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	UIC2D0390798	UIC Well API Number	47-039-00798

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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dep

- [ ] 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.

Reviewed by (Print Name): _____

Reviewed by (Sign): _____

Date Reviewed: _____

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 # UIC2D0390798 API # 47-039-00798 WELL # Jones A-2

Section I. Facility Information

Facility Name: Base Petroleum Inc. Jones A-2

Address: 100 Wilcox Farm Lane

City: South Charleston State: WV Zip: 25309

County: Kanawha

Location description:

Hicumbottom area of Hicumbottom Run of the Pocatalico River Watershed in the Poca District of Kanawha County.

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

Northing: 4268558.4 Easting: 451278

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:

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:

Activities will consist of injecting produced brine water and pit fluids from various other wells in the area.

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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.

(4/25)

APPENDIX A
Injection Well Form

1) GEOLOGIC TARGET FORMATION: Big Lime

Depth: 1531 Feet (top) _____ Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 1613 Feet

3) Approximate water strata depths: Fresh 124 Feet Salt 1143,1153 Feet

4) Approximate coal seam depths: None

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

6) Virgin reservoir pressure in target formation 570 psig Source Treatment Record

7) Estimated reservoir fracture pressure 935 psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour): 30

Injection volume (bbl/day): 720

Injection pressure (psig): Gravity feed

Bottom hole pressure (psig): 650

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

Brine fluid

Temperature of injected fluid: (°F) 70

10) FILTERS (IF ANY)

10 mil to none

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

None

APPENDIX A (cont.)

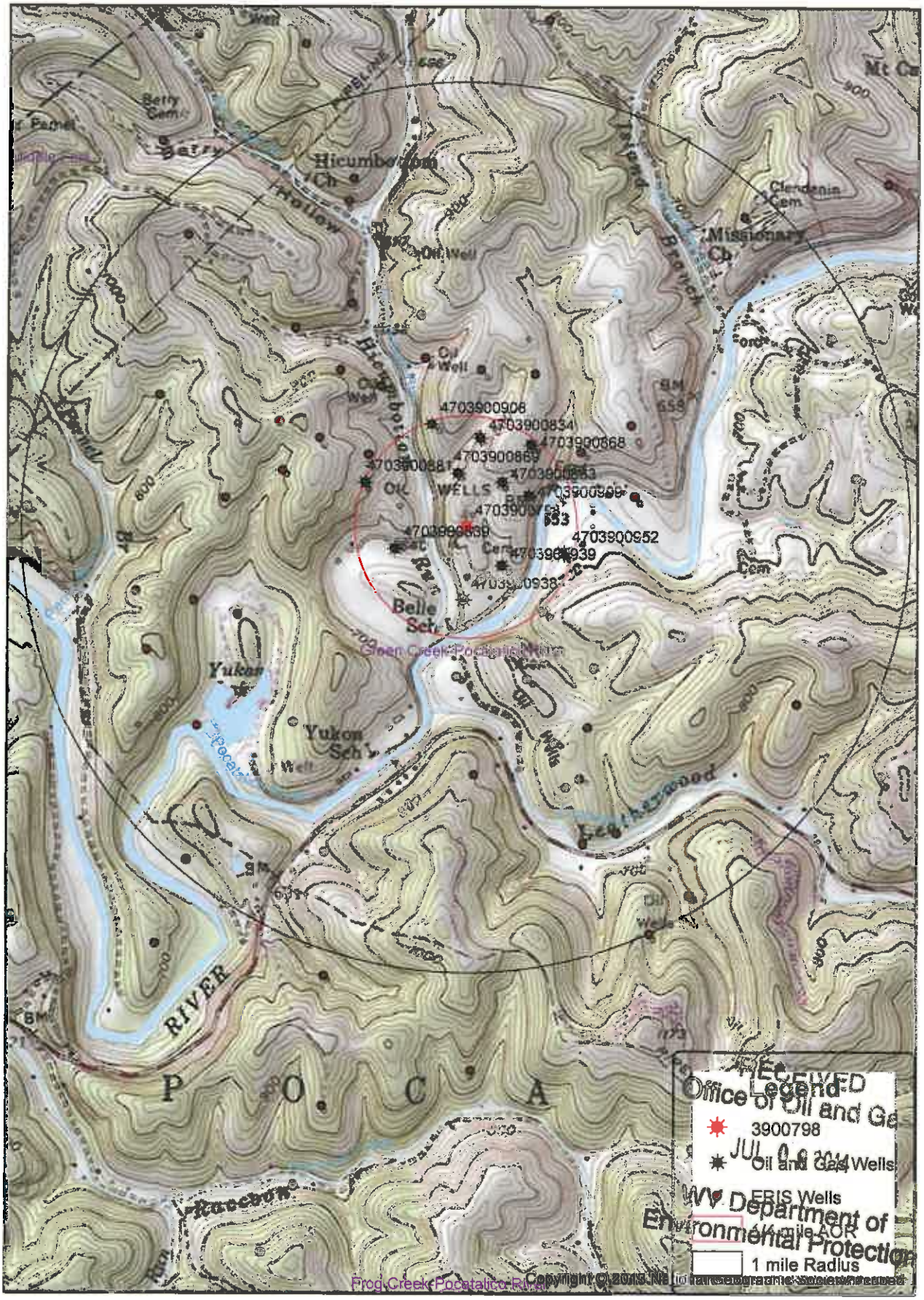
12. Casing and Tubing Program

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	16			55	44	44	
Fresh Water	13 3/8			48	569	569	
Coal							
Intermediate 1	10 3/4			35.75	1563	1563	
Intermediate 2							
Production							
Tubing	3 1/2			8.7	1615	1615	
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:	Anchor Packer			
Sizes:	10x3x5			
Depths Set:	1591			

2D0390798 Area of Review



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
039-00908	Oil	Active	4268929.3	451151.4	Y	Y	1611	806.1
039-00834	Oil	Active	4268880	451328.1	Y	Y	1592	784.0
039-00869	Oil	Active	4268751.7	451246.9	Y	Y	1546	738.8
039-00881	Gas,Oil	Shut-in	4268716.4	450913	Y	Y	1681	716
039-00883	Oil	Active	4268718.6	451407.7	Y	Y	1536	742.5
039-00909	Unknown	Abandoned	42688669.7	451503.9	Unknown	Unknown	Unknown	Unknown
039-00798	Injection	Active	4268558.4	45127	Y	Y	1531	723
039-00952	Unknown	Shut-in	4268463.7	451633.6	Y	Y	Unknown	665
039-00939	Oil	Active	4268416.5	451407	Y	Y	1468	665.7
039-00839	Unknown	Shut-in	4268479.5	451020	Y	Y	1603	641
039-00938	Unknown	Shut-in	4268294.8	451267.2	Y	Y	1440	648

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

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.*

(4/25)

APPENDIX E
Water Sources

Operator: Base Petroleum, Inc. Year 2014 UIC Permit # UIC2D0390798

		Source # 1	Source # 2	Source # 3	Source #
Water Source Name		Stater	Burdette	Young	
Northing	428558.4				
Easting	451278				
Parameter	Units				
TPH - GRO	mg/L				
TPH - DRO	mg/L				
TPH - ORO	mg/L				
BTEX	mg/L				
Chloride	mg/L	11.2	7.40	17.9	
Sodium	mg/L	103.	108.	97.6	
Total Dissolved Solids (TDS)	mg/L	254	256	315	
Aluminum	mg/L				
Arsenic	mg/L				
Barium	mg/L	<.002	.042	.191	
Iron	mg/L	.03	.26	.28	
Manganese	mg/L	.002	.037	.056	
pH	SU	7.4	7.7	7.8	
Calcium	mg/L				
Sulfate	mg/L				
MBAS	mg/L				
Dissolved Methane	mg/L				
Dissolved Ethane	mg/L				
Dissolved Butane	mg/L				
Dissolved Propane	mg/L				
Bacteria (Total Coliform)	c/100mL				

Sturm Environmental Services

COMPANY: MICHAEL LEWIS

SAMPLE ID: BASE PETROLEUM

SAMPLED BY: M. LEWIS

DATE/TIME SAMPLED:* 02-19-14 1330

DATE/TIME RECEIVED: 02-20-14 1446

SAMPLE ID	pH units	SPEC GRAVITY calc.	TSS mg/L	TDS mg/L	Cl^- mg/L	Na mg/L	Fe mg/L	Mn mg/L	TOC mg/L	Ba mg/L
STATER	7.4	.9990	<4	254	11.2	103.	.03	.002	2.4	<.002

*Client Provided

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

APPROVED D. Burns

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Sturm Environmental Services

COMPANY: MICHAEL LEWIS

SAMPLE ID: BASE PETROLEUM

SAMPLED BY: M. LEWIS

DATE/TIME SAMPLED:* 02-19-14 1315

DATE/TIME RECEIVED: 02-20-14 1446

SAMPLE ID	pH units	SPEC GRAVITY calc.	TSS mg/L	TDS mg/L	Cl⁻ mg/L	Na mg/L	Fe mg/L	Mn mg/L	TOC mg/L	Ba mg/L
BURDETTE	7.7	.9993	<4	256	7.40	108.	.26	.037	1.3	.042

*Client Provided

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

APPROVED D. Bruno

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Sturm Environmental Services

COMPANY: MICHAEL LEWIS

SAMPLE ID: BASE PETROLEUM

SAMPLED BY: M. LEWIS

DATE/TIME SAMPLED:* 02-19-14 1345

DATE/TIME RECEIVED: 02-20-14 1446

SAMPLE ID	pH units	SPEC GRAVITY calc.	TSS mg/L	TDS mg/L	Cl⁻ mg/L	Na mg/L	Fe mg/L	Mn mg/L	TOC mg/L	Ba mg/L
YOUNG	7.8	.9980	<4	315	17.9	97.6	.28	.056	<1.0	.191

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

APPROVED D. Bennett

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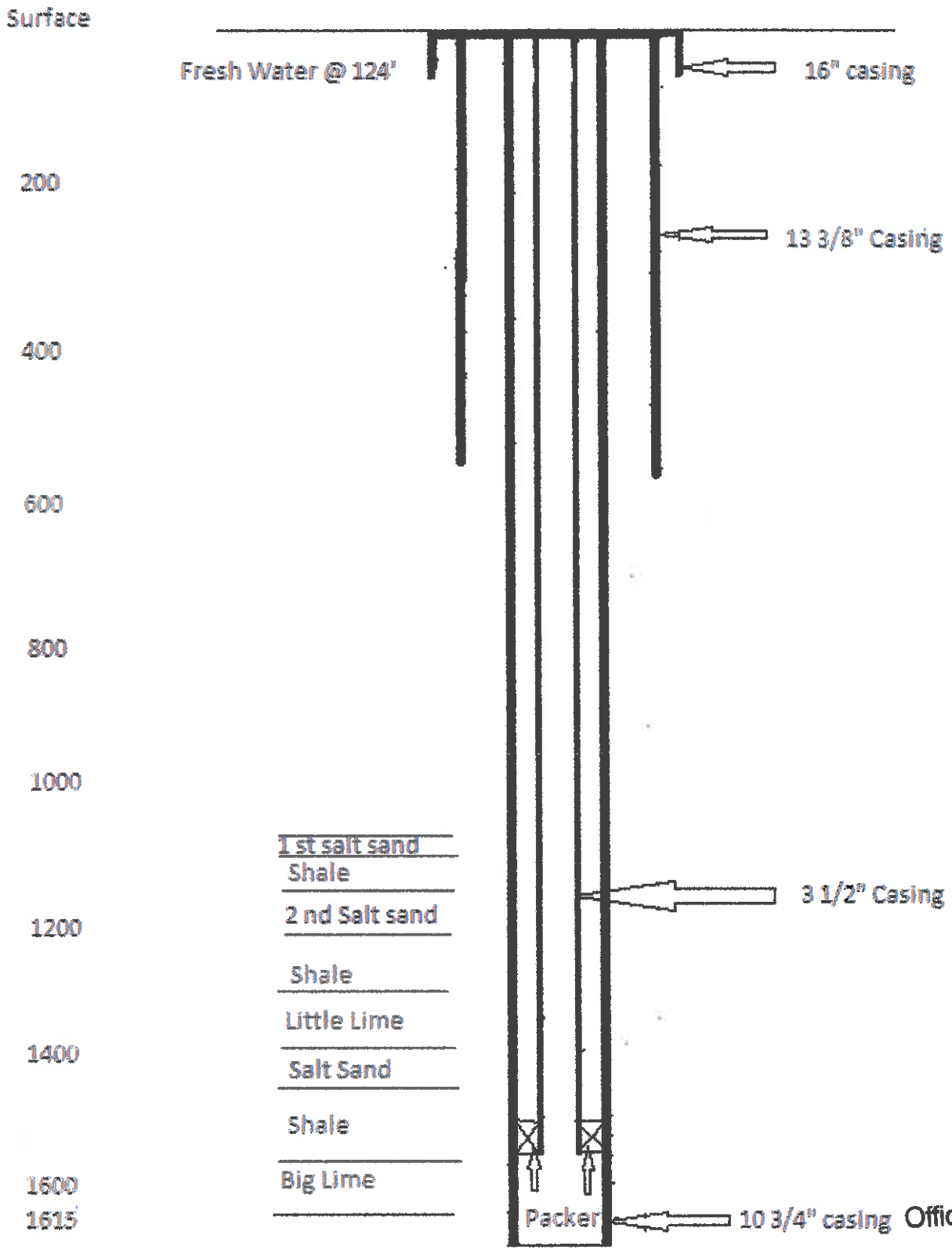
APPENDIX G

Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-039-00834	Base Petroleum Inc.	Big Lime
47-039-00869	Base Petroleum Inc.	Big Lime
47-039-00883	Base Petroleum Inc.	Big Lime
47-039-00908	Base Petroleum Inc.	Big Lime
47-039-00927	Base Petroleum Inc.	Big Lime
47-039-00939	Base Petroleum Inc.	Big Lime
47-039-00954	Base Petroleum Inc.	Big Lime

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

Jones #A-2



No *logs were ever run* on *the Jones A2 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.*

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	2398			
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	@ °F
TIME SINCE CIRC.	4 HRS			
MAX. REC. TEMP.	103 °F	°F		°F
EQUIP. LOCATION	3343 CHARLESTON WV			
RECORDED BY	P SILA			
WITNESSED BY	MR MALCOLM	MR. BENNETT		

FIELD PRINT

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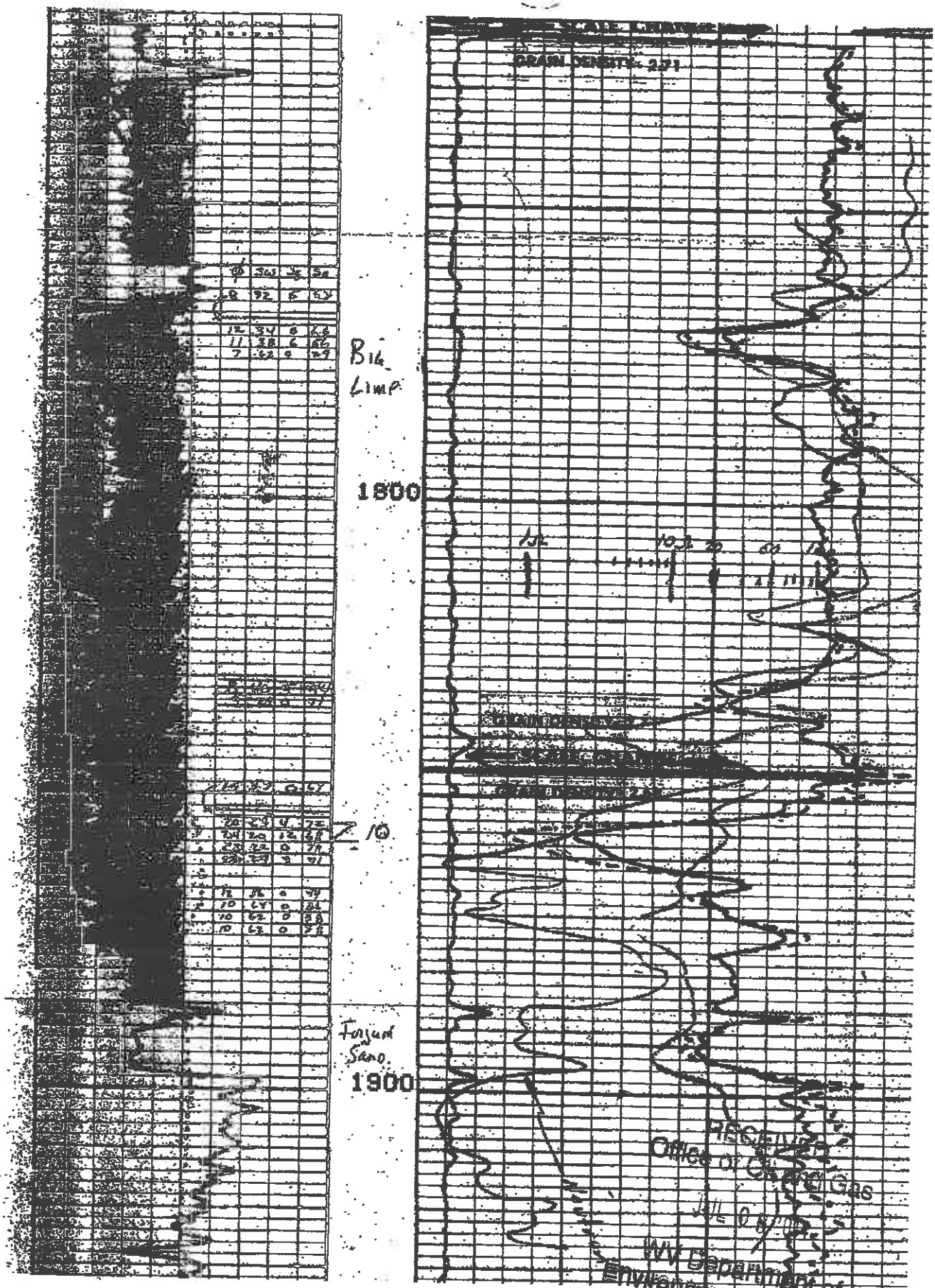


Basin Surveys

BASIN SURVEYS INC.

COMPENSATED DENSITY LOG

FILING NO.: Kan-3464

COMPANY: D.C. Malcolm Inc.

WELL: M. Harding et al #1

FIELD: Poca

COUNTY: Kanawha STATE: W.V.

LOCATION: Aden Creek

Quad - Romance 7.5

OTHER SERVICES: NE... ...

SEC. ____ TWP. ____ RGE. ____

Permanent Datum: Ground Level ____ Elev. 973

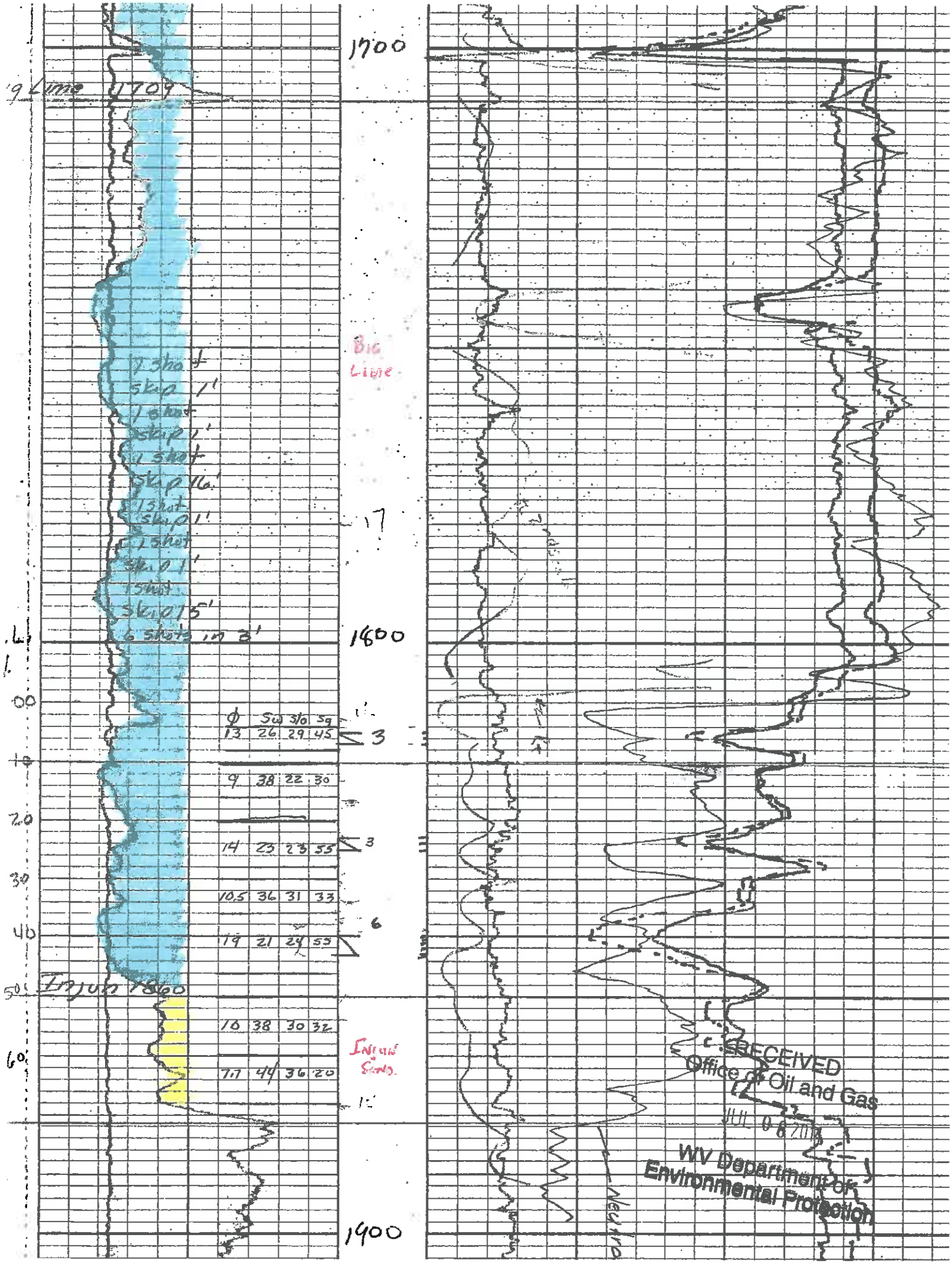
Log Measured From: KB ____ Ft. Above Perm. Datum

Drilling Measured From: KB

G.L. 973

Date	5-1-79		
Run No.	one		
Type Log	GRC Density		
Depth—Driller	2409		
Depth—Logger	2389		
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	9 hr		
Recorded by	Slagg, J. Bowman		
Witnessed by	Mr. Malcolm		

Run No.	Bore-Hole Record Bit	From	To	Casing Record Size	Wgt.	From	To
	7 7/8		TD	5 1/2		Surf.	2000


1700
1600
1500
1400
Big Lime
Injun 1860
Injun Sand
ϕ Sw 3/0 Sg
13 26 29 45
9 38 22 30
14 23 23 55
10.5 36 31 33
19 21 24 55
10 38 30 32
7.7 44 36 20
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A field inspection was made of the two Frame and Leany wells API 47-039-00952 and API 47-039-00909. These wells have not been operated for quite some time and their present condition does not allow any means to *obtain a fluid sample from the wells. Additionally as these are another operators wells, doing anything* on *the wells creates some access/trespass and liability issues. Due* to *their location and the fact that the Jones A2 well is gravity feed, I do not believe that even if the wells should communicate, there would not be sufficient pressure* to *raise the fluid level in the abandoned wells* to *a level that would endanger the USDW.*

The following information 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* Jones 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.

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

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 = 16%
Reservoir Height = 24 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:

$$R = \sqrt{\frac{100{,}000 \; bbls \; x \; 5.615 \; ft3/bbl}{3.14 \; x \; .16 \; x \; 24 \; x \; .25}}$$

R = 432 ft.

Q = 250,000 bbls *R = 682 ft.*

Q = 500,000 bbls *R = 965 ft.*

Q = 1,000,000 bbls *R = 1365 ft.*

As you can see, the lateral distance of the fluid bank from the wellbore is fairly limited 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.

The following information is 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 WVGIS 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 had 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.

Sturm Environmental Services

COMPANY: MICHAEL LEWIS

SAMPLE ID: BASE PETROLEUM

SAMPLED BY: M. LEWIS

DATE/TIME SAMPLED:* 02-19-14 1300

DATE/TIME RECEIVED: 02-20-14 [illegible]

SAMPLE ID	pH units	SPEC GRAVITY calc.	SO_4 mg/L	TSS mg/L	TDS mg/L	TOC mg/L	TDS mg/L	Cl^- mg/L	Na mg/L	Fe mg/L	Ba mg/L	Br mg/L
JONES SWD	5.7	1.1140	[1]<5.0	3208	163164	36.5	91900.	40770.	2010.	3848	11	[1]<1.

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RECEIVED Office of Oil and Gas MAR 19 2014 WV Department of Environmental Protection

*Client Provided

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

[1]RAN @ X 10 DILUTION.

APPROVED D. Bruce

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CHARLESTON BRANCH—POST OFFICE BOX 8337 • SOUTH CHARLESTON, WEST VIRGINIA 25303-0337 • (304) 744-9864

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	882	20.0	NA		µg/L	2/25/2014 10:52 AM	3/4/2014 1:47 AM
o-Xylene	289	10.0	NA		µg/L	2/25/2014 10:52 AM	3/4/2014 1:47 AM
Surr: 1,1,1-Trifluorotoluene	105	61.2-135	NA		%REC	2/25/2014 10:52 AM	3/4/2014 1:47 AM

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

Changes | User Essentials

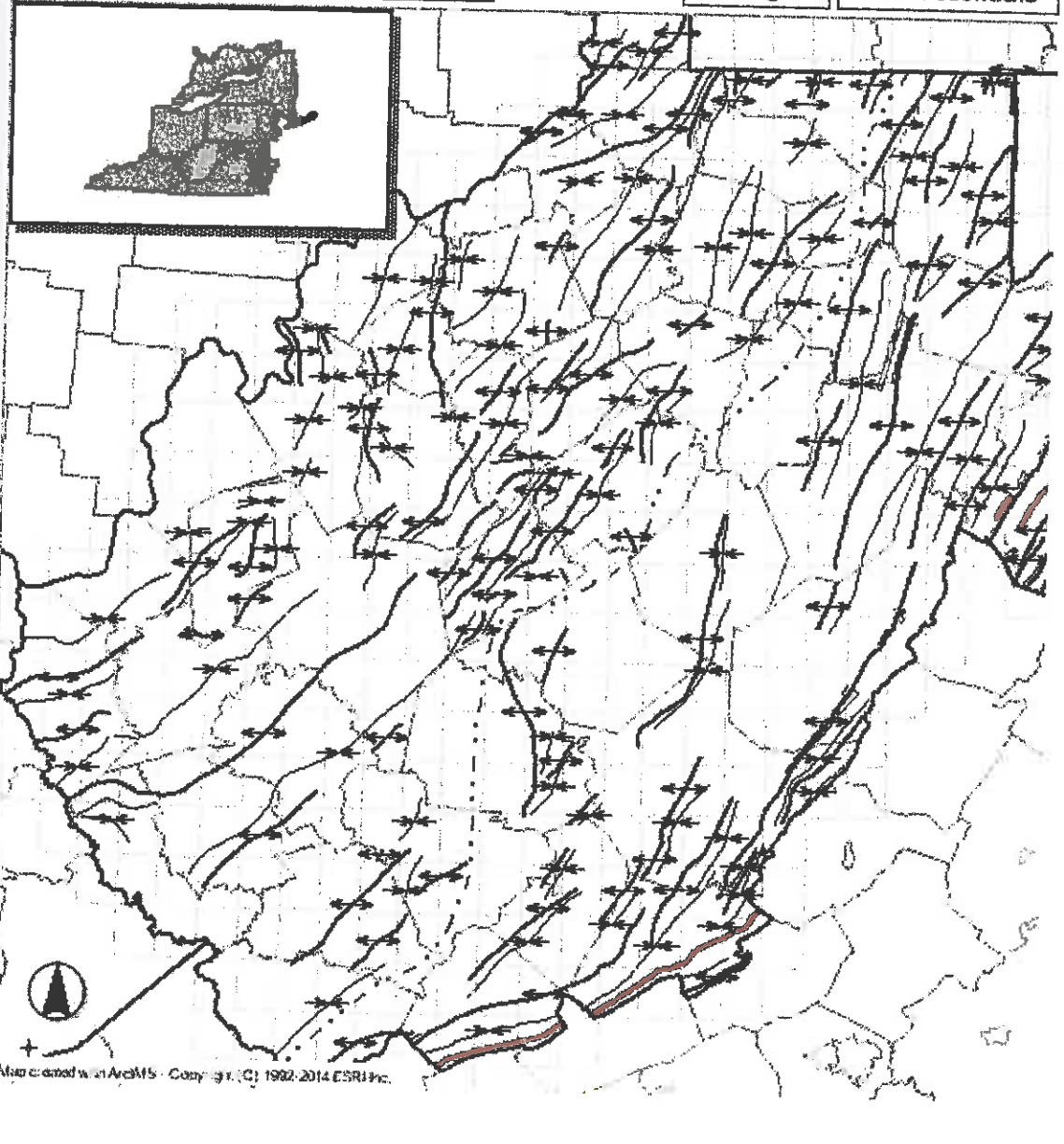
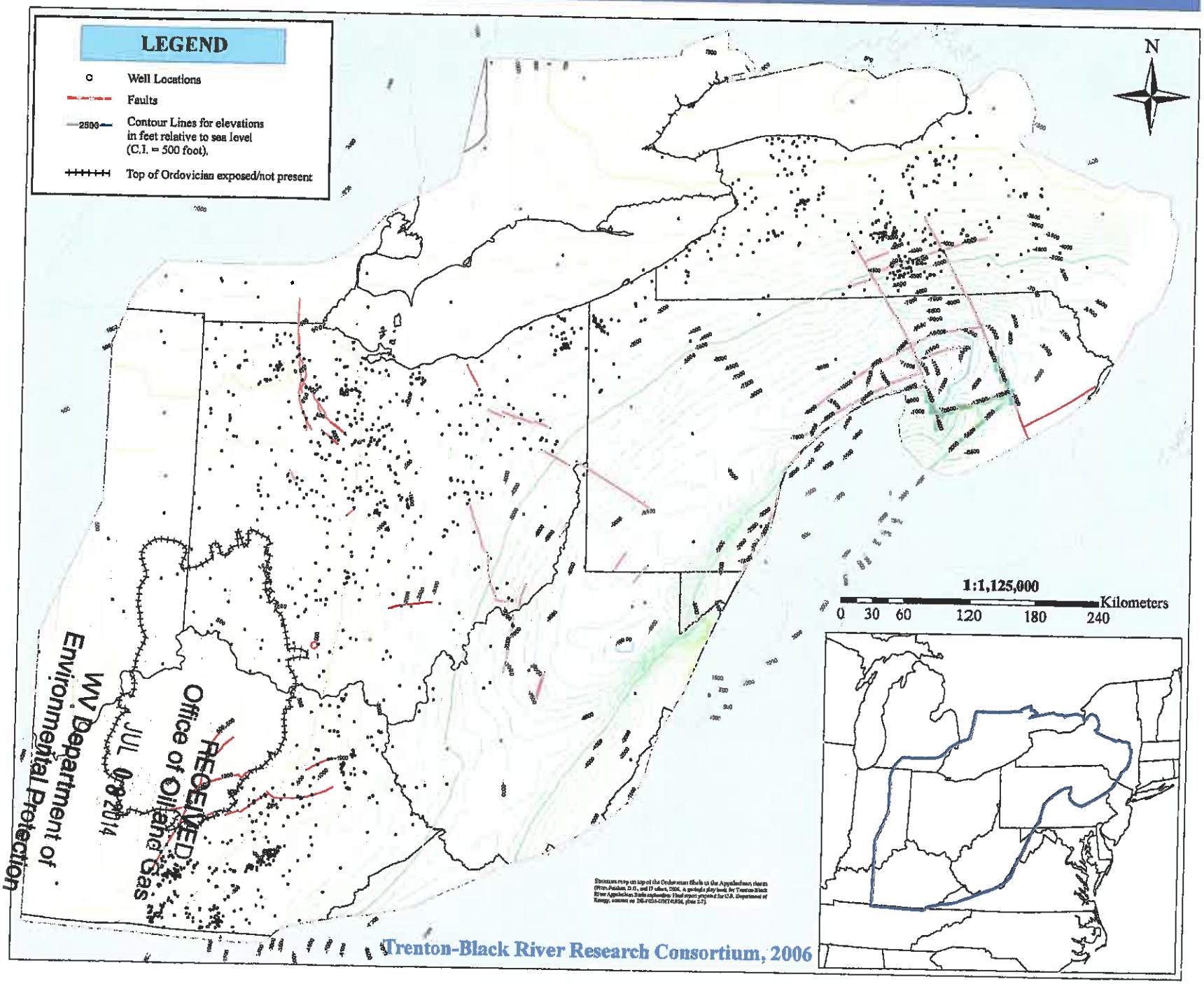
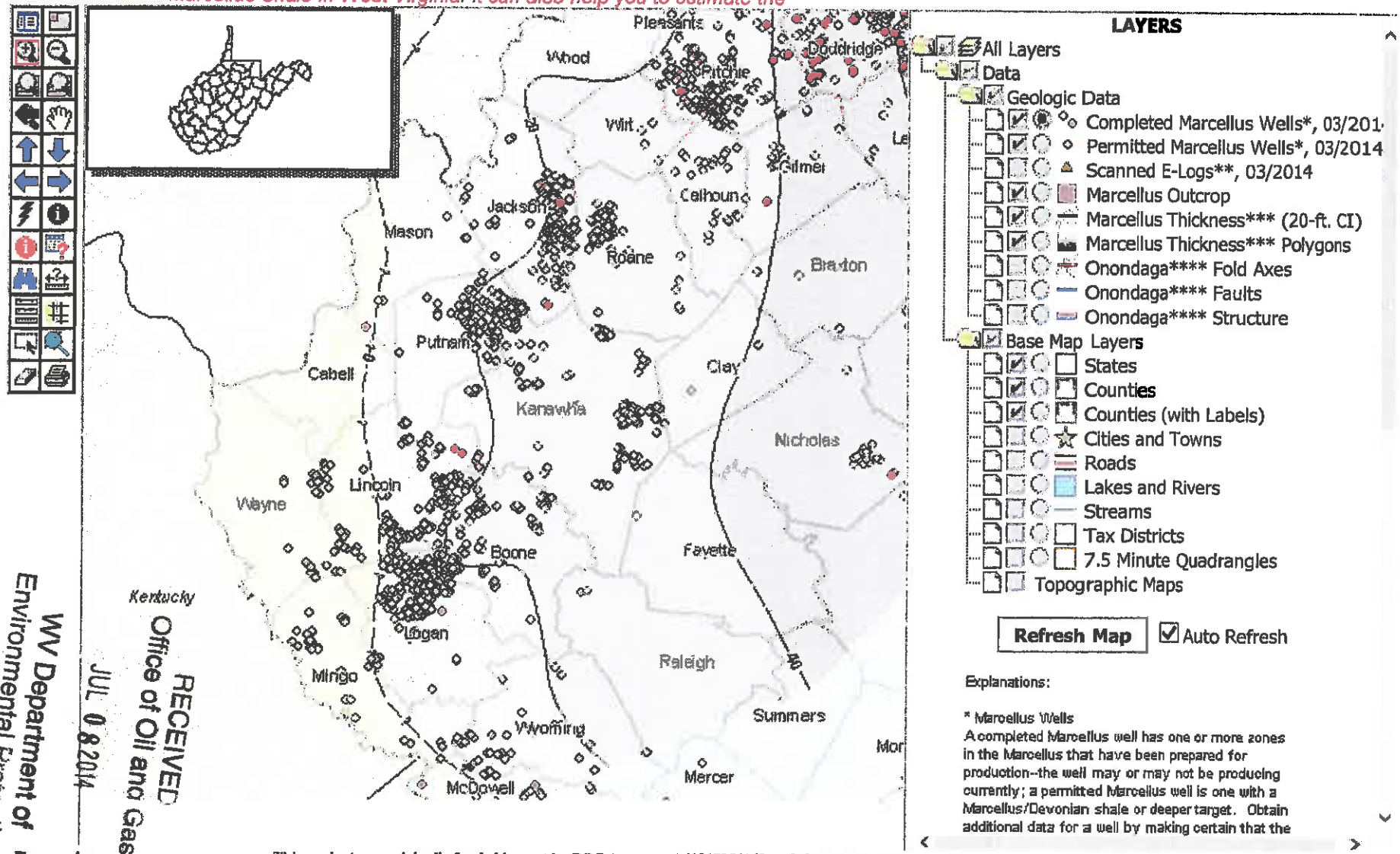


Plate 2-7 : Structure of the Top of the Ordovician Section

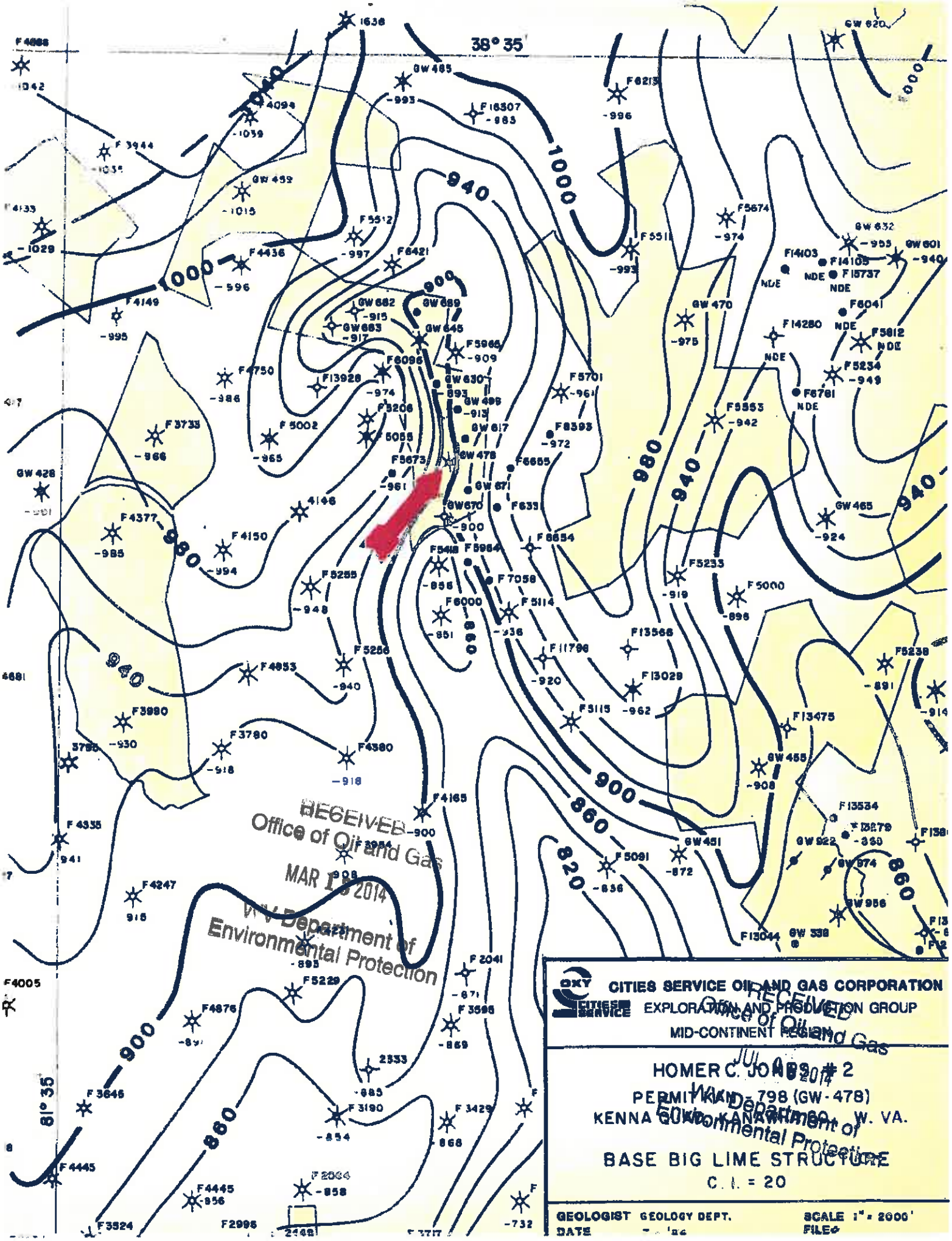


WVGES: Marcellus Shale Mapping System

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



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.

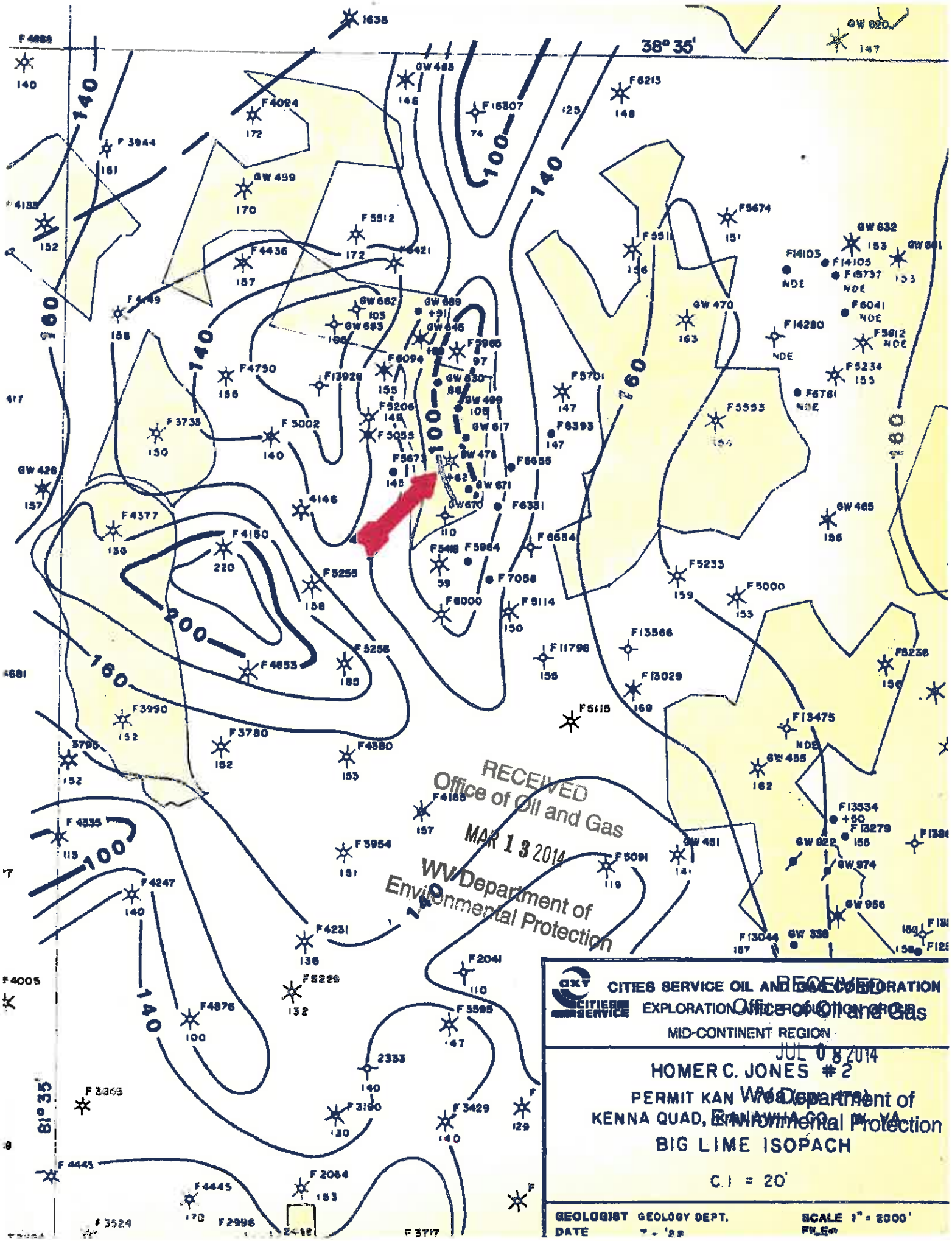


CITIES SERVICE OIL AND GAS CORPORATION
EXPLORATION AND PRODUCTION GROUP
MID-CONTINENT REGION

HOMER C. JONES # 2
PERMIT KAN-798 (GW-478)
KENNA QUADRANGLE, W. VA.

BASE BIG LIME STRUCTURE
C. I. = 20

GEOLOGIST GEOLOGY DEPT.
DATE
SCALE 1" = 2000'
FILE


38° 35'
81° 35'
140
160
100
200
RECEIVED
Office of Oil and Gas
MAR 13 2014
WV Department of
Environmental Protection
CITIES SERVICE OIL AND GAS CORPORATION
EXPLORATION AND PRODUCTION GROUP
MID-CONTINENT REGION
HOMER C. JONES #2
PERMIT KAN
KENNA QUAD, KANAWHA CO., W. VA.
BIG LIME ISOPACH
C.I. = 20'
GEOLOGIST GEOLOGY DEPT.
DATE
SCALE 1" = 2000'
RECEIVED
Office of Oil and Gas
JUL 08 2014
WV Department of
Environmental Protection

Left message Richard Lul[illegible]
[illegible] 984-[illegible]
[illegible] 572-4276

Kermit Tyree – Base Petroleum Disposal Well Test

Date – 12/15/09

- no pressure change between readings
- o.k.

Jones Well – 47-039-00798

39 - 00798

8:23 a.m.
- Shot fluid level down annulus prior to injecting fluid down 3" tubing
- Shot indicated fluid level @ **638.56'** from surface
- Noted flow meter @ 39951 bbls
- Injected fluid down tubing for 1 hour

9:23 a.m.
- Noted flow meter @ 39953 bbls (total metered fluid @ 2 bbl)
- Closed valves on tubing, Shot second fluid level down annulus
- Shot indicated fluid level @ **641.35'** from surface
- Open tubing valve to Inject fluid

1:30 p.m.
- Arrived on location, fluid was being injecting down tubing
- Closed valves on tubing
- Noted flow meter @ 39957 bbls (total metered fluid @ 4 bbl)
- Shot third fluid level down annulus
- Shot indicated fluid level @ **642.02'** from surface

Note: Used Acoustic Velocity method of fluid depth determination on each shot with a common gas gravity of 0.600.

Test Summary:

A total of three fluid levels were taken during the Injection test. The total amount of fluid injected during the test was 6 bbls based on the in line flow meter. The first fluid level taken, indicated the fluid level @ 638.56' from surface. After one hour of fluid injection (2 bbl) the second fluid level indicated the fluid level @ 641.35' from surface, a change of 2.79'. The last fluid level was taken after four hours of fluid injection (4 bbls) which indicated the fluid level @ 642.02' from surface, a change of 0.67'. Also during the test, the annulus pressure remained at less than one psi.

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Office of Oil and Gas

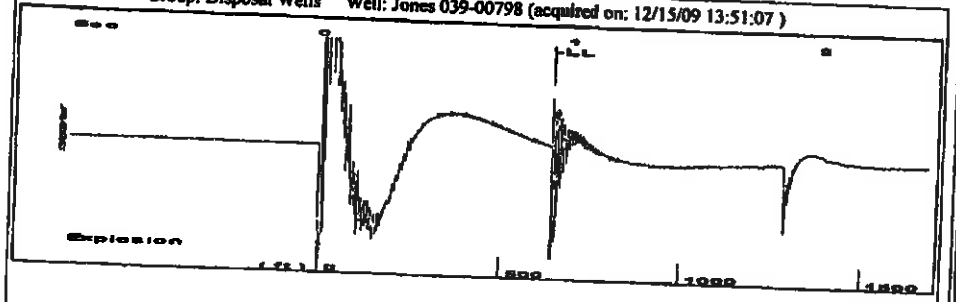
JUL 0 8 2014

WV Department of
Environmental Protection

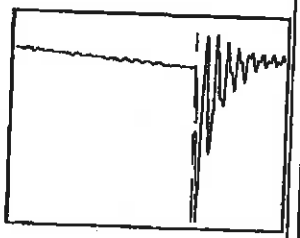
NM AT ST 11Y

39-00798

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 13:51:07)



Time 0.925 sec
Joints 20.2531 Jts
Depth 642.02 ft

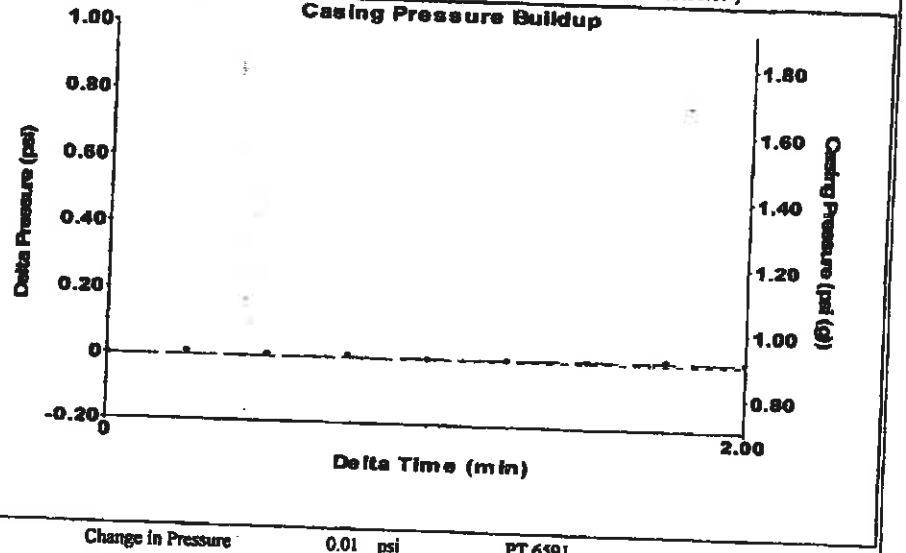


Liquid level calculated with
user supplied Acoustic Velocity

Acoustic Velocity 1388.16 ft/s

Analysis Method: Acoustic Velocity

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 13:51:07)



Change in Pressure 0.01 psi
Change in Time 2.00 min

PT 6591
Range 0 - ? psi

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 13:51:07)

Production

	Current	Potential	
Oil	-*-	-*-	BBL/D
Water	-*-	-*-	BBL/D
Gas	-*-	-*-	Mscf/D

IPR Method Vogel
PBHP/SBHP -*-
Production Efficiency 0.0

Oil 40 deg.API
Water 1.05 Sp.Gr.H2O
Gas 0.60 Sp.Gr.AIR

Acoustic Velocity 1388.16 ft/s

Formation Submergence
Total Gaseous Liquid Column HT(TVD) 973 ft
Equivalent Gas-Free Liquid HT(TVD) 973 ft

Acoustic Test

Casing Pressure
0.9 psi (g)
Casing Pressure Buildup
0.008 psi
2.00 min
Gas/Liquid Interface Pressure
1.1 psi (g)

Liquid Level Depth
642.02 ft

Tubing Intake Depth
1615.00 ft
Formation Depth
1615.00 ft

Producing

Annular
Gas Flow
0 Mscf/D
% Liquid
100 %

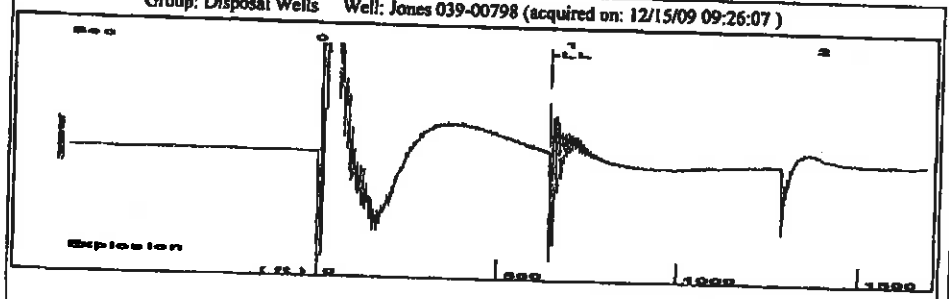
Tubing Intake
341.7 psi (g)
Producing BHP
341.7 psi (g)
Static BHP
-*- psi (g)

Entered Acoustic Velocity for Liquid Level depth determination

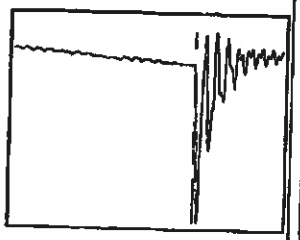
NM AT ST 11Y

39-00798

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 09:26:07)



Time 0.924 sec
Joints 20.2317 Jts
Depth 641.35 ft

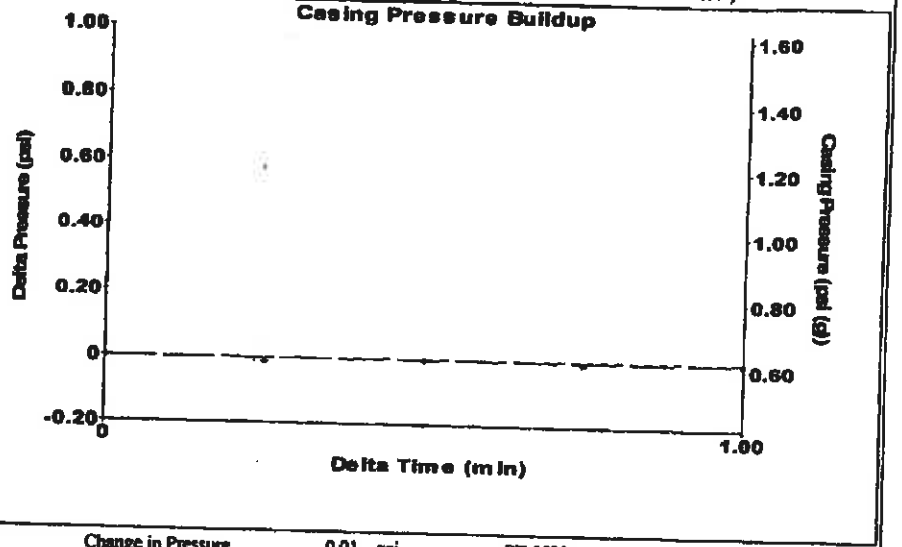


Liquid level calculated with
user supplied Acoustic Velocity

Acoustic Velocity 1388.19 ft/s

Analysis Method: Acoustic Velocity

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 09:26:07)



Change in Pressure -0.01 psi
Change in Time 1.00 min

PT 6591
Range 0 - ? psi

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 09:26:07)

Production

	Current	Potential	
Oil	-*-	-*-	BBL/D
Water	-*-	-*-	BBL/D
Gas	-*-	-*-	Mscf/D

IPR Method Vogel
PBHP/SBHP -*-
Production Efficiency 0.0

Oil 40 deg.API
Water 1.05 Sp.Gr.Rel
Gas 0.60 Sp.Gr.AIR

Acoustic Velocity 1388.19 ft/s

Casing Pressure
0.6 psi (g)
Casing Pressure Buildup
-0.006 psi
1.00 min
Gas/Liquid Interface Pressure
0.8 psi (g)

Liquid Level Depth
641.35 ft

Tubing Intake Depth
1615.00 ft
Formation Depth
1615.00 ft

Producing

Annular
Gas Flow
0 Mscf/D
% Liquid
100 %

Tubing Intake
341.7 psi (g)
Producing BHP
341.7 psi (g)
Static BHP
-*- psi (g)

Formation Submergence
Total Gas Gas Liquid Column HT (TGLC) 974 ft
Equivalent Gas Free Liquid HT (TVD) 974 ft

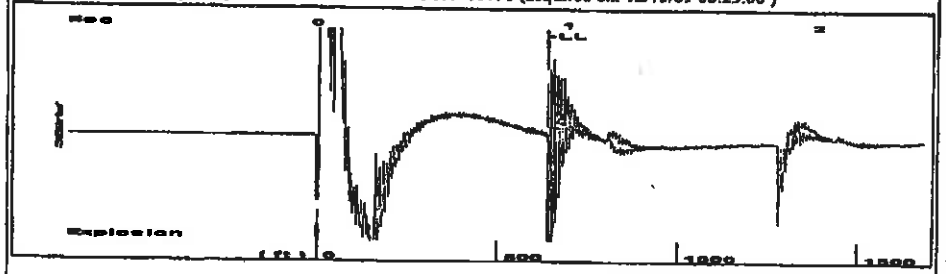
Acoustic Velocity

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 09:26:07)

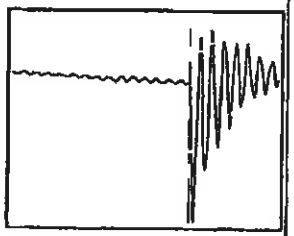
Entered Acoustic Velocity for Liquid Level depth determination

39-00798

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 08:23:00)



Time 0.92 sec
Joints 20.1438 Jts
Depth 638.56 ft

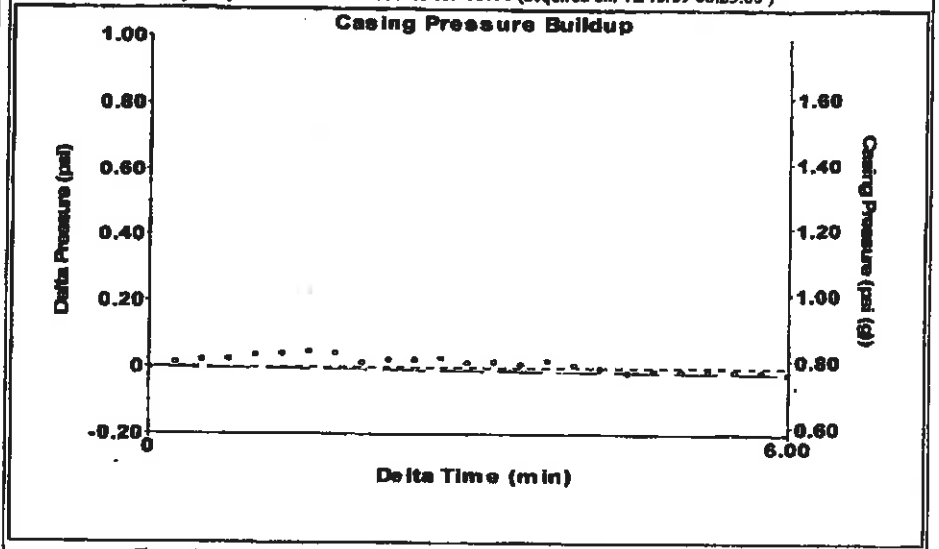


Liquid level calculated with
user supplied Acoustic Velocity

Acoustic Velocity 1388.17 ft/s

Analysis Method: Acoustic Velocity

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 08:23:00)



Change in Pressure -0.02 psi
Change in Time 6.00 min

PT 6591
Range 0 - ? psi

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 08:23:00)

Production

	Current	Potential	
Oil	-*-	-*-	BBL/D
Water	-*-	-*-	BBL/D
Gas	-*-	-*-	Mscf/D

IPR Method Vogel
PBHP/SBHP -*-
Production Efficiency 0.0

Oil 40 deg API
Water 1.05 Sp.Gr. H2O
Gas 0.60 Sp.Gr. AIR

Acoustic Velocity 1388.17 ft/s

Formation Submergence 976 ft
Total Gaseous Liquid Column (TGLCVD) 976 ft
Equivalent Gas Free Liquid (EGFLCVD)

Acoustic Test

Casing Pressure
0.8 psi (g)
Casing Pressure Buildup
-0.019 psi
6.00 min
Gas/Liquid Interface Pressure
1.0 psi (g)

Liquid Level Depth
638.56 ft

Tubing Intake Depth
1615.00 ft
Formation Depth
1615.00 ft

Producing

Annular
Gas Flow
0 Mscf/D
% Liquid
100 %

Tubing Intake
342.8 psi (g)
Producing BHP
342.8 psi (g)
Static BHP
-*- psi (g)

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 08:23:00)

Entered Acoustic Velocity for Liquid Level depth determination

APPENDIX H

GROUNDWATER PROTECTION PLAN

Facility Name: Base Petroleum Inc. Jones #2 SWD

County: Kanawha

Facility Location:

Postal Service Address:	Branch of Leatherwood Creek in the Poca District	
Latitude and Longitude:	38.564137 -81.559247	

Contact Information:

Person:	John B. Wilcox
Phone Number:	(304) 757-2827
E-mail Address:	jhnwilcox@aol.com

Date: 6/27/14

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

Storage of produced fluids until pumped into disposal well and the operation of the disposal well

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

The storage tanks have secondary containment and are visited by well operator daily and checked. This disposal well is constructed, tested, operated and monitored to assure protection of groundwater.

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

No new equipment or operations are anticipated for this facility.

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 the 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.

Employees will be given instruction and training in the recognition of groundwater contamination and the potential sources of contamination. Training will also be provided in the methods of preventing contamination and methods for dealing with potential sources of contamination.

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

Date Person making inspection Any finding of contamination sources Actions taken to eliminate sources Status and condition of water contamination prevention structures Any findings of required further actions

Signature: John B Wilcox

Date: 7/7/14

(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
UIC2D0390798
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

RECEIVED
Office of Oil and Gas
JUL 08 2014
WV Department of
Environmental Protection

Michael W. Lewis, LLC
Independent Petroleum, Regulatory and Environmental Consultants
12 Jonsen Drive, Charleston WV 25312
304-382-5804
mikelewis@michaelwlewisllc.com

October 25, 2014

Mr. Zachary Stevison, ERS
WVDEP
Office of Oil and Gas
602 57th Street. SE
Charleston, WV 25304

Dear Mr. Stevison:

This letter is in response to your request to address the deficiencies for the Jones # A-2 permit # UIC2D0390798 renewal application.

1. Groundwater protection fees are provided
2. Section 5 has been updated to address the current operations and activities to be conducted at the facility.
3. An aerial map as well as a drawing of the facility has been provided in order to show the on the ground conditions at the site.
4. Appendix B is provided.
5. An updated Appendix C has been provided.
6. A drawing of the secondary containment and calculations of the secondary containment is provided.
7. The results of a previous mechanical integrity test are provided. Additional mechanical integrity test will be conducted every 5 years
8. The water quality reports along with chain of custody are provided.
9. Corrections to the GPP have been made. A GPP inspection form is attached and will be used for quarterly inspections of all elements of the GPP.
10. Section 12 has been completed to provide plugging details of the injection well.
11. A site security plan has been provided in appendix J.
12. Attached is information on the injection zone and the confining zone which was submitted previously and on file and available to the OOG along with log sections showing the injection zone and points of contact in yellow and the confining zone in blue.
13. The structure and isopach map of the confining zone have the orientation and scale information added.
14. This well has been used for many years to dispose of produced water coming from essentially the same zone. No problems with compatibility of fluids have occurred.

15. 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.
16. A letter from operator Kermit Tyree is provided to address the hydrostatic fluid level
17. In the event that the Jones 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

Section 3. Applicant Information

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

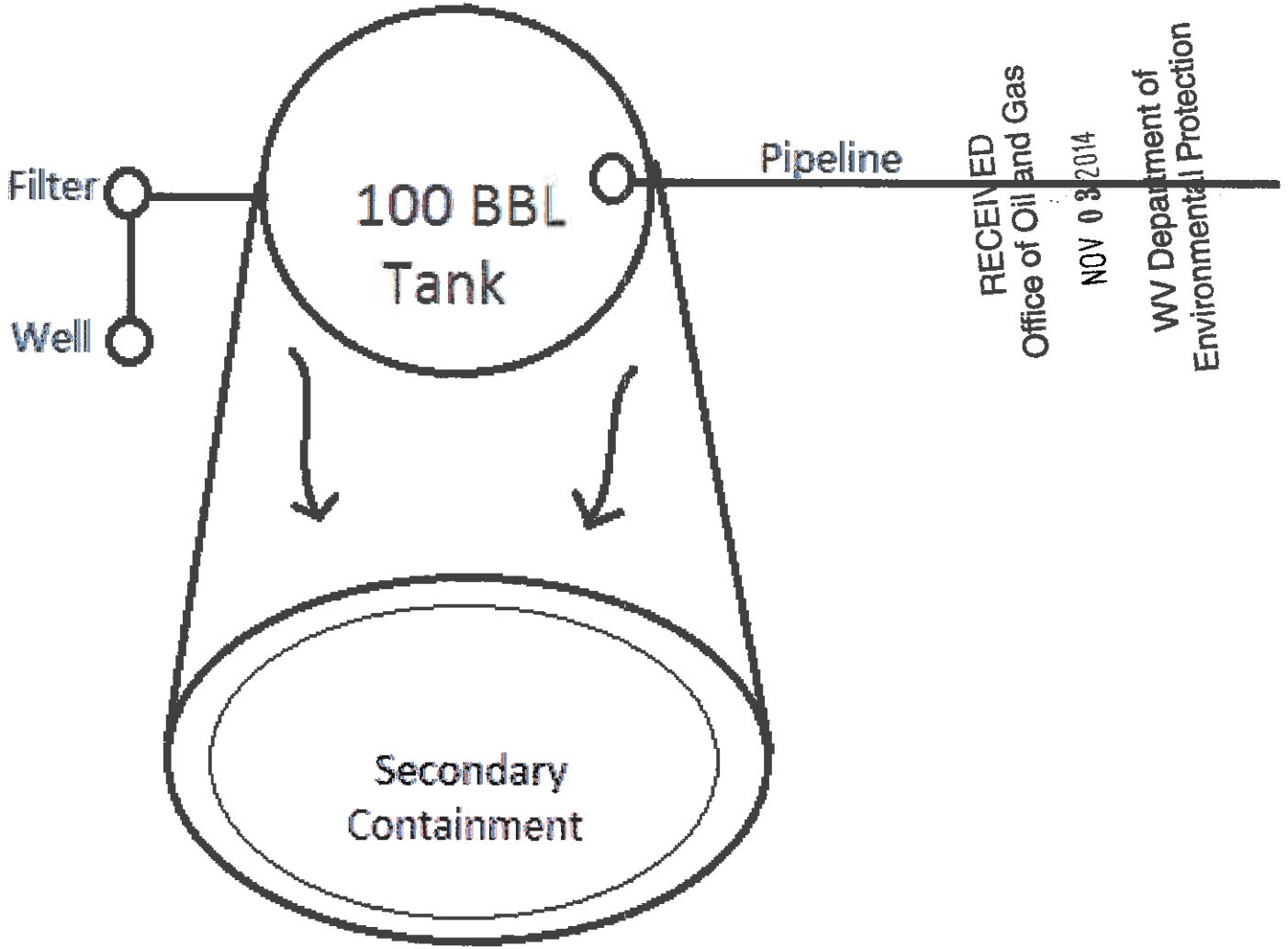
SIC code: ■ 1311 (2D, 2H, 2R) ☐ 1479 (3S) ☐ OTHER (explain):

Section 4. Applicant / Activity Request and Type:

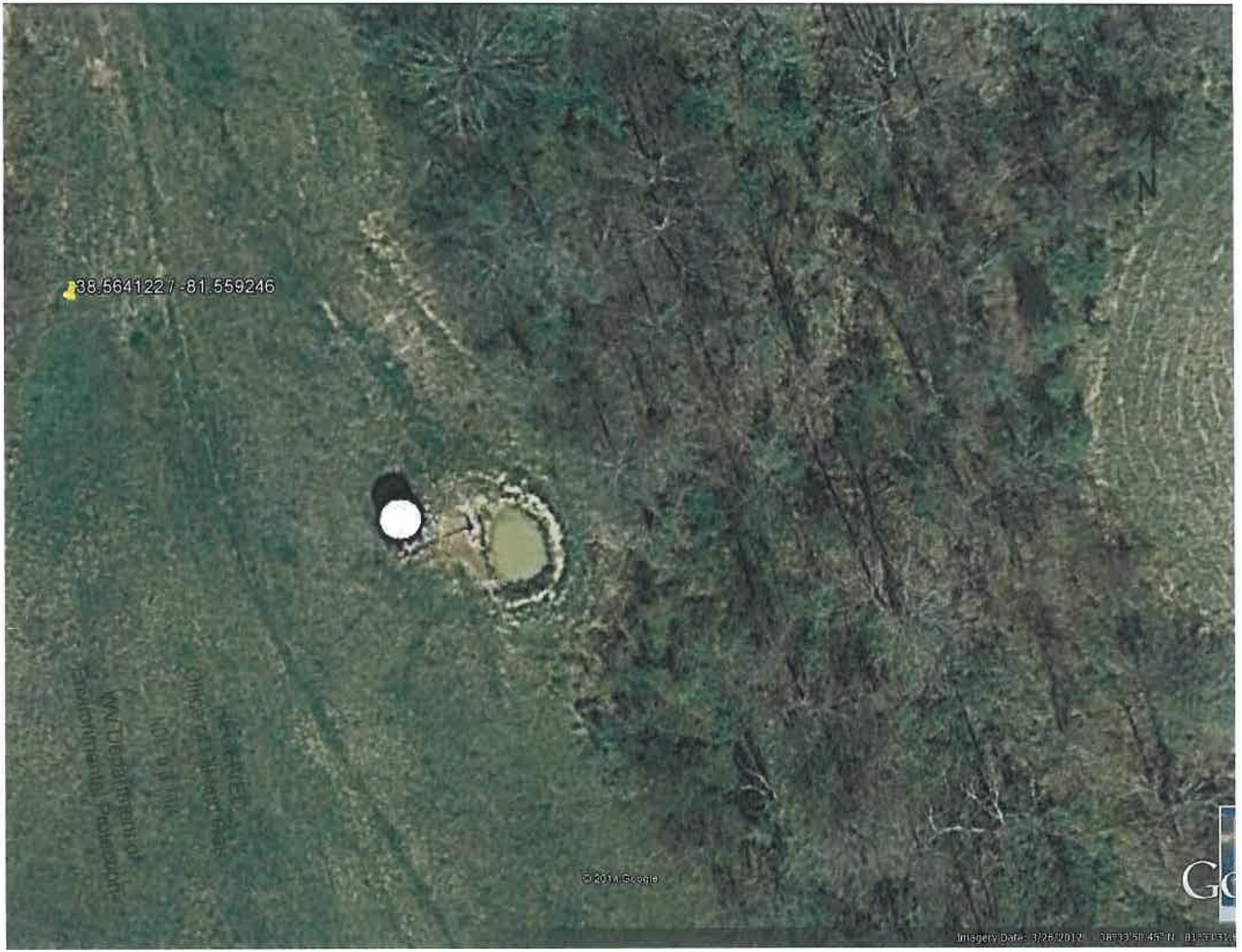
A. Apply for a new UIC Permit: ☐ 2D ☐ 2H ☐ 2R ☐ 3S
B. Reissue existing UIC Permit: ■ 2D ☐ 2H ☐ 2R ☐ 3S
C. Modify existing UIC Permit: ☐ 2D ☐ 2H ☐ 2R ☐ 3S
(Submit only documentation pertaining to the modification request)
2D COMMERCIAL FACILITY: ☐ YES ■ NO

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

Base Petroleum, Inc. operates the Jones #A-2 disposal well in Kanawha County, WV as a private disposal facility in the central West Virginia area. The facility receives produced brine water and pit fluids from Base Petroleum by truck. All trucking operations are hauled by Kermit Tyree Contracting who also operates the disposal facility for Base Petroleum. Kermit Tyree Contracting will maintain the facility as well as keep the facility secured against public access. Safety training and groundwater protection measures will also be provided for all employees by Kermit Tyree Contracting



UIC2D0390798


38.564122 / -81.559246
N
Imagery Date: 3/25/2012

APPENDIX B
Storage Tank Inventory

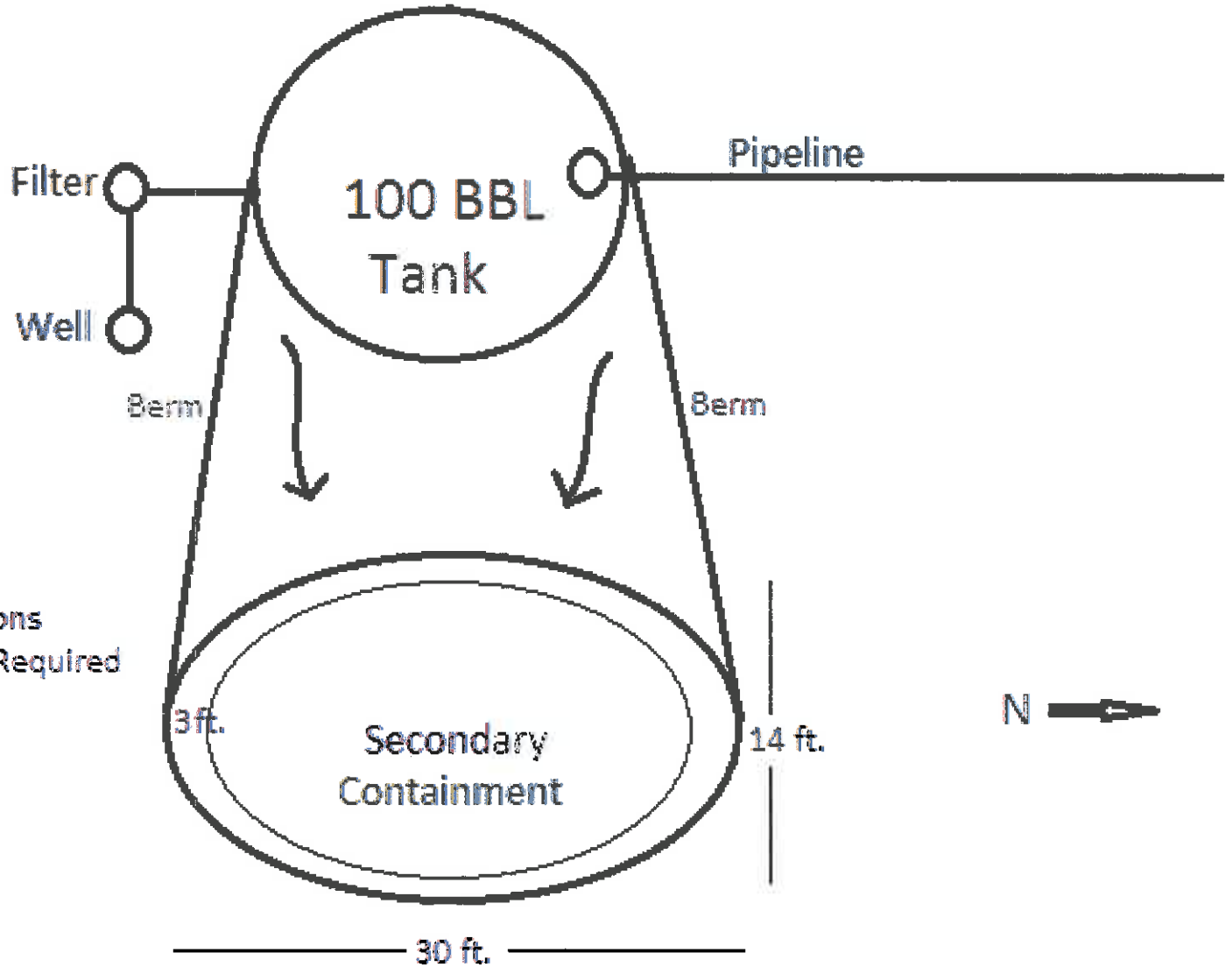
API #	Tank ID	Tank Location (UTM NAD 83 Meters)		Installation Date	Tank Age (Months)	Construction Material (Steel, plastic, etc.)	Capacity (gallons)	Type of Fluid Stored	Volume of Fluid Stored (gallons)	Tank Type Single/Double Wall
		Northing	Easting							
47-039-00798	1	4268558.4	451278	pre 2000	168	Steel	4200	Brine	4200	Single

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
039-00908	Oil	Active	4268929.3	451151.4	Y	Y	1611	806.1
039-00834	Oil	Active	4268880	451328.1	Y	Y	1592	784.0
039-00869	Oil	Active	4268751.7	451246.9	Y	Y	1546	738.8
039-00881	Gas,Oil	Shut-in	4268716.4	450913	Y	Y	1681	716
039-00883	Oil	Active	4268718.6	451407.7	Y	Y	1536	742.5
039-00909	Unknown	Abandoned	42688669.7	451503.9	Unknown	Unknown	Unknown	Unknown
039-00798	Injection	Active	4268558.4	45127	Y	Y	1531	723
039-00952	Unknown	Shut-in	4268463.7	451633.6	Y	Y	Unknown	665
039-00939	Oil	Active	4268416.5	451407	Y	Y	1468	665.7
039-00839	Unknown	Shut-in	4268479.5	451020	Y	Y	1603	641
039-00938	Unknown	Shut-in	4268294.8	451267.2	Y	Y	1440	648

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



Secondary Containment
LxWxHx7.48 Gallons/Cu.Ft.
20x14x3x7.48=6283.2 Gallons
100x42x1.1=4620 Gallons Required

UIC2D0390798

Left message Richard Lilly
1-o- 984-[illegible]
2-o- 572-4276

Kermit Tyree – Base Petroleum Disposal Well Test

Date – 12/15/09

- no pressure change between readings
- O.K.

Jones Well – 47-039-00798

39 - 00798

8:23 a.m.
- Shot fluid level down annulus prior to injecting fluid down 3" tubing
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- Injected fluid down tubing for 1 hour

9:23 a.m.
- Noted flow meter @ 39953 bbls (total metered fluid @ 2 bbl)
- Closed valves on tubing, Shot second fluid level down annulus
- Shot indicated fluid level @ **641.35'** from surface
- Open tubing valve to Inject fluid

1:30 p.m.
- Arrived on location, fluid was being injecting down tubing
- Closed valves on tubing
- Noted flow meter @ 39957 bbls (total metered fluid @ 4 bbl)
- Shot third fluid level down annulus
- Shot indicated fluid level @ **642.02'** from surface

Note: Used Acoustic Velocity method of fluid depth determination on each shot with a common gas gravity of 0.600.

Test Summary:

A total of three fluid levels were taken during the Injection test. The total amount of fluid injected during the test was 6 bbls based on the in line flow meter. The first fluid level taken, indicated the fluid level @ 638.56' from surface. After one hour of fluid injection (2 bbl) the second fluid level indicated the fluid level @ 641.35' from surface, a change of 2.79'. The last fluid level was taken after four hours of fluid injection (4 bbls) which indicated the fluid level @ 642.02' from surface, a change of 0.67'. Also during the test, the annulus pressure remained at less than one psi.

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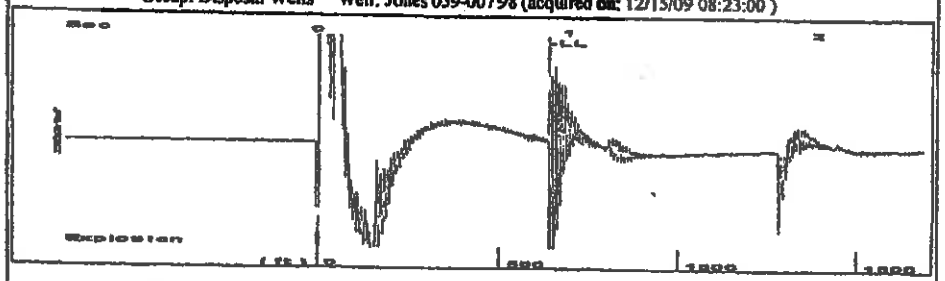
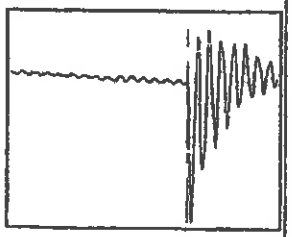
NM AT ST 11Y

39-00798

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 08:23:00)



Time 0.92 sec
Joints 20.1438 Jts
Depth 638.56 ft

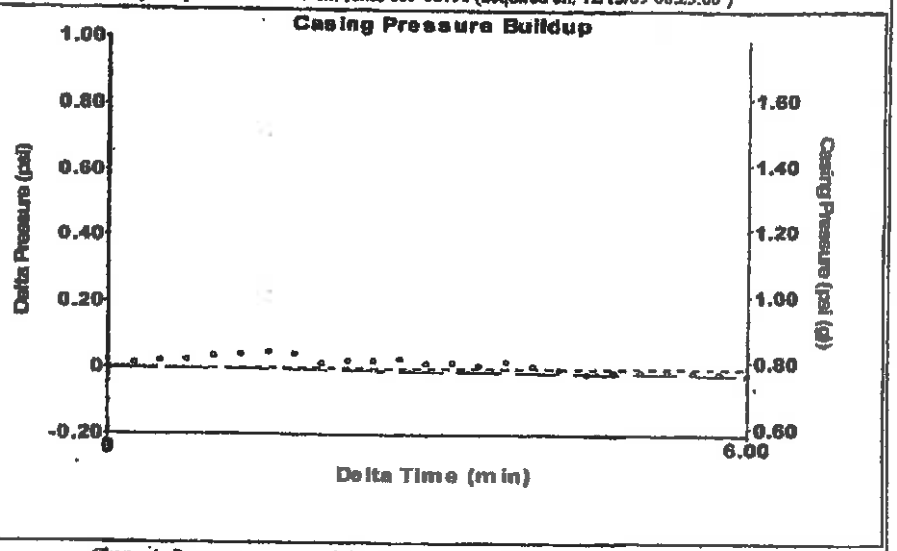


Liquid level calculated with
user supplied Acoustic Velocity

Acoustic Velocity 1388.17 ft/s

Analysis Method: Acoustic Velocity

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 08:23:00)



Change in Pressure -0.02 psi
Change in Time 6.00 min

PT 6591
Range 0 - ? psi

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 08:23:00)

Production

	Current	Potential	
Oil	-*-	-*-	BBL/D
Water	-*-	-*-	BBL/D
Gas	-*-	-*-	Mscf/D

IPR Method Vogel
PBHP/SBHP -*-
Production Efficiency 0.0

Oil 40 deg API
Water 1.05 Spec.Hrv
Gas 0.60 Spec.Air

Acoustic Velocity 1388.17 ft/s

Formation Submergence
Total Gaseous Liquid Column HT (TVD) 976 ft
Equivalent Gas Free Liquid HT (TVD) 976 ft

Acoustic Test

Casing Pressure
0.8 psi (g)
Casing Pressure Buildup
-0.019 psi
6.00 min
Gas/Liquid Interface Pressure
1.0 psi (g)

Liquid Level Depth
638.56 ft

Tubing Intake Depth
1615.00 ft
Formation Depth
1615.00 ft

Producing

Annular
Gas Flow
0 Mscf/D
% Liquid
100 %

Tubing Intake
342.8 psi (g)
Producing BHP
342.8 psi (g)
Static BHP
-*- psi (g)

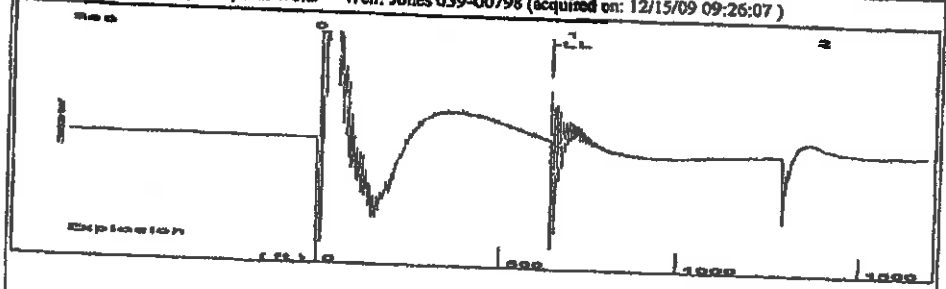
Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 08:23:00)

Entered Acoustic Velocity for Liquid Level depth determination

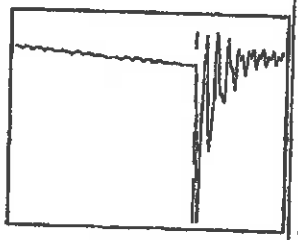
NM AT ST 11Y

39-00798

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 09:26:07)



Time 0.924 sec
Joints 20.2317 Jts
Depth 641.35 ft

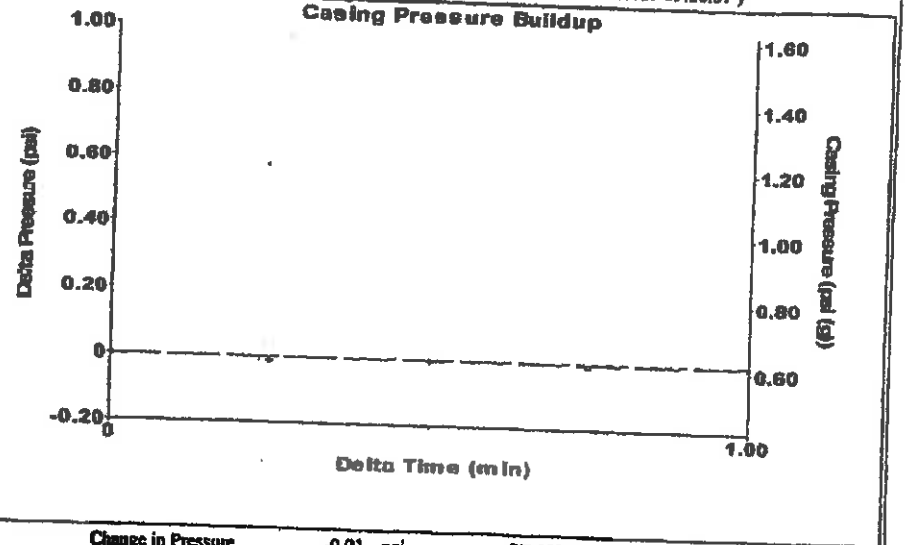


Liquid level calculated with
user supplied Acoustic Velocity

Acoustic Velocity 1388.19 ft/s

Analysis Method: Acoustic Velocity

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 09:26:07)



Change in Pressure -0.01 psi
Change in Time 1.00 min

PT 6591
Range 0 - ? psi

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 09:26:07)

Production

	Current	Potential	
Oil	-*-	-*-	BBL/D
Water	-*-	-*-	BBL/D
Gas	-*-	-*-	Mscf/D

IPR Method Vogel
PBHP/SBHP -*-
Production Efficiency 0.0

Oil 40 deg.API
Water 1.05 Sp.Gr.H2O
Gas 0.60 Sp.Gr.AIR

Acoustic Velocity 1388.19 ft/s

Formation Submergence 974 ft
Total Gaseous Liquid Column Ht (TVD) 974 ft
Equivalent Gas Free Liquid Ht (TVD)

Acoustic Test

Casing Pressure
0.6 psi (g)
Casing Pressure Buildup
-0.006 psi
1.00 min
Gas/Liquid Interface Pressure
0.8 psi (g)

Liquid Level Depth
641.35 ft

Tubing Intake Depth
1615.00 ft
Formation Depth
1615.00 ft

Producing

Annular
Gas Flow
0 Mscf/D
% Liquid
100 %

Tubing Intake
341.7 psi (g)
Producing BHP
341.7 psi (g)
Static BHP
-*- psi (g)

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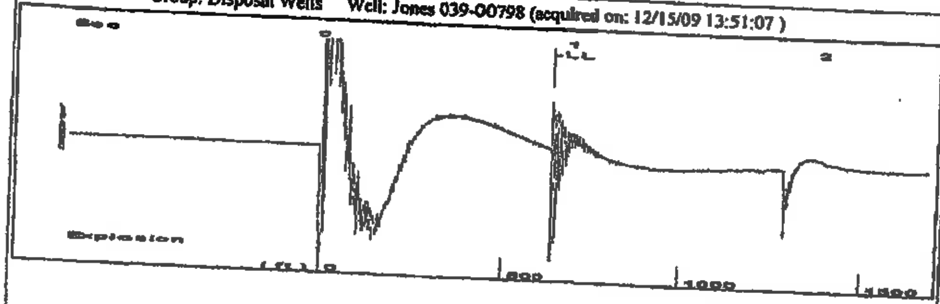
Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 09:26:07)

Entered Acoustic Velocity for Liquid Level depth determination

39 - 00798

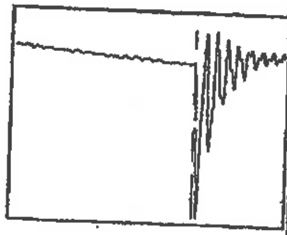
Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 13:51:07)



Time	0.925	sec
Joints	20.2531	Jts
Depth	642.02	ft

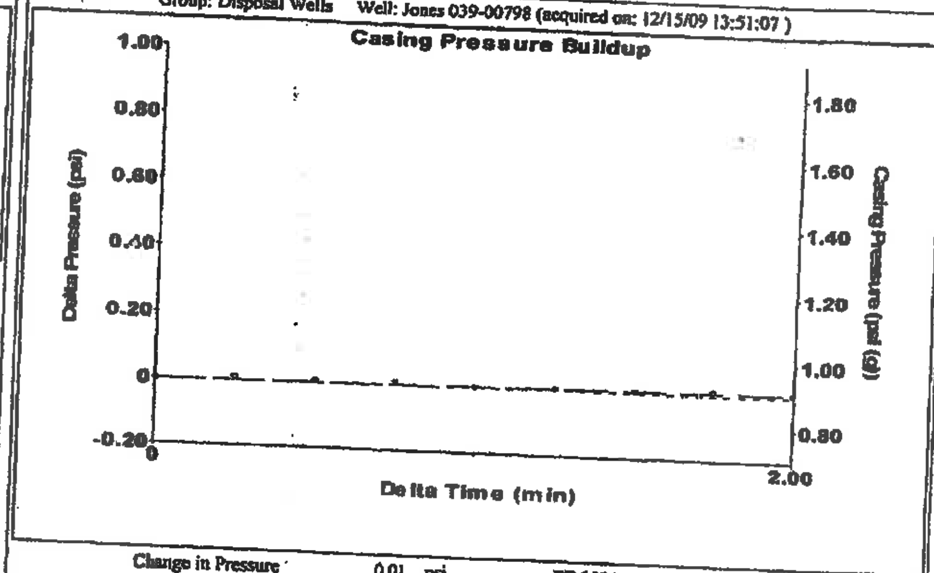
Liquid level calculated with
user supplied Acoustic Velocity

Acoustic Velocity 1388.16 ft/s



Analysis Method: Acoustic Velocity

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 13:51:07)



Change in Pressure 0.01 psi PT 6591
Change in Time 2.00 min Range 0 - 7 psi

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 13:51:07)

Production
Current / Potential

	Current	Potential	
Oil	-*-	-*-	BBL/D
Water	-*-	-*-	BBL/D
Gas	-*-	-*-	Mscf/D

IPR Method Vogel
PBHP/SBHP -*-
Production Efficiency 0.0

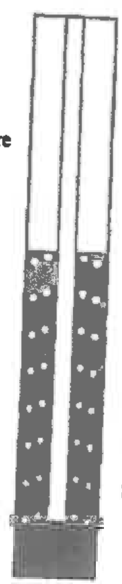
Oil 40 deg.API
Water 1.05 Sp.Gr.H2O
Gas 0.60 Sp.Gr.Air

Acoustic Velocity 1388.16 ft/s

Casing Pressure
0.9 psi (g)
Casing Pressure Buildup
0.008 psi
2.00 min
Gas/Liquid Interface Pressure
1.1 psi (g)

Liquid Level Depth
642.02 ft

Tubing Intake Depth
1615.00 ft
Formation Depth
1615.00 ft



Producing

Annular
Gas Flow
0 Mscf/D
% Liquid
100 %

Formation Submergence
Total Gaseous Liquid Column HT (TVD) 973 ft
Equivalent Gas Free Liquid HT (TVD) 973 ft

Acoustic Test

Tubing Intake
341.7 psi (g)
Producing BHP
341.7 psi (g)
Static BHP
-*- psi (g)

Group: Disposal Wells Well: Jones 039-00798 (acquired on: 12/15/09 13:51:07)

Entered Acoustic Velocity for Liquid Level depth determination

Sturm Environmental Services

COMPANY: MICHAEL LEWIS

SAMPLE ID: BASE PETROLEUM

SAMPLED BY: M. LEWIS

DATE/TIME SAMPLED:* 02-19-14 1345

DATE/TIME RECEIVED: 02-20-14 1446

SAMPLE ID	pH units	SPEC GRAVITY calc.	TSS mg/L	TDS mg/L	Cl^- mg/L	Na mg/L	Fe mg/L	Mn mg/L	TOC mg/L	Ba mg/L
YOUNG	7.8	.9980	<4	315	17.9	97.6	.28	.056	<1.0	.191

*Client Provided

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

APPROVED D. Bennett

Storm Environmental Services

COMPANY: MICHAEL LEWIS

SAMPLE ID: BASE PETROLEUM

SAMPLED BY: M. LEWIS

DATE/TIME SAMPLED:* 02-19-14 1315

DATE/TIME RECEIVED: 02-20-14 1446

SAMPLE ID	pH units	SPEC GRAVITY calc.	TSS mg/L	TDS mg/L	Cl mg/L	Na mg/L	Fe mg/L	Mn mg/L	TOC mg/L	Ba mg/L
BURDETTE	7.7	.9993	<4	256	7.40	108.	.26	.037	1.3	.042

*Client Provided

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

APPROVED D. Bruno

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MAR 13 2014
WV Department of
Environmental Protection

RECEIVED
Office of Oil and Gas
NOV 03 2014
WV Department of
Environmental Protection

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CHARLESTON BRANCH—POST OFFICE BOX 8337 • SOUTH CHARLESTON, WEST VIRGINIA 25303-0337 • (304) 744-9864

Sturm Environmental Services

COMPANY: MICHAEL LEWIS

SAMPLE ID: BASE PETROLEUM

SAMPLED BY: M. LEWIS

DATE/TIME SAMPLED:* 02-19-14 1330

DATE/TIME RECEIVED: 02-20-14 1446

SAMPLE ID	pH units	SPEC GRAVITY calc.	TSS mg/L	TDS mg/L	Cl^- mg/L	Na mg/L	Fe mg/L	Mn mg/L	TOC mg/L	Ba mg/L
STATER	7.4	.9990	<4	254	11.2	103.	.03	.002	2.4	<.002

*Client Provided

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

APPROVED D. Burns

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Office of Oil and Gas
MAR 19 2014
WV Department of
Environmental Protection

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Office of Oil and Gas
NOV 03 2014
WV Department of
Environmental Protection

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CHARLESTON BRANCH—POST OFFICE BOX 8337 • SOUTH CHARLESTON, WEST VIRGINIA 25303-0337 • (304) 744-9864

Stewart Environmental Services
JOHN W. STURM, PRESIDENT

COMPANY MICHAEL LEWIS

PARAMETER	DATE ANALYZED	ANALYST INITIALS	METHOD	Limit of Quantitation	DETECTION LIMITS (mg/L)
Antimony			SM22nd 3113 B	.010	.0004
Arsenic			SM22nd 3113 B	.010	.0005
Beryllium			SM22nd 3113 B	.001	.0001
Dissolved Beryllium			SM22nd 3113 B	.001	.0001
Cadmium			SM22nd 3113 B	.001	.0001
Dissolved Cadmium			SM22nd 3113 B	.001	.0001
Copper			SM22nd 3113 B	.001	.0001
Dissolved Copper			SM22nd 3113 B	.010	.0006
Lead			SM22nd 3113 B	.010	.0006
Dissolved Lead			SM22nd 3113 B	.010	.0005
Silver			SM22nd 3113 B	.010	.0005
Dissolved Silver			SM22nd 3113 B	.001	.0002
Thallium			SM22nd 3113 B	.001	.0002
Dissolved Thallium			SM22nd 3113 B	.010	.0003
Mercury			SM22nd 3113 B	.010	.0003
Barium	02/28/19	TW	CVAA/EPA 245.1 Rev 3.0-1994	.001	.0002
Beryllium			EPA 200.7 Rev 4.4-1994	1.00	.002
Dissolved Beryllium			EPA 200.7 Rev 4.4-1994	1.00	.001
Boron			EPA 200.7 Rev 4.4-1994	1.00	.001
Cadmium			EPA 200.7 Rev 4.4-1994	1.00	.03
Dissolved Cadmium			EPA 200.7 Rev 4.4-1994	1.00	.001
Cobalt			EPA 200.7 Rev 4.4-1994	1.00	.001
Copper			EPA 200.7 Rev 4.4-1994	1.00	.01
Dissolved Copper			EPA 200.7 Rev 4.4-1994	1.00	.003
Molybdenum			EPA 200.7 Rev 4.4-1994	1.00	.003
Nickel			EPA 200.7 Rev 4.4-1994	1.00	.005
Potassium			EPA 200.7 Rev 4.4-1994	1.00	.03
Dissolved Potassium			EPA 200.7 Rev 4.4-1994	1.00	.01
Silica			EPA 200.7 Rev 4.4-1994	1.00	.01
Dissolved Silicon			EPA 200.7 Rev 4.4-1994	1.00	.02
Silver			EPA 200.7 Rev 4.4-1994	1.00	.02
Dissolved Silver			EPA 200.7 Rev 4.4-1994	1.00	.001
Strontium			EPA 200.7 Rev 4.4-1994	1.00	.001
Tin			EPA 200.7 Rev 4.4-1994	1.00	.001
Titanium			EPA 200.7 Rev 4.4-1994	1.00	.005
Vanadium			EPA 200.7 Rev 4.4-1994	1.00	.001
Bromide	225-14	TES	EPA 200.7 Rev 4.4-1994	1.00	.003
Chlorine Residual (AT LAB)			EPA 300.0 Rev 2.1-1993	1.0	.10
Dissolved Oxygen			SM22nd 4500CL G	1.0	.01
Volatile Suspended Solids			SM22nd 4500 O G		1
Total Solids			EPA 160.4		1
% Solids			SM22nd 2540 B		.01
Ferrous Iron			EPA 160.3		1.0
Ferric Iron			SM22 3500 Fe-D	.60	.02
Chloride			Calculation		.05
Nitrite			SM22nd 4500-Cl-E	1.0	.05
Nitrate			EPA 353.2 Rev 2.0-1993	.05	.004
Nitrite-Nitrate			EPA 353.2 Rev 2.0-1993	.05	
Specific Gravity	2-24-14	SW	EPA 353.2 Rev 2.0-1993	.05	.02
Total Nitrogen			Calculation		
			Calculation		

EPA-United States Environmental Protection Agency, "Method for the Chemical Analysis of Water and Waste," EPA 600/4-79-020, March 1983.
SM-Standard Methods for the Examination of Water and Wastewater, 22nd Edition.

Environmental Services

JOHN W. STURM, PRESIDENT

COMPANY: MICHAEL LEWIS

PARAMETER	DATE ANALYZED	ANALYST INITIALS
pH	2.22.14	KC
Hot Acid		
Mineral Acid		
Alkalinity		
NH_3N		
Settleable Solids		
Turbidity		
Conductivity		
TKN		
TSS – Total Suspended Solids	2.22.14	AB
TDS – Total Dissolved Solids	↓	↓
Sulfate	2-25-14	TES
Chloride	2-25-14	TES
Nitrate		
Nitrite		
Fluoride		
Nitrate-Nitrite		
Ortho-Phosphate		
Aluminum		
Dissolved Aluminum		
Calcium		
Dissolved Calcium		
Chromium		
Dissolved Chromium		
Hardness (calc)		
Iron	02/28/14	TW
Dissolved Iron		
Magnesium		
Dissolved Magnesium		
Manganese	02/28/14	TW
Dissolved Manganese		
Sodium	02/28/14	TW
Zinc (ICP)		
MBAS		
Cyanide		
Ortho-Phosphate		
Phenol		
Sulfide		
Hexavalent Chromium		
TPO_4		
Oil & Grease		
BOD		
COD		
TOC	2-25-14	KC
Selenium (furnace)		
Dissolved Selenium		
Total Recoverable Selenium		
Chromium		
Dissolved Chromium		
Selenium (AFS)		
Total Recoverable Selenium		
Dissolved Selenium		

METHOD	Limit of Quantitation	DETECTION LIMITS (mg/L)
SM22nd 4500 HB	2.0 – 10.0	.1 S.U
SM22nd 2310 B (4a)	20	1
SM22nd 2310, Titrimetric		1
SM22nd 2320 B	20	1
SM22nd 4500NH_3B + SM22th 4500 NH_3C	10	.10
SM 22nd 2540 F		.1 ml/L
SM22nd 2130 B	5.0	.05 NTU
EPA 120.1 Rev-1982	20.	1 µmhos
SM22nd 4500 N org + SM22nd 4500 NH_3C	10.	.10
SM22nd 2540 D		4
SM22nd 2540 C		4
EPA 300.0 Rev 2.1-1993	1.0/ 10.	1.0
EPA 300.0 Rev 2.1-1993	1.0	.50
EPA 300.0 Rev 2.1-1993	.05	.01
EPA 300.0 Rev 2.1-1993	.05	.01
EPA 300.0 Rev 2.1-1993	.05	.01
EPA 300.0 Rev 2.1-1993		.01
EPA 300.0 Rev 2.1-1993	1.0	.05
EPA 200.7 Rev 4.4-1994	1.00	.02
EPA 200.7 Rev.4.4-1994	1.00	.02
EPA 200.7 Rev 4.4-1994	1.00	.10
EPA 200.7 Rev 4.4-1994	1.00	.10
EPA 200.7 Rev 4.4-1994	1.00	.003
EPA 200.7 Rev 4.4-1994	1.00	.003
SM22nd 2340B+EPA 200.7 Rev 4.4-1997		1
EPA 200.7 Rev 4.4-1994	1.00	.02
EPA 200.7 Rev 4.4-1994	1.00	.02
EPA 200.7 Rev 4.4-1994	1.00	.01
EPA 200.7 Rev 4.4-1994	1.00	.01
EPA 200.7 Rev 4.4-1994	1.00	.002
EPA 200.7 Rev 4.4-1994	1.00	.002
EPA 200.7 Rev 4.4-1994	1.00	.03
EPA 200.7 Rev 4.4-1994	1.00	.004
SM22nd 5540C	70	.01
EPA 335.4 Rev 1.0-1993	.005	.002
SM22nd 4500P B.5 + 4500PE	.02	.01
EPA 420.4 1983	.010	.004
SM22nd 4500 S2 F		.50
SM22nd 3500 – Cr-B	.02	.007
SM22nd 4500 P E + SM22th 4500 P B.5	.02	.010
EPA 1664A Gravimetric Extraction	5.0	.0
SM22nd 5210B	3.0	2.0
HACH 8000	20	6.0
SM22nd 5310B	5.0	1.0
SM22nd 3113 B	.010	.0006
SM22nd 3113 B	.010	.0006
SM22nd 3113 B	.010	.0006
SM22nd 3113 B	.010	.0002
SM22nd 3113 B	.010	.0002
SM22nd 3114B	.010	.0006
SM22nd 3114B	.010	.0006
SM22nd 3114B	.010	.0006

EPA-United States Environmental Protection Agency, "Method for the Chemical Analysis of Water and Waste," EPA 600/4-79-020, March 1983.
SM-Standard Methods for the Examination of Water and Wastewater, 22nd Edition.

Sturm Environmental Services

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

REPORT TO: Client Name: Michael Lewis
Address: 12 Jansen Drive
City/State/Zip: Charleston WV 25312
Contact Person: Mike Lewis
Telephone Number: 304-382-5804 Fax No.
Email Address: mikelewis25@aol.com
Sampler Name: (Print) Mike Lewis
Sampler Signature: Michael Lewis
Project Name: Base Petroleum
Special Reporting: [X] Email Results [ ] Fax Results

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

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

1 DAY	2 DAY	3 DAY

Sample ID / Description	COMPOSITE SAMPLE: START DATE	START TIME	END DATE	END TIME	GRAB SAMPLE: DATE	TIME	PRESERVATIVE: Ice	OTHER	HCl	NaOH	H_2SO_4 Plastic	H_2SO_4 Glass	None	HNO_3	MATRIX: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	ANALYZE FOR: Cl, Na, Fe	Mn	Sulfate	TDS, TSS	TPH	O&G	BTEX	TOC	Barium	Bromide	# 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
Jones SWD					2/19/14	1:00															✓	✓	✓	✓	✓	✓	✓	✓	✓							
Burdette					2/19/14	1:15															✓	✓	✓					✓	✓							
Slater					2/19/14	1:30															✓	✓	✓	✓				✓	✓							
Young					2/19/14	1:45															✓	✓	✓	✓				✓	✓							

Comments

Records retained for 5-years

Relinquished by:	Date	Time	Received by:	Date	Time
Mike Lewis	2/20/14	2:46	Brandon	2/19/14	2:45
Brandon	2/20/14	1450	LHL	2-20-14	1450

Laboratory Comments:
Temperature Upon Receipt: 1.2
Bottles Preserved? (Y) N

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Environmental Protection

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MAR 18 2014
WV Department of
Environmental Protection

REI Consultants, Inc. - Case Narrative

WO#: 1402M46

Date Reported: 3/6/2014

Client: STURM ENVIRONMENTAL SERVICES
Project: MICHAEL LEWIS

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

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

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

The test results in this report meet all NELAP (and/or VELAP) requirements for parameters except as noted in this report.

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

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

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

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

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

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	28.3-162	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	882	20.0	NA		µg/L	2/25/2014 10:52 AM	3/4/2014 1:47 AM
o-Xylene	289	10.0	NA		µg/L	2/25/2014 10:52 AM	3/4/2014 1:47 AM
Surr: 1,1,1-Trifluorotoluene	105	61.2-135	NA		%REC	2/25/2014 10:52 AM	3/4/2014 1:47 AM

Sturm Environmental Services

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

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MAR 18 2014
WV Department of Environmental Protection

REPORT TO: Client Name: Michael Lewis
Address: 12 Jousen Drive
City/State/Zip: Charleston WV 25312
Contact Person: Mike Lewis
Telephone Number: 304-382-5804 Fax No.
Email Address: mikelewis525@aol.com
Sampler Name: (Print) Mike Lewis
Sampler Signature: Michael Lewis
Project Name: Base Petroleum
Special Reporting: [X] Email Results [ ] Fax Results

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

1 DAY | 2 DAY | 3 DAY

Sample ID / Description	START DATE	START TIME	END DATE	END TIME	COMPOSITE SAMPLE	GRAB SAMPLE DATE	GRAB SAMPLE TIME	PRESERVATIVE: Ice	OTHER	HCl	NaOH	H_2SO_4 Plastic	H_2SO_4 Glass	None	HNO_3	MATRIX: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	ANALYZE FOR:	# of Bottles	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
Jones SWD						2/19/14	1:00															✓							
Burdette						2/19/14	1:15															✓							
Slater						2/19/14	1:30															✓							
Young						2/19/14	1:45															✓							

Comments

Laboratory Comments:
Temperature Upon Receipt: 1-2
Bottles Preserved? (Y) N

Records retained for 5-years

Relinquished by:	Date	Time	Received by:	Date	Time
Michael Lewis	2/19/14	2:46	Breeden	2/19/14	245
Breeden	2/20/14	1450	AHL	2-20-14	1450

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APPENDIX H

GROUNDWATER PROTECTION PLAN

Facility Name: Base Petroleum Jones #A-2 SWD

County: Kanawha

Facility Location:

Postal Service Address:	Hicumbottom area of the Pocatalico Watershed	
Latitude and Longitude:	37.564137 / -81.559247	

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 100 bbl. storage tank. Fluids are then pumped approximately 30 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 6,283 gallons of storage capacity which is significantly more than the 4,400 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.

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.

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: 10/31/14

Base Petroleum Inc. Groundwater Protection Inspection Form

Date _____ Facility Name _____ API Number _____

Tank Condition _____

_____

Pipeline Condition _____

_____

Transfer Point and Hose Condition _____

_____

Secondary Containment Condition _____

_____

Filter Condition _____

Any Findings of Contamination _____

_____

Actions Taken to Eliminate Sources _____

_____

Other Findings _____

_____

Person Conducting Inspection _____

Base Petroleum
Plugging Procedure
47-039-00798 Jones # A-2 Disposal Well

Rig up the rig

Pull the 3" tubing from the hole remove the packer

Pull the 10 ¾" casing from the hole

Run 2 3/8" tubing in the hole to 1,500'

Gel the hole

Cement from 1,500' to 1,300'

Cement from 1,100' to 1,000'

Cement from 700' to 600'

Cement from 500' to 400'

Pull the tubing from the hole

Free point and cut the 13 3/8" casing @500'

Pull the 13 3/8" casing from the hole

Run tubing to 500'

Cement from 500' to 400'

Cement from 100' to surface

Pull the 16" conductor casing from the hole

Top off the hole with cement to the surface

Erect a monument with the API number attached

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

Basin Surveys

COMPENSATED DENSIT . LO

FILE NO. Kan-3454	COMPANY D.C. Malcolm Inc.
	WELL M. Harding etal #1
	FIELD Poca
	COUNTY Kanawha STATE W.Va
	LOCATION Pigeon Creek Quad - Romance 7.5
	SEC. TWP. RGE.

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

Date	5-1-79		
Run No.	one		
Type Log	GRC Density		
Depth—Driller	2404		
Depth—Logger	2388		
Bottom logged interval			
Top logged interval	1000		
Type fluid in hole	Gel		
Salinity, PPM Cl.			
Density			
Level			
Max rec. temp., deg F.			
Operating rig time			
Recorded by			
Witnessed by	Mr. Malcolm		

Run No.	Bore-Hole Record Bit	From	To	Casing Record Size	Wgt.	From	To
	7⅞		TD	5½		Surf	2000

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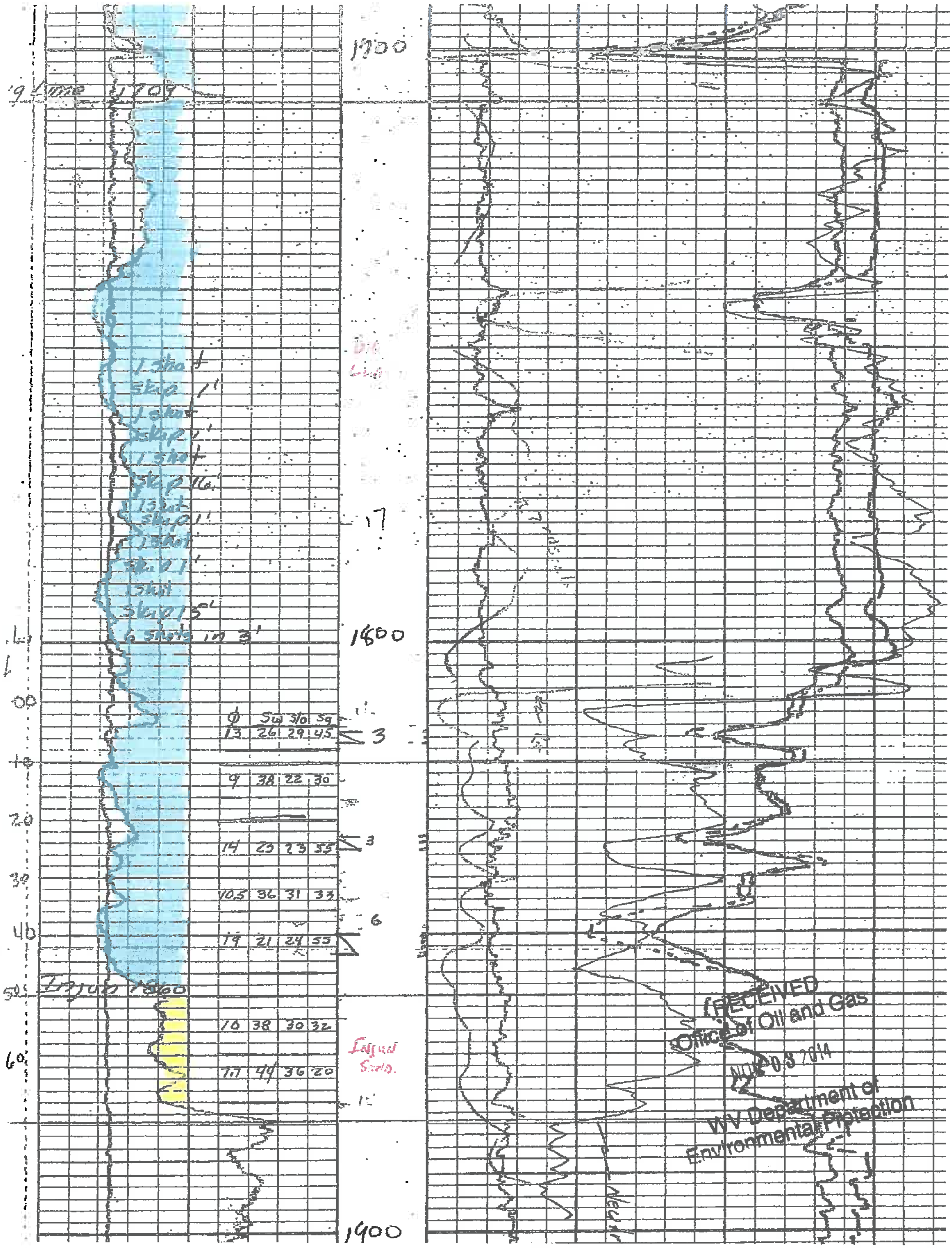
1700
1709
1 shot
skip 1'
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skip 1'
1 shot
skip 16'
1 shot
skip 1'
1 shot
skip 1'
1 shot
skip 15'
6 shots in 3'
17
1800
ϕ Sw S/o Sg
13 26 29 45
3
9 38 22 30
14 23 23 55
3
10.5 36 31 33
6
19 21 24 55
Injun 1860
16 38 30 32
17 44 36 20
1900
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BIRDWELL

Density Borehole Compensated

PERMIT NO
47-039-3467

COMPANY D C MALCOLM, INC

WELL M HARDMAN #2

FIELD

COUNTY KANAWHA STATE WV

LOCATION: COON CREEK WATERSHED
POCA DISTRICT

SEC. TWP. RGE.

OTHER SERVICES:
NBC-LS

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	6-10-79				
RUN NO.	ONE				
DEPTH—DRILLER	2434				
DEPTH—LOGGER	2398				
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_{mf} @ MEAS. TEMP.	@ °F	@ °F	@ °F	@ °F	
R_m @ 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	@ °F	
TIME SINCE CIRC.	4 HRS				
MAX. REC. TEMP.	102 °F	°F	°F	°F	
EQUIP. / LOCATION	3343 / CHARLESTON WV				
RECORDED BY	F SICA				
WITNESSED BY	MR MALCOLM	MR. BENNETT			

FIELD PRINT

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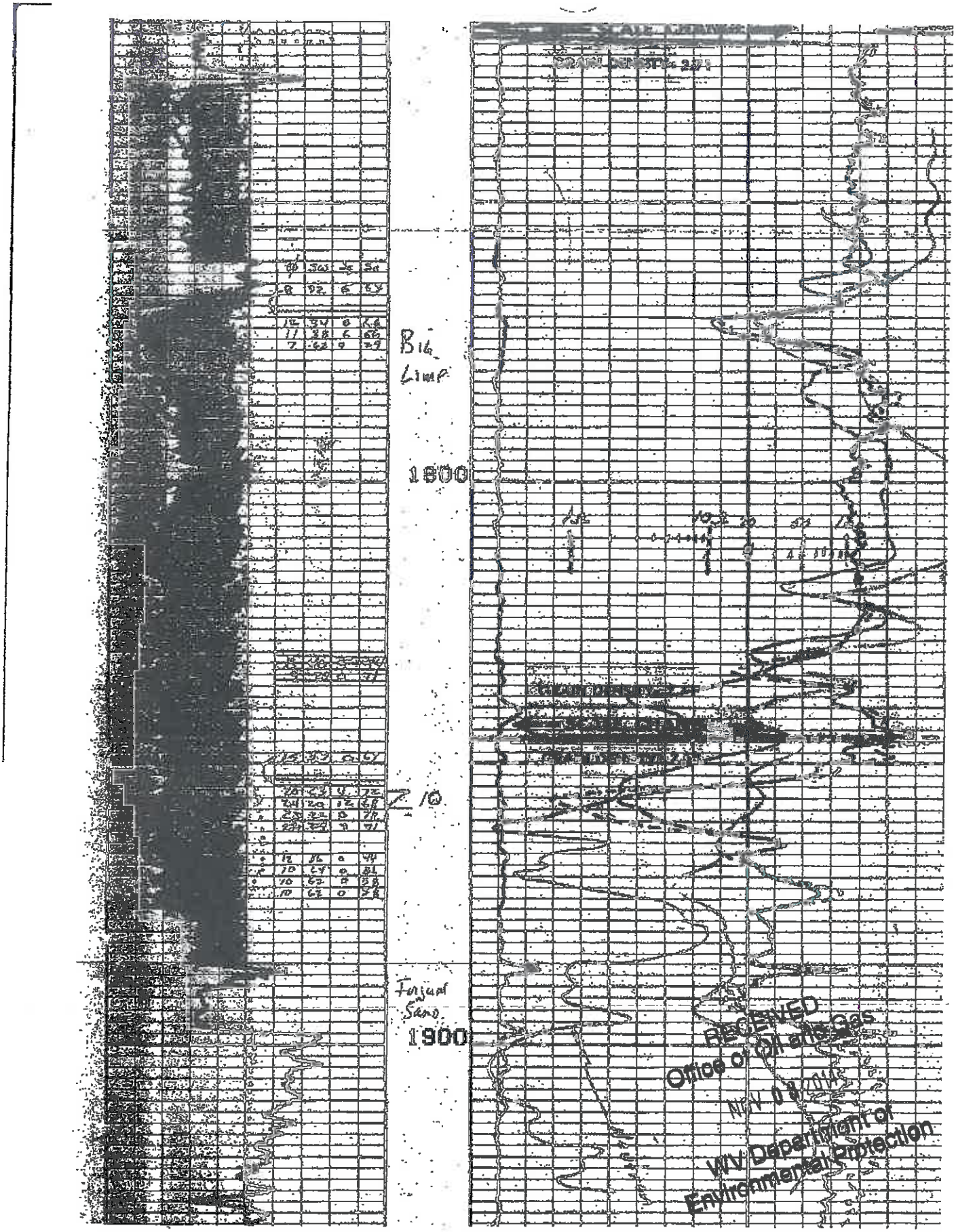
Big Lime
1800
Fifth Sand
1900
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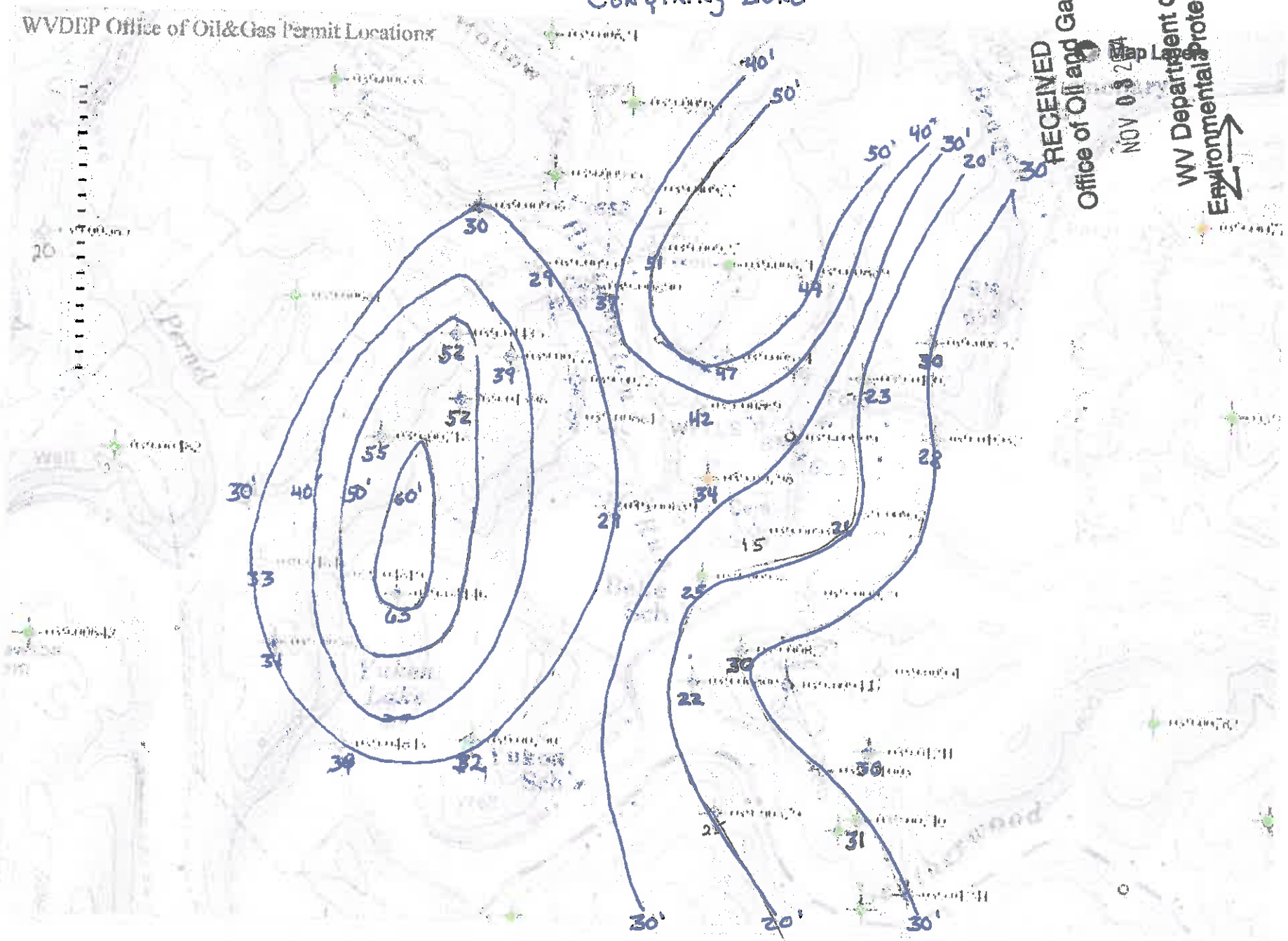
Little Lime Isopach Map
Confining Zone



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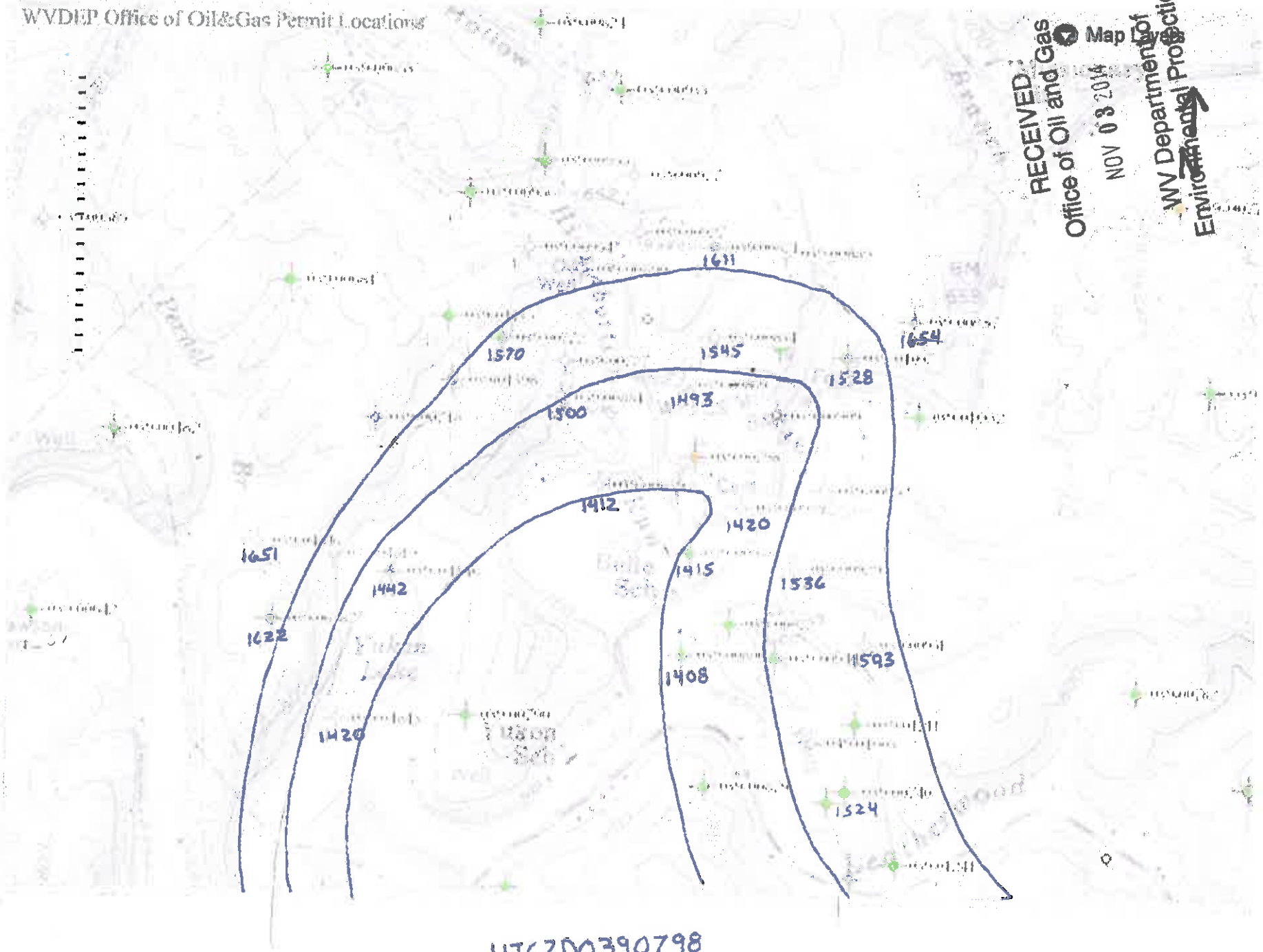
Little Lime Structure Map
Confining Zone



UIC2D0390798

Base Petroleum
47-039-00798
Jones # A-2
Static Fluid level Check
Disposal Well

On 10/1/2014 the Jones A-2 disposal well was shut in. On 10/2/2014 our swab rig was moved in, rigged up, and ran down hole to check the fluid level. The fluid level was found at 732'.

Kermit Tyree

Kermit Tyree