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	Base Petroleum Inc.		
Existing UIC Permit ID Number	UIC2D0390644	UIC Well API Number	47-039-00644

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

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

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

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Reviewed by (Print Name): _____

Reviewed by (Sign): _____

Date Reviewed: _____

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UIC-1
(4/25)

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

UIC PERMIT ID # UIC2D0390644 API # 47-039-00644 WELL # Parsons #1-A

Section I. Facility Information

Facility Name: Base Petroleum inc. Parsons #1-A SWD

Address: 100 Wilcox Farm Lane

City: South Charleston State: WV Zip: 25309

County: Kanawha

Location description:

Branch of Leatherwood Cr. Watershed in the Poca District of Kanawha County

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

Northing: 453430.63 Easting: 4265367.08

Environmental Contact Information:

Name: John Wilcox Title: Designated Agent

Phone: (304) 549-5861 Email: jhnwilcox@aol.com

Section 2. Operator Information

Operator Name: Base Petroleum, Inc.

Operator ID: 305961

Address: 100 Wilcox Farm Lane

City: South Charleston State: WV Zip: 25309

County: Kanawha

Contact Name: John Wilcox Contact Title: Designated Agent

Contact Phone: (304) 549-5861 Contact Email: jhnwilcox@aol.com

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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:

Base Petroleum Inc. operates the Parsons #1-A disposal well in Kanawha County, WV as a private disposal facility for adjacent wells in the area that are owned by Base Petroleum. The facility receives brine water from adjacent wells via a pipeline for wells that can be gravity fed to the disposal well. Brine water is transported by truck for wells that are not able to be gravity fed. All brine water is gravity fed into the disposal well and is under no pressure. Kermit Tyree Contracting maintains all wells and the disposal facility for Base Petroleum as well as maintaining security at the site. Safety training and groundwater protection measures will also be provided for all employees by Kermit Tyree Contracting.

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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: John B. Wilcox

Print Title: Designated Agent

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: John B Wilcox

Date: 7/7/14

[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.

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APPENDIX A
Injection Well Form

1) GEOLOGIC TARGET FORMATION Big Lime

Depth 1560 Feet (top) 1704 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 1690 Feet

3) Approximate water strata depths: Fresh 90, 100 Feet Salt 1123, 1180 Feet

4) Approximate coal seam depths: N/A

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

6) Virgin reservoir pressure in target formation 400 psig Source Offset Wells

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 2 Bbls

Injection volume (bbl/day) 48 Bbls

Injection pressure (psig) Gravity Feed

Bottom hole pressure (psig) 1300 psi

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

Injection fluids will consist of produced water and pit fluids from oil and gas wells. No additives will be used

Temperature of injected fluid: (°F) 70 Degrees Fahrenheit

10) FILTERS (IF ANY)

10 Micron

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

N/A

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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							
Fresh Water	8 5/8"			25.5 #	1584'	956' - 1584'	79 sks
Coal							
Intermediate 1	7"			20 #		200'	125 sks
Intermediate 2							
Production	4 1/2"		J-55	10.5 #	1574'	1574'	200'
Tubing	2 38		J-55	4.6 #		1625'	
Liners							

TYPE	Wellbore Diameter	Casing Size	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./sk)	Cement to Surface ? (Y or N)
Conductor							
Fresh Water							
Coal							
Intermediate 1							
Intermediate 2							
Production							
Tubing							
Liners							

PACKERS	Packer #1	Packer #2	Packer #3	Packer #4
Kind:				
Sizes:				
Depths Set:	1625'			

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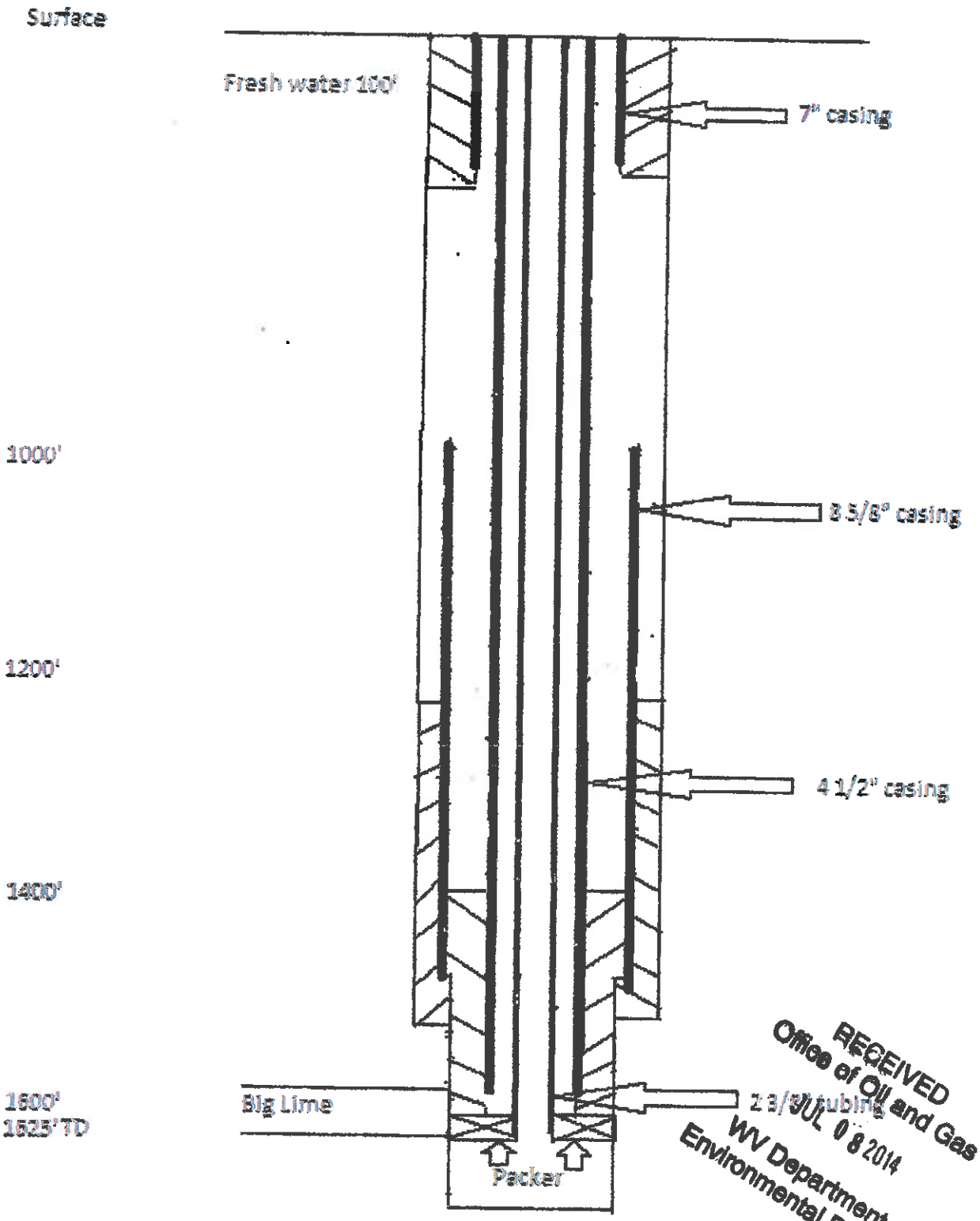
Parsons #1-A



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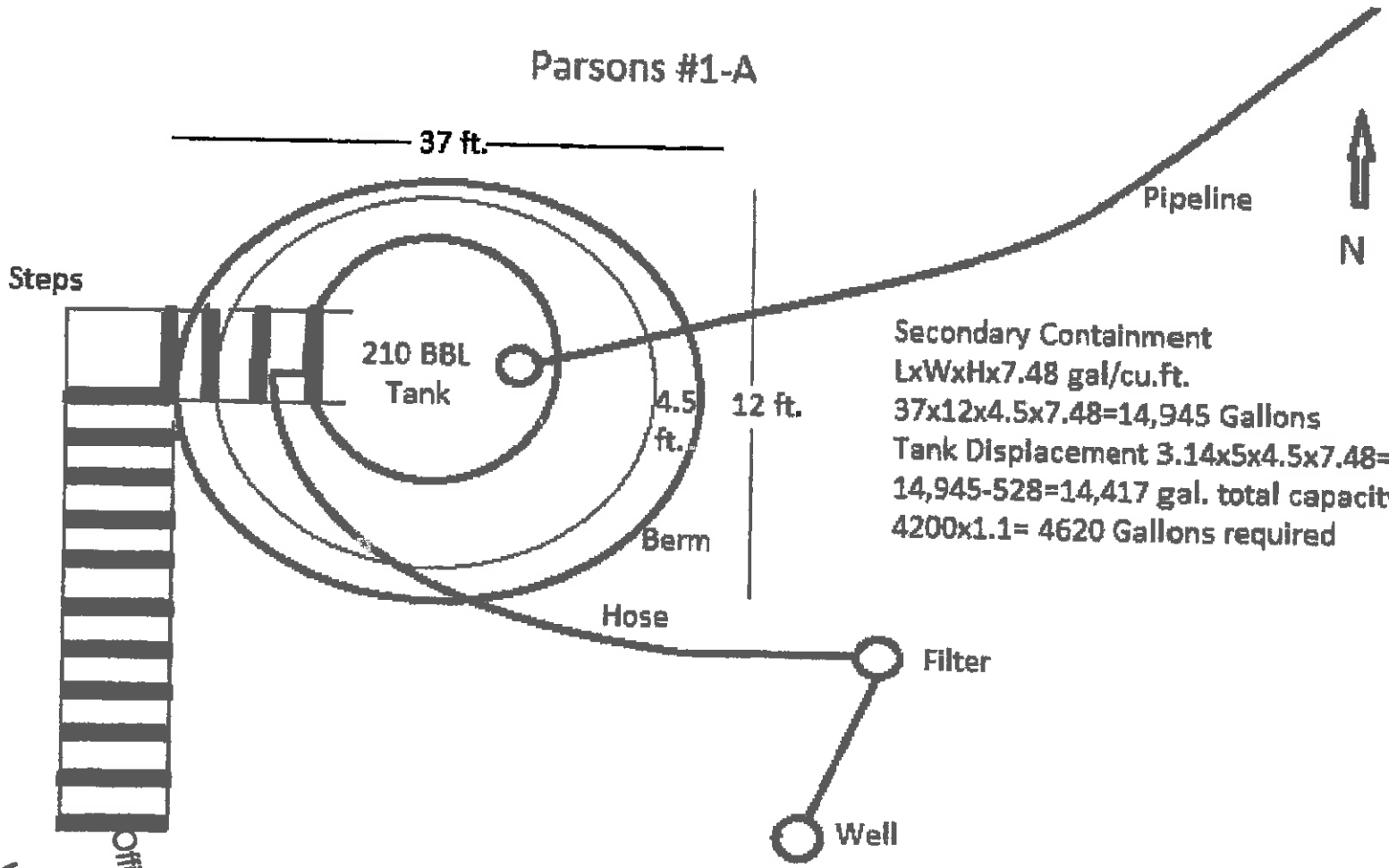
Parsons #1-A



Secondary Containment
LxWxHx7.48 gal/cu.ft.
37x12x4.5x7.48=14,945 Gallons
Tank Displacement 3.14x5x4.5x7.48=528 gal
14,945-528=14,417 gal. total capacity
4200x1.1= 4620 Gallons required

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UIC2D0390644

APPENDIX B
Storage Tank Inventory

API #	Tank ID	Tank Location (UTM NAD 83 Meters)		Installation Date	Tank Age (Months)	Construction Material (Steel, plastic, etc.)	Capacity (gallons)	Type of Fluid Stored	Volume of Fluid Stored (gallons)	Tank Type Single/Double Wall
		Northing	Easting							
47-039-00644	1	4265367.1	453430.6	pre 2000	168	Steel	8820	Brine	8820	Single

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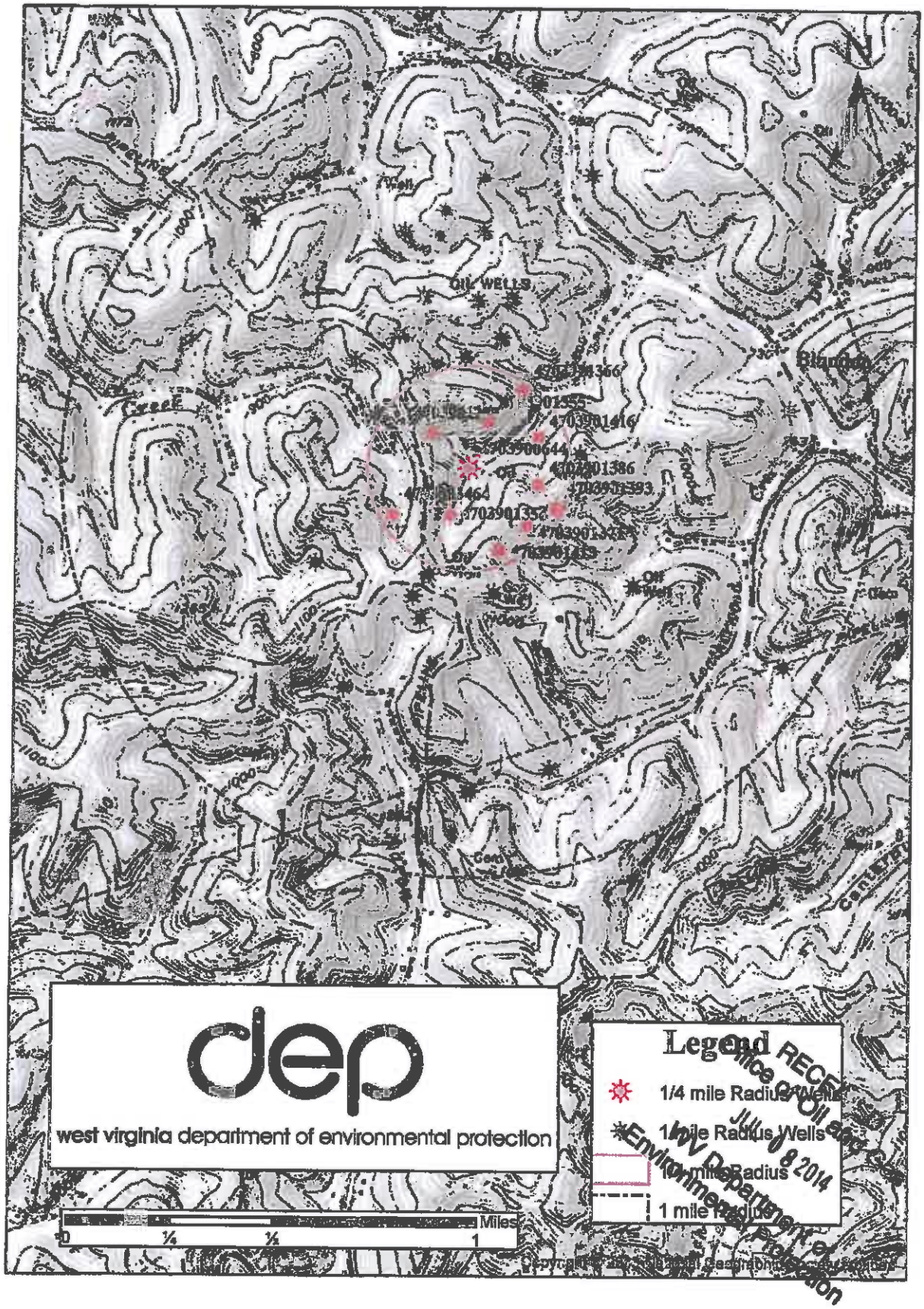

APPENDIX C

Wells within the Area of Review

API #	Well Type	Well Status (Active, Abandoned, Shut-in, Plugged)	Northing (UTM NAD 83 Meters)	Easting (UTM NAD 83 Meters)	Penetrate Injection Zone (Y or N)	Penetrate Confining Zone (Y or N)	Total Vertical Depth	Surface Elevation
47-039-00644	Injection	Active	4265367.08	453430.63	Y	Y	1690'	851'
47-039-01413	Oil and Gas	Plugged ~~Active~~ ZGS	4265048.01	453553.33	Y	Y	1831'	1088'
47-039-01371	Oil and Gas	*Agreed order Abandoned	4265143.94	453659.09	Y	Y	1868'	1089'
47-039-01354	Oil and Gas	Active	4265185.85	453357.49	Y	Y	1756'	926'
47-039-03464	Gas	Plugged ~~Active~~ ZGS	4265185.97	453128.78	Y	Y	2388'	1015'
47-039-01393	Oil and Gas	Plugged ~~Active~~ ZGS	4265213.30	453772.45	Y	Y	1935'	1071'
47-039-01386	Oil and Gas	Active	4265304.93	453700.11	Y	Y	1770'	974'
47-039-01366	Oil and Gas	Active	4265674.71	453636.88	Y	Y	1643'	804'
47-039-01416	Oil and Gas	Active	4265493.36	453699.63	Y	Y	1675'	838'
47-039-01355	Oil and Gas	Active	4265551.97	453504.48	Y	Y	1748'	934'
47-039-01287	Oil and Gas	Active	4265505.11	453281.26	Y	Y	1757'	939'

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

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Robert W. Rutta

FORM 24-2

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 RESPECTIVE ADDRESSES.

NONE
COAL OPERATOR OR OWNER

ADDRESS

COAL OPERATOR OR OWNER

ADDRESS

LEASE OR PROPERTY OWNER

ADDRESS

LEATHERWOOD OIL & GAS COMPANY
NAME OF WELL OPERATOR

Box 2151
Charleston, N.Va.
COMPLETE ADDRESS

July 25, 19 49

WELL AND LOCATION

Poca District

Kanawha County

Well No. # 5

Madison E. Flowers Et Al Farm

STATE INSPECTOR SUPERVISING PLUGGING D.E. Lawson

AFFIDAVIT

STATE OF WEST VIRGINIA,
County of Kanawha } ss:

A.R. McConnell and Fred Smith 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 Leatherwood Oil & Gas Co. [illegible] well operator, and participated in the work of plugging and filling the above well, that said work was commenced on the 30th day of May, 19 49, and that the well was plugged and filled in the following manner:

BAND OR ZONE RECORD	FILLING MATERIAL			PLUGS USED	CASING	
FORMATION	CONTENT	FROM	TO	SIZE & KIND	CSG PULLED	CSG LEFT IN
TOTAL DEPTH 1891'						
Filled with Clay		1891'	1808'			
Cemented		1808'	1798'	-5' Crushed stone on Cement		
Pulled 7" on Casing						
Continued filling with Clay to			1790'			
Cemented		1790'	1780'			
Continued filling with clay to			1365'			
Cemented		1365	1375'	-5' Crushed stone on Cement		
Bridged Hole at			800'			
(2 Bags Cement and 5' Crushed stone on Bridge)						
Filled with Clay to			710'			
Cemented		710'	700'			
Bridged Hole at			200'			
(2 Bags Cement and 5' Crushed stone on Bridge)						
Filled with Clay to Surface.						

COAL SEAMS	DESCRIPTION OF MONUMENT
(NAME)	Piece 10" Casing Cemented in Hole
(NAME)	Bearing following legend: Leatherwood
(NAME)	Oil & Gas Co.-Madison E.Flowers Et Al
(NAME)	# 5- June June 16, 1949.

and that the work of plugging and filling said well was completed on the 16th day of June, 19 49.

And further deponents saith not.

A.R. McConnell
Fred Smith

Sworn to and subscribed before me this 11 day of September, 19 49

Joseph J. [illegible]
Notary Public
Permit No. Kan.1415-P

My commission expires:
12/2/49

Robert W. Kelly

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

WELL RECORD

Permit No. Kan 1418 — Oil or Gas Well Gas (KIND)

Company Leatherwood Oil & Gas Company
Address Box 2151, Charleston, W.Va.
Farm Laura M. Flowers Acres 74
Location (waters) Leatherwood Creek-Poca River
Well No. 8 Elev. 1068.4
District Poca County Kanawha
The surface of tract is owned in fee by Madison E. Flowers Et Al
Address Charleston, W.Va.
Mineral rights are owned by Madison E. Flowers Et Al
Address Charleston, W.Va.
Drilling commenced February 23, 1948
Drilling completed March 22, 1948.
Date Shot Acidized 3/24/48 From 1800' To 1891'
With 1000 Gal. Acid
Open Flow 20 /10ths Water in 5" Inch
/10ths Merc. in Inch
Volume 424,000 Cu. Ft.
Rock Pressure 495 lbs. 12 hrs.
Oil None bbls., 1st 24 hrs.
Fresh water feet feet
Salt water 1450' feet feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
13			
10	16'	None	Size of
8¼	658'	"	
6⅝ 7# OD	1729'	1729'	Depth set
5 3/16			
8			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			0	16			
Slate			16	60			
Red Rock			60	80			
Slate			80	150			
Red Rock			150	160			
Slate			160	210			
Sand			210	235			
Slate			235	250			
Red Rock			250	280			
Sand			280	310			
Slate			310	325			
Red Rock			325	360			
Slate			360	390			
Lime			390	410			
Slate			410	420			
Red Rock			420	440			
Sand			440	460			
Slate			460	485			
Red Rock			485	515			
Slate & Shells			515	545			
Red Rock			545	580			
Slate & Shells			580	590			
Sand			590	685			
Slate & Shells			685	715			
Sand			715	760			
Slate & Shells			760	915			
Sand			915	1010			
Slate			1010	1050			
Sand			1050	1150			
Slate			1150	1180			
Sand			1180	1220			
Slate			1220	1270			
Sand			1270	1290			
Slate			1290	1320			
Broken Sand			1320	1375			
Salt Sand			1375	1785	Show Oil	1400-15'	
Break			1785	1790	Gas & Water		
Big Lime			1790	1955	Water	1450'	Hole Full
Engin Sand			1955	1958	Gas	1886-1891	20/10 M 5#
Total Depth			1958				

(Over)

Note: Filled back with Clay & Stone to 1891'

MAY 1948 WEST VIRGINIA DEPARTMENT OF MINES

NANCY WICKLINE

OG-10
Rev. - 9-71

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
Oil and Gas Division
WELL RECORD

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DEPT. OF MINES

Rotary X Oil ____
Cable ____ Gas X
Recycling ____ Comb. ____
Water Flood ____ Storage ____
Disposal ____ (Kind)

Quadrangle Romance

Permit No. Kan 3464

Company D. C. Malcolm, Inc.
Address 1006 Commerce Sq., Charleston, W.Va.
Farm McKinley Harding Acres 133
Location (waters) Coon Creek
Well No. 1 Elev. 988 K.B.
District Poca County Kanawha
The surface of tract is owned in fee by
T. E. Tignor
Address Blundon, W. Va.
Mineral rights are owned by McKinley Harding et al Address
Drilling Commenced 7-24-79
Drilling Completed 8-1-79
Initial open flow ____ cu. ft. --- bbls.
Final production 350000 cu. ft. per day --- bbls.
Well open 11 hrs. before test 400 RP
Well treatment; details:

Casing and Tubing	Used in Drilling	Left in Well	Cement fill up Cu. ft. (Sks.)
Size 20-16			
Cond.			
13-10"			
9 5/8			
8 5/8	200'	200'	to surface
7			
5 1/2			
4 1/2	2451	2451	140 SX
3			thixotropic
2	2285	2285	on packer
Liners Used			

Attach copy of cementing record.

Frac Berea thru perfs 2285-2288-10 holes-w/500 gals acid, 575 bbls water, 5000# 80/100, 30,000# 20/40.

Acidize Big Lime thru perfs 1815-1817 (3 holes), 1833-1835 (3 holes), 1850-1853 (6 holes) w/1000 gals 28 %, 3000 gals 15%.

Coal was encountered at ____ Feet ____ Inches
Fresh water ____ Feet ____ Salt Water 1420 Feet ____
Producing Sand Berea Depth 2282-2293

Formation	Color	Hard or Soft	Top Feet	Bottom Feet	Oil, Gas or Water	* Remarks
Sand & Shale			0	250		
Shale			250	335		
Sand & Shale			335	1298		
Sand			1298	1700		
Shale			1700	1709		
Big Lime			1709	1860		
Sand (Injun)			1860	1881		
Shale			1881	2282		
Sand			2282	2293		
Shale			2293	2388	T.D.	

(over)

* Indicates Electric Log tops in the remarks section.

Robert W. Ritta

Kanawha

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

WELL RECORD

Permit No. KAN 1871

Oil or Gas Well Oil (KIND)

Company LEATHERWOOD OIL & GAS COMPANY
Address P.O. Box 2151, Charleston, W.Va.
Farm Laura M. Flowers Acres 75
Location (waters) Poca River (Leatherwood Creek)
Well No. 1 Elev. 1089.7
District Poca County Kanawha
The surface of tract is owned in fee by Madison Flowers Et Al
Address Charleston, W.Va.
Mineral rights are owned by Madison Flowers Et Al
Address Charleston, W.Va.
Drilling commenced June 19, 1947
Drilling completed September 15, 1947.
Date Shot Acidized 9/15/47 From 1948' To 1843'
With 1,000 Gal.
Open Flow /10ths Water in Inch
/10ths Merc. in Inch
Volume Cu. Ft.
Rock Pressure lbs. hrs.
Oil 95 bbls. 1st 24 hrs.
Fresh water feet feet
Salt Water feet 1418' feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16"			Kind of Packer Baker 11
13			
10			Size of
8¼	505'	None	
7"OD	1807'	1807'	Depth set 1807'
5 5/16			
3			Perf. top 1860'
2	1949'	1949'	Perf. bottom 1874'
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED 7"OD SIZE No. Ft. 32' Date July 19, 1947.

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			0	6			
Red Rock			6	15			
Slate			15	45			
Red Rock			45	60			
Slate &			60	100			
Red Rock			100	155			
Sand			155	170			
Slate			170	250			
Red Rock			250	340			
Slate			340	390			
Red Rock			390	425			
Slate			425	475			
Red Rock			475	505			
Slate Shells			505	595			
Sand			595	750			
Slate & Shells			750	915			
Sand			915	1040			
Slate & Shells			1040	1070			
Sand			1070	1150			
Slate & Shells			1150	1510			
Salt Sand			1510	1797	Show Gas	1408-10'	
Weak			1797	1799	S. Water	1418'	Hole Full
Big Lime			1799	1964	Oil	1835-38'	Hole filled
Injun Sand			1964	1965			500' 24 Hrs.
Total Depth			1965				

Notes: Filled back to 1949'

DEC 1947 RECEIVED DEPARTMENT OF MINES

(Over)

Robert W. Rutta

39-

STATE OF WEST VIRGINIA

DEPARTMENT OF MINES

OIL AND GAS DIVISION

INSPECTOR'S PLUGGING REPORT

Form No. KAX-1371

Well No. 958

COMPANY Preston Oil Co. ADDRESS Charleston, W.Va.

FARM Imperial Coal Co. DISTRICT Cabin Creek COUNTY Kanawha

Filling Material Used

Liner	Location	Amount	Packer	Location

PLUGS USED AND DEPTH PLACED			BRIDGES	CASING AND TUBING		
CEMENT-THICKNESS	WOOD-SIZE	LEAD	CONSTRUCTION-LOCATION	RECOVERED	SIZE	LOST

Drillers' Names George Cooper

W.V. Pipe Co.

Remarks: Pulling 7" Casing

9-1-65 DATE I hereby certify I visited the above well on this date.

Alex Jones

DISTRICT WELL INSPECTOR

SEP 1 1965 RECEIVED West Virginia

Robert W. Rutta

STATE OF WEST VIRGINIA

DEPARTMENT OF MINES

OIL AND GAS DIVISION

INSPECTOR'S PLUGGING REPORT

Permit No. KAN-1371

Well No. 136

COMPANY Preston Oil Co. ADDRESS Charleston, W.Va.

FARM Imperial Coal Co. DISTRICT Cabin Creek COUNTY Kanawha

Filling Material Used

Liner Location Amount Packer Location

PLUGS USED AND DEPTH PLACED			BRIDGES	CASING AND TUBING		
CEMENT-THICKNESS	WOOD-SIZE	LEAD	CONSTRUCTION-LOCATION	RECOVERED	SIZE	LOST

Drillers' Names Graves Cooper

W. Va. Pipe Co.

Remarks: Complete to Surface

9-7-65 I hereby certify I visited the above well on this date.

DATE

INSPECTOR

RECEIVED SEP 8 1965 West Va. Dept. of Mines

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

WELL RECORD

Permit No. [illegible]

Oil or Gas Well: OIL (Kind)

Company: COLUMBIAN CARBON COMPANY
Address: Box 873, Charleston 23, W. Va.
Farm: H. K. Parsons — Acres: 57
Location (waters): Leatherwood Ck. (on-Sp.)
Well No.: Focus — Elev.: 926.0 G
District: — County: [illegible]
The surface of tract is owned in fee by: H. K. Parsons, et al
Address: Kiewlow, W. Va.
Mineral rights are owned by:
Address:
Drilling commenced: 3-1-47
Drilling completed: 4-11-47
Date Shot: Not Shot — From: — To:
With:
Open Flow: /10ths Water in — Inch
/10ths Merc. in — Inch
Volume — Cu. Ft.
Rock Pressure: 28 (after squirting) — lbs. — hrs.
Oil: — bbls., 1st 24 hrs.
Fresh water: 110 — feet — feet
Salt water: 1270 — feet — feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
13			
10 3/4"	34'0"	34'0"	Size of
8 5/8"	1162"	1162"	
6 5/8"	1632'0"	1632'0"	Depth set
5 3/16			
8			
3 1/8"	1762"	1762"	Perf. top
			Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED — SIZE — No. Ft. — Date
See Below

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
Soil			0	14			
Lime			14	19			
Sand			19	92			
Slate			92	110			
Lime			110	140	Fr. Water	110	Hole Full
Sand			140	160			
Slate			160	173			
Red Rock			173	210			
Slate			210	240			
Red Rock			240	270			
Slate			270	340			
Red Rock			340	360			
Lime			360	380			
Slate			380	492			
Lime			492	472 SLM			
Sand			472 SLM	523			
Slate			523	580			
Sand			580	617			
Slate			617	662			
Sand			662	677			
Slate			677	700			
Sand			700	746			
Slate			746	775			
Sand			775	892			
Slate			892	962			
Sand			962	985			
Slate			985	990			
Sand			990	1010			
Slate			1010	1070			
Sand			1070	1115			
Slate & Shale			1115	1150			
Salt Sand			1150	1692	Oil	1185	Small Show
Slate			1692	1694 SLM	Gas	1290	Show - exhausted 3 hrs.
Big Lime			1694 SLM	1700			
Sand			1700	1708	Sa. Water	1270	Hole Full
Lime			1708	1736	Gas	1728-32	1/10 W 1"
TOTAL DEPTH				1736	Gas	1733	8/10 W 1"
					Gas	1737	8/10 W 1"
					OIL PAY	1728-34, 1737-40	

MAY 1947
WEST VIRGINIA
DEPARTMENT OF MINES

(Over)

(Open)

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

[illegible] RECORD

[illegible]	[illegible] 5 sacks squeezed and [illegible] filtration. No circulation or [illegible].
[illegible]	7" casing. Ran 18 sacks squeezed mixed [illegible]. Circulation and returns. Pipe freed after running squeezed & freed by running [illegible] bailer [illegible] times.
	Ran 12 sacks Alpha cement in [illegible] bailer. Picked pipe up [illegible] and set down in cement. [illegible] cement in hole.
	Elmer Rupper, Cementer.

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found
[illegible]						

METT RECORD

DELVIAWEIL CO. MINES

Date: April [illegible]

APPROVED: COLEMAN GARTON COMPANY

By: C. W. Van Fossen, Supt.

(Title)

PROPOSED MANNER OF PLUGGING AND FILLING WELL

(REQUIRED BY RULES AND REGULATIONS)

WEST VIRGINIA DEPARTMENT OF MINES

OIL AND GAS DIVISION

WORK ORDER

Well to be plugged and filled as follows:

Total Depth 1935'

Fill with Clay	1935'	to	1790'
Cement	1790'	"	1780'
Full 7" OD Casing			
Continue filling with Clay to	1777'		
Cement	1777'	"	1767'
Continue filling with Clay to	1299'		
Cement	1299'	"	1289'
Bridge Hole at	825'		
(2 Bags Cement and 5' Crushed Stone on Bridge)			
Fill with Clay to	715'		
Cement	715'	"	705'
Bridge Hole at	200'		
(2 Bags Cement and 5' Crushed stone on Bridge)			
Fill with Clay to Surface.			

ERECT MARKER SUCH AS DESCRIBED IN RULE BOOK 18, 1931 REGULATIONS.

To the Department of Mines
Coal Owner or Operator,
Lease or Property Owner.

Gentlemen:

This "work order" is submitted for your approval and concurrence and unless notified of your disapproval or non-concurrence, the undersigned will proceed with the plugging and filling of said well in the above described manner on the date stated in the notice of intention to plug and abandon the said well on opposite side of this sheet.

Very truly yours, LEATHERWOOD OIL & GAS COMPANY

By- Emory Kirby

Treasurer Well Operator.

No objections have been filed by the coal owner or coal operator, or any available adjacent lease or property owners or interposed by the Department of Mines to the manner herein described for the plugging and filling of the well above mentioned. Therefore, the same is hereby approved this 3d day of May, 19 49.

DEPARTMENT OF MINES
Oil and Gas Division

By: C N Hall

NOTE: This "work order" shall be filed in triplicate, one copy for the files of the Department of Mines; one to be approved or corrected and returned to the well operator as his authority for plugging said well; and one for the well inspector.

WR-38
DATE: 10-Aug-05

API # 47-039-3464-P

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
SECTION OF OIL AND GAS

AFFIDAVIT OF PLUGGING AND FILLING WELL

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

Farm name: Theodore Tignor **Operator Well No.:** McKinley Harding # 1
LOCATION: **Elevation:** 1015' **Quadrangle:** Romance
District: Poca **County:** Kanawha
Latitude: Feet South of 38 Deg. 35 Min. 30 Sec.
Longitude: Feet West of 81 Deg. 30 Min. 00 Sec.

Well Type: OIL _____ GAS XXXX

Company: Equitable Production Company
1710 Pennsylvania Ave
Charleston WV 25302

Coal Operator or owner McKinley Harding Heirs et al C/O
8964 Alberta Beach ST NE
Louisville, OH 44641

Agent: Stephen G. Perdue

Coal Operator or owner _____

Permit Issued Date: 5/06/04

AFFIDAVIT

STATE OF WEST VIRGINIA,
County of Kanawha ss:

Terry Huffman and Randy Fields 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 the above named well operator, and participated in the work of plugging and filling the above well, and Carlos Hivley Oil and Gas Inspector representing the Director, say that said work was commenced on the 25th day of July 2005, and that the well was plugged and filled in the following manner:

TYPE	FROM	TO	PIPE REMOVED	LEFT
Cement	2191'	2023'	2" tubing 2285'	-0-
Cement	1750'	1582'		
Cement	2nd plug went down hole	To 1864' redone plug	4 ½" casing 1062'	1289'
Cement	1732'	1564'		
Cement	1062'	952'	8⅝" casing 0'	200'
Cement	845'	735'		
Cement	248'	-0-		
All cement plugs have gel between				

Description of monument: 7" casing 8 ft long with API number and that the work of plugging and filling said well was completed on the 5th day of August 2005.

And further deponents saith not. L L Meadows Jr

Sworn and subscribe before me this 8th day of August, 2005
My commission expires: December 24, 2007

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
Zelma M. Meadows
ROUTE 2, BOX 22
RAVENSWOOD, WV 26164
My Commission Expires December 24, 2007

Zelma M. Meadows
Notary Public

Oil and Gas Inspector Carlos W. Hively

RECEIVED
Office of Oil & Gas
Office of Chief
SEP 29 2005
WV Department of Environmental Protection

PLUGGING PROGNOSIS

Harding # 1 (150191)

API # 47-039-03464
Poca District, Kanawha Co., WV
Romance Quad

Prepared by: **Rex Cecil Ray**
4/12/05

Current Status:
8 5/8" @ 200' (Cemented to Surface)
4" @ 2351' (Est. TOC @ 1100' – 140 sks)
2" Tubing @ 2285'
Packer @ 2285'
TD – 2388'

FW @ None Reported SW @ 1145' Coal @ None Reported
Gas Shows @ None reported Oil Shows @ None reported
Completion: Big Lime Perfs @ 1815'-1835' / Acidized Lime w/ 4000 gal.
Berea Perfs @ 2285'-2288'/ Sand Fraced w/ 35,00# Sand & 575 BW
FOF – 350 mcf @ 400# RP

1.) Notify State Inspector, **Carlos Hively @ 304-389-7586**, 24 hrs prior to commencing operations.
2.) TIH w/ Wireline; Check location of packer w/ Collar Locator.
3.) Pull Packer; If packer will not pull Cut Tubing @ 2200' or top of packer.
4.) TOOH w/ Tubing; Check condition
5.) TIH w/ Tubing @ 2388'; Gel Hole @ 2388' to 2200'
6.) TOOH w/ Tubing @ 2200'; Set 100' C1A Cement Plug @ 2200' to 2100'. (Berea Perfs)
7.) TOOH w/ Tubing @ 2100'; Gel Hole @ 2100' to 1750'.
8.) TOOH w/ tubing @ 1750', Set 100' C1A Cement Plug @ 1750' to 1650' (Big Lime Perfs)
9.) TOOH w/ tubing @ 1650'Gel Hole @ 1650' to 1150'.
10.) TOOH w/ Tubing; TIH w/ Wireline @ 1100'; If not Free @ 1100', Set 100' C1A Cement Plug @ 50' IN/OUT of Cut.
11.) If 4" is not free below 200', Perf 4" Casing @ 1100', 850', 500' & 200'
12.) TIH w/ tubing @ 1150'; Set 100' C1A Cement Plug @ 1150' to 1050' (4" Cut, SW @ 1470'.)
13.) TOOH w/ Tubing @ 1050'; Gel Hole @ 1050' to 850'
14.) TOOH w/ Tubing # 850'; Set 100' C1A Cement Plug @ 850' to 750' (Salt Sand)
15.) TOOH w/ Tubing @ 565'; Gel hole @ 750' to 250'.
16.) TOOH w/ tubing to 250'; Set 250' C1A Cement Plug @ 250' to Surface (FW, Coal)
17.) Top off as needed
18.) Set Monument to WV-DEP Specifications
19.) Reclaim Location & Road to WV-DEP Specifications

C. H. 5-17-05

Harding # 1 (150191)
API # 47-0039-03464

Set 250' C1A Cement Plug @ 250' to Surface
(FW, Coal)

Set 100' C1A Cement Plug @ 850' to 750
(Sal Sand)

Set 100' C1A Cement Plug @ 1150' to 1050
(4" Cut, SW)

Cut 4" @ 1100'

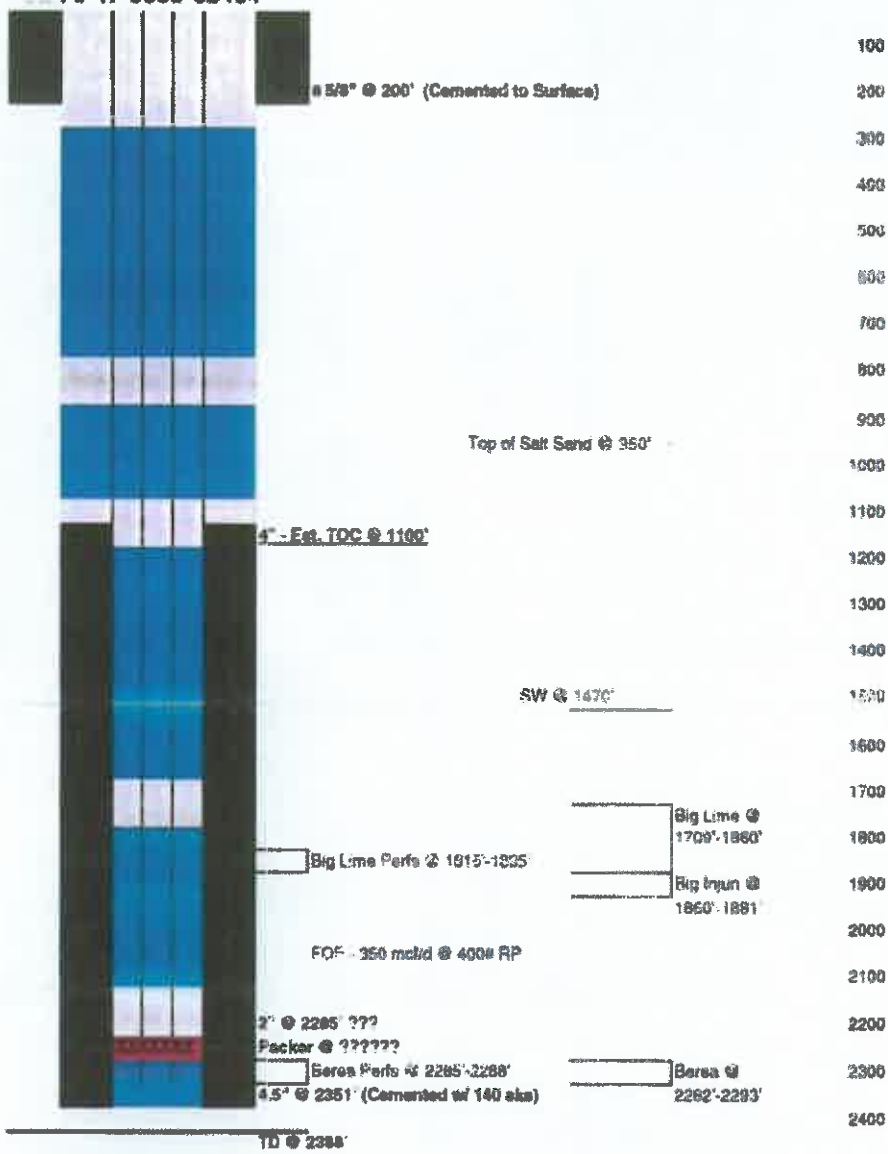
Free-point 4": Set 100' C1A Cement Plug @ 50' IN/Out of 4" Cut.
DO NOT SKIP ANY PLUGGS !!!

If 4" is free above any plugs, FW & SW shown. Casing pt., Coal, Perf at each end name plugs shown.

Set 100' C1A Cement Plug @ 1750' to 1650
(Big Lime Perfs)

Set 100' C1A Cement Plug @ 2200'-2100;
(Berea Perfs)

Pull Packer. If packer will not pul cut 2" @ 2200'.



C1A Cement
6 % Gel

RECEIVED
Office of Oil & Gas
Office of Chief
MAY 1 2 2009
WV Department of
Environmental Protection

IR-8
(REV 4-99)

API NO.: 47-039-3464-P

WELL PLUGGING INSPECTION & RELEASE FORM

PLUGGING COMMENCED 8-1-05
PLUGGING COMPLETED 8-5-05
VERBAL PERMISSION ON

OPERATOR: Equitable Prod. Co.
FARM: Tignor, Theador
WELL NO: #1

1. IS COAL BEING MINED IN THE AREA? YES (NO) N/A

2. WERE CEMENT AND GEL MIXED AND USED IN ACCORDANCE WITH ACCEPTED INDUSTRY STANDARDS?
   - A. BOTTOM HOLE PLUGGED (YES) NO N/A
   - B. 100' PLUGS (YES) NO N/A
   - C. LATEX PLUGS USED FOR H_2S GAS ~~YES~~ ~~NO~~ N/A
   - D. PROPER PLUGS THROUGH COAL SEAMS (YES) NO N/A
   - E. PROPER PLUGS SET TO PROTECT FRESHWATER (YES) NO N/A
   - F. PROPER AMOUNT OF GEL USED TO DISPLACE PLUGS (YES) NO N/A

TYPE	FROM	TO	PIPE REMOVED
Gel	2285'-0'		2285'-2 3/8"
Cement	2191'-2023'	12 sks	1062'-4 1/2"
Cement	1732'-1564'	12 sks	
Cement	1062'-952'	22 sks	
Cement	84.5'-73.5'	22 sks	
Cement	248'-0'	74 sks	

3. WERE ALL CHANGES APPROVED BY INSPECTOR? (YES) NO

4. WAS THE EQUIPMENT USED FOR PULLING CASING PROPERLY SIZED AND RIGGED TO PULL 150% OF THE HEAVIEST STRING OF PIPE EXPECTED TO BE PULLED? (YES) NO

5. DID THE OPERATOR GIVE THE INSPECTOR PROPER NOTICE? (YES) NO

6. WERE ACCURATE PLUGGING RECORDS KEPT BY THE OPERATOR? (YES) NO

7. WAS A PROPER MONUMENT SET WITH API NUMBER ATTACHED? (YES) NO

8. DID WELL SITE AND ACCESS ROAD MEET THE FOLLOWING RECLAMATION REQUIREMENTS?
   - A. RECLAIMED (YES) NO
   - B. FENCES REPLACED (YES) NO
   - C. MULCHED (YES) NO
   - D. PROPER DRAINAGE (YES) NO
   - E. SEEDED (YES) NO
   - F. ALL EQUIPMENT REMOVED (YES) NO

6-23-06
DATE RELEASED

Carlos W. Hively
INSPECTOR'S SIGNATURE

RECEIVED
Office of Oil & Gas
JUN 27 2006
WV Department of Environmental Protection

FORM OG-5

39-1393

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 RESPECTIVE ADDRESSES.

NONE
COAL OPERATOR OR OWNER

ADDRESS

COAL OPERATOR OR OWNER

ADDRESS

LEASE OR PROPERTY OWNER

ADDRESS

LEATHERWOOD OIL & GAS COMPANY
NAME OF WELL OPERATOR

P.O. Box 2151
Charleston, W.Va.
COMPLETE ADDRESS

July 26, 19 49
WELL AND LOCATION

Poca District

Kanawha County

Well No. #1

L.H. Fields Et Al Farm

STATE INSPECTOR SUPERVISING PLUGGING D.E. Lawson

AFFIDAVIT

STATE OF WEST VIRGINIA,
County of Kanawha } ss:

A.R. McConnell and Fred Smith 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 Leatherwood Oil & Gas Company, well operator, and participated in the work of plugging and filling the above well, that said work was commenced on the 9th day of May, 19 49, 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
TOTAL DEPTH 1935'						
Filled with Clay	1935' to	1790'				
Cemented	1790' "	1780'				
Pulled 900' 7" OD Casing (880' unable to recover and same left in hole)						
Continued filling with Clay to		1777'				
Cemented	1777' to	1767'				
Continued filling with Clay to		1299'				
Cemented	1299' "	1289'				
Hole Bridged		825'				
(2 Bags Cement and 5' Crushed stone on Bridge)						
Filled with Clay to		715'				
Cemented	715' "	705'				
Hole Bridged		200'	(2 Bags Cement and 5' Crushed stone on Bridge)			
Filled with Clay to Surface.						

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

DESCRIPTION OF MONUMENT
Piece 10" Casing Cemented in Hole Bearing following legends Leatherwood Oil & Gas Co.-L.H. Fields Et Al # 1 May 24.1949.

and that the work of plugging and filling said well was completed on the 24th day of May, 19 49.

And further deponents saith not.

A.R. McConnell
Fred Smith

Sworn to and subscribed before me this 10 day of September, 19 49

Joseph J. Mendez
Notary Public.

My commission expires:
10/2/49

Permit No. 13130

Kenna

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

WELL RECORD

Permit No. Kan 1395

Oil or Gas Well Gas (KIND)

Company Leatherwood Oil & Gas Company
Address Box 2151, Charleston, W.Va.
Farm L.H. Fields Et Al Acres 36
Location (waters) Poca River (Leatherwood Creek)
Well No. -1- Elev. 1068'
District Poca County Kanawha
The surface of tract is owned in fee by L.H. Fields Et Al
Address Elkview, W.Va.
Mineral rights are owned by L.H. Fields Et Al
Address Elkview, W.Va.
Drilling commenced September 16, 1947.
Drilling completed October 25, 1947.
Date Shot From To
With
Open Flow 90/10ths Water in 3 Inch
/10ths Merc. in Inch
Volume 1,000,000 Cu. Ft.
Rock Pressure 590 lbs. 24 hrs.
Oil bbls., 1st 24 hrs.
Fresh water feet feet
Salt water 1395' feet feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
13			Hookwall
10			Size of 7" OD
8¼	587'	None	
XXX 7" OD	1780'	1780'	Depth set 1780'
5 3/16			
3			Perf. top
2	None	None	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			0	5			
Clay	White		5	20			
Clay	Red		20	35			
Clay	White		35	75			
Mud	Blue		75	105			
Slate		Broken	105	160			
Sand		Soft	160	220			
Shale	Black		220	295			
Rock	Red		295	340			
Slate & Shells			340	450			
Rock	Red		450	480			
Slate & Shells			480	575			
Sand			575	765			
Slate & Shells			765	850			
Sand			850	875			
Slate & Shells			875	905			
Sand			905	970			
Slate			970	1030			
Sand			1030	1145			
Slate			1145	1217			
Sand			1217	1245			
Slate & Shells			1245	1289			
Salt Sand			1289	1773	Show Gas	1380-88'	
Pencil			1773	1777	Salt Water	1395'	Hole Full
Big Lime			1777	1932	Gas	1810-16'	90/10 W. 3"
Injun			1932	1935	Show Oil	1933-40'	
Total Depth			1935				

DEC 1947
WEST VIRGINIA
DEPARTMENT OF MINES

Plat - Kan - 1385

OIL AND GAS DIVISION

WELL RECORD

Permit No. KAN-1386

Oil or Gas Well OIL WELL (KIND)

Company Columbian Carbon Company

Address Box 873, Charleston 23, W. Va.

Farm H. H. Parsons, et al Acres 117

Location (waters) Leatherwood Creek

Well No. DW-976 - B-7 Elev. 973.7' @

District Poca County Kanawha

The surface of tract is owned in fee by H. H. Parsons

Rt. #2, Box 75 Address Blaview, W. Va.

Mineral rights are owned by H. H. Parsons, et al

(For further addresses contact Columbian Carbon)

Address

Drilling commenced 10-19-47

Drilling completed 11-27-47

Date Shot not shot From To

With acidized 11-29-47 with 1000 gallons acid

Open Flow 4/10ths Water in 2 Inch

/10ths Merc. in Inch

Volume 84,000 Cu. Ft.

Rock Pressure lbs. hrs.

Oil Approx. 70 bbls. daily bbls., 1st 24 hrs.

Fresh water feet feet

Salt water 1273' 1426' feet feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer none
18			
10 3/4"	21'	21'	Size of
8 1/4" 25.55#	514'	pulled	
7"	1714'6"	1714'6"	Depth set
5 3/16			
8			Perf. top
2 3/8" 4#	1762'6"	1762'6"	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED SIZE No. Ft. Date

see reverse side

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 Found	Remarks
Top soil			0	15			
Slate			15	69			
Sand			69	75			
Lime			75	92			
Sand			92	131			
Lime			131	138			
Red Rock			138	162			
Blue Slate			162	179			
Sand			179	222			
Red Rock			222	280			
Blue Slate			280	305			
Red Rock			305	322			
Blue Slate			322	344			
Sand			344	361			
Slate			361	370			
Red Rock			370	419			
Gray Slate			419	464			
Sand			464	479			
Slate			479	494			
Sand			494	497			
Slate			497	507			
Sand			507	707			
Slate			707	718			
Gritty Lime			718	769			
Sand			769	784			
Slate			784	822			
Sand			822	902			
Slate			902	930			
Sand			930	1011			
Slate			1011	1127			
Sand			1127	1168			
Slate			1168	1217	Oil & Gas	1245'	show
Salt Sand			1217	1643	S. Water	1273'	hole full
Gritty Lime			1643	1681	S. water	1426'	hole full
Sand			1681	1693			
Slate & Lime			1693	1707' DLM			
				1697' SLM	Gas	1733'	4/10 W. 2" 84M
Big Lime			1697' SLM	1770'	Oil	1762'	50 bbls. 9 hours
			Total depth - - -	1770'			

DEC 1947 WEST VIRGINIA DEPARTMENT OF MINES

(Over)

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
CEMENT RECORD							
10-27-47	8-5/8" casing. Ran 6 sacks Aquagel. Columbian Carbon Company Crew.						
11-19-47	7" casing. Ran 12 sacks Aquagel mixed with 25# Fibertex. Circulation and returns. Dumped 14 sacks cement around pipe. Columbian Carbon Crew.						

Kenna

Plot Kan-1366

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

WELL RECORD

Permit No. KAN-1366

Oil or Gas Well Oil well (Kind)

Company Columbian Carbon Company
Address Box 873, Charleston 23, W. Va.
Farm H. H. Parsons, et al Acres 117
Location (waters) Leatherwood Creek
Well No. B-5, GW-957 Elev. 804.0
District Poca County Kanawha
The surface of tract is owned in fee by H. H. Parsons
Rt. #2, Box 75 Address Elkview, W. Va.
Mineral rights are owned by H. H. Parsons, et al
(for further addresses contact C.C.Co)
Address
Drilling commenced 8-26-47
Drilling completed 10-12-47
Date Shot not shot From To
With acidised 10-18-47 with 1000 gal. acid
Open Flow /10ths Water in Inch
/10ths Merc. in Inch
Volume Cu. Ft.
Rock Pressure lbs. hrs.
Oil approx. 15 bbls. daily bbls., 1st 24 hrs.
Fresh water feet feet
Salt water 1162' 1641' feet feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer none
13			
10 3/4"	27'	27'	Size of
8 1/4" 24#	393'7"	pulled	
7" 20#	1552'5"	1552'5"	Depth set
5 3/16			
8			Perf. top
3 3/8" 4#	1608'4"	1608'4"	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED SIZE No. Ft. Date
see below

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 Found	Remarks
Surface			0	27			
Sand			27	75			
Red Rock			75	177			
Slate			177	190			
Sand			190	231			
Red Rock			231	244			
Slate			244	394			
Sand			394	435			
Slate			435	470			
Sand			470	580			
Slate & Shells			580	700			
Sand			700	736			
Slate & Shells			736	741			
Sand			741	773			
Slate			773	806			
Sand			806	878			
Slate & Shells			878	1001			
Sand			1001	1025			
Slate & Shells			1025	1080			
Sand			1080	1100			
Slate			1100	1140	Oil	1155'	show
Sand			1140	1458	S. water	1162'	900'
Lime			1458	1508	Gas	1167'	show
Slate			1508	1510'DLM			
				1521'SLM			
Big Lime			1521'SLM	1643'	S. water	1641'	hole full

TOTAL DEPTH - - - - 1643' OIL PAY: 1587-1595'

CEMENT RECORD

9-3-47 8-5/8" casing - ran 6 sacks Aquagel and 25# Fibertex. Circulation and Returns. Columbian Carbon Company Crew.

9-30-47 7" casing - ran 12 sacks Aquagel with 50# Fibertex and 4 bags Alpha Cement. Circulation and returns. Columbian Carbon Company Crew.

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
							11-28-47

DEC 1947 WEST VIRGINIA DEPARTMENT OF MINES

(Over)

Kenna
Plot Kan-1364

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

WELL RECORD

Permit No. KAN-1346

Oil or Gas Well [illegible]

Company Columbian Carbon Company
Address Box 873, Charleston 23, W. Va.
Farm H. H. Parsons, et al Acres 117
Location (waters) Leatherwood Creek
Well No. B-5, [illegible] Elev. 804.0
District Poca County Kanawha
The surface of tract is owned in fee by H.H. Parsons
Rt. #2, Box 75 Address Elkview, W. Va.
Mineral rights are owned by H. H. Parsons, et al
(for further addresses contact C.C.Co)
Address
Drilling commenced 8-26-47
Drilling completed 10-12-47
Date Shot not shot From To
Was acidized 10-18-47 with 1000 gal. acid
Open Flow /10ths Water in Inch
/10ths Merc. in Inch
Volume Cu. Ft.
Rock Pressure lbs. hrs.
Oil approx. 15 bbls. daily bbls., 1st 24 hrs.
Fresh water feet feet
Salt water 1162' 1641' feet feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer none
12			
10¾"	27'	27'	Size of
8¼" 24#	393'7"	pulled	
7" 20#	1552'5"	1552'5"	Depth set
5 3/16			
2			Perf. top
2 3/8" 4#	1608'4"	1608'4"	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED SIZE No. Ft. Date
see below

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 Found	Remarks
Surface			0	27			
Sand			27	75			
Red Rock			75	177			
Slate			177	190			
Sand			190	231			
Red Rock			231	244			
Slate			244	394			
Sand			394	435			
Slate			435	470			
Sand			470	580			
Slate & Shells			580	700			
Sand			700	736			
Slate & Shells			736	741			
Sand			741	773			
Slate			773	806			
Sand			806	878			
Slate & Shells			878	1001			
Sand			1001	1025			
Slate & Shells			1025	1030			
Sand			1080	1100			
Slate			1100	1140	Oil	1155'	show
Sand			1140	1458	S. water	1162'	900#
Lime			1458	1508	Gas	1167'	show
Slate			1508	1510'DLM 1521'SLM			
Big Lime			1521'SLM	1643'	S. water	1641'	hole full
		TOTAL DEPTH - - - -		1643'	OIL PAY:	1587-1595'	

CEMENT RECORD

9-3-47 8-3/8" casing - run 6 sacks Aquagel and 25# Fiberton. Circulation and Returns. Columbian Carbon Company Crew.

9-30-47 7" casing - run 12 sacks Aquagel with 50# Fiberton and 4 bags Alpha Cement. Circulation and returns. Columbian Carbon Company Crew.

DEC 1947
WEST VIRGINIA
DEPARTMENT OF MINES

11-[illegible]-47

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

WELL RECORD

Permit No. KAN-1416 Oil or Gas Well Oil (KIND)

Company Columbian Carbon Company
Address Box 873, Charleston 23, W. Va.
Farm H. H. Parsons, et al Acres 117
Location (waters) Leatherwood Creek
Well No. GW-1052, B-9 Elev. 837.8' G
District Poca County Kanawha
The surface of tract is owned in fee by H. H. Parsons
Rt. 2, Box 75 Address Elkview, W. Va.
Mineral rights are owned by H. H. Parsons, et al
(For further addresses contact C.C.C.) Address
Drilling commenced 3-19-48
Drilling completed 5-1-48
Date Shot not shot From To
With
Open Flow 8/10ths Water in 1" Inch
/10ths Merc. in Inch
Volume 29,800 cubic feet Cu. Ft.
Rock Pressure lbs. hrs.
Oil approx. 5 bbls. oil daily bbls., 1st 24 hrs.
Fresh water feet feet
Salt water 1170' 1628-30' feet feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer none
13			
10 3/4"	16'8"	16'8"	Size of
8 1/4" 25#	384'6"	pulled	
5 3/16" 7" 22#	1569'10"	1569'10"	Depth set
5 3/16"			
3			Perf. top
2 3/8" 4#	1677'10"	1677'10"	Perf. bottom
Liners Used 2" tubing disc			Perf. top
			Perf. bottom

CASING CEMENTED SIZE No. Ft. Date
see below
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
Soil			0	22			
Sand			22	65			
Slate			65	76			
Red Rock			76	112			
Slate			112	160			
Red Rock			160	180			
Slate			180	230			
Red Rock			230	258			
Slate			258	265			
Red Rock			265	295			
Slate			295	372			
Sand	381'DLM-381'SLM		372	572			
Slate			572	583			
Sand			583	612			
Slate & Shells			612	690			
Sand			690	775			
Slate			775	804			
Sand			804	888			
Slate			888	1002			
Sand			1002	1038			
Slate			1038	1066	Oil	1080-1086'	show
Sand			1066	1127			
Slate			1127	1154	S. water	1170'	hole full
Sand			1154	1160			
Black Lime			1160	1502			
Maxon Sand			1502	1550	Gas	1595'	show
Big Lime	1560'DLM-1560'SLM		1550	1675'	S. water	1628-30'	100'
					Gas Pay:	1595' show	
		TOTAL DEPTH - - - - -		1675'		1620-23'	8/10 M. 1"-29,800 cubic feet
					Oil	1595' 1628-30'	

CEMENT RECORD

3-25-48 8-5/8" casing. Ran 5 sacks Aquagel. Circulation and returns. Columbian Carbon Company Crew.

4-27-48 7" casing - dumped 15 sacks Alpha Cement on bottom. Columbian Carbon Company Crew.

5-19-48

(Over)

MAY 1948 WEST VIRGINIA DEPARTMENT OF MINES

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

Plat Kan-1359

WELL RECORD

Permit No. KAN-1355 Oil or Gas Well OIL (Kind)

Company COLLINGIAN GASTRONCOMPANY
Address Box 873, Charles [illegible] 23, W. Va.
Farm M. H. Parsons Acres 57
Location (waters) Leatherwood Creek
Well No. A-4 (GW-541) Elev. 955.9 G
District Pass County Nicholas
The surface of tract is owned in fee by
Address
Mineral rights are owned by
Address
Drilling commenced 3-18-47
Drilling completed 4-29-47
Date Shot From To
With
Open Flow /10ths Water in Inch
/10ths Merc. in Inch
Volume Cu. Ft.
Rock Pressure lbs. hrs.
Oil 60 bbls., 1st 24 hrs.
Fresh water 680' feet feet
Salt water 1202' feet feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer
13			
10 3/4"	24'6"	24'6"	Size of
8 5/8"	472'11"	0	
6 3/4 7"	1652'11"	1652'11"	Depth set
5 3/16			
3			Perf. top
2 3/8"	1752'3"	1752'3"	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED SIZE No. Ft. Date
Gas Below

COAL WAS ENCOUNTERED AT 579 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			0	36			
Sand			36	93			
Slate			93	113			
Red Rock			113	143			
Sand			143	177			
Red Rock			177	316			
Slate			316	420			
Sand			420	440			
Slate Shell			440	467			
Sand			467	579			
Slate & Coal			579	585			
Sand			585	685	Fresh Water	680	1 1/2-8" Blrm./Hrs
Slate			685	751			
Sand			751	777			
Slate			777	810			
Sand			810	870			
Slate & Shells			870	920			
Sand			920	946			
Slate & Shells			946	1181	Gas	1194	2/10 W 1" - Estimated
Salt Sand			1181	1658 BLM			
Big Lime			1658 BLM	1740	Oil	1194	Est. 1 bbl./day
					Salt Water	1202	Hole full
TOTAL DEPTH				1740			

PAY: 1725-46

CEMENT RECORD:
3-26-47 8 5/8" casing. Ran 6 sacks Aquagel mixed 6% Fibrotex. Circulation and returns.

4-14-47 7" casing. Ran 12 sacks Aquagel mixed 6% Fibrotex. Circulation and returns.

Ran 11 sacks Alpha cement in deep bailer with pipe 27' off bottom. Set pipe down in cement. 50' cement in hole.

MAY 1947 WEST VIRGINIA DEPARTMENT OF MINES

(Over)

STATE OF WEST VIRGINIA

DEPARTMENT OF MINES

OIL AND GAS DIVISION

WELL RECORD

Permit No. [illegible] Oil or Gas Well [illegible]

Company Columbian Carbon Company

Address Box 177, Charleston 25, W. Va.

Farm H. H. Parsons, et al Acres 57

Location (waters) Branch of Tenmile Creek

Well No. [illegible] Elev. 957.8 DF

District Eden County Harrison

The surface of tract is owned in fee by H. H. Parsons, et al

Box 75 Address Salem, W. Va.

Mineral rights are owned by H. H. Parsons, et al

(For further addresses contact Columbian Carbon)

Drilling commenced 9-29-16

Drilling completed 10-26-16

Date Shot [illegible] From To

With [illegible] Qty. [illegible]

Open Flow [illegible]/10ths Water in 2" Inch

/10ths Merc. in Inch

Volume [illegible] Cu. Ft.

Rock Pressure 165 lbs. 48 hrs.

Oil 50 bbls. 1st 24 hrs.

Fresh water [illegible] feet feet

Salt water [illegible] feet feet

Casing and Tubing	Used in Drilling	Left in Well	Packers
Size			
16			Kind of Packer [illegible]
13			Size of [illegible]
10	[illegible]	[illegible]	Size of [illegible]
8¼	[illegible]	[illegible]	
6⅝	[illegible]	[illegible]	Depth set [illegible]
5 3/16			
3			Perf. top
2 3/16	[illegible]	[illegible]	Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED SIZE No. Ft. Date

COAL WAS ENCOUNTERED AT [illegible] FEET [illegible] INCHES

FEET INCHES FEET INCHES

FEET INCHES FEET INCHES

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
Red			0	[illegible]			
Shale			[illegible]	[illegible]			
Sand			[illegible]	45			
Shale			[illegible]	[illegible]			
Sand			[illegible]	[illegible]			
Blue Shale			100	[illegible]			
Sand			[illegible]	[illegible]			
Shale			[illegible]	175			
Red Rock			175	275			
Shale			[illegible]	[illegible]			
Sand			[illegible]	[illegible]			
Shale			[illegible]	[illegible]			
Red Rock			[illegible]	[illegible]			
Sand			[illegible]	[illegible]			
Shale & Sand			[illegible]	[illegible]			
Sand			[illegible]	[illegible]			
Shale

Formation	Color	Hard or Soft	Top	Bottom	Oil, Gas or Water	Depth Found	Remarks
Little Lime			1556	1596			
Sand	1635'SLM-1628'DLM		1596	1635 SLM			
Big Lime	1664'SLM-1657'DLM		1635'SLM	1756½*			
		TOTAL DEPTH - - - - - -		1756½*	PAYS: Gas - 1668' 30/10 W. 2" 377MCF Oil - 1741-1750' made 50 bbls. first 24 hours		

CEMENT RECORD

9-28-46	8-5/8" casing - Ran 6 sacks Aquagel and 20# Fibertex. Circulation and returns at 376'. Columbian Carbon Company Crew.
10-18-46	7" casing - ran 12 sacks Aquagel and 2 bales Fibertex. Got circulation at 900'. Pumped plug to 1850' - pipe froze and wouldn't move until about a dozen bailers of water were bailed off and hole back flushed. Columbian Carbon Company Crew.
10-31-46	Ran 2-3/8" tubing with working barrel.

MEET RECORD

Department of Water
[illegible]

Date [illegible] 19[illegible]

APPROVED Columbian Carbon Company Owner

By [illegible]
(Title)

Appendix E – Water Sources

No water wells exist within the ¼ mile radius as all of the area is covered by public water supply.

(4/25)

APPENDIX G

Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-039-0644	Base Petroleum Inc.	Big Lime/ Disposal well
47-039-1287	Base Petroleum Inc.	Big Lime
47-039-1354	Base Petroleum Inc.	Big Lime
47-039-1355	Base Petroleum Inc.	Big Lime
47-039-0656	Base Petroleum Inc.	Big Lime
47-039-1331	Base Petroleum Inc.	Big Lime
47-039-1348	Base Petroleum Inc.	Big Lime
47-039-1365	Base Petroleum inc.	Big Lime
47-039-1366	Base Petroleum Inc.	Big Lime
47-039-1385	Base Petroleum Inc.	Big Lime
47-039-1386	Base Petroleum Inc.	Big Lime
47-039-1406	Base Petroleum Inc.	Big Lime
47-039-1416	Base Petroleum Inc.	Big Lime
47-039-1419	Base Petroleum Inc.	Big Lime
47-039-0719	Base Petroleum Inc.	Big Lime

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

Promoting a healthy environment.

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: MICHAEL LEWIS

SAMPLE ID: BASE PETROLEUM

SAMPLED BY: M. LEWIS

DATE/TIME SAMPLED:* 10-15-13 1400

DATE/TIME RECEIVED: 10-18-13 1535

SAMPLE ID	pH units	TDS mg/L	Cl mg/L	SPEC GRAV calc.	TOC mg/L	Fe mg/L	Mn mg/L	Al mg/L	Ba mg/L	Na mg/L
PARSONS PF	5.7	171280	104000.	1.1157	291.	35.8	.876	4.81	12.1	36100.

*Client Provided

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

D. Bu

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MAIN OFFICE—POST OFFICE BOX 650 • BRIDGEPORT, WEST VIRGINIA 26330 • (304) 623-2049
CHARLESTON BRANCH—POST OFFICE BOX 8337 • SOUTH CHARLESTON, WEST VIRGINIA 25303-0337 • (304) 744-9864

SECTION 4: Ground water discussion

As per the completion log, fresh water was encountered at 90' and at 100'.

As per the completion log, salt water was encountered at 1123' and 1180'.

The fresh water aquifers, as indicated by the completion report , indicate that the fresh water is from the Dunkard Group Series, which is Paleozoic and is found from 0' to approximately 400'. The Dunkard Group is primarily comprised of a series of sandstones, siltstones, red and gray shales and limestone in this area. Within the Dunkard Group the sandstones of the Casselman and Glenshaw Formations are the primary water producing stratas.

The ground waters primary source is precipitation and its percolation through the rock series to the resevoir where it is stored and eventually used for residential use in this area.

The Elk River Basin, of which this area is a part of, is typically characterized as having poor ground water quality. According to the Elk River Basin Atlas it is not unusual to see hardness higher than 120 mg/l, iron greater than 300 mg/l and elevated chlorides.

The yield potentials are higher when the scource rock is sandstone. Past studies have shown the following yields: Wells located in a valley where alluvium is the cover - 38 GPM, wells located in a valley where bedrock is the cover - 32 GPM, wells located on a hillside - 24 GPM, and wells located on a hilltop - 5 GPM. The alluvium is higher because precipitation has the greatest opportunity to migrate to the resevoir. All yields are dependent on the amount of rainfall and its availibilty to migrate to the resevoir. The greater the runoff the less the yield.

Attached are two water well samples obtained from the immediate area. Please refer to the attached map which shows the location of the water well samples highlighted in blue, the proposed disposal well highlighted in green and the lease line highlighted in yellow.

Sturm Environmental Services conducted all lab test. Sturm is located at Post office Box 8337, South Charleston W.V. 25303-0337. Phone (304) 744-9864.

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SECTION 5: Desciption of the injection zone

A. Injection Zone - Big Lime

1. General Desciption - The Big lime, or Greenbrier Limestone, is of the Mississippian Era. It is a marine sediment and calcareous in nature. The Big Lime is usually representative of a shoal or reef structure. In the Poca District of Kanawha County, the Big Lime has a long history of oil and gas production.

2. Formation Thickness - Big Lime
   a. Total Thickness - 144' from 1560' to 1704'.
   b. Thickness of producing area - 18' from 1637' to 1655', see attached record.
   c. The primary producing section of the Big Lime is at its base. This was determined from available well records and also the offset logs Kan. 3464 and Kan. 3468 (attached). No logs are available for the Parsons A-1. The Big Lime producing area can be correlated from the offsets to the proposed disposal well.

3. Permiability - Big Lime
   a. Permiability is not available for the Big Lime in this area.
   b. Permiability can be determined by a pressure build up test or by coring the formation and examining the pore space characteristics via thin section.
   c. The permiability of the Big Lime in this area is caused by the pore space characteristics of the pores themselves and also the pore interconnections. The interconnections determine the passageway thickness and thus the permiability.
   d. Permiability can also be caused by fracturing. The fracturing of the Big Lime in this area is very minimal. Because of this, the Big Lime would make a very good disposal candidate as the disposed fluid is less likely to migrate to other formations. This has proven true for the existing oil production and the past history of thr Parsons A-1 as a pre-existing disposal well.

4. Parson A-1 History
   a. Well was completed on October 27, 1939.
   b. Target formation - Oriskany Sand formation - T.D. 5080'.
   c. Well was plugged back to the Big Lime on April 27, 1946.
   d. New P.B.T.D. - 1690'
   e. Due to the low volume of oil that the well produced, Cities Service Oil Company filed for a disposal permit on form WRD 1-69 on January 29, 1971 and the permit was issued on August 4, 1970. The well temporarily abandoned due to casing problems and the implementation of the new UIC Program and its requirements.

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Little Lime Confining Layer

The injection formation confining layer in this well is the Little Lime and a low porosity layer immediately above it. The Little Lime is of low permeability and should act well as a confining layer to prevent upward fluid movement.

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No *logs were ever run* on *the Parson 1-A well. In the original permit application, a copy of the log* on *an offset Jones production well that was reworked was submitted* to *show the formation and properties.*

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Basin Surveys

COMPENSATED DENSITY LOG

Kan 3454

COMPANY: D.C. Malcolm Inc.
M. Harding et al. #1

FIELD: Poca

COUNTY: Kanawha STATE: WVA

LOCATION: Eden Creek
Quad Romance 7.5

OTHER: NE
IE

Permanent Datum: Ground Level Elev. 978
Log Measured From: KB Ft. Above Perm. Datum
Drilling Measured From: KB

G.L. 978

Date	8-1-79		
Run No.	OVE		
Type Log	GRC Density		
Depth—Driller	2409		
Depth—Logger	2328		
Bottom logged interval			
Top logged interval	1000 Gamma Ray to Surf.		
Type fluid in hole	Gel		
Salinity, PPM-Cl			
Density			
Level			
Max rec. temp., deg F.			
Operating rig time	4 hr		
Recorded by	J. Long, J. Hannon		
Witnessed by	mr Malcolm		

Run No.	Bore Hole Record Bit	From	To	Casing Record Size	Wgt.	From	To
	2 7/8		TD	5 5/8		Surf	200

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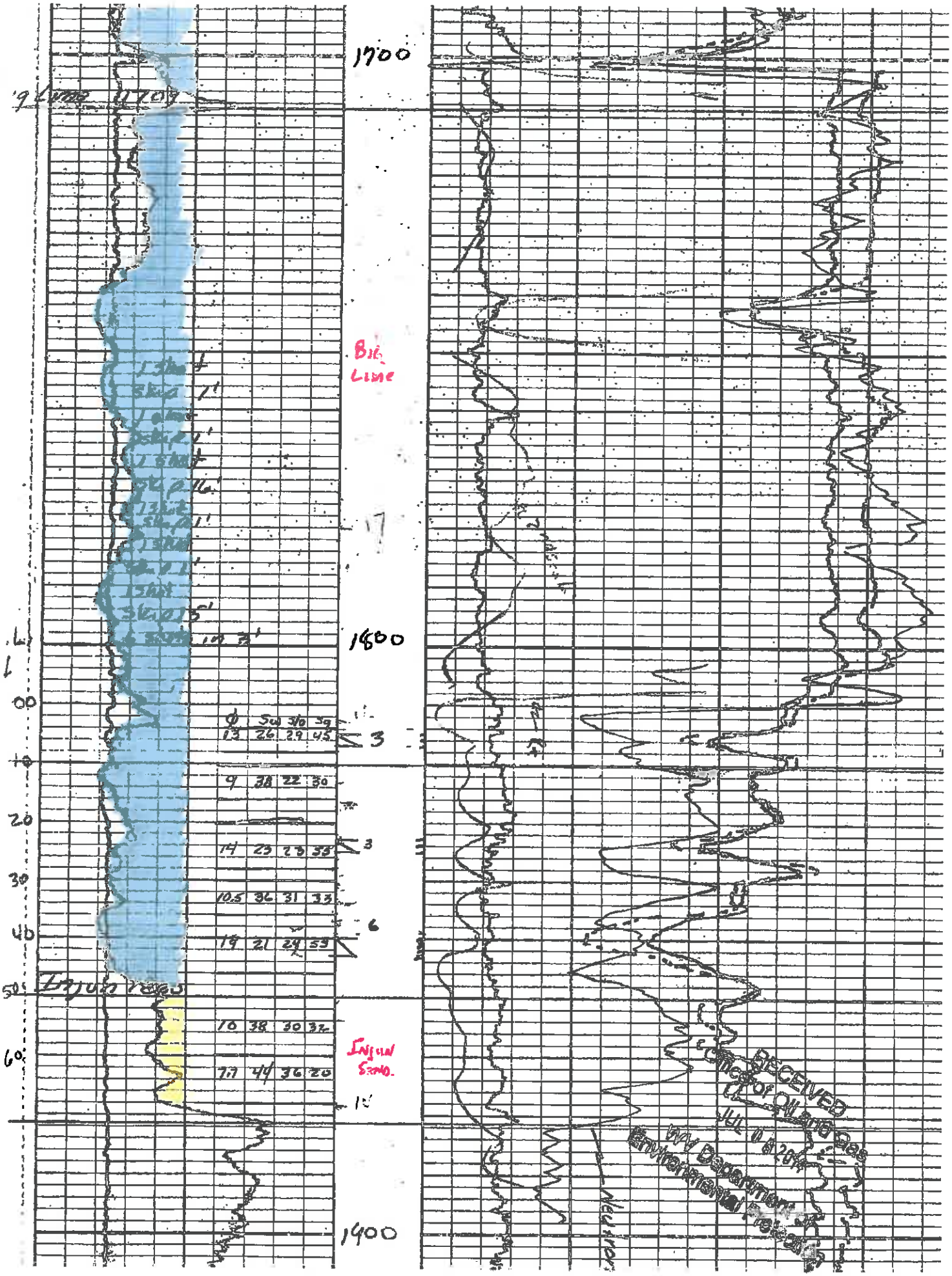

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BIRDWELL

Density
Borehole Compensated

PERMIT NO
47-039-3467

COMPANY D C MALCOLM, INC

WELL M HARDING #2

FIELD

COUNTY KANAWHA STATE WV

LOCATION: COON CREEK WATERSHED POCA DISTRICT

SEC. TWP. RGE.

OTHER SERVICES: NBC-IS

PERMANENT DATUM GROUND LEVEL ELEV.
LOG MEASURED FROM KB 10 FT. ABOVE PERM. DATUM
DRILLING MEASURED FROM KELLY BUSHING

ELEV. K.B.
D.F.
G.L.

DATE	8-10-79			
RUN NO.	ONE			
DEPTH-DRILLER	2434			
DEPTH-LOGGER	2378			
BTM. LOG INTER.	2396			
TOP LOG INTER.	SURFACE			
CASING-DRILLER	8 5/8 @ 235	@	@	@
CASING-LOGGER	—			
BIT SIZE	7 7/8			
TYPE FLUID IN HOLE	MUD			
FLUID LEVEL	SURFACE			
DENS. / VISC.	— / —			
PH / FLUID LOSS	— / — ml	ml	ml	ml
SOURCE OF SAMPLE				
R_m @ MEAS. TEMP.	@ °F	@ °F	@ °F	@ °F
R_{mf} @ MEAS. TEMP.	@ °F	@ °F	@ °F	@ °F
R_{mc} @ MEAS. TEMP.	@ °F	@ °F	@ °F	@ °F
SOURCE R_{mf}, R_{mc}	—	—	—	
R_m @ B.H.T.	@ °F	@ °F	@ °F	
TIME SINCE CIRC.	4 HRS			
MAX. REC. TEMP.	103 °F	°F	°F	°F
EQUIP. / LOCATION	3343 / CHARLESTON WV			
RECORDED BY	P SICA			
WITNESSED BY	MR MALCOLM MR BENNETT			

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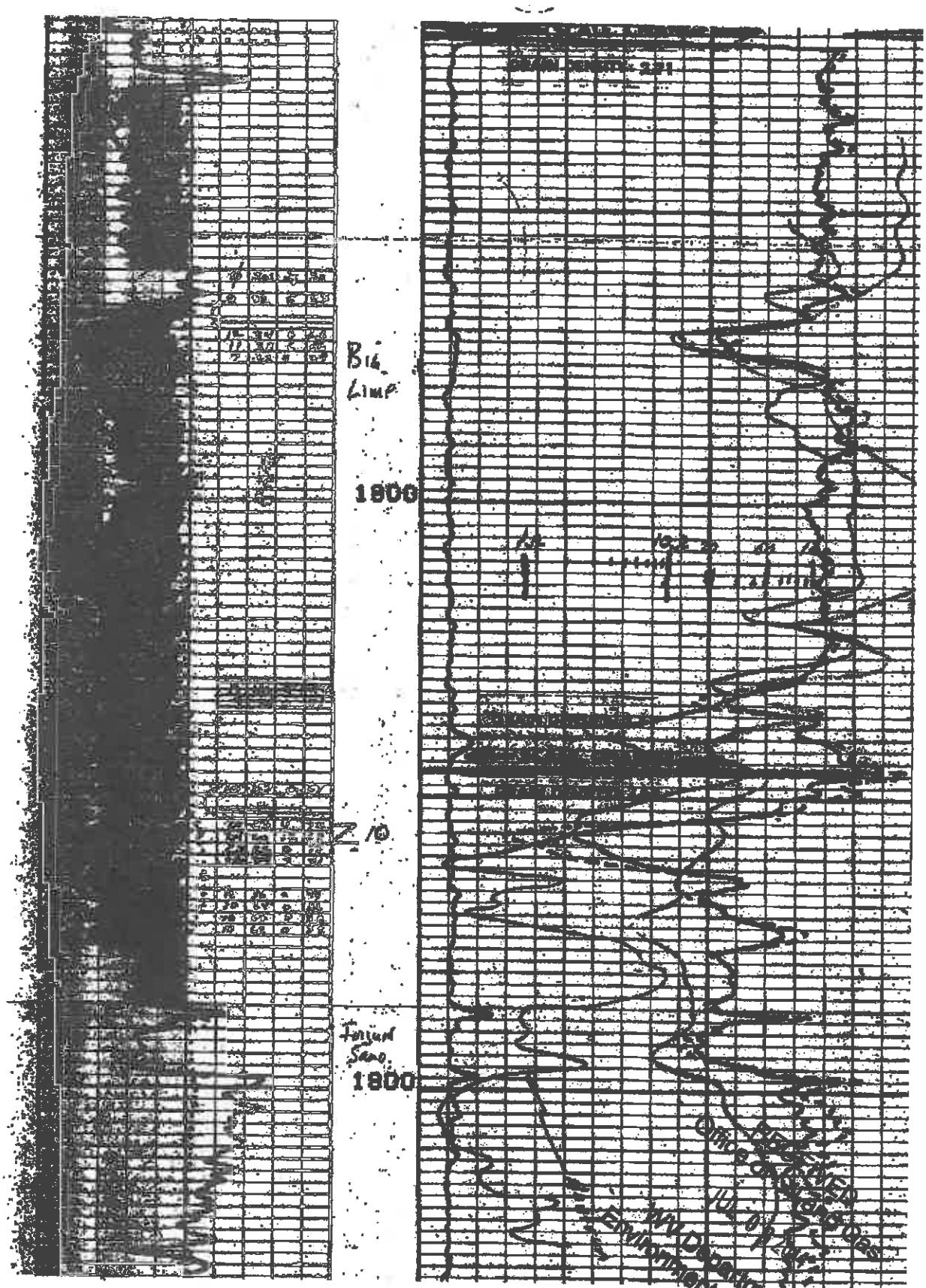
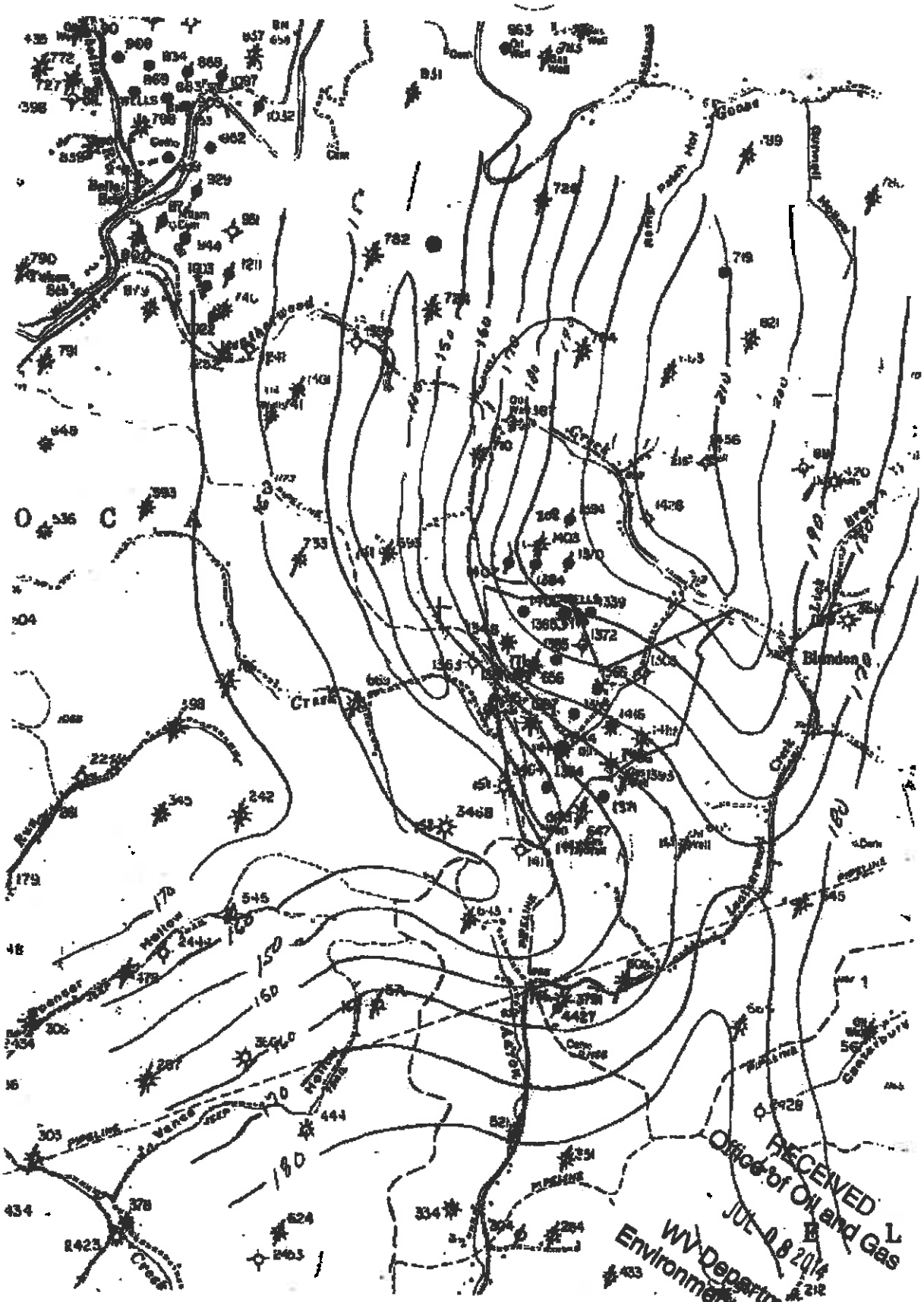


Ohio Department of Natural Resources
Division of Oil and Gas
Environmental Protection



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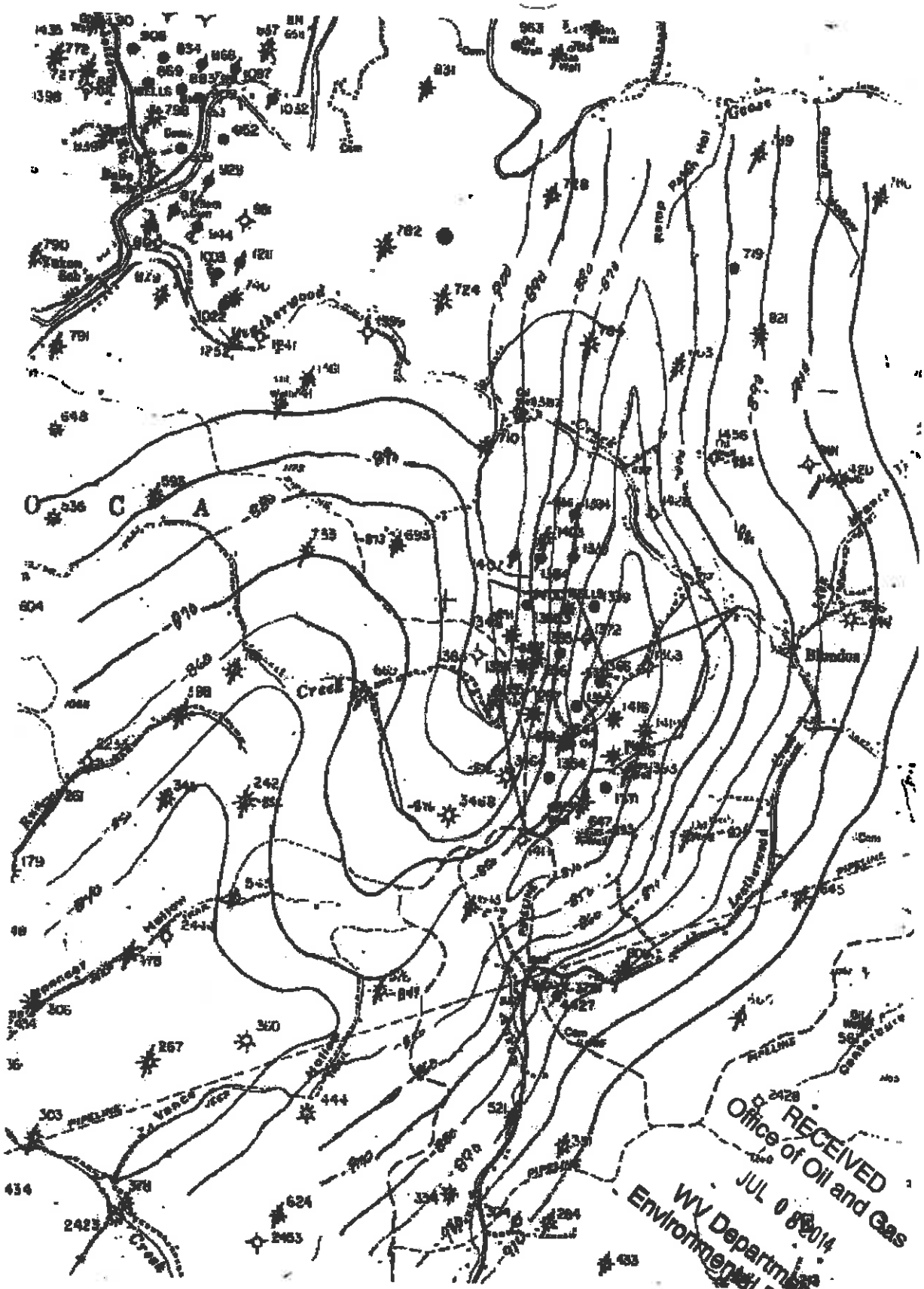

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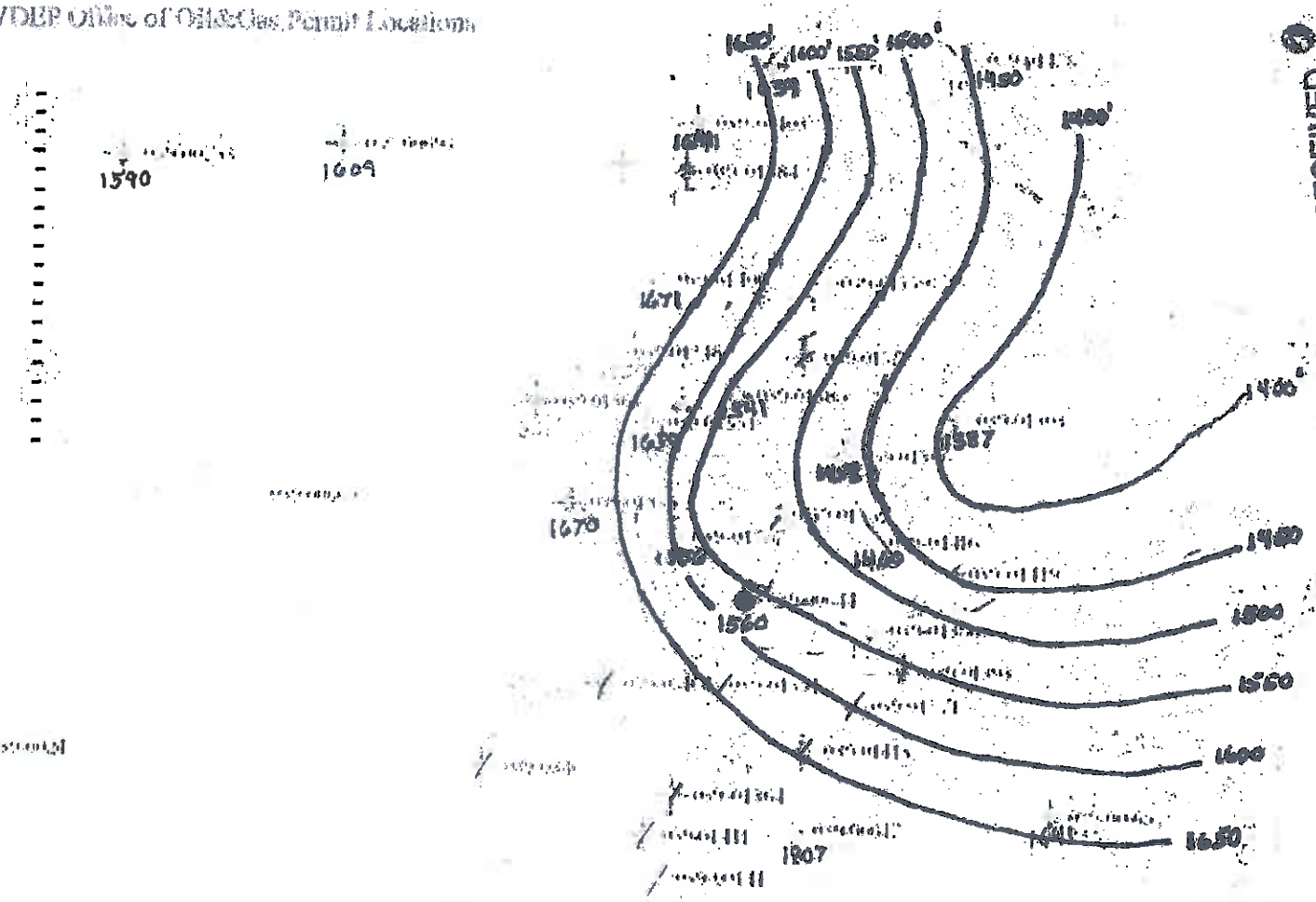
Little Lime Structure Map
Confining Zone

WVDEP Office of Oil&Gas Permit Locations



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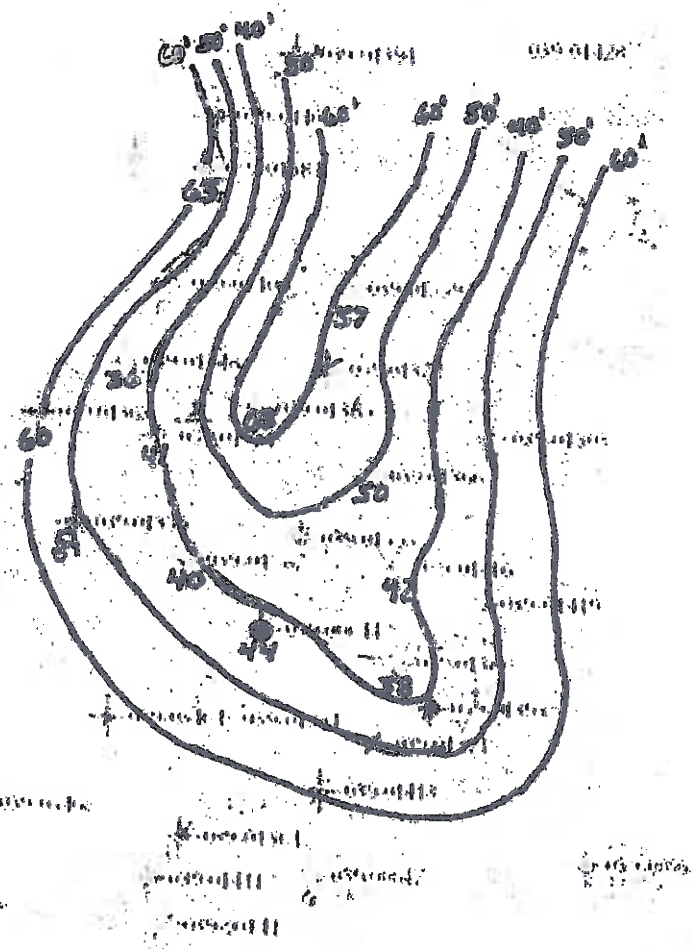
UIC2D0390644

Little Lime Isopach Map
Confining Zone

WVDEP Office of Oil&Gas Permit Locations



Map Layers

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UIC2D0390644

This memo is being provided in response to your request to provide calculations for estimating the extent of fluid migration in the Big Lime formation from injection into the zone in the Parsons 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 (%)

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Values used for calculations are:

Cumulative Volume = variable
Porosity Average = 16%
Reservoir Height = 18 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:

$$R = \sqrt{\frac{100{,}000\ bbls\ x\ 5.615\ ft3/bbl}{3.14\ x\ .16\ x\ 18\ x\ .25}}$$

R = 498 ft.

Q = 250,000 bbls *R = 788 ft.*

Q = 500,000 bbls *R = 1115 ft.*

Q = 1,000,000 bbls *R = 1576 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.

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The following is information on the general faulting trends in the Jakes Fork area of Kanawha County WV as it relates to the re-permitting of the Parsons No. 1-A disposal well by Base Petroleum Inc.

The formation being utilized for disposal in the Parsons No. 1-A well is the Big Lime Formation which is at an average depth of 1600' in the area. A review of well records for a number of wells drilled in the general area does not give any indication of faults in the area as the formation depths throughout the area are very consistent with no significant deviations noted, a fact further supported by a review of the structure and isopach maps submitted with the original UIC permit application. Research of geologic maps and reports was also conducted in order to determine the presence of any faults in. the area that may have been identified by such data in the Big Injun or any other formations for which data existed. Mapping of the Big Lime in West Virginia by the West Virginia Geological Survey does not show the presence of any known faults which have been mapped in the state. As no faults were identified in the Big Lime, research was conducted to look at faults in other formations which could be used to identify faulting trends in the area.

A structure map of the Ordovician Section for the Appalachian Basin is provided on the following page in which faults are identified and mapped. This map does not indicate the presence of faults anywhere in the Kanawha County and surrounding areas. The faults identified on this map represent a general southwest/northeast trend with all mapped faults being well north of the Kanawha County area. The second map provided is for the Marcellus Shale with faults in the Onondaga Limestone mapped and showing a similar southwest/northeast trend in the northern part of the state in the same general locations of the Ordovician mapped faults. Finally in an effort to locate mapping information and data from a formation shallower than the Ordovician and Marcellus, the report from the Appalachian Tight Gas Reservoirs Project conducted by the WVGES was researched. This project evaluated well logs and data to extensively map a number of shallow gas plays in the state creating an interactive mapping system which was used to create the final two maps provided. These maps show folds and faults throughout the state with the same general fault trends and locations as previously noted.

In summary, a variety of data in the form of well records, maps and reports were researched to determine the presence of or the absence thereof any faults in the area which could be possibly affected by the injection operations of the Parsons No. 1-A disposal well. Data was found indicating the presence of faults in the state and that mapping efforts have been undertaken but that all faults identified are at significant distance from the Kanawha County area and should have no impacts on continued injection operations at the Parsons No. 1-A disposal well.

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Appalachian Tight Gas

Refresh Map ☐ Auto Refresh

LAYERS

- General Geography Layers
- General Geology Layers
  - All Gas and Oil Wells
  - Folds (WV Only)
  - Faults (WV Only)
  - Aeromagnetic Data (WV Only)
  - Gravity Data (WV Only)
  - Basic Stratigraphy
- Play-Specific Layers and Documents
  - Berea/Murrysville (BERE)
  - Venango (VNNG)
  - Bradford (BDFD)
  - Elk (ELK)
  - Medina/"Clinton" (MDIN)
  - Tuscarora (TCRR)

Refresh Map ☐ Auto Refresh

Help:

- A closed group, click to open.
- An open group, click to close.
- A map layer.
- A hidden group/layer, click to make visible.
- A visible group/layer, click to hide.
- A visible layer, but not at this scale.
- A partially visible group, click to make visible.
- An inactive layer, click to make active.
- The active layer.
- Indicates a hyperlink to further information.

Pan

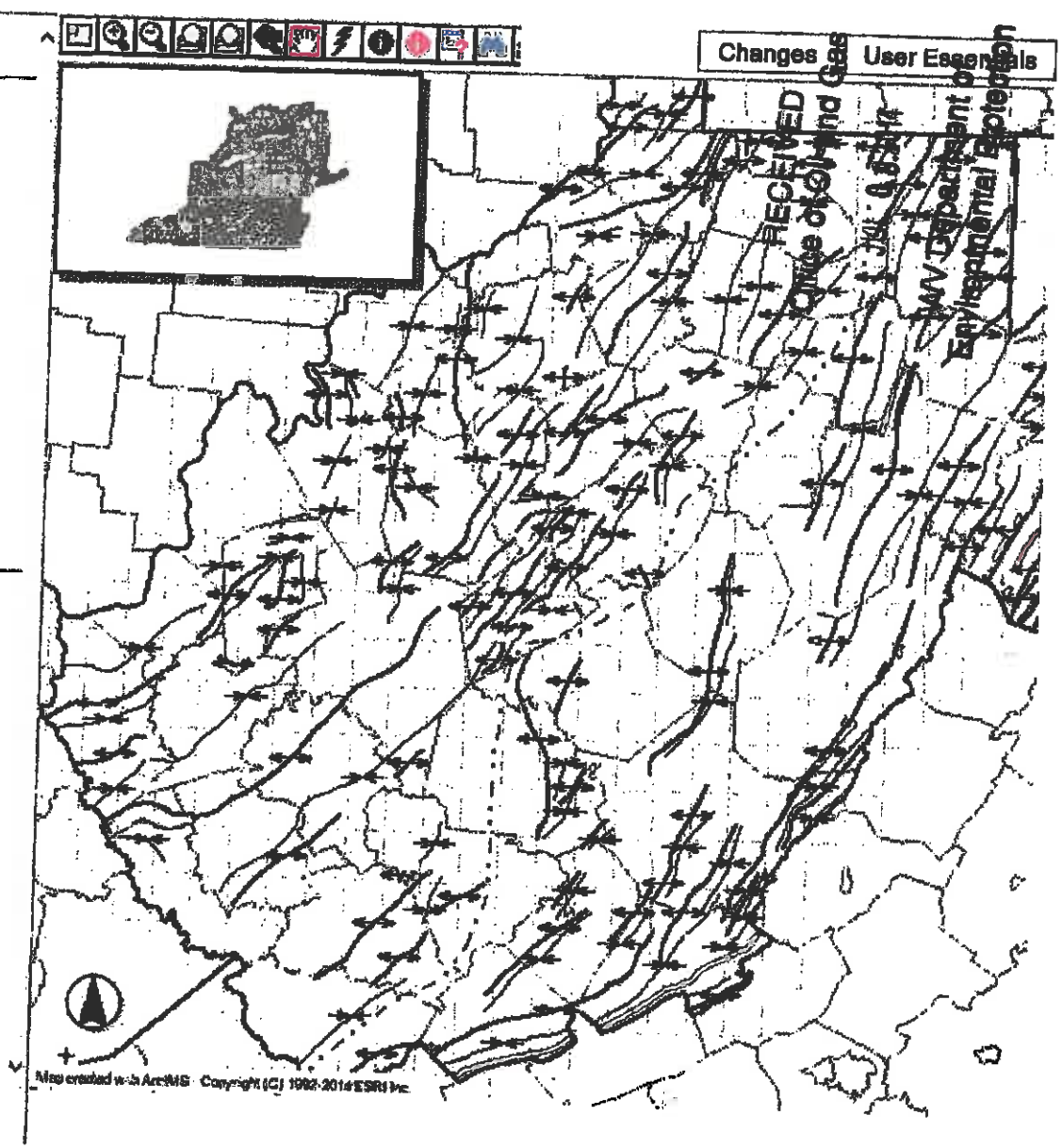

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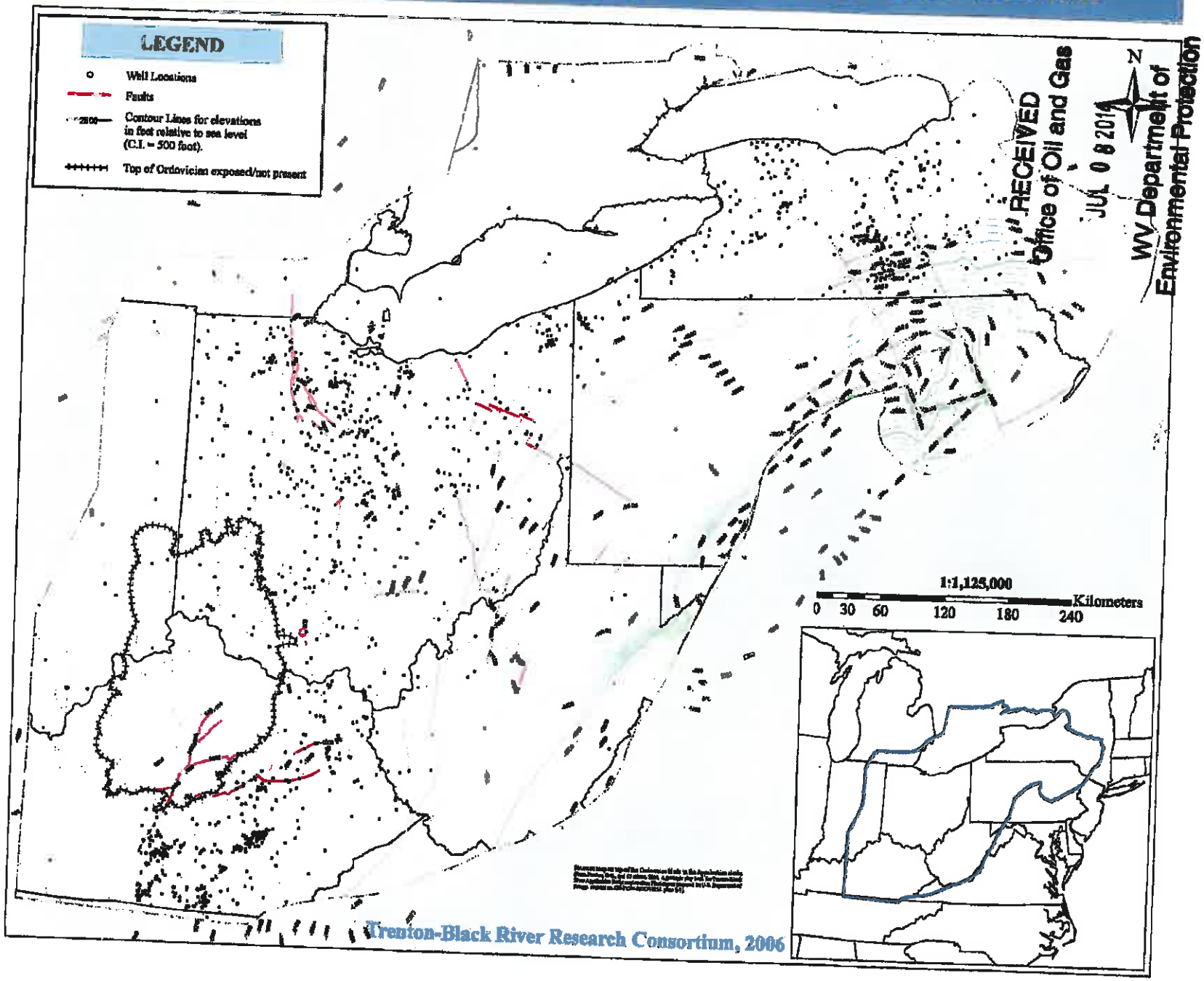
Plate 2-7 : Structure of the Top of the Ordovician Section



Trenton-Black River Research Consortium, 2006

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WVGES: Marcellus Shale Mapping System

This system can enable you to locate wells completed and permitted in the Marcellus Shale in West Virginia. It can also help you to estimate the

Disclaimer | Marcellus Main Page | Marcellus FAQ | IMS Help Desk

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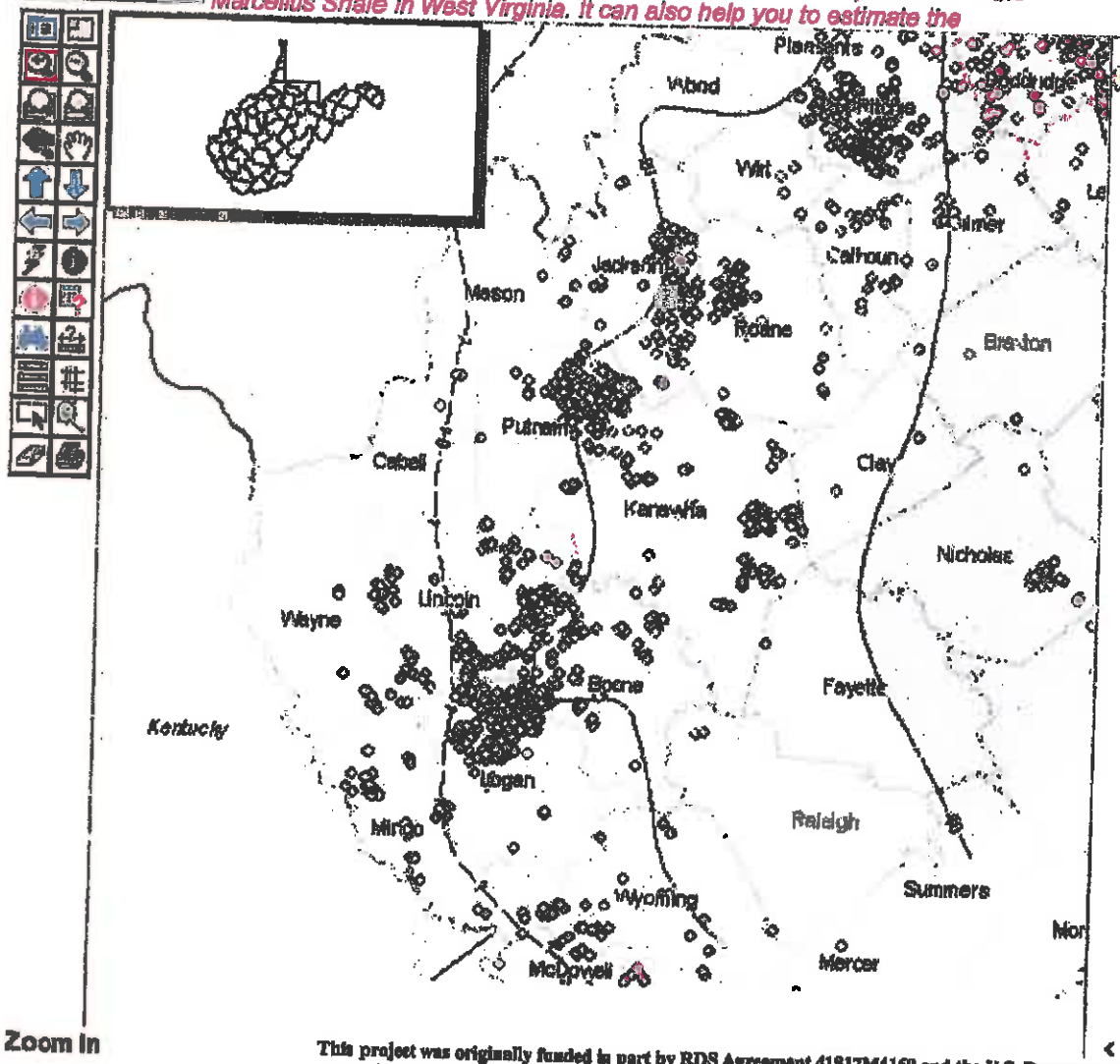

Zoom In

LAYERS

- All Layers
- Data
  - Geologic Data
    - Completed Marcellus Wells*, 03/2014
    - Permitted Marcellus Wells*, 03/2014
    - Scanned E-Logs**, 03/2014
    - Marcellus Outcrop
    - Marcellus Thickness*** (20-ft. CI)
    - Marcellus Thickness*** Polygons
    - Onondaga**** Fold Axes
    - Onondaga**** Faults
    - Onondaga**** Structure
  - Base Map Layers
    - States
    - Counties
    - Counties (with Labels)
    - Cities and Towns
    - Roads
    - Lakes and Rivers
    - Streams
    - Tax Districts
    - 7.5 Minute Quadrangles
    - Topographic Maps

Refresh Map ☑ Auto Refresh

Explanations:

* Marcellus Wells
A completed Marcellus well has one or more zones in the Marcellus that have been prepared for production--the well may or may not be producing currently; a permitted Marcellus well is one with a Marcellus/Devonian shale or deeper target. Obtain additional data for a well by making certain that the

This project was originally funded in part by RDS Agreement 41817M4160 and the U.S. Department of Energy Contract DE-AC26-04NT41817.630.01.14. The support is appreciated greatly.

Sturm Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: MICHAEL LEWIS

SAMPLE ID: BASE PETROLEUM

SAMPLED BY: M. LEWIS

DATE/TIME SAMPLED:* 10-15-13 1400

DATE/TIME RECEIVED: 10-18-13 1535

SAMPLE ID	pH units	TDS mg/L	Cl^- mg/L	SPEC GRAV calc.	TOC mg/L	Fe mg/L	Mn mg/L	Al mg/L	Ba mg/L	Na mg/L
PARSONS PF	5.7	171280	104000.	1.1157	291.	35.8	.876	4.81	12.1	36100.

*Client Provided

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

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APPROVED

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

CHAIN OF CUSTODY RECORD

REIC
Research Environmental & Industrial Consultants, Inc.

MAIN LABORATORY & CORPORATE HEADQUARTERS:
P.O. Box 286 • 225 Industrial Park Rd, Beaver, WV 25813
800-999-0105 • 304-255-2500 • www.reiclabs.com

Client: Sturm Environmental
Contact Person: Laurie / Kim
QUOTE #: _____ Fax: _____
Address: on file
Billing Address (if different): _____
City: _____
Site ID & State: _____ Project ID: _____

PO #: 6479
Phone: 623-6549
Email: _____
City: _____ State: _____ Zip: _____
State: _____ Zip: _____
Sampler: m Lee

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MID-OHIO VALLEY Service Center
101 17th Street
Ashland, KY 41101
606-393-5027

SHENANDOAH Service Center
1557 Commerce Rd., Ste 201
Verona, VA 24482
540-248-0183

ROANOKE Service Center
3029-C Peters Creek Rd
Roanoke, VA 24019
540-777-1276

MORGANTOWN Service Center
16 Commerce Drive
Westover, WV 26501
304-241-5861

SAMPLE LOG & ANALYSIS REQUEST

TURNAROUND TIME
[X] NORMAL

RUSH TURNAROUND
[ ] 5 DAY [ ] 3 DAY [ ] 2 DAY [ ] 1 DAY

*Rush work needs prior laboratory approval and will incur additional charges

ANALYSIS & METHOD REQUESTED: BTEX, TPH-DRC, DRO, GRO

SAMPLE ID	No. & Type of Containers	Sampling Date/Time	Matrix	Sample Comp/Grab	BTEX	TPH-DRC, DRO, GRO
14035	1-Liter glass 4-SM VOA's	2-20-14 1450			X	X

ENTER PRESERVATIVE CODE:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide
6 Zinc Acetate
7 EDTA
8 Ascorbic Acid

COMMENTS:

All analytical requests are subject to REIC's Standard Terms and Conditions.

Temperature at arrival: 3 °C ICED? Y✓ N___

Containers provided by: [-] REIC [✓] Client

K. Kehel (Relinquished by (signature))	2-21-14 Date/Time	Relinquished by (signature)	Date/Time
[illegible]	2-21-14 Date/Time	Received by (signature)	Date/Time

FAX RESULTS [ ] EMAIL RESULTS [ ]

SHIPMENT ___ Hand Delivered ✓ Courier ___ UPS ___ FEDEX ___ USPS ___ OTHER

COC-NCR-050213

REI Consultants, Inc. - Analytical Report

WO#: 1402M46

Date Reported: 3/6/2014

Client:	STURM ENVIRONMENTAL SERVICES	Collection Date:	2/20/2014 2:50:00 PM
Project:	MICHAEL LEWIS	Date Received:	2/21/2014
Lab ID:	1402M46-01A	Matrix:	Liquid
Client Sample ID:	14035 JONES SWD	Site ID:	

Analysis	Result	PQL	MCL	Qual	Units	PrepDate	Date Analyzed
SEMI-VOLATILE RANGE ORGANICS			**Method: SW8015C**			**SW3510B**	**Analyst: CL**
TPH (Diesel Range)	220	3.00	NA		mg/L	2/27/2014 8:45 AM	2/28/2014 3:11 PM
TPH (Oil Range)	124	7.50	NA		mg/L	2/27/2014 8:45 AM	2/28/2014 3:11 PM
Surr: o-Terphenyl	183	28.3-152	NA	S	%REC	2/27/2014 8:45 AM	2/28/2014 3:11 PM

Notes:

Surrogate recovery exceeded REIC control limits due to sample dilution and does not reflect extraction efficiency.

VOLATILE RANGE ORGANICS			**Method: SW8015C**			**SW5030**	**Analyst: CB**
TPH (Gasoline Range)	62.2	50.0	NA		mg/L	2/25/2014 10:52 AM	2/25/2014 10:51 PM
Surr: 2,5-Dibromotoluene	120	37.2-152	NA		%REC	2/25/2014 10:52 AM	2/25/2014 10:51 PM
VOLATILE ORGANIC COMPOUNDS			**Method: SW8021B**			**SW5030**	**Analyst: CB**
Benzene	187	10.0	NA		µg/L	2/25/2014 10:52 AM	3/4/2014 1:47 AM
Toluene	403	10.0	NA		µg/L	2/25/2014 10:52 AM	3/4/2014 1:47 AM
Ethylbenzene	115	10.0	NA		µg/L	2/25/2014 10:52 AM	3/4/2014 1:47 AM
m,p-Xylene	862	20.0	NA		µg/L	2/25/2014 10:52 AM	3/4/2014 1:47 AM
o-Xylene	269	10.0	NA		µg/L	2/25/2014 10:52 AM	3/4/2014 1:47 AM
Surr: 1,1,1-Trifluorotoluene	108	61.2-135	NA		%REC	2/25/2014 10:52 AM	3/4/2014 1:47 AM

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Base Petroleum
47-039-00644
Parsons # A-1
Static Fluid level Check
Disposal Well

On 10/2/2014 the Parsons A-1 disposal well was shut in. On 10/3/2014 our swab rig was moved in, rigged up, and ran down hole to check the fluid level. The fluid level was found at 942'.

Kermit Tyree

Kermit Tyree

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17. This well is a gravity feed operation in which all fluid is flowed into the injection formation under gravity or vacuum flow. The tubing annulus is empty of fluid and should injection cease down the tubing a fluid column would build up and any leakage in the tubing would be indicated on the annulus.
18. A letter from operator Kermit Tyree is provided to address the hydrostatic fluid level.
19. In the event that the Parsons well should have a failure of the injection tubing which is under gravity or vacuum flow, all fluid would continue to flow into the injection formation. Should the well discontinue taking fluid under gravity flow a fluid column would build up and the lack of injection would be noticed by the injection well operator and flow to the well discontinued. Base Petroleum operates 3 other disposal wells in the general area and fluid will be transported and disposed into one of those wells in the event of a failure.

Sincerely,

Michael W. Lewis

Michael W. Lewis

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APPENDIX H

GROUNDWATER PROTECTION PLAN

Facility Name: Base Petroleum Parsons #1-A SWD

County: Kanawha

Facility Location:

Postal Service Address:	Leatherwood Creek Watershed	
Latitude and Longitude:	37.535493 / -81.534326	

Contact Information:

Person:	John Wilcox
Phone Number:	304-756-2827
E-mail Address:	jhnwilcox@aol.com

Date: 8/23/14

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

There is one transfer point where tanker trucks operated by Kermit Tyree Contracting are able to dump produced fluids from various wells as indicated in Appendix G into a single 210 bbl. storage tank. Fluids are then pumped approximately 100 feet to the salt water disposal well.

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

Tanker trucks are backed onto the site to the transfer point which is located directly above the tank battery and the secondary containment. The transfer point has a plastic tub lined with absorbent pads to collect any drippings from the transfer. Any line breaks in the transfer would be contained in the secondary containment. The secondary containment provides 14,417 gallons of storage capacity which is significantly more than the 9,240 gallons of required capacity by law. An illustration of the secondary containment is provided. Mechanical integrity tests were conducted and passed all requirements on the facility.

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

No new equipment or operations are anticipated for this facility at this time.

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

UIC regulations are applicable to the disposal well and oil and gas laws and regulations are applicable to all associated operations.

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

Little information exists for the general area due to the lack of water supply wells. Historical information and limited water samples from the area indicate fair water quality due to typical higher iron concentrations that exist throughout many areas of the state.

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

No waste material will be used for deicing or fill material on the property.

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.

Kermit Tyree Contracting currently operates this well for Base Petroleum Inc. and will provide employees instruction and training in the recognition and prevention of groundwater contamination and the potential sources of contamination on quarterly basis. Employees will be trained on proper procedures for filling tanker trucks at the producing well locations in order to eliminate contamination at other sites as well as transportation of those fluids. Once the tanker truck enters the disposal facility, employees will be given instruction as to the proper procedures for connecting to the transfer station and pumping of the fluids into the storage tanks. Employees will be instructed on measures to be taken in the event of a spill and will be provided with materials in order to begin clean up of any spills. The proper procedures and contacts for the reporting of any spills will be provided to all employees. Instruction and training for employees will be updated as conditions and requirements change.

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

Representatives for Base Petroleum will conduct quarterly inspections using the attached form. Employees will visually inspect the tank for any signs of material damage or leakage. Any pipelines will be walked and checked for leaks. All transfer points and hoses associated with the disposal well will be checked for flaws or areas of weakness. Secondary containment berms will be checked for any signs of weakness and any standing water will be removed. The filter will be checked and cleaned if necessary. Any findings of possible contamination will be noted on the inspection form and the remedial measures to address these concerns will be documented on the inspection form. All inspection forms will be maintained at Base Petroleum's office for a minimum of three years. Mechanical integrity test will be conducted every five years.

Signature: John B Wilcox

Date: 10/25/14

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Base Petroleum
Plugging Procedure
47-039-00644 Parsons # A-1 Disposal Well

Rig up the rig

Pull the 2 3/8" tubing from the hole remove the packer

Run 2 3/8" tubing in the hole to 1,680'

Gel the hole

Cement from 1,680' to 1,530'

Pull the tubing

Free point and cut the 8 5/8" casing @ 1,400'

Pull the 8 5/8" casing from the hole

Run tubing in the hole to 1,400'

Gel the hole

Cement from 1,400' to 1,300'

Cement from 1,000' to 900'

Cement from 500' to 400'

Cement from 100' to surface

Pull the conductor casing

Top off the hole with cement to the surface

Erect a monument with the API number attached

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(4/25)

APPENDIX I

Requirement for Financial Responsibility to Plug/Abandon an Injection Well

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

From: John B. Wilcox
Base Petroleum Inc.
100 Wilcox Farm Lane
South Charleston, WV 25309

Date: August 7, 2014

Subject: Underground Injection Control (UIC) Permit Application
UIC2D0390644
Requirement for Financial Responsibility

I, John B. Wilcox, 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: John B. Wilcox

Signature: John B Wilcox

Date: 7/7/14

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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.

Base Petroleum Inc. will maintain security at the disposal site with a locked gate at the entrance to the facility. All tanks and valves will be secured with pad locks as well as any groundwater protection containers. Fences and security cameras may also be used as well as any other security measures as deemed necessary

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39-0644

YOUNG WIRELINE SERVICES

2260 ROXALANA RD.
DUNBAR, WV. 25064

GAMMA RAY CCL X-Y CALIPER LOG

FILING NO.
30773

COMPANY BASE PETROLEUM
WELL PARSONS 1-A
FIELD POCA DISTRICT
COUNTY KANAWHA STATE WV

LOCATION PERMIT , KAN-644
QUAD:
WATERSHED: BRANCH OF LEATHERWOOD

SEC TWP RGE

OTHER SERVICE

PERMANENT DATUM GROUND LEVEL ELEV 861
LOG MEASURED FROM TOC ,0 FT. ABOVE PERMANENT DATUM
DRILLING MEASURED FROM N/A

ELEVATIONS
KB N/A
DF N/A
GL 861

DATE	6-17-94			
RUN NO.	ONE			
TYPE LOG	GR-CCL-X Y			
DEPTH DRILLER	1690			
DEPTH LOGGER	1690			
BOTTOM LOGGED INT.	1689			
TOP LOGGED INT.	0			
TYPE FLUID IN HOLE	H20			
DENSITY	N/A			
FLUID LEVEL	583			
MAX. HOLE TEMP.	N/A			
TRUCK NO.	113			
LOCATION	DUNBAR			
RECORDED BY	D. LEGG			
WITNESSED BY	J. WILCOX			

BORE HOLE RECORD				CASING RECORD			
RUN	BIT	FROM	TO	SIZE	WT.	FROM	TO

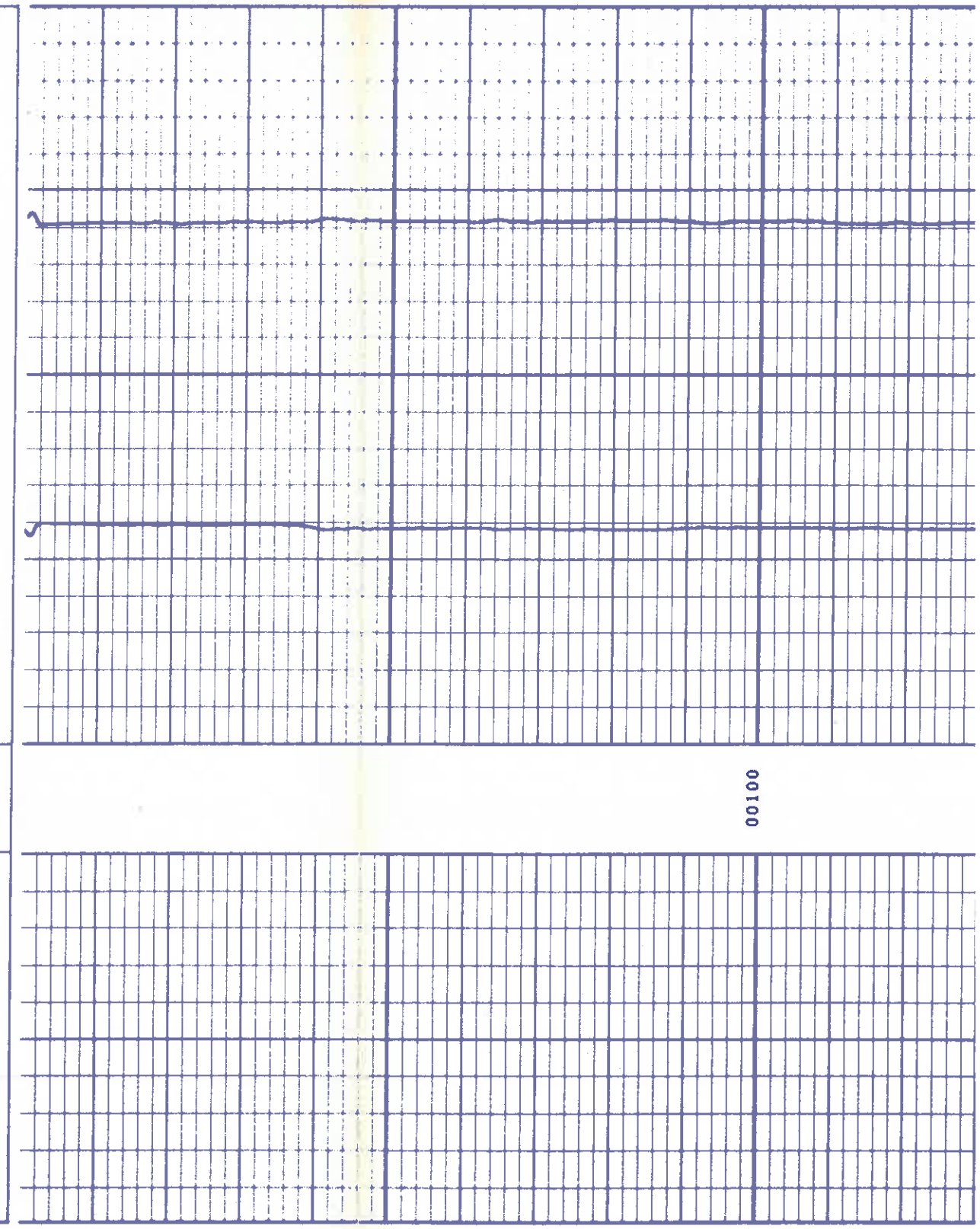
RUN NO. ONE
TOOL NO.
PANEL NO.
GR/SENS.
SCALE
TOOL TYPE 4 ARM CALIPER
UNITS / DIVISION 1 IN/DIV

REMARKS

CALIPER INCHES 14 — 1

CALIPER INCHES 1 — 14

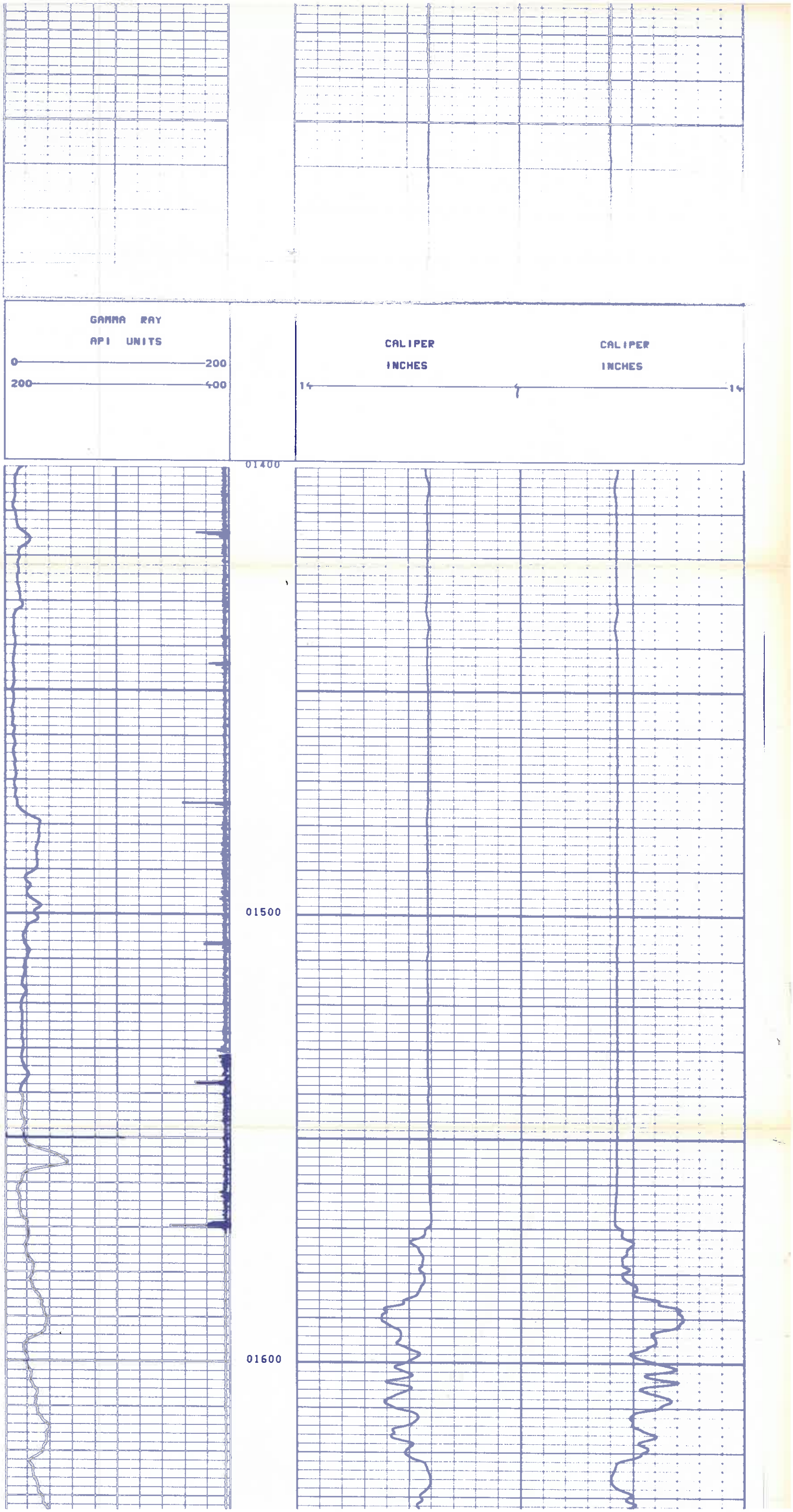
GAMMA RAY API UNITS 0 — 200 — 200 — 400



00200

00300

00400


GAMMA RAY
API UNITS
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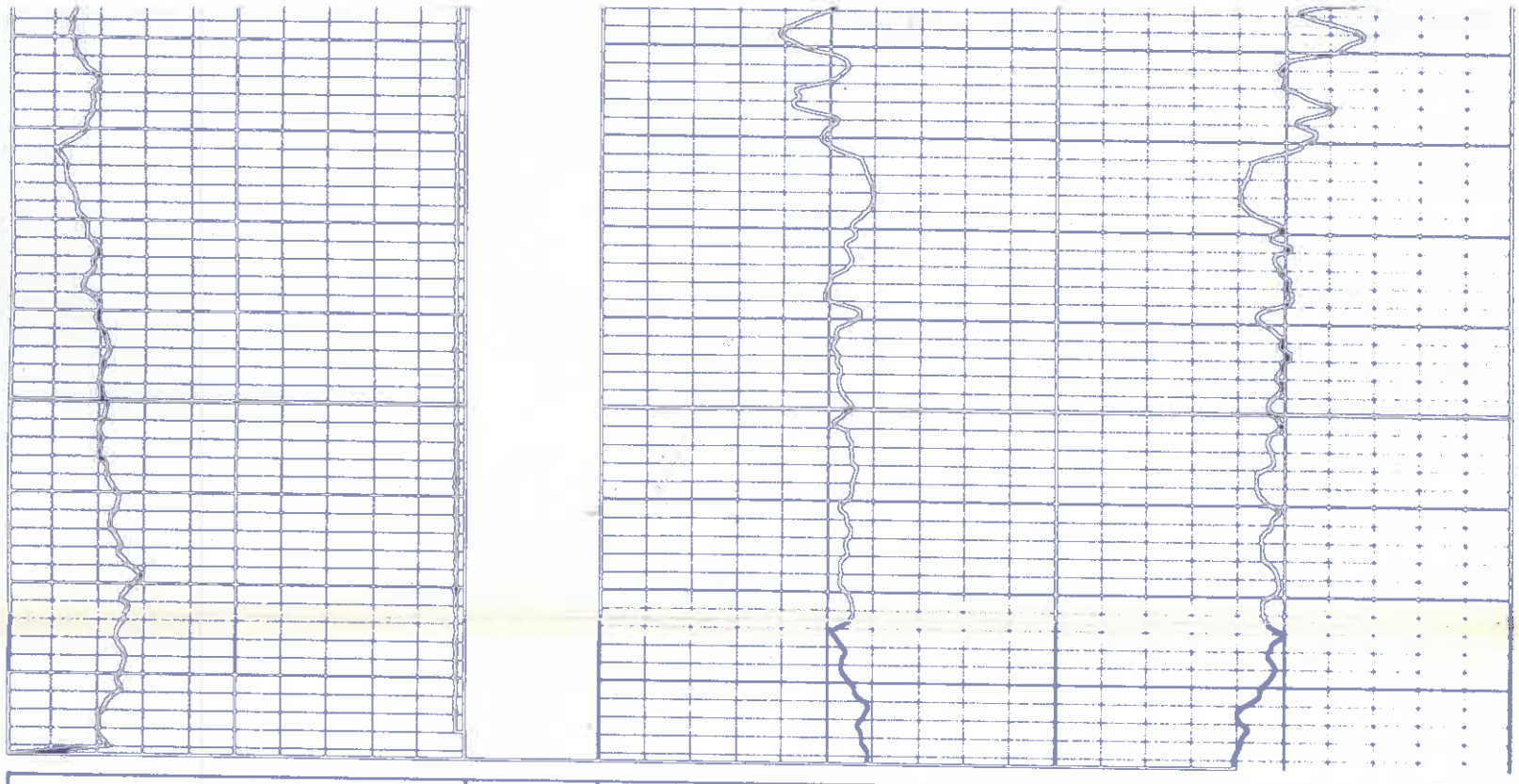
200
200
400
CALIPER
INCHES
14
CALIPER
INCHES
14
01400
01500
01600



GAMMA RAY
API UNITS

0 — 200

200 — 400

CALIPER
INCHES

14 — 7

CALIPER
INCHES

7 — 14