse
Charleston, WV 25301

Remit payment to:
P.O. Box 200969
Dallas, TX 75320

uld be directed to (814) 333-2656

Invoice#: 39727
Date: 06/08/2015
Well Name: Wallace Inj. Well
Job: 1180002169
District: Buckhannon Well Services District
County / State: Kanawha/West Virginia

	Qty	UOM	List Price	Disc %	Extension
: - Trucks and Vans (Except Bulk Units), Per Unit Miles	50.00	MILES	[redacted]	25.00	[redacted]
Top	1.00	EACH		25.00	
	100.00	SACK		25.00	
	100.00	CU FT		25.00	
nt Pump Charge, 1st 2 hrs	100.00	LB		25.00	
elivery Charge	1.00	EACH		25.00	
ge, Per Unit Miles	1.00	EACH		25.00	
	50.00	MILES		25.00	

Total due: [redacted]

is subject to the terms and conditions set forth in the contract between the parties that governs the matters reflected in this invoice.

API Permit #:

Customer: [illegible]

Lease and Well Number: [illegible]

AFE #:

UNIVERSAL

[illegible]

Customer Item Information

No. of Items	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Wellbore Information

	New/Used	Diameter (in)	Weight (lb/ft)	Top (ft)	Bottom (ft)	Collapse/Burst Pressure (psi)
Casing	USED	5.500	20.0	GL	6,500	
Previous Casing						
Tubing or Drill pipe						
Open Hole						
Open Hole						

Requested TOC (ft)	6,500
TVD (ft)	8,500
Displacement Depth (ft)	4,310
Displacement (bbl)	

Packoff Balance	
Spacer or Cut Scrap Behind Shoe at Surface	
Cement Returns Seen at Surface	
Amount of Cement Returns (bbl)	

Cement Slurry Temperature Record (°F)

Cement	Reading 1	Reading 2	Reading 3	Average
Stand 1				
Stand 2				
Stand 3				

Fluid Information

Mix Water Temp (°F)	
Displacement Fluid Type	
Displacement Fluid Temp (°F)	
Displacement Fluid Density (lb/gal)	

Time	Rate (bpm)	Volume (bbl)	Pressure (psi)	Event or Stage Description
16:20				ARRIVE ON LOACTION
16:25				SPOT TRUCKS
16:30				SAFTEY MEETING
16:35				RIG IN
13:10	2			INJECTION TEST
13:15	2			H2O
13:20	2			GEL
13:25	2			H20
13:30	2			CEMENT
13:40	2			DISPLACEMENT
14:40				RELEASE PRESURE
15:20				RIG DOWN
16:00				LEAVE LOCATION

Received
Office of Oil & Gas
JAN 04 2016

Comments:

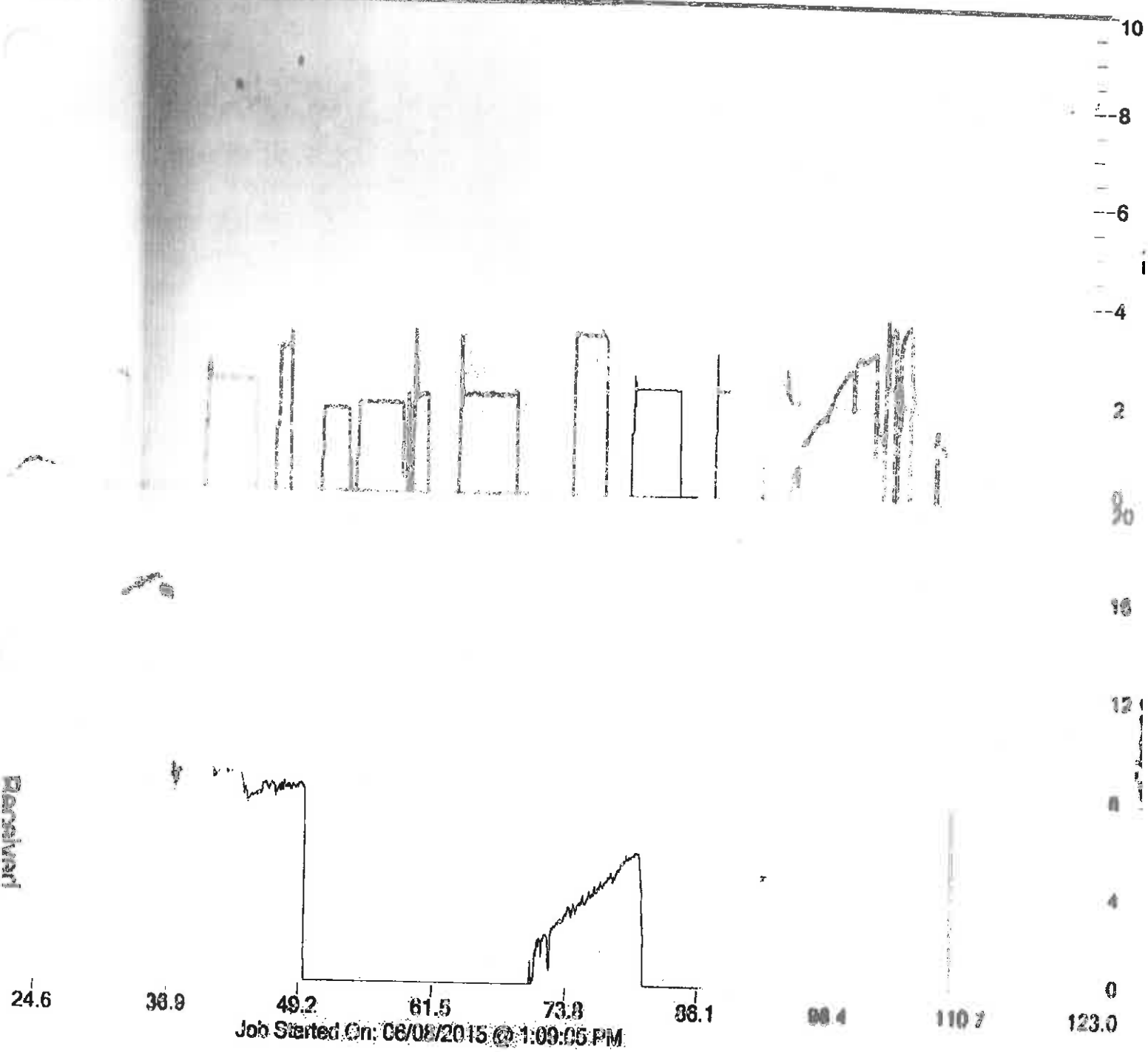
[illegible]

UWS Cement Operator Signature: [signature]

Customer Representative Signature: [signature]

VIKI ENERGY

IRU WELL - API PERMIT # - SQUEEZ JOB



WR-37
REV. 5/01

Date: 6/17/15

Operator's Well Number 2D0392210

API Well No.: 47- 039 - 2210 (State County Permit)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENT-OFFICE OF OIL AND GAS
PRE-OPERATION CERTIFICATE
FOR LIQUID INJECTION OR WASTE DISPOSAL WELL

WELL OPERATOR Viking Energy Corp.
Address PO Box 13366
Sissonville, WV 25360

DESIGNATED AGENT Eric Pinkerton
Address PO Box 13366
Sissonville, WV 25360

GEOLOGICAL TARGET FORMATION Newburg Depth 5557 feet(top) to 5574 feet(bottom)

Virgin reservoir pressure in target formation 2,125 psig

Source of information on virgin reservoir pressure: field estimate, and well record

Perforation intervals Open hole Open-hole intervals 5514'-5584'

MAXIMUM PERMITTED INJECTION OPERATIONS

Well head injection pressure: 2045 psig Bottom hole pressure: 4837 psig

Volume per hour: 150

DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED

Liquids to be injected for oil recovery: Brine,

Wastes to be disposed of: Brine, FlowBack

Additives (Slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.) Biocides, Corrosion Inhibitors

SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL cathodic protection, well head grounded. corrosion additive mixed in with fresh water in annulus.

ADDITIONAL DRILLING AS PART OF THE CONVERSION (Complete form WR-35)

DETAILS ON NEW CASING AND TUBING PROGRAM AS PART OF THE CONVERSION (To be completed below unless the new casing and tubing program is described on a form WR-35, submitted in connection with the permit to which this form WR-37 relates.)

CASING OR TUBING TYPE	SIZE	GRADE	WEIGHT PER FT.	NEW	USED	FOOTAGE USED IN DRILLING	FOOTAGE LEFT IN WELL	CEMENT USED	PACKERS (KIND, SIZE, DEPTH SET)
CONDUCTOR	20"	J-55		x		15.66	15.66	CTS	
FRESH WATER	13 3/8"	n-80	48	x		241.25	241.25	CTS	
COAL									
INTERMEDIATE	8 5/8	n-80	24	x		1745.15	1745.15	CTS	
PRODUCTION	5 1/2"	n-80	20	x		5565.83	5565.83	TOC 4,430'	
TUBING	2 2/3"	n-80	5.6	x		5462'	5462'	added 10' pup joint	Backer-Lock Set
LINERS									5,452

Received
Office of Oil & Gas
JAN 04 2016

WR37

MECHANICAL INTEGRITY TEST

Test Method: [illegible]
Held for 30 min. Recorded test with 1 day chart using Barton flowmeter.

The undersigned certifies that the test was performed on June 17th, 2015 and demonstrated mechanical integrity of the well. The test was witnessed by Eric Urbin and Zach Stevens representing the Office of Oil and Gas.

Danial A. Long
Well Operator

Jun17, 2015
Date

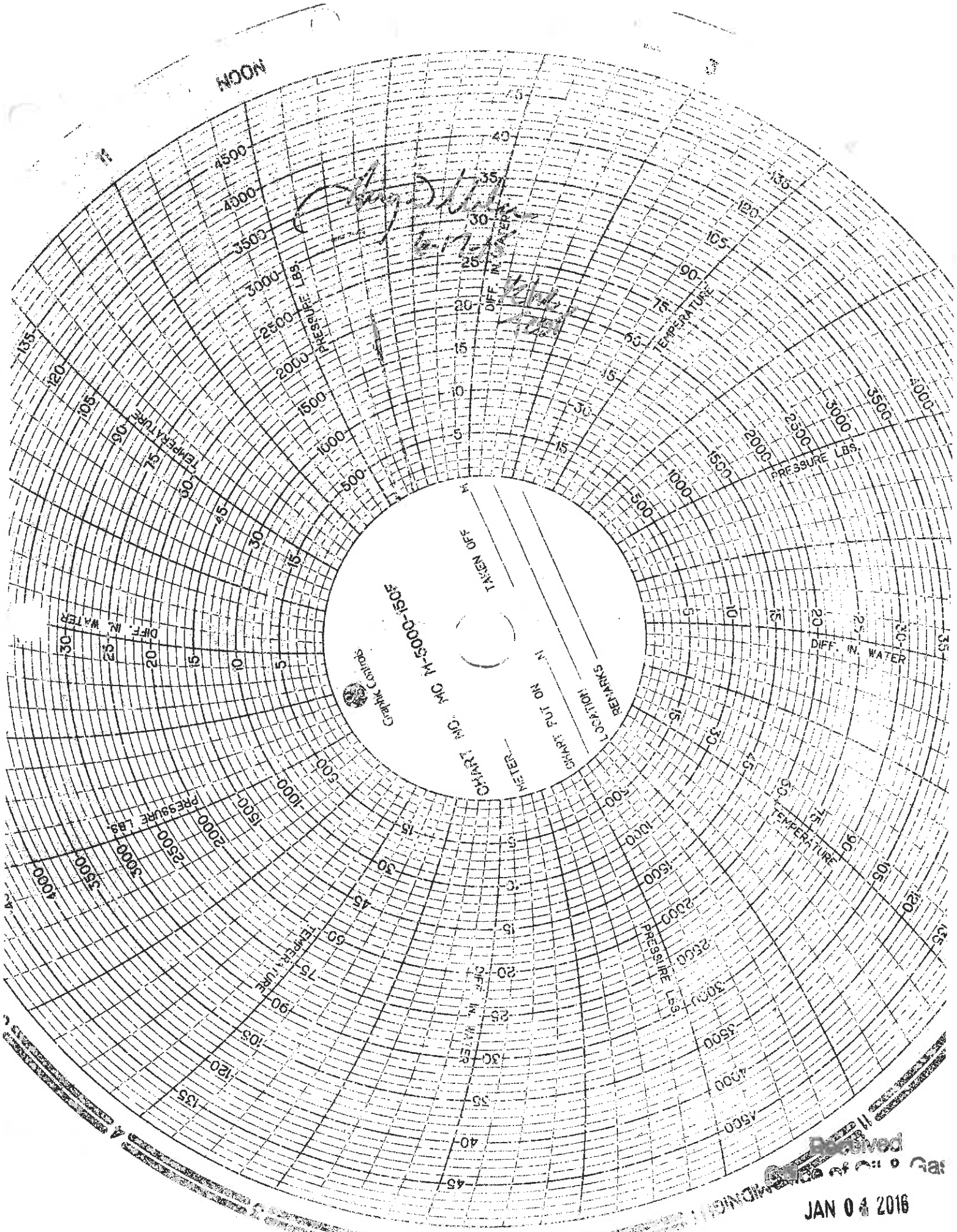
HIS WELL IS AUTHORIZED FOR INJECTION.

Signed _____ UIC PROGRAM DIRECTOR

Date _____

[NOTE: That the mechanical integrity of this well must be demonstrated again within ninety (90) days of five years from this date in order for injection to continue. Please notify the state inspector 24 hours in advance of the test].

Danial A. Long
Well Operator
By: Eric Pinkerton
Its Owner



State of West Virginia
DEPARTMENT OF MINES
OIL AND GAS DIVISION

Rotary ☐
Spudder ☐
Cable Tools ☐
Storage ☐

Quadrangle CHARLESTON

Permit No. KAN-2210

WELL RECORD

Oil or Gas Well _____

Company PENNZOIL COMPANY
Address P. O. Box 1588, Parkersburg, West Va.
Farm Wallace Unit No. 1 Acres 138-1/2
Location (waters) _____
Well No. 1 Elev. 661.73 GR-ch 20" Contract 15.00
District Hurricane County Putnam
The surface of land is owned in fee by J. R. Wallace
Address Route 5, Box 413 Charleston, West Va.
Mineral rights are owned by J. R. Wallace
Address Route 5, Box 413 Charleston, West Va.
Drilling commenced March 11, 1968
Drilling completed April 10, 1968
Date Shot _____ From _____ To _____
Well _____ Depth _____
Open Flow _____ /10ths Water in _____ Inch
_____ /10ths Gas in _____ Inch
Volume _____ Cu. Ft.
Rock Pressure _____ lbs. _____ hrs.
Oil _____ Bbls. 1st 24 hrs.
WELL ACIDIZED _____
WELL FRACTURED 4-20-68 with 500 Gal. Acid 2,B... 3000 JT13, 3000 JT4, 10 Gal. F-52, 50 Gals. Calcium Chloride, 10,000# 20-40 Frac. Sand. Treated with 3 Jet Perforations and 20.5 Bbls. of Water.
RESULT AFTER TREATMENT: Gas: 10 MCF
ROCK PRESSURE AFTER TREATMENT: 1125 #
Fresh Water _____ Feet _____ Salt Water _____ Feet _____

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Soil & Sand			0	30			
Sand (Hard)			30	75			
Red Rock			75	100			
Sand (Hard)			100	115			
Red Rock			115	120			
Shale-Sand-L.S.			120	860			
Sandy Lime			860	890			
Salt Sand			890	1150			
Shale			1150	1183			
Salt Sand			1183	1464			
Little Lime			1464	1486	Water	1190	
Big Lime			1486	1630			
Injun Sand			1630	1703			
Sand & Shale			1703	1750			
Shale			1750	2115			
Lime			2115	2120			
Sand & Shale			2120	2310			
Little Lime			2310	2360			
Berea Lime			2360	4700			
Oriskany			4700	4820			
Lime & Dolo.			4820	5557			
Keyburg			5557	5574			
Lower Dolo.			5574	5584			
Total Depth				5584			

(over)

Received
Office of Oil & Gas
JAN 04 2016

20330
038165

Section 7

Section 7 – Area of Review

1. Attached a the topographic map showing the Columbia Gas 20320 (Wallace Unit #1) Class IID injection well and a one-mile radius around this injection well showing all other oil and gas wells within the one-mile radius, Also attached is a list of all of these wells and copies of their well records.
2. A current evaluation of the ¼ mile area of review (AOR) for the Columbia Gas 20320 (Wallace Unit #1) Class IID injection well has been performed by ALL Consulting (ALL) on December 14, 2015. ALL utilized the West Virginia Department of Environmental Protection's (WV DEP) online oil and gas database and map search features to determine the issuance of new well permits for Kanawha County, West Virginia after the issuance of the Columbia Gas 20320 (Wallace Unit #1) Class IID permit on June 3, 2011. Since June 3, 2011, a total of 75 well permits were issued by WV DEP, of which, 69 are active gas wells and six have been issued permits, but have not been drilled yet. None of the permitted wells are located within the Columbia Gas 20320 (Wallace Unit #1) ¼ mile AOR, so there have been no changes to the original AOR. **Attached is the list of the 69 new well permits issued and their status.**
3. Attached is a ¼ mile AOR map showing the current oil and gas wells in the vicinity of the Columbia Gas 20320 (Wallace Unit #1) well (Permit No. 039-02210). Additionally, included are the well records and plugging reports for the two Oriskany Sandstone wells that occur within the ¼ mile AOR and **Appendix C**. Only one of these wells is on WV DEP's online locator map and the other well is located from the original historic Ohio Fuel Gas map (Columbia Gas) and has been plotted on the new ¼ mile AOR map (see attached).
4. Groundwater is obtained from the bedrock aquifers within the Upper to Lower Pennsylvanian rocks. The bedrock aquifers in Kanawha County occur predominantly within the Pennsylvanian Conemaugh, Allegheny, and Pottsville groups and the Kanawha Formation. Sandstones and siltstones within these three groups can yield groundwater at rates of two to four gallons per minute of potable water and occur at depths of from approximately 50 to 300 feet below the surface. The deepest underground source of drinking water (USDWs) is most likely the Pennsylvanian-aged Saltsburg (Moundsville) Sandstone, which occurs at depths of less than 630 feet.
5. **See attached documents from original permit application.** There are no water wells located within the ¼ mile radius of the Tuppers Creek injection facility. One water well, Denise Eden, which is approximately 1,375 feet from the Tuppers Creek injection facility is sampled and the analysis is attached. Additionally, per permit requirements, Tuppers Creek is sampled in both the upstream and downstream locations and these analyses are attached also.
6. **See attached documents.**
7. No corrective action is necessary. No other oil and gas wells in the ¼ mile area of review are penetrating into or through the existing Newburg dolomite injection zone.
8. Not applicable as this well is not an area permit.

API	Last Permit Issue Date for Well	Completion Date	Surface Owner	Well Number	Current Operator	Well Status	Well Type
039-01754	07/07/2015		BLUE CK COAL & LAND	9033	CHESAPEAKE APPALACHIA, L.L.C.	Active Well	Gas Well
039-01839	01/24/2014		BLUE CREEK GAS CO.	A-2	BLUE CREEK GAS COMPANY	Active Well	Gas Well
039-01935	01/24/2014		BLUE CREEK GAS CO.	3-A	BLUE CREEK GAS COMPANY	Active Well	Gas Well
039-01942	01/24/2014		BLUE CREEK GAS CO.	4-A	BLUE CREEK GAS COMPANY	Active Well	Gas Well
039-02160	02/18/2014	09/19/2014	BAILEY, CLAY & LESLIE	CASSIE BAILEY #1 (9747)	VIKING ENERGY CORPORATION	Active Well	Gas Well
039-02380	09/09/2015		SUTTON, HARRY	1	EXCO RESOURCES (PA), LLC	Active Well	Gas Well
039-02727	05/15/2014	06/19/2014	LAWRENCE, MARY LEE	W.H. LAWRENCE #1	SHALE GAS PRODUCTION, LLC	Active Well	Gas Well
039-02732	03/07/2014		KELLEY, KARL L.	THOMAS W. KELLY #1	SHALE GAS PRODUCTION, LLC	Active Well	Gas Well
039-02733	04/24/2015		BAILEY, C. E.	1	SHALE GAS PRODUCTION, LLC	Active Well	Gas Well
039-02736	02/25/2014	08/20/2014	JONES, RALPH D.	C. E. BAILEY 2	SHALE GAS PRODUCTION, LLC	Active Well	Gas Well
039-02739	04/24/2015		BAILEY, HISEL W.	1	SHALE GAS PRODUCTION, LLC	Active Well	Gas Well
039-02747	08/21/2014	09/17/2014	BAILEY, HISEL W.	HW BAILEY #3	SHALE GAS PRODUCTION, LLC	Active Well	Gas Well
039-02862	04/17/2015		BOWERS, WILLIAM	19-642	CABOT OIL & GAS CORPORATION	Active Well	Gas Well
039-03972	08/30/2013		ORLANDI, INC.	(BR-117) WV 210011	EQT PRODUCTION COMPANY	Active Well	Gas Well
039-04549	12/10/2014		LEMMA REALTY CO., INC.	LEMMA REALTY 1	VIKING ENERGY CORPORATION	Active Well	Gas Well
039-05303	08/30/2013	12/13/1999	THE COURTLAND CO	(COURTLAND 18) WV 215391	EQT PRODUCTION COMPANY	Active Well	Gas Well
039-05763	11/30/2011	12/30/2006	VIKING ENERGY	L. PUGH 2	VIKING ENERGY CORPORATION	Active Well	Gas Well
039-05763	11/30/2011	06/10/2012	VIKING ENERGY	L. PUGH 2	VIKING ENERGY CORPORATION	Active Well	Gas Well
039-05815	07/09/2013	07/13/2006	SHAVER LAND HOLDING, LLC.	GODSHALL 13	MOUNTAIN V OIL & GAS, INC.	Active Well	Gas Well
039-05815	07/09/2013	11/06/2013	SHAVER LAND HOLDING, LLC.	GODSHALL 13	MOUNTAIN V OIL & GAS, INC.	Active Well	Gas Well
039-06284	01/13/2012	04/20/2011	FLEMING, JOHN & SANDRA	JOHN FLEMING 3	LARCH OIL & GAS CORPORATION	Active Well	Gas Well
039-06284	01/13/2012	01/16/2012	FLEMING, JOHN & SANDRA	JOHN FLEMING 3	LARCH OIL & GAS CORPORATION	Active Well	Gas Well
039-06295	06/06/2011	08/28/2011	JEFF'S AUTO PARTS	CAVENDER 1A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06296	06/10/2011	09/16/2011	LEWIS, RICHARD L. II	LEWIS 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06297	06/24/2011	09/02/2011	SETTLE, BOBBY	SETTLE 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06298	07/07/2011	08/04/2011	MOLES, STEPHEN L. & MAXINE D.	MOLES 1	SCHULTZ RUN GAS COMPANY	Active Well	Gas Well
039-06299	07/18/2011	08/17/2011	MOLES, STEPHEN L. & MAXINE D.	MOLES 2	SCHULTZ RUN GAS COMPANY	Active Well	Gas Well
039-06300	07/21/2011	08/28/2011	MOONEY, CARMA LEE	MOONEY 1	SCHULTZ RUN GAS COMPANY	Active Well	Gas Well
039-06301	07/21/2011	09/15/2011	MOFFATT, PHYLLIS J.	MOFFATT 1	SCHULTZ RUN GAS COMPANY	Active Well	Gas Well
039-06303	08/16/2011	01/30/2012	MIKE ROSS, INC.	CROMWELL 1A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06304	08/16/2011	12/08/2011	MIKE ROSS, INC.	CROMWELL 2A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06305	07/29/2011	12/12/2011	HUFFMAN, ROBERT	SAMPLES 4	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06306	07/29/2011	10/27/2011	HUFFMAN, ROBERT	SAMPLES 5	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06310	08/18/2011	10/06/2011	SMITH, MITCHELL	BROOME 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06311	09/06/2011	10/28/2011	EAGLE, EARL RAY	PENNINGTON 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06312	09/27/2011	11/16/2011	REED, ANDREW	REED 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06321	10/28/2011	12/22/2011	ASHLEY, LESLIE D.	BIRD DODD 1A	RAVEN RIDGE ENERGY	Active Well	Gas Well
039-06323	10/24/2011	11/30/2011	GUNNOE, EARL R.	GUNNOE 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06324	01/04/2012	04/16/2012	SMITH, DEXTER	ROLLINS 1A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06325	12/29/2011		SMITH, DEXTER	ROLLINS 2A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06327	04/28/2014	09/06/2013	CENTRAL WV REGIONAL AIRPORT AUTH.	YEAGER 2	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06327	04/28/2014	06/19/2014	CENTRAL WV REGIONAL AIRPORT AUTH.	YEAGER 2	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06329	02/27/2012	05/25/2012	PENN VA. OPERATING, LLC	CF-2H	NORTHSTAR ENERGY CORPORATION	Active Well	Gas Well
039-06330	02/27/2012	06/04/2012	PENN VA. OPERATING, LLC	CARBON FUEL 4H	NORTHSTAR ENERGY CORPORATION	Active Well	Gas Well
039-06331	02/13/2012	04/25/2012	BAIL, RAYMOND III & JANICE	NANCY GREEN 1A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06332	02/13/2012	03/28/2012	BAIL, RAYMOND III & JANICE	NANCY GREEN 2A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06333	02/13/2012	03/24/2012	BAIL, RAYMOND III & JANICE	NANCY GREEN 3A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06334	04/05/2012	05/14/2012	BAIL, RAYMOND III & JANICE	NANCY GREEN 4A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06335	02/13/2012	08/09/2013	HARPER, GARY	HARPER PERDUE 2A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06336	03/20/2012	05/31/2012	KANAWHA CO. PARKS & REC COMMISSION	COONSKIN 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06337	03/29/2012		FLEMING, JOHN	JOHN FLEMING 4	LARCH OIL & GAS CORPORATION	Active Well	Gas Well
039-06338	04/27/2012	06/13/2012	FINNER, DAVID	COPENHAVER 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06339	07/10/2012	08/19/2012	HARPER, CINDY	HARPER PERDUE 1 A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06341	07/05/2012	11/09/2012	FORESTLAND GROUP, LLC	ANNA C. SKINNER 26	C. I. MCKOWN & SON, INC.	Active Well	Gas Well

039-06343	12/11/2012	04/15/2013	FISHER, HOWARD	CRESTON 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06344	11/27/2012	05/24/2013	FISHER, HOWARD	FISHER 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06345	11/21/2013	03/30/2013	ASHLEY, LESLIE AND CONNIE	M. BIRD 1A	RAVEN RIDGE ENERGY	Active Well	Gas Well
039-06345	11/21/2013	06/15/2014	ASHLEY, LESLIE AND CONNIE	M. BIRD 1A	RAVEN RIDGE ENERGY	Active Well	Gas Well
039-06347	12/09/2013	09/13/2013	BODKINS, DANIEL & LAURA	OSBORNE 1A	RAVEN RIDGE ENERGY	Active Well	Gas Well
039-06347	12/09/2013	12/30/2013	BODKINS, DANIEL & LAURA	OSBORNE 1A	RAVEN RIDGE ENERGY	Active Well	Gas Well
039-06348	12/09/2013	12/30/2013	BODKINS, DANIEL & LAURA	OSBORNE 2A	RAVEN RIDGE ENERGY	Active Well	Gas Well
039-06348	12/09/2013	08/08/2013	BODKINS, DANIEL & LAURA	OSBORNE 2A	RAVEN RIDGE ENERGY	Active Well	Gas Well
039-06349	11/21/2013	03/20/2013	BODKINS, DANIEL & LAURA	CRUM 1A	RAVEN RIDGE ENERGY	Active Well	Gas Well
039-06349	11/21/2013	06/10/2014	BODKINS, DANIEL & LAURA	CRUM 1A	RAVEN RIDGE ENERGY	Active Well	Gas Well
039-06352	03/20/2013	07/17/2013	HAYNES, D. ET AL.	D. HAYNES 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06353	03/20/2013	06/05/2013	PEGGY DAVIS HEIRS	DAVIS 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06354	11/20/2013	04/17/2013	TEX SEABOLT	WHITE 1A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06354	11/20/2013	02/01/2014	TEX SEABOLT	WHITE 1A	CUNNINGHAM ENERGY, LLC	Active Well	Gas Well
039-06358	06/12/2013	10/13/2013	PINKERTON, MICHAEL	L.S. HAYNES 2	VIKING ENERGY CORPORATION	Active Well	Gas Well
039-06359	06/26/2013		KANAWHA CO. BOARD OF EDUCATION	CAPITOL HIGH 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06360	07/10/2013	10/28/2013	WALLACE , MATTHEW M.	WALLACE #1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06361	08/08/2013	11/05/2013	PRESSURE PRODUCTS CO. INC.	PRESSURE PRODUCTS #1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06362	08/09/2013	10/01/2013	RIVER RIDGE COMMUNITY CHURCH	RIVER RIDGE 1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06363	08/29/2013	05/18/2014	BOARD OF GOVERNORS , WVSU	WEST VIRGINIA STATE UNIVERSIT	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06365	04/18/2014	05/23/2014	WV DEPT. OF PUBLIC SAFETY, ARMORY BD	NATIONAL GUARD #1	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06366	05/20/2014	10/01/2014	WVSU BRD. OF GOVERNORS	WVSU 2	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06371	02/12/2015	04/14/2015	BOARD OF GOVERNORS, WV STATE UNIVERS	WVSU 3	RESERVE OIL & GAS, INC.	Active Well	Gas Well
039-06372	03/11/2015	04/28/2015	WV STATE POLICE	STATE POLICE #1	RESERVE OIL & GAS, INC.	Active Well	Gas Well

Section 8 – Geological Data on the Injection and Confining Zones:

1. A detailed geological investigation of subsurface features (structural contour and isopach maps) was previously conducted during the original permit application process. Additional geologic research indicates that the Columbia Gas 20320 (Wallace Unit #1) was part of the Rocky Fork Newburg gas field that was discovered and developed in Kanawha County in the late 1960s. The attached structural contour map on the top of the Newburg sandstone shows 20-foot contour intervals and there are no structural geologic features near the Columbia Gas 20320 (Wallace Unit #1) well. Also attached is the isopach map of the Newburg sandstone in the immediate area.
2. The Newburg sandstone is typically a thin, white to gray, very fine-to fine-grained, well sorted sandstone consists mainly of rounded quartz grains (Patchen, 1996). The Newburg sandstone occurs within the C unit of the Salina Group in West Virginia and directly above the Silurian-aged Lockport Dolomite. This well was drilled within the Rocky Fork Field, which is a combination of stratigraphic and structural traps (see attached geologic structure map for the Rocky Fork Field). A geologic cross-section from Patchen (1996) is also attached and shows the open-hole geophysical log correlation of the Newburg sandstone through several wells in Kanawha County. The average porosity of the Newburg sandstone in the Rocky Fork field is 18 percent (Patchen, 1996).
3. The well was drilled in 1968 by Pennzoil and the well completion record is attached. The open-hole geophysical log for the Newburg sandstone interval is included in Section 6.
4. There are multiple confining layers within the Salina and Bass Islands groups in the Columbia Gas 20320 (Wallace Unit #1) injection well. These confining layers, which are composed of interbedded salt units, dolomite, shales, and anhydrite serve as barriers for vertical fluid movement of injectate out of the injection zone. The immediate primary confining zone for the Columbia Gas 20320 (Wallace Unit #1) injection well are dolomites within the Salina C and Salina D units (see attached geophysical log with confining units identified in blue and green). Thickness of the first dolomite immediate above the Newburg injection zone is 22 feet thick and thickness of the second dolomite confining zone is 40 feet. These dolomite units have porosity development of less than two percent with permeabilities of less than 0.01 millidarcies. The fracture pressure gradient for both dolomite confining units would be higher than the maximum allowable surface injection pressure for the Columbia Gas 20320 (Wallace Unit #1) due to the low porosity and permeability of these confining zones. Additional secondary confinement of this injection well would include interbedded dolomites and shales within the Salina D and E units, salt within the Salina F unit, anhydrite within the Salina G unit. and the dolomites within the Helderberg Group. **Additionally, the multiple layers of steel casing strings (of which two of these strings are cemented to the surface), will prevent any potential migration of injected fluids into the Underground Sources of Drinking Water (USDWs).**
5. A review of the well completion and drillers records for all of the Newburg oil and gas wells within a one-mile radius does not distinguish or identify the top and bottom of the

Salina Group in Kanawha County, West Virginia. Very little published data is available for the Salina Group in West Virginia. In Pleasants County, West Virginia, the Salina Group is typically over 900 feet thick with at least 90 to 100 feet of salt occurring within the F unit and a fairly thick section of impermeable anhydrite within the Salina G unit.

6. The geologic structure of the confining zones within the Salina Group will mimic the geologic structural contour map developed on the Newburg sandstone, which occurs within the Salina C unit. Attached is the structural contour map prepared from the well records for the Newburg sandstone of the Salina C unit. The Columbia Gas 20320 (Wallace Unit #1) injection well is highlighted in yellow. The structural contour map on the Newburg sandstone demonstrates normal contours with some nosing, but does not define any geological structure such as a fault in this area.
7. Chemical compatibility of existing in place formation fluids with the injection fluids from various other oil and gas reservoirs present no compatibility issues as the main chemical constituents in the injected brine are naturally-occurring metals, non-metals, and organics (BTEX) that occur from the drilling, completion, and production of oil and natural gas. Some treatment of the injectate at the surface is accomplished to avoid precipitation of other constituents such as iron, bacteria, and scale. Only Class I wells which continuously inject industrial wastes is there an issue with chemical compatibility and original formation fluids.
8. There have been a total of 97 seismic events recorded in West Virginia since 1824 (see attached WVGES documents). There has been one seismic event recorded in Kanawha County, West Virginia since 1824 and that event occurred on June 28, 1991 and was a magnitude of 3.0. This seismic event was located in the very southern portion of Kanawha County. The majority of the seismic events in West Virginia occur very deep within the Rome Trough and are well below the injection depth in the Newburg sandstone in the Columbia Gas 20320 (Wallace Unit #1) well. In 2012, the U.S. Transportable Array (TA) was deployed to West Virginia and a total of 10 portable passive seismic stations were installed and combined with the permanent seismic station at WVU in Morgantown, WV. Currently, most of the TA stations have been removed and there are only four portable seismic stations remaining in WV as of 2016. ALL Consulting has been actively involved in passive seismic monitoring at injection wells in Ohio and has the expertise to evaluate potential seismicity, should it occur.
9. **Fluid movement within the Newburg dolomite injection zone will be a combination radial and linear flow. Based on a total thickness of 17 feet and an average porosity of 9 percent of the injection zone and current inject rates, fluid migration within the Newburg injection zone over time will be limited to the ¼ mile radius around the well (See attached information).**
10. **Currently, there are no domestic or municipal water wells within the ¼ mile AOR.**
11. **The Columbia Gas 20320 (Wallace Unit #1) well injectate is treated with a scale inhibitor, bactericide, and is filtered to assist in chemical compatibility. The SDS sheets and the chemical analysis of the injectate from various sources is in Section 9.**

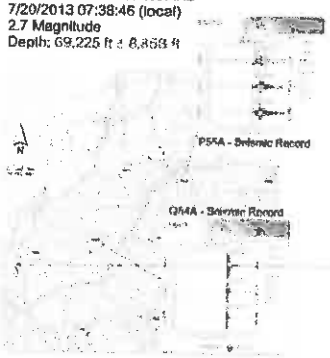
Reference

Patchen, D.G. 1996. Play Sns: The Upper Silurian Newburg sandstone Play, *In* The Atlas of Major Appalachian Gas Plays, John B. Roen and Brian J. Walker (eds.), p. 139-144.

Lewis, E.J. and others. 2009. Characterization of the Helderberg Group as a geologic seal for CO2 sequestration, *In* Environmental Geosciences, V. 16, No. 4., p.201-210.

RECENT EARTHQUAKES IN WEST VIRGINIA

GLENVILLE EARTHQUAKE
7/20/2013 07:38:46 (local)
2.7 Magnitude
Depth: 69,225 ft ± 8,858 ft

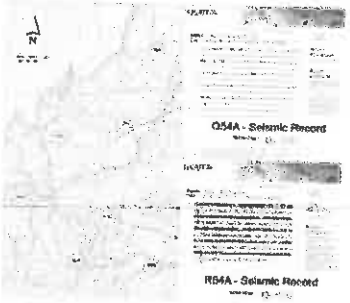


Transportable Array Seismic Stations in WV

Regional Structure Map

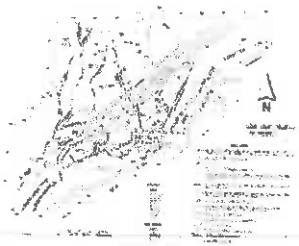
This earthquake is located within the Rome Trough fault zone. 69,000+ ft depth places it deep within the Trough, at or below the top of the crystalline basement rock and well below any sedimentary rock layers. NOTE: there are no injection wells in Gilmer County and this earthquake originated more than 10 miles below the Marcellus Interval.

GLENVILLE EARTHQUAKE
7/30/2013 02:09:05 (local)
2.8 Magnitude
Depth: 41,036 ft ± 8,530 ft



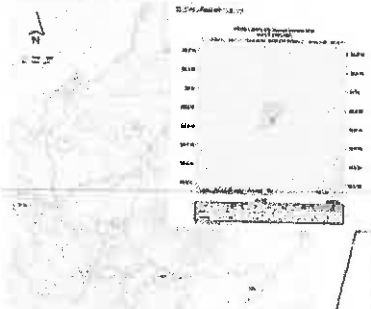
Transportable Array Seismic Stations in WV

Regional Structure Map



This second earthquake is located within the Rome Trough fault zone. 42,000 ft depth places it deep within the Trough, at or below the top of the crystalline basement rock and well below any sedimentary rock layers. NOTE: there are no injection wells in Gilmer County and this earthquake originated more than 6 miles below the Marcellus Interval.

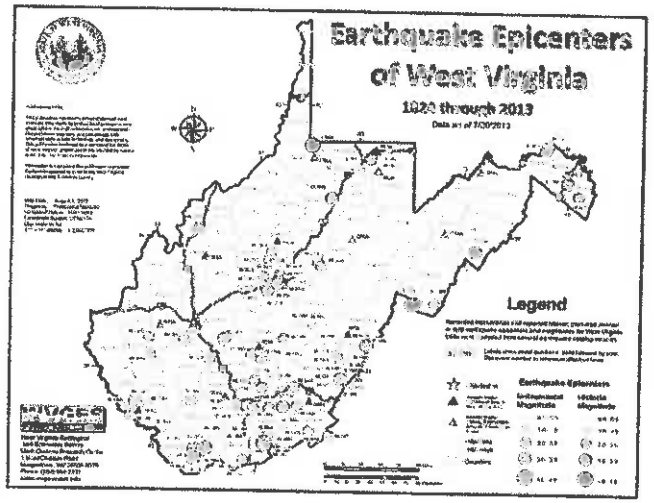
GLENVILLE EARTHQUAKE
8/16/2013 07:02:21 (local)
2.6 Magnitude
Depth: 20,013 ft ± 11,155 ft

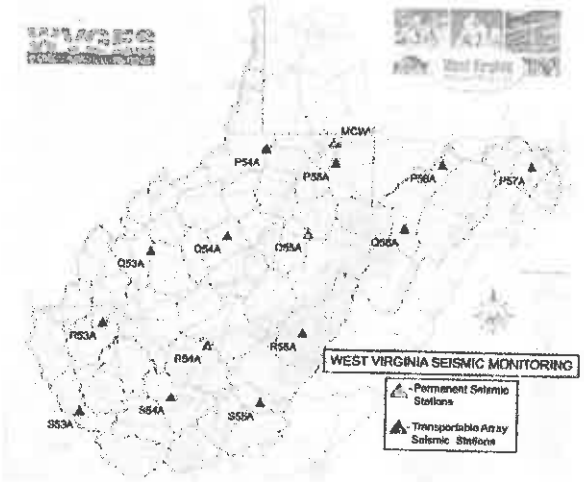


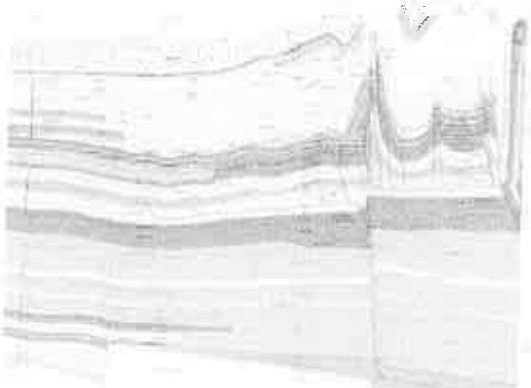
Transportable Array Seismic Stations in WV

Regional Structure Map

This third earthquake is located within the Rome Trough fault zone. 20,000 ft depth places it deep within the Trough, at or slightly above the top of the crystalline basement rock and possibly within the lower sedimentary rock layers. NOTE: there are no injection wells in Gilmer County and this earthquake originated more than 2.5 miles below the Marcellus Interval.





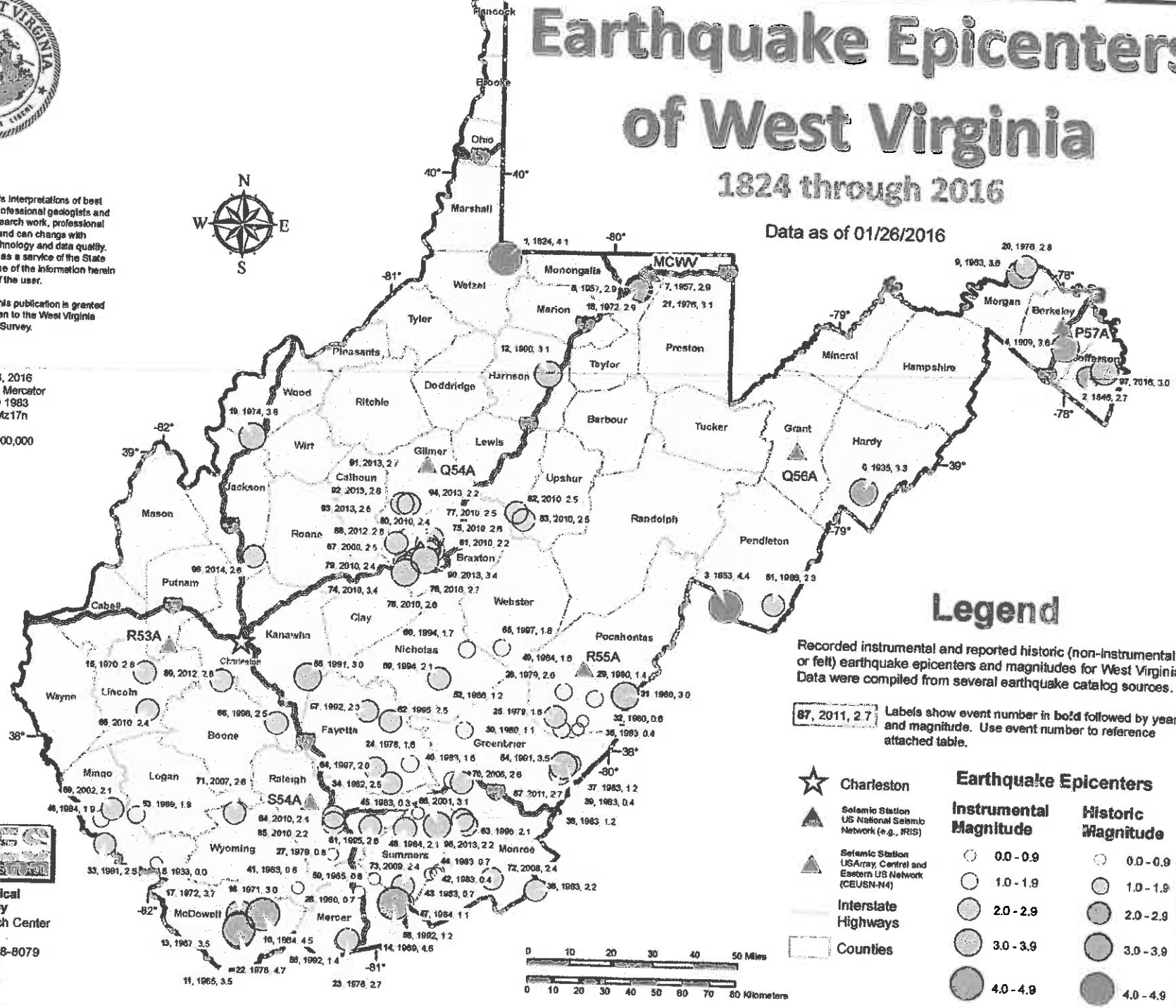


Portion of Rome Trough Cross-section
(from Ryder and other, 2008)

Earthquake Epicenters of West Virginia

1824 through 2016

Data as of 01/26/2016



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

Legend

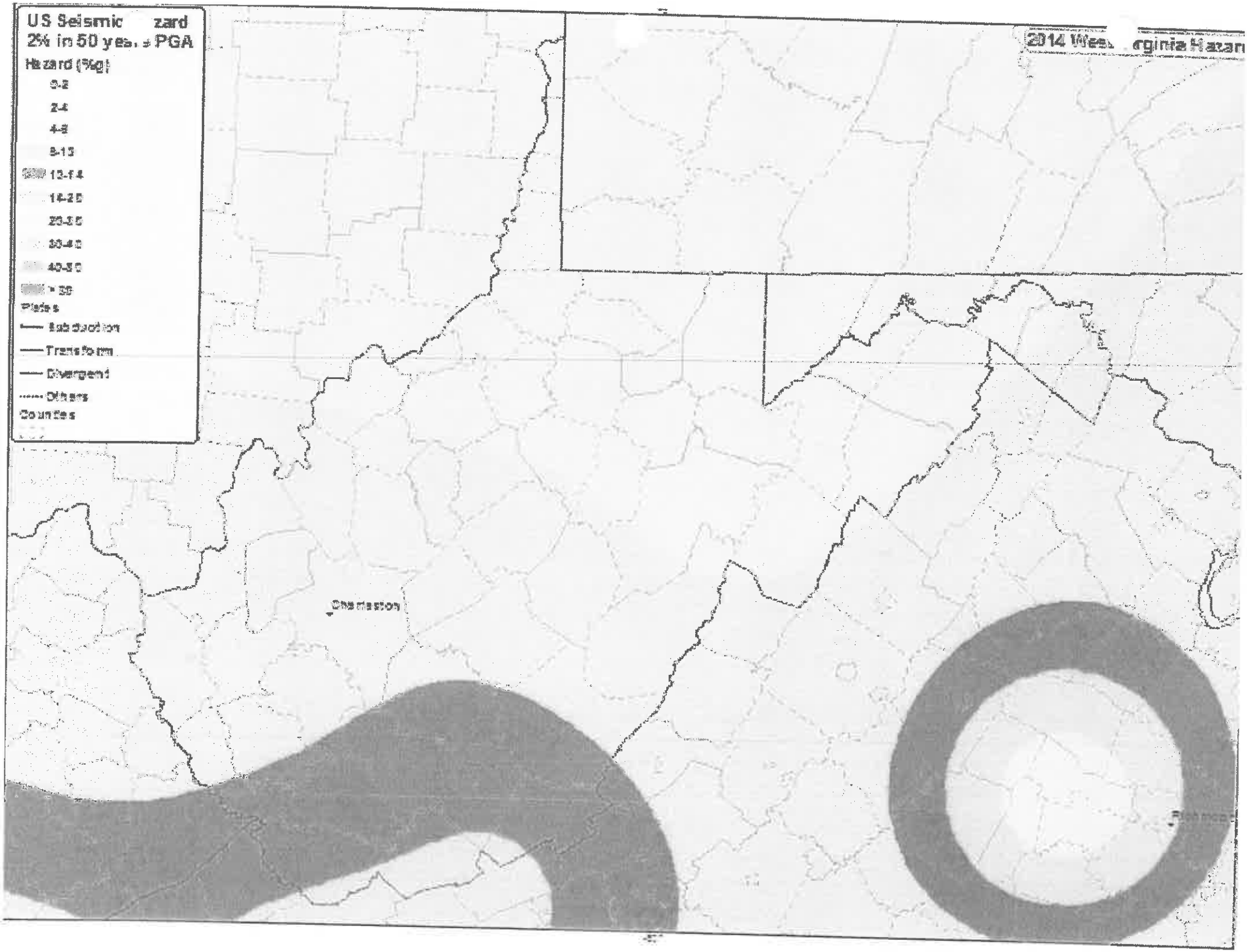
Recorded instrumental and reported historic (non-instrumental or felt) earthquake epicenters and magnitudes for West Virginia. Data were compiled from several earthquake catalog sources.

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

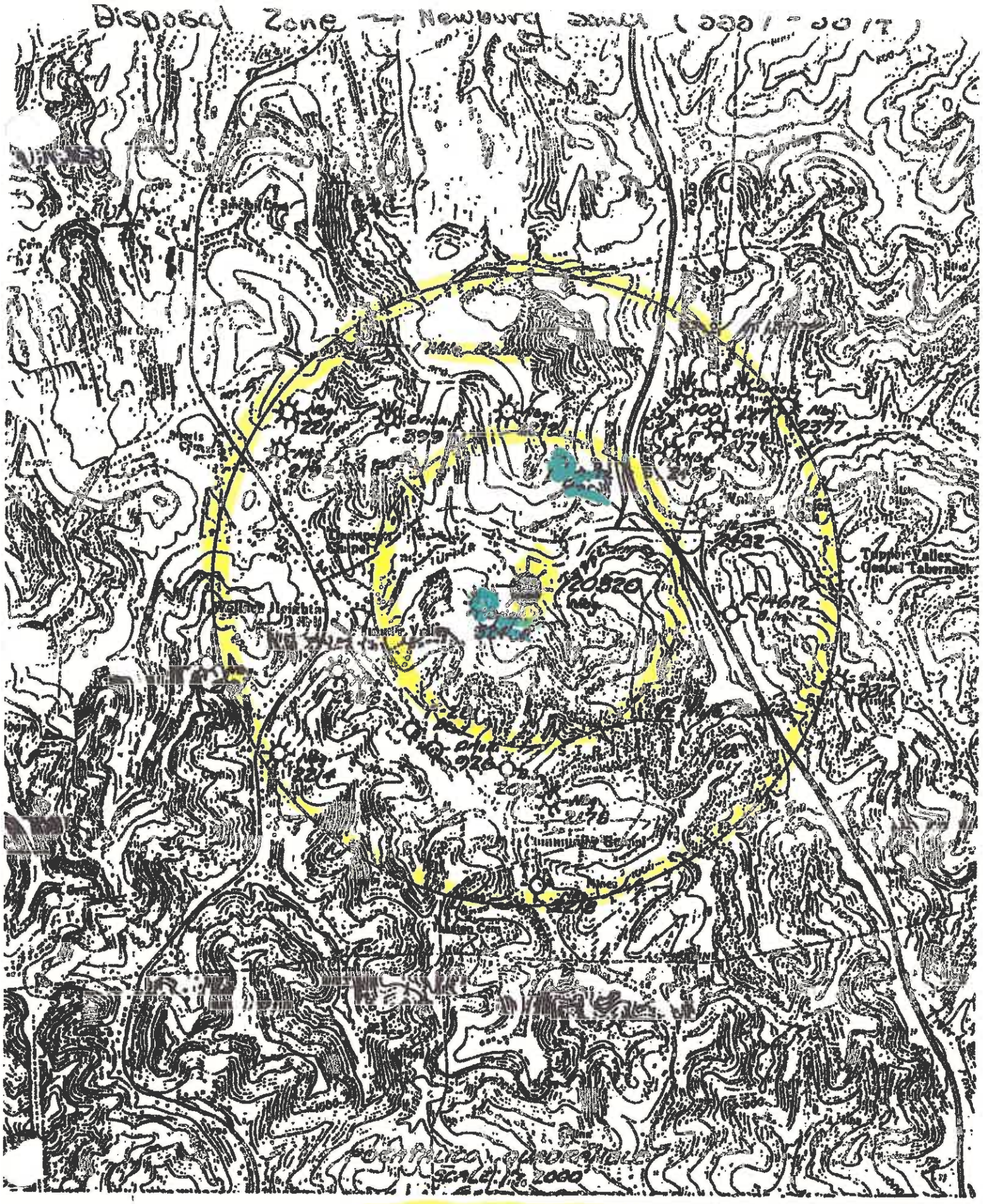
Earthquake Epicenters

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


US Seismic zard
2% in 50 yea. PGA
Hazard (%g)
0-2
2-4
4-8
8-13
13-14
14-20
20-30
30-40
40-50
> 50
Plates
Subduction
Transform
Divergent
Others
Counties
2014 Wes rginia Hazar
Charleston
Richmond

Structural Contour Map on TOP OF NEWBURG
Based on Drillers Logs -
All Datum Subsea

Columbia Gas 30320
(Wallace Unit #1)



LOCATION MAP OF PROPOSED DISPOSAL WELL 20320

1432' S of 38° 30' 00"
7400' W of 81° 37' 30"

- AOR wells

WELL NUMBER	PERMIT NUMBER	F-NUMBER	DATE	ABD.	DEEPEST FORMATION
20320	Kan-2210	F-38663	1968		Newburg
4763	Kan-447		1938	1945	Oriskany
9660	Kan-2226	F-38748	1968		Newburg
9661	Kan-2191	F-38546	1967		Newburg
9666	Kan-2214	F-38689	1968		Newburg
9700	Kan-2192	F-38549	1967		Newburg
9734	Kan-2429	F-39893	1970		Newburg
9838	Kan-2211	F-38664	1968		Newburg
20188	Kan-2377	F-39481	1969		Newburg
20189	Kan-2422	F-39815	1969		Newburg
	No Permit #	F-281	1912		Berea
	Kan-324	F-14591	1937		Oriskany
	No Permit #	F-14612	1937		Big Injun
	Kan-400	F-14901	1937	1943	Oriskany
	Kan-421	F-14945	1937	1945	Oriskany
	Kan-399	F-15021	1938	1943	Oriskany
	Kan-417	F-15211	1938	1969	Oriskany
	Kan-926	F-17687	1942	1942	Oriskany
	Kan-2078	F-37545	1966		Big Injun
	Kan-2178	F-38524	1968		Newburg
	Kan-2212	F-38665	1968	1968	Newburg

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

Rotary ☐
Spudder ☐
Cable Tools ☐
Storage ☐

Quadrangle CHARLESTON

Permit No. KAN-2210

WELL RECORD

Oil or Gas Well

Company PENZOIL COMPANY
Address P. O. Box 1588, Parkersburg, West Va.
Farm Wallace Unit No. 1 Acres 110-1/2
Location (waters)
Well No. 1 Elev. 661.72
District Malden County Kanawha
The surface of tract is owned in fee by J. F. Wallace
Route 5, Box 413
Charleston, West Virginia
Mineral rights are owned by J. F. Wallace
Route 5, Box 413
Charleston, West Va. 25314
Drilling commenced March 21, 1965
Drilling completed April 16, 1965
Date Shot From To
With Open Flow /10ths Water in 4" 1,420 Hrs. Inch
/10ths Merc. in Inch
Volume Est. After Frac. 10,000 Cu. Ft.
Rock Pressure 2125# Hrs. Inch
Oil None Bbls. 1st 24 hrs.
FRESH WATER:

Casing and Tubing	Used in Drilling	Left in Well	Packers
20" Conductor	15.65		Guide Shoe, Cast Iron
13-3/8"	261.35		Kind of Packer
8-5/8"	1745.19		Size of Casing, Cement Shoe, Float Collar
5-1/2"	5563.83		Size of Hole 13-1/8", 8-5/8, 5-1/2, 5-1/2"
5-1/2"	5574.34		Depth set 261.11, 1738.32, 5514.34
			Perf. top
			Perf. bottom
			Perf. top
			Perf. bottom

CASING CEMENTED 13-3/8" size 261.11 No. Ft. 1-27-65 Date
8-5/8" 1738.32 4-1-65
5-1/2" 5514.34 4-16-65
COAL WAS ENCOUNTERED AT FEET INCHES
FEET INCHES FEET INCHES
FEET INCHES FEET INCHES

WELL FRACTURED 4-20-65 with 500 Gal. Acid 5.F., 2000 J111, 5000 J06, 20 Gal. F-52, 50 sacks Calcium Chloride, 20,000# 20-40 Frac. Sand. Treated with 3 Jet perforations and 896 Bbls. of Water.
RESULT AFTER TREATMENT: Gas: 10 MMCF
ROCK PRESSURE AFTER TREATMENT: 2125 #
Fresh Water Feet Salt Water Feet

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Soil & Sand			0	30			
Sand (Hard)			30	75			
Red Rock			75	100			
Sand (hard)			100	113			
Red Rock			113	120			
Shale-Sand-R.R.			120	860			
Sandy Lime			860	950			
Salt Sand			950	1138			
Shale			1138	1183			
Salt Sand			1183	1444			
Little Lime			1444	1486	Water	1190	
Big Lime			1486	1650			
Injun Sand			1650	1703			
Sand & Shale			1703	1750			
Shale			1750	2115			
Lime			2115	2123			
Sand & Shale			2123	2218			
Shale			2218	4600			
Corn. Lime			4600	4788			
Oriskany			4788	4820			
Lime & Dolo.			4820	5557			
Newburg			5557	5574			
Lisch Dolo.			5574	5584			
Total Depth				5584			

(over)

20320

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION 2.

Rotary ☐
Spudder ☐
Cable Tools ☐
Storage ☐

Quadrangle CHARLESTON

Permit No. KAN-2211

WELL RECORD

Oil or Gas Well Gas

Company PENNZOIL COMPANY
Address P. O. Box 1588, Parkersburg, West Va.
Farm Aulen Unit No. 1 Acres 112.50
Location (waters) -
Well No. 1 Elev. 1004.78
District Union County Kanawha
The surface of tract is owned in fee by Marvin L. Aulen
Route 3, Box 489
Address Charleston, West Va.
Mineral rights are owned by Marvin L. Aulen
Route 3, Box 489
Address Charleston, West Va.
Drilling commenced January 28, 1968
Drilling completed February 17, 1968
Date Shot - From - To -
With -
Open Flow /10ths Water in Inch
/10ths Merc. in Inch
Volume Est. 10,000 Mcf. Cu. Ft.
Rock Pressure 2100 lbs. 168 hrs.
Oil None Bbls. 1st 24 hrs.
WELL ACIDIZED -

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
20			Kind of Packer Guide Shoe, Cu
13-3/8"	258.70	258.70	Size of Packer Guide Shoe, Cu
8-5/8"	2100.64	2100.64	Depth set Guide Shoe, Cu
5-1/2"	5835.80	5835.80	Size of Liners 5-1/2", 5-1/2", 2-3
2-3/8"	5879.00	5879.00	Depth set 256.35
13/10			2005.81, 5791.64
8			5782.00, 5853.00
5			Perf. top
Liners Used			Perf. bottom
			Perf. top
			Perf. bottom

CASING CEMENTED 13-3/8" SIZE 258.70 No. Ft. 1-30-68 Date
8-5/8" 2002.81 2-1-68
5-1/2" 5791.44 2-13-68
5-1/2" 5791.44 2-13-68
COAL WAS ENCOUNTERED AT - FEET - INCHES
- FEET - INCHES - FEET - INCHES
- FEET - INCHES - FEET - INCHES

WELL FRACTURED 2-1-68 with 1210 bbls. 120000# 20-40, 30 Gal. Napam acid, 1500# HAC-10, 1000# WG-6, 5000 CW-1, 100000# Potassium Chloride
RESULT AFTER TREATMENT Gas: 29 M.M.C.F.
ROCK PRESSURE AFTER TREATMENT 1954#
Fresh Water - Feet - Salt Water - Feet

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Clay			0	15			
Sand Rock			15	31			
Shale			31	45			
Sand(Water)			45	60			
Shale & Lime			60	75			
Sandy Shale			75	125			
Sand			125	134			
Shale			134	180			
Red Rock			180	240			
Sand			240	252			
Shale			252	370			
Red Rock			370	422			
Shale (Berkan)			422	461			
Red Rock			461	500			
Lime			500	550			
Red Rock			550	570			
Shale			570	840			
Sand			840	900			
Shale			900	930			
Sand			930	1000			
Shale			1000	1230			
Sand			1230	1323			
Salt Sand			1323	1784			
Little Lime			1784	1815			
Pencil Cave			1815	1820			
Big Lime			1820	2005			
Injun Sand			2005	2058			
Shale			2058	4150			
Lime & Shale			4150	4351			

(over)

9838

F. 25639

Form OG-3

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

Rotary ☒
Spudder ☐
Cable Tools ☐
Storage ☐

Quadrangle _____

WELL RECORD

Oil or Gas Well Gas

Permit No. PA-2214

Company Jay Jay Enterprises, Inc.
Address 62 N. Abney, Charleston, W. Va.
Farm L. S. Haynes Acres
Location (waters) _____
Well No. 1 Elev. 844.12
District Union County Kanawha
The surface of tract is owned in fee by L. S. Haynes
Address Charleston, W. Va
Mineral rights are owned by L. S. Haynes
Charleston, W. Va.
Drilling commenced 2-16-63
Drilling completed 2-27-63
Date Shot _____ From _____ To _____
With _____
Open Flow /10ths Water in _____ Inch
/10ths Merc. in _____ Inch
Volume 1 MMCF Cu. Ft.
Rock Pressure 2105 lbs. _____ hrs.
Oil _____ bbls., 1st 24 hrs.
WELL ACIDIZED (DETAILS) _____
WELL FRACTURED (DETAILS) 1000 Bbls water + KCl, 26,000 #20-40 sand

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
13 3/8	251	251	
10			Size of
8-5/8	1960	1960	
7	5700	5700	Depth set
5 3/16			
4½			
3 Tubing	5790	5700	Perf. top
2			Perf. bottom
Liners Used			Perf. top
			Perf. bottom

Attach copy of cementing record.
CASING CEMENTED _____ SIZE _____ No. Ft. _____ Date _____
Amount of cement used (bags) see other side
Name of Service Co. _____
COAL WAS ENCOUNTERED AT _____ FEET _____ INCHES
_____ FEET _____ INCHES _____ FEET _____ INCHES
_____ FEET _____ INCHES _____ FEET _____ INCHES

REMARKS AFTER TREATMENT (Initial open flow or bbls.) 2 MMCF 2,000,000
ROCK PRESSURE AFTER TREATMENT 2105 HOURS 24
Fresh Water _____ Feet _____ Salt Water _____ Feet _____
Producing Sand _____ Depth _____

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Sand & Shale			0	1655			
Shale & Lime			1655	1700			
Big Lime			1700	1867			
Injun Sand			1867	1900			
Sand & Shale			1900	1971			
Shale & Shells			1971	4870			
Onondaga corniferous			4870	4930			
Oriskany			4930	4970			
Lime & Dolomite			4970	5730			
Newburg			5730	5745			

F 39427 P

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

Rotary ☒
Spudder ☐
Cable Tools ☐
Storage ☐

County Charleston
Permit No. KAN 2178-REV

WELL RECORD

Oil or Gas Well Gas

Company M & N Drilling Company
Address P. O. Box 34, Spencer, W. Va.
Farm Blackwell - Cood et al Acres 250
Location (waters) Wolf Fork
Well No. Three (3) Elev. 930
District Union County Kanawha
The surface of tract is owned in fee by
Address
Mineral rights are owned by
Address
Drilling commenced January 3, 1968
Drilling completed January 14, 1968
Date Shot N.A. From To
Open Flow /10ths Water in Inch
/10ths Merc. in Inch
Volume 10,000,000 Cu. Ft.
Rock Pressure N.A. lbs. hrs.
Oil None Bbls. 1st 24 hrs.
WELL ACIDIZED (DETAILS) 1,000 gals. Mud Acid ahead of Frac. Treatment (spearhead)
WELL FRACTURED (DETAILS) Treated with 38,000 gals. waterfrac and 28,000 # sand Treated at 25 BPM and 5,500 PSI
RESULT AFTER TREATMENT (Initial open flow or bbls.) 7,600,000 (MFGC four point test)
ROCK PRESSURE AFTER TREATMENT 1712 HOURS 24
Fresh Water Feet Salt Water 1300 Feet
Producing Sand Newburg Depth 5828-5838'

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer None
13-3/8"	252'	252'	
10 9-5/8"	2045'	2045'	Size of
8			
7"	5815'	5815'	Depth set
5 3/16			
4½			
3			Perf. top None
Tubing		1850'	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

Attach copy of cementing record.
CASING CEMENTED 7" Size 5815' No. ft. 1-13-68 Date
Amount of cement used (bags) 9 5/8"-150sks. / 7"-150sks
Name of Service Co. Well Service/Dowell
COAL WAS ENCOUNTERED AT None 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	30			
Red rock & shale			30	252			
Shale & sand			252	325			
Lt. shale			325	650			
Sand			650	825			
Gr. shale			825	1285			
Salt sand			1285	1690	Salt water 1300'		
Little Lime			1690	1760			
Big lime			1760	1920			
Shale			1920	1940			
Injun sand			1940	1980			
Shale			1980	4958			
Conif. lime			4958	5044			
Oris. sand			5044	5082	Gas		
Lime & dolomite			5080	5828			
Newburg sand			5828	5838	Gas 5829-34'		
Total Depth				5838'			

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Office of Oil & Gas
JAN 04 2016

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F-2851

Form 6043

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

Rotary ☒
Spudder ☐
Cable Tools ☐
Storage ☐

Quadrangle _____

Permit No. KAN 2191

WELL RECORD

Oil or Gas Well Gas

Company Allen Brand
Address P. O. BOX 179, Spencer, W. Va.
Farm D. A. McFarland Acres 48.7
Location (waters) _____
Well No. 1 Elev. 1058
District Union County Kanawha
The surface of tract is owned in fee by _____
Address _____
Mineral rights are owned by D. A. McFarland
Address Charleston, W. Va.
Drilling commenced 11/18/62
Drilling completed 11/29/62
Date Shot _____ From _____ To _____
Well _____
Open Flow /10ths Water in _____ Inch
/10ths Merc. in _____ Inch
Volume Approx. 12,000 MCF Cu. Ft.
Rock Pressure _____ lbs. _____ hrs.
Oil _____ bbls., 1st 24 hrs.
WELL ACIDIZED (DETAILS) _____
WELL FRACTURED (DETAILS) Mac Acid 500 - 1111 1909 - 384 908 Sand 30,200

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
10 1/8	75'	25'	
8 5/8	2120	2120	Size of
6			
5 3/16 2	5835	5835	Depth set
4			
3			Perf. top
2	5828	5828	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

Attach copy of cementing record
CASING CEMENTED 13 3/8 SIZE 75 No. Ft. 11/17/62
Amount of cement used (bags) 65 SK
Name of Service Co. Dowell
COAL WAS ENCOUNTERED AT _____ FEET _____ INCHES
_____ FEET _____ INCHES _____ FEET _____ INCHES
_____ FEET _____ INCHES _____ FEET _____ INCHES

RESULT AFTER TREATMENT (Initial open Flow or bbls.) 41,000 MCF
ROCK PRESSURE AFTER TREATMENT 2200 HOURS
Fresh Water _____ Feet _____ Salt Water _____ Feet _____
Producing Sand _____ Depth _____

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Surface				0			
Shale			0	76			
Shale			76	254			
Sand & Shale			254	500			
Shale			500	775			
Shale			775	921			
Sand			921	1265			
Sand			1265	1400			
Sand			1400	1445			
Sand			1445	1450			
Sand			1450	1652			
1 Water			1652	1652			
Shale			1652	1698			
Shale			1698	1825			
Shale			1825	1940			
Lime			1940	2021			
Sand			2021	2120			
Shale			2120	2400			
Shale			2400	2850			
Shale			2850	3357			
Shale			3357	3902			
Shale			3902	4325			
Grey Shale			4325	4800			
Shale			4800	5020			
Lime			5020	5126			
Sand			5126	5155			
Lime			5155	5180			
Lime			5180	5400			
Lime			5400	5690			

Mr. Robert H. Burdison
Status Oil Wells
Owenby Co.
North

28270

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Office of Oil & Gas
JAN 04 2016

F 38546

Form 23-B

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

Quadrangle _____

Permit No. KAN-2192

WELL RECORD

Rotary ☒
Spudder ☐
Cable Tools ☐
Storage ☐

Oil or Gas Well Gas

Company Moulder Oil & Gas Co.
Address 316 Lincoln Ave., Cadiz, Ohio
Farm V. Aulez Acres 11.5
Location (waters) _____
Well No. 1 Elev. 621.6
District Union County Kanawha
The surface of tract is owned in fee by _____
St al Address _____
Mineral rights are owned by Ethel Spadie et al
Address South Side, W. Va.
Drilling commenced 11-7-67
Drilling completed 11-17-67
Date Shot _____ From _____ To _____
With _____
Open Flow /10ths Water in _____ Inch
/10ths Merc. in _____ Inch
Volume 12,000,000 Cu. Ft.
Rock Pressure 2100# Hr. 24 hrs.
Oil _____ Bbls. 1st 24 hrs.
WELL ACIDIZED (DETAILS) _____
WELL FRACTURED (DETAILS) 1004 Bbls - 28,000# 20-40 sand - 2% KCl
RESULT AFTER TREATMENT (Initial open Flow or Bbls.) 38,000,000 cu ft
ROCK PRESSURE AFTER TREATMENT 2100# HOURS 48
Fresh Water _____ Feet _____ Salt Water _____ Feet _____
Producing Sand _____ Depth _____

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
13 3/8	61	61	
10-3/8	1881	1881	Size of
8 5/8			
6 5/8 7	5620	5620	Depth set
5 1/2			
4½			
3			Perf. top
2 Tubing		5658	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

Attach copy of cementing record.
CASING CEMENTED _____ SIZE _____ No. Sx. _____ Date _____
Amount of cement used (bags) 2100#
Name of Service Co. _____
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
Top Soil			0	10			
Sand-Shale			10	1722			
Big Lime			1722	1793			
Inj Sand			1793	1866			
Shale			1866	4787			
Lime & Dol.			4787	4908			
Oriskany			4908	4960			
Lime & Dol.			4960	5649			
Newburg			5649	5661	gas	5658	
TD			5658				

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JAN 04 2016

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DEPARTMENT OF MINES, DIVISION OF MINES
OIL AND GAS DIVISION

Rotary ☒
Spudder ☐
Cable Tools ☐
Storage ☐

Quadrangle Charleston

Permit No. Kan 2226

WELL RECORD

Oil or Gas Well Gas

Company Big S Investment Company
Address P.O. Box 179, Spencer, W.Va.
Farm Flora Crowder Acres 20
Location (waters) Wolf Pen Branch
Well No. 1 Elev. 832.37
District Union County Kanawha
The surface of tract is owned in fee by
Address
Mineral rights are owned by Joseph Crowder, etal
Address Charleston, W.V.
Drilling commenced 4/19/68
Drilling completed 5/3/68
Date Shot From To
With

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
13 3/8	262	262	
10			Size of
8 5/8	1944	1944	
6			Depth set
5 3/16			
4½	5650	5650	
3			Perf. top
2			Perf. bottom
Liners Used			Perf. top
			Perf. bottom

Open Flow /10ths Water in Inch
/10ths Merc. in Inch
Volume 3,000 Cu. Ft.
Rock Pressure 1235.0 lb. hr.
Oil Bbls. 1st 24 hrs.
WELL ACIDIZED (DETAILS)

Attach copy of cementing record.
CASING CEMENTED 13 SIZE No. Ft. 4/20/68 Date
Amount of cement used (bags)
Name of Service Co. Dowell
COAL WAS ENCOUNTERED AT FEET INCHES
FEET INCHES FEET INCHES
FEET INCHES FEET INCHES

WELL FRACTURED (DETAILS) Mud Acid 500; J-111 1000; J-84 500; Sand 30,000 lbs.

RESULT AFTER TREATMENT (Initial open flow or bbls.) 15,000 mcf 15 bbls oil
ROCK PRESSURE AFTER TREATMENT 1235 HOURS
Fresh Water Feet Salt Water Feet
Producing Sand Newburg Depth 5702

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Subsoil			0	250			
Shale			250	450			
Shale			450	765			
Sand & Shale			765	1111			
Salt Sand			1111	1370			
Salt Sand & Shale			1370	1617			
Lime			1617	1664			
Powell Cave			1664	1669			
Big Lime			1669	1825			
Shale			1825	1944			
Shale			1944	4837			
Lime			4837	4980			
Lime Sand & Shale			4980	5702			
Newburg			5702	5717			
Shale & Lime			5717	5718 TD			

766 PI
F-2748

Form 8510

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

Rotary ☒
Spudder ☐
Cable Tools ☐
Storage ☐

Quadrangle Procktalico
Permit No. 1327

WELL RECORD

Oil or Gas Well Gas

Company Harry A. Holton
Address 208 High St. Barchington, Ohio
Farm L.O. Edens Acres 272.47 Initial
Location (waters) Rock Br. of Tuppers Crk.
Well No. #1 Elev. 794 G.L. 808 K.B.
District Poca County Kanawha
The surface of tract is owned in fee by L.O. Edens
Address Procktalico, W.Va.
Mineral rights are owned by Gizos Service & H. Holton
Address as above
Drilling commenced 6/2/69
Drilling completed 6/10/69
Date last fractured From 5657 To 5717
With 200BBL 1000BW 30,000# 20/40 Sd.
Open Flow /10ths Water in Inch
/10ths Merc. in Inch
Volume Four Point AOF 28 Million Cu. Ft.
Rock Pressure 1722 lbs. hrs.
Oil bbls. 1st 24 hrs.
WELL ACIDIZED (DETAILS)
WELL FRACTURED (DETAILS) Frac. w/500 galls MCA, 1000 BW and 30,000 # 20/40 mesh Sd.
Avg. Injection rate 22.4 BPM @ 4861 #.

Casing and Tubing	Used in Drilling	Left in Well	Packers
16			Kind of Packer
13 3/8"	90'	90'	
10			Size of
8¼ 5/8"	1885'	1885'	
6¼			Depth set
5 1/2"	5657'	5657'	
4¼			
3			Perf. top
2 Tub.	5693	5693	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

Attach copy of cementing record.
CASING CEMENTED 5 1/2" SIZE 5657 No. Ft. 4/8/69 Date
Amount of cement used (bags) 175 cubic feet
Name of Service Co. Dowell
COAL WAS ENCOUNTERED AT FEET INCHES
FEET INCHES FEET INCHES
FEET INCHES FEET INCHES

REMARKS AFTER TREATMENT (Initial open Flow or bbls.) 28 MMCFPD
ROCK PRESSURE AFTER TREATMENT 1722 HOURS
Fresh Water Feet Salt Water Feet
Producing Sand Depth

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Injun Sd	gray	soft	1752	1984			
Berea	brown	hard	2402	2417	show of gas at top		
Devonian Sh	gray	soft	2417	4812			
Onondaga	green	hard	4812	4904			
Oriskany	white	hard	4904	5038			
Helderberg	white	hard	4938	5692			
Marbury	green	hard	5692	5717	gas	5692	10 MM natural

Date 6/9/69
Approved by [signature]
Title

Log
F. 37351

Form 2000-C

Welling 9-30
9-32

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

WELL RECORD

Rotary ☐
Spudder ☐
Cable Tools ☐
Storage ☐
Oil or Gas Well Gas

Quadrangle Charleston
Farm Koch-2429

Company PAN Corp.
Address Box 1273, Jane Lew, W. Va.
Farm Wesley Wolfe C Acres 251
Location (waters) Hughes Fork
Well No. Koch #1 Elev. 834.50
District Pleasant County Harrison
The surface of tract is owned in fee by
Address
Mineral rights are owned by Wesley Wolfe & Wife
Address 1504 Pennsylvania Ave.
Drilling commenced 11-26-69
Drilling completed 12-04-69
Date Shot 2-23-70 From To
Open Flow Hole Water in Inch
Volume Hole Water in Inch
Rock Pressure Cu. Ft.
Oil Bbls. 1st hr.
WELL ACIDIZED (DETAILS)
WELL FRACTURED (DETAILS) Halliburton Co. fractured Newburg with 20 gal. 15% acid (1-20-70)
OPEN FLOW AFTER TREATMENT (Initial open flow or MCF) 15,000 cu.ft.
ROCK PRESSURE AFTER TREATMENT HOURS
Fresh Water Feet Salt Water Feet
Producing Sand Newburg Depth 5840'

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
13 3/8	29'	29'	
10			Size of
8 5/8	1165'	1165'	
6 5/8			Depth set
5 3/16	5770'	5770'	
4 1/2			
3			Perf. top
2 3/8	5842'	5842'	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

Attach copy of cementing record.
CASING CEMENTED 5 1/2 SIZE 5770' No. FT. 13 hrs. Date
Amount of cement used (bags) 150 Sks.
Name of Service Co. Halliburton Co.
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
Surface-Clay			0	40			
Sand			40	165			
Shale			165	215			
Salt & Sand			215	1195			
Limestone			1195	1265			
Sand & Shale			1265	1400			
Shale			1400	4955			
Limestone			4955	5840			
Sand			5840	5842	Gas	5842'	
Total Depth 5842'							

Received
Office of Oil & Gas
JAN 04 2016

RECEIVED
MAR 28 1971
OIL & GAS DIVISION
DEPT. OF MINES

(over)

9.734 ac
F-39893

Form 2049

State of West Virginia
DEPARTMENT OF MINES
OIL AND GAS WELLS DIVISION

Rotary ☒
Spudder ☐
Cable Tools ☐
Storage ☐

Quadrangle Charleston
Permit No. KAN-2422

WELL RECORD

Oil or Gas Well Gas

Company Harry A. Holton
Address 903 High St., Worthington, Ohio
Farm S. J. Pauley Acres 63
Location (waters) Branch of Tuppers Creek
Well No. #1 Elev. 714 G. L.
District Poca County Kanawha
The surface of tract is owned in fee by S. J. Pauley et al
Address Charleston, West Va.
Mineral rights are owned by Harry A. Holton & Cities Service Oil Company Address As above
Drilling commenced 7/17/69
Drilling completed 7/23/69
Date Shot Fractured From 5563 To 5614
With —
Open Flow — /10ths Water in inch
/10ths Merc. in inch
Volume — Cu. Ft.
Rock Pressure — lbs. hrs.
Oil — bbls. in 24 hrs.
WELL ACIDIZED (DETAILS)

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
13 3/10"	129'	129'	
10			Size of
8 5/8"	1809'	1809'	
6 5/8"			Depth set
4½"	5563	5563	
3			Perf. top
2 3/8" Tbg.		5579'	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

Attach copy of cementing record.
CASING CEMENTED 4½" size 5563 No. ft. 7/25/69 Date
Amount of cement used (bags) 175 cubic feet
Name of Service Co. Dowell
COAL WAS ENCOUNTERED AT FEET INCHES
FEET INCHES FEET INCHES
FEET INCHES FEET INCHES

WELL FRACTURED (DETAILS) Truck w/500 gallons MCA, 1141 B.P.S. & 30,000 # 20/40 mesh sand
Average Injection Rate 24 BPM @ 4700#
RESULT AFTER TREATMENT (Initial Open Flow or bbls.) 43 MCF/D 43,000,000
ROCK PRESSURE AFTER TREATMENT 1647 HOURS
Fresh Water Feet Salt Water Feet
Producing Sand Depth

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Injun Sand	Gray	Soft	1625	1745			
Berea	Brown	Hard	2343	2375	Show of gas & water		
Devonian Sh.	Gray	Soft	2375	4735			
Onondaga	Green	Hard	4735	4825			
Helderberg	White	Soft	4825	4900			
Oriskany	White	Hard	4900	5398			
Seneca	Green	Hard	5398	5614	Gas	5398	12.5 MM Natural

Date 9/7/69
Approved By: [signature]
Owner

(over)

20189
5-37516 P.

Form C-6: Jan 1-31

Kanr-399

OUTSIDE WELLS
COMPLETION REPORT

Elev. 983.98 L DF (SPO) F 15021

Map Sq. 60-67

Farm Ellen Good, et al Well No. 1

Well Owners K. Va. Gas Corporation 60-27

On Waters of Tappers Creek

State K. Va. County Kanawha Dist. Union

Depth 5145 Completed 1-31-38, 19

Big Lime { Top 1600 / Bottom 1640 } Sand { Top 1960 / Bottom 1990 }

Oil First Day Barrels Gas 1,986 M Cu. Ft.

Reported by Date 2-3-38, 19

Salt sand 1260-1586. Keener sand 1[illegible]-1759. Berea sand 2422-2432. Brown shale 3630-3710. Brown shale 4080-4245. Brown shale 4740-4965. Coniferous lime 4965-5025. Oriskany sand 5093-5139. Lime 5139-5145. Show gas 1328'. Water 1370'. Little gas 2[illegible]. Gas 3[illegible]-3[illegible]. 27/10 K 6 5/8" (24#) 2,170 L, blew down in 12 hr.

to 2[illegible]/10 M [illegible] (24#) M)
was 5113-5119, 2/10 Hero. 6 5/8" (24#)
2,[illegible]

Tubed 1-31-38. Ran tubing and shown pulling to shoot

Test before shot 5/10 Hero. 6" (390 M)
Shot with 200# gelatin from 5100-5130 2-2-38
Test 15 min. after shot 4/10 Hero. 6 5/8"
(24#) 3,096 M
Test 30 min. after shot 3/10 Hero. 6 5/8"
(24#) 2,68[illegible]
Test 60 min. after shot 3/10 Hero. 6 5/8"
(24#) 2,68[illegible]
Test 2 hrs. after shot 2/10 Hero. 6 5/8" (24#)
2,146 M
Final test (when cleaned out and tubed) 8/10
Hero. 4" (2,089 M)

Casing: 10" 16'
10" 650'
8" 2001'
6 5/8" (24#) 4936'
15 Ft. R. P. 1740'.

COMPLETE LOG ON FILE

Abandoned 1943

OUTSIDE WELLS

Elev. 803.73 1 DF (EPO)

COMPLETION REPORT

F 14591

Map Sq. 60-67

Farm Elmer Thornton, et al. Well No. 1

Well Owners G. R. Ray

On Waters of Tuppers Creek

State W. Va. County Kanawha Dist. Poca

Depth 4936 Completed 6-27-37, 19

Big Lime { Top 1590 / Bottom 1746 } Sand Injun { Top 1755 / Bottom 1904 }

Oil First Day Barrels Gas 1,335 M Cu. Ft.

Reported by Date 7-13-37, 19

Salt sand 1065-1376. Maxon sand 1437-1503. Brown shale 3454-3530. Brown shale 3760-3766. Brown shale 3833-4060. Brown shale 4333-4703. Brown shale 4723-4777. Coniferous lime 4777-4896. Gritsany sand 4896-4933. Lime 4933-4936. Water, 4 bbl per hr. 559'. Hole full water 575'. Show gas 2153'.

Gas 4700-4 [illegible]

6 1/8 H 10 [illegible] (325 M)

Gas 6900, 22/10 M 2" (325 M)

Gas 6914, 24/10 M 2" (278 M)

Gas 6914, 0/10 M 2" 6 5/8" (24/3) 1,017 M

Gas 4926, 0/10 M 2" 6 5/8 M 6 5/8" (24/3) (2[illegible]

Gas 4926, 100/10 M 2" (476 M)

Show test 3 0533, 126/10 M 2" (535 M)

Show before shot, - 159 M

Shot 6-26-37 from 4917-4933 with 60 lbs. [illegible]

nitro before shot. Shot hung off 12:[illegible]

P.M. 6-26-37.

Shot blowing 8 cubic feet gas per hour [illegible]

Hung the fire blew one in 8 seconds and

fired test 2 hrs. after shot - 12/10 hero.

6 5/8" (24/3) 2,227 M

Shut in 2:35 P.M. (Dry Holes Showing Flow)

(-88-54)

Initial load - 5,142

7" Int. P.P. 1,[illegible]

Casing: 13" 20'

10" 404'

8 5/8" 1,[illegible]

6 1/8" (4/3) [illegible]

Pipe in [illegible]

Received
Office of Oil & Gas
JAN 04 2016

PEOPLES NATURAL GAS COMPANY

FOREIGN WELL COMPLETION

Union	PARISH	WELL NO.	37595
Kanawha	DISTRICT	MAP NO.	60-65
W. Va.	COUNTY	ELEV.	787.20
	STATE	DIVISION	Northern
OPERATOR	N & R Drilling Company	COMP. DATE	11-13-66
FARM	W.O. Saad #1		

GAS PURCHASE CONTRACT NO _____

FINAL ABSO. FLOW MCF	Dry	MONITOR	Injun	SOUR PRESSURE
4½" casing 1865'		Big Lime	1610 - 1776	
		Injun	1774 - 1838	
		Total Depth	1865'	

Perforated 4½" casing from 1786-1788 & 1808-1810 with 10 holes.
Fractured 11-21-66 with 300 Bbls. water, 20,000# Sand and 4000# Walnut Hulls.
No Results.
Dry Hole.
Plugged and abandoned.

SIGNED Otto Barnhouse

DATE _____

Form Tr-15 Rev 9-48

Kan-417

1

OUTSIDE WELLS

Elev. 845.15 L.F. (ESP) **COMPLETION REPORT** F. 15211

Map Sq. 60-67

Farm Emmett Thaxton Well No. 1

Well Owners C. E. Bay

On Waters of Tupper Creek

State W. Va. County Lewis Dist. Poca

Depth 5002 Completed 7-3-38, 19

Big Lime { Top 1617 / Bottom 1785 } Sand Injun { Top 1785 / Bottom 1839 }

Oil First Day Barrels Gas 6" 1" Cu. Ft.

Reported by Date 19

Salt sand 1100-1455. Berea sand 2230-2248. Brown shale 3490-3520. Brown shale 3750-3770. Brown shale 3980-4040. Brown shale 4370-4386. Coniferous lime 4386-4951. Oriskany sand 4951-5002. Gas 4950, 3/10 x 2" (13 M). Less before shot 2/10 x 2" (67 M). Shot 7-3-38 with 400# gelatin from 4951-4991.

Sand 15 min. [illegible] 20/10 x 2" (273 M)
Next 30 mins. [illegible] 20/10 x 2" (260 M)
Next 45 mins. [illegible] 20/10 x 2" (213 M)

Final test (mins closed) 1/10 x 2" (45 M)
7-7-38

Casing 13" 88'
10" 1039'
8" 1839'
6 5/8" (Left) 1836'

COMPLETE LOG ON FILE

Ken-926

OUTSIDE WELLS

Elev. 710.2 L (GC) COMPLETION REPORT # 17667

Map Sq. 60-65

Farm W. L. Dood Well No.

Well Owner R. L. Cabot, Inc. #1037

On Waters of

State W. Va. County Kanawha Dist. Union

Depth 4942 Completed 4-29-42 19

Big Lime { Top 1548 / Bottom 1720 } Sand Injun { Top 1720 / Bottom 1763 }

Oil First Day Barrels Gas Dry Cu. Ft.

Reported by Date 19

Corniferous Lime 4819-4847. Oriskany 4847-4886. Lime 4886-4890. Sand 4890-4900. Lime 4900-4902. Sand 4902-4911. Lime 4911-4942. Show oil 7 gas 1726. Show gas 3910. R.P.H 176. Salt water 4858-4861 1½ B.P.H. No shows of gas or oil in Oriskany Sd.

(over)

PLUGGED AND ABANDONED

CASING: 10" 520'
7" 2147' 1767'

COMPLETE LOG ON FILE

Received
Office of Oil & Gas
JAN 04 2016

no permit number

Form Sept 27 1923

OUTSIDE WELLS

COMPLETION REPORT

Elev. 796 L. F. 281

Map Sq. 60-65

Farm Mt. I. Good Well No. 1

Well Owner S. O. G. Oil Company (Clark & Krebs)

On Waters of Wolf Run Branch

State W.Va. County Kanawha Dist. Union

Depth 2304 Completed Dec. 1922

Big Lime	Top 1577	Sand Berea	Top 2224
	Bottom 1703		Bottom 2230
Sand Salt	Top 997	Sand Salt	Top 1015
	Bottom 1011		Bottom 1257

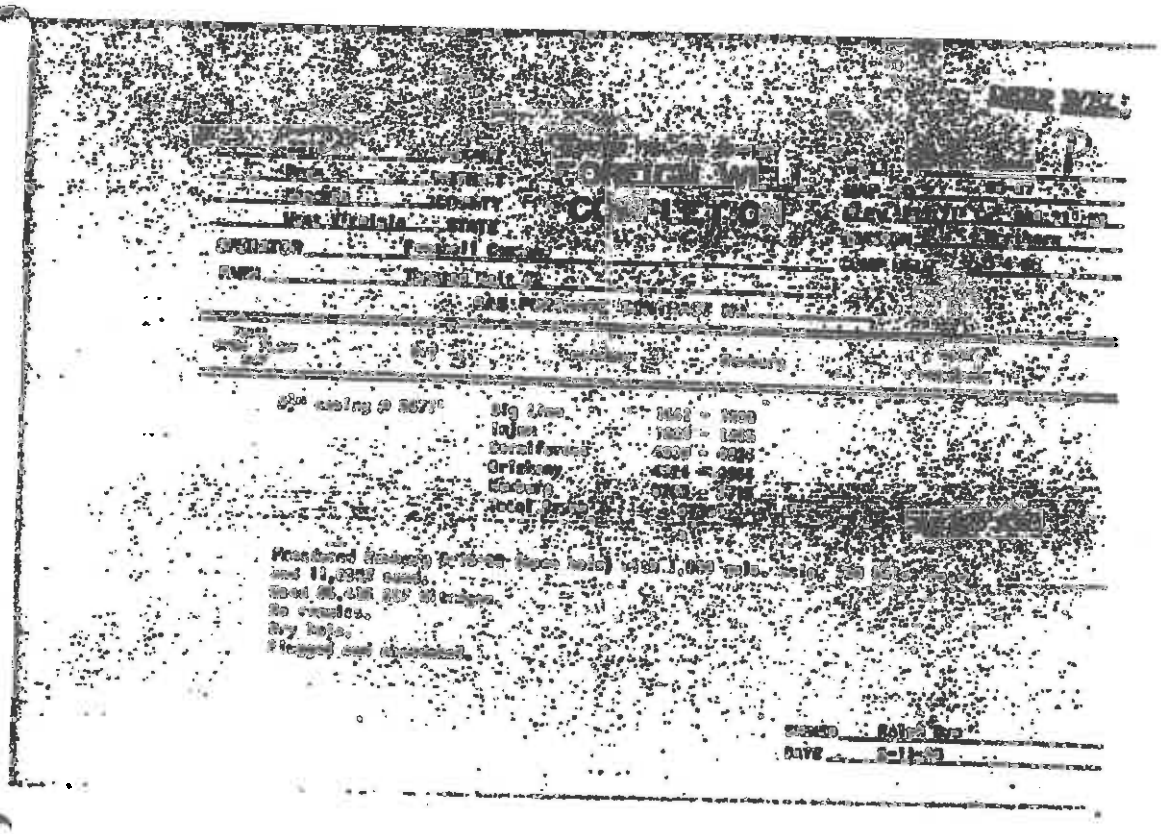
Oil First Day Barrels Gas DRY Cu. Ft.

Reported by I. I. Clark Date Jan-23 19

Remarks: Dry. Sand & Lime 1264-1430. Injun 1703-1793; Squaw 1821-1843. Show oil, g-s and water in Injun. Show oil Berea: 2224'.

Casing: 10" 8" 6 5/8" 5 3/16"

Tbg: 3/4" 4.6# 1505' 2224'



Non-Well No. 1

OUTSIDE WELLS

Elev. 1700

COMPLETION REPORT F. 14512

Map Sq. 63-65

Farm W. E. Shepherd Well No. 2

Well Owner Shepherd Oil Company

On Waters of

State W. Va. County Ritchie Dist. Union

Depth 1697 Completed , 19

Big Lime { Top / Bottom } Sand Injun { Top 1655 / Bottom 1672 }

Oil First Day Barrels Gas Dry hole Cu. Ft.

Reported by Date 7-27-37 , 19

Slate 1671-1697. Shot from 1663-1693 with 60 qts. Sand blue and soft. Show oil in second streak. Dry hole.

FORM 8-20—20M—8-37

OUTSIDE WELLS

Elev. 840.21 L DF (G.S.) **COMPLETION REPORT** F 14931

Map Sq. 60-67

Farm Mary A. Fisher Well No. 1

Well Owners Columbian Carbon Company 631-397

On Waters of Tupper Creek

State W. Va. County Kanawha Dist. Poca

Depth 3026 Completed 11-10-37, 19

Big Lime { Top 1650 / Bottom 1801 } Sand Injun { Top 1801 / Bottom 1847 }

Oil First Day Barrels Gas 2,682 M Cu. Ft.

Reported by Date 12-14-37, 19

Salt sand 970-1080. Salt sand 1085-1152. Keener sand 1377-1384. Berea sand 2254-2270. Brown shale 3275-3300. Brown shale 3875-3925. Brown shale 4540-4845. Coniferous lime 4845-4951. Oriskany sand 4951-4995. Lime 4995-5005. Sand 5005-5016. Lime 5016-5026. Show oil & gas 2580'. Hole full water 1197

(over)

Abandoned 1943

Gas [illegible] 40/10 M [illegible] (201 M)
Gas 4571-4577. 30/10 M 5 5/8" (24#) 1,465 M

Sand before shot 12/10 Berea. 3" (1,366 M)
Filled solid from 5986-4984
Shot 11-11-37 with 50 qts. from 4959-4984.
Test 28 hrs. after shot 5/10 Berea. 6 5/8"
(24#) 4,635 M 6 5/8"
Test 56 hrs. after shot 5/10 Berea. 6 5/8"
(24#) 3,429 M

Final test - when cleaned out - 3/10 Berea.
Tested and shut in 11-15-37 6 5/8" (24#) 2,682 M
1 hr. H.P. 1200#
12 hr. S.I.P. 1700#

Casing: 13" 43'
10" 490'
6 5/8" 1557'
6 5/8" (24#) 4855'

COMPLETE LOG ON FILE

Form U-87 Rev 9-34

DETAILED REPORT
OUTSIDE WELLS

Elev. 835.18 I. BF (SPO)

COMPLETION REPORT

F 14945

Map No. 80-87

Farm Henry Thornton, et al. Well No. 2

Well Owners G. E. Ray

On Waters of Tuppers Creek

State W. Va. County Kanawha Dist. Poca

Depth 4961 Completed 12-22-37, 19

Big Lime { Top 1601 / Bottom 1772 } Sand Injun { Top 1772 / Bottom 1802 }

Oil First Day Barrels Gas 3,492 M Cu. Ft.

Reported by Date 1-5-38 19

Gas 770-1070. Salt sand 1100-1422. Lime sand 1455-1473. Brown shale 3430-3470. Brown shale 3510-3750. Brown shale 3715-4005. Brown shale 4500-4831. Coralferous lime 4831-4931. Gritty sand 4931-4961. Shot per 1215', 1427'. Shot 568 4955' well abandoned.

Hole 4961. 6 5/8" (24#) 1,[illegible]
Open 4955, 6/10 M 6 5/8" (24#) 1,248.
Open 4947, 6/10 M 6 5/8" (24#) 1,017 M
Open 4939, 6/10 M 6 5/8" (24#) 1,[illegible] M
Open before shot 6/10 M 6 5/8" (24#) 1,017 M
Shot 12-22-37 with 60 qts. from 4931-4961
Open after shot 10/10 M 6 5/8" (24#) 3,492 M
Test 1 hr. after shot 10/10 M 6 5/8" (24#) 3,492 M
Well shut in 12-22-37
Final test - 10/10 M 6 5/8" (24#) 3,492 M
9 hrs. B.P. 1575#

Casing: Line 608'
6 5/8" (24#) 1854'
6 5/8" (24#) 4847'

COMPLETE LOG ON FILE

MINING INSPECTOR - 2-11-38

Original depth 4961'
Sand 4931-4961
Total depth 4961
Salt - Min. 2 Bcf 1575# Hydro. 2m (1/61 b.

Kan-447

Elev. 960.97 L DF UNITED FUEL GAS COMPANY

U. 4783 F

COMPLETION REPORT

Map Sq. 60-67

Farm C. L. Whittington Well No.

State W. Va. County Kanawha District Reon

T. D. 5100 Date Started 9-28-37 Date Completed 1-19-38

Sand Salt 1210-1380 Sand Salt 1385-1580 Packer 14" 666'

B. LIME 1750-1915 Mason sand 1600-1708 Casing 10" 1331'

Sand Injun 1915-1945 Br. shale 3560-3640 Casing 8 5/8" 1959'

Sand Berea 2358-2374 Br. shale 3875-3900 Water 7" (24#) 4972'

Oil First Day Bbl. Gas 4,989 M. Cu. Ft. Orig Rock Press Ext. 1200#

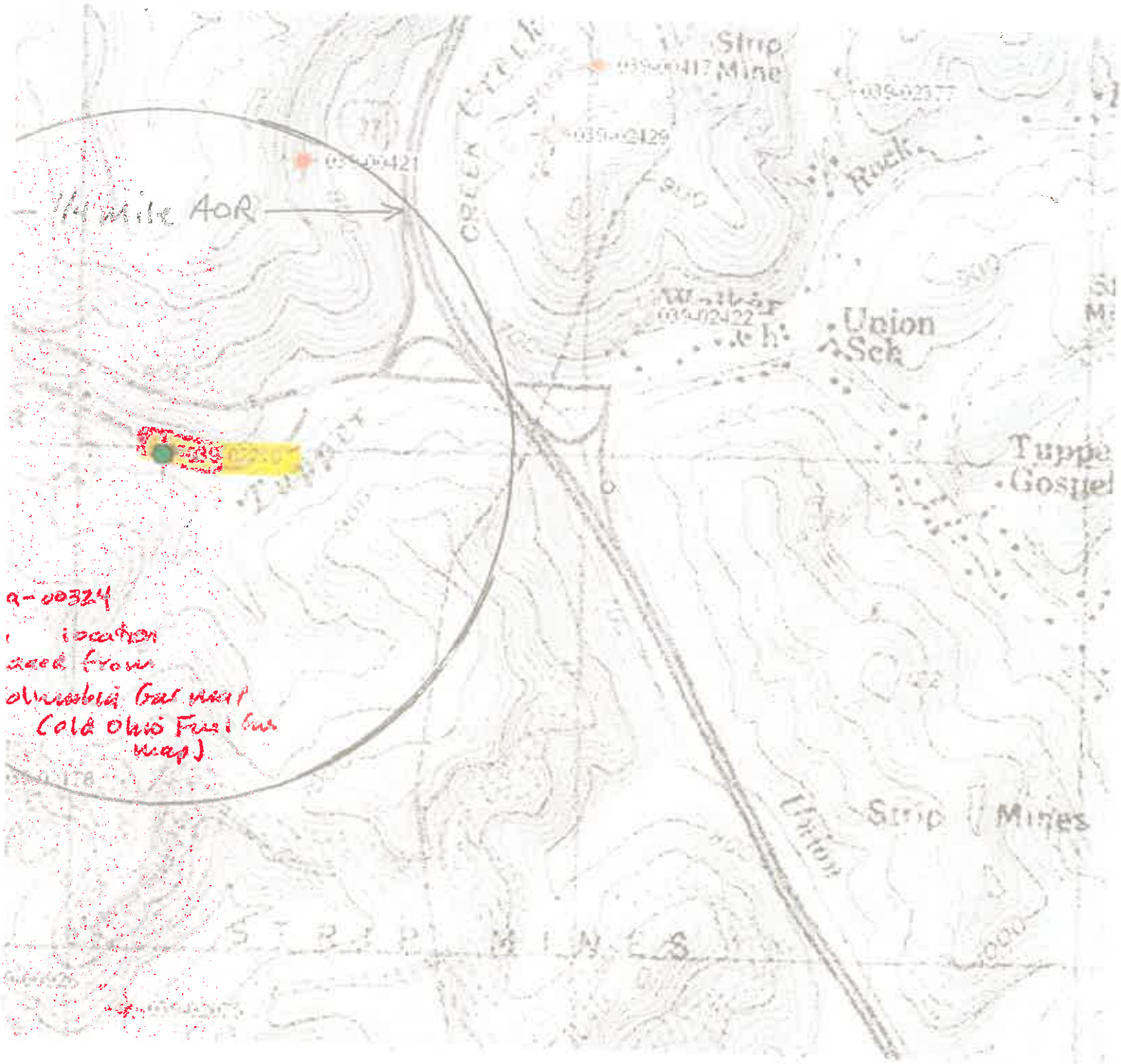
Remarks: Brown shale 3948-3980. Brown shale 4000-4200. Brown shale 4621-4663. Brown shale 4680-4962. Corniferous lime 4962-5062. Oriskany sand 5062-5100. Hole full water, salt 1285-1290. Water 1660'. Hole full water, salt 1355-1370. Show gas 5072. Gas 5072-5075, 2/10 W 2" (67 M). Gas test 5077', 2/10 W 2" (67 M). Gas 5077-5079, 7/10 Mers. 2" (468 M). Gas test 5087, 4/10 Mers. 2" (355 M). Gas 5087-5093, 30/10 M 7" (24#) 2,615 M. Gas 5093-5100, 8/10 Mers. 7" (24#) 4,989 M. Final test - 8/10 Mers. 7" (24#) 4,989 M

Note: Top Oriskany sand 5062' from sand samples - A. E. McClain

COMPLETE LOG ON FILE

4967
9/61
10 of 1

*Current AOR map on WV DEP Oil and Gas website



a-00324
location
taken from
Columbia Gas map
(Cold Ohio Fuel Gas
map)

(4/25)

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
039-00421	Oriskany	Plugged	4257739.72	443449.03	No	No	4961'	833.8'
039-00324	Oriskany	Plugged	4256939.06	442840.12	No	No	4936'	800'

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

Page __ of __

WEST VIRGINIA DEPARTMENT OF MINES
OIL AND GAS DIVISION

Charleston N.W. **WELL RECORD** Permit # 039-00421

Permit No. Kan. 421

Oil or Gas Well Gas
(Kind)

Company Guy B. Ray
Address 213 Kanawha Banking and Trust Bldg., Charleston, W.Va.
Farm Harry Thexton, et al Acres 44.6
Location (waters) Tuppers Creek
Well No. 1 - Serial #8 Elev. 833.8
District Poca County Kanawha
The surface of tract is owned in fee by Harry Thexton
and G. F. Dudley Address Charleston, W.Va.
Mineral rights are owned by Same
Address Same
Drilling commenced August 28, 1937
Drilling completed December 23, 1937
Date shot 12/23/37 Depth of shot 4937-4961
Open Flow 90 /10ths Water in 6 5/8" O.D. Inch
/10ths Merc. in Inch
Volume 3 [illegible] 3862 M.Cu. Ft.
Rock Pressure lbs. hrs.
Oil bbls., 1st 24 hrs.
Fresh water feet feet
Salt water feet feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			
13			Kind of Packer
10	603'	603'	
8 1/4	1054'	1054'	Size of
6 5/8 O.D.	4849'	4849'	
5 3/16			Depth set
3			
2			Perf. top
Liners Used			Perf. bottom
			Perf. top
			Perf. bottom

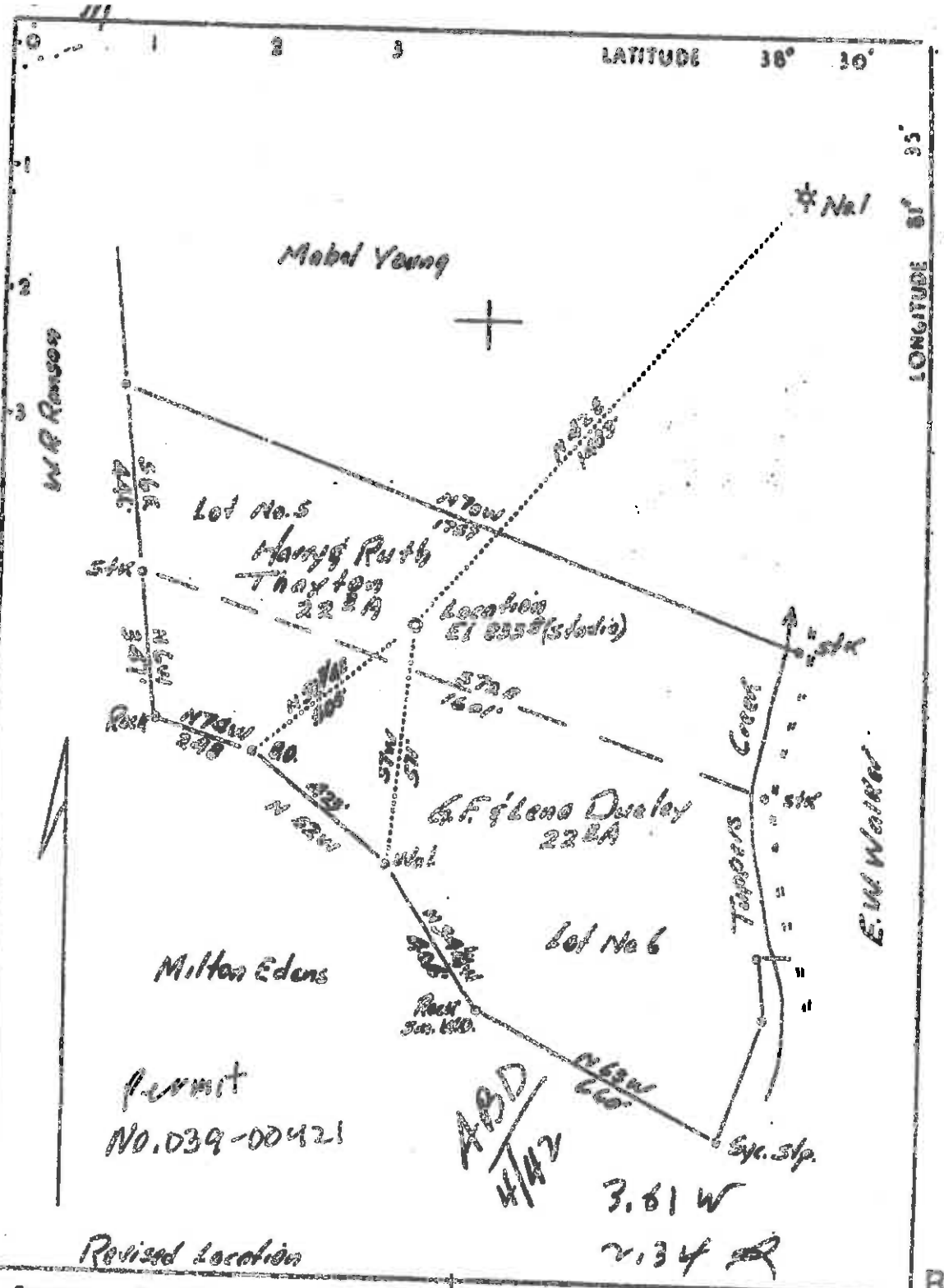
CASING CEMENTED 6 5/8 SIZE No. FT. 12/6/37 Date
60 Bags behind casing.
COAL WAS ENCOUNTERED AT FEET INCHES
FEET INCHES FEET INCHES
FEET INCHES FEET INCHES

Formation	Color	Hard or Soft	Top	Bottom	Oil Gas or Water	Depth Found	Remarks
Surface							
Red Rock			0	50			
Sand			50	60			
Red Rock			60	170			
Slate			170	180			
Red Rock			180	200			
Slate			200	220			
Red Rock			220	280			
Sand			280	380			
Slate			380	405			
Sand			405	455			
Slate			455	560			
Gas Sand			560	970			
Slate			970	1070			
Salt Sand			1070	1100			
Slate and Lime Shells			1100	1402	Gas	1115	Show
Maxon Sand			1402	1455			
Slate			1455	1573			
Little Lime			1573	1575			
Pencil Cave			1575	1597			
Big Lime			1597	1601			
Big Injun			1601	1772			
Slate			1772	1802			
Lime Shell			1802	1829			
Slate and Shells			1829	1870			
Brown Shale			1870	3430			
Lime Shell			3430	3470			
Shale			3470	3510			
Brown Shale			3510	3710			
Slate and Shells			3710	3750			
Brown Shale			3750	3785			
Lime			3785	4005			
Slate, grey	Grey		4005	4050			
Brown Shale			4050	4500			
Corniferous Lime			4500	4831			
Oriskany Sand		Hard	4831	4931	Gas	4936	S.I.P. 4849'
			4931	4961	"	4953	60/10 W 6 5/8"
		TOTAL DEPTH		4961	"	4955	90/10 W 6 5/8"

Elevation 835.18 rig floor.

Shot 60 Qts.

45 days accumulation



Company Guy E. Ray

Address 215 Kanawha Banking & Trust Bldg. Charleston, W.Va.

Farm Harry Thaxton et al

Tract 5 & 6 Acres 44.6 Lease No.

Well (Farm) No. 1 Serial No. 5

Elevation (Spirit Level) 855.8 (Studio)

Quadrangle Charleston

County Kanawha District Pock

Engineer Robert S. Hyde

Engineer's Registration No. 646

File No. Drawing No.

Date July 27, 1957 Scale 1"=500'

STATE OF WEST VIRGINIA
Department of Mines
OIL AND GAS DIVISION
CHARLESTON

WELL LOCATION MAP

File No. KAN-421 Rev P

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.

Form 08-8

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

AFFIDAVIT OF PLUGGING AND FILLING WELL

Permit No. 039-00121

AFFIDAVIT SHOULD BE MADE IN TRIPLICATE, ONE COPY MAILED TO THE INSPECTOR, 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.

COAL OPERATOR OR OWNER: _____

ADDRESS: _____

COAL OPERATOR OR OWNER: _____

ADDRESS: _____

LESSOR OR PROPERTY OWNER: _____

ADDRESS: _____

NAME OF WELL OPERATOR: William J. Maier et al.

COMPLETE ADDRESS: Kanawha Valley Bank Bldg., Chas. W.Va

WELL AND LOCATION: Harry Thaxton et al. 194

Poca District

Kanawha County

Well No. 1 (Serial #3)

Harry Thaxton et al. Farm

STATE INSPECTOR SUPERVISING PLUGGING: Mr. Hall

AFFIDAVIT

STATE OF WEST VIRGINIA,
County of _____ } ss:

G.W.Kelly and Leo C.Miller 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 Ohio Eastern Service, Inc., well operator, and participated in the work of plugging and filling the above well, that said work was commenced on the 29th day of April, 194?, and that the well was plugged and filled in the following manner:

SAND OR ZONE RECORD	FILLING MATERIAL			PLUGS USED	CASING	
FORMATION	CONTENT	FROM	TO	SIZE & KIND	CSG PULLED	CSG LEFT IN
4958' tubing pulled (2")						
Plug #1					4958'	None
Oriskany--filled with non-porous material from 4961' to 4829' and drove 5½" wood plug--Then dumped 10 sacks cement and filled 50' with red clay.						
	Pulled 3575' --6 5/8" O.D. casing				3575'	1274'
Plug # 2						
Set permanent bridge at 1864'--10' below 8¼" casing--Dumped one (1) sack cement--Pulled 8¼" casing					1815'	39'
Then filled withered clay from 1864' to 1621' and dumped 10 sacks cement; Filled to 1050' and drove wood plug 1050' to 1047': Dumped 12 sacks cement-Sealing Maxon Sand.						
Plug #3						
Set permanent bridge at 603'--at 10" casing seat--drove wood plug and filled to surface with red clay and erected monument-as described in rule 18, 1951 regulations--Giving name of operator, Farm name, well No. and date of abandonment						

COAL SEAMS

(NAME) No coal seams shown on well log.
(NAME)
(NAME)
(NAME)

DESCRIPTION OF MONUMENT: Made of cement 28"x28" x36" high

and that the work of plugging and filling said well was completed on the 23 day of _____, 1942.

And further deponents saith not.

L.C. Miller
G.W. Kelly

Sworn to and subscribed before me this 30 day of May, 1942

F.N. Mills
Notary Public.

My commission expires:
Nov. 2, 1950

Permit No. Kan-421-(2)

JARRETT PRINTING COMPANY, CHARLESTON, W. VA.

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

Permit No. 039-00324

WELL RECORD

Permit No. KAN-324

Oil or Gas Well (KIND)

Company Guy B. Ray
Address Charleston, W. Va.
Farm Elmer Thaxton et al Acres 89.2
Location (waters) Tuppers Creek
Well No. Thaxton No. 1 Elev. 800- B
District Pena County Kanawha
The surface of tract is owned in fee by Elmer Thaxton
Address
Mineral rights are owned by same
Address
Drilling commenced March 6, 1937
Drilling completed June 27, 1937
Date Shot 8/28/37 From 4918 To 4961
With
Open Flow /10ths Water in Inch
12 /10ths Merc. in 6-h/0" Inch
Volume 5329 M - 2 hrs after shot Cu. Ft.
Rock Pressure lbs. hrs.
Oil bbls., 1st 24 hrs.
Fresh water 388e 539 feet feet
Salt water feet feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
13		20'	
10			Size of
8¼		1828' 3"	
6⅝		4825' 6"	Depth set
5 3/16			
3			Perf. top
2			Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED SIZE No. Ft. 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 Found	Remarks
Surface				5			
Sand			5	115			
Red rock			115	145			
Blue mud			145	205			
Red rock			205	225			
Blue mud			225	230			
Red Rock			230	385			
Sand			385	425			
Slate			425	435			
Sand			435	440			
Slate			440	500			
Sand			500	515			
Slate			515	545			
Sand			545	575	water 469 - 4 bailers		
Slate			575	945			
Sand			945	970			
Slate			970	990			
Sand			990	1025			
Slate			1025	1040			
Sand			1040	1045			
Slate			1045	1065			
SALT SAND			1065	1376			
Slate break			1376	1381	Finished cleaning out to produce 6/28/47 and shot several times - decided to abandon		
Sand			1381	1400			
Slate - shells			1400	1437			
MAXTON SAND			1437	1505			
Lime slate			1505	1560			
Little Lime			1560	1584			
Pencil Cave			1584	1590			
BIG LIME			1590	1746			
Shell			1746	1755			
INJUN SAND			1755	1804			
Slate			1804	1815			
Shell			1815	1840			
Slate - shells			1840	1930			
slate - blue			1930	2010			
slate - shells			2010	2295	gas 2165		
Shell - hard			2295	2310			
White slate			2310	2560			

(Over)

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
Lime shells			2560	2588			
White slate			2588	3442			
Shell		hard	3442	3454			
Brown shale			3454	3530			
slate shells			3530	3700			
Brown shale			3700	3788			
Slate			3788	3830			
Brown shale			3830	4060			
Slate			4060	4530			
Brown shale			4530	4705			
slate			4705	4725			
brown shale			3725	4797			
CORNIFEROUS	LIME		4797	4898			
ORISKANY			4898	4933	Gas 4905'		
Lime			4933	4936			

Permit No. 039-00324

Date July 16, 1937

APPROVED Guy R. Ray, Owner

By _____
(Title)

FORM 00-3

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

AFFIDAVIT OF PLUGGING AND FILLING WELL

AFFIDAVIT SHOULD BE MADE IN TRIPLICATE. ONE COPY MAILED TO THE DEPARTMENT, 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 REPORTED ADDRESSES.

COAL OPERATOR OR OWNER

ADDRESS

COAL OPERATOR OR OWNER

ADDRESS

LEASE OR ROYALTY OWNER

ADDRESS

TUPPERS CREEK OIL & GAS COMPANY
NAME OF WELL OPERATOR
Charleston, West Va.
COMPANY ADDRESS

Permit No. 039-00324

19 4

WELL AND LOCATION

POCA District

KANAWHA County

Well No. 1

ELMER THAXTON ET AL Farm

STATE INSPECTOR SUPERVISING PLUGGING D. E. Lawson

AFFIDAVIT

STATE OF WEST VIRGINIA,
County of KANAWHA } SS:

H. O. Perkins and J. Holley

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 Superior Pipe & Supply Co., well operator, and participated in the work of plugging and filling the above well, that said work was commenced on the 29th day of April, 1947, and that the well was plugged and filled in the following manner:

BAND OR TOPS RECORD	FILLING MATERIAL			PLUGS USED	CASING	
FORMATION	CONTENT	FROM	TO	SIZE & KIND	CSG PULLED	CSG LEFT IN
TOTAL DEPTH - 4936'						
Set a permanent bridge at 4855' - 30' below 6-5/8" casing and above shot hole 2 sacks cemetn on bridge and 5' crushed stone - 30' clay on cement and rock.						
CUT - 6/58" and remove. SET A PERMANENT BRIDGE at 2185' - 2 sacks neat cement and 5' crushed stone on cement. Fill with clay to 1990' - Neat cement 1990-1980' Wood plug or 5' crushed stone on cement.						
CUT - 8-1/4" casing above point cemented and pull. SET A PERMANENT BRIDGE on Parted 8-1/4" casing. Finish Filling salt sand with clay. SET A PERMANENT BRIDGE at 575' - 2 sacks neat cement and 5' crushed stone on bridge. Fill to surface.						

COAL SEAMS
(NAME)
(NAME)
(NAME)
(NAME)

DESCRIPTION OF MONUMENT
Erected Marker as prescribed by Law.

Received
Office of Oil & Gas
JAN 04 2016

and that the work of plugging and filling said well was completed on the May 15th day of May, 1947.

And further deponents saith not.

H. O. Perkins
Jay Holley

Sworn to and subscribed before me this 14th day of May, 1947.

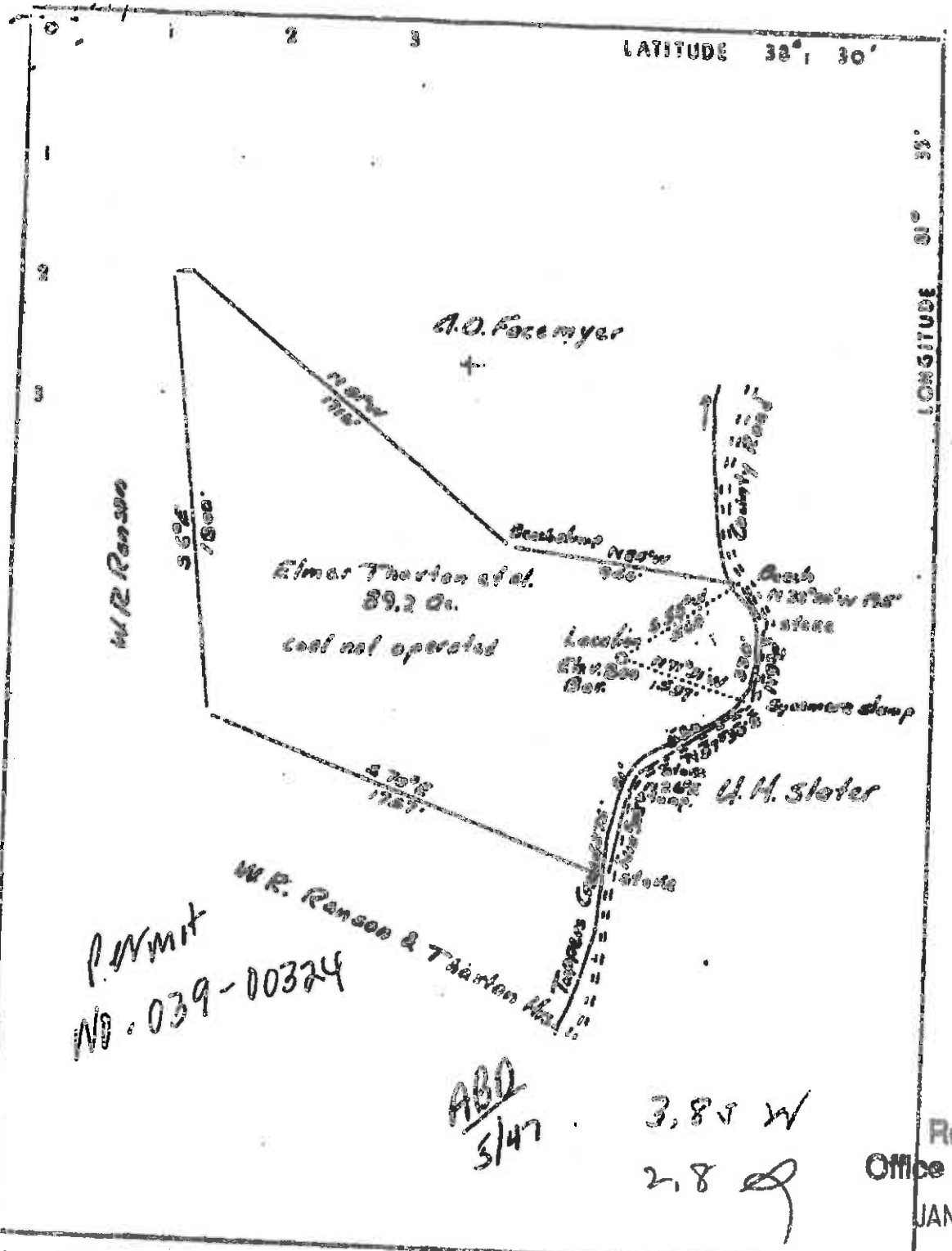
Margaret Martin
Notary Public.

My commission expires:
My Commission Expires Jan. 20, 1952

Permit No. KAN-324-P

MARSH PRINTING COMPANY, CHARLESTON, W. VA.

C.M.H.



Company Guy R. Ray
Address Hamlin, W. Va.
Farm Elmer Thornton et al
Tract Acres 89.2 Lease No. 1
Well (Farm) No. 1 Serial No.
Elevation (Spirit Level)
Quadrangle Charleston - N.W. NC
County - Kanawha District Pond
Engineer S. B. Cook
Engineer's Registration No. 4274-Pe.
File No. Drawing No.
Date 1-12-57 Scale 1" = 500'

STATE OF WEST VIRGINIA
Department of Mines
OIL AND GAS DIVISION
Charleston

WELL LOCATION MAP

File No. KAN-324 P

+ Denotes location of well on U. S. 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.

IDENTIFICATION OF PUBLIC DRINKING WATER SOURCES WITHIN A ONE MILE RADIUS OF THE COLUMBIA GAS 20320 (WALLACE UNIT #1) CLASS IID INJECTION WELL

ALL Consulting initially contacted the Sissonville Public Service District on December 11, 2015 in Sissonville, West Virginia to identify any public drinking water sources within a one-mile radius or complete the required WV DEP affidavit (see attached letter). Additionally, Viking Energy Corporation contacted West Virginia American Water and received a letter on December 11, 2015 that WV American Water did not have any public drinking wells within the one-mile radius of the Tuppers Creek injection facility (see attached letter). On December 17, 2015, ALL Consulting received the attached affidavit from the Sissonville Public Service District that they have only sewer jurisdiction and not oversight of public drinking water supplies in the area.

KANAWHA-CHARLESTON HEALTH DEPARTMENT
108 Lee Street, East /PO Box 927
Charleston, WV 25323-0927
(304) 344-KCHD (5243)

www.kchd.wv.org

December 29, 2015

Eric Pinkerton
Viking Energy Corp

Re: F.O.I.A. Request For Records
Water Wells within 1 mile of 529 Old Tuppers Creek Road since 6/2011

Dear Eric Pinkerton:

The Kanawha-Charleston Health Department (KCHD) has received the Freedom of Information Act (FOIA) request concerning potable water wells drilled since 6/3/2011 within a mile radius of 529 Old Tuppers Creek Road, Charleston WV 25312.

There have been no potable water well permits issued for the above-referenced area in the time frame requested.

Sincerely,

David Winowich RS

David Winowich, RS
Registered Sanitarian

DW/lh

Received
Office of Oil & G
JAN 04 2016

NOTARY

State of West Virginia, County of Kanawha

To Wit: Suscribed and sworn to before me this 30th day of December

My commission expires April 10, 2021

Lolita Kirk
Notary Public

OFFICIAL SEAL
Notary Public, State of West Virginia
LOLITA KIRK
[illegible]
South Charleston, WV 25303
My commission expires April 10, 2021

Administration	Clinic	Environmental	Epidemiology & Threat Preparedness	Prevention & Wellness
Phone: 304.348.6494	Phone: 304.348.8080	Phone: 304.348.8050	Phone: 304.348.1088	Phone: 304.348.6493
Fax: 304.348.6821	Fax: 304.346.4756	Fax: 304.348-8054	Fax: 304.384.8149	Fax: 304.348.6821

ALL CONSULTING
GOVERNMENT RELATIONS · ENERGY · PLANNING · TECHNOLOGY
ENGINEERING · ENVIRONMENTAL

December 11, 2015

PN 1600

Sissonville Public Service District
P.O. Box 7314
Charelston, WV 25356

Subject: Public Service District Affidvait requirement for WV DEP

To whom it may concern:

On behalf of our client, Viking Energy Corporation, I am enclosing an affidavit required by WV DEP. This affidavit is to be filled out and notarized by the local county public service district attesting to the fact that there are no publically recorded drinking water sources are within a one mile radius of the existing Class II D injection well facility operated by Viking Energy Corporation in Kanawha County, West Virginia. Also, there are enclosed maps showing the location of the existing injection well facility for your reference.

If there are no publically recorded drinking water sources within one (1) mile of the radius of the existing injection well, please complete the enclosed affidavit and return to my attention at the Ohio address listed below. If there are public drinking water sources within the one-mile radius, please contact me and let me know. Thank you for your cooperation and assistance in this matter. If you vae any questions regarding this matter, please feel free to contact me by e-mail at ttomastik@all-llc.com or call me at (614) 940-3521.

Sincerely,

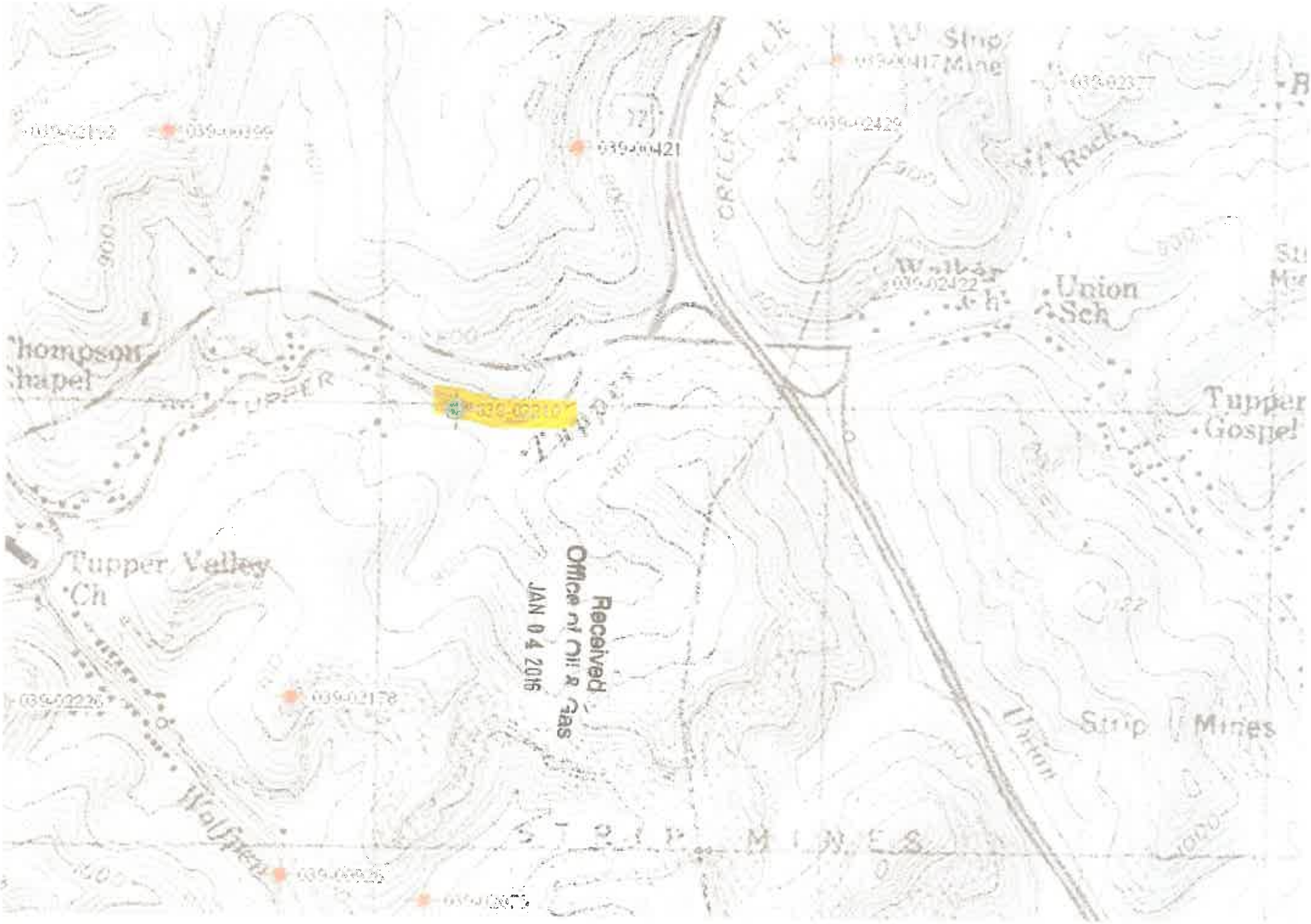
Tom Tomastik

Tom Tomastik, Senior Geologist and Regulatory Specialist
ALL Consulting
10811 Keller Pines Court
Galena, Ohio 43021

Cc: File
Enclosure


Rust Dr
622/7
622/10
Rust Dr
672/6
622/7
Grant Dr
29
Hamstead Ln
29/2
Winter Oak Dr
77
21, 8
29
Redbrook Ln
28/8
29
29/1
Elderberry Ln
24/1
29/1
28
Wallace
24/1
24


Creek Injection Well Facility
24/1
Goo



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)

Viking Energy Corporation

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

Sissonville P.S.D. sewer only

that there are no such publically recorded sources.

(Signature of Authorized Representative)

Sworn and subscribed to before me this 17 day of Dec, 2015.

Annjanette Vealey, my commission expires 5/20/20

(Notary Signature)

Annjanette Vealey

NOTARY PUBLIC
West Virginia
ANNJANETTE VEALEY
HARRISON AVENUE
ST. ALBANS, WV 25177
My Commission Expires 5/20/2020

Received
Office of Oil & Gas
JAN 04 2016

WEST VIRGINIA
AMERICAN WATER

WV American Water
Water Quality Department
PO Box 1906
Charleston, WV 25327
Jon.jarvis@amwater.com

P 304-353-8367
F 304-345-4963

12/11/2015
Viking Energy

Re: Water Wells status of WV American Water in Kanawha County

Mr. Pinkerton,

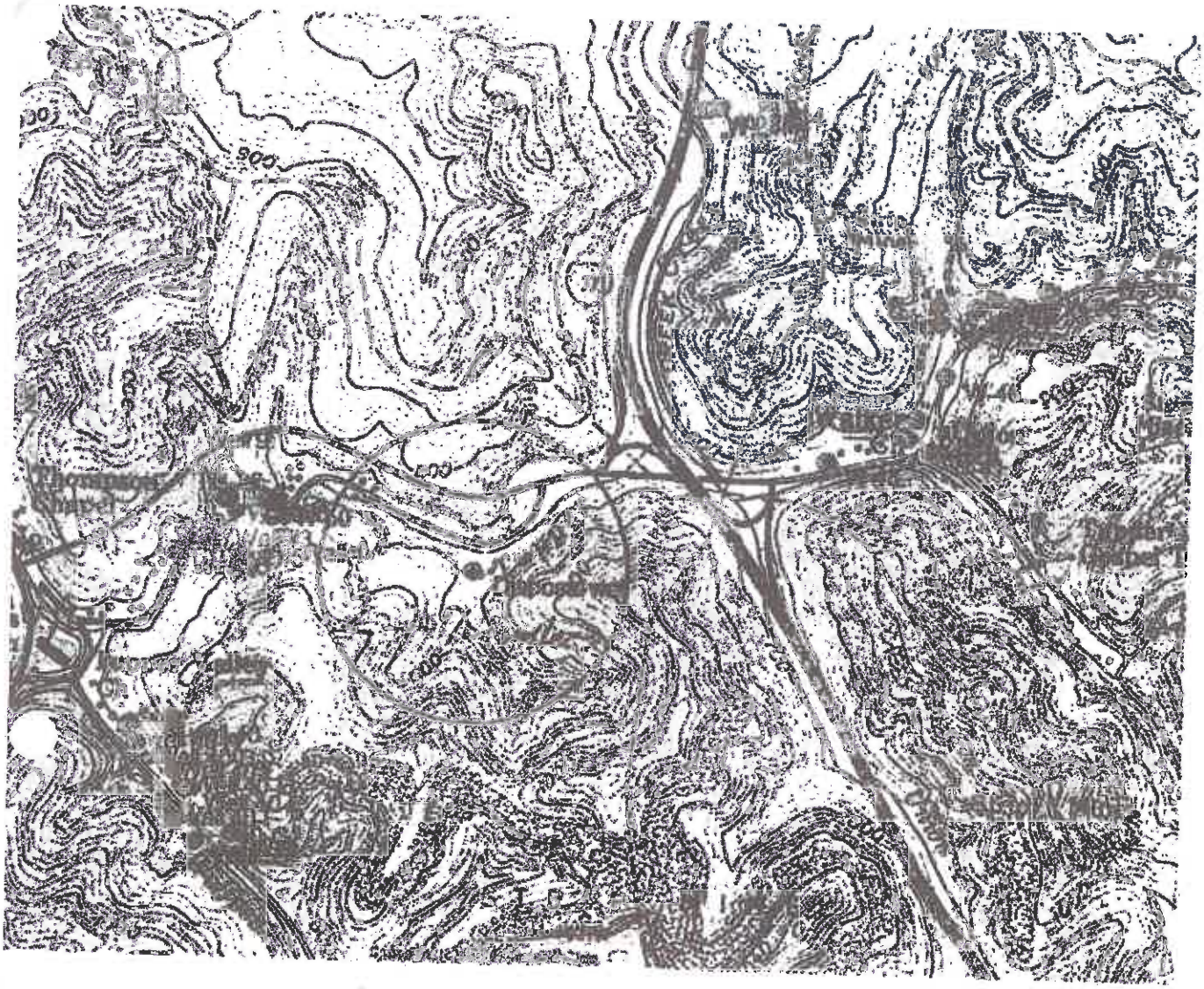
WV American Water does not have any water wells in a 1 mile radius of 259 Old Tuppers Creek Road. In fact, WV American Water does not have any water wells in Kanawha County. Our Kanawha Valley Water Treatment Plant utilizes surface water only from the Elk River in Charleston.

If you need any further information, please let me know.

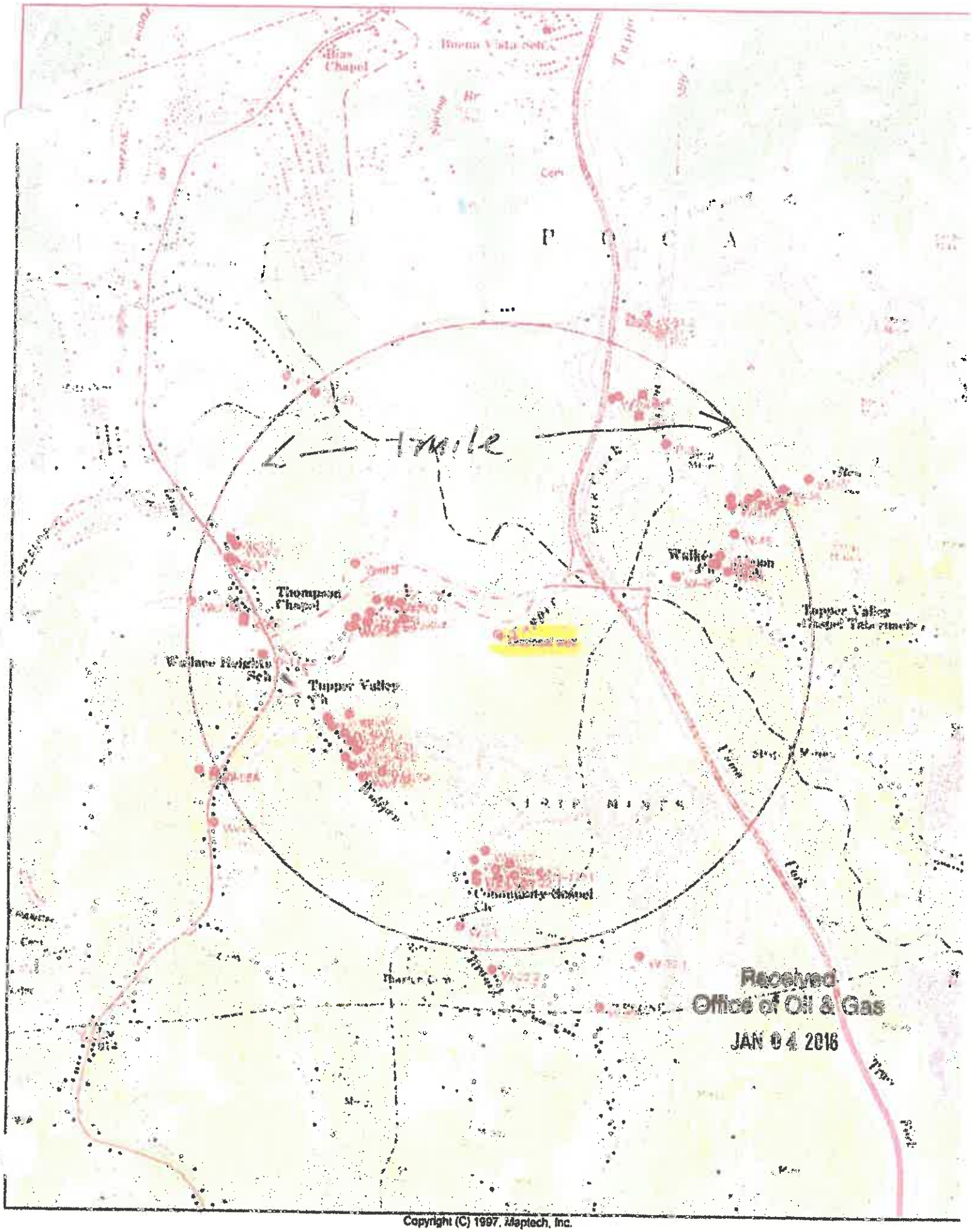
Respectively,

Jon Jarvis
Environmental Compliance & Water Quality Supervisor

Received
Office of Oil & Gas
JAN 04 2016



Location of ALL
WATER WELLS IN THE
AOR AREA.



LANDOWNERS WITH POSSIBLE WATER WELLS TO BE NOTIFIED

	ADDRESS	DATE LETTER SENT	DATE GREEN CARD RECEIVED	DATE RESPONSE RECEIVED FROM LANDOWNER	WATER TEST NEEDED	DATE WATER TESTED	COMMENTS
Patrick K.	5485 A. Sissonville Dr., Charleston, WV 25312	5/11/2010					
	5867 Sissonville Dr. Charleston, WV 25312	5/11/2010	5/15/2010	5/26/2010			letter returned
	5485 Sissonville Dr. Charleston, WV 25312	5/11/2010	5/15/2010				Water well 26
	Allens Rt. Box 78, Sissonville, WV 25320	5/11/2010	5/15/2010	5/31/2010			
Herrick	5884 Sissonville Dr. Charleston, WV 25301	5/11/2010	5/13/2010				
ar	5838 Sissonville Dr. Charleston, WV 25312	5/11/2010	5/14/2010				
ton (Ella)							
kington							
	5414 Sissonville Dr. Charleston, WV 25312	5/11/2010	5/20/2010				
	P. O. Box 13018, Sissonville, WV 25560						Water well 5
(Ella) Perry							
...ander)	4831 Sissonville Rd. Charleston, WV 25312	5/11/2010	5/15/2010				
	520 Crawford Run Rd. Cheswick, PA 15024	5/11/2010	5/18/2010				
	5884 Sissonville Dr. Charleston WV 25312	5/11/2010	5/13/2010				
mith	479 Wolf Pen Dr. Charleston, WV 25312	5/11/2010	5/16/2010				
	98 Country Lane Charleston, WV 25312						
Betty J.							
	1306 Woodland Dr. Charleston, WV 25302	5/11/2010	5/15/2010				
Virginia,							
	P.O. Box 1450 Chicago, IL 60680	5/11/2010	5/19/2010				
n G.							
	475 Wolf Pen Dr. Charleston, WV 25312	5/11/2010					
	481 Wolf Pen Dr. Charleston, WV 25312	5/11/2010					
W.							letter returned
	505 Wolf Pen Dr. Charleston, WV 25312	5/11/2010	5/13/2010				
e Thaxton	505 Wolf Pen Dr. Charleston, WV 25312	5/11/2010	5/13/2010	5/26/2010			

LANDOWNERS WITH POSSIBLE WATER WELLS TO BE NOTIFIED

. Schnaider	1914 Winding Hill Dr. Sissonville, WV 25320	5/11/2010	5/14/2010			
(Ella) John						
r						
	631 Wolf Pen Dr. Charleston WV 25312	5/11/2010	5/14/2010	6/4/2010		Water well 24
on	P.O. Box 13388 Charleston, WV 25360	5/11/2010	5/18/2010			
	624 Wolf Pen Dr. Charleston WV 25312	5/11/2010	5/18/2010			
rcell	635 Wolf Pen Dr. Charleston WV 25312	5/11/2010	5/18/2010			
ampanier	631 Wolf Pen Dr. Charleston WV 25312	5/11/2010				
ase	P.O. Box 8534 Charleston WV 25302	5/11/2010	5/18/2010			Water well 24
d	630 Wolf Pen Dr. Charleston WV 25312	5/11/2010				
nda L.						letter returned
	629 Wolf Pen Dr. Charleston WV 25312	5/11/2010	5/14/2010			
Haynes	Rt. 5 Box 412 Charleston WV 25312	5/11/2010	5/18/2010	6/20/2010		
	P.O. Box 133988 Charleston WV 25360	5/11/2010				
						letter returned
	HC 70 Box 114 Elkview, WV 25071	5/11/2010	6/27/2010			
	2879 Sissonville Dr. Charleston WV 25312	5/11/2010	5/14/2010	5/14/2010		
	1870 Sissonville Dr. Charleston WV 25312	5/11/2010		5/14/2010		
	617 Wolf Pen Dr. Charleston WV 25320	5/11/2010	5/18/2010			letter returned
						Water wells 22 & 22.1
	P.O. Box 13018 Sissonville WV 25360	5/11/2010	5/18/2010	5/18/2010		
r	428 21st Street Dunbar WV 25064	5/11/2010				Water wells 15 to 19
h Cobb						letter returned
	Rt. 5 Box 361 Charleston WV 25312	5/11/2010	6/18/2010			
r	428 21st Street Dunbar WV 25064	5/11/2010				
	2884 Sissonville Dr. Charleston WV 25312	5/11/2010	5/21/2010	5/1/2010		letter returned
						Water well 21
ester (Ms)						
rmatoder)	628 Wolf Pen Dr. Charleston WV 25312	5/11/2010	5/20/2010	6/4/2010		
L. Fowler	2210 Tate Dr Charleston WV 25312	5/11/2010				
ner	6941 Valley Brook Rd. Charleston WV 25312	5/11/2010	5/18/2010	5/17/2010		letter returned
	625 Wolf Pen Dr. Charleston WV 25312	5/11/2010	5/20/2010	5/24/2010		Water well 23
						Water well 37

(4/25)

APPENDIX E
Water Sources

Operator: Viking Energy Corporation Year 2015 UIC Permit # UIC2DS92210

		Source # 1	Source # 2	Source # 3	Source #
Water Source Name		Denise Edens Water Well	Old Tuppers Creek - Downstream	Old Tuppers Creek - Upstream	
Northing	4257197.96	4257277.35	N/A	N/A	
Easting	443183.55	442769.59	N/A	N/A	
Parameter	Units				
TPH - GRO	mg/L				
TPH - DRO	mg/L				
TPH - ORO	mg/L				
BTEX	mg/L				
Chloride	mg/L	29.4	28.4	27.2	
Sodium	mg/L	108	19.2	19.9	
Total Dissolved Solids (TDS)	mg/L	334	380	357	
Aluminum	mg/L				
Arsenic	mg/L				
Barium	mg/L	0.083	0.056	0.056	
Iron	mg/L	0.77	0.18	0.19	
Manganese	mg/L	0.021	0.069	0.073	
pH	SU	6.3	7.8	7.8	
Calcium	mg/L				
Sulfate	mg/L	35.8	125	124	
MBAS	mg/L				
Dissolved Methane	mg/L				
Dissolved Ethane	mg/L				
Dissolved Butane	mg/L				
Dissolved Propane	mg/L				
Bacteria (Total Coliform)	c/100mL				

Page __ of __

COMPANY: VIKING ENERGY, INC.

DATE/TIME SAMPLED: 12-20-10

SAMPLE I.D.:

DATE/TIME RECEIVED: 12-21-10 1300

SAMPLED BY: K. WILLIAMS

FIELD TEMP °C	FIELD COND µmhos	TIME SAMP	pH units	TDS mg/L	Cl mg/L	Ba mg/L	Na mg/L	Mn mg/L	Fe mg/L
2	550	1235	7.3	544	5.84	.047	31.7	.740	.28
11	550	1301	6.7	400	3.92	.304	39.0	9.20	31.7
11	560	1312	7.1	508	2.38	.145	17.9	8.11	9.95
11	610	1326	6.5	502	4.76	.361	25.6	5.88	73.4
11	560	1340	6.7	370	6.51	.149	31.1	3.40	57.5
11	590	1355	7.5	398	7.60	.111	27.8	.023	.12

Former well

nt

Approved D. Bennett

Received Office of Oil & Gas JAN 04 2016

ST OFFICE BOX 660 • BRIDGEPORT, WEST VIRGINIA 26330 • (304) 623-6549
T OFFICE BOX 8337 • SOUTH CHARLESTON, WEST VIRGINIA 25303-0337 • (304) 744-9864

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: VIKING ENERGY

SAMPLE ID: DENISE EDENS WELL
TUPPERS CR

SAMPLED BY: C. ROSS

DATE/TIME SAMPLED: 05-15-15 1110

DATE/TIME RECEIVED: 05-15-15 1400

LABORATORY ID: VE 150515-1

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
FLOW	POOLED 6'	gpm			05-15-15 1110	CR
FIELD pH	8.30	units			05-15-15 1110	CR
FIELD TEMP	13.5	°C			05-15-15 1110	CR
FIELD COND	550	µmhos			05-15-15 1110	CR
pH	8.3	units	SM22nd 4500 HB	.1	05-15-15 1720	KH
Fe	.77	mg/L	EPA 200.7 Rev 4.4-1994	.01	05-18-15 1424	RS
Mn	.021 J	mg/L	EPA 200.7 Rev 4.4-1994	.002	05-18-15 1424	RS
TSS	8 J	mg/L	SM22nd 2540 D	4	05-15-15 1705	EK
TDS	334 J	mg/L	SM22nd 2540 C	4	05-15-15 1705	EK
SO_4	35.8	mg/L	EPA 300.0 Rev 2.1-1993	1.0	05-21-15 0815	DC
Cl	29.4	mg/L	EPA 300.0 Rev 2.1-1993	.50	05-21-15 0815	DC
Ba	.083	mg/L	EPA 200.7 Rev 4.4-1994	.002	05-28-15 1027	RS
Na	108.	mg/L	EPA 200.7 Rev 4.4-1994	.03	05-19-15 0852	RS
MBAS	.02	mg/L	SM22nd 5540C	.01	05-15-15 2134	SW
TOC	1.2 J	mg/L	SM22nd 5310B	1.0	05-22-15 1554	MW

*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.
N	Organic constituents tentatively identified. Confirmation is needed.
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.

Approved _____

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Sturm Environmental Services

JOHN W. STURM, PRESIDENT

April 9th, 2015

Due to our most recent audit, Sturm Environmental Services will now be including a data qualifier footnote in the final data reports. These qualifiers are based on the U.S Environmental Protection Agency guidelines. Sturm Environmental Services will now be replacing all results that are less than the method detection limit with a "U" qualifier and denoting all results between our minimum reporting level and our method detection limit with a "J" qualifier. This change does not alter the integrity of the results. It only provides a clearer image of the test conditions of the results and helps differentiate between quantifiable and estimated values. Other qualifiers listed refer to conditions of the results, method, or quality control and how the integrity of the results could be affected.

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.
N	Organic constituents tentatively identified. Confirmation is needed.
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.

Sincerely,

STURM ENVIRONMENTAL SERVICES

Morgen Miller
QA Officer / Technical Director
mmmiller@sturmenvironmental.com
ph (304)-623-6549
fx (304-623-6552
Mon-Fri 8A.M-4:30P.M

CHAIN OF CUSTODY RECORD

...ental

STURM ENVIRONMENTAL
BRUSHY FORK ROAD
BRIDGEPORT, WV 26330
PHONE: 304-623-6549
FAX: 304-623-6552

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

MAILING ADDRESSES ARE LISTED BELOW

...g Energy

2814 Fax No.

...Ross

...rs Cr

BILL TO: Client Name:
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*

1 DAY	2 DAY	3 DAY

...ts ___ Fax Results

___ Date Needed

...AMPLE		GRAB SAMPLE		PRESERVATIVE							MATRIX						ANALYZE FOR:															
...TIME	END TIME	DATE	TIME	Ice	OTHER	HCl	NaOH	H_2SO_4 Plastic	H_2SO_4 Glass	None	HNO_3	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):													# of Bottles	Field pH	Flow (gpm, cfs, mgd) circle one	Field Conductivity	Field DO	Field Chlorine (mg/L or ug/L) circle one	Field Temp (F° or C°) circle one
		5/5/15	1110	X				X		XXX																				5	8.30	Visual	0.550			35

Laboratory Comments:
Temperature Upon Receipt
Bottles Preserved?
Temp upon Receipt:

Records retained for 5 years

Time	Received by:	Date	Time
400	[illegible]	5/5/15	[illegible]
Time	Received by:	Date	Time

Received
Office of Oil & Gas
JAN 04 2016

Sturm Environmental Services

COMPANY: VIKING ENERGY

SAMPLE ID: OLD TUPPERS UPSTREAM OTUS

SAMPLED BY: C. ROSS

DATE/TIME SAMPLED: 06-17-15 1045

DATE/TIME RECEIVED: 06-18-15 1330

LABORATORY ID: VE 150618-2

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
FLOW	385	gpm			06-17-15 1045	CR
FIELD pH	8.10	units			06-17-15 1045	CR
FIELD TEMP	22.5	°C			06-17-15 1045	CR
FIELD COND	540	µmhos			06-17-15 1045	CR
pH	7.8	units	SM22nd 4500 HB	.1	06-18-15 1445	KH
Fe	.19 J	mg/L	EPA 200.7 Rev 4.4-1994	.01	06-22-15 1404	RS
Mn	.073 J	mg/L	EPA 200.7 Rev 4.4-1994	.002	06-22-15 1404	RS
TSS	9 J	mg/L	SM22nd 2540 D	4	06-19-15 1300	EK
TDS	357	mg/L	SM22nd 2540 C	4	06-19-15 1300	EK
SO_4	124.	mg/L	EPA 300.0 Rev 2.1-1993	1.0	06-20-15 1000	DC
Cl^-	27.2	mg/L	EPA 300.0 Rev 2.1-1993	.50	06-20-15 1000	DC
Ba	.058	mg/L	EPA 200.7 Rev 4.4-1994	.002	06-22-15 1404	RS
Na	19.9	mg/L	EPA 200.7 Rev 4.4-1994	.03	06-22-15 1404	RS
MBAS	.02	mg/L	SM22nd 5540C	.01	06-18-15 2232	SW

*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.
N	Organic constituents tentatively identified. Confirmation is needed.
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.

Approved Joseph W. Sturm

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Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: VIKING ENERGY

SAMPLE ID: OLD TUPPERS DOWNSTREAM OTDS

SAMPLED BY: C. ROSS

DATE/TIME SAMPLED: 06-17-15 1035

DATE/TIME RECEIVED: 06-18-15 1330

LABORATORY ID: VE 150618-1

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
FLOW	385	gpm			06-17-15 1035	CR
FIELD pH	8.10	units			06-17-15 1035	CR
FIELD TEMP	22	°C			06-17-15 1035	CR
FIELD COND	540	µmhos			06-17-15 1035	CR
pH	7.8	units	SM22nd 4500 HB	.1	06-18-15 1445	KH
Fe	.18 J	mg/L	EPA 200.7 Rev 4.4-1994	.01	06-22-15 1404	RS
Mn	.069 J	mg/L	EPA 200.7 Rev 4.4-1994	.002	06-22-15 1404	RS
TSS	7 J	mg/L	SM22nd 2540 D	4	06-19-15 1300	EK
TDS	380	mg/L	SM22nd 2540 C	4	06-19-15 1300	EK
SO_4	125.	mg/L	EPA 300.0 Rev 2.1-1993	1.0	06-20-15 1000	DC
Cl^-	28.4	mg/L	EPA 300.0 Rev 2.1-1993	.50	06-20-15 1000	DC
Ba	.056	mg/L	EPA 200.7 Rev 4.4-1994	.002	06-22-15 1404	RS
Na	19.2	mg/L	EPA 200.7 Rev 4.4-1994	.03	06-22-15 1404	RS
MBAS	.02	mg/L	SM22nd 5540C	.01	06-18-15 2232	SW

*Client Provided

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

Received
Office of Oil & Gas
JAN 04 2016

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.
N Organic constituents tentatively identified. Confirmation is needed.
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.

Approved _____

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CHARLESTON FIELD OFFICE—POST OFFICE BOX 5337 • SOUTH CHARLESTON, WEST VIRGINIA 25303-0337 • (304) 744-9864

CHAIN OF CI[illegible]DY RECORD

ental

STURM ENVIRONMENTAL
BRUSHY FORK ROAD
BRIDGEPORT, WV 26330
PHONE: 304-623-6549
FAX: 304-623-6552

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

MAILING ADDRESSES ARE LISTED BELOW

Energy
kerton
3514 Fax No.
Ross
[illegible]
[illegible] Fax Results

BILL TO: Client Name:
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

[illegible]MPLE END TIME	GRAB SAMPLE DATE	TIME	Ice	OTHER	PRESERVATIVE 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	Field pH	Flow (gpm, cfs, mgd) circle one	Field Conductivity	Field DO	Field Chlorine (mg/L or ug/L) circle one	Field Temp (F° or C°) circle one
	6/17/15		X						XXX									3	8.10	385	540			22.
	↓		X						XXX									2	8.10	385	540			23.5

Records retained for 5 years

Laboratory Comments:
Temperature Upon Receipt
Bottles Preserved? Y N
Temp upon Receipt. C 3

[illegible]me	Received by:	Date	Time
[illegible]/15	Brandy [illegible]	6/17/15	1745
[illegible]me [illegible]35	K. [illegible]	6/18/15	1330

Received
Office of Oil & Gas
JAN 04 2016

	DATE LETTER SENT	GREEN CARD RECEIVED	RESPONSE RECEIVED FROM LANDOWNER	WATER TEST NEEDED	DATE WATER TESTED	COMMENTS
	12-12-14					Returned
	12-14-15	12-17-15				water well 25
	12-12-15	12-115-15	No water wells	No	None	
	12-12-15	12-19-15				
	12-15-15	12-18-15				
	12-12-15	12-16-15	Talked to Roger - No wells	No	None	P
ille,	12-12-15	12-14-15	12-15-15 Johnny called	No	None	water well 8
	12-12-15	12-14-15				
	12-12-15	12-20-15	Received Office of Oil & Gas			
	12-15-15	12-19-15	JAN 04 2016			
	12-14-15	12-16-15				
	—	—				
	12-12-15	12-16-15	No Water Wells	NO	None	Betty called 12/27/15 1:30pm.
IL	12-12-15	12-15-15				
	12-14-15	12-17-15				

	12·12·15					Returned
	12·14·15	12·16·15				
	12·12·15	12·15·15				
	12·15·15	12·19·15				
	12·12·15	12·14·15				Water well 24
on,	12·14·15	12·16·15				
	12·12·15	12·14·15				
	12·12·15					
	12·12·15	12·14·15				Water well 24
312	12·12·15	12·14·15				
on,	12·12·15	12·14·15	Vickie called 512.3212 No Wells On Property			
	12·14·15	12·14·15				
,	12·12·15					Returned
e,	12·12·15					
N,	12·16·15	12·19·15				
	12·12·15	12·15·15				Water well 52

	12·12·15	12·14·15				Water wells 22 & 22.1
ille,	12·12·15	12·15·15	12·15·15 Jonny called Do Not Need to Test	No	None	Water wells 15 through 18
ille,	12·12·15	12·16·15	12·22·15 Called in No water Sources	No	None	
, WV	12·12·15					
	12·12·15	12·14·15				
	12·12·15	12·14·15				
	12·12·15	12·14·15	12·15·15 Walter Goff Jr. called. Do Not need to test Water well.	No	None	Water well 21
9	12·14·15	12·16·15				
	12·12·15	12·15·15				
	12·14·15	12·16·15				Water well 37
	12·14·15	12·16·15				
	12·14·15	12·16·15				
	12.14·15	12·16·15				
	12·12·15					
	12·12·15					Returned

	12-12-15	12-15-16				
ton,	12-14-15	12-16-15	12-17-15 Called No water Sources Derek Burnham Called	No	None	
	12-12-15					Returned Water well 40
	12-12-15	12-15-15				
	12-14-16	12-16-15	12-18-16 Called No water Sources	No	None	
	12-12-15	12-16-15				
on,	12-12-16	12-14-15				
	12-12-15	12-15-15				
	12-12-15	12-15-15				
	12-12-15					Returned Water wells 23,23.1,23.2
	12-12-15	12-14-15				Water well 21
	12-12-15	12-15-15	12-15-15 Gail Called Dont need to test	No	None	Pond 1
	12-12-15	12-15-15				

12·12·15					Returned
12·12·15	12·15·15				Water well 26
12·12·15					Returned
12·12·15					Returned
12·12·15					Returned
12·12·15					Returned
12·12·15	12·15·15				
12·12·15	12·15·15	12·17·15 No test needed	No	None	Sybil called Anna Hissom called as neice well
12·12·15					
12·12·15					Returned
12·12·15					Returned
12·12·15					Returned
12·16·15	12·19·15				
12·12·15	12·14·15				

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JAN 04 2016

	12·12·15	12·16·15				
	12·14·15	12·16·15				
d.,	12·12·15	12·15·15				
on, V	12·14·15	12·16·15				
	12·14·15	12·17·15				
n,	12·12·15	12·15·15				Water well 38
n,	12·12·15	12·15·15				Water wells 1 & 2
	12·12·15	12·15·15				
, WV	12·12·15	12·15·15	12·15·15 Edith called Newater Sources	No	None	
1,	12·14·15	12·16·15				
1,	12·12·15					
1,	12·14·15	12·16·15	Daughter called sent letter said didn't need to test	No	none	Spribg 3 & Water well 14
	12·14·15	12·16·15				
	12·12·15	12·15·15				

Received
Office of Oil & Gas
JAN 04 2016

	[illegible]	[illegible]				
	12·12·15	12·15·15				
n,	12·14·15	12·16·15				
	12·12·15	12·15·15				
	12·12·15	12·15·15				
le,	12·14·15	12·16·15				
	12·12·15	12·15·15	Called 12·16·15 No water sources	NO	None	
l,	12·12·15	12·15·15	Called 12·16·15 No water sources	NO	None	
n,	12·12·15	12·17·15				
d.,	12·12·15	12·15·15				
WV	12·12·15					Returned
	12·12·15	12·15·15				
a,	12·12·15					

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Office of Oil & Gas
JAN 04 2016

Rd.,	12·12·15	12·15·15				
	—	—				
ston,	12·12·15					Returned Water Well 5
Rd.,	12·12·15	12·15·15	12·18·15 Lisa called No Water Sources	No	No	
Rd.,	12·12·15	12·15·15	12·18·15 Deana called No Water Sources	No	None	
	12·12·15					
, WV	12·12·15					Returned
Rd.,	12·12·15	12·15·15	12·18·15 Deana called No Water Sources	No	None	
,	12·12·15					Returned Water Well 6
ston,	12·12·15					Returned
on	12·12·15					

Rd.,	12·12·15		Received Office of Oil & Gas JAN 04 2016			Returned Water Well 4
,	12·14·15	12·17·15				
	12·14·15	12·17·15				
	12·12·15	12·14·15				Water Well 9
	12·14·15	12·16·15				
	12·12·15					
, WV	12·12·15					Returned
Old	12·12·15					Water Well 33
ston,	12·12·15					Returned Water Well 13
Rd.,	12·12·15					Returned
d.,	12·12·15	12·28·15				

, WV	12·12·15		Ran into Dick Humphreys said to test well	Yes	12·23·15	Returned
WV	12·12·15	12·14·15	Received Office of Oil & Gas			Water Well 50
, WV	12·12·15		JAN 04 2016			Returned
Old	12·12·15	12·15·15	Received Office of Oil & Gas JAN 04 2016			
,	12·14·15					Returned
, WV	12·14·15	12·17·15				
nd	12·12·15	12·15·15	12·18·15 called No Water Sources	No	None	
	12·14·15	12·17·15				
ton,	12·12·15	12·15·15				
	12·14·15	12·16·15				
	12·12·5	12·15·15				
ton,	12·14·15					Returned
	12·12·15	12·15·15				

	12·15·15	12·18·15				
; WV	12·15·15	12·18·15				
	12·15·15					Returned
	12·15·15	12·19·15				
ton,	12·15·15					Returned
ne,	12-15-15	12-22-15				Water Well 35
	12·14·15	12·17·15				
e, 64 1,	12·14·15	12·17·15				Water Well 10
ton,	12·14·15	12·17·15				
ton,	12.14.15	12·17.15				
ton,	12·15·15	12·17·15	Talked to Terry of High School said as well take hold			Returned
ton,	12·14·15	12·16·15				
ton,	12·14·15	12·16·15				
s	12·15·15					Watre Well 20
	12·14·15	12·17·15				

n,	12·12·14	12·15·15				
	12·15·15					Returned
	12·14·15	12·17·15	12·17·15 Melinda called No Water Test Needed	No	None	Water Well 12
	12·14·15	12·17·15	12·17·15 called at 12:38 pm Hilda Griffin Called	No	None	Water Well 11
	12·14·15	12·17·15				
on,	12·15·15					Returned
on,	12·15·15	12·19·15				
	12·14·15	12·17·15				
on,	12·14·15	12·16·15				
n,	12·14·15	12·23·15	Called in 12/28/15 2:10pm	No	None	
	12·14·15	12·17·15				
,	12·14·15	12·16·15				
,	12·14·15	12·17·15				

	12·14·15	12·17·15				
	12·14·15	12·22·15				
	12·15·15					Returned
	12·15·15					Returned
	12.14·15	12·17·15				
v	12.14·15	12·17·15				
	12·15·15					Returned
;	12·15·15	12·18·15				
on,	12·14·15	12·17·15				
n,	12·15·15					Returned
;	12·15·15	12·18·15				
,	12·15·15					
	12·15·15	12·22·15				
	12.14.15	12·16·15				

	12·14·15	12·17·15				
	12·14·15	12·16·15				
, , WV	12·15·15		Talked to Bill on 12/24/15 Did not need to test			Returned Spring 2
	12·14·15	12·16·15				
	12·14·15	12·16·15				Water Well 21
	12·14·15	12·16·15				
	12·12·15	12·14·15				
	12·15·15					
	12·15·15					Returned
id, WV	12·15·15		Called 12.17.15 Christina McFarland Does not need to test	No	None	Water Wells 40-A through 40-G
	12·15·15					Returned
on,	12·15·15					
	12·15·15					Returned
	12·14·15	12·16·15				

Office of Oil & Gas

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rtona	12·14·15	12·17·15	Sent letter, called 12/17/15 wanting well tested	Yes	12·25·15	Water Well 54
Rd.,	12·14·15	12·17·15	12·18·15 called in Michael Allen + Lisa No water Sources	No	None	
, TN	12·15·15					Returned
	12·14·15	12·17·15	Wants well tested called 12/22/15	Yes	12·23·15	Water Well 55
on,	12·14·15	12·24·15	Talked to Mena No need to test well water gauge coming up.	NO	None	Water Well 31
	12·15·15					Returned
315 on,	12·15·15					Returned
	12·14·15	12·16·15				
312	12·14·15	12·30·15				
n,	12·15·15					Returned
V	12·14·15	12·16·15				
NV	12·15·15					Returned
	12·14·15	12·16·15				

ille,	12·12·15	12·14·15				
	12·14·15	12·16·15				
	12·14·15	12·16·15				
	12·14·15	12·16·15				
	12·14·15	12-22-15				
	12·16·15	12·19·15				
TX	12·15·15					Returned
	12·15·15					Returned
ı,	12·15·15					Returned
ı,	12·14·15	12·16·15	No	No	No	Letter Sent to 100 Kingsbrook Lane
	12·14·15	12·16·15				Water Well 19
	12·14·15	12·16·15	No	No	No	No
ın,	12·15·15					
ɔn,	12·14·15	12·28·15	No water well Larry Called in	No	None	
	12·14·15	12·23·15				
	12·15·15					Returned

	12·15·15	12·18·15	Received Office of Oil & Gas JAN 04 2016			
	12·15·15					Returned
	12·16·15					Returned
	12·15·15					Returned
	12·15·15	12·16·15				
	12·14·15	12·17·15				
on,	12·14·15	12·17·15				
	12·15·15	12·17·15				
le,	12·14·15	12·16·15				
	12·15·15	12·18·15				
,	12·15·15	12·18·15				
on,	12·15·15					Returned
	12·16·15	12·19·15				

	12.14.15	12.18.15				
on,	12.14.15					
	12.14.15	12.22.15				
	12.14.15	12.17.15	12.17.15 Called Wanted to Know how we tested	NO	None	
	12.14.15	12.16.15				
	12.14.15	12.16.15				
, WV	12.14.15	12.16.15				
	12.15.15	12.18.15				
	12.15.15	12.18.15				
	12.14.15	12.16.15				
on,	12.16.15	12.21.15	No Water Sources	No	No	
	12.16.15	12.21.15				

Dr.,	12·16·15	12·21·15				
	12·15·15	12·18·15				
	12-15-15	12-23-15	Mr. Meeker called Said no water	NO	NONE	Called 3:50 12/23/15
	12·14·15	12·17·15				
	12·14·15					
WV	12·14·15	12·16·15				
	12·14·15					
311	12·14·15	12·18·15				
311	12·15·15	12·18·15				
on,	12·15·15	12·18·15				
	12·14·15	12·16·15				

	12·14·15	12·16·15	Received Office of Oil & Gas			Water Well 28
	12·12·15	12·15·15	JAN 04 2016			Water Wells 51. 51.1, 51.2
	12·12·15	12·15·15				Water Well 27
	12·15·15					
	12·12·15	12·15·15				Water Well 34
	12·14·15					Water Well 36
	12·15·15	12·24·15				Water Well 53
	12·14·15	12·16·15				Water Well 32
	12·12·15	12·15·15	12·22·15 wants well tested	Yes	12·23·15	Water Well 34
ston,	12·14·15					Water Wells 37-A, 37-B
	12·15·15	12·21·15				Water Well 32
W	12·15·15	12·18·15				
W	12·15·15	12·18·15				

	12·12·15	12·15·15	Called in, James, wants well tested 12·17·15	Yes	12·23·15	Water Well 47
ton,	12·14·15					Returned
	12·16·15	12·21·15				
	12·14·15	12·15·15				
WV	12·14·15					
	12·14·15	12·15·15				
lle,	12·14·15	12·16·15				
	12·14·15	12·22·15	12·17·15 No Test Needed Walter Goff called	No	None	Water Well 48
	12·14·15	12·22·15				
ton,	12·14·15	12·16·15				
ton,	12·14·15	12·16·15				
	12·12·15	12·15·15				
, WV	12·14·15					Returned
	12·14·15	12·17·15				
	12·14·15	12·16·15				

s, P e, ,	12·14·15	12·16·15				RTS Box 388 Returned
	12·14·15	12·16·15				
on,	12·14·15					Returned
	12·14·15					Returned
on,	12·12·15	12·15·15				
on,	12·14·15					Returned Water Well 30
on,	12·14·15					Returned.
on,	12·14·15					Returned
on,	12·12·15	12·15·15				
on,	12·12·15	12·15·15				
le,	12·12·15	12·15·15				
n, V	12·14·15	12·16·15				Water Well 7
n, V	12·14·15	12·16·15				Water Well 7

ton,	12·14·15	12·16·15				
	12·12·15	12·15·15				
ton,	12·12·15	12·15·15				
	12·12·15	12·15·15	Called 12-15-15 wanting well tested 12-23-15	Yes	12-29-15	Water Well 41
	12·12·15	12·15·15	12·17·15 Called No water Sources	No	None	Water Well 46
	12·12·15	12·15·15	12.16·15 Brian Stonesheet owner Rebecca Hightower Daughter - called No Test Needed	No	None	Water Well 39
	12·12·15	12·14·15				
n,	12·14·15					Returned
on,	12·14·15	12·16·15				
on,	12·15·15					
e,	12·14·15	12·16·15				
	12·14·15					
n,	12·14·15					Returned
	12·14·15	12·17·15				

ton,	12·14·15	12·17·15				
n,	12·14·15					Returned
on,	12·14·15					Returned
ston,	12·12·15.	12·15·15				
on,	12·14·15	12·16·15				
	12·14·15					Returned.
:on,	12·14·15	12·16·15				
t	12·14·15					
:on,	12·12·15	12·15·15				

APPENDIX F

Area Permit Wells

API #	Well Type (Injection, Production, Observation, Monitoring)	Well Status (Active, Abandoned, Shut-in, Plugged)	Northing (UTM NAD 83 Meters)	Easting (UTM NAD 83 Meters)
Not Applicable				

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

Section 8

Section 8 – Geological Data on the Injection and Confining Zones:

1. A detailed geological investigation of subsurface features (structural contour and isopach maps) was previously conducted during the original permit application process. Additional geologic research indicates that the Columbia Gas 20320 (Wallace Unit #1) was part of the Rocky Fork Newburg gas field that was discovered and developed in Kanawha County in the late 1960s. The attached structural contour map on the top of the Newburg sandstone shows 20-foot contour intervals and there are no structural geologic features near the Columbia Gas 20320 (Wallace Unit #1) well. Also attached is the isopach map of the Newburg sandstone in the immediate area.
2. The Newburg sandstone is typically a thin, white to gray, very fine-to fine-grained, well sorted sandstone consists mainly of rounded quartz grains (Patchen, 1996). The Newburg sandstone occurs within the C unit of the Salina Group in West Virginia and directly above the Silurian-aged Lockport Dolomite. This well was drilled within the Rocky Fork Field, which is a combination of stratigraphic and structural traps (see attached geologic structure map for the Rocky Fork Field). A geologic cross-section from Patchen (1996) is also attached and shows the open-hole geophysical log correlation of the Newburg sandstone through several wells in Kanawha County. The average porosity of the Newburg sandstone in the Rocky Fork field is 18 percent (Patchen, 1996).
3. The well was drilled in 1968 by Pennzoil and the well completion record is attached. The open-hole geophysical log for the Newburg sandstone interval is included in Section 6.
4. There are multiple confining layers within the Salina and Bass Islands groups in the Columbia Gas 20320 (Wallace Unit #1) injection well. These confining layers, which are composed of interbedded salt units, dolomite, shales, and anhydrite serve as barriers for vertical fluid movement of injectate out of the injection zone. Additionally, the multiple layers of steel casing strings (of which two of these strings are cemented to the surface), will prevent any potential migration of injected fluids into the USDWs.
5. Fluid movement within the Newburg dolomite injection zone will be a combination radial and linear flow. Based on a total thickness of 17 feet and an average porosity of 9 percent of the injection zone and current inject rates, fluid migration within the Newburg injection zone over time will be limited to the ¼ mile radius around the well (See attached information).
6. Currently, there are no domestic or municipal water wells within the ¼ mile AOR.
7. The Columbia Gas 20320 (Wallace Unit #1) well injectate is treated with a scale inhibitor, bactericide, and is filtered to assist in chemical compatibility. The SDS sheets and the chemical analysis of the injectate from various sources is in **Section 9**.

Reference

Patchen, D.G. 1996. Play Sns: The Upper Silurian Newburg sandstone Play, *In* The Atlas of Major Appalachian Gas Plays, John B. Roen and Brian J. Walker (eds.), p. 139-144.

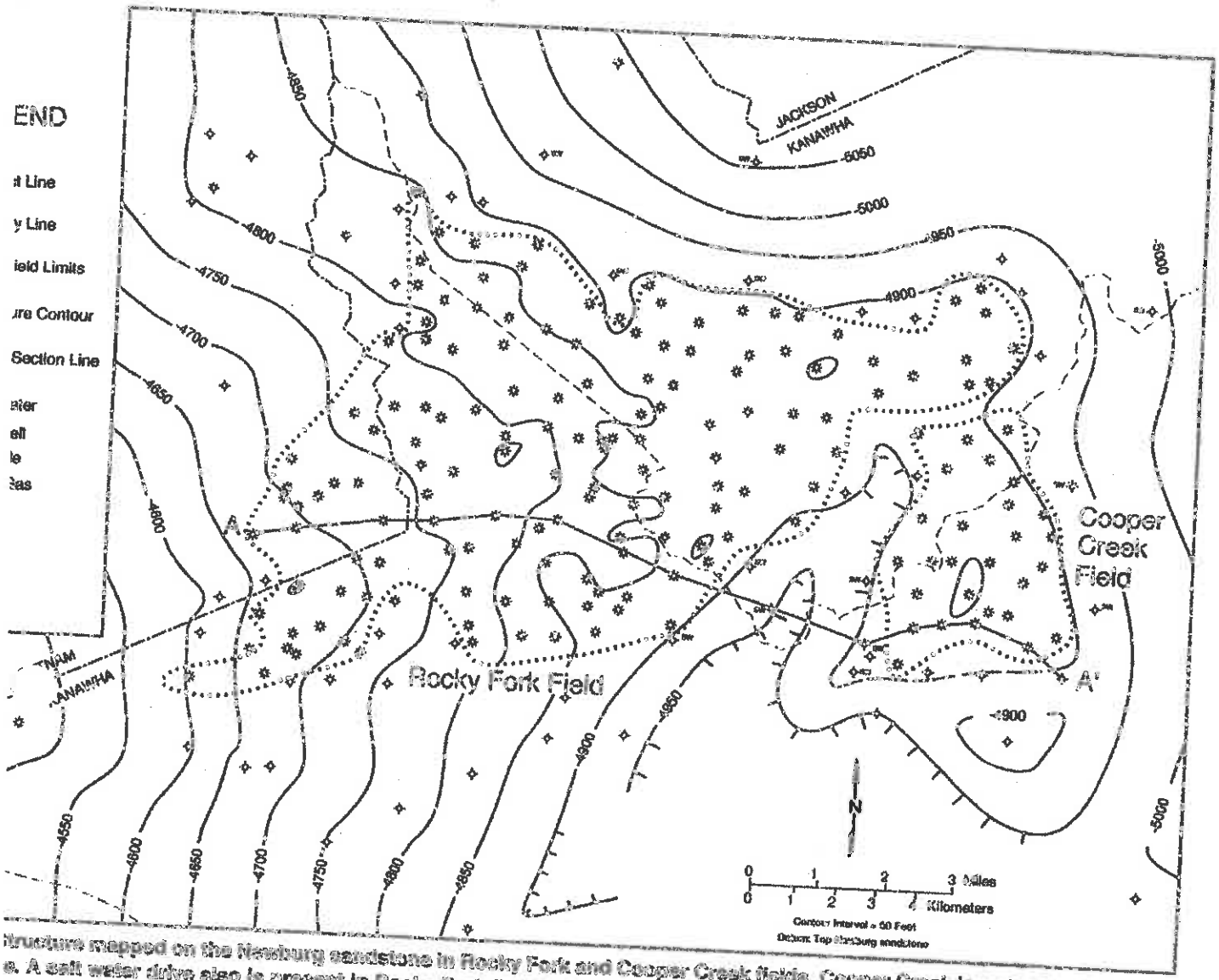
Office of Oil & Gas

JAN 04 2016

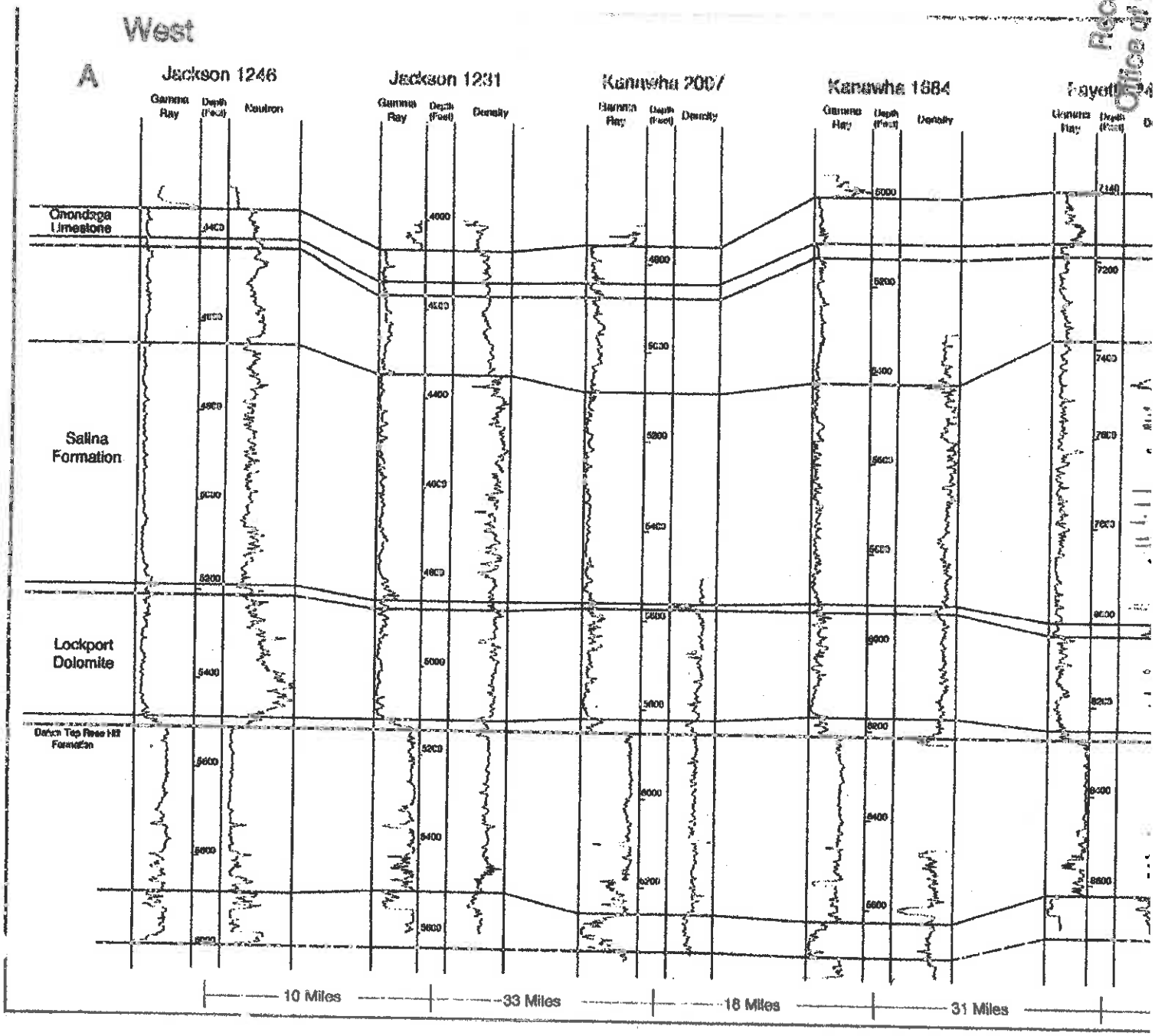
TOP OF NEWBURG
Based on Drillers Logs -
All Datum Subsea

ISOPACH OF THE NEWBURG

Contour Interval - 1 Ft.



Structure mapped on the Newburg sandstone in Rocky Fork and Cooper Creek fields. Cooper Creek is a structural trap with e. A salt water drive also is present in Rocky Fork field, but updip production must be limited by a loss of permeability as line westward. The southern edge of the field also must be controlled by loss of porosity and permeability. From Cardwell tructural cross section A-A' (Figure Sns-16) is also shown. See Figure Sns-2 for location.



STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

Rotary [ ]
Spudder [ ]
Cable Tools [ ]
Storage [ ]

Quadrangle CHARLESTON

Permit No. KAN-2210

WELL RECORD

Oil or Gas Well (KIND)

Company PENNZOIL COMPANY
Address P. O. Box 1588, Parkersburg, West Va.
Farm Wallace Unit No. 1 Acres 110-1/2
Location (waters)
Well No. 1 Elev. 661.72 gr.
District Union County Kanawha
The surface of tract is owned in fee by J. H. Wallace
Address Route 5, Box 413 Charleston, West Va.
Mineral rights are owned by J. H. Wallace
Address Route 5, Box 413 Charleston, West Va.
Drilling commenced March 21, 1968
Drilling completed April 14, 1968
Date Shot ____ From ____ To ____
With ____

Casing and Tubing	Used in Drilling	Left in Well
Size		
20" Conduit	15.60	
13-3/8"	241.25	
8-5/8"	1745.15	
5-1/2"	5565.83	
2-3/8"	5574.54	
1		
2		
Liners Used		

Packers: Guide Shoe, Cut Kind of Packer Shoe, Float Collar, Guide Shoe, Float Collar
Size of 13-3/8", 8-5/8, 8-5/8, 5-1/2, 5-1/2"
Depth set 243.31, 1738.32, 5514.54, 5480.61
Perf. top ____
Perf. bottom ____
Perf. top ____
Perf. bottom ____

Open Flow /10ths Water in 4" 1,628 Mcf. inch
/10ths Merc. in. inch
Volume Est. After Frac. 10,000 Cu. Ft.
Rock Pressure 2125# lbs. 24 hrs.
OIL None Bbls. 1st 24 hrs.
WELL ACIDIZED

CASING CEMENTED 13-3/8" 243.31 No. Ft. 3-27-68 Date
8-3/8" 1738.32 4-1-68
5-1/2" 5514.54 4-9-68
COAL WAS ENCOUNTERED AT ____ FEET ____ INCHES
____ FEET ____ INCHES ____ FEET ____ INCHES
____ FEET ____ INCHES ____ FEET ____ INCHES

WELL FRACTURED 4-20-68 with 500 Gal, Acid X.E., 800# J111, 500# J84, 30 Gal, F-52, 50 sacks Calcium Chloride, 20,000# 20-40 Frac. Sand. Fraced with 3 Jet turbines and 840 Bbls. of Water.
RESULT AFTER TREATMENT Gas 10 MCF
ROCK PRESSURE AFTER TREATMENT 2125 #
Fresh Water ____ Feet ____ Salt Water ____ Feet ____

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth	Remarks
Soil & Sand			0	30			
Sand (Hard)			30	75			
Red Rock			75	100			
Sand (hard)			100	113			
Red Rock			113	120			
Shale-Sand-R.R.			120	860			
Sandy Lime			860	950			
Salt Sand			950	1158			
Shale			1158	1183			
Salt Sand			1183	1444			
Little Lime			1444	1486	Water	1190	
Big Lime			1486	1650			
Injun Sand			1650	1703			
Sand & Shale			1703	1750			
Shale			1750	2115			
Lime			2115	2123			
Sand & Shale			2123	2218			
Shale			2218	4680			
Corn. Lime			4680	4788			
Orinkany			4788	4820			
Lime & Dolo.			4820	5557			
Newburg			5557	5574			
Lime& Dolo.			5574	5584			
Total Depth				5584			

(over)

20320

Michael W. Lewis
Independent Petroleum Consultant
12 Jonsen Drive
Charleston, WV 25312
304 382-5804 mikelewis25@aol.com

Memorandum

To: Eric Pinkerton

From: Michael Lewis

Subject: Wallace Disposal Well Fluid Migration Calculations

Date: November 18, 2010

This memo is being provided in response to your request to provide calculations for estimating the extent of fluid migration in the Newburg formation from injection into the zone in the Wallace disposal well.

To make this estimation I used the volumetric method of determining reservoir fill up from injection operations. This method requires the number of barrels of fluid injected over time so I have therefore supplied the calculations and extent of fluid movement estimates for a few different total fluid volumes that may be expected over the wells life. As you are aware, this well had been previously operated for injection purposes several years ago and I do not have that volume information available. The calculations are based upon total volumes over the life of the well and therefore take into account any previous volumes.

Calculations are as follows:

$$R = \sqrt{\frac{\left(Q \times 5.625 \left(\frac{ft3}{bbl}\right)\right)}{(\pi \, x \, \theta \, x \, h \, x \, Sd}}$$

Where: R = Lateral Distance of Fluid Bank From Wellbore
Q = Cumulative Volume (bbls)
θ = Porosity Average (%)
h = Reservoir Height (ft)
Sd= Saturation Displacement (%)

Values used for calculations are:

Cumulative Volume = variable
Porosity Average = 9%
Reservoir Height = 20 ft
Saturation Displacement = 25%

The calculation is provided below for a cumulative injection volume of 100,000 bbls only with other volumes and the respective R values listed below the calculation:

$$R = \sqrt{\frac{100{,}000\ bbls\ x\ 5.615\ ft3/bbl}{3.14\ x\ .09\ x\ 20\ x\ .25}}$$

R = 630 ft.

Q = 250,000 bbls	*R = 996 ft.*
Q = 500,000 bbls	*R = 1410 ft.*
Q = 1,000,000 bbls	*R = 1993 ft.*

As you can see, the lateral distance of the fluid bank from the wellbore is fairly minimal for a large volume of water being injected in the well. While these calculations provide an estimate only, I believe this type of estimation is most likely the best that can be made with the information which is available.

Received
Office of Oil & Gas
JAN 04 2016

Section 9

Section 9 – Operating Requirements/Data:

1. Attached are Columbia Gas 20320 (Wallace Unit #1) injection well monthly operational sheets from June and through November of 2015.
2. Attached is Appendix G. A list of all well sources is attached.
3. Attached is the injection fluid analysis as of July of 2015.
4. Attached is the SDS sheets for the corrosion inhibitor, scale inhibitor, and bactericide used as additives to the injection stream.
5. The annulus fluid is freshwater.
6. In the event of loss of mechanical integrity, well failure or leak, the well will be immediately shutdown and taken out of service and all valves and piping closed. Any spill clean-up will be addressed per the SPCC plan. If there is a loss of mechanical integrity or other type of well failure, WV DEP will be immediately notified and a work plan will be developed to get the Columbia Gas 20320 (Wallace Unit #1) injection well back into operation. During the shutdown of the Columbia Gas 20320 (Wallace Unit #1) injection well, fluids can be re-routed to Viking Energy's other Class II injection well in Kanawha County, West Virginia.

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
REPORT FOR WASTE DISPOSAL WELLS

MONTH /YEAR (MM/YYYY): 06/2015
WELL NO. Wallace Well
API NO. 47- 039 - 02210
PERMIT NO. 2D0392210

********MAXIMUM PERMITTED INJECTION PRESSURE 2,045 PSIG.********

US PRESSURES (PSIG)		MAXIMUM DAILY INJECTION PRESSURE (PSIG)	SHUT IN PRESSURE (PSIG)	VOLUME IN BBLS AND/OR MCF.		RATE IN GALLONS PER MINUTE	
	OTHER			DAILY	ACCUMULATED	MAXIMUM	MINIMUM
0	0	800	800	570	570	22	22
0	0	800	800	350	920	22	22
0	0	800	550	110	1030	22	22
0	0	810	810	220	1250	22	22
0	0	550	550	190	1440	22	22
0	0	0	0	0	1440	0	0
0	0	0	0	0	1440	0	0
0	0	450	450	600	2040	22	22
0	0	450	450	110	2150	22	22
0	0	450	450	430	2580	22	22
0	0	650	650	110	2690	22	22
0	0	800	800	380	3070	22	22
0	0	1,200	1,200	490	3560	22	22
0	0	0	0	0	3560	0	0
0	0	1,200	1,200	110	3670	22	22
0	0	1,250	1,250	190	3860	22	22
0	0	1,300	1,300	220	4080	22	22
	0	1,450	1,650	450	4530	22	22
	0	1,650	1,650	570	5100	22	22
0	0	0	0	0	5100	0	0
0	0	0	0	80	5180	22	22
0	0	1,500	1,500	380	5560	22	22
0	0	1,500	1,500	350	5910	22	22
0	0	1,500	1,500	380	6290	22	22
0	0	1,600	1,600	160	6450	22	22
0	0	1,600	1,600	310	6760	22	22
0	0	1,600	1,600	550	7310	22	22
0	0	1,600	1,600	460	7770	22	22
0	0	1,600	1,600	350	8120	22	22
0	0	1,600	1,600	500	8620	22	22
					8620		
0	0	1,650	1,650	8,620	8,620	22	22

ORMATION ON THIS REPORT IS TRUE AND CORRECT. BY: Jessica Pinkerton
TITLE: Administrative Assistant

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
REPORT FOR WASTE DISPOSAL WELLS

MONTH /YEAR (MM/YYYY): 07/2015
WELL NO. Wallace Well
API NO. 47- 039 - 02210
PERMIT NO. 2D0392210

Corporation

********MAXIMUM PERMITTED INJECTION PRESSURE 2,045 PSIG.********

S PRESSURES PSIG)	MAXIMUM DAILY INJECTION PRESSURE (PSIG)	SHUT IN PRESSURE (PSIG)	VOLUME IN BBLS AND/OR MCF.		RATE IN GALLONS PER MINUTE	
OTHER			DAILY	ACCUMULATED	MAXIMUM	MINIMUM
0	1,850	1,850	80	80	0	0
0	1,600	1,600	80	160	0	0
0	1,750	1,750	240	400	0	0
0	0	0	0	400	0	0
0	0	0	0	400	0	0
0	1,600	1,600	80	480	0	0
0	1,650	1,650	240	720	0	0
0	1,700	1,700	240	960	0	0
0	1,700	1,700	540	1500	0	0
0	1,850	1,850	600	2100	0	0
0	1,850	1,850	440	2540	0	0
0	0	0	0	2540	0	0
0	1,850	1,850	380	2920	0	0
0	1,900	1,900	440	3360	0	0
0	1,900	1,900	220	3580	0	0
0	1,900	1,900	440	4020	0	0
0	1,900	1,900	300	4320	0	0
0	1,850	1,850	440	4760	0	0
0	0	0	0	4760	0	0
0	1,800	1,800	300	5060	0	0
0	1,750	1,750	460	5520	0	0
0	1,900	1,900	330	5850	0	0
0	1,900	1,900	230	6080	0	0
0	1,900	1,900	300	6380	0	0
0	0	0	0	6380	0	0
0	0	0	0	6380	0	0
0	1,750	1,900	460	6840	0	0
0	1,900	1,950	220	7060	0	0
0	1,850	1,950	610	7670	0	0
0	1,900	1,950	500	8170	0	0
0	1,800	1,900	370	8540	0	0
0	1,900	1,950	8,540	8,540	0	0

RMATION ON THIS REPORT IS TRUE AND CORRECT. BY: Jessica Pinkerton
TITLE: Administrative Assistant

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
REPORT FOR WASTE DISPOSAL WELLS

MONTH /YEAR (MM/YYYY): 06/2015
WELL NO. WALLACE
API NO. 47- 039 - 02210
PERMIT NO. 2D0392210

:GY CORP

********MAXIMUM PERMITTED INJECTION PRESSURE 2,045 PSIG.********

S PRESSURES (PSIG)		MAXIMUM DAILY INJECTION PRESSURE (PSIG)	SHUT IN PRESSURE (PSIG)	VOLUME IN BBLS AND/OR MCF.		RATE IN GALLONS PER MINUTE	
	OTHER			DAILY	ACCUMULATED	MAXIMUM	MINIMUM
	0	1,800	1,800	270	270	0	0
	0	0	0	0	270	0	0
	0	1,800	1,800	410	680	0	0
	0	1,800	1,800	400	1080	0	0
	0	0	0	80	1160	0	0
	0	1,800	1,800	320	1480	0	0
	0	1,400	1,400	320	1800	0	0
	0	0	0	0	1800	0	0
	0	0	0	0	1800	0	0
	0	1,500	1,500	270	2070	0	0
	0	1,500	1,500	390	2460	0	0
	0	1,500	1,500	240	2700	0	0
	0	0	0	240	2940	0	0
	0	1,500	1,500	230	3170	0	0
	0	0	0	0	3170	0	0
	0	0	0	0	3170	0	0
	0	1,500	1,500	330	3500	0	0
	0	0	0	0	3500	0	0
	0	0	0	80	3580	0	0
	0	1,700	1,700	450	4030	0	0
	0	1,900	1,900	150	4180	0	0
	0	1,500	1,500	0	4180	0	0
	0	0	0	0	4180	0	0
	0	0	0	240	4420	0	0
	0	0	0	80	4500	0	0
	0	1,400	1,400	160	4660	0	0
	0	1,500	1,500	160	4820	0	0
	0	1,600	1,600	240	5060	0	0
	0	0	0	0	5060	0	0
	0	0	0	0	5060	0	0
	0	1,500	1,500	150	5210	0	0
	0	1,900	1,900	5,210	5,210	0	0

RMATION ON THIS REPORT IS TRUE AND CORRECT. BY: Jessica Pinkerton
TITLE: Administrative Assistant

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
REPORT FOR WASTE DISPOSAL WELLS

MONTH /YEAR (MM/YYYY): 09/2015
WELL NO. Wallace Well
API NO. 47- 039 - 02210
PERMIT NO. 2D0392210

' Corporation

********MAXIMUM PERMITTED INJECTION PRESSURE 2,045 PSIG.********

US PRESSURES (PSIG)		MAXIMUM DAILY INJECTION PRESSURE (PSIG)	SHUT IN PRESSURE (PSIG)	VOLUME IN BBLS AND/OR MCF.		RATE IN GALLONS PER MINUTE	
	OTHER			DAILY	ACCUMULATED	MAXIMUM	MINIMUM
0	0	1,600	1,600	620	620	0	0
0	0	1,600	1,600	220	840	0	0
0	0	1,600	1,600	610	1450	0	0
0	0	1,700	1,700	610	2060	0	0
0	0	0	0	0	2060	0	0
0	0	0	0	0	2060	0	0
0	0	0	0	0	2060	0	0
0	0	1,800	1,800	460	2520	0	0
0	0	1,900	1,900	480	3000	0	0
0	0	1,900	1,900	690	3690	0	0
0	0	1,900	1,900	360	4050	0	0
0	0	0	0	0	4050	0	0
0	0	0	0	0	4050	0	0
0	0	1,900	1,900	680	4730	0	0
0	0	1,900	1,900	620	5350	0	0
0	0	1,900	1,900	560	5910	0	0
0	0	1,900	1,900	520	6430	0	0
0	0	1,800	1,800	540	6970	0	0
0	0	0	0	0	6970	0	0
0	0	0	0	0	6970	0	0
0	0	1,800	1,800	460	7430	0	0
0	0	1,800	1,800	320	7750	0	0
0	0	1,800	1,800	970	8720	0	0
0	0	1,800	1,800	480	9200	0	0
0	0	1,800	1,800	450	9650	0	0
0	0	0	0	0	9650	0	0
0	0	0	0	0	9650	0	0
0	0	1,800	1,800	690	10340	0	0
0	0	1,800	1,800	320	10660	0	0
0	0	1,800	1,800	320	10980	0	0
					10980		
0	0	1,900	1,900	10,980	10,980	0	0

ORMATION ON THIS REPORT IS TRUE AND CORRECT. BY: Jessica Pinkerton
TITLE: Administrative Assistant

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
REPORT FOR WASTE DISPOSAL WELLS

MONTH /YEAR (MM/YYYY): 10/2015
WELL NO. Wallace Well
API NO. 47- 039 - 02210
PERMIT NO. 2D0392210

Corp

********MAXIMUM PERMITTED INJECTION PRESSURE 2,045 PSIG.********

JS PRESSURES (PSIG)		MAXIMUM DAILY INJECTION PRESSURE (PSIG)	SHUT IN PRESSURE (PSIG)	VOLUME IN BBLS AND/OR MCF.		RATE IN GALLONS PER MINUTE	
	OTHER			DAILY	ACCUMULATED	MAXIMUM	MINIMUM
)	0	1,800	1,800	860	860	0	0
)	0	1,800	1,800	300	1160	0	0
)	0	0	0	0	1160	0	0
)	0	0	0	0	1160	0	0
)	0	1,800	1,800	640	1800	0	0
)	0	1,800	1,800	480	2280	0	0
)	0	1,800	1,800	530	2810	0	0
)	0	1,800	1,800	560	3370	0	0
)	0	1,800	1,800	540	3910	0	0
)	0	0	0	0	3910	0	0
)	0	0	0	0	3910	0	0
)	0	1,800	1,800	780	4690	0	0
)	0	1,900	1,900	760	5450	0	0
)	0	1,900	1,900	340	5790	0	0
)	0	1,900	1,900	430	6220	0	0
)	0	1,900	1,900	400	6620	0	0
)	0	0	0	0	6620	0	0
	0	0	0	0	6620	0	0
	0	1,800	1,800	160	6780	0	0
)	0	1,800	1,800	300	7080	0	0
)	0	1,800	1,800	0	7080	0	0
)	0	1,800	1,800	550	7630	0	0
)	0	1,800	1,800	310	7940	0	0
)	0	0	0	0	7940	0	0
)	0	0	0	0	7940	0	0
)	0	0	1,800	240	8180	0	0
)	0	1,900	1,900	530	8710	0	0
)	0	1,900	1,900	240	8950	0	0
)	0	1,900	1,900	80	9030	0	0
)	0	0	0	0	9030	0	0
)	0	0	0	0	9030	0	0
)	0	1,900	1,900	9,030	9,030	0	0

)RMATION ON THIS REPORT IS TRUE AND CORRECT. BY: Jessica Pinkerton
TITLE: Administrative Assistant

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
REPORT FOR WASTE DISPOSAL WELLS

MONTH /YEAR (MM/YYYY): 11/2015
WELL NO. Wallace Well
API NO. 47- 039 - 02210
PERMIT NO. 2D0392210

*********MAXIMUM PERMITTED INJECTION PRESSURE 2,045 PSIG.********

S PRESSURES PSIG)	MAXIMUM DAILY INJECTION PRESSURE (PSIG)	SHUT IN PRESSURE (PSIG)	VOLUME IN BBLS AND/OR MCF.		RATE IN GALLONS PER MINUTE	
OTHER			DAILY	ACCUMULATED	MAXIMUM	MINIMUM
0	0	0	0	0	0	0
0	1,800	1,800	240	240	0	0
0	1,800	1,800	320	560	0	0
0	1,900	1,900	570	1130	0	0
0	1,900	1,900	770	1900	0	0
0	1,900	1,900	0	1900	0	0
0	1,900	1,900	220	2120	0	0
0	1,900	1,900	220	2340	0	0
0	1,900	1,900	630	2970	0	0
0	1,900	1,900	550	3520	0	0
0	1,900	1,900	0	3520	0	0
0	1,900	1,900	0	3520	0	0
0	1,900	1,900	360	3880	0	0
0	0	0	0	3880	0	0
0	1,800	1,800	110	3990	0	0
0	1,800	1,800	540	4530	0	0
0	1,800	1,800	320	4850	0	0
0	1,900	1,900	240	5090	0	0
0	1,900	1,900	430	5520	0	0
0	1,900	1,900	490	6010	0	0
0	1,900	1,900	0	6010	0	0
0	1,900	1,900	220	6230	0	0
0	1,900	1,900	320	6550	0	0
0	1,900	1,900	240	6790	0	0
0	0	0	0	6790	0	0
0	0	0	0	6790	0	0
0	0	0	0	6790	0	0
0	0	0	0	6790	0	
0	0	0	0	6790	0	0
0	1,700	1,700	320	7110	0	0
				7110		
0	1,900	1,900	7,110	7,110	0	0

RMATION ON THIS REPORT IS TRUE AND CORRECT. BY: Jessica Pinkerton
TITLE: Administrative Assistant

APPENDIX G

Wells Serviced by Injection Wells

API #	Operator	Producing Formation
*See attached list.		

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

Class II Manifest

UIC # 2D0392210

; of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
CLETS	Joey Beane	[illegible]	47-087-04759	80	no	6-8-15
	Joey Beane	[illegible]	47-087-04759	80	no	6-8-15
	Joey Beane	[illegible]	47-001-1091 47-001-0711	100	Yes 60/40	6-10-15
	Joey Beane	[illegible]	47-087-04777	80	no	6-18-15
	Joey Beane	[illegible]	47-087-04777	70	no	6-18-15
	Joey Beane	[illegible]	47-087-04777	80	no	6-18-15
	Joey Beane	[illegible]	47-087-04777	80	no	6-19-15
	Joey Beane	[illegible]	47-079-01538	110	no	6-19-15
	Joey Beane	[illegible]	47-087-04777	80	no	6-19-15
	Joey Beane	[illegible]	47-087-04777	80	no	6-19-15
	Joey Beane	[illegible]	47-087-04777	80	no	6-22-15
	Joey Beane	[illegible]	47-087-04777	80	no	6-22-15
	Joey Beane	[illegible]	47-087-04759	80	no	6-23-15
	Joey Beane	[illegible]	47-087-04759	80	no	6-23-15
	Joey Beane	[illegible]	47-087-04765	80	no	6-23-15
	Joey Beane	[illegible]	47-087-04765	80	no	6-24-15
	Joey Beane	[illegible]	47-079-01538	110	no	6-24-15
	Joey Beane	[illegible]	47-087-04765	80	no	6-24-15
	Joey Beane	[illegible]	47-079-01538	110	no	6-24-15
	Joey Beane	[illegible]	47-087-04765	80	no	6-25-15
	Joey Beane	[illegible]	47-087-04767	80	no	6-25-15
	Joey Beane	[illegible]	47-087-04767	80	no	6-26-15
	Joey Beane	[illegible]	47-087-04767	80	no	6-26-15
	Joey Beane	[illegible]	47-087-04767	70	no	6-26-15

Make as many copies of the document as necessary to comply with the UIC permit.
Page numbers should be maintained sequentially to provide an adequate record.

Class II Manifest

UIC # 2D03.210

of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
Joey Beane		47-087-04767	80	no	6-26-15
Joey Beane		47-087-04767	80	no	6-29-15
			~~80~~		~~6-29-15~~
Joey Beane		47-079-01538	110	no	6-29-15
Joey Beane		47-087-04767	80	no	6-29-15
Joey Beane		47-087-04767	80	no	6-29-15
Joey Beane		47-053-0361 / 47-053-0373	100	yes	6-30-15
Joey Beane		47-087-04779	80	no	6-30-15
Joey Beane		47-087-04779	80	no	6-30-15
Joey Beane		47-087-04779	80	no	6-30-15
Joey Beane		47-087-04779	80	no	6-30-15
Joey Beane		47-087-04779	80	no	6-30-15
Joey Beane		47-087-0467	80	no	6-31-15

Make as many copies of the document as necessary to comply with the UIC permit.
Page numbers should be maintained sequentially to provide an adequate record.

Class II Manifest

UIC # 2D0392210

; of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane	Joey Beane	47.087.04765	80	no	7.1.15
	Joey Beane		47.087.04779	80	no	7.2.15
	Joey Beane		47.087.04779	80	no	7.3.15
	Joey Beane		47.087.04779	80	no	7.3.15
	Joey Beane		47.087.04779	80	no	7.3.15
	Joey Beane		47.087.04777	80	no	7.6.15
	Joey Beane		47.087.04777	80	no	7.7.15
	Joey Beane		47.087.04777	80	no	7.7.15
	Joey Beane		47.087.04777	80	no	7.7.15
	Joey Beane		47.087.04766	80	no	7.8.15
	Joey Beane		47.087.04782	80	no	7.8.15
	Joey Beane		47.087.04782	80	no	7.8.15
	Joey Beane		47.087.04782	80	no	7.9.15
	Joey Beane		47.087.04782	80	no	7.9.15
	Joey Beane		47.087.04782	80	no	7.9.15
	Joey Beane		512067	110	no	7.9.15
	Joey Beane		513106	110	no	7.9.15
	Joey Beane		47.087.04782	80	no	7.10.15
	Joey Beane		512067	110	no	7.10.15
	Joey Beane		47.087.04782	80	no	7.10.15
	Joey Beane		513106	110	no	7.10.15
	Joey Beane		511038	110	no	7.10.15
	Joey Beane		514135	110	no	7.10.15
	Joey Beane		514135	110	no	7.11.15

Make as many copies of the document as necessary to comply with the UIC permit.
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Class II Manifest

UIC # 2D0392210

of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane	Joey Beane	514135	110	no	7.11.15
	Joey Beane		512073	110	no	7.11.15
	Joey Beane		500010	110	no	7.11.15
	Joey Beane		511038	110	no	7.13.15
	Joey Beane		47.087.04782	80	no	7.13.15
	Joey Beane		500010	110	no	7.13.15
	Joey Beane		47.087.04782	80	no	7.13.15
	Joey Beane		500010	110	no	7.14.15
	Joey Beane		511035	110	no	7.14.15
	Joey Beane		500010	110	no	7.14.15
	Joey Beane		511035	110	no	7.14.15
	Joey Beane		512073	110	no	7.15.15
	Joey Beane		512073	110	no	7.15.15
	Joey Beane		511036	110	no	7.16.15
	Joey Beane		511036	110	no	7.16.15
	Joey Beane		511036	110	no	7.16.15
	Joey Beane		511042	110	no	7.16.15
	Joey Beane		47.087.04781	80	no	7.17.15
	Joey Beane		511042	110	no	7.17.15
	Joey Beane		511035	110	no	7.17.15
	Joey Beane		511042/500016	110	yes 50/50	7.18.15
	Joey Beane		500016	110	no	7.18.15
	Joey Beane		500016	110	no	7.18.15
	Joey Beane		500016	110	no	7.18.15

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Page numbers should be maintained sequentially to provide an adequate record.

Class II Manifest

UIC # 2D0392210

s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

'e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane	Joey Beane	511034/512080	110	yes 50/50	7.20.15
	Joey Beane	[illegible]	47.087.04781	80	no	7.20.15
	Joey Beane	[illegible]	511051	110	no	7 20.15
	Joey Beane	[illegible]	512089	110	no	7.21.15
	Joey Beane	[illegible]	47.087.04781	80	no	7.21.15
	Joey Beane	[illegible]	512080/511058	110	yes 50/50	7.21.15
	Joey Beane	[illegible]	47.087.04774	80	no	7.21.15
	Joey Beane	[illegible]	47.087.04774	80	no	7.21.15
	Joey Beane	[illegible]	47.087.04781	80	no	7.22.15
	Joey Beane	[illegible]	47.087.04763	70	no	7.22.15
	Joey Beane	[illegible]	511058	110	no	7.22.15
	Joey Beane	[illegible]	47.087.04763	70	no	7.22.15
	Joey Beane	[illegible]	511058	110	no	7.22.15
	Joey Beane	[illegible]	47.087.04774	80	no	7.23.15
	Joey Beane	[illegible]	47.087.04774	80	no	7.23.15
	Joey Beane	[illegible]	47.087.04781	70	no	7.23.15
	Joey Beane	[illegible]	47.087.04781	80	no	7.24.15
	Joey Beane	[illegible]	47.087.04781	70	no	7.24.15
	Joey Beane	[illegible]	47.087.04781	70	no	7.24.15
	Joey Beane	[illegible]	47.087.04781	80	no	7.24.15
	Joey Beane	[illegible]	47.087.04783	70	no	7.27.15
	Joey Beane	[illegible]	47.087.04783	80	no	7.27.15
	Joey Beane	[illegible]	47.087.04783	80	no	7.27.15
	Joey Beane	[illegible]	47.087.04782	70	no	7.27.15

Make as many copies of the document as necessary to comply with the UIC permit.
Page numbers should be maintained sequentially to provide an adequate record.

Class II Manifest

UIC # 2D0392210

s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane		47.087.04782	80	no	7.27.15
	Joey Beane		47.087.04783	80	no	7.27.15
	Joey Bea		47.087.04783	70	no	7.28.15
	Joey Beane		47.087.04783	80	no	7.28.15
	Joey Beane		47.087.04783	70	no	7.28.15
	Joey Beane		47.087.04780	70	no	7.28.15
	Joey Beane		396374	110	no	7.29.15
	Joey Beane		396374	110	no	7.29.15
	Joey Beane		47.087.04780	70	no	7.29.15
	Joey Beane		47.087.04780	70	no	7.29.15
	Joey Beane		47.079.01538	110	no	7.29.15
	Joey Beane		47.087.04780	70	no	7.29.15
	Joey Beane		47.087.04780	80	no	7.30.15
	Joey Beane		47.087.04780	80	no	7.30.15
	Joey Beane		47.087.04780	70	no	7.30.15
	Joey Beane		47.087.04780	80	no	7.30.15
	Joey Beane	47.079.01538	[illegible]	110	no	7.30.15
	Joey Beane		47.087.04773	70	no	7.31.15
	Joey Beane		47.087.04773	80	no	7.31.15
	Joey Beane		47.087.04773	70	no	7.31.15
	Joey Beane		47.087.04773	80	no	7.31.15
	Joey Beane		47.087.04773	70	no	7.31.15
	Joey Beane					
	Joey Beane					

Make as many copies of the document as necessary to comply with the UIC permit.
Page numbers should be maintained sequentially to provide an adequate record.

Class II Manifest

UIC # 2D0392210

s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane	Joey Bee	47-087-04773	80	No	8-1-15
	Joey Beane		47-087-04773	80	No	8-1-15
	Joey Beane		47-09-01538	110	No	8-1-15
	Joey Beane		47-087-04768	70	No	8-3-15
	Joey Beane		47-087-04768	80	No	8-3-15
	Joey Beane		47-087-04768	70	No	8-3-15
	Joey Beane		47-079-01538	110	No	8-3-15
	Joey Beane		47-039-04202	80	No	8-3-15
	Joey Beane		47-087-04768	70	No	8-3-15
	Joey Beane		47-087-04768	80	No	8-4-15
	Joey Beane		47-087-04768	70	No	8-4-15
	Joey Beane		47-079-01538	110	No	8-4-15
	Joey Beane		47-087-04768	70	No	8-4-15
	Joey Beane		47-039-04202	80	No	8-5-15
	Joey Beane		47-087-04761	70	No	8-6-15
	Joey Beane		47-079-01538	110	No	8-6-15
	Joey Beane		47-087-04761	70	No	8-6-15
	Joey Beane		47-087-04761	70	No	8-6-15
	Joey Beane		47-087-04761	70	No	8-7-15
	Joey Beane		47-087-04761	70	No	8-7-15
	Joey Beane		47-087-04761	70	No	8-7-15
	Joey Beane		47-079-01538	110	No	8-7-15
	Joey Beane		47-087-04761	80	No	8-10-15
	Joey Beane		47-079-01538	110	No	8-10-15

Make as many copies of the document as necessary to comply with the UIC permit.
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Class II Manifest

UIC # 2D0392210

; of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane		47-087-04761	80	no	8-10-15
	Joey Beane		E Smith 212	70	no	8-11-15
	Joey Beane		E Smith 212	80	no	8-11-15
	Joey Beane		E Smith 212	70	no	8-11-15
	Joey Beane		Bull Town Stock	100	no	8-11-15
	Joey Beane		47-087-04769	70	no	8-11-15
	Joey Beane		47-087-04770	80	no	8-12-15
	Joey Beane		47 087 04770	80	no	8-12-15
	Joey Beane		47 087 04770	80	no	8-12-15
	Joey Beane		47 087 04770	80	no	8-13-15
	Joey Beane		47 087 04770	80	no	8-13-15
	Joey Beane		47 087 04770	80	no	8-13-15
	Joey Beane		47 087 04770	80	no	8-14-15
	Joey Beane		47 087 04770	80	no	8-14-15
	Joey Beane		47-087-04770	70	no	8-14-15
	Joey Beane		47-087-04767	80	no	8-17-15
	Joey Beane		47-087-04767	70	no	8-17-15
	Joey Beane		47-087-04767	70	no	8-17-15
	Joey Beane		804129	110	no	8-17-15
	Joey Beane		47-087-04767	80	no	8-19-15
	Joey Beane		47-087-04756	80	no	8-20-15
	Joey Beane		47-087-04756	70	no	8-20-15
	Joey Beane		47-087-04756	80	no	8-20-15
	Joey Beane		47-087-04756	70	no	8-20-15

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Class II Manifest

UIC # 2D0392210

s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

re	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane	Joey Beane	47-087-04756	80	No	8-20-15
	Joey Beane		47-087-04756	70	No	8-20-15
	Joey Beane		47-087-04769	80	No	8-21-15
	Joey Beane		47-087-04769	70	No	8-21-15
	Joey Beane		47-087-04769	80	No	8-21-15
	Joey Beane		47-087-04769	80	No	8-24-15
	Joey Beane		47-039-04202	80	No	8-24-15
	Joey Beane		47-039-04202	80	No	8-25-15
	Joey Beane		47-087-04769	80	No	8-26-15
	Joey Beane		47-087-04769	80	No	8-26-15
	Joey Beane		47-087-04769	80	No	8-27-15
	Joey Beane		47-087-04769	80	No	8-27-15
	Joey Beane		47-087-04778	80	No	8-28-15
	Joey Beane		47-087-04778	80	No	8-28-15
	Joey Beane		47-039-04202	80	No	8-28-15
	Joey Beane		47-087-04769	70	No	8-31-15
	Joey Beane		47-087-04768	80	No	8-31-15
	Joey Beane		47-087-04768	70	No	8-31-15

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Class II Manifest

UIC # 2D039 2210

s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beare		47-087-04769	70	no	9-1-15
	Joey Beare		47-087-04769	80	no	9-1
	Joey Beare		47-039-04202	80	no	9-1
	Joey Beare		47-087-04769	70	no	9-1
	Joey Beare		47-039-04202	80	no	9-1
	Joey Beare		47-039-04202	80	no	9-1
	Joey Beare		47-039-04202	80	no	9-1
	Joey Beare		47-039-04202	80	no	9-1
	Joey Beare		47-087-04769	80	no	9-2
	Joey Beare		47-087-04769	70	no	9-2
	Joey Beare		47-087-04778	70	no	9-2
	Joey Beare		47-039-04202	80	no	9-3
	Joey Beare		47-087-04778	70	no	9-3
	Joey Beare		47-039-04202	80	no	9-3
	Joey Beare		47-039-04202	80	no	9-3
	Joey Beare		47-087-04778	70	no	9-3
	Joey Beare		47-039-04202	80	no	9-3
	Joey Beare		47-039-04202	80	no	9-3
	Joey Beare		47-087-04778	70	no	9-3
	Joey Beare		47-039-04202	80	no	9-4
	Joey Beare		47-039-04202	80	no	9-4
	Joey Beare		47-039-04202	80	no	9-4
	Joey Beare		47-087-04778	70	no	9-4
	Joey Beare		47-039-04202	70	no	9-4

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Class II Manifest

UIC # 2D0392210

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e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane		47-039-04202	80	No	9-4-15
	Joey Beane		47-087-04778	70	No	9-4-15
	Joey Beane		47-039-04202	80	No	9-4-15
	Joey Beane		47-087-04778	70	No	9-8-15
	Joey Beane		47-039-04202	80	No	9-8-15
	Joey Beane		47-039-04202	80	No	9-8-15
	Joey Beane		47-087-04757	70	No	9-8-15
	Joey Beane		47-039-04202	80	No	9-8-15
	Joey Beane		47-039-04202	80	No	9-8-15
	Joey Beane		47-087-04757	80	No	9-8-15
	Joey Beane		47-039-04202	80	No	9-9-15
	Joey Beane		47-039-04202	80	No	9-9-15
	Joey Beane		47-039-04202	80	No	9-9-15
	Joey Beane		47-039-04202	80	No	9-9-15
	Joey Beane		47-039-04202	80	No	9-9-15
	Joey Beane		47-039-04202	80	No	9-10-15
	Joey Beane		47-087-04757	70	No	9-10-15
	Joey Beane		47-039-04202	80	No	9-10-15
	Joey Beane		47-039-04202	80	No	9-10-15
	Joey Beane		47-087-04757	70	No	9-10-15
	Joey Beane		47-039-04202	80	No	9-10-15
	Joey Beane		47-039-04202	80	No	9-10-15
	Joey Beane		47-087-04762	70	No	9-10-15
	Joey Beane		47-087-04762	70	No	9-11-15

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Class I. anifest

UIC # 2D0392210

ents of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane	Joey Beane	47-087-04760	70	No	9-14-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-14-15
	Joey Beane	[illegible]	47-087-04760	70	No	9-14-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-14-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-14-15
	Joey Beane	[illegible]	47-039-04202	70	No	9-14-15
	Joey Beane	[illegible]	47039-04202	80	No	9-14-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-14-15
	Joey Beane	[illegible]	47-039-04202	70	No	9-14-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-15-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-15-15
	Joey Beane	[illegible]	47-087-04760	70	No	9-15-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-15-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-15-15
	Joey Beane	[illegible]	47-087-04760	70	No	9-15-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-15-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-15-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-16-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-16-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-16-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-16-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-16-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-16-15
	Joey Beane	[illegible]	47-039-04202	80	No	9-16-15

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Class I[illegible] [illegible]anifest

UIC # 2D0572210

[illegible]ts of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

[illegible]e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane	Joey Beane	47-039-04202	80	no	9-17-15
	Joey Beane	[illegible]	47-087-04760	70	no	9-17-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-17-15
	Joey Beane	[illegible]	47-039-04202	70	no	9-17-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-17-15
	Joey Beane	[illegible]	47-039-04202	70	no	9-17-15
	Joey Beane	[illegible]	47-039-04202	70	no	9-17-15
	Joey Beane	[illegible]	47-087-04760	70	no	9-18-15
	Joey Beane	[illegible]	47-039-04202	70	no	9-18-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-18-15
	Joey Beane	[illegible]	47-087-04760	70	no	9-18-15
	Joey Beane	[illegible]	47-039-04202	70	no	9-18-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-18-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-21-15
	Joey Beane	[illegible]	47-087-04768	70	no	9-21-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-21-15
	Joey Beane	[illegible]	47-087-04768	70	no	9-21-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-21-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-21-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-22-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-22-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-22-15
	Joey Beane	[illegible]	47-039-04202	80	no	9-22-15
	Joey Beane	[illegible]	47-039-04202	70	no	9-23-15

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Class II Manifest

UIC # 2D392210

s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane		47-039-04202	80	no	9-23-15
	Joey Beane		47-039 04202	80	no	9-24-15
	Joey Beane		47 039 04202	80	no	9-24-15
	Joey Beane		47 039 04202	80	no	9-24-15
	Joey Beane		47 039 04202	80	no	9-24-15
	Joey Beane		47 039 04202	80	no	9-24-15
	Joey Beane		47 039 04202	80	no	9-25-15
	Joey Beane		47 039 04202	70	no	9-25-15
	Joey Beane		47 039 04202	80	no	9-25-15
	Joey Beane		47 039 04202	70	no	9-25-15
	Joey Beane		47 039 04202	80	no	9-25-15
	Joey Beane		47 039 04202	70	no	9-25-15
	Joey Beane		47 039 04202	80	no	9-28-15
	Joey Beane		47 039 04202	80	no	9-28-15
	Joey Beane		47 039 04202	70	no	9-28-15
	Joey Beane		47 039 04202	80	no	9-28-15
	Joey Beane		47 039 04202	80	no	9-28-15
	Joey Beane		47 039 04202	70	no	9-28-15
	Joey Beane		47 039 04202	80	no	9-28-15
	Joey Beane		47 039 04202	80	no	9-28-15
	Joey Beane		47 039 04202	70	no	9-28-15
	Joey Beane		47 039 04202	80	no	9-29-15
	Joey Beane		47 039 04202	80	no	9-29-15
	Joey Beane		47 039 04202	80	no	9-29-15

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Class II Manifest

UIC # 20039-2210

of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane	[illegible]	47-039-04202	80	NO	9-29-15
	Joey Beane	[illegible]	47-039-04202	80	NO	9-30-15
	Joey Beane	[illegible]	47-039-04202	80	NO	9-30-15
	Joey Beane	[illegible]	47-039-04202	80	NO	9-30-15

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Class II Manifest

UIC 2D0392210

of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
Joey Beane/D Walker	Joey Beane	47.039.04202	80	no	10.1.15
Joey Beane/D Walker	Joey Beane	47.039.04202	80	no	10.1.15
Joey Beane/D Walker	Joey Beane	47.039.04202	80	no	10.1.15
Joey Beane/D Walker	Joey Beane	47.039.04202	80	no	10.1.15
Joey Beane/D Walker	Joey Beane	~~47.~~1468762146877	110	50/50	10.1.15
Joey Beane/D Walker	Joey Beane	47.039.04202	80	no	10.1.15
Joey Beane/D Walker		47.039.04202	80	no	10.1.15
Joey Beane/D Walker		1468762146877	110	50/50	10.1.15
Joey Beane/D Walker		47.039.04202	80	no	10.1.15
Joey Beane/D Walker		47.039.04202	80	no	10.1.15
Joey Beane/D Walker		47.039 04202	80	no	10.2.15
Joey Beane/D Walker		47.039.04202	70	no	10.2.15
Joey Beane/D Walker		47.039.04202	80	no	10.2.15
Joey Beane/D Walker		47.039.04202	70	no	10.5.15
Joey Beane/D Walker		47.039.04202	80	no	10.5.15
Joey Beane/D Walker		47.039.04202	80	no	10.5.15
Joey Beane/D Walker		47.039.04202	80	no	10.5.15
Joey Beane/D Walker		47.039.04202	80	no	10.5.15
Joey Beane/D Walker		47.039.04202	80	no	10.5.15
Joey Beane/D Walker		47.039.04202	80	no	10.5.15
Joey Beane/D Walker		47.039.04202	80	no	10.5.15
Joey Beane/D Walker		47.039.04202	80	no	10.5.15
Joey Beane/D Walker		47.039 04202	80	no	10.6.15
Joey Beane/D Walker		47.039.04202	80	no	10.6.15

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Class II Manifest

UIC 2D0392210

..s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane/D Walker		47-039-04202	80	no	10-6-15
	Joey Beane/D Walker		47-039-04202	80	no	10-6-15
	Joey Beane/D Walker		47-039-04202	70	no	10-6-15
	Joey Beane/D Walker		47-039-04202	80	no	10-6-15
	Joey Beane/D Walker		47-039-04202	80	no	10-7-15
	Joey Beane/D Walker		47-039-04202	80	no	10-7-15
	Joey Beane/D Walker		47-039-04202	80	no	10-7-15
	Joey Beane/D Walker		47-039-04202	80	no	10-7-15
	Joey Beane/D Walker		47-039-04202	70	no	10-7-15
	Joey Beane/D Walker		47-039-04202	80	no	10-7-15
	Joey Beane/D Walker		47-039-04202	70	no	10-7-15
	Joey Beane/D Walker		47-039-04202	80	no	10-8-15
	Joey Beane/D Walker		47-039-04202	70	no	10-8-15
	Joey Beane/D Walker		47-039-04202	80	no	10-8-15
	Joey Beane/D Walker		47-039-04202	70	no	10-8-15
	Joey Beane/D Walker		47-039-04202	80	no	10-8-15
	Joey Beane/D Walker		47-039-04202	70	no	10-8-15
	Joey Beane/D Walker		146872 & 146877	110	50/50	10-8-15
	Joey Beane/D Walker		47-039-04202	80	no	10-9-15
	Joey Beane/D Walker		47-039-04202	80	no	10-9-15
	Joey Beane/D Walker		47-039-04202	70	no	10-9-15
	Joey Beane/D Walker		47-039-04202	80	no	10-9-15
	Joey Beane/D Walker		47-039-04202	80	no	10-9-15
	Joey Beane/D Walker		47-039-04202	70	no	10-9-15

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Class II Manifest

UIC 2D0392210

of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane/D Walker		47-039-04202	80	no	10-9-15
	Joey Beane/D Walker		47-039-04202	80	no	10-12-15
	Joey Beane/D Walker		47-03-04202	80	no	10-12-15
	Joey Beane/D Walker		47-039-04202	80	no	10-12-15
	Joey Beane/D Walker		47-039-04202	70	no	10-12-15
	Joey Beane/D Walker		47-039-04202	80	no	10-12-15
	Joey Beane/D Walker		47-039-04202	80	no	10-12-15
	Joey Beane/D Walker		47-039-04202	80	no	10-12-15
	Joey Beane/D Walker		47-039-04202	70	no	10-12-15
	Joey Beane/D Walker		47-039-04202	80	no	10-12-15
	Joey Beane/D Walker		47-039-04202	80	no	10-12-15
	Joey Beane/D Walker		47-039-04202	80	no	10-13-15
	Joey Beane/D Walker		47-039-04202	80	no	10-13-15
	Joey Beane/D Walker		47-039-04202	80	no	10-13-15
	Joey Beane/D Walker		47-039-04202	70	no	10-13-15
	Joey Beane/D Walker		47-039-04202	80	no	10-13-15
	Joey Beane/D Walker		146877 & 146876	110	50/50	10-13-15
	Joey Beane/D Walker		47-083-10163	100	no	10-13-15
	Joey Beane/D Walker		47-039-04202	80	no	10-13-15
	Joey Beane/D Walker		47-039-04202	80	no	10-13-15
	Joey Beane/D Walker		47-039-04202	80	no	10-14-15
	Joey Beane/D Walker		47-039-04202	80	no	10-14-15
	Joey Beane/D Walker		47-039-04202	70	no	10-14-15
	Joey Beane/D Walker		146877 & 146876	110	50/50	10-14-15

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Class II Manifest

UIC 2D0392210

s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane/D Walker		47-039-04202	80	no	10-15-15
	Joey Beane/D Walker		47-039-04202	80	no	10-15-15
	Joey Beane/D Walker		47-039-04202	70	no	10-15-15
	Joey Beane/D Walker		47-039-04202	80	no	10-15-15
	Joey Beane/D Walker		146876-146877	40	50/50	10-15-15
	Joey Beane/D Walker		47-039-04202	80	no	10-15-15
	Joey Beane/D Walker		47-039-04202	80	no	10-16-15
	Joey Beane/D Walker		47-039-04202	80	no	10-16-15
	Joey Beane/D Walker		47-039-04202	80	no	10-16-15
	Joey Beane/D Walker		47-039-04202	80	no	10-16-15
	Joey Beane/D Walker		47-039-04202	80	no	10-16-15
	Joey Beane/D Walker		47-039-04202	80	no	10-19-15
	Joey Beane/D Walker		47-039-04202	80	no	10-19-15
	Joey Beane/D Walker		146876-146877	50	50/50	10-20-15
	Joey Beane/D Walker		47-039-04202	80	no	10-20-15
	Joey Beane/D Walker		146876-146877	110	50/50	10-20-15
	Joey Beane/D Walker		47-039-04202	80	no	10-22-15
	Joey Beane/D Walker		47-039-04202	80	no	10-22-15
	Joey Beane/D Walker		47-039-04202	80	no	10-22-15
	Joey Beane/D Walker		47-039-04202	80	no	10-22-15
	Joey Beane/D Walker		47-039-04202	70	no	10-22-15
	Joey Beane/D Walker		47-039-04202	80	no	10-22-15
	Joey Beane/D Walker		47-039-04202	80	no	10-22-15
	Joey Beane/D Walker		47-039-04202	80	no	10-23-15

Make as many copies of the document as necessary to comply with the UIC permit.
Page numbers should be maintained sequentially to provide an adequate record.

Class II Manifest

UIC 2D0392210

s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

re	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane/D Walker		47-039-04202	70	no	10-23-15
	Joey Beane/D Walker		47-039-04202	80	no	10-23-15
	Joey Beane/D Walker		47-039-04202	80	no	10-23-15
	Joey Beane/D Walker		47-039-04202	80	no	10-26-15
	Joey Beane/D Walker		47-039-04202	80	no	10-26-15
	Joey Beane/D Walker		47-039-04202	80	no	10-26-15
	Joey Beane/D Walker		47-039-04202	80	no	10-27-15
	Joey Beane/D Walker		47-039-04202	70	no	10-27-15
	Joey Beane/D Walker		47-039-04202	80	no	10-27-15
	Joey Beane/D Walker		47-039-04202	80	no	10-27-15
	Joey Beane/D Walker		47-039-04202	70	no	10-27-15
	Joey Beane/D Walker		47-039-04202	80	no	10-27-15
	Joey Beane/D Walker		47-039-04202	80	no	10-28-15
	Joey Beane/D Walker		47-039-04202	80	no	10-28-15
	Joey Beane/D Walker		47-039-04202	80	no	10-28-15
	Joey Beane/D Walker		47-039-04202	80	no	10-29-15
	Joey Beane/D Walker		146876/146877	110	50/50	10-30-15
	Joey Beane/D Walker		47-039-04202	80	no	10-30-15
	Joey Beane/D Walker					
	Joey Beane/D Walker					
	Joey Beane/D Walker					
	Joey Beane/D Walker					
	Joey Beane/D Walker					

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Class II Manifest

UIC 2D0392210

:s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

re	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane/D Walker		47-039-04202	80	NO	11-2-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-2-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-2-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-3-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-3-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-3-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-3-15
	Joey Beane/D Walker		[redacted]	110	NO	11-3-15
	Joey Beane/D Walker		47-039-04707	80	NO	11-4-15
	Joey Beane/D Walker			110	NO	11-4-15
	Joey Beane/D Walker		47-039-04707	80	NO	11-4-15
	Joey Beane/D Walker		653843	110	NO	11-4-15
	Joey Beane/D Walker		653843	110	NO	11-4-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-4-15
	Joey Beane/D Walker		653843	110	NO	11-4-15
	Joey Beane/D Walker		653843	110	NO	11-4-15
	Joey Beane/D Walker		653843	110	NO	11-5-15
	Joey Beane/D Walker		653843	110	NO	11-5-15
	Joey Beane/D Walker		653843	110	NO	11-5-15
	Joey Beane/D Walker		653843	110	NO	11-5-15
	Joey Beane/D Walker		653843	110	NO	11-5-15
	Joey Beane/D Walker		653843	110	NO	11-5-15
	Joey Beane/D Walker		653843	110	NO	11-7-15
	Joey Beane/D Walker		653843	110	NO	11-7-15

Make as many copies of the document as necessary to comply with the UIC permit.
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Class II Manifest

UIC 2D0392210

s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

re	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane/D Walker		653843	110	no	11-8-15
	Joey Beane/D Walker		47-039-04202	80	no	11-9-15
	Joey Beane/D Walker		653843	110	no	11-9-15
	Joey Beane/D Walker		653843	110	no	11-9-15
	Joey Beane/D Walker		653843	110	no	11-9-15
	Joey Beane/D Walker		653843	110	no	11-9-15
	Joey Beane/D Walker		653843	110	no	11-9-15
	Joey Beane/D Walker		653843	110	no	11-9-15
	Joey Beane/D Walker		653843	110	no	11-10-15
	Joey Beane/D Walker		653843	110	no	11-10-15
	Joey Beane/D Walker		653843	110	no	11-10-15
	Joey Beane/D Walker		653843	110	no	11-10-15
	Joey Beane/D Walker		653843	110	no	11-10-15
	Joey Beane/D Walker		653843	110	no	11-10-15
	Joey Beane/D Walker		~~653843~~	80	no	11-13-15
	Joey Beane/D Walker		47-035-1582	60	no	11-13-15
	Joey Beane/D Walker					
	Joey Beane/D Walker		47-039-04202	80	no	11-13-15
	Joey Beane/D Walker		47-039-04202	70	no	11-13-15
	Joey Beane/D Walker		47-039-04202	80	no	11-13-15
	Joey Beane/D Walker		653843	110	no	11-15-15
	Joey Beane/D Walker		47-039-04202	80	no	11-16-15
	Joey Beane/D Walker		47-039-04202	80	no	11-16-15
	Joey Beane/D Walker		47-039-04202	70	no	11-16-15
	Joey Beane/D Walker		47-039-04202	80	no	11-16-15

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Class II Manifest

UIC 2D0392210

s of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

re	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane/D Walker		47-039-04202	80	NO	11-16-15
	Joey Beane/D Walker		47-039-04202	70	NO	11-16-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-16-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-17-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-17-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-17-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-17-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-18-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-18-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-18-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-19-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-19-15
	Joey Beane/D Walker		176778	110	NO	11-19-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-19-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-19-15
	Joey Beane/D Walker		AFE# 176778	110	NO	11-20-15
	Joey Beane/D Walker		176778	110	NO	11-20-15
	Joey Beane/D Walker		47-03-04202	80	NO	11-20-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-20-15
	Joey Beane/D Walker		653843	110	NO	11.20.15
	Joey Beane/D Walker		653843	110	NO	11.21.15
	Joey Beane/D Walker		653843	110	NO	11-21-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-23-15
	Joey Beane/D Walker		47-039-04202	80	NO	11-23-15

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Page numbers should be maintained sequentially to provide an adequate record.

Class I. Manifest

UIC 2D0392210

tents of this shipment are Class II fluids that were brought to the surface in connection with oil or natural gas

e	Receiver's Name	*Signature	API or Other	Volume of Load (Barrels)	Was the Load Split (Y/N)	Date
	Joey Beane/D Walker		47-039-04202	80	no	11-23-15
	Joey Beane/D Walker		47-039-04202	80	no	11-23-15
	Joey Beane/D Walker		47-039-04202	80	no	11-24-15
	Joey Beane/D Walker		47-039-04202	80	no	11-24-15
	Joey Beane/D Walker		47-039-04202	80	no	11-24-15
	Joey Beane/D Walker	Joey Beane	47-039-04202	80	no	11-30-15
	Joey Beane/D Walker	Joey Beane	47-039-04202	80	no	11-30-15
	Joey Beane/D Walker	Joey Beane	47-039-04202	80	no	11-30-15
	Joey Beane/D Walker	Joey Beane	47-039-04202	80	no	11-30-15
	Joey Beane/D Walker					
	Joey Beane/D Walker					
	Joey Beane/D Walker					
	Joey Beane/D Walker					
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	Joey Beane/D Walker					
	Joey Beane/D Walker					
	Joey Beane/D Walker					
	Joey Beane/D Walker					
	Joey Beane/D Walker					

Make as many copies of the document as necessary to comply with the UIC permit.
Page numbers should be maintained sequentially to provide an adequate record.

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: VIKING ENERGY

SAMPLE ID: KERMIT TYREE WELL HIVELY #1
47-039-04202

SAMPLED BY: D. WALKER

DATE/TIME SAMPLED:* 05-11-15 0800

DATE/TIME RECEIVED: 05-28-15 1346

LABORATORY ID: VE 150528-1

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
TOC	3153.	mg/L	SM22nd 5310B	1.0	06-03-15 1828	MW
Fe	38.0	mg/L	EPA 200.7 Rev 4.4-1994	.01	06-02-15 1902	RS
Mn	2.11	mg/L	EPA 200.7 Rev 4.4-1994	.002	06-02-15 1902	RS
Na	2308.	mg/L	EPA 200.7 Rev 4.4-1994	.03	06-05-15 1210	RS
Ba	33.7	mg/L	EPA 200.7 Rev 4.4-1994	.002	06-10-15 1247	RS
Cl-	6000.	mg/L	EPA 300.0 Rev 2.1-1993	.50	06-04-15 0630	DC

*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.
N Organic constituents tentatively identified. Confirmation is needed.
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.

Approved _____

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) 744-9664

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: VIKING ENERGY

SAMPLE ID: H&G ENERGY WELL A.J. EPLING
47-087-04722

SAMPLED BY: D. WALKER

DATE/TIME SAMPLED:* 05-14-15 2200

DATE/TIME RECEIVED: 05-28-15 1346

LABORATORY ID: VE 150528-2

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
TOC	313.	mg/L	SM22nd 5310B	1.0	06-03-15 1828	MW
Fe	1.40	mg/L	EPA 200.7 Rev 4.4-1994	.01	06-02-15 1902	RS
Mn	.031 J	mg/L	EPA 200.7 Rev 4.4-1994	.002	06-02-15 1902	RS
Na	21800.	mg/L	EPA 200.7 Rev 4.4-1994	.03	06-05-15 1210	RS
Ba	373.	mg/L	EPA 200.7 Rev 4.4-1994	.002	06-10-15 1247	RS
Cl	44000.	mg/L	EPA 300.0 Rev 2.1-1993	.50	06-04-15 0630	DC

*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.
N Organic constituents tentatively identified. Confirmation is needed.
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.

Approved _____

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Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: VIKING ENERGY

SAMPLE ID: COBALT OIL & GAS WELL CABOT #50
47-079-01538

SAMPLED BY: D. WALKER

DATE/TIME SAMPLED:* 05-21-15 0930

DATE/TIME RECEIVED: 05-28-15 1346

LABORATORY ID: VE 150528-3

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
TOC	177.	mg/L	SM22nd 5310B	1.0	06-03-15 1823	MW
Fe	14.7	mg/L	EPA 200.7 Rev 4.4-1994	.01	06-02-15 1902	RS
Mn	.032 J	mg/L	EPA 200.7 Rev 4.4-1994	.002	06-02-15 1902	RS
Na	21370.	mg/L	EPA 200.7 Rev 4.4-1994	.03	06-05-15 1210	RS
Ba	2.25	mg/L	EPA 200.7 Rev 4.4-1994	.002	06-10-15 1247	RS
Cl	35800.	mg/L	EPA 300.0 Rev 2.1-1993	.50	06-04-15 0630	DC

*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.
N	Organic constituents tentatively identified. Confirmation is needed.
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.

Approved _____

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BRUSHY FORK ROAD
BRIDGEPORT, WV 26330
PHONE: 304-623-6549
FAX: 304-623-6552

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

MAILING ADDRESSES ARE LISTED BELOW

veny

BILL TO: Client Name:
Address:
City/State/Zip:
Contact Person:
Fax No.
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 DA

VALKER

lts ☐ Fax Results

AMPLE	END TIME	GRAB SAMPLE DATE	TIME	Ice	OTHER	PRESERVATIVE HCl	NaOH	H_2SO_4 Plastic	H_2SO_4 Glass	None	HNO_3	MATRIX Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	ANALYZE FOR: TOC	K, Mg, Na, Ca	Cl	# of Bottles	Field pH	Flow (gpm, cfs, mgd) circle one	Field Conductivity	Field DO	Field Chlorine (mg/L or ug/L) circle one	Field Temp (F° or C°) circle one
		5-11-15	8:00	X				X		X	X						X	X	X	X	3						
		5-14-15	10:00	X				X		X	X						X	X	X	X	3						
		5-21-15	9:30	X				X		X	X						X	X	X	X							

Records retained for 5 years

Time	Received by:	Date	Time
935	[illegible]	5/28/15	0935
ime	Received by:	Date	Time
46	[illegible]	5/28/15	1346

Laboratory Comments:
Temperature Upon Receipt: <6
Bottles Preserved? Y N
4.2

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: VIKING ENERGY

SAMPLE ID: WELL CHARLEST McGRAW #115

SAMPLED BY: D. WALKER

DATE/TIME SAMPLED:* 06-10-15 0930

DATE/TIME RECEIVED: 06-30-15 1350

LABORATORY ID: VE 150630-1

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
TOC	U		SM22nd 5310B	1.0	07-06-15 1730	MW
Fe	2.05	mg/L	EPA 200.7 Rev 4.4-1994	.01	07-02-15 0944	RS
Mn	.374	mg/L	EPA 200.7 Rev 4.4-1994	.002	07-02-15 0944	RS
Na	21530.	mg/L	EPA 200.7 Rev 4.4-1994	.03	07-06-15 1353	RS
Ba	73.3	mg/L	EPA 200.7 Rev 4.4-1994	.002	07-06-11 1353	RS
Cl^-	44800.	mg/L	EPA 300.0 Rev 2.1-1993	.50	07-06-15 1500	DC

*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.
N Organic constituents tentatively identified. Confirmation is needed.
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.

Received
Office of Oil & Gas
JAN 04 2016

Approved _____

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Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: VIKING ENERGY

SAMPLE ID: WELL B-250 API 47-011-1091 CO. ECA

SAMPLED BY: D. WALKER

DATE/TIME SAMPLED:* 06-10-15 1100

DATE/TIME RECEIVED: 06-30-15 1350

LABORATORY ID: VE 150630-2

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
TOC	1934.		SM22nd 5310B	1.0	07-06-15 1730	MW
Fe	110.	mg/L	EPA 200.7 Rev 4.4-1994	.01	07-02-15 0944	RS
Mn	19.9	mg/L	EPA 200.7 Rev 4.4-1994	.002	07-02-15 0944	RS
Na	37280.	mg/L	EPA 200.7 Rev 4.4-1994	.03	07-06-15 1353	RS
Ba	242.	mg/L	EPA 200.7 Rev 4.4-1994	.002	07-06-11 1353	RS
Cl	85800.	mg/L	EPA 300.0 Rev 2.1-1993	.50	07-06-15 1500	DC

*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.
N	Organic constituents tentatively identified. Confirmation is needed.
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.

Approved _____

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610 D STREET
SO. CHARLESTON, WV 25303
PHONE: 304-744-9864
FAX: 304-744-7866

MAILING ADDRESSES ARE LISTED BELOW

very

BILL TO: Client Name:
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 DA

Fax No.

Fax Results

SAMPLE		GRAB SAMPLE		PRESERVATIVE							MATRIX					ANALYZE FOR:														
	END TIME	DATE	TIME	Ice	OTHER	HCl	NaOH	H_2SO_4 Plastic	H_2SO_4 Glass	None	HNO_3	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	TDC	Ca, Mg, Na, Sr	Cl				# of Bottles	Field pH	Flow (gpm, cfs, mgd) circle one	Field Conductivity	Field DO	Field Chlorine (mg/L or ug/L) circle one	Field Temp (F° or C°) circle one
		6-10-15						X		X	X						X	X	X	X				3						
		6-10-15	11:00 am	X				X		X	X						X	X	X	X				3						

Records retained for 5 years

Time	Relinquished by:	Date	Time
43 pm	[signature]	6/10/15	6:45
Time	Received by:	Date	Time
350	L/L	6/10/15	1350

Laboratory Comments:
Temperature Upon Receipt: 2.6
Bottles Preserved? Y N
5.9

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: VIKING ENERGY

SAMPLE ID: CO H&G ENERGY WELL IVY FISHER 203
47-087-04779 7

SAMPLED BY: J. BEANE

DATE/TIME SAMPLED:* 07-13-15 1030

DATE/TIME RECEIVED: 07-30-15 1345

LABORATORY ID: VE 150730-1

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
TOC	143.		SM22nd 5310B	1.0	08-03-15 1710	KC
Fe	9.38	mg/L	EPA 200.7 Rev 4.4-1994	.01	08-04-15 1042	RS
Mn	.406	mg/L	EPA 200.7 Rev 4.4-1994	.002	08-04-15 1042	RS
Na	3540.	mg/L	EPA 200.7 Rev 4.4-1994	.03	08-04-15 1042	RS
Ba	88.3	mg/L	EPA 200.7 Rev 4.4-1994	.002	08-03-15 1035	RS
Cl^-	7600.	mg/L	EPA 300.0 Rev 2.1-1993	.50	08-01-15 1000	DC

*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.
N Organic constituents tentatively identified. Confirmation is needed.
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.

Approved _____

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

nental

STURM ENVIRONMENTAL
BRUSHY FORK ROAD
BRIDGEPORT, WV 26330
PHONE: 304-623-6549
FAX: 304-623-6552

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

MAILING ADDRESSES ARE LISTED BELOW

VENY

Fax No.

Fax Results

BILL TO: Client Name:
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 DA

SAMPLE		GRAB SAMPLE		PRESERVATIVE						MATRIX						ANALYZE FOR:														
	END TIME	DATE	TIME	Ice	OTHER	HCl	NaOH	H_2SO_4 Plastic	H_2SO_4 Glass	None	HNO_3	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	TOC	K, Mg, Na, Ca	Cl									# of Bottles	Field pH	Flow (gpm, cfs, mgd) circle one	Field Conductivity	Field DO	Field Chlorine (mg/L or ug/L) circle one	Field Temp (F° or C°) circle
		7-15-15	8:30	✓				X	X	X							X	X	X	X									3						

Records retained for 5 years

Time	Received by:	Date	Time
	Brenda S	7/30/15	1005
345	Received by: K. Lindell	Date 7/30/15	Time 1345

Laboratory Comments:
Temperature Upon Receipt: 5.6
Bottles Preserved? Y N

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: VIKING ENERGY

SAMPLE ID: CABOT OIL & GAS WELL CABOT #50
47-079-01538

SAMPLED BY: D. WALKER

DATE/TIME SAMPLED:* 08-10-15 0930

DATE/TIME RECEIVED: 08-28-15 1400

LABORATORY ID: VE 150828-1

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
TOC	110.		SM22nd 5310B	1.0	09-02-15 1528	MW
Fe	10.4	mg/L	EPA 200.7 Rev 4.4-1994	.01	08-31-15 0936	RS
Mn	.272	mg/L	EPA 200.7 Rev 4.4-1994	.002	08-31-15 0936	RS
Na	20370.	mg/L	EPA 200.7 Rev 4.4-1994	.03	08-31-15 0936	RS
Ba	2.67	mg/L	EPA 200.7 Rev 4.4-1994	.002	09-01-15 1137	RS
Cl^-	35800.	mg/L	EPA 300.0 Rev 2.1-1993	.50	09-02-15 0100	DC
SPEC GRAVITY	1.0413	mg/L	CALC.		09-01-15 1551	SW

*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.
N Organic constituents tentatively identified. Confirmation is needed.
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.

Received
Office of Oil & Gas
JAN 04 2016

Approved Doyle W Bowlds

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Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: VIKING ENERGY

SAMPLE ID: H & G ENERGY E SMITH 47-087-04767

SAMPLED BY: D. WALKER

DATE/TIME SAMPLED:* 08-10-15 1030

DATE/TIME RECEIVED: 08-28-15 1400

LABORATORY ID: VE 150828-2

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
TOC	142.		SM22nd 5310B	1.0	09-02-15 1528	MW
Fe	.77	mg/L	EPA 200.7 Rev 4.4-1994	.01	08-31-15 0936	RS
Mn	.043 J	mg/L	EPA 200.7 Rev 4.4-1994	.002	08-31-15 0936	RS
Na	19700.	mg/L	EPA 200.7 Rev 4.4-1994	.03	08-31-15 0936	RS
Ba	374.	mg/L	EPA 200.7 Rev 4.4-1994	.002	09-01-15 1137	RS
Cl^-	42300.	mg/L	EPA 300.0 Rev 2.1-1993	.50	09-02-15 0100	DC

*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.
- N — Organic constituents tentatively identified. Confirmation is needed.
- 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.

Approved Doyle W. Bunch

MAIN OFFICE AND LABORATORY—POST OFFICE BOX 850 • BRIDGEPORT, WEST VIRGINIA 26330 • (304) 623-6549
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STURM ENVIRONMENTAL
BRUSHY FORK ROAD
BRIDGEPORT, WV 26330
PHONE: 304-623-6549
FAX: 304-623-8552

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

MAILING ADDRESSES ARE LISTED BELOW

NEMY

Fax No.

WALKER

BILL TO: Client Name:
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 DA

ults | Fax Results

SAMPLE		GRAB SAMPLE		PRESERVATIVE							MATRIX						ANALYZE FOR:															
	END TIME	DATE	TIME	Ice	OTHER	HCl	NaOH	H_2SO_4 Plastic	H_2SO_4 Glass	None	HNO_3	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	TOC	K, Mg, Na, Ca	Cl		Specific gravity					# of Bottles	Field pH	Flow (gpm, cfs, mgd) circle one	Field Conductivity	Field DO	Field Chlorine(mg/L or ug/L) circle one	Field Temp (F° or C°) circle
		8-10-15	9:30 am	X				X	X	X	X						X	X	X	X		X					3						
		8-10-15	10:30 am	X				X	X	X							X	X	X	X							3						

Office of Oil & Gas
Received

Records retained for 5 years

Time	Relinquished by:	Date	Time
1:14	[illegible]	8-10-15	1:30
Time	Received by:	Date	Time
0C	[illegible]	[illegible]	14.

Laboratory Comments:
Temperature Upon Receipt:
Bottles Preserved? Y N
1.9

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: VIKING ENERGY

SAMPLE ID: CA H&G ENERGY WELL P.A.BAYS #208
47-087-04778

SAMPLED BY: D. WALKER

DATE/TIME SAMPLED:* 09-08-15 1100

DATE/TIME RECEIVED: 09-24-15 1400

LABORATORY ID: VE 150924-1

PARAMETER	TEST RESULTS	UNITS	METHOD	METHOD DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
TOC	79.9		SM22nd 5310B	1.0	10-02-15 2143	MW
Fe	13.4	mg/L	EPA 200.7 Rev 4.4-1994	.01	09-25-15 1005	RS
Mn	.387	mg/L	EPA 200.7 Rev 4.4-1994	.002	09-25-15 1005	RS
Na	20950.	mg/L	EPA 200.7 Rev 4.4-1994	.03	09-25-15 1005	RS
Ba	886.	mg/L	EPA 200.7 Rev 4.4-1994	.002	09-30-15 1433	RS
Cl^-	42900.	mg/L	EPA 300.0 Rev 2.1-1993	.50	09-26-15 0600	DC

*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.
N	Organic constituents tentatively identified. Confirmation is needed.
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.

Approved Doug W Bays

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STURM ENVIRONMENTAL
BRUSHY FORK ROAD
BRIDGEPORT, WV 26330
PHONE: 304-623-6549
FAX: 304-623-6552

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

MAILING ADDRESSES ARE LISTED BELOW

ieny

Fax No.

KEX

BILL TO: Client Name:
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 DA

Fax Results

MPLE		GRAB SAMPLE		PRESERVATIVE							MATRIX					ANALYZE FOR:																
	END TIME	DATE	TIME	Ice	OTHER	HCl	NaOH	H_2SO_4 Plastic	H_2SO_4 Glass	None	HNO_3	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	TOC	K, Mg, Na, Ca	Cl	# of Bottles	Field pH	Flow (gpm, cfs, mgd) circle one	Field Conductivity	Field DO	Field Chlorine (mg/L or ug/L) circle one	Field Temp (F° or C°) circle one
		9-8-15	11:00 am	X				X		X	X					X	X	X	X	X	3						

eceived

Records retained for 5 years

	Received by:	Date	Time
	[signature]	9/24/15	0959
	Received by: K. Hunsbul	Date 9/24/15	Time 1400

Laboratory Comments:
Temperature Upon Receipt: <6
Bottles Preserved? Y N

Safety Data Sheet

1. IDENTIFICATION

Product Name: MB-7104
Chemical Name: THPS
Revised: 5/22/15
Description: Clear, pale yellow to pale pink with characteristic odor
Recommended Use: Water Treatment Biocide
Restrictions on Use: For industrial use only. Not for use in treating drinking water or some food processing cooling systems.

COMPANY IDENTIFICATION
ONE AQUASOURCE, INC.
P.O. BOX 207
WATERVILLE, OH 43566

PHONE NUMBER: 419-861-7019

EMERGENCY PHONE NUMBERS
800 255-3924
Outside USA: COLLECT 800 255-3924

2. HAZARD(S) IDENTIFICATION

GHS Classification:
- Serious eye damage/irritation - Category 1
- Acute toxicity, oral - Category 4
- Acute toxicity, inhalation - Category 3
- Sensitization, skin - Category 1
- Reproductive toxicity - Category 2
- Hazardous to the aquatic environment, acute hazard - Category 3

Signal Word: Danger

Symbol(s):

Hazard Statements:
- Causes serious eye damage
- Harmful if swallowed
- Toxic if inhaled
- May cause an allergic skin reaction
- Suspected of damaging fertility or the unborn child
- Harmful to aquatic life

Precautionary Statements:

Prevention
Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing dusts or mists. Wash hands, forearms, gloves and contaminated surfaces thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves/eye protection/face protection.

Response
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CONTROL CENTER or doctor for treatment advice.
IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice or attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CONTROL CENTER or doctor for treatment advice if you feel unwell.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Call a POISON CONTROL CENTER or doctor for treatment advice if you feel unwell.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CONTROL CENTER or doctor for treatment advice. Specific treatment (see First Aid on SDS or on this label).
If skin irritation or rash occurs: Get medical advice or attention. Take off contaminated clothing and wash it before reuse.
IF exposed or concerned: Call a POISON CONTROL CENTER or doctor for treatment advice.

Storage
Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal
Dispose of contents/container in accordance with local, regional, national and international regulations.

Hazards Not Otherwise Classified:

Percentages of Components with Unknown Acute Toxicity:

3. COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENTS	CAS NO.*	PERCENT (%)
TETRAKIS(HYDROXYMETHYL) PHOSPHONIUM SULFATE	55566-30-8	20%

* Exposure limit and regulatory information in Sections 8 & 15
** Exact percentage is a trade secret. Concentration range is provided to assist users in providing appropriate protections.

4. FIRST AID MEASURES

Eye Contact: Immediately flush with clean, cool water for 15 minutes and if irritation persists, get medical attention.

Skin Contact: Immediately wash skin with soap and plenty of water while removing contaminated clothing, for at least 15 minutes. If irritation persists, get medical attention. Launder contaminated clothing before reuse.

Inhalation: Remove victim to fresh air. If individual experiences nausea, headache, dizziness, has difficulty in breathing or is cyanotic, seek medical attention. If not breathing, give artificial respiration via a suitable mechanical device such as a bag and mask. Do not use mouth-to-mouth resuscitation.

Ingestion: Do not induce vomiting. Rinse mouth with copious quantities of water first and get immediate medical attention. Drink several glasses of water. Never give anything by mouth to an unconscious person. If vomiting occurs, keep airways clear.

Note to Physician: There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Aspiration may cause lung damage. Probable mucosal damage may contraindicate the use of gastric lavage.

Most Important Symptoms/Effects:

Eye Contact: May cause severe irritation. Prolonged contact may cause irreversible damage and/or blindness. Vapor may cause eye irritation experienced as mild discomfort and redness.

Skin Contact: Prolonged contact may cause irritation. Severity is generally determined by concentration of solution and duration of contact. May cause sensitization.

Inhalation: Harmful if inhaled. May cause coughing, shortness of breath, chest pain.

Ingestion: May be mildly toxic. May cause gastrointestinal irritation. Do not take internally. May cause nausea, vomiting, and/or diarrhea.

Indication of Immediate Medical Attention and Special Treatment, if Necessary:
Skin contact may aggravate existing skin disease.

5. FIRE FIGHTING MEASURES

Suitable (and Unsuitable) Extinguishing Media: Any media suitable for the surrounding fire.

Specific Hazards Arising from the Chemical: Product is corrosive to eyes, skin, and respiratory system. Closed containers may rupture (due to buildup of pressure) when exposed to extreme heat. If evaporated to dryness, some product residuals may burn. Thermal decomposition may release oxides of carbon, phosphorous and sulfur, and/or phosphine.

Special Protective Equipment and Precautions for Fire-Fighters: Wear self-contained breathing apparatus and full turn-out gear. Approach fire from upwind direction. If possible, move containers away from fire. Cool fire exposed containers with water spray. If containers rupture or leak, product may evolve irritating or toxic gas under extreme heat. Contain runoff.

6. ACCIDENTAL RELEASE MEASURES

Spill Containment and Clean-up Instructions:

Wear suitable protective equipment found in section 8. Small spill may be absorbed in sawdust or other suitable absorbent. Larger spills should be diked to prevent runoff and the material pumped into a suitable container. The area may then be flushed with copious quantities of water. Sweepings constitute a hazardous waste and must be disposed of accordingly. Floor may be slippery; use care to avoid falling. This product is toxic to aquatic life. Avoid release of this product into the environment to prevent contamination of soil, sewers, natural waterways and/or groundwater. See Section 12 for Ecological Information.

7. HANDLING AND STORAGE

Handling and Storage:

Store in a cool, dry, well ventilated area, between 10°C and 49°C. Keep containers tightly closed when not in use and follow all recommended safety precautions when handling the material. Keep out of sun and away from heat or open flame. Keep away from incompatible materials. See Section 10 for incompatible materials.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Engineering Controls: General ventilation satisfactory. Mechanical may be required to keep concentration below maximum airborne exposure limits in confined areas.

PERSONAL PROTECTION EQUIPMENT

Respiratory: Not normally required unless product is openly handled in confined areas where high concentrations of vapor could occur. Where misting may occur, wear an OSHA/NIOSH approved (or equivalent) half-mask, dust/mist air purifying respirator. Air-purifying respirators should be equipped with organic vapor cartridges.

Eyes and Face: Chemical resistant goggles or face shield.

Hands and Skin: Chemical resistant rubber, neoprene latex or PVC

Other Protective Equipment: Eyewash station and safety shower in area of use. Rubber apron and boots are also recommended where workers will be handling the product.

EXPOSURE GUIDELINES

Exposure Limits:

COMPONENT	TLV
TETRAKIS(HYDROXYMETHYL) PHOSPHONIUM SULFATE	ACGIH: 2mg/m³

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor:	Clear, pale yellow to pale pink with characteristic odor		
Odor Threshold:	N.D.	**Vapor Pressure:**	N.A.
pH (undiluted):	3.0 - 6.0	**Vapor Density:**	N.A.
Freeze Point:	< 0°C (32°F)	**Specific Gravity(@25°C):**	1.08 - 1.13
Boiling Point:	> 106°C (226°F)	**Solubility in Water:**	Complete
Flash Point:	None	**Partition Coefficient:**	N.D. (n-octanol/water)
		Auto-Ignition Temperature:	N.D.
Evaporation Rate:	N.A.	**Decomposition Temperature:**	N.D.
Flammability (solid, gas):	No	**Viscosity:**	N.D.
Flammable Limits in Air:	LFL –		
	UFL –		

10. STABILITY AND REACTIVITY

Reactivity: Not normally reactive at normal temperatures and pressure.

Chemical Stability: Stable under normal conditions

Possibility of Hazardous Reactions: Will not occur under normal conditions.

Conditions to Avoid: Avoid excessive heat, sparks or open flames.

Incompatible Materials: Concentrated acids or bases and strong oxidizing and/or reducing agents.

Hazardous Decomposition Products: Thermal decomposition may release oxides of carbon, phosphorous and sulfur, and/or phosphine.

11. TOXICOLOGICAL INFORMATION

Ingestion Testing: Rat, LD50: 2,012 mg/kg

Skin Testing: Rat, LD50: > 5,000 mg/kg

Inhalation Testing: Rat, LD50/4hr: 2.07 mg/kg

CHRONIC TOXICITY DATA

Sensitization Testing: Sensitizing. (Guinea pig)

Other Testing: Possible developmental hazard, may adversely affect the developing fetus based on animal data).

Routes of Exposure: Eyes, Ingestion, Inhalation, Skin.

Eye Contact: May cause severe irritation. Prolonged contact may cause irreversible damage and/or blindness. Vapor may cause eye irritation experienced as mild discomfort and redness.

Skin Contact: Prolonged contact may cause irritation. Severity is generally determined by concentration of solution and duration of contact. May cause sensitization.

Inhalation: Harmful if inhaled. May cause coughing, shortness of breath, chest pain.

Ingestion: May be mildly toxic. May cause gastrointestinal irritation. Do not take internally. May cause nausea, vomiting, and/or diarrhea.

Medical Conditions Aggravated by Exposure: Skin contact may aggravate existing skin d

Chronic Effects from Repeated Overexposure: Repeated excessive exposures may cause injuries to liver and/or kidneys. Possible developmental hazard, may adversely affect the developing fetus based on animal data).

12. ECOLOGICAL INFORMATION

Aquatic Toxicity Data:
Invertebrate: Water Flea, LC50/48hrs: 67.9 mg/l
Fish: Rainbow trout, LC50/96hrs: 355 mg/l

Product Fate Data: Not expected to bioaccumulate.

Biodegradation Data: Shown to degrade to rapidly once diluted to sub-ppm concentrations and forms trishydroxymethyl phosphine oxide which is classified as non-toxic.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of in accordance with local, regional, national and international regulations. Contact the Hazardous Waste representative at the nearest EPA Regional Office for guidance. Container Disposal: Triple rinse container (or equivalent) promptly after emptying and offer for reconditioning if appropriate. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal.

14. TRANSPORT INFORMATION

US DEPARTMENT OF TRANSPORTATION (DOT) INFORMATION
NOT REGULATED

VESSEL TRANSPORT (IMO/IMDG)
NOT REGULATED

15. REGULATORY INFORMATION

US FEDERAL REGULATIONS

TSCA: All ingredients listed or exempt from listing.
CERCLA and/or SARA RQ: No ingredients listed in this section.
SARA Section 302 Hazard Class: No ingredients listed in this section.
SARA Section 311/312 Chemicals:
Acute Health Hazard: Yes
Chronic Health Hazard: Yes
Fire Hazard: No
Sudden Release of Pressure Hazard: No
Reactive Hazard: No
SARA Section 313 Chemicals: No ingredients listed in this section.

STATE REGULATIONS

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
This product contains a substance known to the State of California to cause cancer, birth defects or other reproductive harm.

Federal Insecticide, Fungicide and Rodenticide Act
EPA Registration Number: 4564-18
This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

DANGER
Corrosive

Causes irreversible eye damage.
May be fatal if swallowed.
Harmful if inhaled.
Harmful if absorbed through skin.
Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.
This product is toxic to fish.

16. OTHER INFORMATION

HAZARD RATING SUMMARY

Hazard Rating System:	NFPA	CODE TRANSLATION
Health:	2	0 = Minimal Hazard
Flammability:	0	1 = Slight Hazard
Reactivity:	1	2 = Moderate Hazard
Special:		3 = Severe Hazard
		4 = Extreme Hazard

Other Precautions: This product has been designed for use as a biocide in specific types of cooling water circuits and should be used only in accordance with the instructions provided by the technical representative servicing the facility. It may not be used for the treatment of potable water. Note: It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

SDS REVISION SUMMARY

Revised Date	Revision Notes
5/22/15	GHS Version 1.0: Supersedes: 9/10/14

ABBREVIATION CODE SUMMARY

N.A. – Not Applicable
N/A – Not Available
N.D. – Not Determined
N.E. – None Established

Disclaimer: The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given.

HP-9280
SAFETY DATA SHEET

24 HR. EMERGENCY CONTACT (CHEM TEL) US Tel: 1- 800 - 255-3924

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

SUPPLIER: One AquaSource, Inc.
P.O. Box 207
Waterville, OH 43566
Phone: 888-777-9555

PRODUCT NAME: HP-9280

PRODUCT USE/CLASS: Scale Inhibitor

SDS REVISION DATE: 10/15/2015

2. HAZARDS IDENTIFICATION

GHS Labeling
Hazard pictograms

Signal word: WARNING

Hazard Statements:	H290	May be corrosive to metals.
	H319	Causes serious eye irritation.
	H412	Harmful to aquatic life with long lasting effects.
Precautionary Statements:	P273	Avoid release to the environment.
	P280	Wear protective gloves/protective clothing/eye protection/face protection.
	P305+351+338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P337+313	If eye irritation persists get medical advice/attention.
	P501	Dispose of contents/container in accordance with national regulations.

GHS Classification	Physical and Chemical Hazards	Met. Corr. 1 – H290
	Human health	Eye Irrit. 2-H319
	Environment	Aquatic Chronic 3 – H412

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients and Impurities

Chemical Name	Identification number CAS-No.	Concentration [%]
Organic phosphate copolymer	71050-62-9	5 - 10%
Proprietary blend of acrylic and carboxylate polymers	Not hazardous	Trade Secret

GHS Classification: Met. Corr. 1 – H290; Eye Irrit. 2 – H319; Aquatic Chronic 3 – H412
Composition Comments
Aqueous solution of acid

4. FIRST AID MEASURES

Description of first-aid measures

Inhalation	Provide fresh air, warmth and rest, preferably in a comfortable upright sitting position. Get medical attention if any discomfort continues.
Ingestion	DO NOT INDUCE VOMITING! Rinse mouth thoroughly. Never give liquid to an unconscious person. Get medical attention.
Skin contact	Immediately remove contaminated clothing. Rinse immediately with plenty of water. Continue to rinse for at least 15 minutes. Get medical attention if irritation persists after washing.
Eye contact	Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyelids widely. If irritation persists: Seek medical attention and bring these instructions.

Most important symptoms and effects, both acute and delayed

Inhalation	No specific symptoms noted. Irritation of nose, throat and airway.
Ingestion	No specific symptoms noted. May cause discomfort if swallowed.
Skin contact	No specific symptoms noted. Prolonged skin contact may cause redness and irritation
Eye contact	May cause severe irritation to eyes. Profuse watering of the eyes.

Indication of any immediate medical attention and special treatment needed
Notes To The Physician
Treat Symptomatically.

5. FIRE FIGHTING MEASURES

Auto Ignition Temperature	Not available
Flammability Limit – Lower(%)	Not available
Flammability Limit – Upper(%)	Not available
Flash point	Not available
Extinguishing Media	The product is non-combustible. Use: Water spray, fog or mist. Foam, carbon dioxide or dry powder.
Unusual Fire & Explosion Hazards	No unusual fire or explosion hazards noted.
Specific Hazards	Fire creates: Toxic gases/vapors/fumes of: Carbon monoxide (CO). Carbon dioxide (CO2). Oxides of: Sulfur, Nitrogen, Phosphorus.
Special Fire Fighting Procedures	Move container from fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. Keep run-off water out of sewers and water sources. Dike for water control.
Protective Equipment for Fire-Fighters	Leave danger zone immediately. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Follow precautions for safe handling described in this material safety data sheet. For personal protection, see section 8.
Environmental Precautions	Avoid release to the environment. To prevent release, place container with damaged side up.
Spill Clean Up Methods	Should be prevented from entering drains. Absorb in vermiculite, dry sand or earth and place into containers. Collect and reclaim or dispose in sealed containers in licensed waste. Containers with collected spillage must be properly labeled with correct contents and hazard symbol.
Reference to other sections	For waste disposal, see Section 13.

7. HANDLING AND STORAGE

Handling	Avoid spilling, skin and eye contact. Observe good chemical hygiene practices.
Storage	Store in tightly closed original container in a dry and cool place. Store at temperature below 50° (122°F). Do not store for extended periods below freezing point or in direct sunlight. IF FROZEN: once fully thawed, agitate container vigorously to ensure the product is homogeneous. Store separated from: Alkalis. Reducing Agents. Do NOT use container made of: Carbon steel.
Storage Class	Corrosive storage.
Specific end use(s)	The identified uses for this product are detailed in Section1 1.2.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredient Comments
No exposure limits noted for ingredient(s).

Process Conditions	Provide eyewash station.
Engineering Measures	Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded.
Respiratory Equipment	No specific recommendation made, but respiratory protection must be used if the general level exceeds the Recommended Occupational Exposure Limit
Hand Protection	Selection of a suitable glove depends on work conditions and whether the product is present on its own or in combination with other substances. Use protective gloves made of: Neoprene, nitrile, polyethylene or PVC. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.
Eye Protection	Wear approved safety goggles. Use face shield in case of splash risk.
Other Protection	Wear appropriate clothing to prevent repeated or prolonged skin contact.
Hygiene Measures	No specific hygiene procedures noted, but good personal hygiene practices are always advisable, especially when working with chemicals.
Skin Protection	Wear apron or protective clothing in case of splashes.

HP-9280
SAFETY DATA SHEET

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Liquid
Color	Clear to Pale Yellow
Odor	Slight
Solubility	Miscible with water
Initial boiling point and boiling range	101 – 105 @ 760 mm Hg
Melting point	Not applicable
Specific Gravity	1.04 @ 70°F
Vapor density (air=1)	Not available.
Vapor pressure	Not available.
Evaporation rate	Not available.
Evaporation Factor	Not available.
pH-Value, Conc. Solution	3.5 – 4.5
Viscosity	Not applicable
Decomposition temperature	>180° C (356°F)
Odor Threshold, Lower	Not available.
Odor Threshold, Upper	Not available.
Flash Point	Not available.
Auto Ignition Temperature	Not available.
Flammability Limit – Lower (%)	Not available.
Flammability Limit – Upper (%)	Not available.
Partition Coefficient (N-Octanol/Water)	log Pow<0
Explosive properties	Not applicable.
Oxidizing properties	Does not meet the criteria for oxidizing.

10. STABILITY AND REACTIVITY DATA

Reactivity	Does not react with acids or bases.
Stability	Stable under normal temperature conditions and recommended use.
Hazardous Polymerization	Will not polymerize.
Conditions to Avoid	Avoid excessive heat for prolonged periods of time.
Materials to Avoid	None Known
Hazardous Decomposition Products	Fire creates: Toxic gases/vapors/fumes of: Carbon monoxide (CO). Carbon dioxide (CO_2). Oxides of: Sulfur. Nitrogen. Phosphorus.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:
Acute Toxicity (Oral LD50)
>5000 mg/kg Rat

12. ECOLOGICAL INFORMATION

Ecotoxicity	The product contains a substance which is harmful to aquatic organisms and which may cause long term adverse effects in the aquatic environment.
Acute Toxicity – Fish	LC50 96 hours >1000 mg/l Cyprinodon variegatus (Sheepshead minnow)

Acute Toxicity -- Aquatic Invertebrates	EC50 48 > 1000 mg/l Acartia tonsa
Acute Toxicity -- Aquatic Plants	EC50 72 hours > 1000 mg/l Skeletonema costatum IC50 72 hours est 48 mg/l Selenastrum capricornutum
Degradability	Not inherently biodegradable
Bioaccumulative potential	The product does not contain any substances expected to be bio-accumulating.
Partition coefficient	log Pow<0
Mobility	The product is miscible with water. May spread in water systems.
Results of PBT and vPvB assessment	Not classified as PBT/vPvB by current EU criteria.
Other adverse effects	Not available.

13. DISPOSAL CONSIDERATIONS

Waste Management	When handling waste, consideration should be made to the safety precautions applying to handling of the product.
Disposal Methods	Dispose of waste and residues in accordance with local authority requirements. Absorb in vermiculite or dry sand and dispose of at a licensed hazardous waste collection point. Liquid material should be incinerated. Material absorbed onto sand or earth should be disposed of as solid waste in accordance with local regulations. Empty packaging may contain product residues and due consideration should be given prior to disposal.

14. TRANSPORTATION INFORMATION

DOT Proper Shipping Name	Not regulated
DOT Hazard Class	Not regulated
DOT Hazard Label	Not regulated
Environmentally Hazardous Substance/Martine Pollutant	No

15. REGULATORY INFORMATION

Regulatory Status (US)

Regulatory Status (US)	SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372. TSCA: The ingredients of this product are on the TSCA Inventory. PROPOSITION 65: This product does not contain chemicals considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity and for which warnings are now required.
Regulatory References	29 CFR 1910.1010 Federal Regulations (OSHA Standard).
US Federal Regulations	
SARA 313 Emission Reporting	None of the ingredients are listed.
US State Regulations	

California Proposition 65 Carcinogens and Reproductive Toxins	None of the ingredients are listed.
Massachusetts "Right To Know" List	None of the ingredients are listed.
Rhode Island "Right To Know" List	None of the ingredients are listed.
Minnesota "Right To Know" List	None of the ingredients are listed.
New Jersey "Right To Know" List	None of the ingredients are listed.
Pennsylvania "Right To Know" List	None of the ingredients are listed.

10. OTHER INFORMATION

HMIS Rating
Health: 1
Flammability: 0
Reactivity: 0
Personal Protection: C

NFPA Rating
Health: 1
Fire: 0
Reactivity: 0

THIS PRODUCT'S HEALTH AND SAFETY INFORMATION IS PROVIDED TO ASSIST OUR CUSTOMERS IN ASSESSING COMPLIANCE WITH HEALTH, SAFETY AND ENVIRONMENTAL REGULATIONS. THE INFORMATION CONTAINED HEREIN IS BASED ON DATA AVAILABLE TO US, AND IS BELIEVED TO BE ACCURATE, ALTHOUGH NO GUARANTEE OR WARRANTY IS PROVIDED OR IMPLIED BY THE COMPANY IN THIS RESPECT. SINCE THE USE OF THIS PRODUCT IS WITHIN THE EXCLUSIVE CONTROL OF THE USER, IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE CONDITIONS OF SAFE USE. SUCH CONDITIONS MUST COMPLY WITH ALL GOVERNMENTAL REGULATIONS.

CS-3108
SAFETY DATA SHEET

24 HR. EMERGENCY CONTACT (CHEM TEL) US Tel: 1- 800 - 255-3924

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

SUPPLIER: One AquaSource, Inc.
P.O. Box 207
Waterville, OH 43566
Phone: 888-777-9555

PRODUCT NAME: CS-3108

PRODUCT USE/CLASS: Corrosion inhibitor

SDS REVISION DATE: 08/28/2015

2. HAZARDS IDENTIFICATION

Label elements

Signal Word:
DANGER

Hazard Statement:

H315	Causes skin irritation.
H319	Causes eye irritation.
H301	Harmful if swallowed.
H400	Toxic to aquatic life.

Precautionary Statements (Prevention):

P280	Wear protective gloves and eye/face protection.
P270	Do not eat, drink or smoke when using this product.
P264	Wash with plenty of water and soap thoroughly after handling.
P273	Avoid release to the environment

Precautionary Statements (Response):

P302 + P352	IF ON SKIN: Wash with plenty of soap and water
P310	Immediately call a POISON CENTER or doctor/physician.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P301 + P330	IF SWALLOWED: rinse mouth.
P370 + P378	In case of fire: Use water spray for extinction.

Hazards not otherwise classified
If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture. No specific dangers known, if the regulations/notes for storage and handling are considered.

Emergency overview
DANGER:
May cause pulmonary edema.
Avoid contact with the skin, eyes and clothing.
Use with local exhaust ventilation.
Wear NIOSH-certified chemical goggles.
Wear chemical resistant protective gloves.
Wear protective clothing.
Eye wash fountains and safety showers must be easily accessible.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS Number	Content (W/W) %	Chemical Name
7632-00-0	10.0 – 20.0	Sodium nitrite (NaNO2)
7631-95-0	3 - 8	Sodium Molybdate (Na2MoO4)

4. FIRST AID MEASURES

General advice	Remove contaminated clothing.
If inhaled	Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.
If on skin	Wash affected areas thoroughly with soap and water. Seek medical attention.
If in eyes	In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. If irritation develops, seek medical attention.
If swallowed	Rinse mouth and then drink plenty of water. Induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required.

Most important symptoms and effects, both acute and delayed

Symptoms	Extreme overexposure may cause:, vomiting, convulsions, cyanosis, death, coma, methaemoglobinaemia, nausea
Hazards	Risk of pulmonary edema if inhaled (unlikely route). Symptoms can appear later. Danger of methaemoglobin formation after ingestion.

Indication of any immediate medical attention and special treatment needed

5. FIRE FIGHTING MEASURES

Extinguishing media	Water spray
Unsuitable extinguishing media	All methods acceptable
Special hazards arising from the substance or mixture	Hazards during fire-fighting: Nitrogen oxides The substances/groups of substances mentioned can be released in case of fire.
Advice for fire-fighters	Protective equipment for fire-fighting: Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.
Impact Sensitivity	Remarks: Based on the chemical structure there is no shock-sensitivity.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Avoid contact with eyes.

Environmental precautions
Not regulated

Methods and materials for containment and cleaning up
Spills should be contained and placed in suitable containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling	Keep container tightly sealed. Do not mix with combustible substances. Handle in accordance with good industrial hygiene and safety practice.
Protection against fire and explosion	The substance/product is non-combustible.
Conditions for safe storage, including any incompatibilities	Segregate from oxidizable substances. Segregate from acids. Segregate from ammonium salts. Further information on storage conditions: Keep container tightly closed and in a well-ventilated place. The authority permits and storage regulations must be observed. Keep away from food, drink and animal feeding stuffs.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protective equipment

Respiratory protection:

Wear a NIOSH-certified (or equivalent) respirator.

Hand protection:
Suitable materials, polyvinylchloride (Pylox), nitrile rubber (Buna N), chloroprene rubber (Neoprene), Consult with glove manufacturer for testing data.

Eye protection:
Tightly fitting safety goggles (chemical goggles).

General safety and hygiene measures:
Eye wash fountains and safety showers must be easily accessible. Wear protective clothing as necessary to prevent contact. Take off immediately all contaminated clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Form	Liquid
Odor	Faint odor
Color	White to yellow
pH	8 – 9
Melting point/range	Not applicable
Boiling point	> 212F
Flammability	Not flammable
Lower explosion limit	Not applicable
Density	1.21
Partition coefficient: n-octanol/water	Not determined
Thermal decomposition	Not determined
Viscosity, dynamic	Not determined
Solubility in water	Readily soluble
Evaporation rate	Not determined

10. STABILITY AND REACTIVITY DATA

Reactivity
No hazardous reactions if stored and handled as prescribed/indicated.

Oxidizing properties: Oxidizing.

Chemical stability
The product is chemically stable.

Possibility of hazardous reactions
Hazardous reactions in presence of mentioned substances to avoid.

Conditions to avoid
See MSDS section 7 - Handling and storage.

Incompatible materials
reducing agents, oxidizable substances, ammonium salts, amines, amine compounds, acids

Hazardous decomposition products
Decomposition products:
Hazardous decomposition products: disodium oxide, nitrogen oxides

Thermal decomposition:
Not determined

11. TOXICOLOGICAL INFORMATION

Primary routes of exposure

Routes of entry for liquids are ingestion and inhalation, but may include eye or skin contact. Skin contact may be a route of entry for liquids.

AcuteToxicity/Effects

Acute toxicity
Not determines

Oral
Not Determined.

Inhalation
Study scientifically not justified.

Dermal
Study scientifically not justified.

Irritation / corrosion
Assessment of irritating effects: Not irritating to the skin. Eye contact causes irritation.

Skin
Not determined

Eye
Not determined

Sensitization
Assessment of sensitization: There is no evidence of a skin-sensitizing potential.

Study scientifically not justified.

Aspiration Hazard
No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity
Assessment of repeated dose toxicity: After repeated administration the prominent effect is damage of the blood (methemoglobin formation).

Carcinogenicity
Assessment of carcinogenicity: In long-term studies in rats and mice in which the substance was given by drinking-water, a carcinogenic effect was not observed. Under certain conditions nitrites can enhance the formation of nitrosamines in vivo. Nitrosamines are carcinogenic in animal studies.

Reproductive toxicity
Assessment of reproduction toxicity: The results of animal studies gave no indication of a fertility impairing effect.

Teratogenicity
Assessment of teratogenicity: In animal studies the substance did not cause malformations. Animal studies gave no indication of a developmental toxic effect at doses that were not toxic to the parental animals. After the uptake of small doses toxicity to development will not be expected in humans.

Symptoms of Exposure

Overexposure may cause:, vomiting, convulsions, cyanosis, death, coma, methaemoglobinaemia, nausea

12. ECOLOGICAL INFORMATION

Toxicity

Aquatic toxicity: Assessment of aquatic toxicity - Very toxic (acute effect) to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish
Not determined on mixture

Aquatic Invertebrates
Not determined on mixture

Aquatic plants
Not determined on mixture

Chronic toxicity to fish
Not determined on mixture

Chronic toxicity to aquatic invertebrates
Not determined on mixture

Assessment of terrestrial toxicity
Study scientifically not justified.

Microorganisms/Effect on activated sludge

Toxicity to microorganisms
Not determined on mixture

Persistence and degradability

Assessment biodegradation and elimination (H2O)
Inorganic product which cannot be eliminated from water by biological purification processes. Can be oxidized to nitrate, or be reduced to nitrogen, by microorganisms.

Assessment of stability in water
Study technically not feasible.

Bioaccumulative potential

Assessment bioaccumulation potential
Accumulation in organisms is not to be expected.

Mobility in soil

Assessment transport between environmental compartments
Adsorption to solid soil phase is not expected.

Additional information

Other ecotoxicological advice:
Do not allow to enter soil, waterways or waste water channels. Do not release untreated into natural waters. Inhibition of degradation activity in activated sludge is not to be anticipated during correct introduction of low concentrations.

13. DISPOSAL CONSIDERATIONS

Waste disposal of substance:
Do not discharge substance/product into sewer system. Dispose of in accordance with national, state and local regulations.

Container disposal:
Dispose of in a licensed facility. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

14. TRANSPORTATION INFORMATION

Land transport USDOT

Hazard class:	9
Packing group:	III
ID number:	UN3082
Hazard label:	9
Proper shipping name:	Other regulated substances, liquid, nos, (sodium nitrite)

Sea transport IMDG

Hazard class:	9
Packing group:	III
ID number:	UN 3082
Hazard label:	9
Marine pollutant:	YES
Proper shipping name:	Other regulated substances, liquid, nos, (sodium nitrite)

15. REGULATORY INFORMATION

14. Federal Regulations

Registration status:
Chemical TSCA, US released; restriction on use / listed

TSCA § 5 final Significant New Use Restriction (SNUR)

EPCRA 311/312 (Hazard categories): Acute; Chronic; Reactivity

EPCRA 313:

CAS Number	Chemical name
7632-00-0	sodium nitrite

State regulations

State RTK	CAS Number	Chemical name
MA, NJ, PA	7632-00-0	sodium nitrite

16. OTHER INFORMATION

HMIS Rating

Health: 2
Flammability: 0
Reactivity: 1

NFPA Rating

Health: 2
Fire: 0
Reactivity: 1

Training advice

Read the safety data sheet before using the product.

Further information

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Section 10

Section 10 -- Monitoring:

1. Viking Energy Corporation monitors injection pressure, annulus pressure, and injection volumes daily through gauges and flow meter recorded by the Viking Energy employee that mans the Tuppers Creek surface injection facility location. Monthly monitoring data for the last six months of 2015 is included in **Section 9**.
2. All fluids are tracked at the Tuppers Creek surface facility and entered into a manifest spreadsheet, which includes volumes, dates, and sources transported by truck to the Tuppers Creek surface injection facility. The last six months of 2015 are included in **Section 9**.

Section 11

APPENDIX H

GROUNDWATER PROTECTION PLAN

Facility Name: Tuppers Creek Disposal Facility

County: Kanawha

Facility Location:

Postal Service Address:	P.O. Box 13366 Sissonville, WV 25320	
Latitude and Longitude:	38.461281/-81.651229	

Contact Information:

Person:	Eric Pinkerton, Operations Manager
Phone Number:	(304) 988-1161
E-mail Address:	epinkerton@vikingwell.com

Date:_____

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

The operations that can potentially cause contamination would be the wellhead, injection pipeline, and tank battery. Potential leaks from the wellhead or a leak in the pipeline has the possibility to contaminate. Any leaks or spills within the tank battery would be contained within the secondary containment.

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

Viking Energy Corporation routinely conducts inspections of this facility and monitors injection volumes and pressures daily. The facility is manned daily by an employee of Viking Energy Corporation during operational hours to ensure proper unloading of the trucks is accomplished. An SPCC plan has been developed and is in place. An copy of the SPCC plan is attached.

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

Any addition of new equipment or well workover operations will be conducted in a manner to ensure there is primary and secondary containment to prevent and spills or leakage onto the ground surface. Procedures will be followed as developed in the SPCC plan.

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

The activities at the Tuppers Creek Disposal Class IID facility that are regulated for groundwater protection would include the injection well, monitoring of injection pressures and volumes, maintaining mechanical integrity of the well and injection pipeline, and ensure the tank battery facility is in compliance and has primary and secondary containment.

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

Viking Energy Corporation samples Tuppers Creek bi-annually as required by conditions to the Class IID permit. Sample analysis results are attached.

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 fluid or solid wastes from the Tuppers Creek injection well facility 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.

All Viking Energy Corporation field personnel have been throughly trained with detailed instruction and training. They are familiar with the procedures outlined in the Spill Prevention, Control, and Countermeasures (SPCC) plan developed for the Tuppers Creek injection well facility. These procedures are discussed in detail in the SPCC plan. Additionally, all field personnel have been through the appropriate Site Safety Plan. Both plans are attached.

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

Viking Energy Corporation conducts regular monthly inspections of the facility, but also does routine daily walk-throughs to ensure compliance of the all groundwater protection plan elements and equipment.

Signature: Eric Pinkerton

Date: 12-23-15

Section 12

VIKING TD
TRANSPORTATION & DISPOSAL
PO Box 13366 Charleston, WV 25360 • 304-988-1161

Proposed Work Order: The work order for the manner of plugging 2D0392210 Wallace

1) 5584' -5350' Cement Plug, cut and pull 5 ½" casing at 3500'
2) Cement from 3600' – 3350' (Plug over cut)
3) Hydro Gel from 3250' – 900' (covering salt sand)
4) Cement plug from 900' – 750' ← Cement plug 1800'-1700'
5) Set Gel 750' – 300' (for elevation)
6) Surface Cement plug from 300' to surface
7) 36" above ground casing monument will be left. Welded with API# and date of plugging end date.

Eric Pinkerton

VP

Viking Energy Corp.

Section 13

Section 13 – Additional Bonding:

1. Additional bonding is on file at WV DEP for the Tuppers Creek Class IID commercial injection well facility.

West Virginia State Treasurer's Office

John D. Perdue, State Treasurer

Statement of Account

VIKING ENERGY CORPORATION-03 (9318-9312)

Statement Period
Tue, 01 Sep 2015 through Wed, 30 Sep 2015

Viking Energy Corporation
P O Box 13366
Sissonville WV 25360

Account Type
WV MONEY MARKET POOL (POOL-3001)

Prior Balance	$ 5,001.41
Deposits	$ 0.00
Withdrawals	$ 0.00
Earnings Reinvested	$ 0.63
New Balance	$ 5,002.04

Date	Activity	Amount	Balance
9/01/15	Forward Balance	$ 0.00	$ 5,001.41
9/30/15	Reinvestment	$ 0.63	$ 5,002.04
9/30/15	Ending Balance	$ 0.00	$ 5,002.04

Current period earnings received after close:	$ 0.00
Previous period earnings received after close:	$ 0.00
Average daily invested balance during period:	$ 5,001.41

{Effective: 09/30/2015} *The simple money market yield for the WV Money Market Pool for September 2015 = 0.15%*
The simple money market yield for the WV Government Money Market Pool for September 2015 = 0.05%
The total return for the WV Short Term Bond Pool for the twelve months ending September 30, 2015 = 0.742%

Past returns are not intended to indicate future performance.

Please direct questions to Participant Accounting at 304 340-1577 or participantaccountinggroup@wvsto.com

Section 14

Section 14 -- Financial Responsibility:

1. Appendix I is attached.

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: Viking Energy Corporation
8113 Sissonville Drive, P.O. Box 13366
Sissonville, West Virginia 25320

Date: _____

Subject: Underground Injection Control (UIC) Permit Application
UIC2D0392210
Requirement for Financial Responsibility

I, Eric Pinkerton, 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: Eric Pinkerton, Operations Manager

Signature: Eric Pinkerton

Date: 12-23-15

Section 15

APPENDIX J

Site Security for Commercial Facilities

Provide a detailed description of the method(s) utilized at the facility to restrict or prohibit illegal dumping of unauthorized waste or vandalism at the facility.

1. Complete enclosure of all wells, holding tank/pits and manifold assemblies within a chain link or other suitable fencing; and

2. Require that all gates and other entry points be locked when the facility is unattended; or

3. Providing tamper-proof seals for the master valve on each well (a "lock-out" or chain & padlock system would be more secure; however, these devices could create a potential safety hazard if the well needed to be quickly shut in due to an emergency); and

4. Installing locking caps on all valves and connections on holding tanks, unloading racks, and headers.

The Columbia Gas 20320 (Wallace Unit #1) injection well and surface facility is located directly off of Old Tuppers Creek Road and access to the lease road, injection well, and surface facility is fenced with two locking gates when the facility and well are not in operation and employees are not on site. Signage is attached to the gate with proper warnings and identification of the well site. The surface facility dike area is 38.5' x 20.5' with 24" high walls for secondary containment (See attachments,which includes further discussion and facility schematic). The injection well is within the fenced surface facility. Additionally, daily annular and injection tubing pressure monitoring is accomplished on the Columbia Gas 20320 (Wallace Unit #1) injection well. There are also six color night-vision security video cameras at the facility, with one being high resolution that is able to identify license plates at the unloading area. The DVR is programmed to save video data for 30 days. Additionally, there are four dusk to dawn security lights that provide light throughout the facility at night.

Also attached is a separate document with photographs of the gate and signage, lock and chain at the gate, location of the security cameras, surface facility and dike area showing secondary containment, well house enclosure, and wellhead with monitoring equipment.

COLUMBIA GAS 20320 (WALLACE UNIT #1), UIC 2D0392210 KANAWHA COUNTY, WEST VIRGINIA

LEASE ROAD, ACCESS GATE, SURFACE FACILITY, WELLHEAD AND SECURITY CAMERA LOCATION PHOTOGRAPHS

Figure 1 – Photograph of access road and gate to the Columbia Gas 20320 (Wallace Unit #1) injection well location and Tuppers Creek surface facility.

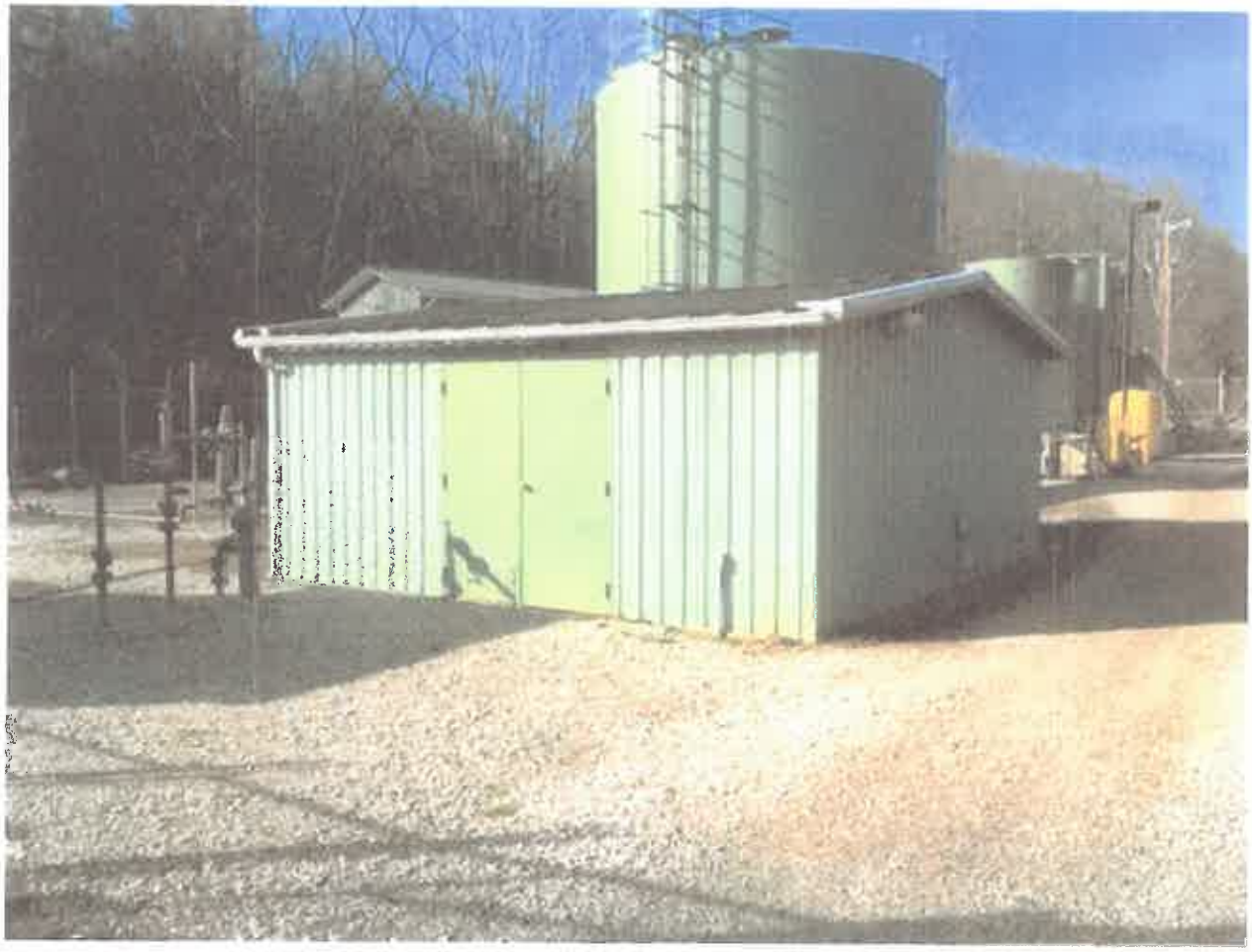

Figure 2 – Photograph of Tuppers Creek surface facility showing pump house and tank battery.

Figure 3 – Photograph of tank battery and concrete secondary containment at the Tuppers Creek surface facility.

Figure 4 – Unloading pad and filtering system at the facility.

Figure 5 – Columbia Gas 20320 (Wallace Unit #1) wellhead assembly and pressure monitoring.

Figure 6 – Double-walled large storage tank.

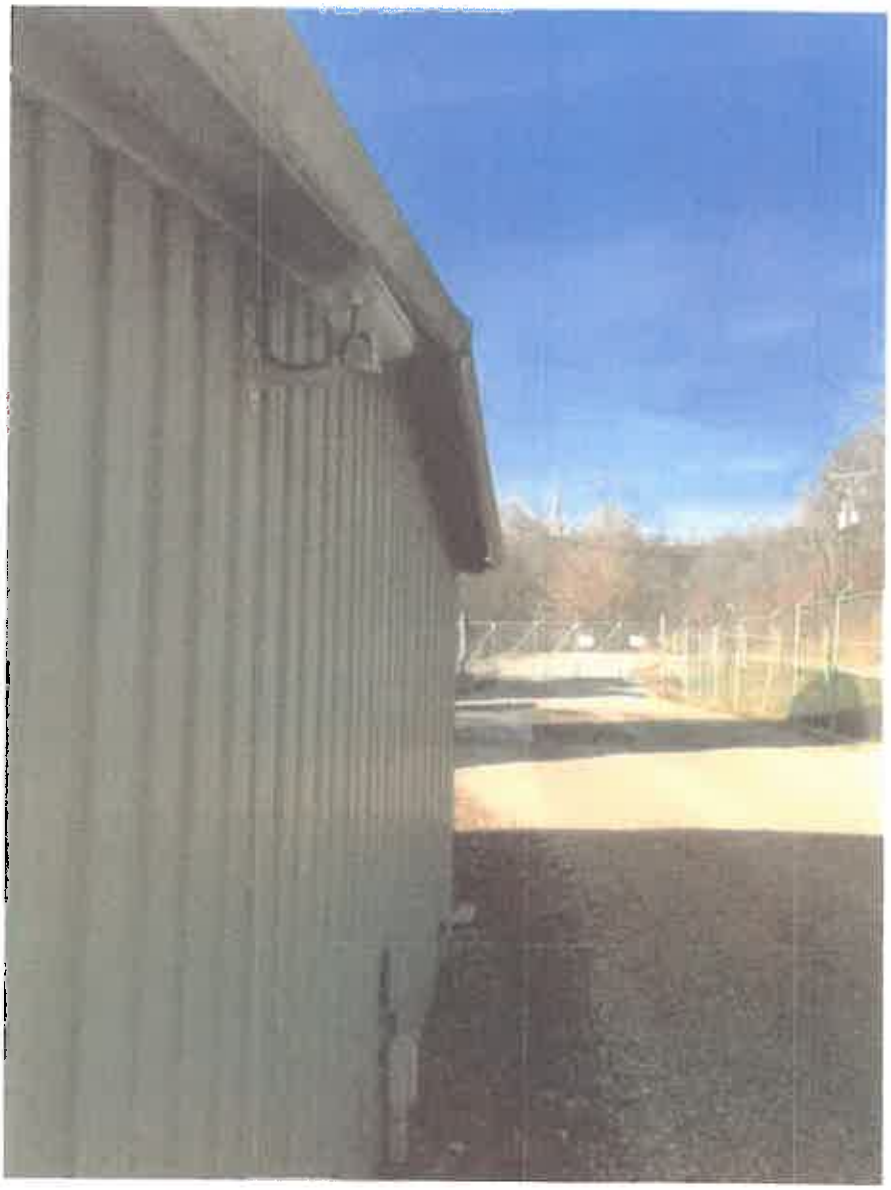

Figure 7 – Security camera on the side of building.

Figure 8 – Security camera on pole.

Figure 9 – Security camera on back of building.

Figure 10 – Two security cameras on pole at tank battery.

Figure 11 – Security camera on building over garage door.

Section 16

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	NA
NPDES Program	NA
Prevention of Significant Deterioration (PSD)	NA
Nonattainment Program	NA
Dredge or Fill	NA
NPDES/NPDES – Stormwater	NA
WVDEP – Office of Waste Management (OWM) – Solid Waste Facility	NA
WVDEP – OWM – RCRA (Hazardous Waste TSD or Transporter)	NA
WVDEP – OWM – UST	NA
CERCLA – Superfund	NA
WV Voluntary Remediation – Brownfields	NA
FIFRA – Federal Insecticide, Fungicide and Rodenticide Act	NA
Well Head Protection Program (WHPP)	NA
Underground Injection Control (UIC)	UIC2D0392210
Toxic Substances Control Act (TSCA)	NA
Best Management Plans	NA
Management of Used Oil	NA
Other Relevant Permits (Specify):	
AST	020-00003182, 020-000320,
AST	020-0003241, 020-0003442

Viking T & D LLC.

Spill Prevention Control & Countermeasure (SPCC) Plan

State of West Virginia

2015

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40 CFR 112.7

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SUBPART A

APPLICABILITY, DEFINITIONS, AND GENERAL REQUIREMENTS FOR ALL FACILITIES AND ALL TYPES OF FLUIDS

Received
Office of Oil & Gas
JUN 14 2016

Introduction

Viking T & D LLC. Pursuant to 40 CFR 112 hereby establishes a Spill Prevention Control & Countermeasure Plan (hereinafter referred to as SPCC Plan), which shall be maintained at this site. The management of Viking T & D LLC. acknowledges its responsibility to its neighbors, employees, and the community to take all reasonable steps necessary to prevent spills from its facilities in order to protect human health and the environment. If, despite Viking T & D LLC. Efforts, a spill does occur, the agents and employees of Viking T & D LLC. shall take all necessary steps a outlined in the SPCC Plan to minimize the impact of such a spill.

The SPCC Plan is a working document designed to be a tool Viking T & D LLC. uses regularly to prevent or minimize spills. As such, Viking T & D LLC. shall see that its agents and employees are properly informed of the provisions of the SPCC Plan and know their role in maintaining the SPCC Plan or in minimizing a spill that occurs. Viking T & D LLC. is committed to providing the necessary resources to establish and maintain the Spill Prevention Control & Countermeasures set forth herein. The Plan shall be reviewed every 5 years or sooner if facility changes impact the Plan.

Management Approval

The management at a level of authority to commit the necessary resources to implement this SPCC Plan extends full approval.

Eric Pinkerton
Owner Signature

12-1-15
Date

Eric Pinkerton
Print Name

Name of Facility: Tuppers Creek Disposal Well
Type of Facility: Class II Saltwater Disposal Well
Location: Old Tuppers Creek Rd. Sissonville, WV

Owner Name: Viking Energy Corp.
Address: 8113 Sissonville Dr.
Sissonville, WV 25320
Phone: (304) 988-1161

Company Contact: Eric Pinkerton
Phone: (304) 988-1161

Designated Person Responsible for Spill Prevention: Eric Pinkerton
Phone: (304) 988-1161
Alternate Phone: (304) 552-2814

40 CFR 112.3 (d)(1)(iv)
I hereby certify that:

1. I am familiar with the SPCC requirements;
2. Either I or my agent has visited this site;
3. The Plan is prepared with good engineering practices and applicable industry standards;
4. The procedures for SPCC required inspections and testing are established herein; and
5. This SPCC plan is adequate for this facility

Date: 12-1-15

Name: Eric Pinkerton

The Facility's Conformance with the requirements of 40 CFR 112.7 40 CFR 112.7 (a)(1) and (2)

Viking T & D LLC. has taken all reasonable steps to comply with the 40 CFR 112. The following is a list of exceptions and the details are noted in the applicable provisions of this SPCC Plan.

1. The aboveground piping supports are steel and should be inserted on the pipe and the steel support to prevent abrasions during expansion, contractions and vibration.
2. Signs need to be installed by the fill ports to notify delivery drivers of the following:

FLUID DELIVERY INSTRUCTIONS

1) Confirm product and volume to be delivered with on site manager or check site levels on tanks.
2) There is an audible overfill alarm. It will sound when the tank si reaching its capacity. If you hear it – cease delivery of the product IMMEDIATELY.
3) No smoking.
4) Keep any fire away from tanks and vehicles.
5) Set handbrake or use tire chucks while unloading.
6) You must remain within 25 feet and in view of the fill port.
7) Shut off your engine unless it is used to power the delivery pump.
8) Disconnect the transfer lines before departure.
9) Examine all valves, hoses, connections, fittings and lowermost drains on the vehicle prior to departure.

Physical Layout of the Facility
40CFR 112.7 (a)(3) and (i)

The facility is located in the Poca District of Kanawha County, West Virginia. The property sets off of Old Tuppers Creek Rd. off of Interstate 77 Exit 111 (Tuppers Creek). The address has a topography that is generally crowned to provide a flat surface for equipment, but will drain to the northeast. The facility persists of a saltwater disposal well that is used for oil and gas operations. Vehicles enter and exit the facility by the driveway from Old Tuppers Creek Rd. There is 1 unloading area consisting of a drive on 4200-gallon containment basin. The aboveground storage tanks are located at the central and northwest corner of the facility, which is double-walled and or diked. 10,000-gallon double walled oil water separator is located in the building adjacent from the 52,000-gallon double walled tank.

The site has storage tanks containing product as noted in the table:

Table 1

Type	Capacity (gallons)	Product Stored	Material
AST	56,440	Brine/Frac	DW Steel
AST	10,000	Brine/Frac	DW Steel
AST	10,500	Brine/Frac	Steel
AST	10,500	Brine/Frac	Steel
AST	4,200	Brine/Frac	Steel

A diagram if the facility is located in Appendix A.

Discharge Prevention Measures
40 CFR 112.7 (a)(3)(iii)

Discharge Prevention Measures are those steps or procedures taken to minimize the potential for a discharge of fluids at the facility. This includes an evaluation of the following:

a) Buried piping installation and protection and examination procedures.
b) Not-in-service and standby service terminal connections.
c) Pipe supports design.
d) Aboveground valve and pipeline examinations.
e) Aboveground piping protection from vehicular traffic.
f) The loading, unloading and transfer of fluids at the facility.

Buried piping installation and protection and examination procedures.

All present and future buried piping (whether steel, fiberglass or thermoplastic) shall be tested annually using pressure gauging.

Any failed line tests shall be addressed immediately. If line fails, it will be taken out of service until the problem is resolved.

Not-in-service and standby service terminal connections.

If a pipeline is not in service or is placed in standby mode it shall be capped or blank-flanged at the transfer point or otherwise sealed to prevent spills. Presently there is no "not-in-service" product piping.

Pipe supports design.

The piping supports are designed to allow for expansion and contraction and to minimize corrosion and abrasion. Presently, the supports are steel "Y" shaped. A cushion needs to be placed between the piping and the support.

Aboveground valve and pipeline examinations.

Aboveground valve and piping shall be inspected on a regular basis and note the conditions of pipes, flange joints, expansion joints, valve glands and bodies, pipeline supports, locking of valves, metal surfaces and those areas where the piping has a high potential for leaking. The inspection form for aboveground piping is in Appendix B.

Aboveground piping protection from vehicular traffic

All aboveground piping is and shall remain protected from vehicular traffic by means of bumper poles, barriers, clearance and warning signs or verbally warned upon entering the facility. All the current aboveground piping is within the protection or the containment area. NO bumpers or other means of protection are required.

The loading, unloading and transfer of fluid at the facility.

The facility personnel, when present, shall oversee vendors unloading fluids to the facility. All facilities must comply with the minimum requirements or the U.S. Department of Transportation regulations for loading and unloading including but not limited to:

> No smoking while loading or unloading. Smoking on or about any motor vehicle while loading or unloading any fluid material is forbidden.
>
> Keep fire away while loading and unloading. Extreme care shall be taken in the loading and unloading materials into or from any motor vehicle to keep fire away and to prevent persons in the vicinity from smoking, lighting matches, or carrying any flame or lighted cigar, pipe, or cigarette.
>
> Handbrake set while loading and unloading. No hazardous material shall be loaded into or on, or unloaded from, any motor vehicle unless the handbrake be securely set and all other reasonable precautions be taken to prevent motion of the motor vehicle during such loading or unloading process.
>
> **Attendance requirements while loading and unloading.**
>
> A cargo tank must be attended by a qualified person at all times when being loaded. The person who is responsible for loading the cargo tank is also responsible for ensuring that it is so attended. A qualified person "attends" the loading or unloading of a cargo tank if, throughout the process, he is alert and is within 25 feet of the cargo tank. The qualified person attending the unloading of a cargo tank must have an unobstructed view of the cargo tank and delivery hose to the maximum extent practicable during the unloading operation.
>
> Engine stopped. Unless the engine of a cargo tank motor vehicle is to be used for the operation of a pump. Fluid may not be loaded into, or on, or unloaded from any cargo tank motor vehicle while the engine is running.

Prior to delivering fluids to the site the vendor shall either notify Viking T & D LLC, who shall confirm the types and amounts of fluids to be delivered to each tank, or check the site levels on the tank to assure sufficient space for the delivery.

The facility uses an automatic tank gauge consisting of electronic tank gauge and tank probes as well as tank balls. The tank probe is set to trigger an audible alarm during unloading when the volume of the tank reaches 90% capacity. The alarm is on the west side of the pump building facing the tanks and unloading area. Upon hearing the alarm, the delivery driver ceases the delivery and shuts off the alarm. The automatic tank gauge system is tested periodically to assure proper operation.

Warning signs will be used at the facility to prevent vehicles from departing prior to completely disconnecting from transfer lines. The sign is not currently present but shall be installed.

The signage shall instruct the attendant loading or unloading to examine the valves, hoses, connections, fittings and lowermost drain and outlets of their vehicle for leakage prior to loading, unloading or departure.

Discharge or Drainage Controls such as secondary containment around containers and other structures, equipment, and procedures for the control of a discharge.

The two 250 barrel and 100 barrel steel tanks containing Brine/Frac fluids, listed in Table 1 are contained by a secondary concrete containment dike. The floor of the containment area is 14" thick of concrete with 5/8" rebar separated by 1' X 1' grid. A plastic liner covers the lower middle of the base inside the concrete. There are no specifications available on the construction of the containment dike. The containment area does have volume sufficient to contain 24,000 gallons of fluid. Which is well above the acquired 250-barrel plus 10% additional volume to contain precipitation. Any release from the tanks will be contained in the secondary containment area. There are two 2" valves on the backside of containment dike. The 10,000-gallon Oil water separator is double-walled construction made up of steel and corrosion proof paint. The 56,440-gallon tank is made up of double-walled steel construction painted with corrosive resistant paint. If any sheen exists in containment area, absorbent materials shall be used to remove the visible fluid. The absorbent materials are located in the storage building next to the containment area.

The above provision meets the specific requirements of 40 CFR 112.8(b)(1) and (2).

Countermeasures for Discharge Discovery, Response and Cleanup 40 CFR 112.7 (a)(3)(iv)

In the event of a discharge Viking T & D LLC. shall be immediately notified. The employee on duty will be trained to attempt to stop the continuation of the discharge – for example: close valves, turning off pumps or isolating a line leak. A "kill switch" is located In pump building. The facility personnel are and shall continue to be trained to respond to spills of less than 100 gallons at the facility. Absorbent materials shall be used to contain and dispose of the fluid that is spilled. See 40 CFR 112.7 (a)(5) below for a detailed procedure. For spills greater than 25 gallons, Viking T & D LLC. shall report the spill to the West Virginia Department of Environmental Protection Emergency Spill Line at 1 (800) 642-3074 and call the following parties for assistance:

1) Viking Energy Corp office
2) Local Sissonville fire department – 911
3) The environmental remediation companies to come to the site and provide clean up

Methods of Disposal of Recovered Materials 40 CFR 112.7 (A)(3)(v)

If facility personnel contain the discharge, the recovered material will be stored in drums. The material shall then be disposed at a licensed landfill. If the discharge required the use of an environmental remediation contrator such contractor shall make arrangements for the proper disposal of recovered materials.

Contact List and Phone Numbers
40 CFR 112.7 (a)(3)(vi)

EMERGENCY CALL DOWN LIST	
ADAM LONG	(304) 539-2989
ERIC PINKERTON	(304) 552-2814
LOCAL POICE FIRE DEPARTMENT MEDICAL EMERGENCY	911
WVDEP EMERGENCY SPILL INE	1 (800) 642-3074
NATIONAL RESPONSE CENTER EPA	1 (800) 424-8802
INSURANCE	(304) 720-2000

Information to be given to Contacts
40 CFR 112.7 (a)(4)

When you call the contacts above be prepared to provide details when asked about the following:

1. The address of the facility:
2. Phone number of corporate office:
3. Any injuries at the facility.
4. Date and time of the discharge / spill.
5. The type of fluid discharged or spilled.
6. Estimates of the quantity of material discharged / spilled.
7. The source of the discharge / spill (pipe, tank, truck).
8. Whether the discharge / spill is on soil, pavement, or ran into the street or a waterway.
9. Actions taken to contain the discharge / spill.

(THIS PAGE SHALL BE COPIED AND POSTED FOR EMPLOYEES – See Appendix G)

Procedures to Follow in the Event of a Discharge
40 CFR 112.7 (a)(5)

In the event of a discharge follow these procedures:

1. Immediately initiate the contact reporting procedures.
2. Take prompt necessary measures to stop the discharge such as turning off pumps, shutting valves, or isolating lines.
3. Identify the source of the discharge, the type of fluid discharged, an approximation of the amount discharged and the area covered by the discharge.
4. Evaluate the possibility of fire hazard to inform the Fire Department accordingly.
5. Evaluate the potential risk to persons located on property surrounding the site. If a risk exists notify the Fire Department accordingly.
6. Viking T & D LLC. shall contact an environmental remediation company if the release is not contained on site, or cannot be addressed by use of first response absorbent materials on site.
7. Take prompt action to contain the discharge on the site by use of temporary dams and/or use of absorbent materials. DO NOT TAKE ACTION THAT WOULD RISK PERSONAL SAFETY.
    a. Contain the discharge or spill with the use of booms and absorbents. Use large quantities of absorbent materials, such as sand or vermiculite, to soak up and contain the spill in place by direct application.
    b. Once the spill is contained use brooms and shovels to place the absorbent material in drums on the site.
    c. The drums shall be properly labeled and stored until disposed at an appropriate facility.

Direction, Rate of Flow and Total Quantity of a Potential Discharge 40 CFR 112.7 (b)

The facility faces north. The site drains to the northeast. All liquid will flow to the north east. The surface drainage will reach the ditch and potentially reach the creek approximately 100 feet away from the facility. This is only surface water drainage.

All spills are contained by secondary containment.

Prevention Systems: Containment and Diversionary Structures and Equipment utilized to prevent a discharge from reaching waterways 40 CFR 112.7 (c)

The following means have been evaluated for the containment or diversion of a potential discharge:

1. Dikes, berms, retaining walls by stream, containment areas sufficiently impervious to contain the product.
2. Curbing.
3. Culverts, gutters and other drainage systems.
4. Barriers.
5. Sorbent Materials.

The facility makes use of a concrete dikes, steel double-walled tanks, containment absorbent wall on hill, and sorbent materials to contain and divert the potential release.

If Measures listed in 40 CFR 112.7 © above are not practicable then explain why.
40 CFR 112.7 (d)

The measures noted in 40 CFR 112.7 (c) above is practical. Secondary containment is provided using all mentioned materials above.

Inspections, Tests and Records
40 CFR 112.7 (e)

All fluid-handling employees of Viking T & D LLC. shall be trained to observe the aboveground storage tanks, valves, aboveground piping and dispensers for potential problems. If a problem is observed the employee shall inform Viking T & D LLC. who will in turn take necessary action.

The forms found in Appendix B, C, and E are to be used to record the inspections. All aboveground storage tanks, valves, aboveground piping, catch basins, spill control, dispensers and emergency response equipment and supplies shall be inspected annually by Viking T & D LLC. employees. Each inspection shall be recorded, dated, signed and placed in this binder. All items requiring attention shall be noted and then checked off as each item sis corrected.

All underground piping shall be pressure tested annually.

Excessive vegetation is currently non-existent. No vegetation shall be allowed to grow or debris accumulated in the containment area.

Tanks are labeled to show the product that each contains.

Personnel, Training for Discharge Prevention Procedures
40 CFR 112.7 (f)

Viking T & D LLC. is responsible for properly instructing the necessary employees in the operation and maintenance of equipment to prevent a discharge and this SPCC Plan.

Viking T & D LLC. shall schedule and conduct spill prevention briefings for the necessary personnel at intervals frequent enough to maintain knowledge and skills adequate to execute the provisions of this SPCC Plan. The briefings shall review actual events that occurred on the site, equipment failures or malfunctions and any newly adopted preventive measures. All new hires shall be trained on the provisions of this SPCC Plan. Once a year, refresher training shall be conducted.

Security
40 CFR 112.7 (g)

1. **Fencing**
2. **Containment Valves**
3. **Starter Control**
4. **Cap or Blank-Flange loading and unloading connections**
5. **Lighting to assist in discovery of a discharge or vandalism**

The following safety measures are in place or are to be implemented:

1. Fence – There is 6' and 8' fencing locked and gated around the entire facility
2. All containment valves are locked.
3. When the facility is closed for business, the starter controls on all pumps shall be locked in the OFF position.
4. The AST loading and unloading connections are securely capped and or locked when not in use or in standby service mode.
5. The containment area, as well as most of the facility, is illuminated after dark by night-lights throughout the facility. There are 6 security cameras overseeing the entire facility for vandalism discouragement.

Tank Truck Loading Unloading Area Containment
40 CFR 112.7 (h)

This facility does have a secondary containment area for the loading and unloading of trucks consisting of steel and concrete.

Field Constructed ASTs
40 CFR 112.7 (i)

The ASTs at this facility are not field constructed.

Conformance with Other Applicable Requirements
40 CFR 112.7 (j)

This SPCC Plan does not incorporate any additional requirements of the State of West Virginia or its agencies, city or county requirements or the requirements of the Federal EPA. The West Virginia Department of Environmental Protection inspects this facility periodically and Viking T & D LLC. shall see that the site conforms to all applicable requirements.

SUBPART B

REQUIREMENTS FOR ONSHORE FLUID SPILLS

General Requirements
40 CFR 112.8 (a)

Viking T & D LLC. shall operate in compliance with the requirements of Section 112.7, as outlined in this SPCC Plan, and the specific discharge prevention and containment procedures listed in Section 112.8 as set forth below.

Facility Drainage
40 CFR 112.8 (b)(1) and (2) Diked areas

Drainage in the diked areas is discussed in detail pursuant to 40 CFR 112.7 (a)(30)(iii). Butterfly valves are used in the secondary containment area.

Facility Drainage
40 CFR 112.8 (b)(3) and (4) Undiked areas

All aboveground piping is located in the containment area and as such a release from the piping will be contained in the diked secondary containment area. The area where a delivery truck parks is immediately over a containment area.

Bulk Storage Containers
40 CFR 112.8 9C)(1)

The five tanks at the site are constructed of steel, an appropriate material for storing fluids under the variable climate temperatures. The tank system is designed not to add pressure to the tank other than from the fluid contained therein.

Capacity of the Secondary Containment Area
40 CFR 112.8(c)(2)

The secondary containment area must have the capacity to contain the entire volume of the largest tank. This is addressed within this Plan at 40 CFR 112.7 (a)(3)(iii).

Method to Address Precipitation within the Secondary Containment
40 CFR 112.8 (c)(3)

This is addressed within this Plan at 40 CFR 112.7 (a)(3)(iii).

Cathodically Protected Metal Underground Storage Tanks
40 CFR 112.8 (c)(4) and (5)

There are no underground storage tanks at this site.

Periodically Test the Integrity of Aboveground Tanks
40 CFR 112.8 (c)(6)

This is addressed within this Plan at 40 CFR 12.7 (e)

Leakage From Heating Coils
40 CFR 112.8 (c)(7)

Heating coils are not in use at this facility.

Updated or Engineer containers to avoid discharge
40 CFR 112.8 (c) (8)

Viking T & D LLC. uses an automatic tank gauge system consisting of a tank probe and an audible alarm. Once 90% of the tank's capacity is reached, an alarm sounds notifying the delivery driver to cease the delivery to the particular tank.

Observe effluent treatment
40 CFR 112.8 (c)(9)

The facility consists of a water flow meter showing effluent water flowing throughout the system.

Promptly address visible discharge
40 CFR 112.8 (c)(10)

This is addressed within this Plan at 40 CFR 112.7 (e)

Mobile or Portable Storage Containers
40 CFR 112.8 (c)(11)

Viking T & D LLC. does not utilize any mobile or portable storage devises ant this site.

Facility transfer operations
40 CFR 112.8 (d)(1), (2), (3), (4), and (5)

These items are addressed within this Plan at 40 CFR 112.7(a)(3)(ii)

APPENDICES

A. Site Sketch
B. Tank & Piping Inspection Checklist
C. Secondary Containment Area & Inspection Checklist
D. Secondary Containment Drainage Report
E. Response Equipment Inspection
F. Spill Response Notification Form
G. Emergency Notification Phone List
H. Emergency Response Contractors
I. Personnel Response Training
J. Discharge Prevention Meetings
K. Reviews & Engineer Certified Amendments

Appendix A: Site Sketch

Appendix B:
Tank & Piping Inspection Checklist

TANK & PIPING INSPECTION CHECKLIST

1. Check tanks for leaks, specifically looking for:

	Drip marks
	Discoloration of tanks
	Puddles containing spilled or leaked material
	Corrosion
	Cracks
	Localized dead vegetation
	Vent caps operational
	Water in the tanks
	Tank Support

2. Check foundation for:

	Cracks or spallings
	Discoloration
	Puddles containing spilled or leaked material
	Settling
	Gaps between tank and foundation
	Damage caused by vegetation roots

3. Checking piping for:

Droplets of stored material
Discoloration
Corrosion
Bowing of pipe between supports
Evidence of stored material seepage from valves or seals
Localized dead vegetation
Abrasions at pipe supports

Tank/Surface Impoundment Inspection Log

Facility Supervisor	Tank or SI#	Date	Comments

Appendix C:
Secondary Containment Area
&
Inspection Checklist

Viking T & D LLC.

Calculating the Volume of Containment Dike

Step 1. Gross Volume of Containment Area.

Containment Dike

Length	44.00 ft.
Width	24.00 ft.
Height	2.00 ft.
	2,112 ft.3

2,112 sqft. X 7.48 sqft. = 15,797.76 gallons

Step 2. Results.

Containment area is volume sufficient to contain the contents of the largest tank.

SECONDARY CONTAINMENT INSPECTION CHECKLIST

Inspect the secondary containment (as described in 40 CFR 112.7 (a)(3)(iii) of the SPCC Plan), checking the following:

1. Steel Double-walled tank

	Level of precipitation/available capacity
	Operational status of drainage valves
	debris
	Corrosion
	Leaks
	Location/status of pipes, inlets, drainage beneath tanks, etc.

2. Concrete secondary containment for tanks

	Level of precipitation/available capacity
	Cracks or spalling of concrete
	Discoloration
	Location/Status of pipes, drainage beneath tanks, etc.
	Debris
	Presence of spilled or leaked material (standing Liquid)
	Corrosion

During inspection, make note of discrepancies in any of the above-mentioned items, and report them immediately to the proper facility personnel.

Secondary Containment Inspection Log

Facility Supervisor	Date	Comments

Appendix D:
Secondary Containment Drainage Report

Secondary Containment Drainage Report

Name of Facility: Tuppers Creek Disposal Well
Address: 8113 Sissonville Dr.
Sissonville, WV 25320

Water released from a secondary containment area must not have a sheen. If a sheen is present, the water must be cleaned by use of absorbent pads, absorbent booms or other approved methods. When the sheen is removed, the water may be drained or pumped out. If the water cannot be cleaned adequately, contact the owner immediately.

Date	Employee Signature	Is the sheen Present?	Type of Absorbent Material Used	Water Removal		Estimate Gallons of Water Removed
				Start Time	End Time	

Appendix E:
Response Equipment Inspection

RESPONSE EQUIPMENT INSPECTION

Checking for the following:

1. Inventory (item and quantity)
2. 2. Storage Location
3. Accessibility (time to access and respond)
4. Operational status/condition
5. Actual use/testing (last test date and frequency of testing)
6. Shelf life (present age, expected replacement date)

Please note any discrepancies between this list and the available response equipment.

Response Equipment Inspection Log

Facility Supervisor	Date	Comments

Appendix F:
Spill Response Notification Form

SPILL RESPONSE NOTIFICATION FORM

Reporter's Name:_____ Reporter's Title:_____

Company:_____

Organization Type:_____

Address:_____

City:_____ State:_____ Zip:_____

Phone Numbers:_____

Were materials discharged? Yes No

Meeting with Federal Obligations to Report? Yes No Date Called:___

Calling for Responsible Party? Yes No Time Called:_____

Incident Description

Source and/or Cause of Incident:_____

_____

Date of Incident:_____ Time of Incident:_____ A.M. P.M.

Incident Address/Location:_____

Nearest City:_____ State:_____ County:_____ Zip:_____

Container Type:_____ Tank Storage Capacity:_____ Units of Measure:_____

Facility Storage Capacity:_____ Units of Measure:_____

Material

Material	Discharged quantity

Response Action

Actions Taken to Correct, Control or Mitigate Incident:_____

_____

_____

_____

Impact

Number of Injuries:_____ Number of Deaths: _____

Were there Evacuations?_____ Number Evacuated:_____

Was there any damage? Yes No

Medium Affected:_____

Descrption:_____

More Information about Medium:_____

_____

_____

_____

Additional Information

Any information about the incident not recorded elsewhere in the report?_____

_____

_____

_____

_____

_____

Caller Notifications

State? Yes No EPA? Yes No

Other? Yes No Describe:_____

_____

_____

Appendix G:

Emergency Notification Phone List

EMERGENCY NOTIFICATION PHONE LIST

Reporter's Name:_____ Reporter's Title:_____

Date:_____

Facility Name: Tuppers Creek Disposal Well Facility ID# 2D0392210

Owner Name:_____

Organization	Phone Number
1. Viking T & D LLC.	(304) 988-1161
2. Company Response Team	(304) 539-2989
3. Local Response Team Local Police Fire Department Medical Emergency	911
4. WVDEP Emergency Spill Line	1 (800) 642-3074

When you call the contacts above be prepared to provide details when asked about the following:

1. The exact address of the facility:
2. Any injuries at the facility.
3. Date and time of the discharge/spill
4. The type of fuel discharged or spilled.
5. Estimates of the quantity of material discharged / spilled.
6. The source of the discharge / spill (pipe, tank, truck).
7. Whether the discharge / spill is on soil, pavement, or ran into the street or a waterway.
8. Actions taken to contain the discharge / spill.

Appendix H:

Emergency Response Contractors

EMERGENCY RESPONSE CONTRACTORS

Date of Last Update: 12-1-15

1. BBU Services of WV 1 (304) 372-8192

Appendix I:

Personnel Response Training

PERSONAL RESPONSE TRAINING

SECTION 112.21(a) requires facility owners or operators to develop programs for facility response training. Facility owners or operators are required by 112.21(h)(8)(iii) to provide a description of the response-training program to be carried out under the response plan.

Personal Response Training Log

	Name	Response Training	Date	# of Hrs	Prevention training	Date	# of Hrs

Appendix J:

Discharge Prevention Meetings

DISCHARGE PREVENTION MEETINGS

Discharge Prevention Meeting Logs

Date:_____

Attendees:_____ _____

_____ _____

_____ _____

Subject/Issue Identified	Required Action	Implementation Date

Appendix K:

Reviews
&
Engineer Certified Amendments

Important Telephone Numbers for the Community of Sissonville
Kanawha County, West Virginia

FIRE DEPARTMENT.

Sissonville Volunteer Fire Department	1-304-984-0674

HOSPITAL.

CAMC General Hospital	1-304-388-5432
CAMC Memorial Hospital	1-304-388-5432
Thomas Memorial Hospital	1-304-766-3600

STATE POLICE.

South Charleston Troop 1	1-304-746-4840

KANAWHA COUNTY SHERIFF.

Jonathan D. Rutherford	1-304-357-0216

PUTNAM COUNTY SHERIFF.

Steve Deweese	1-304-586-0256

WEST VIRGINIA DEPT. OF OIL & GAS.

Terry Urban - Inspector	1-304-549-5915
Rick Campbell – Inspector	1-304-926-0499
James Martin – Chief	1-304-926-0499

Maranatha Church

1 Maranatha Acres,
Charleston, WV 25312
Pastor: Kevin Bartlett 1-304-984-9514

Viking T&D LLC. CONTACTS.

Michael Pinkerton – President	1-304-988-1161
Eric Pinkerton – Well Site Sup.	1-304-988-1161
Merle Richards – Drilling Consultant	1-304-561-5269

DRILLING AND WELL WORK CONTRACTORS.

(Have not been determined as of this date – Prior to drilling Well site copy of this plan will be revised to contain names and Contact numbers for the contractors)

Residences within one mile of drilling pad

'SEE ATTACHED SPREADSHEET"