This Well is - not commercial!

west virginia department of environmental protection

Office of Oil and Gas
601 57th Street
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Jim Justice, Governor
Austin Caperton, Cabinet Secretary
dep.wv.gov

January 23, 2018

MIP =
.8 x 7674 = 6139.2
.433 x 1.04 x 7674 = 3455.7
2683.5

Mr. Mike Shaver, President
Mountain V Oil and Gas, Inc.
PO Box 470
Bridgeport, WV 26330

Notice of Deficiency

Re: Underground Injection Control Permit Application for 2D0973737002 Brine Disposal Well/Facility

Dear Mr. Shaver,

Upon completion of the Technical Review of the UIC Permit Application submitted January 13, 2017 and corrections/additions submitted on February 21, 2017, the following deficiencies have been identified and must be addressed in order for continued UIC Permit consideration for permit application 2D0973737002.

1. Section 6 - Construction:

   OK a. Well Schematic lacks details need to be corrected. Both the injection and confining layers must be labeled with corresponding intervals. Also label any freshwater, saltwater or coal zones. Please correct and submit.

2. Section 7- Geological Data:

   OK a. Provide an assessment for the potential for seismically active features. Any likelihood of injected fluids causing seismically anomalous events?

   OK b. Provide a fluid migration model or calculation if possible.

   OK c. Provide signed Appendix D or statement that the PSD has been notified but have not returned the signed Appendix D.

3. Section 9 – Operating Requirements/Data:

OK a. Include any injection fluid additives, including concentrations. Include all necessary chemical MSDS (Material Safety Data Sheets). If there are no additives then state such.

4. Section 11 – Groundwater Protection Plan (GPP): Please sign the GPP Appendix H and submit.

OK

Please address these deficiencies and submit your response to the WVDEP Office of Oil and Gas within fifteen (15) days of receipt of this letter so that we may proceed with permit determination. If you need clarification or have questions, please feel free to either email your concerns to Gene.C.Smith@wv.gov or call me at 1(304) 926-0499 ext. 1652.

Respectfully,

Gene Smith

Gene Smith
WVDEP Office of Oil & Gas

MOUNTAIN V
OIL & GAS, INC.

P. O. Box 470
Bridgeport, WV 26330

Office: 304-842-6320
Fax: 304-842-0016

February 9, 2018

WVDEP
Office of Oil & Gas
601 57th Street
Charleston, WV 25304

RE: Notice of Deficiency: Underground Injection Control Permit Application for 2D0973737002 Brine Disposal Well/Facility

To Whom it May Concern,

Please see included with this letter the responses necessary to complete the deficiencies pertaining to the permit for the above referenced UIC Permit as stated below.

1. Section 6 – Construction:
   a. Well Schematic has been updated and is attached.
2. Section 7 – Geological Data:
   a. See enclosed assessment for the potential for seismically active features, and responses to question on the likelihood of injected fluids causing seismically anomalous events.
   b. See enclosed fluid migration model.
   c. See enclosed Appendix D and statement thereon.
3. Section 9 – Operating Requirements/Data:
   a. There are no injection fluid additives.
4. Section 11 – Groundwater Protection Plan (GPP): Please see enclosed signed GPP.

Should you have any further questions, comments, or concerns please contact me.

Best

Jamie Andrews
Mountain V

Well Name: Haun #1 WV0402

API: 47-097-03737

Location: Rock Cave 7.5' Quad

Downhole Information (By Depth)

ELEV.
KB 2,378'
GL 2,388'

Casing:

13-3/8" @ 42' (Sand-In)

9-5/8" @ 344' (W/120 SKS - Cement to Surface)

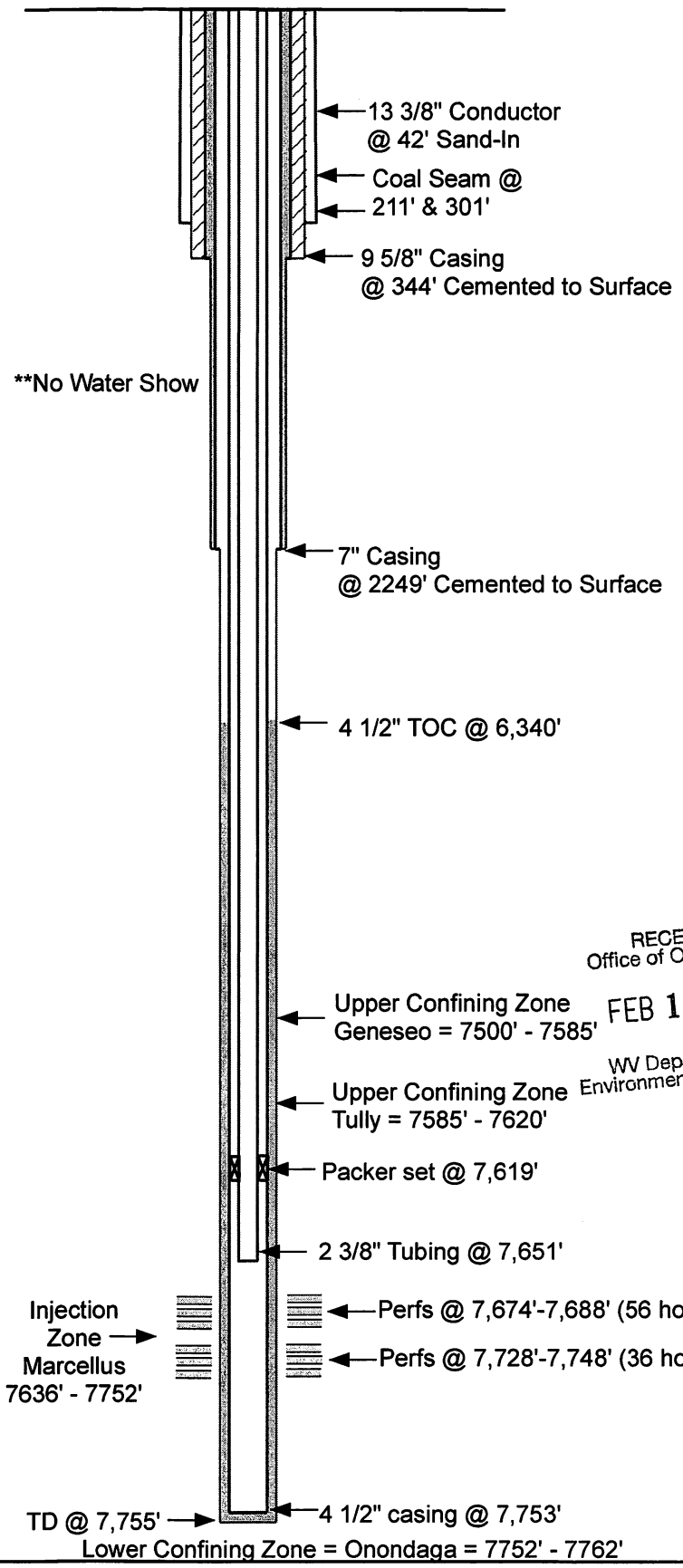
7" @ 2,249' (W/308 SKS - Cement to Surface)

4-1/2" @ 7,651' (W/150 SKS - Cemenrt to 6,340'

Perforations: (DIL Depths)
Marcellus: 7,674' - 7,688' (56 Holes)
Marcellus: 7,728' - 7,748' (36 Holes)

Tubing:
2-3/8" @ 7,651'
Tension Packer @ 7,619'

Logs:
GR/CD/CAL/TEMP



N

Haun UIC2D0973737 Well Schematic
Banks District, Upshur County, WV
Rock Cave 7.5' Quad

MOUNTAIN V OIL & GAS, INC.

Carpenter Energy, LLC

To: Mr. Jamie Andrews, Mountain V Oil & Gas, Inc.

From: William O. Carpenter, CPG, President, Carpenter Energy, LLC

Subject: Geologic Review of the Haun #1 WV0402 (47-097-03737), Upshur County, West Virginia

Date: 2/5/2018

Mr. Jamie Andrews of Mountain V Oil & Gas, Inc. has requested that Carpenter Energy, LLC evaluate the geologic conditions of the proposed Haun #1 WV0402 salt water disposal (SWD) well (47-097-03737), located in Banks District, Upshur County, West Virginia. The well is also located on Rock Cave 7.5-minute quadrangle.

Assessment for the Potential for Seismically Active Features

Structurally the area around the Haun #1 proposed salt water disposal well can be described as having gentle flexures of strata, particularly at the Marcellus Shale depth. The Haun #1 well is structurally located between the Webster Springs and Hiram anticlines. Smaller unnamed folds do appear to be present at the Onondaga that exhibit approximately 100 ft of relief. These features are broad and have low bed dips. Bed dips in the vicinity of the proposed injection well tend to be less than 2 degrees at the Onondaga Limestone depth. The Haun #1 well appears to be located in a small synclinal feature plunging to the north-northwest based on limited Onondaga penetrations.

Through the mapping of shallow strata it has been observed that a small blind back thrust fault exists in the vicinity of the Haun #1 proposed salt water disposal well (Figure 1). For the purpose of this evaluation the fault will be referred to as the Alexander Fault due to its proximity to the town of Alexander in Upshur County. It is a back thrust in respect that its fracture direction is opposite of major structures observed in the Appalachian Basin. Blind thrust denotes that the fault propagated as a decollement feature in the Geneseo Shale and ramping up at approximately 10.4 degrees to the Bradford where displacement ceased. Based on the accompanying cross section (Figure 2), the faults displacement is approximately 32 ft. Through extensive mapping of this fault feature, the fault does not appear to penetrate the Onondaga Limestone nor ever penetrate above the overlying Bradford. The Alexander Fault can be noted in the Haun #1 open hole log at a depth of 4,102 ft MD. It is characterized on the well log by its impact on the caliper log. The caliper log is responding to a drilling induced wash out zone aided by natural fracturing associated to the fault. The fault transects the wellbore approximately 3,600 ft above the proposed injection formation center (Marcellus Shale). Laterally the fault does not propagate down to the Geneseo Shale until approximately 16,000 ft, or 3 miles, to the northwest.

Based on the West Virginia Geologic and Economic Survey (WVGES) Interactive Mapping site there are no known faults that penetrate the Onondaga Limestone in the vicinity of the Haun #1. Additionally, no Onondaga faults are noted in Upshur County. Deeper faults were also investigated and no faults are

noted from the Onondaga to Basement. Because this fault does not penetrate the Onondaga or deeper to a Basement fault system there is little chance of induced seismicity.

To evaluate historic seismicity of the region, both the WVGES Appalachian Regional Earthquakes (http://ims.wvgs.wvnet.edu/TBR_ver3/viewer.htm) and the USGS ALL Earthquakes 1900-Present (https://earthquake.usgs.gov/earthquakes/byregion/westvirginia.php) mapping systems were utilized. According to the WVGES mapping no earthquakes have been reported in Upshur County. USGS mapping conflicts noting a 2010-08-21 03:16:21 (UTC) magnitude 2.5 earthquake 26 km SSW of Buckhannon (38.792N, 80.398W) with a depth of 10.6 km. The site of the observance was Robinson Road which is 8.0 miles due west of the Haun #1 well. Historic seismicity would indicate preexisting planes of strata weakness and areas prone to future seismicity induced by an injection well.

In conclusion, Carpenter Energy has reviewed data provided by Mountain V Oil & Gas, Inc., publically available data, as well as generated maps and cross sections based on aforementioned data to provide sound geologic interpretations. Based on the data Carpenter Energy does not anticipate seismicity related to injection of salt water within safe engineering limitations. Carpenter Energy reserves the right to reinterpret based on the inclusion of new or uncovered data not previously obtained.

Respectfully submitted by:

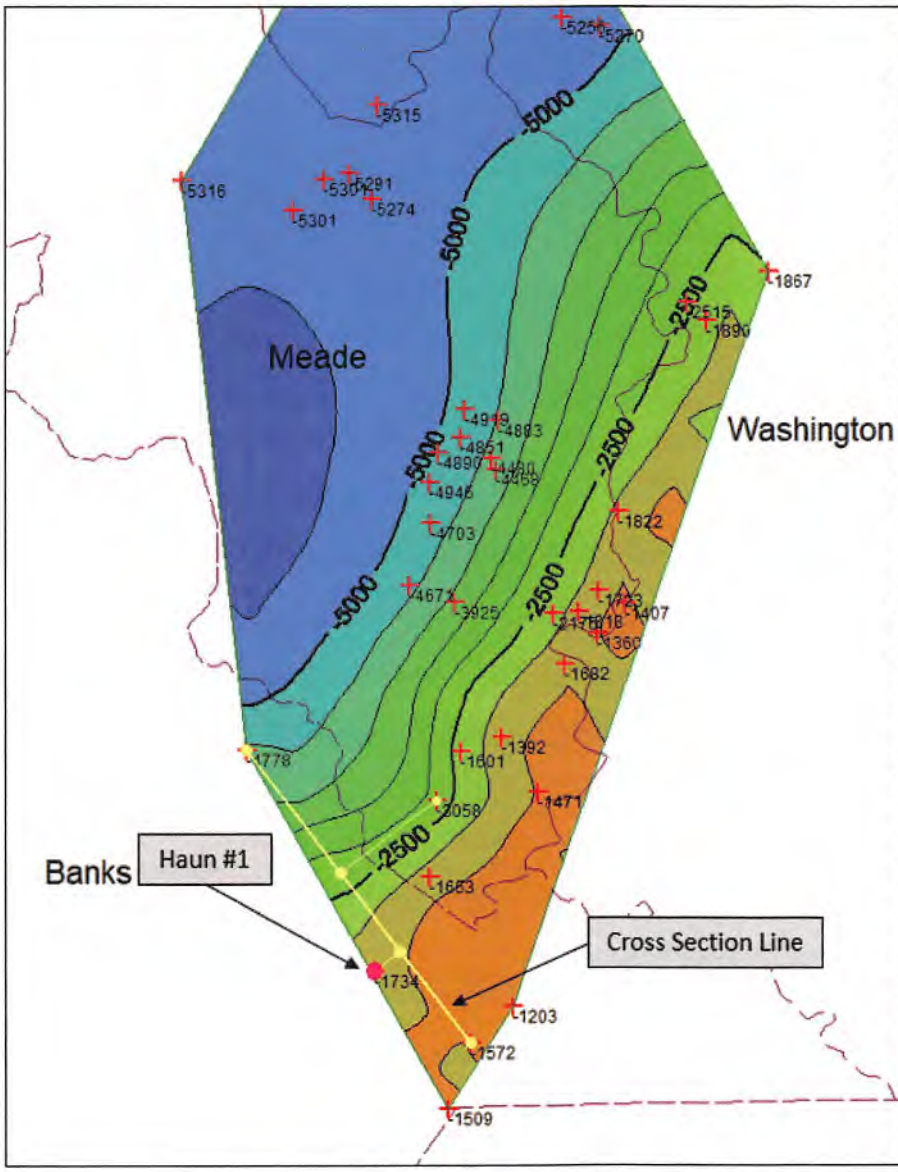
William O. Carpenter, CPG

President, Carpenter Energy, LLC

Disclaimer

DISCLAIMER

This document includes forward-looking statements as well as historical information. Forward-looking statements include, but are not limited to statements relating to geological and seismic data interpretations, prospect reserve estimates and prospect risk. Although Carpenter Energy (CE) believes that its expectations reflected in these forward-looking statements are reasonable, such statements involve risks and uncertainties, and no assurance can be given that actual results will be consistent with these forward-looking statements. Investment in oil and gas exploration is high risk by its very nature. Important factors that could cause actual results to differ from these forward-looking statements include, but are not limited to: erroneous interpretations of the seismic and geological data; the inability to acquire leases on identified prospects; mechanical problems while drilling and producing wells which prevent completion of a well or result in plugging of a well; dry holes; less reserves than originally estimated due to poor sand development or drainage by offsetting wells; non-commercial wells; and the variations in future gas pricing. CE cannot and has not beyond normal due diligence care standards confirmed the accuracy and completeness of all the information we have reviewed in the course of this consulting engagement. Data for this review has been provided by Mountain V Oil & Gas, Inc., LLC, its clients or is publicly available and CE, Inc. cannot be held responsible for errors in this provided data. Further, we express no opinion regarding any legal or securities issues. CE shall assume no liability whatsoever for the use or reliance there upon by Mountain V Oil & Gas, Inc., their clients and/or their investors, of information, opinions and interpretations provided by CE. CE reserves the right to adjust these findings and interpretations with the discovery of relevant data or future production data.



Well ID	Depth Subsea (ft)
4709701403	-1,890
4709701589	-1,471
4709701903	-1,822
4709701992	-1,723
4709702009	-1,601
4709702059	-1,867
4709702072	-1,360
4709702076	-2,175
4709702084	-1,653
4709702160	-1,407
4709702171	-1,572
4709702244	-1,392
4709702272	-1,818
4709702277	-3,058
4709702407	-1,203
4709702455	-2,515
4709702708	-1,509
4709702802	-1,682
4709703398	-4,778
4709703415	-4,703
4709703416	-4,480
4709703515	-5,270
4709703626	-4,851
4709703638	-4,945
4709703713	-5,301
4709703715	-4,883
4709703717	-4,671
4709703737	-1,734
4709703741	-4,468
4709703742	-5,499
4709703744	-5,316
4709703753	-5,256
4709703754	-5,291
4709703763	-3,925
4709703766	-5,242
4709703780	-5,274
4709703841	-4,919
4709703842	-5,374
4709703843	-5,301
4709703844	-5,315
4709703845	-4,890

Figure 1) Subsea depth of the Alexander Fault. Mountain V Oil & Gas Inc. and publically available well logs (WVGES) noted with subsea depth data points. At the Haun #1, the Alexander fault is at a depth of -1,734 ft. The Onondaga Limestone is at a depth of -5,384 ft at the site.

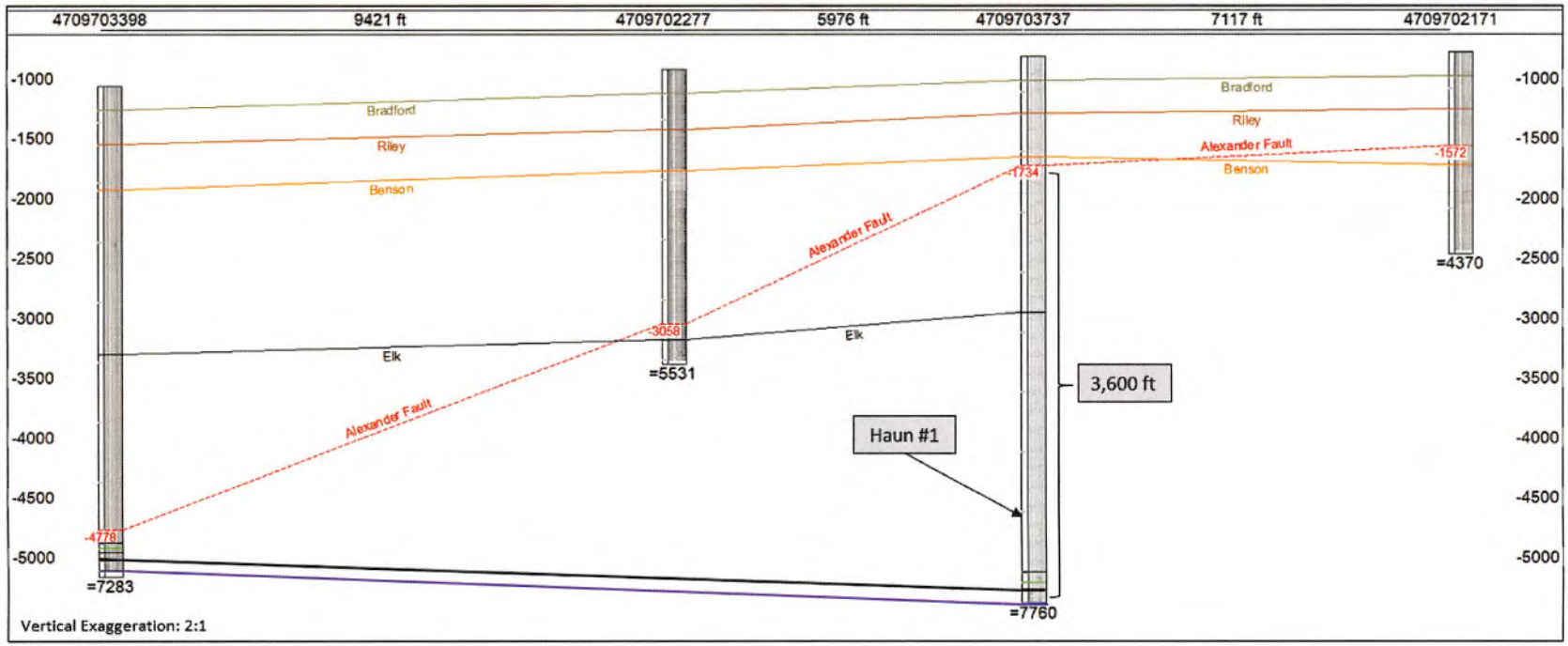


Figure 2) Cross section, yellow trace on Figure 1, exhibiting Alexander fault and Haun #1 well.

Carpenter Energy, LLC

To: Mr. Jamie Andrews, Mountain V Oil & Gas, Inc.

From: William O. Carpenter, CPG, President, Carpenter Energy, LLC

Subject: Geologic Review and Fluid Migration Model of the Haun #1 WV0402 (47-097-03737), Upshur County, West Virginia.

Date: 2/9/2018

Mr. Jamie Andrews of Mountain V Oil & Gas, Inc. has requested that Carpenter Energy, LLC evaluate the geologic conditions of the proposed Haun #1 WV0402 salt water disposal (SWD) well (47-097-03737), located in Banks District, Upshur County, West Virginia. The well is located on Rock Cave 7.5-minute quadrangle.

Assessment of Fluid Migration

Structurally the area around the Haun #1 proposed salt water disposal well can be described as having gentle flexures of strata, particularly at the Marcellus Shale depth. The Haun #1 well is regionally located between the Webster Springs and Hiram anticlines of Upshur, Randolph, and Webster counties. The proposed injection site is located on the western flank of the Hiram Anticline with typical bed dips of 0.8 degrees to the northwest. Based on local Onondaga Limestone (conformably below the injection interval) structure mapping, smaller unnamed folds do appear to be present which tend to lessen or reverse regional dips. Two sets of anticlines and synclines are present based on numerous data points from existing Marcellus Shale wells (Figure 1). These small folds will likely control long term fluid migration pathways as the proximal strata becomes saturated and natural fractures connect.

Based on World Stress Map data (http://www.world-stress-map.org/) and scholarly articles the Marcellus Shale J1 fracture orientation should be approximately 60/240 degrees (dominant northeast orientation) regionally. The orientation of existing horizontal wells in the vicinity of the Haun #1 have a preferred azimuth of 160/340 degrees which supports this observation. In general, operators orient the azimuth of horizontal wells to be perpendicular to the maximum stress direction unless other factors are present. This azimuth is typically supported with micro seismic, FMI (Sclumberger Fullbore Formation Microimager), or similar data. This is done to intersect the maximum number of natural fractures. It is these natural fractures that will dictate the preferential fluid migration direction.

With regards to the Haun #1 injection well, it is predicted that fluid will preferentially flow in a northeast and southwest direction following the dominant J1 natural fracture orientation. As fluid propagates outward the fractures inherently connect and fluid will start to respond to gravitational forces by flowing down dip to the northwest. The fluid will then likely respond to the small folds identified in Figure 1. As the fluid moves along the steeper bed dips it will intersect with the two synclinal folds and migrate down structure. Once within the synclinal features, parallel to J1 orientation, the fluid will resume following the natural fractures to the northeast.

In conclusion, Carpenter Energy has reviewed data provided by Mountain V Oil & Gas, Inc., publically available data, as well as generated a structural map on aforementioned data to provide sound geologic interpretations. Based on the data, Carpenter Energy has interpreted the preferential fluid migration model to flow predominantly northwest in the regional dip direction until acted upon by other features that may alter its direction. Carpenter Energy reserves the right to reinterpret based on the inclusion of new or uncovered data not previously obtained.

Respectfully submitted by:

William O. Carpenter, CPG

President, Carpenter Energy, LLC

Disclaimer

DISCLAIMER

This document includes forward-looking statements as well as historical information. Forward-looking statements include, but are not limited to statements relating to geological and seismic data interpretations, prospect reserve estimates and prospect risk. Although Carpenter Energy (CE) believes that its expectations reflected in these forward-looking statements are reasonable, such statements involve risks and uncertainties, and no assurance can be given that actual results will be consistent with these forward-looking statements. Investment in oil and gas exploration is high risk by its very nature. Important factors that could cause actual results to differ from these forward-looking statements include, but are not limited to: erroneous interpretations of the seismic and geological data; the inability to acquire leases on identified prospects; mechanical problems while drilling and producing wells which prevent completion of a well or result in plugging of a well; dry holes; less reserves than originally estimated due to poor sand development or drainage by offsetting wells; non-commercial wells; and the variations in future gas pricing. CE cannot and has not beyond normal due diligence care standards confirmed the accuracy and completeness of all the information we have reviewed in the course of this consulting engagement. Data for this review has been provided by Mountain V Oil & Gas, Inc., LLC, its clients or is publicly available and CE, Inc. cannot be held responsible for errors in this provided data. Further, we express no opinion regarding any legal or securities issues. CE shall assume no liability whatsoever for the use or reliance there upon by Mountain V Oil & Gas, Inc., their clients and/or their investors, of information, opinions and interpretations provided by CE. CE reserves the right to adjust these findings and interpretations with the discovery of relevant data or future production data.

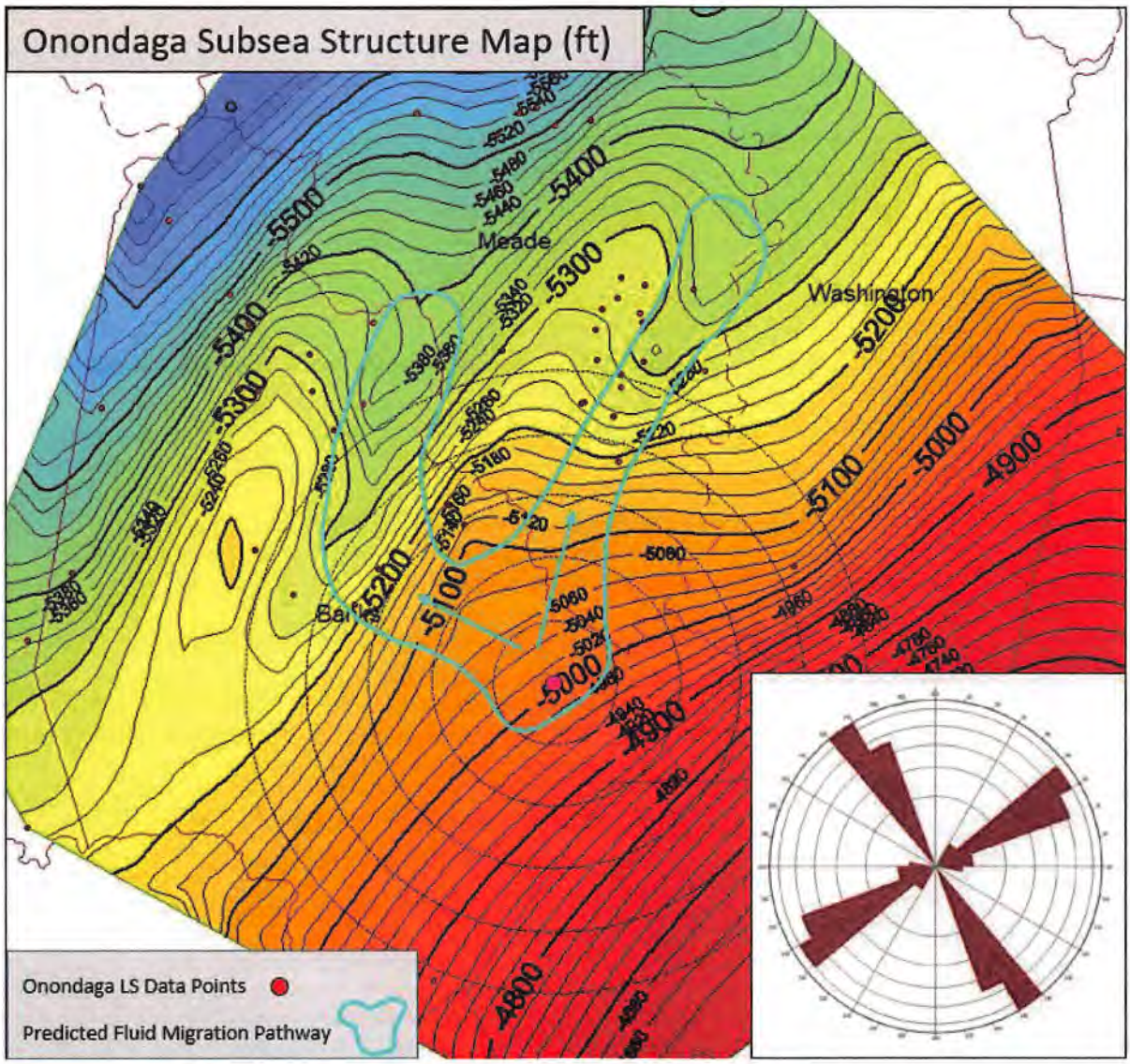


Figure 1) Subsea depth (ft) of the Onondaga Limestone. Data points based on geophysical well logs provided by Mountain V Oil & Gas Inc. and publically available well logs at the West Virginia Geologic and Economic Survey (WVGES). One mile incremental concentric circles denoted on map. Fracture orientation model provided by MicroSeismic Corporation, Mary Ellison 2014. (www.microseismic.com/wp.../02/brochures_MSI_MUG_POSTERS_ELLISON.PDF)

Disclaimer: The Haun #1 geophysical well log was not utilized for Onondaga structure mapping purposes. The Haun #1 well appears to be deviated below the Elk Formation and measured depth is elongated compared to offset wells making the Onondaga subsea depth much greater than reality.

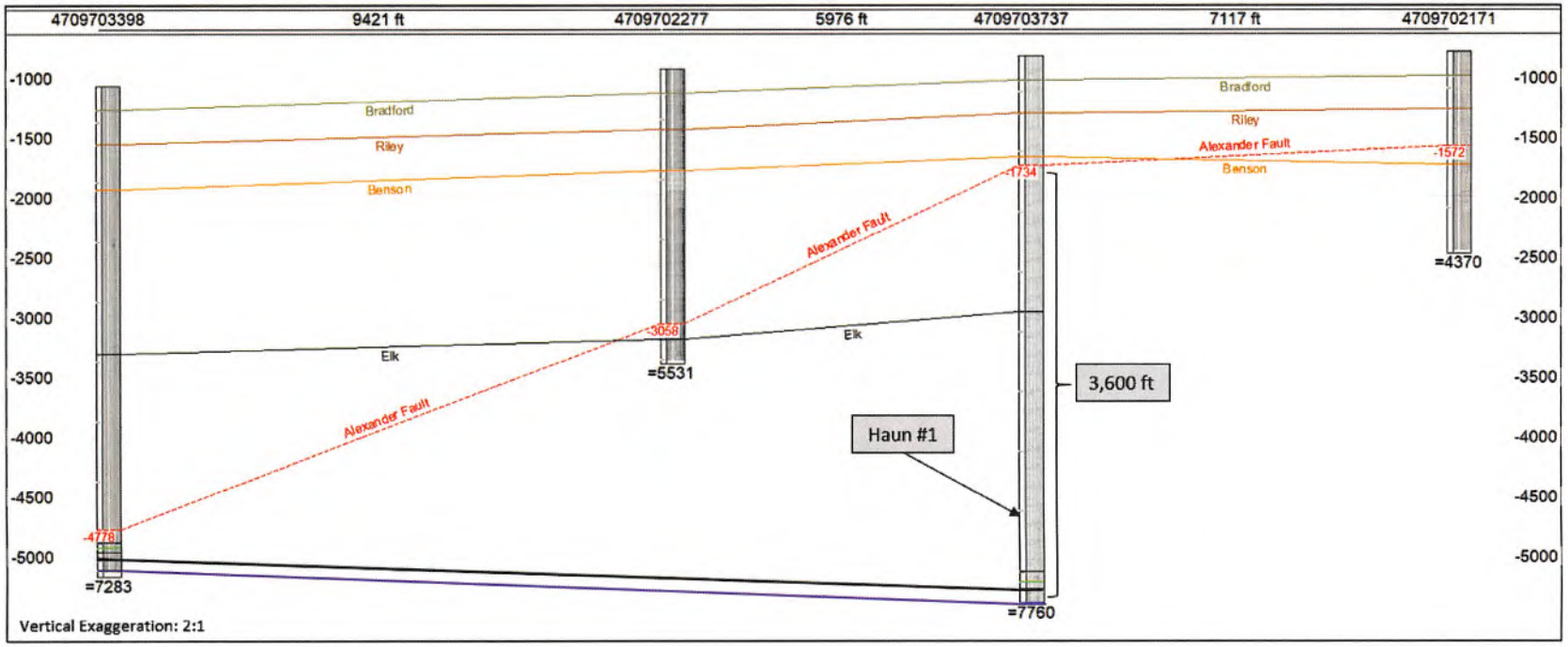


Figure 2) Cross section, yellow trace on Figure 1, exhibiting Alexander fault and Haun #1 well.

APPENDIX D

Public Service District Affidavit

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

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

_____

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

_____

that there are no such publically recorded sources.

_____

(Signature of Authorized Representative)

Sworn and subscribed to before me this _____day of _____, 20_____.

_____, my commission expires _____

(Notary Signature)

_____.

**** No PSD's were notified, there are none that service the area. Conversations with the Upshur County O&M director indicated the closest PSD's are in the French Creek & Adrian areas. Public water is not available to residents in this area.**

APPENDIX H

GROUNDWATER PROTECTION PLAN

Facility Name: Haun D Well

County: Upshur

Facility Location:

Postal Service Address:		
Latitude and Longitude:		

Contact Information:

Person:	Jamie Andrews
Phone Number:	304-203-7555
E-mail Address:	jandrews@mountainvoilandgas.com

Date:_____

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

   1. Storage of produced formation brine.
   2. Injection of produced formation brine.
   3. Improper Transfers of fluids

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

   1. All storage facilities have secondary containment.
   2. Injected fluids are confined to the tubing in the injection well by utilizing, an isolation packer. The annulus pressure is continuously monitored to check for leaks.
   3. MIT's

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

   No new equipment or operations will be added to this facility.

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

1. Injection of waste
2. Secondary containment
3. Above ground storage tanks

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

See attached map and water analysis results. Section 7.4.

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 at the facility, unless allowed by some other regulation or permit.

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.

1. Employees are trained in secondary containment construction, maintenance, and monitoring.
2. Employees are trained in leak detection.
3. Employees are trained in spill prevention and counter measure procedures.

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

1. Secondary containment is inspected monthly. 2. Tubing / casing annulus pressure is monitored continuously. 3. Piping and fitting are inspected monthly for leaks.

Signature: S. Michael Slunn

Date: 2-12-18

RECEIVED
Office of Oil and Gas

FEB 13 2018

WV Department of
Environmental Protection

2D0976373702

MOUNTAIN V
OIL & GAS, INC.

P. O. Box 470
Bridgeport, WV 26330

Office: 304-842-6320
Fax: 304-842-0016

May 10, 2017

Justin Nottingham
WVDEP
Office of Oil & Gas
Underground Injection Control (UIC)

RECEIVED
Office of Oil and Gas

JUN 30 2017

WV Department of
Environmental Protection

RE: Permit Renewal for UIC2D0973737

Dear Justin,

Please find enclosed with this letter the permit renewal for UIC2D0973737 in Upshur County, WV. As I stated on the phone with you yesterday the 28th of June, my geologist has not given me the final geological review for this well. I should have it by the 2nd week in July, and upon receipt I will promptly forward to you.

Should you have any questions comments or concerns please contact us.

Best

Jamie Andrews
Mountain V Oil & Gas, Inc.

Check# 52953
Date 6/28/17
Amt 550.00

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	Mountain V Oil & Gas, Inc.		
Existing UIC Permit ID Number	2D0973737	UIC Well API Number	47-097-03737

Office of Oil and Gas Office Use Only	
Permit Reviewer	Gene Smith
Review date Date Received	1/18/18 6/30/17
Administratively Complete Date	
Approved Date	
Permit Issued	

Please check the fees and payment included.

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

Please check the items completed and enclosed.

RECEIVED
Office of Oil and Gas
JUN 30 2017
WV Department of Environmental Protection

✓ 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

___Appendix D Public Service District Affidavit

___Appendix E Water Sources

___Appendix F Area Permit Wells

_____ Section 8 – Geological Data on Injection and Confining Zones

_____ Section 9 – Operating Requirements / Data

____Appendix G Wells Serviced by Injection Well

_____ Section 10 – Monitoring

_____ Section 11 – Groundwater Protection Plan (GPP)

____Appendix H Groundwater Protection Plan (GPP)

_____ Section 12 – Plugging and Abandonment

_____ Section 13 – Additional Bonding

_____ Section 14 – Financial Responsibility

____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): Jamie Andrews

Reviewed by (Sign): Jamie Andrews

Date Reviewed: 6/30/17

UNDERGROUND INJECTION CONTROL (UIC)
PERMIT APPLICATION

UIC-1
SECTION 1-5
CERTIFICATION

UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

RECEIVED
Office of Oil and Gas
JUN 30 2017
WV Department of
Environmental Protection

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 # 2D0973737 **API #** 47-097-03737 **WELL #** HAUN #1 WV0402

Section I. Facility Information

Facility Name: HAUN D WELL

Address:

City: Rock Cave State: WV Zip:

County: Upshur

Location description: Existing Well Site. Directions to Site: From exit 99 of I-79 proceed east on US Route 33 & 119 for approximately 10.5 miles; turn right on County Route 7 (Brushy Fork Road) and follow for approximately 2.3 miles; turn left on County Route 14 (Stoney Run Road) and follow for approximately 2.6 miles; turn right on State Route 20 and follow for approximately 9.0 miles; turn left on County Route 11, (Alexander Helvetia Road) and follow for approximately 9.2 miles; turn right on County Route 11/14 (Zion Selbyville Road) and follow for approximately for 1.2 miles; Continue straight ahead (to left) merging with County Route 44 and follow for 1.7 miles; turn left on existing driveway and follow for approximately 0.6 miles to wellsite.

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

Northing: 4,291,147.78 N Easting: 564,745.94 E

Environmental Contact Information:

Name: Jamie Andrews Title: Land & Business Development

Phone: 304-203-7555 Email: jandrews@mountainvoilandgas.com

RECEIVED
Office of Oil and Gas
JUN 30 2017
WV Department of
Environmental Protection

Section 2. Operator Information

Operator Name: Mountain V Oil & Gas, Inc.

Operator ID: 370020

Address: PO Box 470

City: Bridgeport State: WV Zip: 26330

County: Harrison

Contact Name: Jamie Andrews Contact Title: Land & Business Development Contact

Phone: 304-203-7555 Contact Email: jandrews@mountainvoilandgas.com

Section 3. Applicant Information

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

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

Section 4. Applicant / Activity Request and Type:

A. Apply for a new UIC Permit: ☐ 2D ☐ 2H ☐ 2R ☐ 3S
B. Reissue existing UIC Permit: ■ 2D ☐ 2H ☐ 2R ☐ 3S
C. Modify existing UIC Permit: ☐ 2D ☐ 2H ☐ 2R ☐ 3S
(Submit only documentation pertaining to the modification request)

2D COMMERCIAL FACILITY: ■ YES ☐ NO

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

Mountain V Oil & Gas, Inc. is a private owned corporation, who utilizes this UIC well to dispose of produced and/or brine water from wells operated Mountain V Oil & Gas, Inc.

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: Mike Shaver

Print Title: President

B. Signature and Date.

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

Signature: Mike Shaver

Date: 6-28-17

[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.

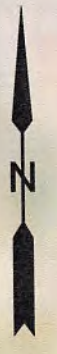
The written authorization is submitted to the Director.

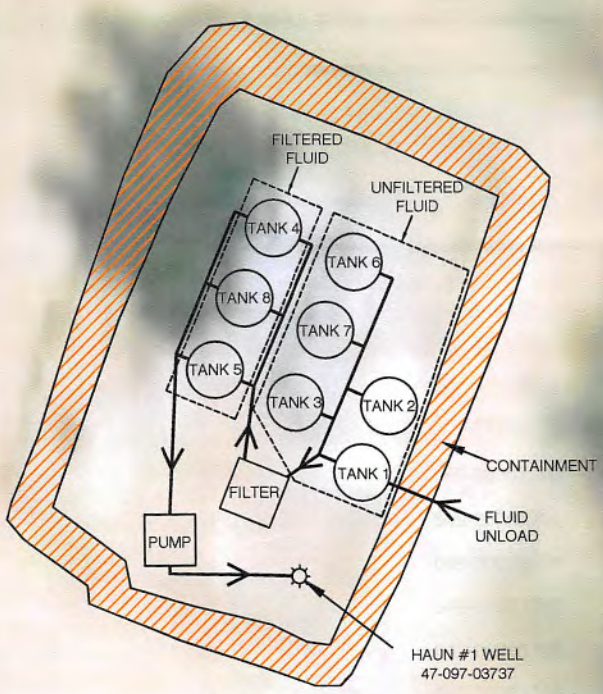
UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

SECTION 6

UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

HAUN #1 WELL SITE DETAIL





SCALE
1 INCH = 30-FEET

Well Name: Haun #1 WV0402

API: 47-097-03737

Location: Rock Cave 7.5' Quad

Downhole Information (By Depth)

ELEV.
KB 2,378'
GL 2,388'

Casing:

13-3/8" @ 42' (Sand-In)

9-5/8" @ 344' (W/120 SKS - Cement to Surface)

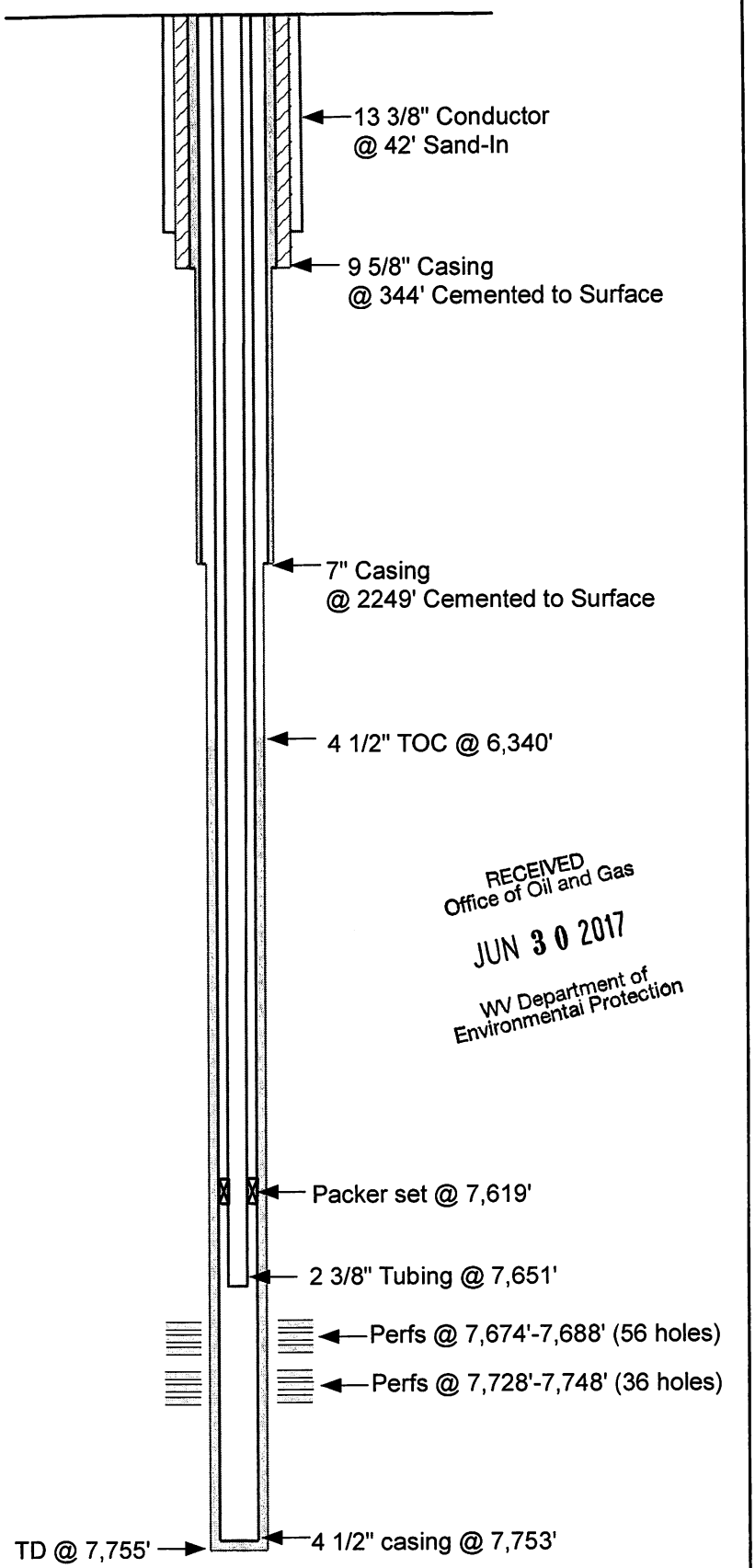
7" @ 2,249' (W/308 SKS - Cement to Surface)

4-1/2" @ 7,651' (W/150 SKS - Cemenrt to 6,340'

Perforations: (DIL Depths)
Marcellus: 7,674' - 7,688' (56 Holes)
Marcellus: 7,728' - 7,748' (36 Holes)

Tubing:
2-3/8" @ 7,651'
Tension Packer @ 7,619'

Logs:
GR/CD/CAL/TEMP



N

Haun UIC2D0973737 Well Schematic
Banks District, Upshur County, WV
Rock Cave 7.5' Quad

MOUNTAIN V OIL & GAS, INC.

APPENDIX A
Injection Well Form

1) GEOLOGIC TARGET FORMATION Marcellus

Depth 7,674 Feet (top) 7,748 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 7,755 Feet

3) Approximate water strata depths: Fresh 280 Feet Salt N/A Feet

4) Approximate coal seam depths: N/A

5) Is coal being mined in the area? Yes _____ No X

6) Virgin reservoir pressure in target formation 500 psig Source Field Estimates

7) Estimated reservoir fracture pressure 7,680 psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 300

Injection volume (bbl/day) 8500

Injection pressure (psig) 2746

Bottom hole pressure (psig) 6140

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

Production water and/or brine

Temperature of injected fluid: (°F) Ambient temperature

10) FILTERS (IF ANY)

50 micron sock, 25 micron and 10 micron cartridge

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

MC S-2101 Corrosion Inhibitor

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	13-3/8"	New	J-55	54.5	42'	42'	N/A
Fresh Water	9-5/8"	New	J-55	36	344'	344'	120 SKS CTS
Coal							
Intermediate 1	7"	New	J-55	20	2249'	2249'	308 SKS CTS
Intermediate 2							
Production	4-1/2"	New	J-55	11.6	7753'	7753'	150 SKS
Tubing	2-3/8"	New	J-55	4.6	7651'	7651'	N/A
Liners							

TYPE	Wellbore Diameter	Casing Size	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./sk)	Cement to Surface ? (Y or N)
Conductor	15"	13-3/8"	0.760	2730			N
Fresh Water	12-1/4"	8-5/8"	0.704	3520			Y
Coal							
Intermediate 1	8-1/4"	7"	0.272	4360			Y
Intermediate 2							
Production	6 ½"	4 ½"	0.500	5350			N
Tubing	N/A	2 3/8"	0.190	7700 PSI	N/A	N/A	N/A
Liners							

PACKERS	Packer #1	Packer #2	Packer #3	Packer #4
Kind:	Tension			
Sizes:	2-3/8" x 4-1/2"			
Depths Set:	7619'			

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							
47-097-03737	1	4,291,147.78	564,745.94	2013	48	Poly	10,500	Brine Water	Varies	Single
47-097-03737	2	4,291,147.78	564,745.94	2013	48	Poly	10,500	Brine Water	Varies	Single
47-097-03737	3	4,291,147.78	564,745.94	2013	48	Steel	21,000	Brine Water	Varies	Single
47-097-03737	4	4,291,147.78	564,745.94	2013	48	Steel	21,000	Brine Water	Varies	Single
47-097-03737	5	4,291,147.78	564,745.94	2013	48	Steel	21,000	Brine Water	Varies	Single
47-097-03737	6	4,291,147.78	564,745.94	2013	48	Steel	21,000	Brine Water	Varies	Single
47-097-03737	7	4,291,147.78	564,745.94	2013	48	Steel	21,000	Brine Water	Varies	Single
47-097-03737	8	4,291,147.78	564,745.94	2013	48	Steel	21,000	Brine Water	Varies	Single

Weatherford

Photo Density
Compensated Neutron
Array Induction

COMPANY	Mountain V Oil and Gas Incorporated
WELL	Haun # 1 WV0402
FIELD	Banks District
PROVINCE/COUNTY	Upshur County
COUNTRY/STATE	U.S.A / West Virginia
LOCATION	Rock Cave 7.5' Quadrangle
PERMIT NUMBER	Watershed : Trib of Alec Run

FIELD PRINT

SEC	TWP	RGE	Other Services	
			Temperature	Density Caliper
			Gamma Ray	Gamma Ray
API Number			Gamma Ray	Gas Detector

Permanent Datum Ground Level, Elevation 2368 feet
Log Measured From feet above Permanent Datum
Drilling Measured From K.B.10 ft.

Elevations:	feet
KB	2378.00
DF	2378.00
GL	2368.00

Date	11-Aug-2010			
Run Number	1			
Service Order	---			
Depth Driller	7760.00	feet		
Depth Logger	7760.00	feet		
First Reading	7760.00	feet		
Last Reading	0.00	feet		
Casing Driller	2239.00	feet		
Casing Logger	2244.00	feet		
Bit Size	6.500	inches		
Hole Fluid Type	Dusted			
Density / Viscosity	---	---		
PH / Fluid Loss	---	---		
Sample Source	---			
Rm @ Measured Temp	---			
Rmf @ Measured Temp	---			
Rmc @ Measured Temp	---			
Source Rmf / Rmc	---	---		
Rm @ BHT	---			
Time Since Circulation	5 Hours			
Max Recorded Temp	153.00	deg F		
Equipment / Base	13036	Weston		
Recorded By	Frank Lattea			
Witnessed By	Mike Shaver		Luke Sands	
Field Ticket #	3524155		.	

BOREHOLE RECORD

Last Edited: 11-AUG-2010 22:24

Bit Size inches	Depth From feet	Depth To feet
6.500	2244.00	7760.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
	7.000	0.00	2244.00	17.00

REMARKS

Density Matrix was ran on 2.71 GG/CC from TD at 7760' to 2244' casing shoe
Gamma-neutron ran from casing shoe at 2244' to 0.0' ground level
Crew : Bryan West
Log was measured from ground level
Logging speed was ran at customers request
4.5 inch surface casing used to calculate annular hole volume.
Filtrate density was ran on 1.0 GM/CC.
Fluid level : None
Longitude : 80-15-00
Latitude : 38-47-30
Temperature and gas detector were recorded on inhole pass
Inhole temperature was displayed on main log section as requested by customer
Main log spliced at 7000' due to second trip in well
Petty Drilling Rig # 1

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Thank You For Using Weatherford Wireline Services

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.

5 Inch Main Log

Depth Based Data - Merged File — Plotted on 28-JUN-2017 09:43

Filename: C:\Users\JAMIEA~1\AppData\Local\Temp\Weatherford PreView\0\Main Data 2.mge — Merged on 11-AUG-2010 22:30

System Versions: Logged with 10.07.0791 Merged with 10.07.0791 Plotted with 16.05.3392

Depth in Feet

Timing Marks every 60.0 sec

Gamma Ray API: 0 100 200 / 200 300 400

Differential Temperature degrees F/sample: -0.10 0 0.10

Density Caliper inches: 5 10 15

Borehole Temp in deg F

HVI

Upper Gas Detector: 1000 750 500 250 0 / 10000 7500 5000 2500 0

Lower Gas Detector: 0 250 500 750 1000 / 0 2500 5000 7500 10000

Borehole Temperature degrees F: 70 71.25 72.50 73.75 75

Limestone Neutron Por. percent: 30 20 10 0 -10

Compensated Density grams/cc: 2 2.25 2.50 2.75 3

PE barns/electron: 0 2.50 5 7.50 10

Base Density Porosity percent: 30 20 10 0 -10

every
10 cu ft

Matrix density
grams/cc
2 2.25 2.50 2.75 3

Bit Size
inches
5 10 15

Annular
Integral
every
10 cu ft

Medium Induction
ohm metres
0 50 100
0 500 1000

Density Correction
grams/cc
-0.30 -0.05 0.20

Deep Induction
ohm metres
0 50 100
0 500 1000

DST Uphole Tension
pounds
0 3000
3000 6000

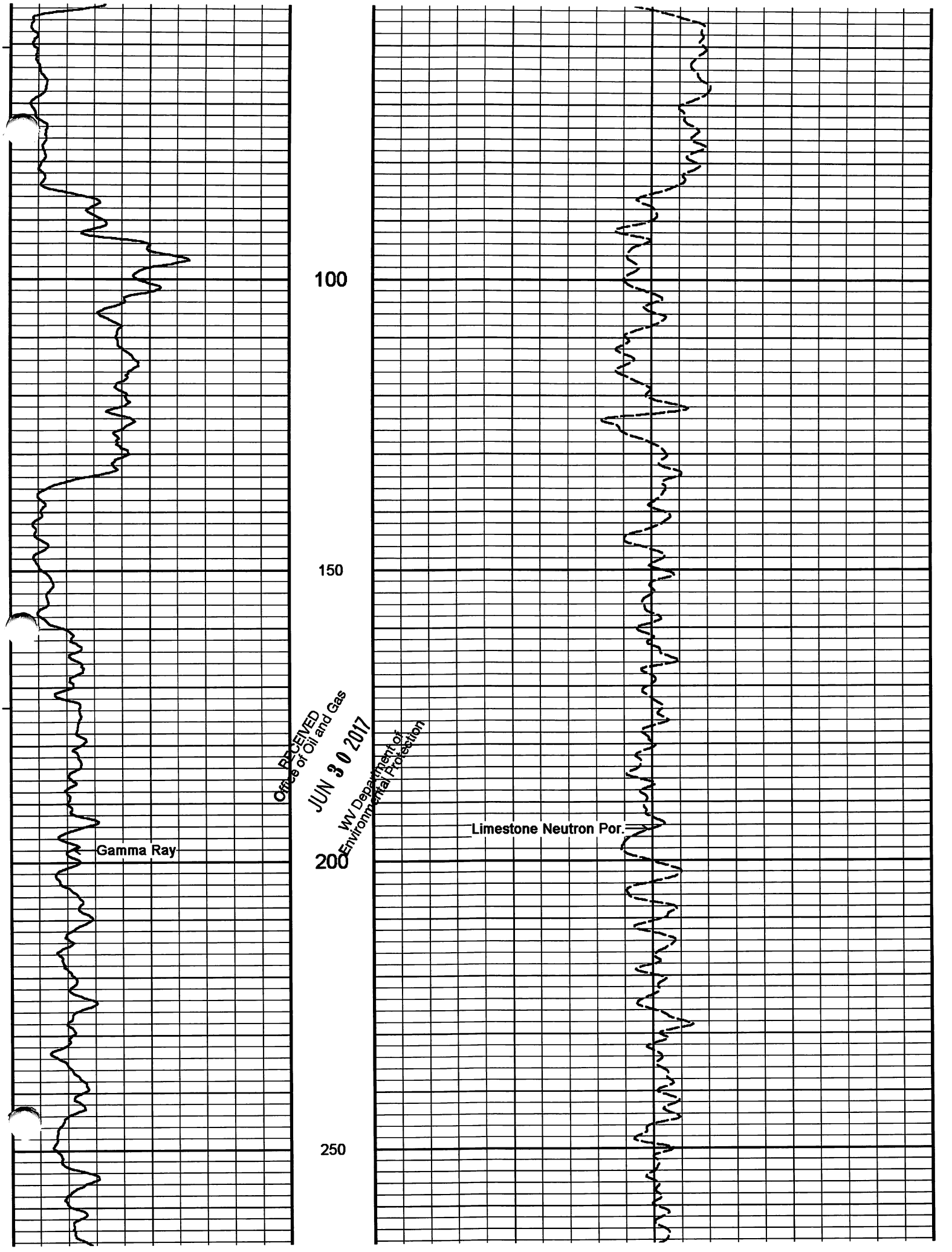
Replay
Scale
1:240

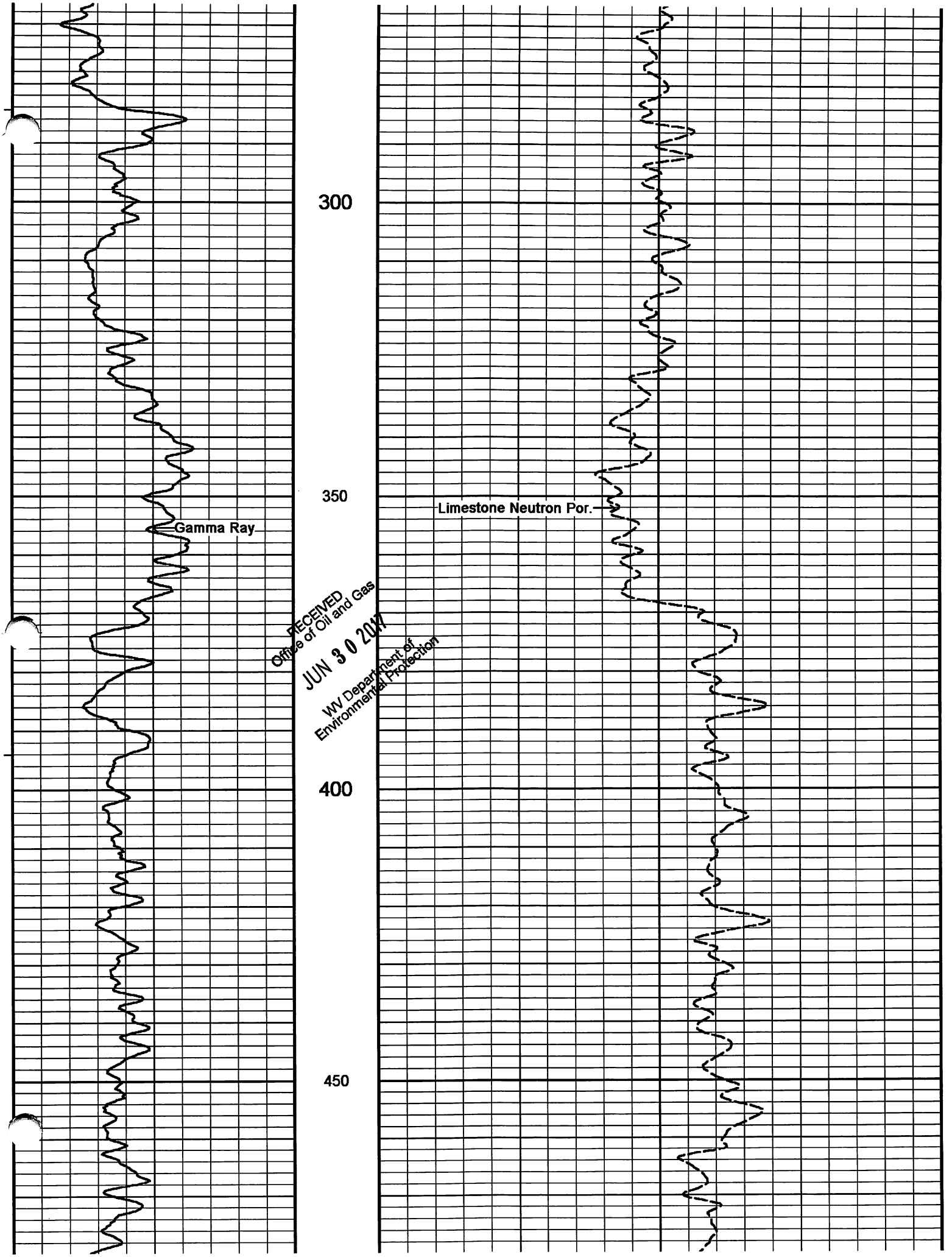
0

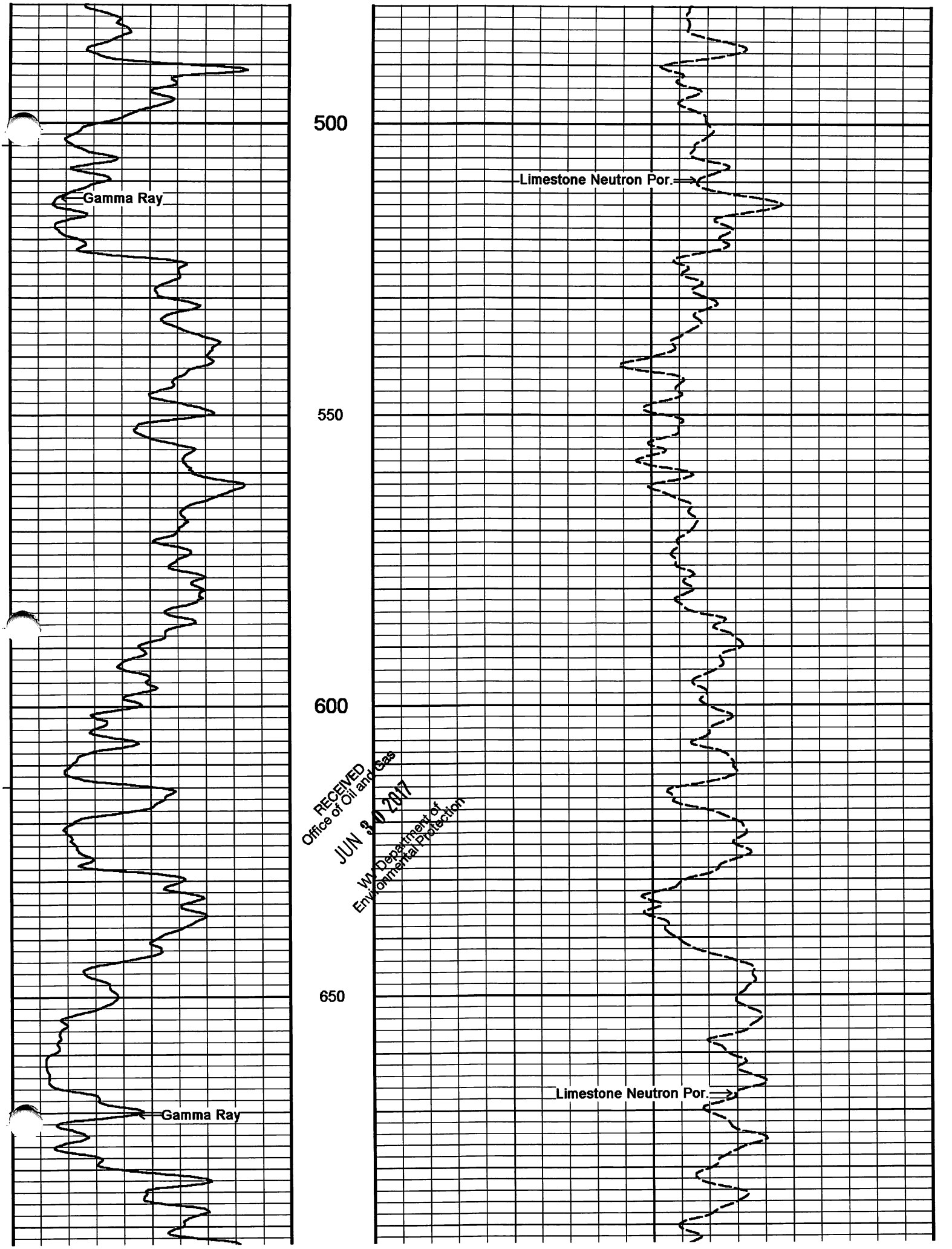
Gamma Ray

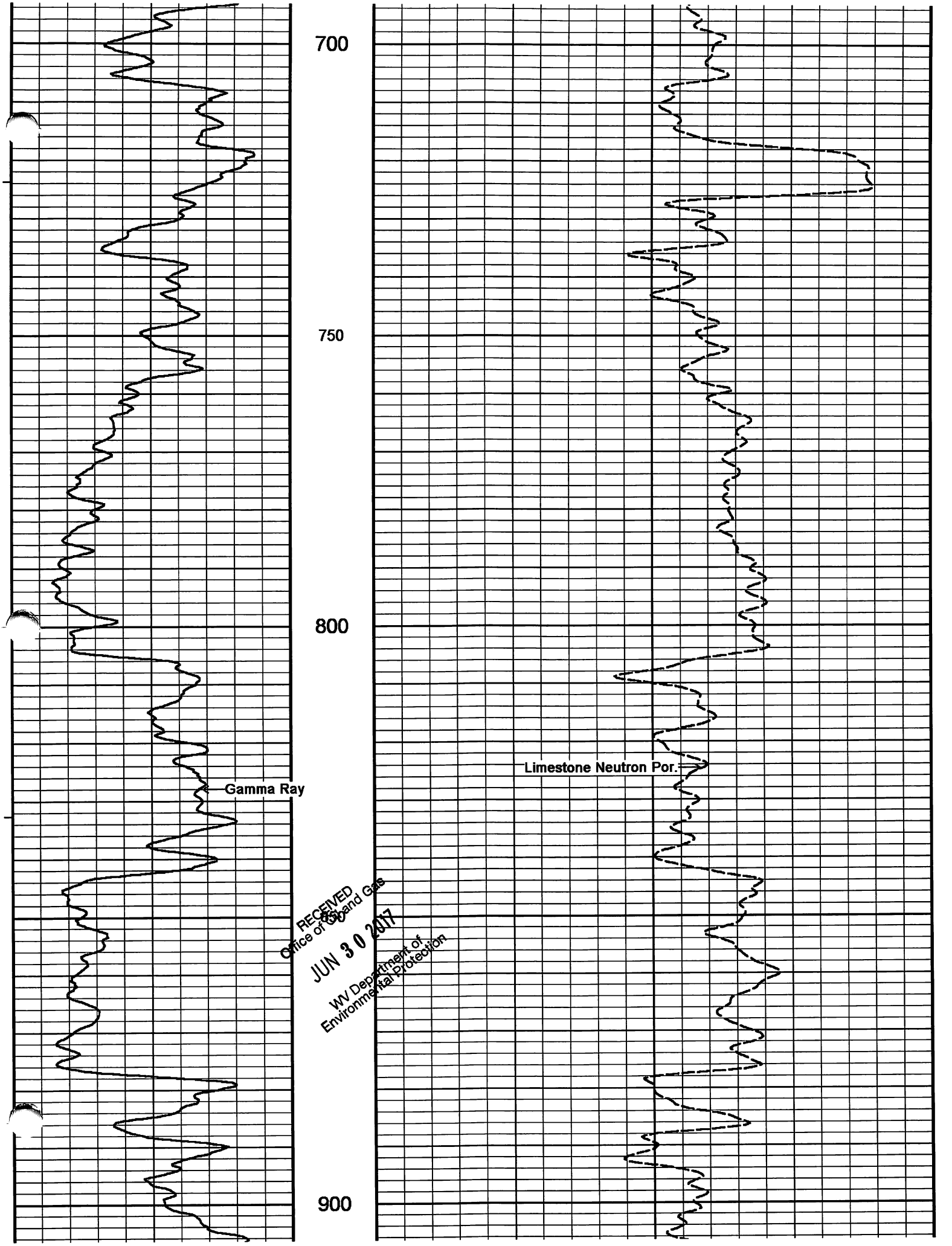
Limestone Neutron Por.

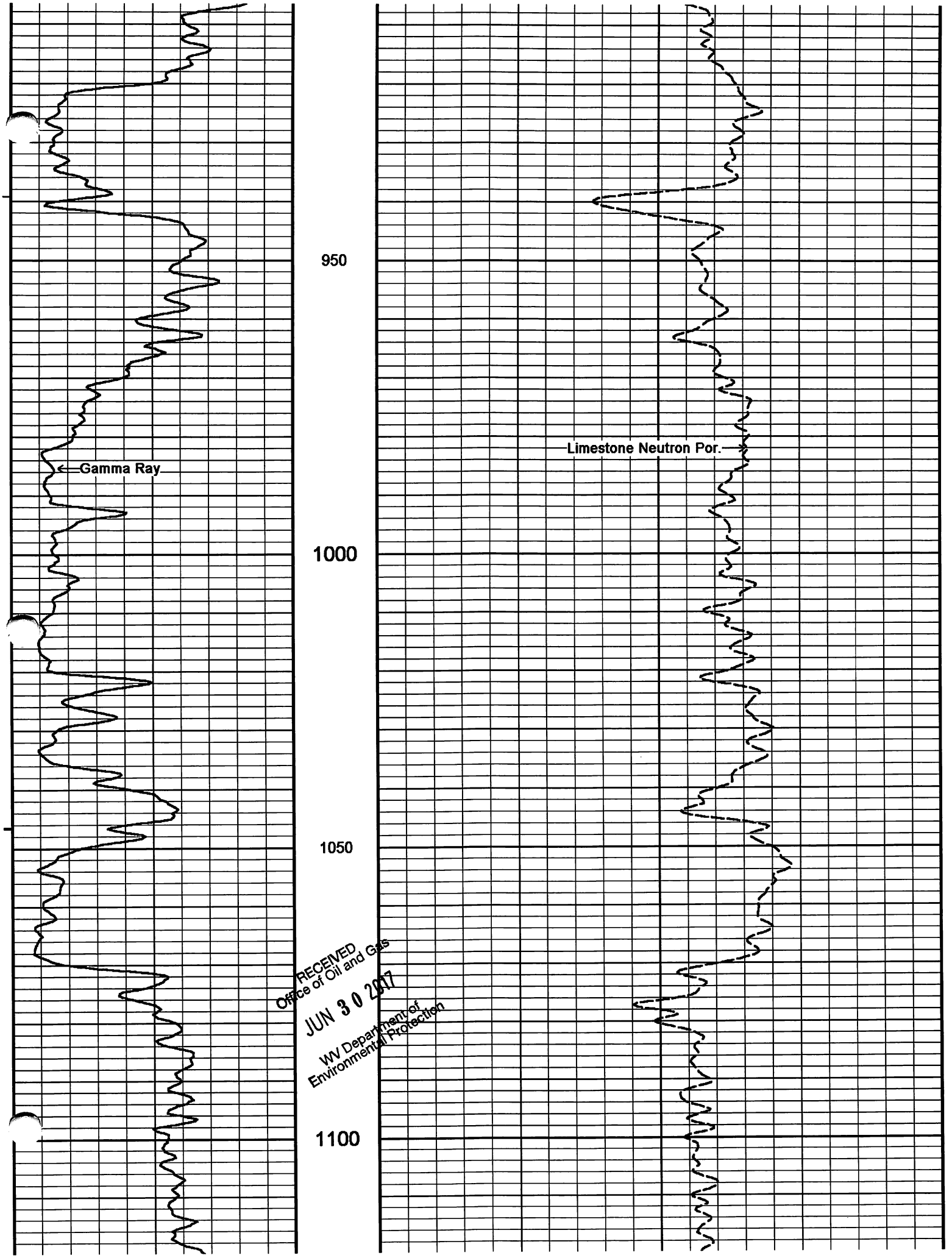
50

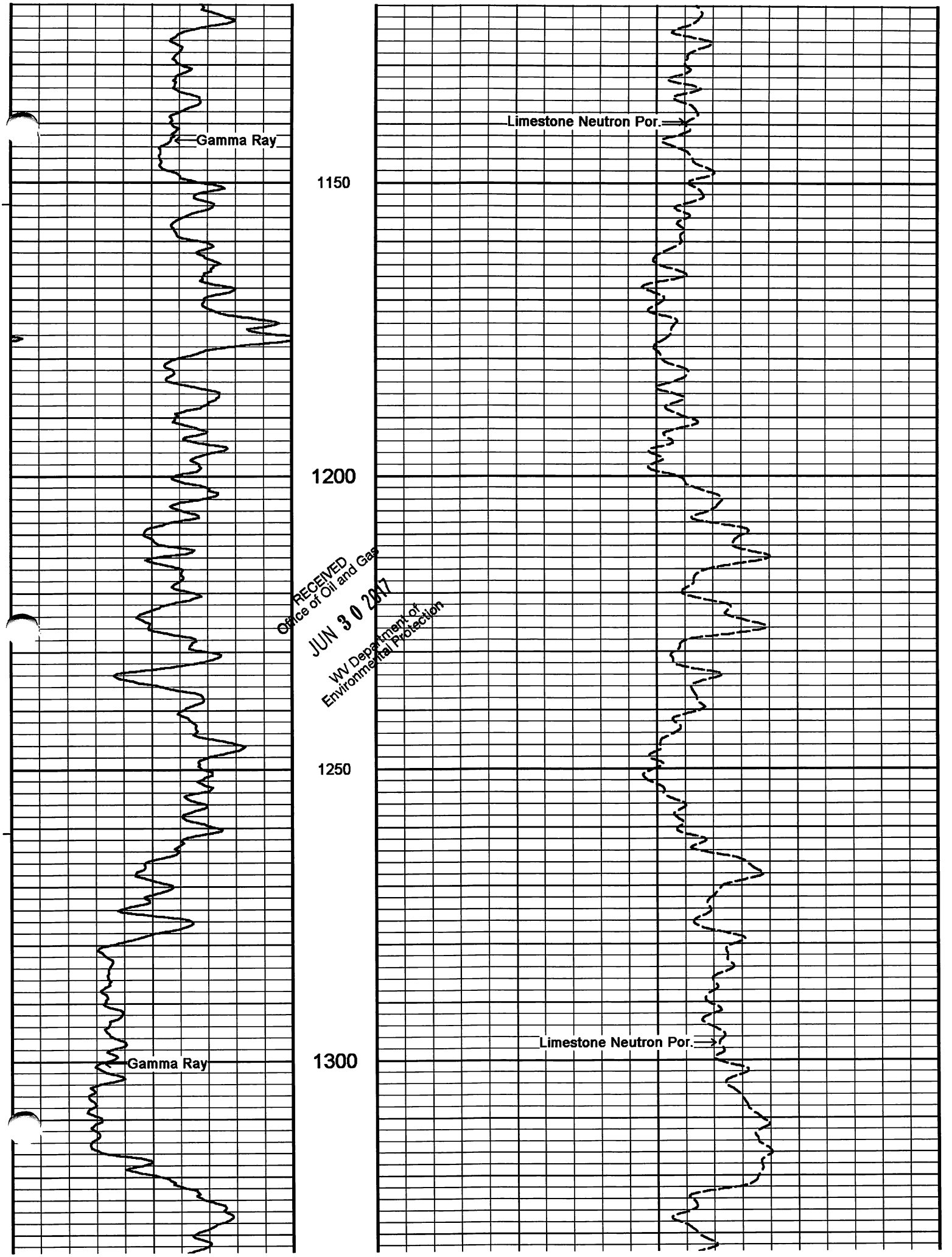


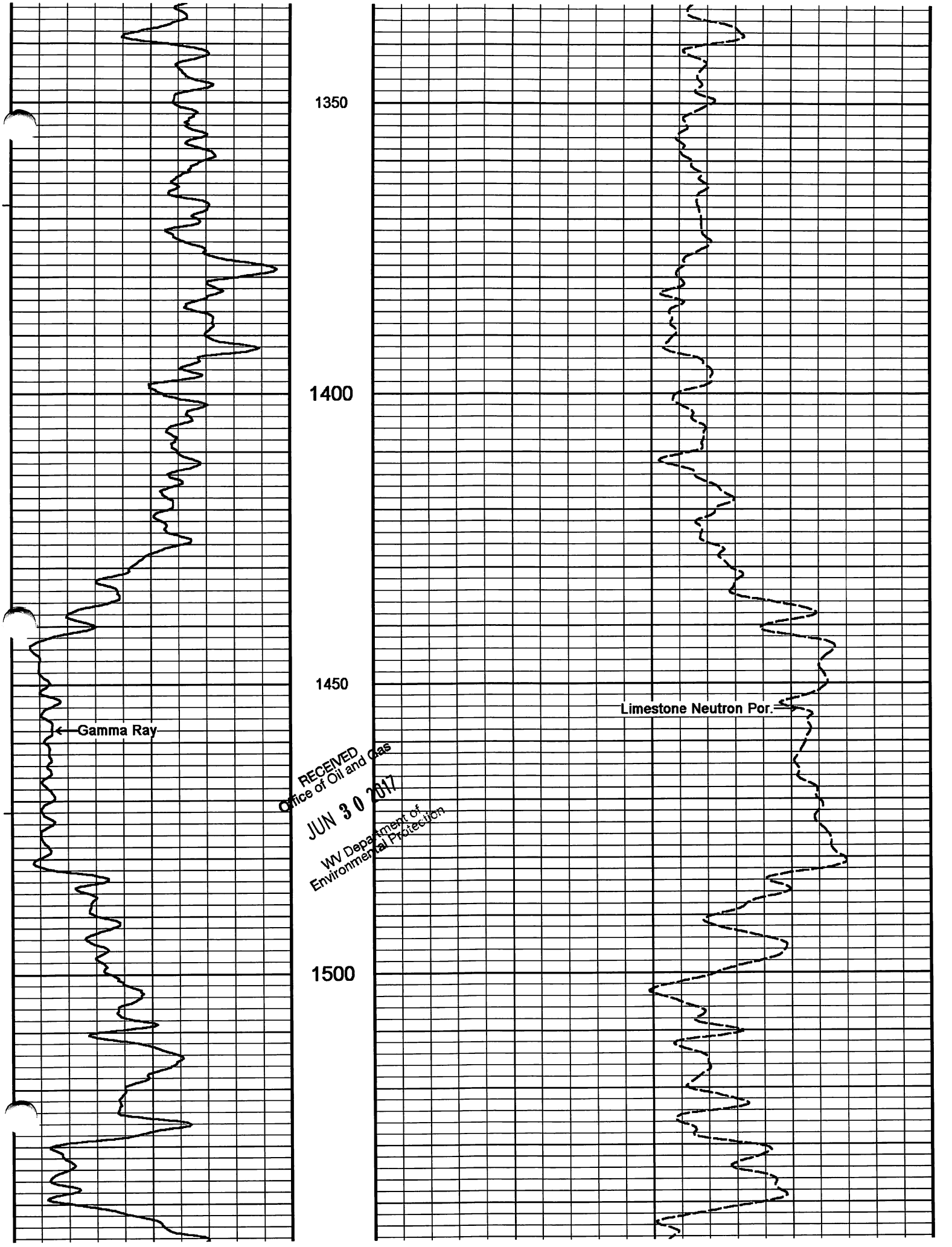


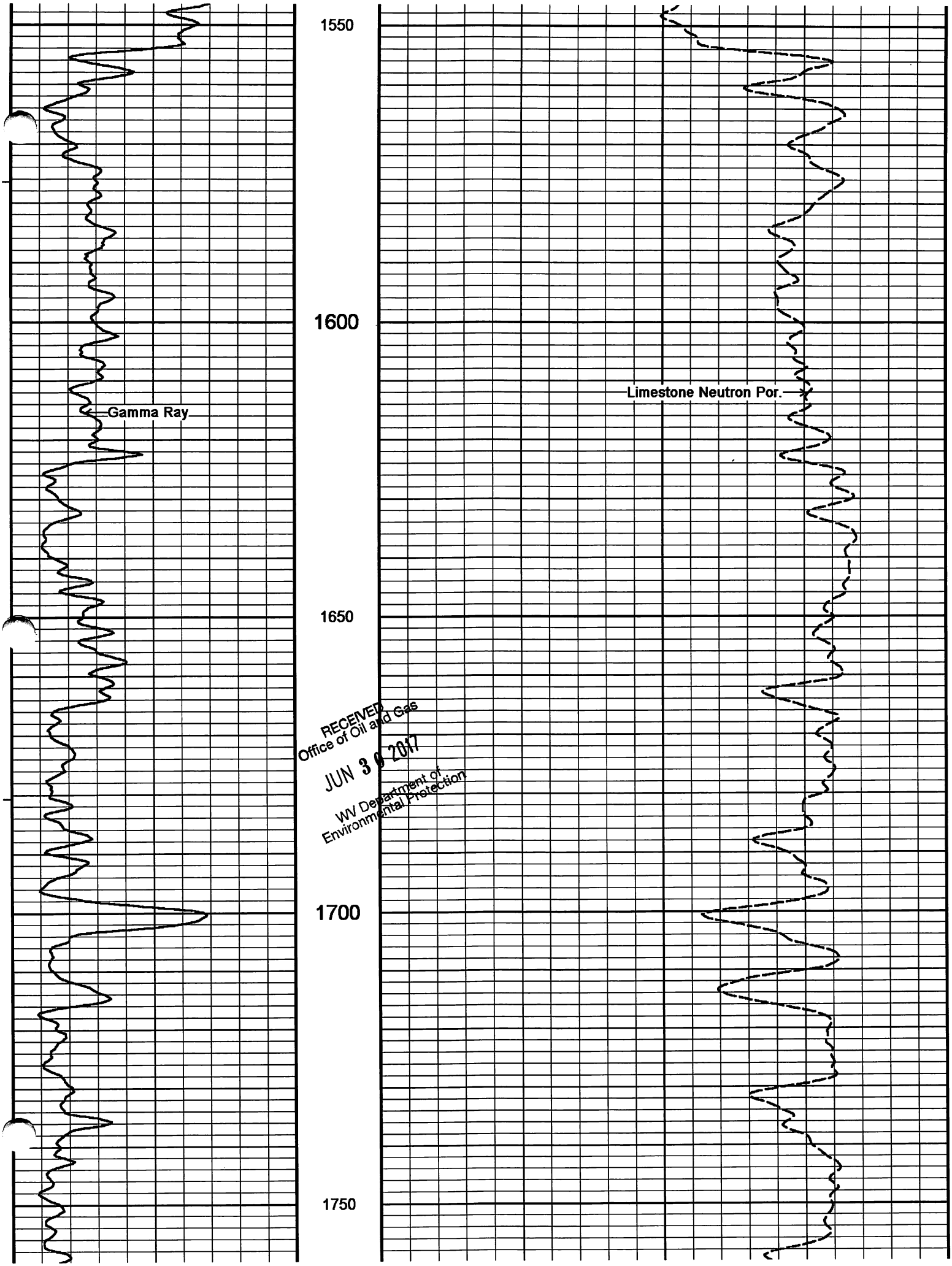


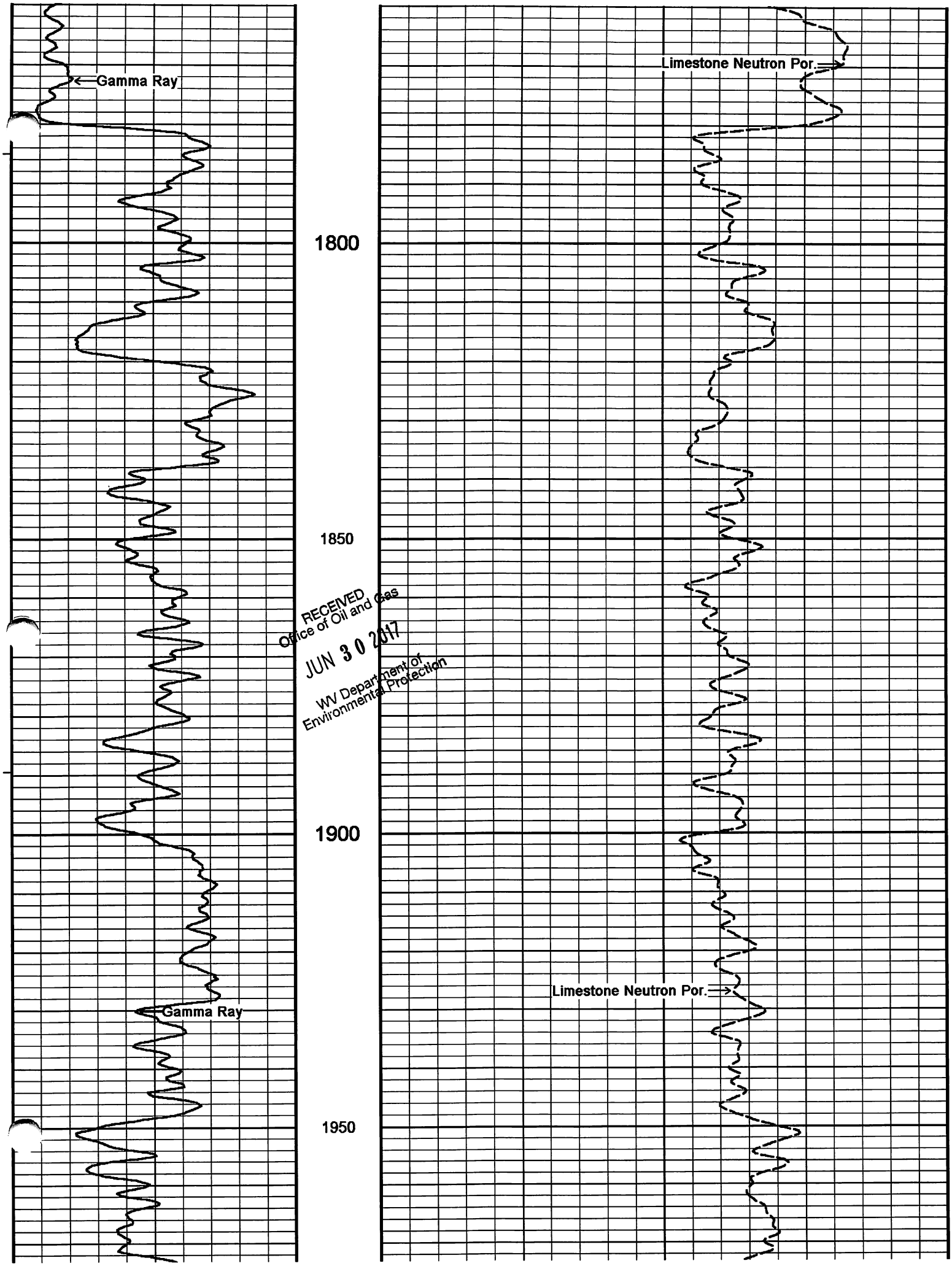


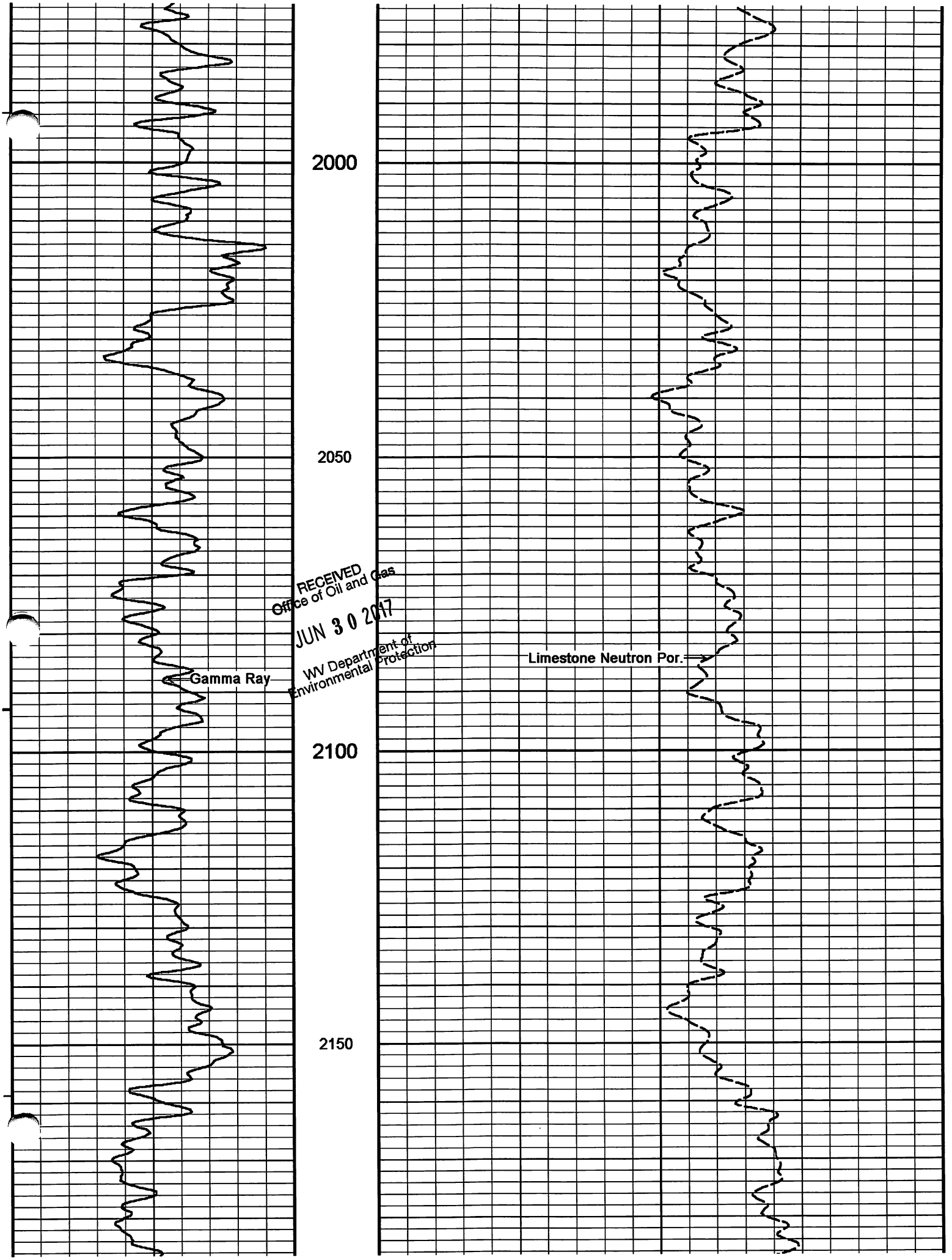


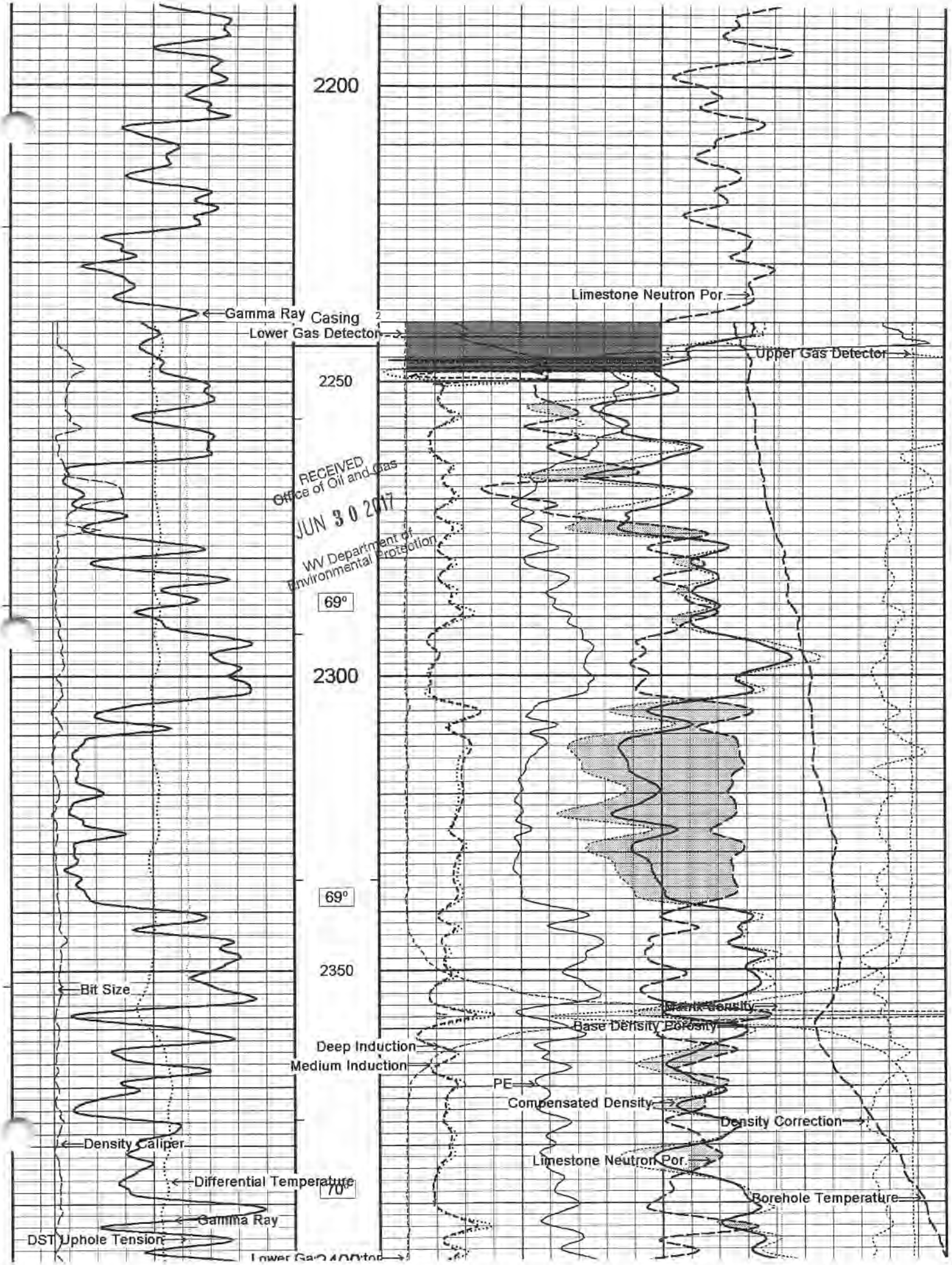


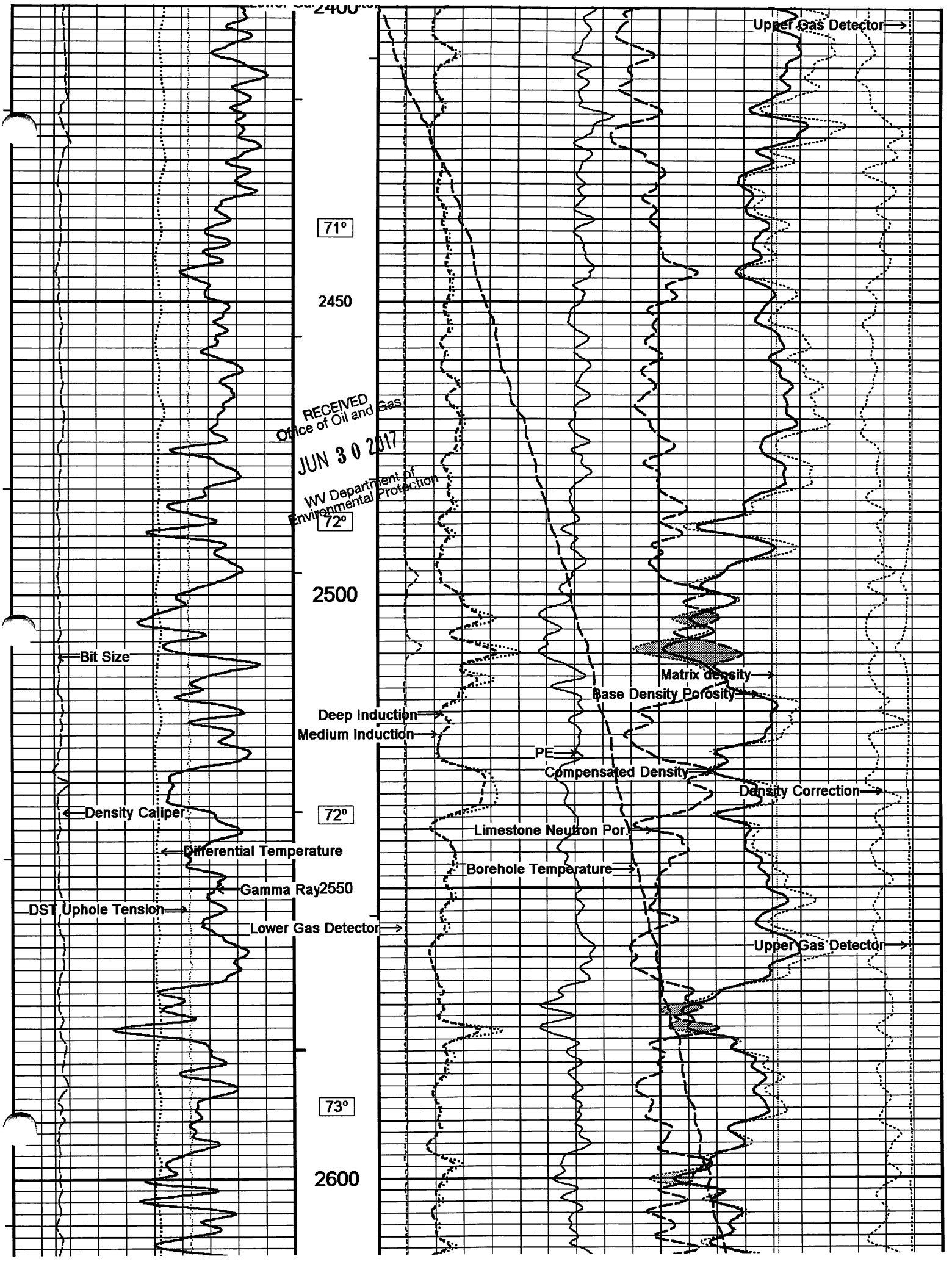


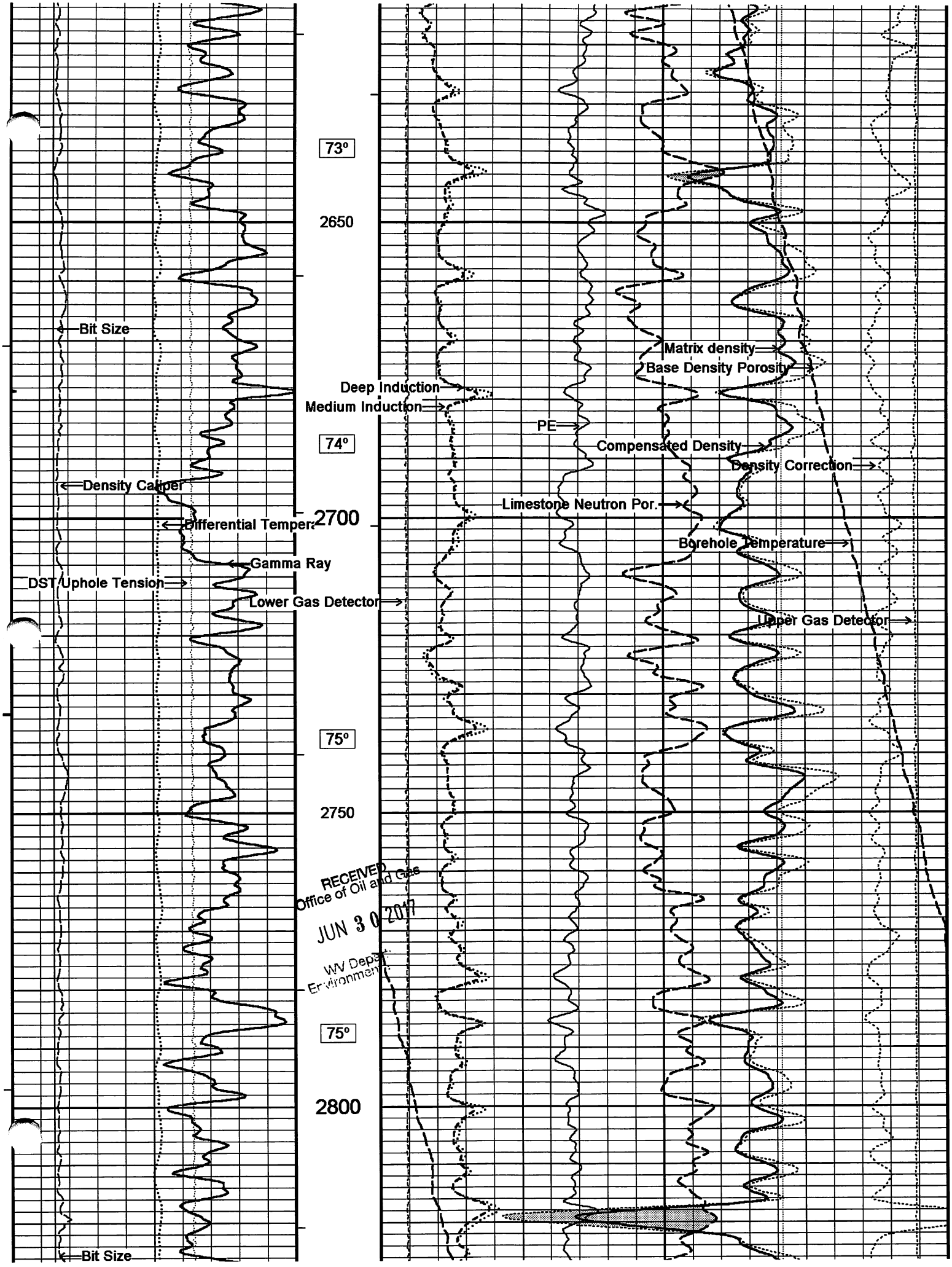


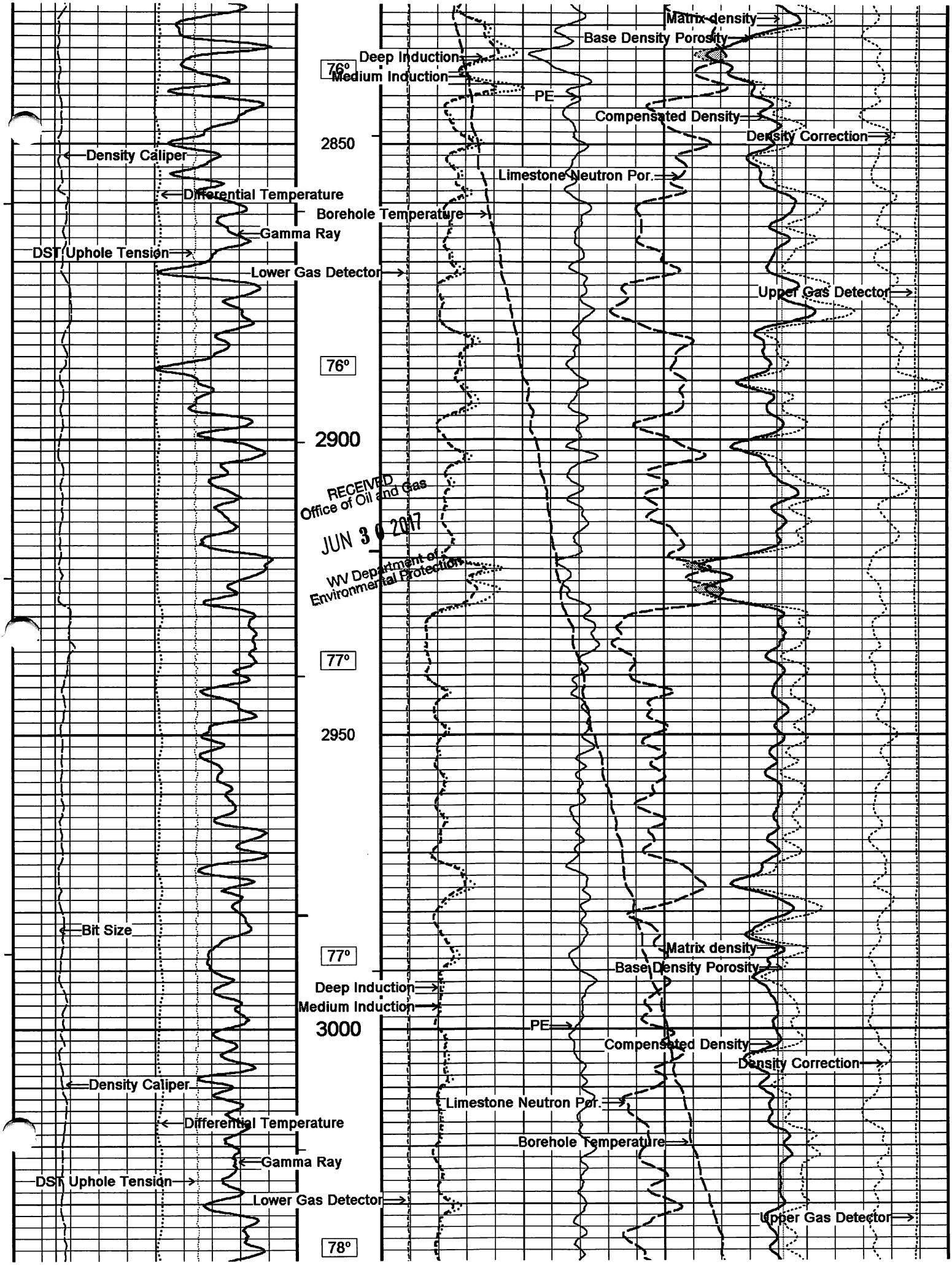







2400
Upper Gas Detector
71°
2450
RECEIVED
Office of Oil and Gas
JUN 30 2017
WV Department of
Environmental Protection
72°
2500
Bit Size
Matrix density
Base Density Porosity
Deep Induction
Medium Induction
PE
Compensated Density
Density Correction
Density Caliper
72°
Limestone Neutron Por.
Differential Temperature
Borehole Temperature
Gamma Ray
2550
DST Uphole Tension
Lower Gas Detector
Upper Gas Detector
73°
2600

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Deep Induction
Medium Induction
76°
PE
Compensated Density
Density Correction
2850
Density Caliper
Limestone Neutron Por.
Differential Temperature
Borehole Temperature
Gamma Ray
DST Uphole Tension
Lower Gas Detector
Upper Gas Detector
76°
2900
RECEIVED
Office of Oil and Gas
JUN 30 2017
WV Department of
Environmental Protection
77°
2950
Bit Size
77°
Matrix density
Base Density Porosity
Deep Induction
Medium Induction
3000
PE
Compensated Density
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Differential Temperature
Borehole Temperature
Gamma Ray
DST Uphole Tension
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Upper Gas Detector
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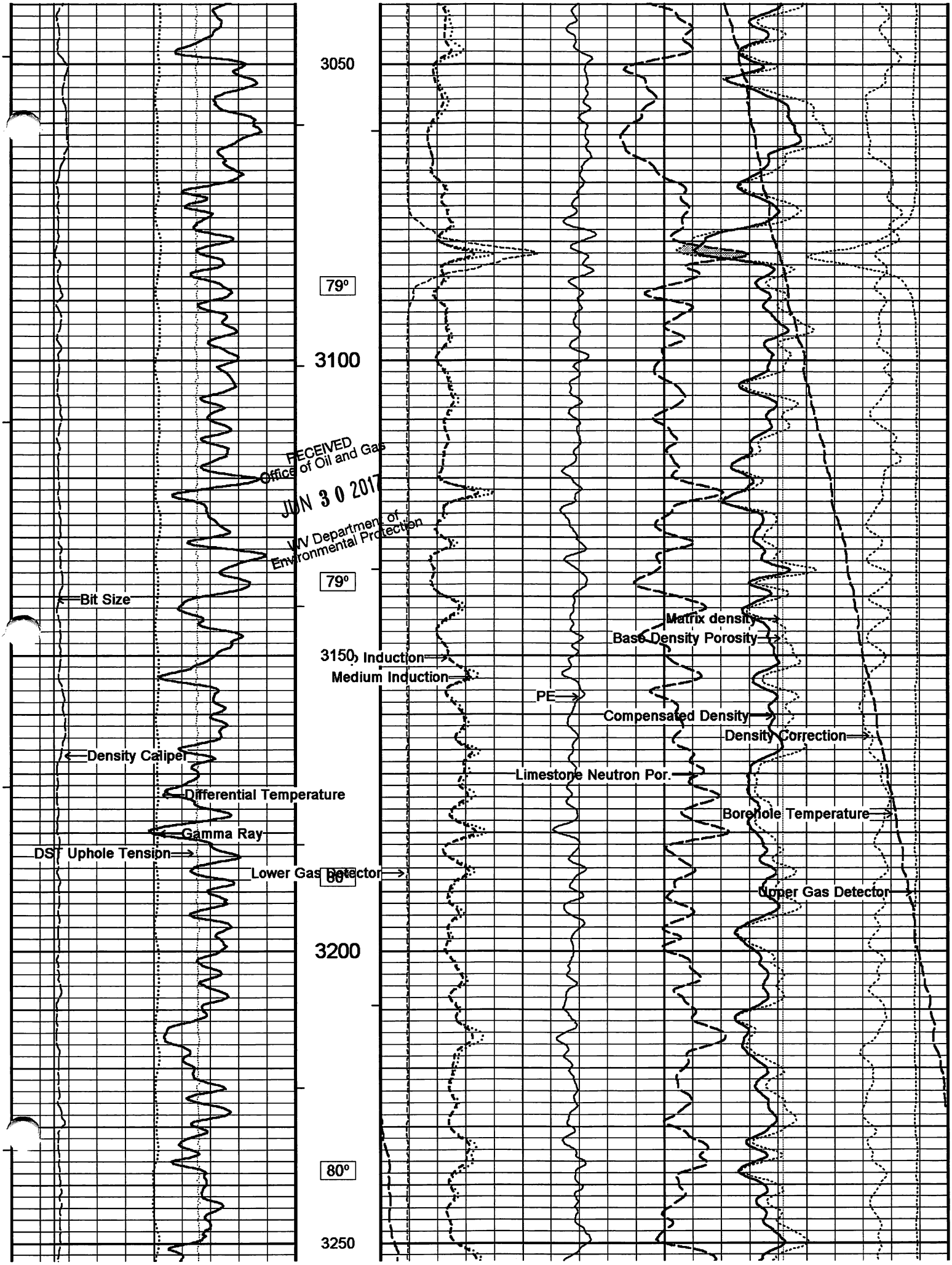
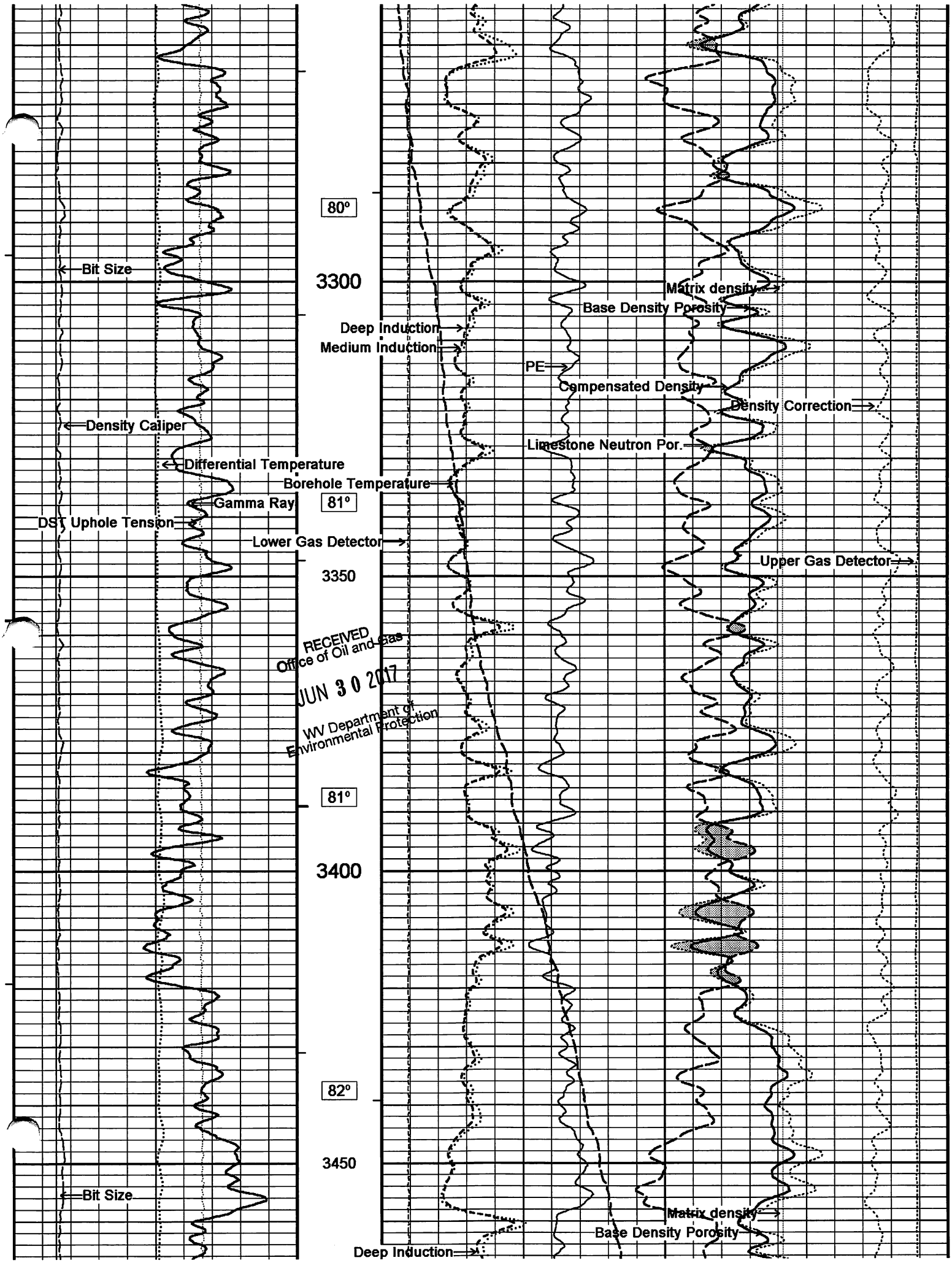
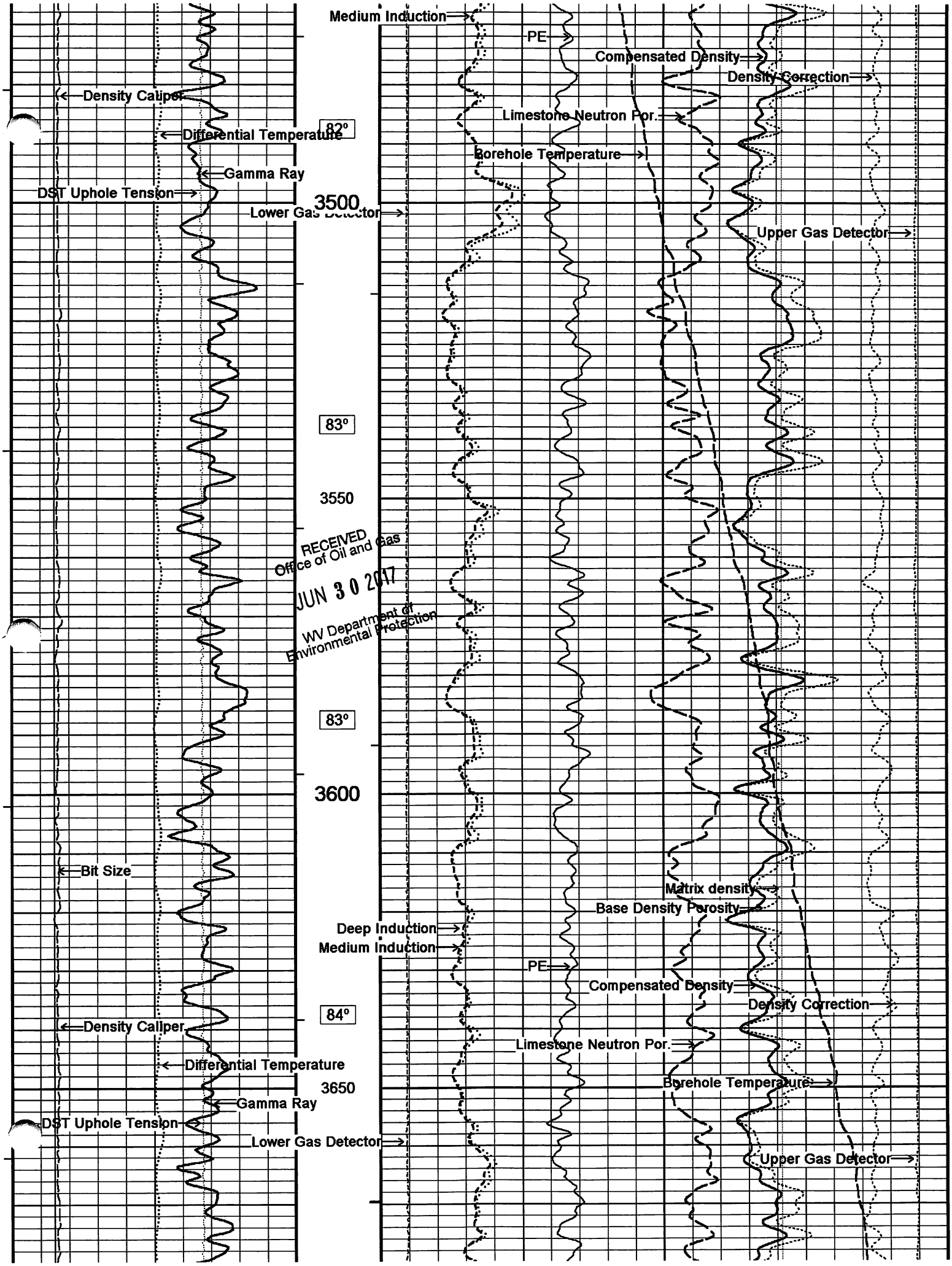
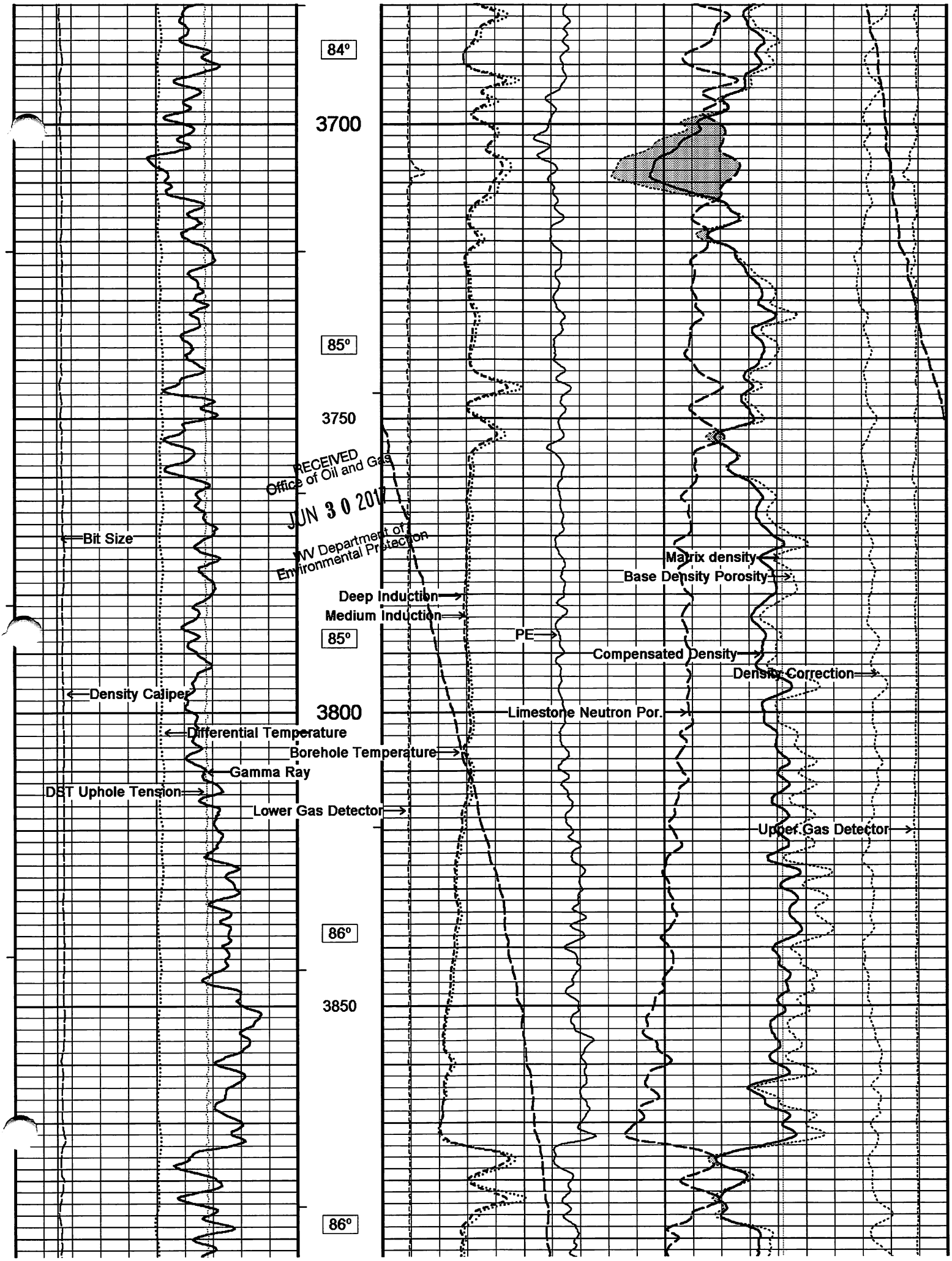
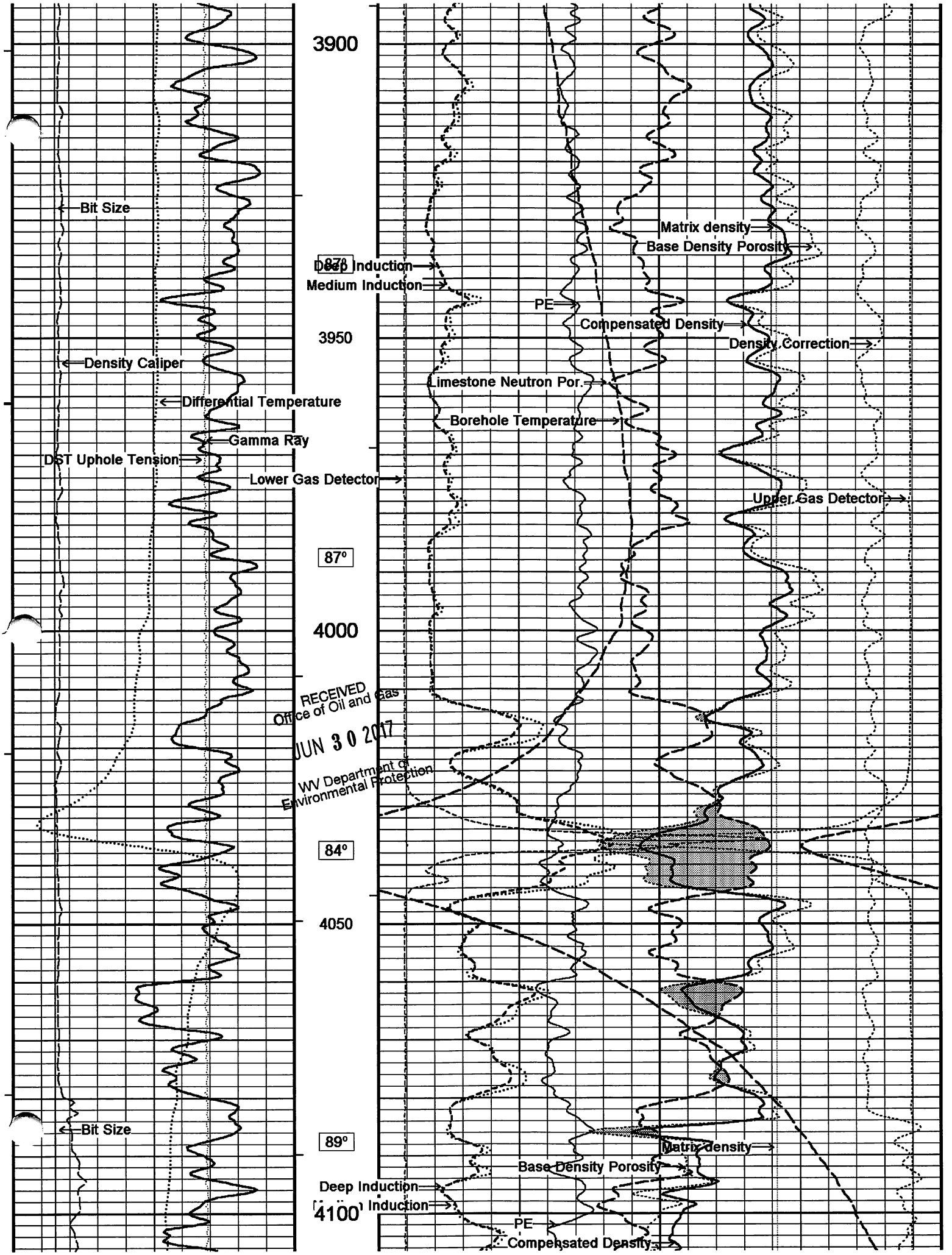
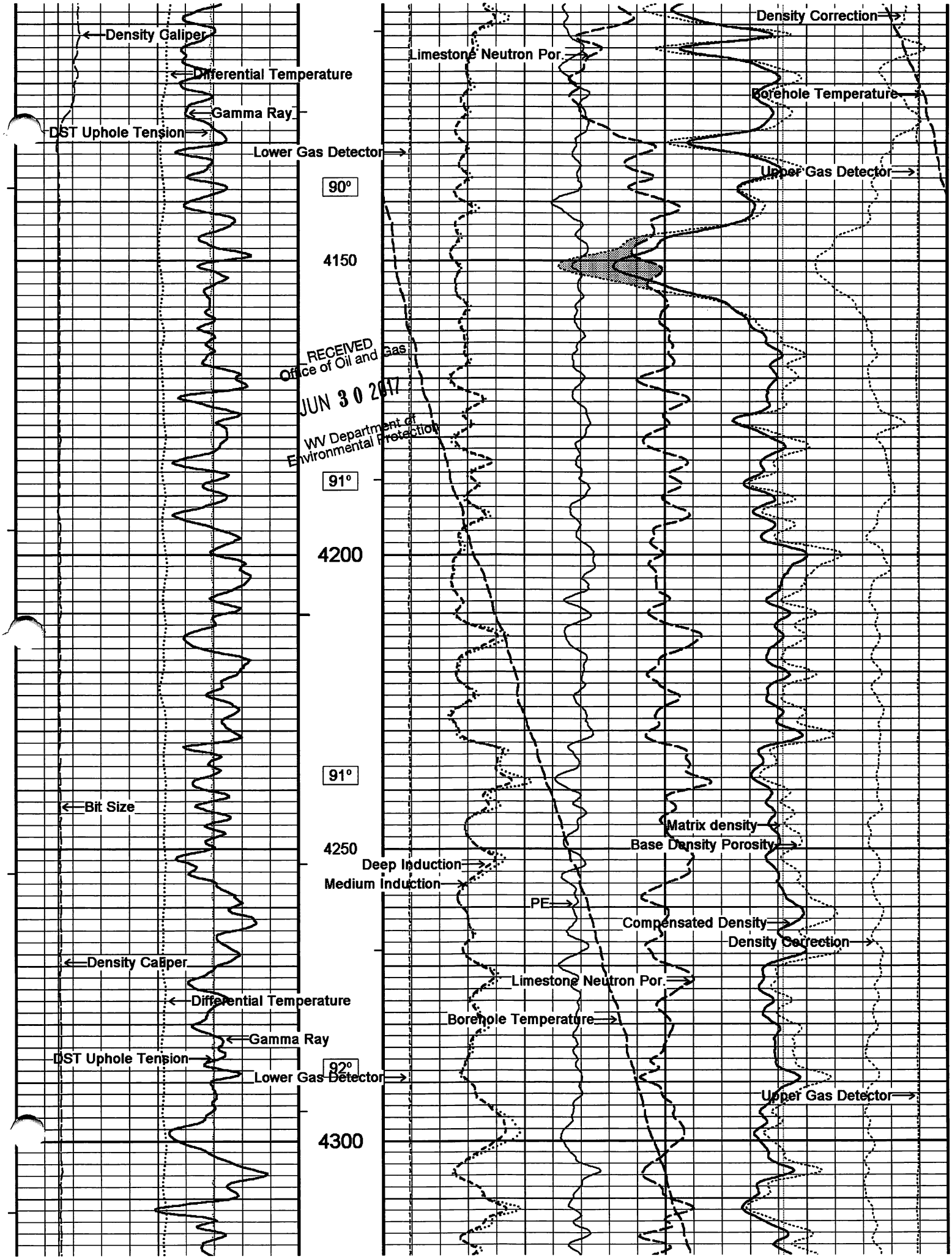


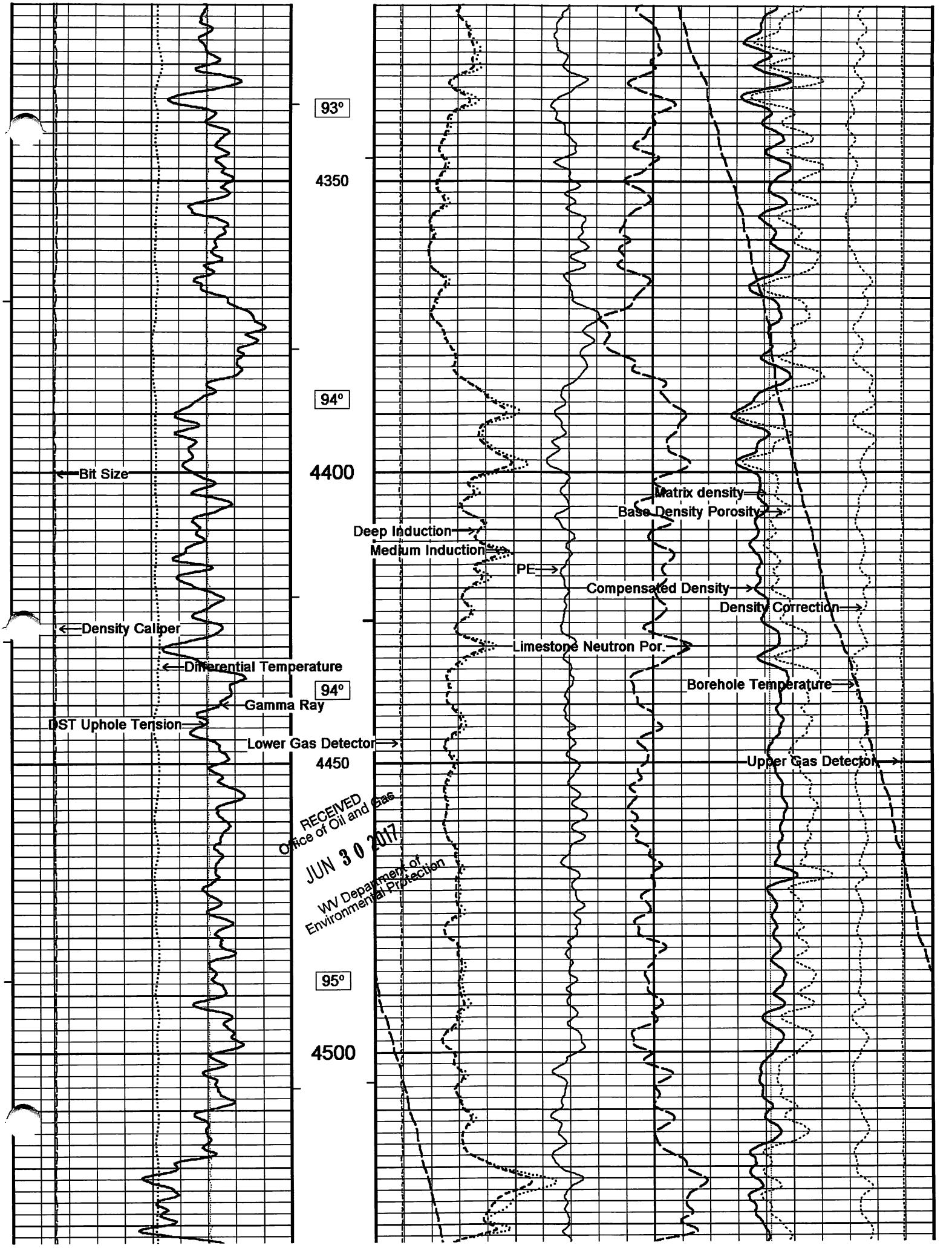


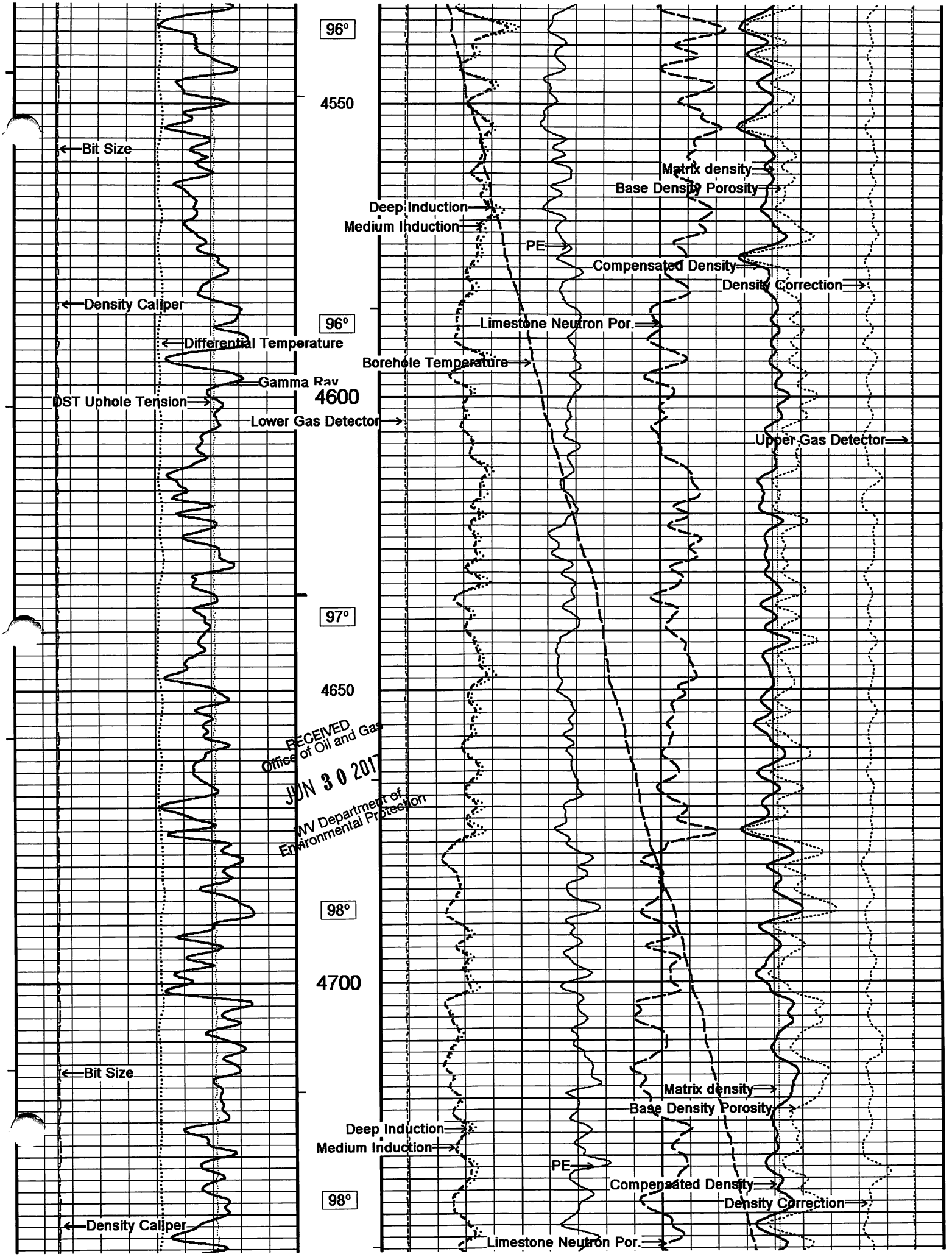


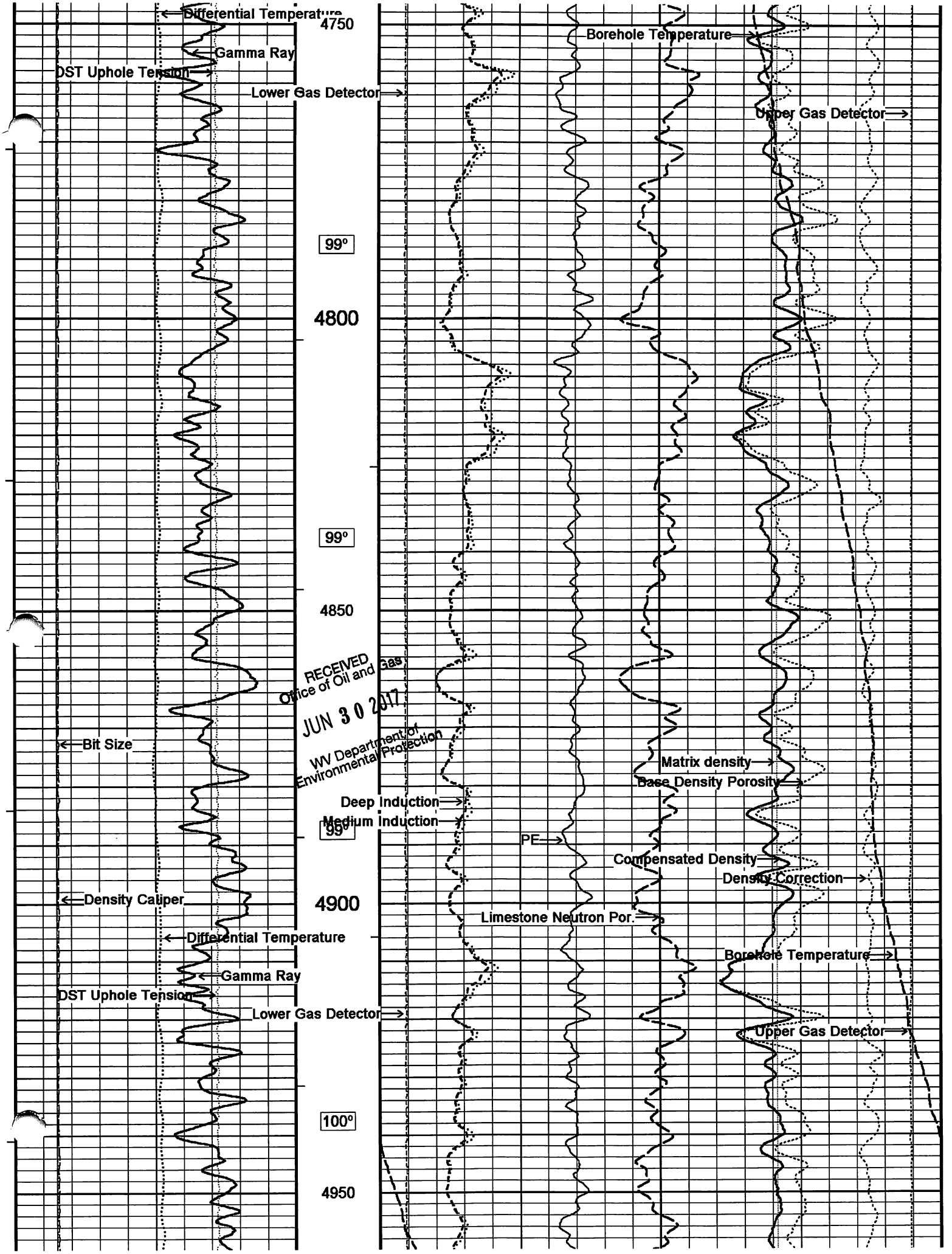


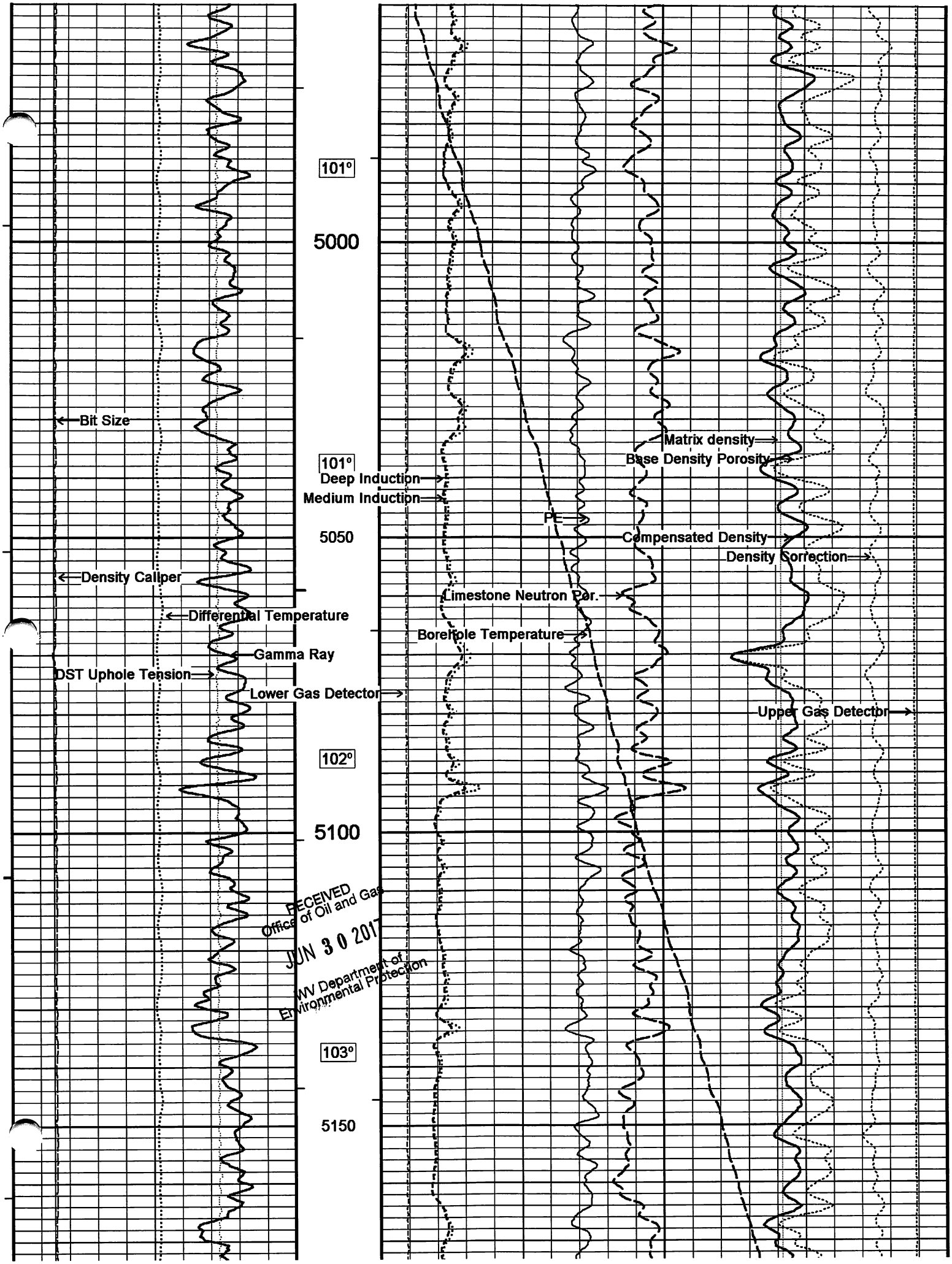


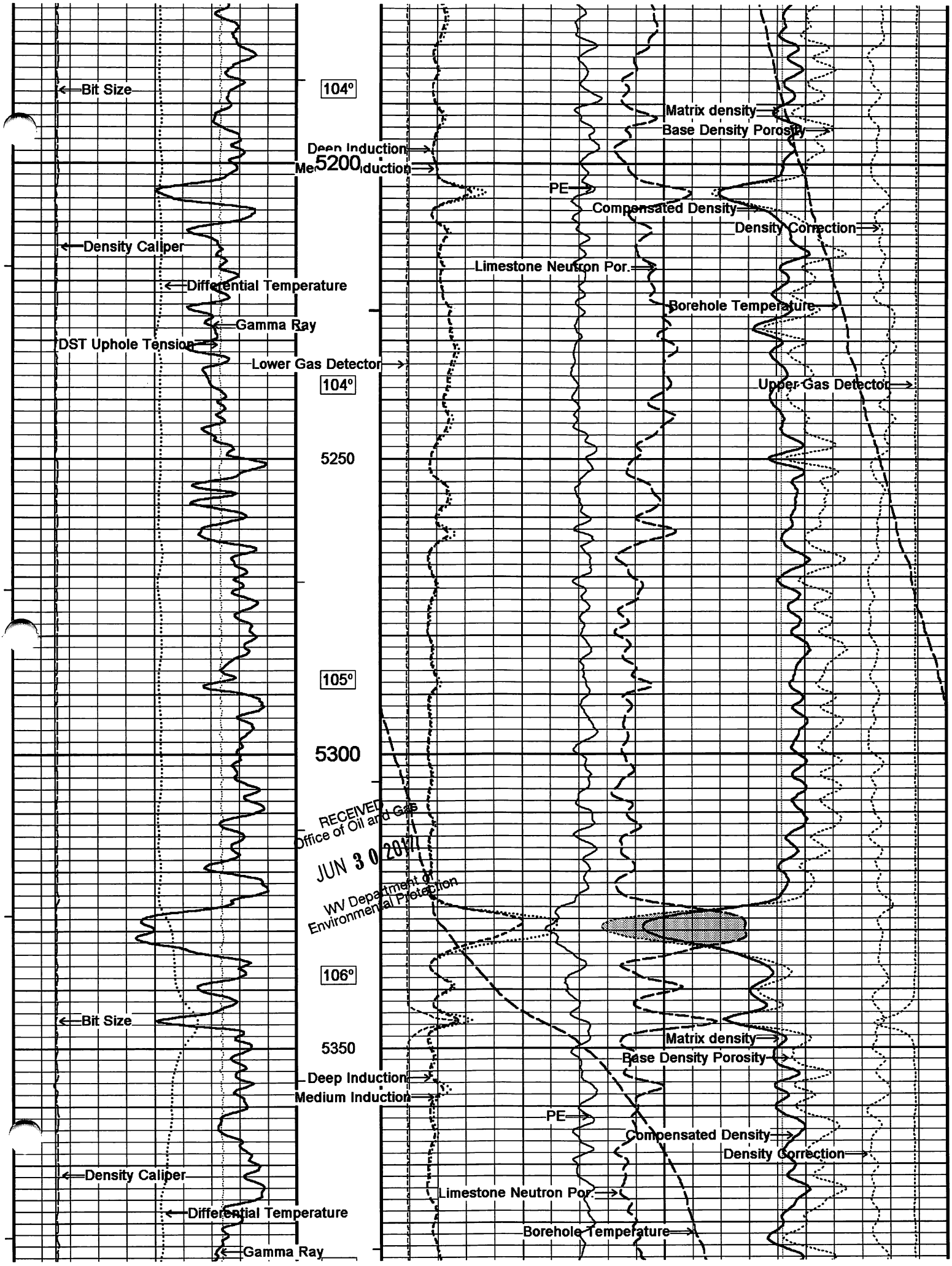


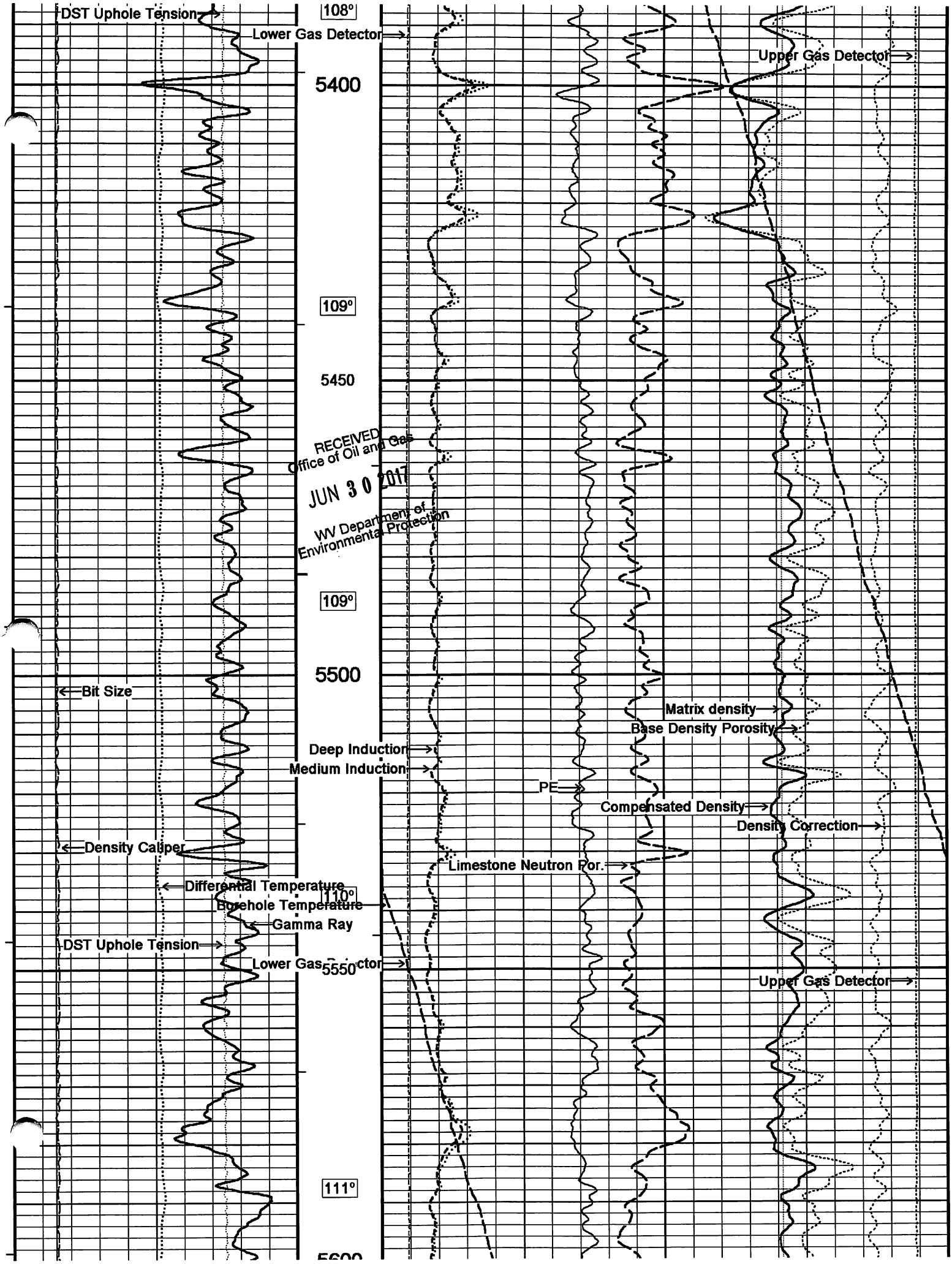


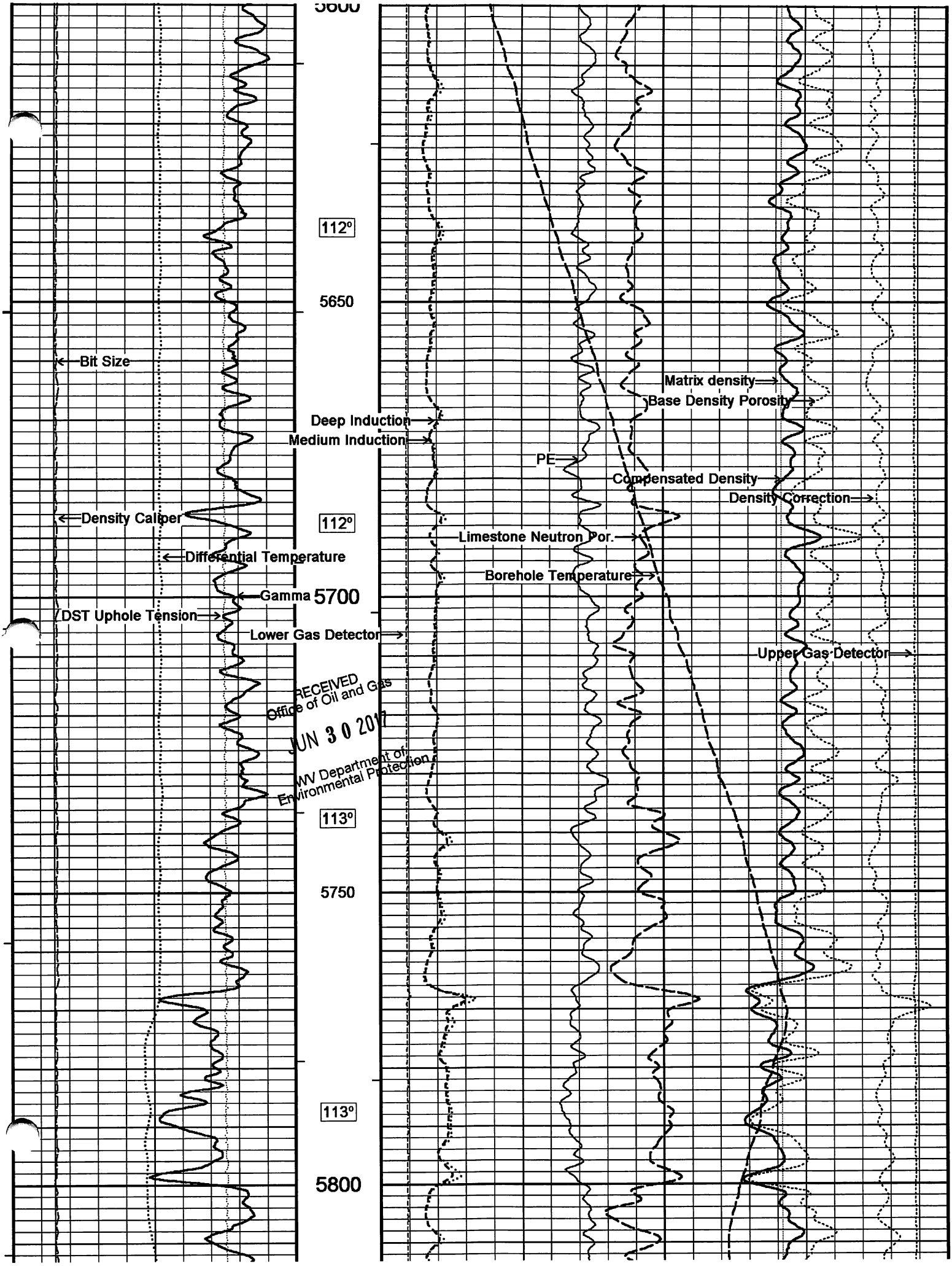


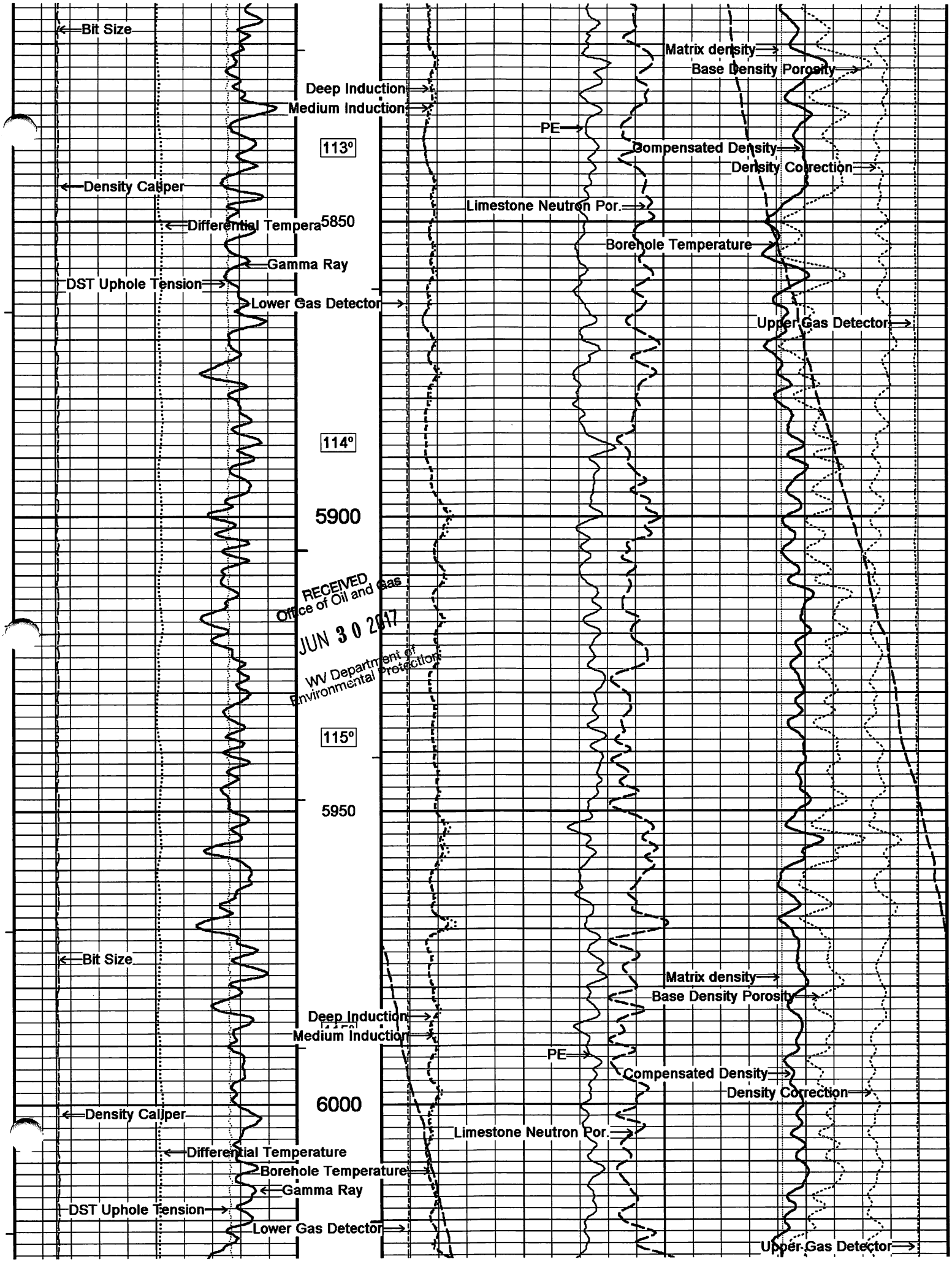


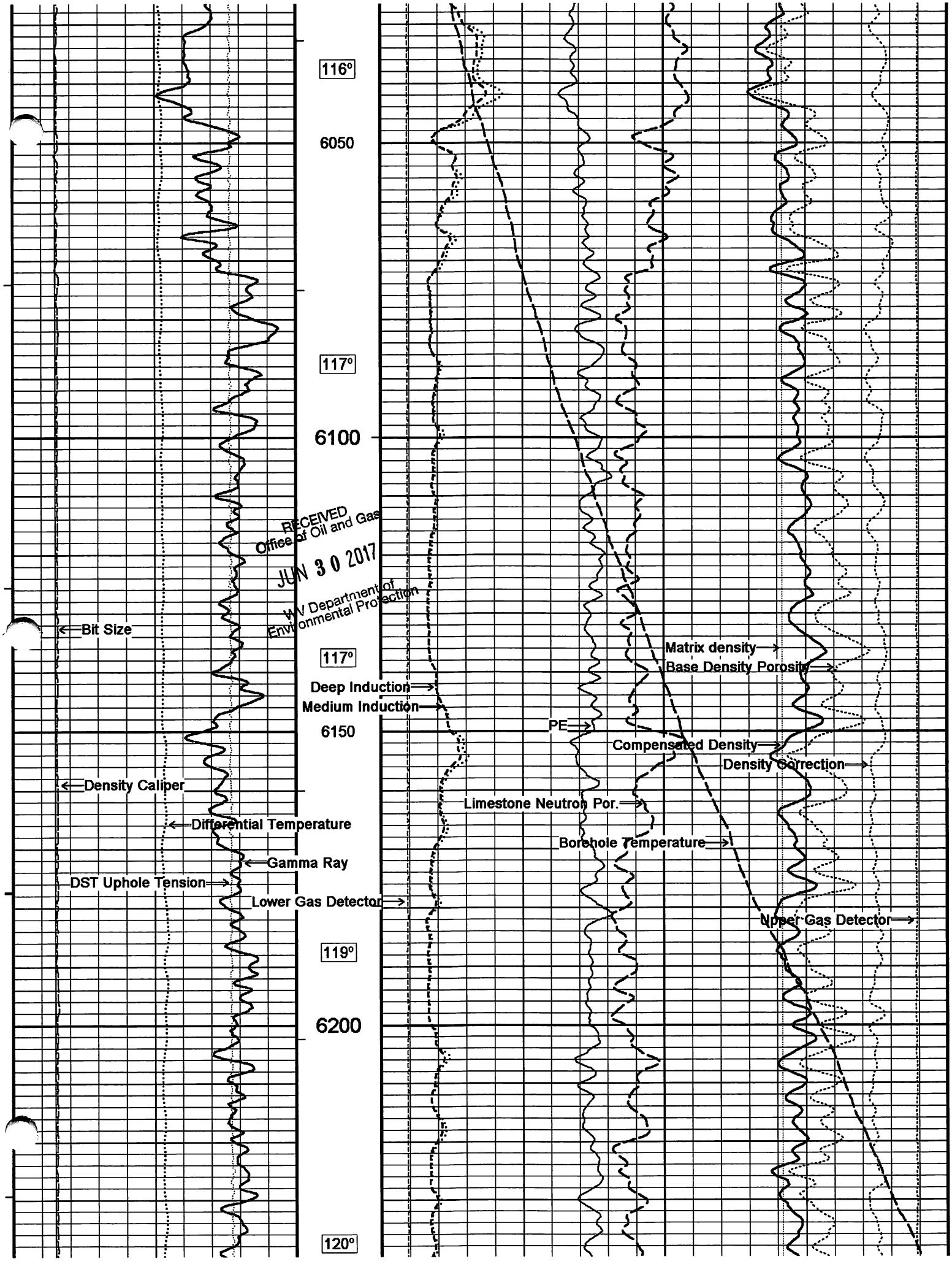


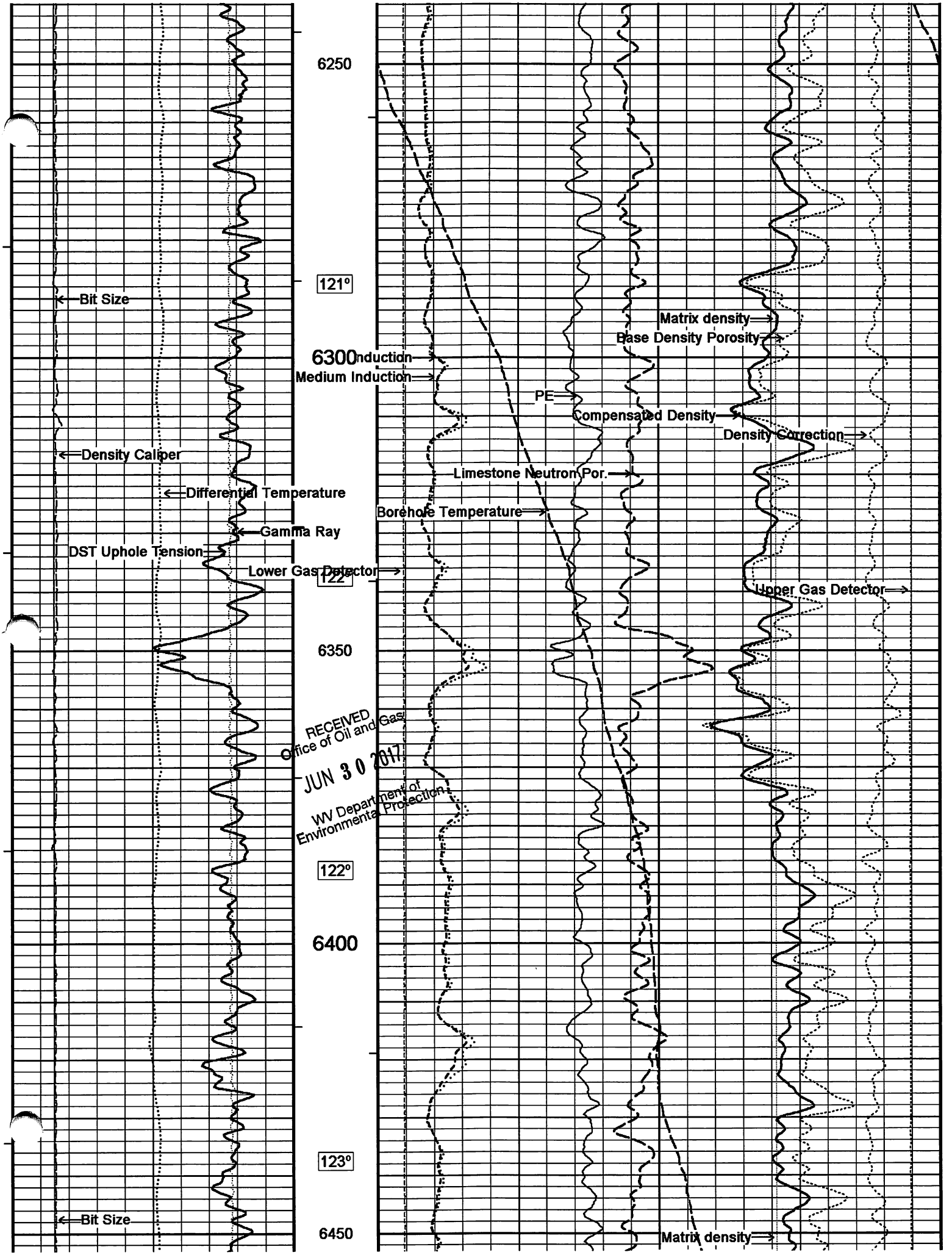


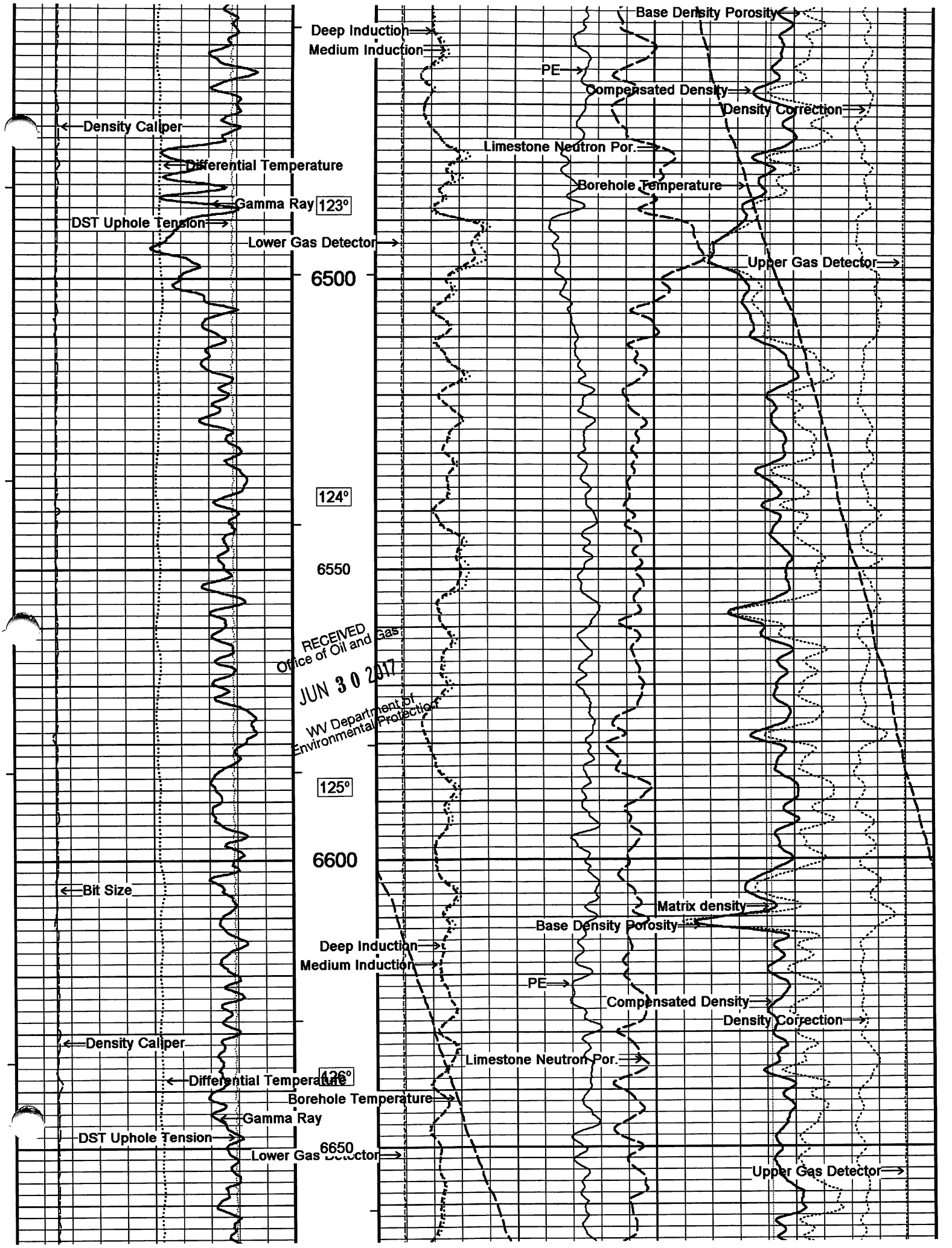


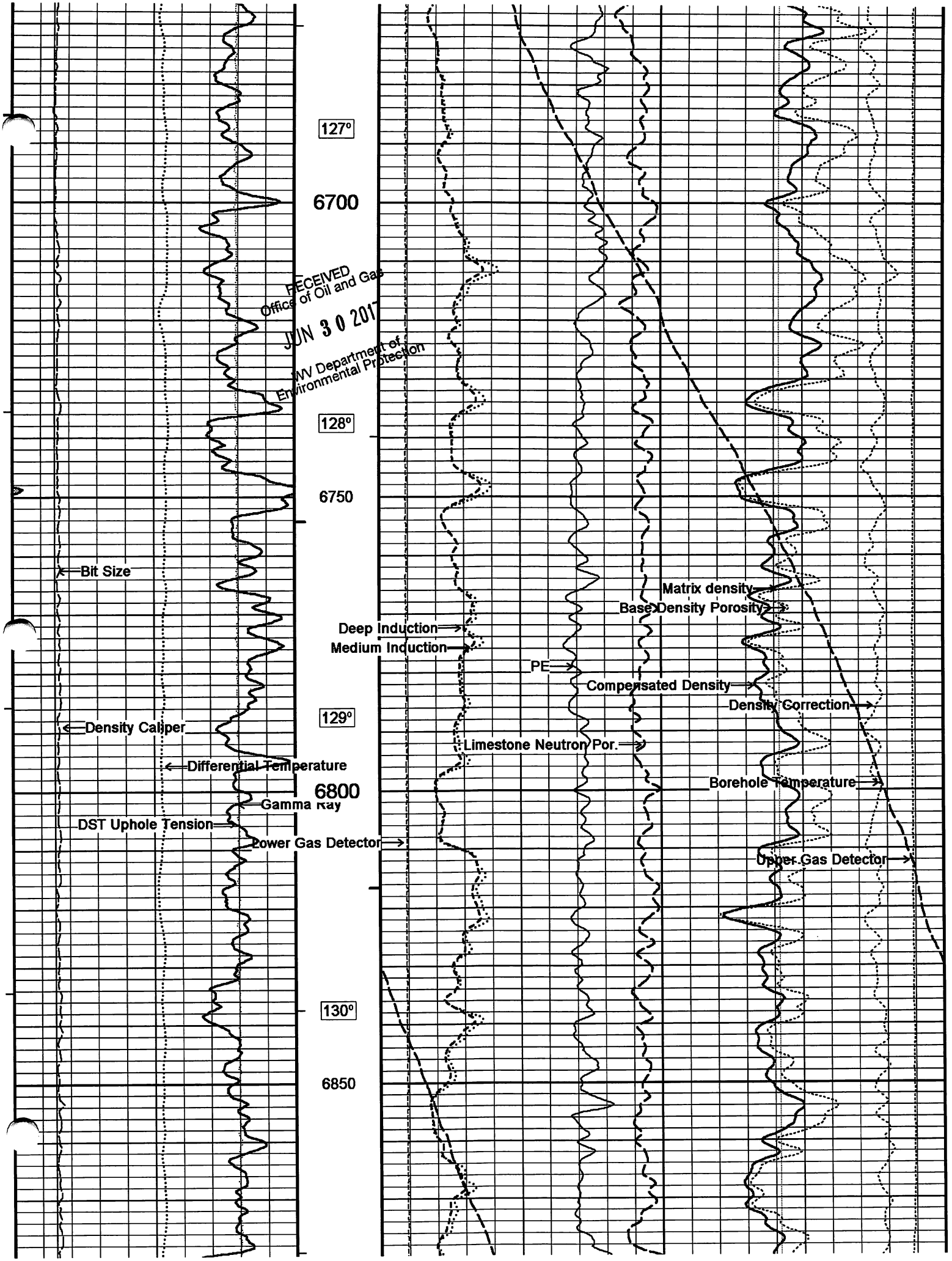


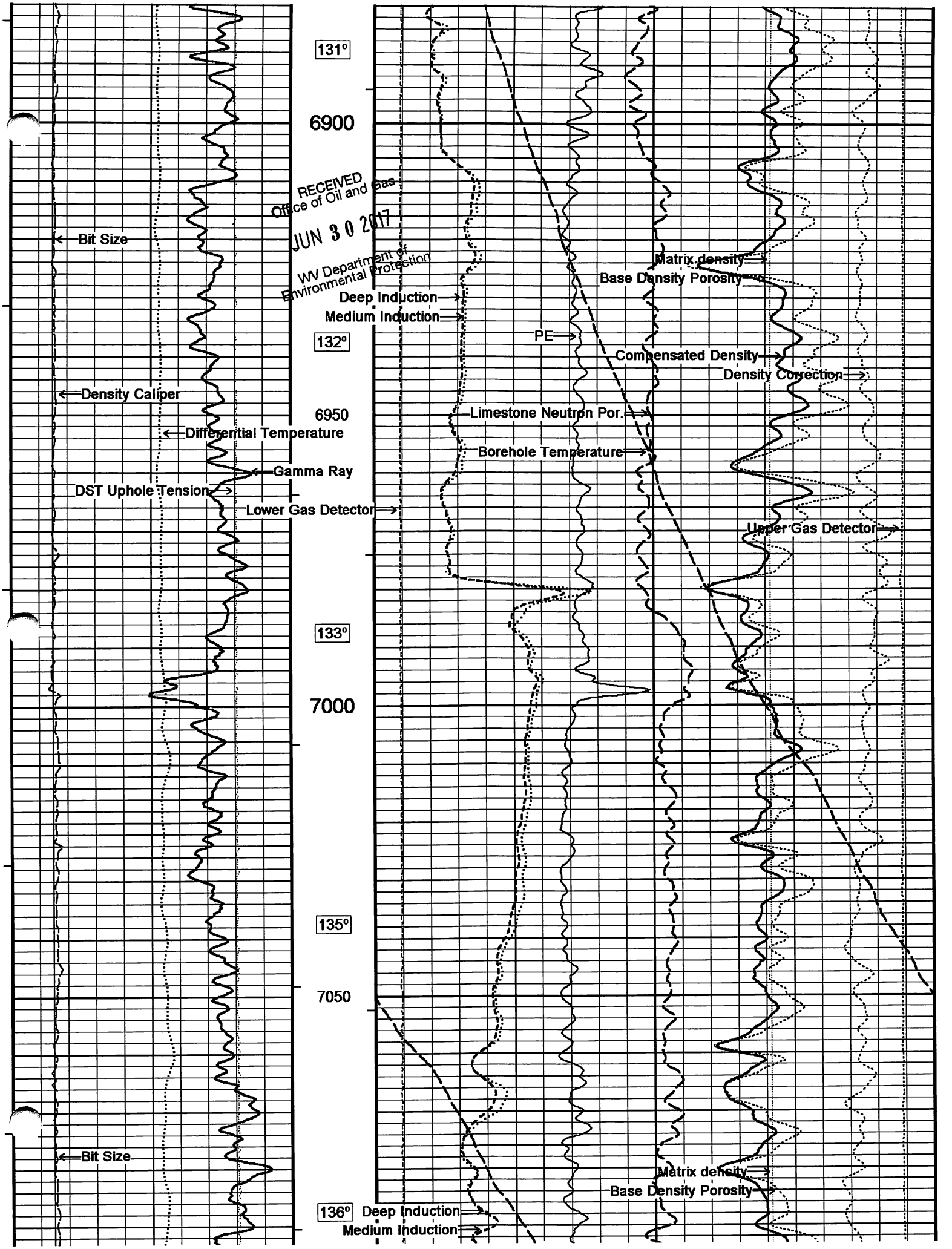


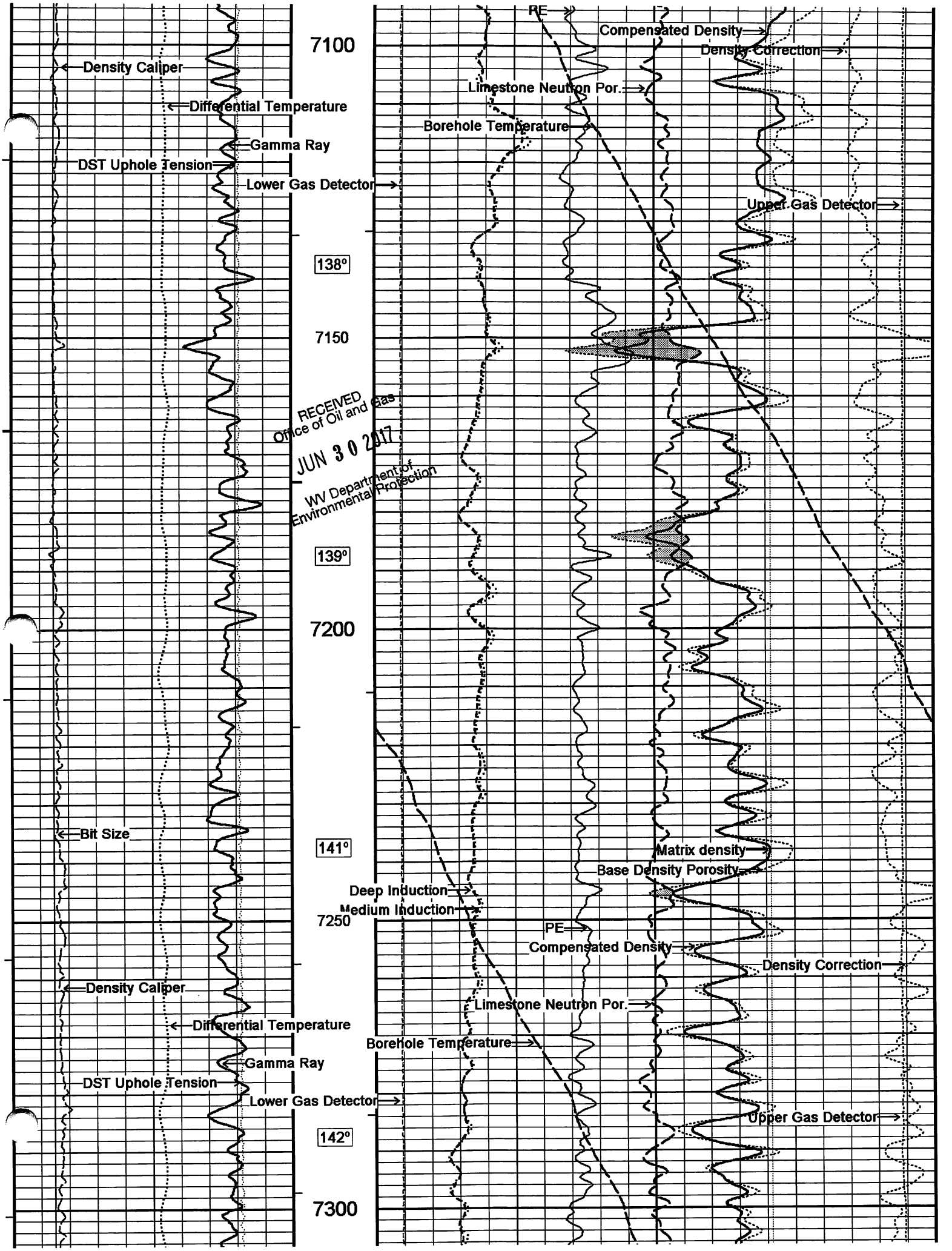


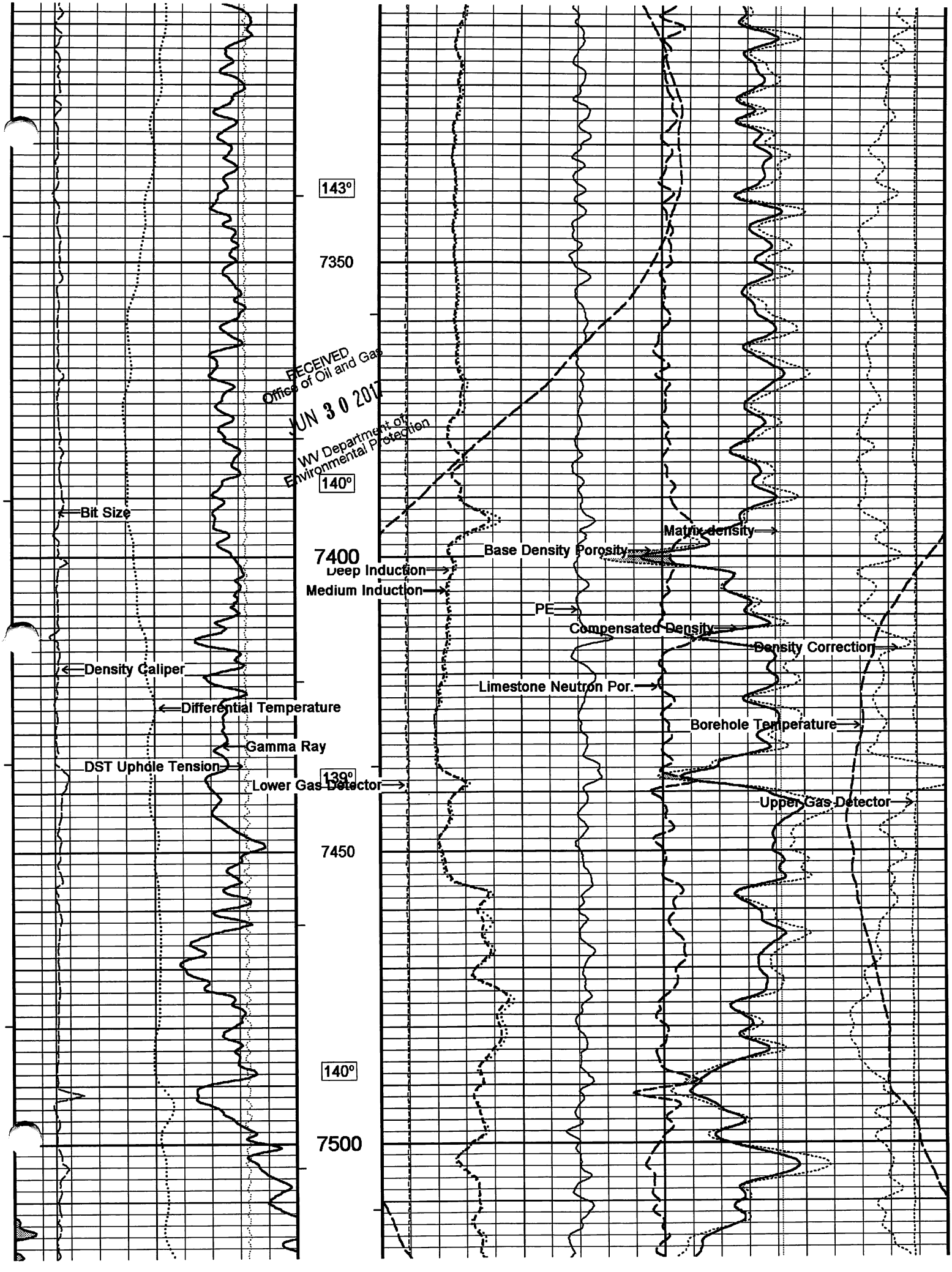

6250
121°
Bit Size
Matrix density
Base Density Porosity
6300
Induction
Medium Induction
PE
Compensated Density
Density Correction
Density Caliper
Limestone Neutron Por.
Differential Temperature
Borehole Temperature
Gamma Ray
DST Uphole Tension
Lower Gas Detector
122°
Upper Gas Detector
6350
RECEIVED
Office of Oil and Gas
JUN 30 2017
WV Department of
Environmental Protection
122°
6400
123°
Bit Size
6450
Matrix density

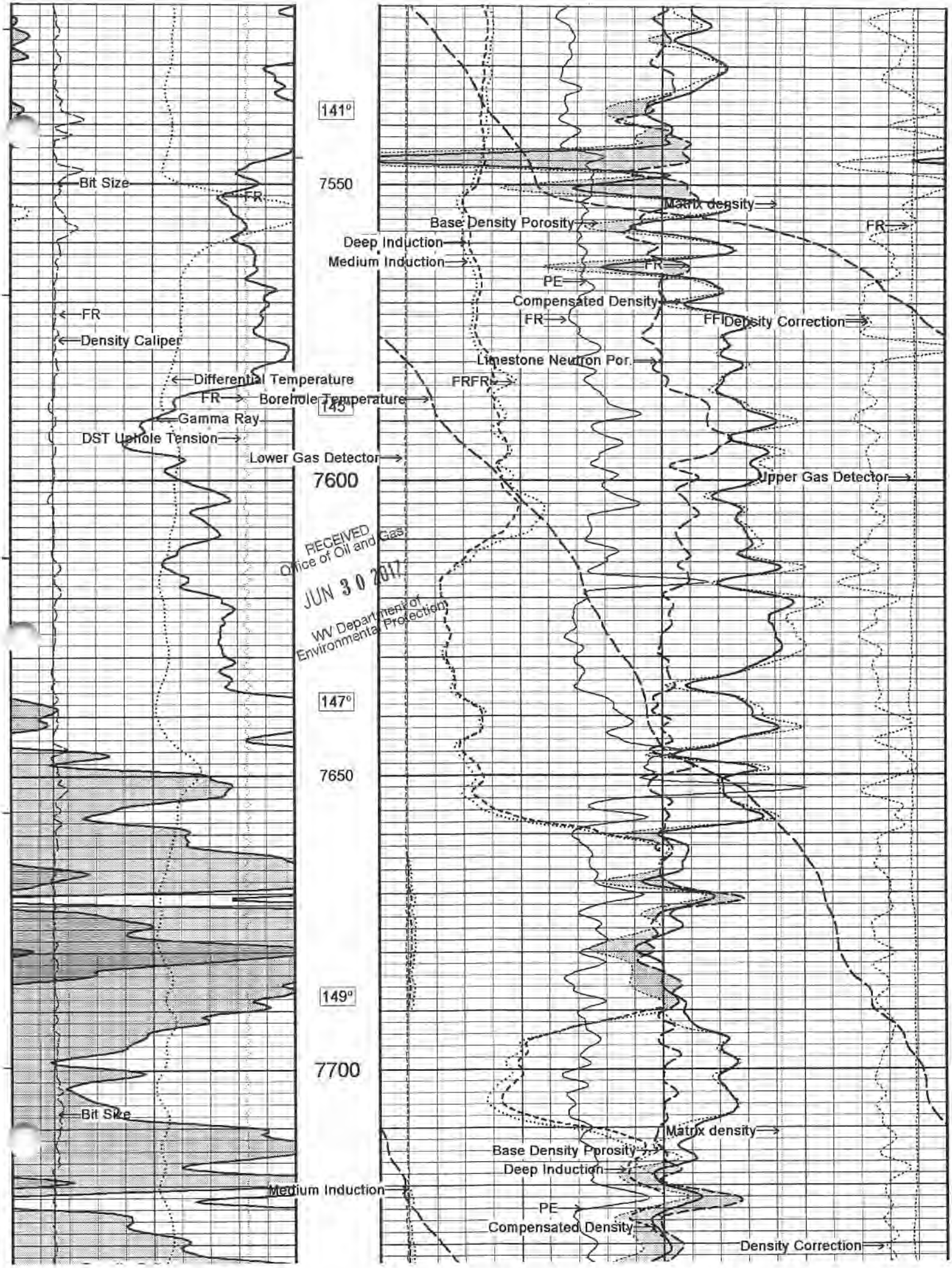


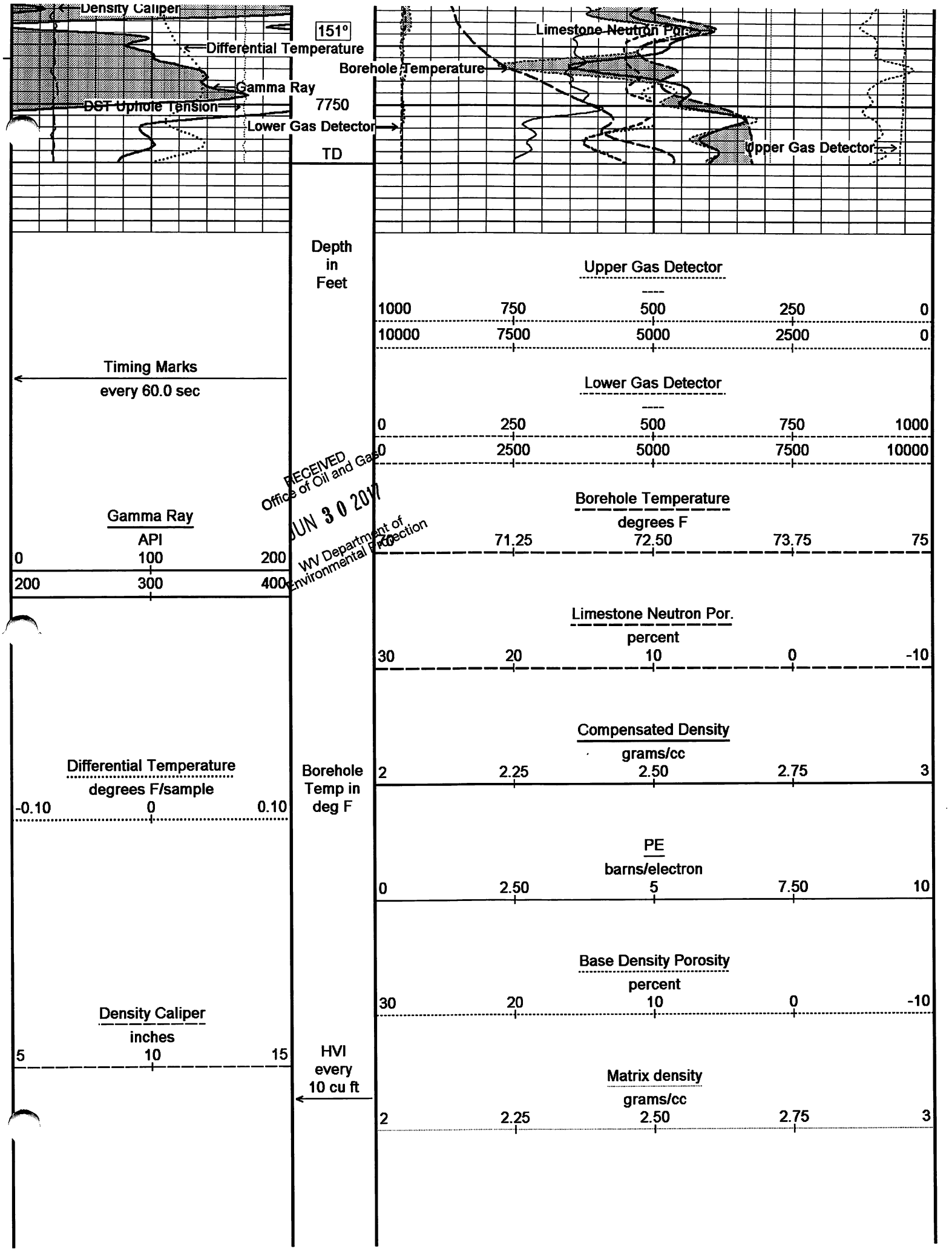


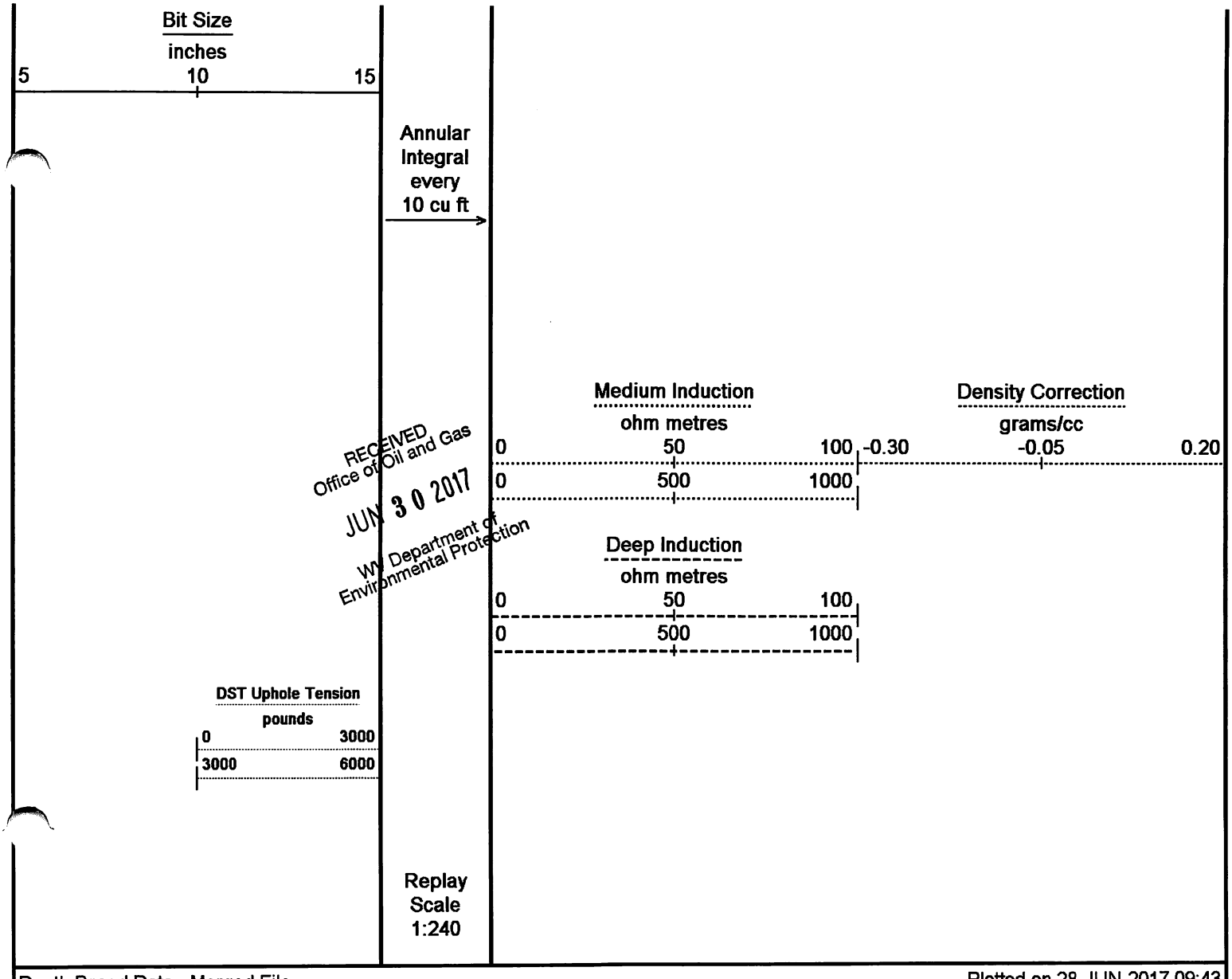












Depth Based Data - Merged File — Plotted on 28-JUN-2017 09:43

Filename: C:\Users\JAMIEA~1\AppData\Local\Temp\Weatherford PreView\0\Main Data 2.mge — Merged on 11-AUG-2010 22:30

System Versions: Logged with 10.07.0791 Merged with 10.07.0791 Plotted with 16.05.3392

5 Inch Main Log

BEFORE SURVEY CALIBRATION

C:\Users\JAMIEA~1\AppData\Local\Temp\Weatherford PreView\0\Main Data 2.mge

General Constants All 000 — Last Edited on 10-AUG-2010,06:03

General Parameters		
Mud Resistivity	3.800	ohm-metres
Mud Resistivity Temperature	1000.000	degrees F
Water Level	10000.000	feet
Borehole Fluid Processing	Water Level Switch	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	Density Caliper	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Deep Induction	

RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source		

Gamma Calibration MCG 060

Field Calibration on 16-JUL-2010,09:44

	Measured	Calibrated (API)
Background	62	34
Calibrator (Gross)	2263	1227
Calibrator (Net)	2201	1194

Gamma Constants MCG 060

Last Edited on 08-JUN-2010,05:13

Gamma Calibrator Number	44	
GRC-M Calibrator Jig in Use?		
Inactive Background Jig in Use?		
Mud Density	1.00	gm/cc
Caliper Source for Processing	Bit Size	
Tool Position	Eccentred	
Potassium Equivalence		
K Mud Concentration		%

SP Calibration MCG 060

Field Calibration on 14-JUL-2010,08:55

	Measured	Calibrated (mV)
Reference 1	100.0	101.0
Reference 2	-100.0	99.0

High Resolution Temperature Calibration MCG 060

Field Calibration on 14-JUL-2010,08:55

	Measured	Calibrated(Deg F)
Lower	60.00	61.00
Upper	160.00	161.00

High Resolution Temperature Constants MCG 060

Last Edited on

Pre-filter Length	11

Neutron Calibration MDN 151

Base Calibration on 14-JUL-2010,09:29
Field Check on

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3334	101	3714	110
Ratio	33.037		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	1517	2279
Ratio	0.666	

Field Check

	Calibrated (cps)
Ratio	

Neutron Constants MDN 151

Last Edited on 09-AUG-2010,10:57

Neutron Source Id	811	
Neutron Jig Number	Water Tank	
Air Hole Processing		
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	4.26	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	Constant Value	
Formation Pressure	0.00	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Salinity Correction		

Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

Induction Calibration MAI 056

Base Calibration on 14-JUL-2010,09:29
Field Check on

Base Calibration

Test Loop Calibration

Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) High
1	16.5	464.5	9.3	966.2
2	6.1	377.9	7.6	821.4
3	3.5	253.3	5.2	566.0
4	2.1	130.7	2.6	279.2

Array Temperature 74.3 Deg F

Test Loop Calibration Verified

Channel	Base Check (mmho/m) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1				
2				
3				
4				
Deep				
Medium				
Shallow				

Array Temperature 0.0 0.0 Deg F

Induction Constants MAI 056

Last Edited on 10-AUG-2010,06:07

Induction Model	VECTAR	
Borehole Correction Constants		
Tool Centred	No	
Hole Size Source	Constant Value	
Hole Size Constant Value	6.500	inches
Stand-off Type	Pineapple	
Stand-off	0.49	inches
Number of Fins on Stand-off	5.0000	
Stand-off Fin Angle	72.00	degrees
Stand-off Fin Width	1.3878	inches
Rm Source	Constant Value	
Temp. for Rm Corr.	N/A	
Squasher Start	0.0020	mhos/metre
Squasher Offset	0.0000	mhos/metre

Borehole Normalisation

DRM1	35.0000	DRC1	35.0000
DRM2	1933.0000	DRC2	200.0000
MRM1	34.0000	MRC1	36.0000
MRM2	1317.0000	MRC2	300.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000

Calibration Site Corrections

Channel 1	0.00	mmhos/metre
Channel 2	0.00	mmhos/metre
Channel 3	0.00	mmhos/metre
Channel 4	0.00	mmhos/metre

Symmetrised Receiver Gains

Receiver 1
Receiver 2
Receiver 3
Receiver 4

Apparent Porosity and Water Saturation Constants		
Archie Constant (A)	1.00	
Cementation Exponent (M)	2.00	
Saturation Exponent (N)	2.00	
Saturation of Water for Apor	100.00	percent
Resistivity of Water for Apor and Sw	0.05	ohm-m
Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

High Resolution Temperature Calibration MAI 056

Field Calibration on 17-FEB-2010,16:22

	Measured	Calibrated(Deg F)
Lower	60.00	61.00
Upper	100.00	101.00

High Resolution Temperature Constants MAI 056

Last Edited on

Pre-filter Length	11

Photo Density Calibration MPD 084

Base Calibration on 14-JUL-2010 09:28
Field Check on

Density Calibration

Base Calibration	Measured Near	Measured Far	Calibrated (sdu) Near	Calibrated (sdu) Far
Background				
Reference 1	48032	15755	53306	19389
Reference 2	21848	1912	24963	2524
Field Check at Base	732.7	804.7		
Field Check				

PE Calibration

Base Calibration	WS	WH	Ratio	Calibrated Ratio
Background	130	640		
Reference 1	16056	47901	0.337	0.321
Reference 2	5897	21744	0.273	0.273
Field Check at Base	129.9	640.2		
Field Check				

Density Constants MPD 084

Last Edited on 10-AUG-2010,06:07

Density Source Id	NSD-L-297	
Nylon Calibrator Number	DNC-D-526	
Aluminium Calibrator Number	DAC-D-526	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.00	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Advanced	

Precision Enhanced Density Processing

Matrix Density (gm/cc)	Depth (ft)
2.71	0.00
0.00	0.00
0.00	0.00
0.00	0.00

0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

Caliper Calibration MPD 084

Base Calibration on 14-JUL-2010 09:07
Field Calibration on 14-JUL-2010 09:09

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	12115	3.99
2	22082	5.97
3	32224	8.00
4	42662	10.03
5	53153	11.98
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.96	5.97

DOWNHOLE EQUIPMENT

C:\Users\JAMIEA~1\AppData\Local\Temp\Weatherford PreView\0\Haun 1 up.dta

Compact Gamma
MCG 60 Length: 8.70 ft Weight: 63.9 lb

Compact Gas detector
MGD 29 Length: 4.87 ft Weight: 35.3 lb

Compact Neutron
MDN 151 Length: 5.04 ft Weight: 50.7 lb

Compact Density/Caliper
MPD 84 Length: 9.59 ft Weight: 90.4 lb

Compact Induction
MAI 56 Length: 10.81 ft Weight: 48.5 lb

Total Length: 39.01 ft Weight: 288.8 lb

33.72 ft	GRGC - Gamma Ray
29.17 ft	GDUP - Upper Gas Detector
26.63 ft	GDLO - Lower Gas Detector
-0.13 ft	SMTU - DST Uphole Tension
22.40 ft	NPRL - Limestone Neutron Por.
13.92 ft	AVOL - Annular Volume
13.92 ft	HVOL - Hole Volume
13.92 ft	CLDC - Density Caliper
13.23 ft	DEN - Compensated Density
13.23 ft	DCOR - Density Correction
13.23 ft	MTXD - Matrix density
13.23 ft	DPOR - Base Density Porosity
13.16 ft	PDPE - PE
2.58 ft	RILM - Medium Induction
2.58 ft	RILD - Deep Induction
Tool Zero	(0.13ft from bottom)
0.00 ft	IHTD - Differential Temperature
0.00 ft	IHTF - Borehole Temperature

All measurements relative to tool zero.

COMPANY	Mountain V Oil and Gas Incorporated
WELL	Haun # 1 WV0402

WELL	Haun # 1 WV0402
FIELD	Banks District
PROVINCE/COUNTY	Upshur County
COUNTRY/STATE	U.S.A / West Virginia

Elevation Kelly Bushing	2378	feet	First Reading	7760.00	feet
Elevation Drill Floor	2378	feet	Depth Driller	7760.00	feet
Elevation Ground Level	2368	feet	Depth Logger	7760.00	feet

Weatherford®

Photo Density
Compensated Neutron
Array Induction

Weatherford®

Printed with PreView™

08 11 10 Mtn V Haun 1 WV0402

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

SECTION 7

UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

Section 7 – Area of Review:

Section 7.3 Depth to the bottom of all USDWs:

- There are One (1) water supply within the AOR. The owners of the water supply sampled was unable to provide any information as to the depth of their source. The topographic map showing the locations of the source is attached. The location of the facility and the sites of all surface bodies of water, including drinking water wells, ponds, springs, and creeks are noted in the Water Supply Exhibit in Section 7 of this permit application.

RELIANCE LABORATORIES, INC. - CHAIN OF CUSTODY RECORD

☐ 2044 MEADOWBROOK ROAD
POST OFFICE BOX 4657
BRIDGEPORT, WV 26330
TEL. (304) 842-5285 • FAX (304) 842-5351
E-MAIL reliancelabs@wvdsl.net
INTERNET www.RelianceLabs.net

☐ RIDGEFIELD BUSINESS CENTER
25 CRIMSON CIRCLE
MARTINSBURG, WV 25403
TEL. (304) 596-2084 • FAX (304) 596-2086

*CLIENT NAME ASLS LAND & ENERGY

*ADDRESS P.O. BOX 150, GLENVILLE, WV 26351

CUSTOMER # _____ *TEL.# 304-462-5634 FAX # 304-462-5656

*SAMPLER (S) ADAM WILSON E-MAIL awilson@slslandenergy.com

SHEET NO. 1 OF 1

LABORATORY #	*DATE	*TIME	COMP	GRAB	MATRIX W, DW, S, O, M	TEMP ≤ 4°C Yes No	*# OF CONTAIN.	HN03	H2S04	HCL	NaOH	BAC-T	NO PRES.									*PROJECT/REMARKS
001 [illegible]	6-23	1530		✓	W	6.0	7															
002 [illegible]	6-23	1530		✓	W	↓	14															

SAMPLES DO ___ DO NOT ___ MEET USEPA GUIDELINES FOR HOLDING TIMES
SAMPLES DO ___ DO NOT ___ MEET USEPA GUIDELINES FOR CHEMICAL PRESERVATIVES
SAMPLES DO ___ DO NOT ___ MEET USEPA GUIDELINES FOR SAMPLE CONTAINERS
SAMPLES ARE ___ ARE NOT ___ FOR REGULATORY COMPLIANCE PURPOSES

*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: ADAM WILSON	DATE: 6-23-17	PRINT: [illegible]
SIGN: [illegible]	TIME: 5:[illegible] pm	SIGN:
*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT:	DATE:	PRINT:
SIGN:	TIME:	SIGN:
*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT:	DATE:	PRINT:
SIGN:	TIME:	SIGN:
*COURIER:	*DATE/TIME	*RECEIVED BY:
TRACKING#:	DATE:	PRINT:
	TIME:	SIGN:

RECEIVED
Office of Oil and Gas
JUN 30 2017
WV Department of
Environmental Protection

REMARKS:

PWS# _____

WEATHER/TEMPERATURE:

☐ ***RUSH STATUS*** (INITIAL ACCEPTANCE _____)

*** ADDITIONAL LABORATORY FEES MAY APPLY***

EXTENT OF LIABILITY

SHOULD RELIANCE LABORATORIES, INC. BE AT FAULT AND ANY DISPUTE ARISE REGARDING ANALYTICAL DATA GENERATED BY THE LABORATORY THE EXTENT OF THE LIABILITY TO RELIANCE WILL BE A DUPLICATE ANALYSIS OF THAT SAMPLE (PROVIDING ADEQUATE SAMPLE REMAINS) OR A REFUND OF THE ANALYTICAL FEE. IN NO EVENT WILL RELIANCE LABORATORIES BE LIABLE FOR DAMAGES INCLUDING BUT NOT LIMITED TO DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING FROM SUCH DISPUTE.

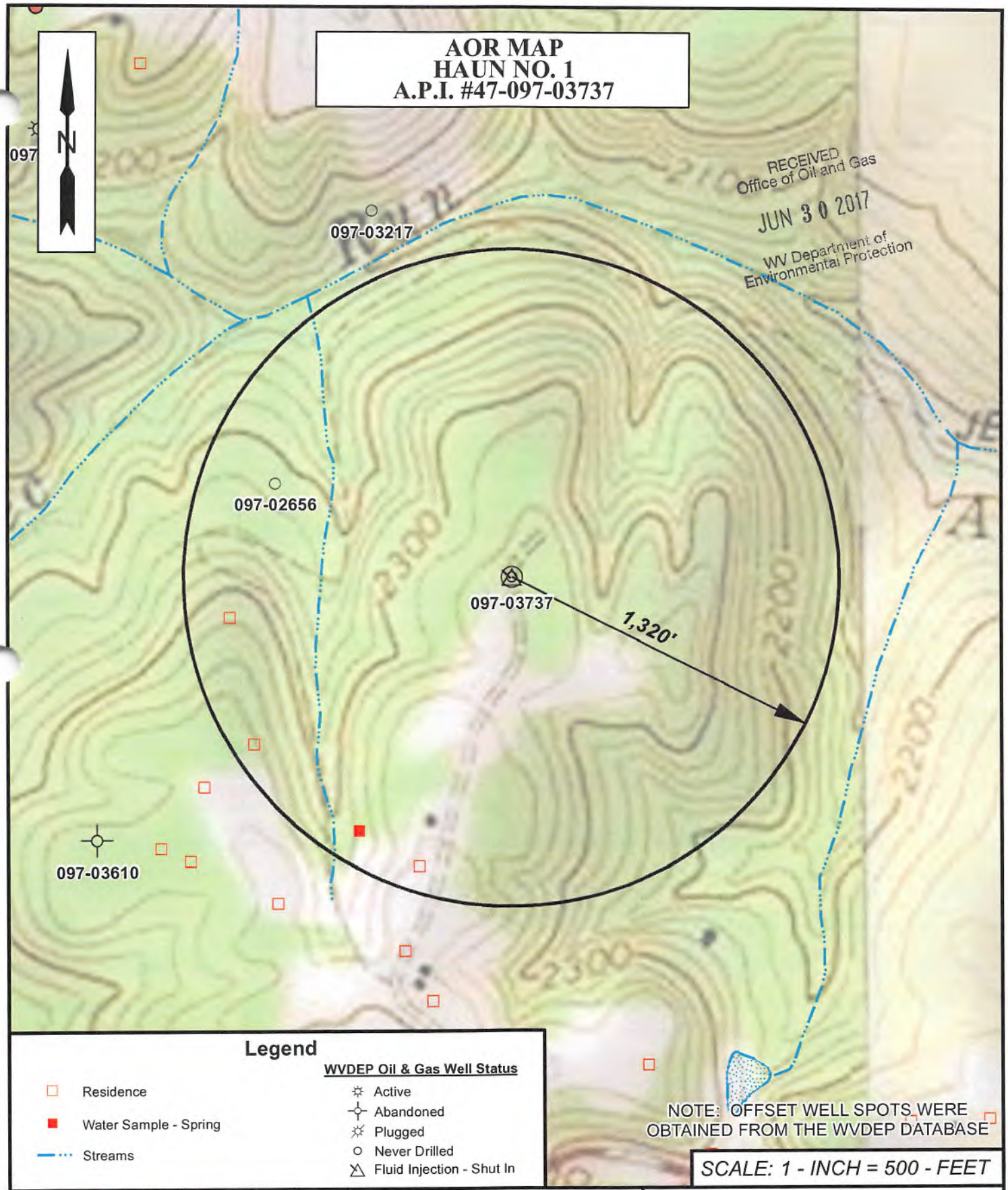
NOTE: TYPICAL SAMPLE TURN AROUND FOR ROUTINE SAMPLES IS 5 TO 10 WORKING DAYS. THIS IN NOT A GUARANTEE THAT SAMPLES WILL BE COMPLETED IN THIS TIME FRAME. HOWEVER, NON-ROUTINE SAMPLES MAY REQUIRE ADDITIONAL TIME.

**** TO BE COMPLETED BY CLIENT***

ORIGINAL CHAIN OF CUSTODY DOCUMENT MUST BE EXECUTED IN INK

WHITE - LABORATORY YELLOW - CLIENT

AOR MAP
HAUN NO. 1
A.P.I. #47-097-03737



Legend

- Residence
- Water Sample - Spring
- Streams

WVDEP Oil & Gas Well Status

- Active
- Abandoned
- Plugged
- Never Drilled
- Fluid Injection - Shut In

NOTE: OFFSET WELL SPOTS WERE OBTAINED FROM THE WVDEP DATABASE

SCALE: 1 - INCH = 500 - FEET

SLS
Land & Energy Development
Solutions from the ground up.

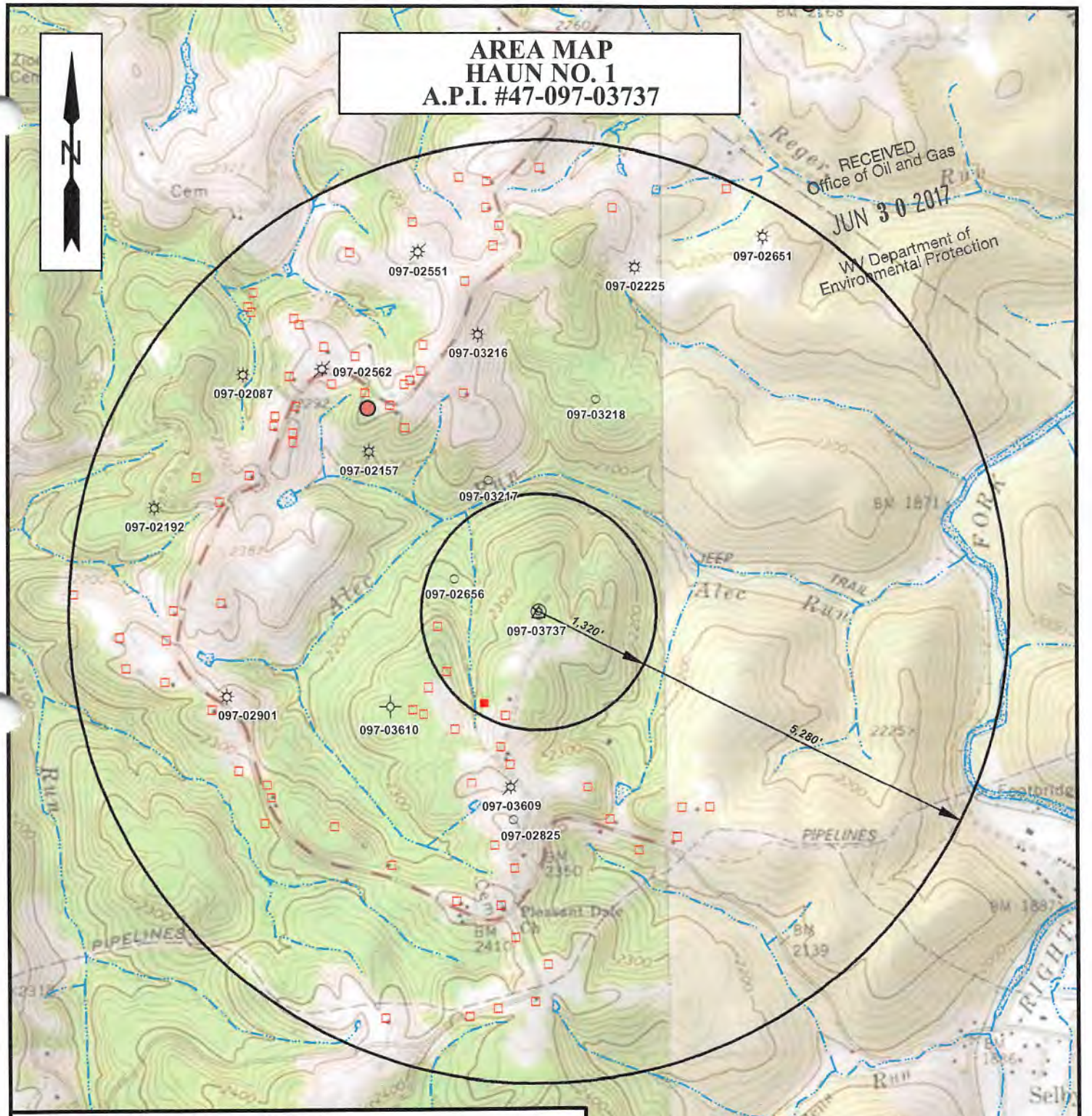
DRAWN BY	FILE NO.	DATE	GIS FILE:
K.G.M.	8669	06-27-17	09703737_AOR.MXD

TOPO SECTION OF:
ROCK CAVE &
ALTON, WV 7.5' QUAD

COUNTY	DISTRICT	TAX MAP-PARCEL
UPSHUR	BANKS	N/A

OPERATOR:
MOUNTAIN V OIL & GAS INC.
P.O. Box 470
Bridgeport, WV 26330

AREA MAP
HAUN NO. 1
A.P.I. #47-097-03737



Legend

- Residence
- Water Sample - Spring
- Streams
- NPDES Outlet

WVDEP Oil & Gas Well Status

- Active
- Abandoned
- Plugged
- Never Drilled
- Fluid Injection - Shut In

NOTE: OFFSET WELL SPOTS WERE OBTAINED FROM THE WVDEP DATABASE

SCALE:1 - INCH = 1500 - FEET

SLS
Land & Energy Development
Solutions from the ground up.

DRAWN BY	FILE NO.	DATE	GIS FILE:
K.G.M.	8669	6-27-17	09703737_MILE.MXD

TOPO SECTION OF:
ROCK CAVE &
ALTON, WV 7.5' QUAD

COUNTY	DISTRICT	TAX MAP-PARCEL
UPSHUR	BANKS	N/A

OPERATOR:
MOUNTAIN V OIL & GAS INC.
P.O. Box 470
Bridgeport, WV 26330

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
47-097-02656	Gas	Never Drilled	4,291,044.52	564,440.95	N	N	N/A	N/A

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

APPENDIX D

Public Service District Affidavit

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

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

_____

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

_____

that there are no such publically recorded sources.

_____

(Signature of Authorized Representative)

Sworn and subscribed to before me this _____day of _____, 20_____.

_____, my commission expires _____

(Notary Signature)

_____.

APPENDIX E
Water Sources

Operator: Mountain V Oil & Gas, Inc. Year 2017 UIC Permit # 2D0973737

Water Source Name		SPRING			
Northing					
Easting					
Parameter	Units				
TPH - GRO	mg/L	ND			
TPH - DRO	mg/L	ND			
TPH - ORO	mg/L	ND			
BTEX	mg/L	ND			
Chloride	mg/L	.56			
Sodium	mg/L	.96			
Total Dissolved Solids (TDS)	mg/L	22			
Aluminum	mg/L	.03			
Arsenic	mg/L	ND			
Barium	mg/L	.02			
Iron	mg/L	.03			
Manganese	mg/L	.009			
pH	SU	5.68			
Calcium	mg/L	3.58			
Sulfate	mg/L	4.70			
MBAS	mg/L	.06			
Dissolved Methane	mg/L	ND			
Dissolved Ethane	mg/L	ND			
Dissolved Butane	mg/L	ND			
Dissolved Propane	mg/L	ND			
Bacteria (Total Coliform)	c/100mL	Present			

Nottingham, Justin E

From: Jamie Andrews <jandrews@mountainvoilandgas.com>
Sent: Wednesday, July 26, 2017 8:39 AM
To: Nottingham, Justin E
Subject: Emailing: UIC2D0973737 Water Sampling Results.pdf
Attachments: UIC2D0973737 Water Sampling Results.pdf

Importance: High

Justin,

Please see attached water sampling results to accompany the permit I sent in for the UIC2D0973737.

I was wondering if you have had an opportunity to compile MIT testing for disposal/injection wells for me? And is there any way for you to tell me when we could expect the UIC2D0413175 Law disposal draft?

Thanks

Jamie
Your message is ready to be sent with the following file or link attachments:

UIC2D0973737 Water Sampling Results.pdf

Note: To protect against computer viruses, e-mail programs may prevent sending or receiving certain types of file attachments. Check your e-mail security settings to determine how attachments are handled.

RELIANCE LABORATORIES, INC. - CHAIN OF CUSTODY RECORD

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*CLIENT NAME: ASLS LAND & ENERGY

*ADDRESS: P.O. BOX 150, GLENVILLE, WV 26351

CUSTOMER #: C00117

*TEL. #: 304-462-5634 FAX #: 304-462-5656

*SAMPLER (S): ADAM WILSON

E-MAIL: awilson@slssurveys.com

SHEET NO. 1 OF 1

LABORATORY #	*DATE	*TIME	COMP.	GRAB	MATRIX W, DW, S, O, M	TEMP. ≤ 4°C Yes No	*# OF CONTAIN.	HNO3	H2SO4	HCL	NaOH	BAC-T	NO PRES.		See attach							*PROJECT/REMARKS
001 - Spring	6-23	1530		✓	W	6.0	7															2695569
002 - INJ FLUID	6-23	1530		✓	W	↓	14															2695570

SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR HOLDING TIMES
SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR CHEMICAL PRESERVATIVES
SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR SAMPLE CONTAINERS
SAMPLES ARE ____ ARE NOT ____ FOR REGULATORY COMPLIANCE PURPOSES

*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: ADAM WILSON SIGN: [signature]	DATE: 6-23-17 TIME: 5:10 pm	PRINT: C. Sivak SIGN: [signature]
*RELINQUISHED BY: PRINT: SIGN:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: SIGN:
*RELINQUISHED BY: PRINT: SIGN:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: SIGN:
*COURIER: TRACKING #:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: SIGN:

REMARKS:

PWS# ____

WEATHER/TEMPERATURE:

☐ ***RUSH STATUS*** (INITIAL ACCEPTANCE ____)

*** ADDITIONAL LABORATORY FEES MAY APPLY***

EXTENT OF LIABILITY

SHOULD RELIANCE LABORATORIES, INC. BE AT FAULT AND ANY DISPUTE ARISE REGARDING ANALYTICAL DATA GENERATED BY THE LABORATORY, THE EXTENT OF THE LIABILITY TO RELIANCE WILL BE A DUPLICATE ANALYSIS OF THAT SAMPLE (PROVIDING ADEQUATE SAMPLE REMAINS) OR A REFUND OF THE ANALYTICAL FEE. IN NO EVENT WILL RELIANCE LABORATORIES BE LIABLE FOR DAMAGES INCLUDING BUT NOT LIMITED TO DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING FROM SUCH DISPUTE.

NOTE: TYPICAL SAMPLE TURN AROUND FOR ROUTINE SAMPLES IS 5 TO 10 WORKING DAYS. THIS IN NOT A GUARANTEE THAT SAMPLES WILL BE COMPLETED IN THIS TIME FRAME, HOWEVER. NON-ROUTINE SAMPLES MAY REQUIRE ADDITIONAL TIME.

*** TO BE COMPLETED BY CLIENT**

ORIGINAL CHAIN OF CUSTODY DOCUMENT MUST BE EXECUTED IN INK

WHITE - LABORATORY YELLOW - CLIENT

converted to TDS (mg/L) or sodium chloride equivalent to verify that the zone in question has less than 10,000 mg/L TDS. It may be necessary to calculate TDS in lower geologic units to verify that the overlying unit is the lowest USDW. Where information is available on USDWs in an area, it may not be necessary to calculate TDS. However, the site-specific depths of the USDWs should be determined from the borehole logs. The entire log should be provided in the permit application and the depth and name of all formations should be indicated on the log. The water resistivity calculations and TDS conversion factors should also be provided.

4. Locate and label all water wells within the AOR. All water wells within the AOR shall be tested. Provide laboratory analysis as supporting documentation. If there are no water wells within the AOR, strategically select and sample enough water wells to accurately describe the groundwater quality in the vicinity of the proposed well or facility. Water well analyses shall include at a minimum the following parameters: Total Petroleum Hydrocarbons (GRO, DRO, ORO), BTEX, pH, Aluminum, Arsenic, Barium, Calcium, Chloride, Detergents (MBAS), Iron, Manganese, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Total Organic Carbon (TOC), Sulfate, Dissolved Methane, Dissolved Ethane, Dissolved Butane, Dissolved Propane, and Bacteria (total coliform). Provide the summary analysis in **APPENDIX E.**

5. Samples shall be collected and analyzed in accordance with methods approved by the Chief or as set forth at 40 CFR Part 136. Laboratories utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section. WVDEP certified laboratories may be identified at the link below.
http://www.dep.wv.gov/WWE/Programs/lab/Pages/default.aspx

6. Corrective Action: In determining the adequacy of corrective action proposed by the applicant and in determining the additional steps needed to prevent fluid migration into underground sources of drinking water, the following shall be considered by the Director:

   For any wells in the AOR which are improperly sealed, completed, or abandoned, submit a "corrective action plan" which consists of the additional steps as are necessary to prevent movement of fluid into USDW(s). The plan must consider the factors below: (47CSR13-6.1) (47CSR13-13.9.a) (40CFR146.7)

   - Nature and volume of injected fluid
   - Nature of native fluids or by-products of injection
   - Potentially affected population

Spring

ATTACHMENT A

Injection Fluid Analysis Parameters

Parameter	Ranges
PH	>2 – 10
TDS	0 - 265,000 mg/1
TSS	0 - 1000 mg/1
Aluminum	0 - 10 mg/1
Arsenic	0 – 10 mg
Barium	0 – 1500 mg/1
Cadmium	0 – 2 mg/1
Chromium	0 – 1 mg/1
Iron	0 – 1000 mg/1
Lead	0 – 7.5 mg/1
Magnesium	0 – 5000 mg/1
Manganese	0 – 15 mg/1
Potassium	0 – 5000 mg/1
Sodium	0 – 110,000 mg/1
Zinc	0 – 15 mg/1
Surfactants	0 – 10 mg/1
TKN	0 – 25 mg/1
Oil and Grease	0 – 100 mg/1
TOC	0 – 10,000 mg/1
COD	0 – 30,000 mg/1
Acidity	0 – 500 mg/1
Chloride	0 – 250,000 mg/1
Sulfate	0 – 500 mg/1
Cyanide	0 – 1 mg/1
Phenols	0 – 10 mg/1
Calcium	0 – 60,000 mg/1
BNA – Extractables	Trace
Purgeable Aromatics	Trace
Purgeable Halocarbons	Trace
PCBs	<MDL or 50 ppm

BTEX
PAHs
TPHs (ORO, DRO, GRO)

Inj. Fluid

Reliance Laboratories, Inc.
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Martinsburg, WV 25403
Phone: 304.596.2084 | Fax: 304.596.2086

Certifications: WV Department of Health #: 00354, 00443 | WV Department of Environmental Protection #: 158, 181
MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

LABORATORY REPORT SUMMARY

Client: C00117

Tuesday, July 11, 2017

SMITH LAND SURVEYING, INC.
P.O. BOX 150
GLENVILLE WV 26351-

Total Number of Pages: 6
(Not Including C.O.C.)

Lab ID	Sample ID	Sample ID 2	Sample Date
269569-2017-W	001-SPRING		6/23/2017
269570-2017-W	002-INJECTION FLUID		6/23/2017

The enclosed results have been analyzed according to the referenced method and SOP. Any deviations to the method have been noted on the report. Unless otherwise noted, all results have been verified to meet quality control requirements of the method. All analysis performed by Reliance Laboratories, Bridgeport, WV unless otherwise noted. Parameters analyzed by Reliance Laboratories, Martinsburg, WV are noted with @ on laboratory report.This report may not be reproduced, except in full, without written approval of Reliance Laboratories, Inc.

Report Reviewed By: Tenley Miller Digitally signed by Tenley Miller Date: 2017.07.18 10:21:10 -04'00'

Reliance Laboratories, Inc.
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SMITH LAND SURVEYING, INC.
P.O. BOX 150

GLENVILLE, WV 26351-

Tuesday, July 11, 2017

Lab Number: 269569-2017-W **Sample ID:** 001-SPRING

Parameter		Value	Units	Method	Date/Time Analyzed		Analyst	MDL	MRL
Analyte Group: Inorganics									
Total Organic Carbon		ND	mg/l	SM5310C-00	6/29/2017	8:36	TH	0.1	0.5
Total Suspended Solids		ND	mg/l	SM2540D-97	6/26/2017	11:43	AAB	4	5
E.coli (Chromogenic)		PRESENT		SM9223B-97	6/23/2017	17:07	CP		
Total Coliform (Chromogenic)		PRESENT		SM9223B-97	6/23/2017	17:07	CP		
pH		# 5.68	S.U.	SM4500H+B-00	6/29/2017	14:23	AAB		
Total Aluminum	J	0.03	mg/l	EPA 200.7 R4.4	7/5/2017	10:48	TH	0.009	0.05
Total Arsenic		ND	mg/l	EPA 200.7 R4.4	7/5/2017	10:48	TH	0.007	0.05
Total Barium	J	0.02	mg/l	EPA 200.7 R4.4	7/5/2017	10:48	TH	0.003	0.05
Total Calcium		3.58	mg/l	EPA 200.7 R4.4	7/5/2017	10:48	TH	0.078	0.5
Total Chloride		0.56	mg/l	EPA 300.0 R2.1	7/7/2017	11:36	TM	0.15	0.5
Total Dissolved Solids		22	mg/l	SM2540C-97	6/26/2017	11:43	AAB	10	20
Total Iron	J	0.03	mg/l	EPA 200.7 R4.4	7/5/2017	10:48	TH	0.004	0.05
Total Manganese	J	0.009	mg/l	EPA 200.7 R4.4	7/5/2017	10:48	TH	0.007	0.05
Total Sodium		0.96	mg/l	EPA 200.7 R4.4	7/5/2017	10:48	TH	0.011	0.5
Total Sulfate		4.70	mg/l	EPA 300.0 R2.1	7/7/2017	11:36	TM	0.12	0.5
Total Surfactant	J	0.06	mg/l	SM5540C-00	6/23/2017	17:05	AAB	0.05	0.2

Remarks:

Date Sample Collected: 6/23/2017 15:30
Sample Submitted By: A.WILSON
Date Sample Received: 6/23/2017 17:10
Sample temp. upon receipt: 6.0 Deg C
MDL - Minimum Detectable Limit
MCL - Maximum Contaminant Level, USEPA Regulated

ND = Not Detected at the MDL or MRL
MRL - Minimum Reporting Limit
J = Reported value is an estimate because concentration is less than the MRL

***Method Code: STANDARD METHODS ONLINE ED; US EPA METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES, Rev. 83; US EPA METHODS FOR THE DETERMINATION OF METALS IN ENVIRONMENTAL SAMPLES, May 1994; TEST METHODS FOR EVALUATING SOLID WASTE, SW-846, 3rd ED; USEPA Manual for Certification of Laboratories Analyzing Drinking Water, 5th ED. In accordance with EPA Regulations, all reports, including raw data and quality control data, are maintained by the laboratory for a minimum of 5 years.**

NOTE: #Holding time exceeded for this analysis. This falls outside criteria set by 40CFR136.

NOTE: This sample does not meet standards set for Total Coliform and E Coli by the State of West Virginia, 64-3-10, Code of State Regulations, adopted July 1, 2002 by the Bureau For Public Health. Sample Analyzed by Certified Laboratory #00354CM and #0044

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SMITH LAND SURVEYING, INC.
P.O. BOX 150

GLENVILLE, WV 26351-

Tuesday, July 11, 2017

Lab Number: 269569-2017-W **Sample ID:** 001-SPRING

Parameter	Value	Units	Method	Date/Time Analyzed		Analyst	MDL	MRL
Analyte Group: **Total Petroleum Hydrocarbons**								
Benzene	ND	mg/l	SW8021B/5030B	7/7/2017	13:36	TM	0.0007	0.01
Ethylbenzene	ND	mg/l	SW8021B/5030B	7/7/2017	13:36	TM	0.0014	0.01
MTBE	ND	mg/l	SW8021B/5030B	7/7/2017	13:36	TM	0.003	0.005
Toluene	ND	mg/l	SW8021B/5030B	7/7/2017	13:36	TM	0.002	0.01
TPH - DRO	ND	mg/l	SW8015B/3535A	7/10/2017	15:00	TM	0.68	1
TPH - GRO	ND	mg/l	SW8015B/5030B	7/7/2017	13:36	TM	0.04	0.5
Xylene	ND	mg/l	SW8021B/5030B	7/7/2017	13:36	TM	0.003	0.01
4-Bromochlorobenzene (Surrogate	109	%	SW8021B/8015B	7/7/2017	13:36	TM		
o-Terphenyl (Surrogate)	92.9	%	SW8015B	7/10/2017	15:00	TM		
TPH - ORO	ND	mg/l	SW8015B/3535A	7/10/2017	15:00	TM	0.54	1
o-Terphenyl (Surrogate)	92.9	%	SW8015B	7/10/2017	15:00	TM		

Remarks:

Date Sample Collected: 6/23/2017 15:30
Sample Submitted By: A.WILSON
Date Sample Received: 6/23/2017 17:10
Sample temp. upon receipt: 6.0 Deg C
MDL - Minimum Detectable Limit
MCL - Maximum Contaminant Level, USEPA Regulated

ND = Not Detected at the MDL or MRL
MRL - Minimum Reporting Limit
J = Reported value is an estimate because concentration is less than the MRL

***Method Code: STANDARD METHODS ONLINE ED; US EPA METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES, Rev. 83; US EPA METHODS FOR THE DETERMINATION OF METALS IN ENVIRONMENTAL SAMPLES, May 1994; TEST METHODS FOR EVALUATING SOLID WASTE, SW-846, 3rd ED; USEPA Manual for Certification of Laboratories Analyzing Drinking Water, 5th ED. In accordance with EPA Regulations, all reports, including raw data and quality control data, are maintained by the laboratory for a minimum of 5 years.**

NOTE: #Holding time exceeded for this analysis. This falls outside criteria set by 40CFR136.

NOTE: This sample does not meet standards set for Total Coliform and E Coli by the State of West Virginia, 64-3-10, Code of State Regulations, adopted July 1, 2002 by the Bureau For Public Health. Sample Analyzed by Certified Laboratory #00354CM and #0044

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SMITH LAND SURVEYING, INC.
P.O. BOX 150

GLENVILLE, WV 26351-

Tuesday, July 11, 2017

Lab Number: 269570-2017-W **Sample ID:** 002-INJECTION FLUID

Parameter		Value	Units	Method	Date/Time Analyzed		Analyst	MDL	MRL
Analyte Group: **Inorganics**									
Oil and Grease		ND	mg/l	EPA 1664A	6/28/2017	9:45	JL	8.23	10
Total Organic Carbon		ND	mg/l	SM5310C-00	6/29/2017	8:36	TH	0.1	0.5
Total Lead		ND	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.005	0.05
pH		# 7.87	S.U.	SM4500H+B-00	6/29/2017	14:23	AAB		
Total Zinc		0.22	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.002	0.05
Total Cyanide		ND	mg/l	SM4500CNE-99	6/27/2017	12:30	TH	0.005	0.05
Total Iron		0.18	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.004	0.05
Total Chloride		67979	mg/l	SM4500CLB-97	6/26/2017	16:05	AAB	2.52	5
Phenol		ND	mg/l	EPA 420.1 (1978)	6/27/2017	9:10	CP	0.002	0.01
Chemical Oxygen Demand		2668	mg/l	EPA 410.4 R2.0	6/27/2017	11:32	AAB	2.94	10
Total Surfactant	J	0.08	mg/l	SM5540C-00	6/23/2017	17:05	AAB	0.05	0.2
Total Aluminum		4.35	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.009	0.05
Total Acidity		72.4	mg CaCO3/l	SM2310B-97	6/26/2017	11:40	JL	1.07	5
Total Kjeldahl Nitrogen		53.8	mg/l	SM4500NB-97	6/26/2017	11:16	AAB	0.17	0.5
Total Dissolved Solids		62942	mg/l	SM2540C-97	6/26/2017	11:43	AAB	10	20
Total Suspended Solids		430	mg/l	SM2540D-97	6/26/2017	11:43	AAB	4	5
Total Cadmium	J	0.002	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.002	0.05
Total Chromium		ND	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.006	0.05
Total Barium		157	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.003	0.05
Total Manganese	J	0.04	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.007	0.05
Total Arsenic		1.75	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.007	0.05
Total Calcium		3540	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.078	0.5
Total Sodium		13160	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.011	0.5
Total Magnesium		338	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.03	0.5

Remarks:

Date Sample Collected: 6/23/2017 15:30
Sample Submitted By: A.WILSON
Date Sample Received: 6/23/2017 17:10
Sample temp. upon receipt: 6.0 Deg C
MDL - Minimum Detectable Limit
MCL - Maximum Contaminant Level, USEPA Regulated
ND = Not Detected at the MDL or MRL
MRL - Minimum Reporting Limit
J = Reported value is an estimate because concentration is less than the MRL

***Method Code: STANDARD METHODS ONLINE ED; US EPA METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES, Rev. 83; US EPA METHODS FOR THE DETERMINATION OF METALS IN ENVIRONMENTAL SAMPLES, May 1994; TEST METHODS FOR EVALUATING SOLID WASTE, SW-846, 3rd ED; USEPA Manual for Certification of Laboratories Analyzing Drinking Water, 5th ED. In accordance with EPA Regulations, all reports, including raw data and quality control data, are maintained by the laboratory for a minimum of 5 years.**

NOTE: #Holding time exceeded for this analysis. This falls outside criteria set by 40CFR136.

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SMITH LAND SURVEYING, INC.
P.O. BOX 150

GLENVILLE, WV 26351-

Tuesday, July 11, 2017

Lab Number: 269570-2017-W **Sample ID:** 002-INJECTION FLUID

Parameter	Value	Units	Method	Date/Time Analyzed		Analyst	MDL	MRL
Total Sulfate	9.11	mg/l	ASTM D516-02	6/27/2017	14:16	AAB	0.75	1
Total Potassium	527	mg/l	EPA 200.7 R4.4	7/5/2017	10:51	TH	0.06	0.5

Remarks:

Date Sample Collected: 6/23/2017 15:30
Sample Submitted By: A.WILSON
Date Sample Received: 6/23/2017 17:10
Sample temp. upon receipt: 6.0 Deg C
MDL - Minimum Detectable Limit
MCL - Maximum Contaminant Level, USEPA Regulated

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Tuesday, July 11, 2017

Lab Number: 269570-2017-W **Sample ID:** 002-INJECTION FLUID

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: **Total Petroleum Hydrocarbons**							
Benzene	ND	mg/l	SW8021B/5030B	7/7/2017 14:05	TM	0.0007	0.01
Ethylbenzene	ND	mg/l	SW8021B/5030B	7/7/2017 14:05	TM	0.0014	0.01
MTBE	ND	mg/l	SW8021B/5030B	7/7/2017 14:05	TM	0.003	0.005
Toluene	ND	mg/l	SW8021B/5030B	7/7/2017 14:05	TM	0.002	0.01
TPH - DRO	ND	mg/l	SW8015B/3535A	7/10/2017 15:42	TM	0.68	1
TPH - GRO	ND	mg/l	SW8015B/5030B	7/7/2017 14:05	TM	0.04	0.5
Xylene	ND	mg/l	SW8021B/5030B	7/7/2017 14:05	TM	0.003	0.01
4-Bromochlorobenzene (Surrogate	138	%	SW8021B/8015B	7/7/2017 14:05	TM		
o-Terphenyl (Surrogate)	80.5	%	SW8015B	7/10/2017 15:42	TM		
TPH - ORO	ND	mg/l	SW8015B/3535A	7/10/2017 15:42	TM	0.54	1
o-Terphenyl (Surrogate)	80.5	%	SW8015B	7/10/2017 15:42	TM		

Remarks:

Date Sample Collected: 6/23/2017 15:30
Sample Submitted By: A.WILSON
Date Sample Received: 6/23/2017 17:10
Sample temp. upon receipt: 6.0 Deg C
ND = Not Detected at the MDL or MRL
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NOTE: #Holding time exceeded for this analysis. This falls outside criteria set by 40CFR136.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-131746-1
Client Project/Site: RSK / 269569

For:
Reliance Laboratories Inc
PO BOX 4657
Bridgeport, West Virginia 26330

Attn: Tenley Miller

Jennifer Gambill

Authorized for release by:
7/7/2017 2:27:43 PM

Jennifer Gambill, Project Manager I
(615)301-5044
jennifer.gambill@testamericainc.com

LINKS

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Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

Table of Contents

Sample Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 269569

TestAmerica Job ID: 490-131746-1

3

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-131746-1	269569-2017-W	Water	06/23/17 15:30	06/28/17 10:00

Job ID: 490-131746-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-131746-1

Comments
No additional comments.

Receipt
The sample was received on 6/28/2017 10:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.4° C.

GC Semi VOA
Method(s) RSK-175: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 490-442694.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Reliance Laboratories Inc
Project/Site: RSK / 269569

TestAmerica Job ID: 490-131746-1

Client Sample ID: 269569-2017-W

Date Collected: 06/23/17 15:30
Date Received: 06/28/17 10:00

Lab Sample ID: 490-131746-1

Matrix: Water

Method: RSK-175 - Dissolved Gases in Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			07/05/17 12:18	1
Ethane	ND		5.00	2.70	ug/L			07/05/17 12:18	1
Methane	**4.04**	**J**	5.00	1.70	ug/L			07/05/17 12:18	1
Propane	ND		5.00	3.30	ug/L			07/05/17 12:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*81*		*62 - 124*		*07/05/17 12:18*	*1*

QC Sample Results

Client: Reliance Laboratories Inc
Project/Site: RSK / 269569

TestAmerica Job ID: 490-131746-1

Method: RSK-175 - Dissolved Gases in Water

Lab Sample ID: MB 490-442694/6
Matrix: Water
Analysis Batch: 442694

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			07/05/17 11:39	1
Ethane	ND		5.00	2.70	ug/L			07/05/17 11:39	1
Methane	ND		5.00	1.70	ug/L			07/05/17 11:39	1
Propane	ND		5.00	3.30	ug/L			07/05/17 11:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*77*		*62 - 124*		*07/05/17 11:39*	*1*

Lab Sample ID: LCS 490-442694/7
Matrix: Water
Analysis Batch: 442694

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Butane	1020	889.3		ug/L		87	80 - 120
Ethane	527	507.2		ug/L		96	80 - 120
Methane	287	286.1		ug/L		100	80 - 120
Propane	771	718.7		ug/L		93	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Acetylene (Surr)	*86*		*62 - 124*

Lab Sample ID: LCSD 490-442694/8
Matrix: Water
Analysis Batch: 442694

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Butane	1020	952.6		ug/L		93	80 - 120	7	33
Ethane	527	507.9		ug/L		96	80 - 120	0	30
Methane	287	283.8		ug/L		99	80 - 120	1	33
Propane	771	732.5		ug/L		95	80 - 120	2	33

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Acetylene (Surr)	*88*		*62 - 124*

QC Association Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 269569

TestAmerica Job ID: 490-131746-1

GC VOA

Analysis Batch: 442694

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-131746-1	269569-2017-W	Total/NA	Water	RSK-175	
MB 490-442694/6	Method Blank	Total/NA	Water	RSK-175	
LCS 490-442694/7	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 490-442694/8	Lab Control Sample Dup	Total/NA	Water	RSK-175	

Lab Chronicle

Client: Reliance Laboratories Inc
Project/Site: RSK / 269569

TestAmerica Job ID: 490-131746-1

Client Sample ID: 269569-2017-W

Date Collected: 06/23/17 15:30
Date Received: 06/28/17 10:00

Lab Sample ID: 490-131746-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	442694	07/05/17 12:18	AAB	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 269569

TestAmerica Job ID: 490-131746-1

Method	Method Description	Protocol	Laboratory
RSK-175	Dissolved Gases in Water	RSK	TAL NSH

Protocol References:

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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Accreditation/Certification Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 269569

TestAmerica Job ID: 490-131746-1

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
West Virginia DEP	State Program	3	219	02-28-18

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Nashville, TN

COOLER RECEIPT FORM

490-131746 Chain of Custody

Cooler Received/Opened On 6/28/2017 @ 1000

Time Samples Removed From Cooler 1800 Time Samples Placed In Storage 1822 (2 Hour Window)

1. Tracking # 9241 (last 4 digits, FedEx) Courier: FedEx

   IR Gun ID 17960353 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 5.4 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

   If yes, how many and where: None

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) [illegible]

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

   Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

   b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (initial) [illegible]

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

   b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) [illegible]

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) [illegible]

I certify that I attached a label with the unique LIMS number to each container (initial) [illegible]

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment

Cooler Receipt Form.doc

LF-1

End of Form

Revised 12/15/15

RELIANCE LABORATORIES, INC. - CHAIN OF CUSTODY RECORD

☒ 2044 MEADOWBROOK ROAD
POST OFFICE BOX 4657
BRIDGEPORT, WV 26330
TEL. (304) 842-5285 • FAX (304) 842-5351
E-MAIL reliancelabs@wvdsl.net
INTERNET www.RelianceLabs.net

☐ RIDGEFIELD BUSINESS CENTER
25 CRIMSON CIRCLE
MARTINSBURG, WV 25403
TEL. (304) 596-2084 • FAX (304) 596-2086

7/7/2017

*CLIENT NAME Reliance Laboratories

*ADDRESS

CUSTOMER #

*TEL. #

FAX #

*SAMPLER (S) A. Wilson

E-MAIL

SHEET NO. 1 OF 1

LABORATORY #	*DATE	*TIME	*COMP.	*GRAB	MATRIX W, DW, S, O, M	TEMP. ≤ 4°C Yes No	*# OF CONTAIN.	HN03	H2S04	HCL	NaOH	BAC-T	NO PRES.		0.55 Methane	0.55 Ethane	0.55 Butane	0.55 Propane				*PROJECT/REMARKS
	6/23/17	15:30			W		1			1V					X	X	X	X				2609509-2017-W

490-131746

SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR HOLDING TIMES
SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR CHEMICAL PRESERVATIVES
SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR SAMPLE CONTAINERS
SAMPLES ARE ✓ ARE NOT ____ FOR REGULATORY COMPLIANCE PURPOSES

*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: C. Grana	DATE: 6/26/17	PRINT: FedEx
SIGN:	TIME: 1600	SIGN:
*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: FedEx	DATE:	PRINT:
SIGN:	TIME:	SIGN:
*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT:	DATE:	PRINT:
SIGN:	TIME:	SIGN:
*COURIER:	*DATE/TIME	*RECEIVED BY:
TRACKING #:	DATE:	PRINT:
	TIME:	SIGN:

REMARKS:

PWS#

WEATHER/TEMPERATURE:

☐ ***RUSH STATUS*** (INITIAL ACCEPTANCE ____)

*** ADDITIONAL LABORATORY FEES MAY APPLY***

EXTENT OF LIABILITY

SHOULD RELIANCE LABORATORIES, INC. BE AT FAULT AND ANY DISPUTE ARISE REGARDING ANALYTICAL DATA GENERATED BY THE LABORATORY, THE EXTENT OF THE LIABILITY TO RELIANCE WILL BE A DUPLICATE ANALYSIS OF THAT SAMPLE (PROVIDING ADEQUATE SAMPLE REMAINS) OR A REFUND OF THE ANALYTICAL FEE. IN NO EVENT WILL RELIANCE LABORATORIES BE LIABLE FOR DAMAGES INCLUDING BUT NOT LIMITED TO DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING FROM SUCH DISPUTE

NOTE: TYPICAL SAMPLE TURN AROUND FOR ROUTINE SAMPLES IS 5 TO 10 WORKING DAYS. THIS IN NOT A GUARANTEE THAT SAMPLES WILL BE COMPLETED IN THIS TIME FRAME, HOWEVER. NON-ROUTINE SAMPLES MAY REQUIRE ADDITIONAL TIME.

*** TO BE COMPLETED BY CLIENT***

ORIGINAL CHAIN OF CUSTODY DOCUMENT MUST BE EXECUTED IN INK

WHITE - LABORATORY YELLOW - CLIENT

RELIANCE LABORATORIES, INC.

ENVIRONMENTAL ANALYSTS AND CONSULTANTS

BRIDGEPORT, WV www.RelianceLabs.net *MARTINSBURG, WV*

Certifications: WV Department of Health #: 00354, 00433 | WV Department of Environmental Protection #: 158, 181 | MD Department of Environment #: 336, 337| US Environmental Protection Agency #: WV00042, WV00901

Monday, June 26, 2017

TestAmerica - Nashville
2960 Foster Creighton Drive
Nashville, TN 37204

Please analyze the following sample(s) for: **Diss. Methane, Diss. Ethane, Diss. Butane, Diss. Propane**

Please identify as:

269569-2017-W DATE/TIME SAMPLED: 6/23/2017 15:30

Sampled by: A.Wilson

PLEASE SEND RESULTS & INVOICE TO:

RELIANCE LABORATORIES, INC.
ATTN: TENLEY MILLER
P.O. BOX 4657
BRIDGEPORT, WV 26330
tmiller@wvdsl.net

Loc: 490
131746

Thank You

2044 MEADOWBROOK ROAD | P.O. BOX 4657 | BRIDGEPORT, WV 26330 | VOICE: 304-842-5285 | FAX: 304-842-5351
RIDGEFIELD BUSINESS CENTER | 25 CRIMSON CIRCLE | MARTINSBURG, WV 25403 | VOICE: 304-596-2084 | FAX: 304-596-2086

Login Sample Receipt Checklist

Client: Reliance Laboratories Inc

Job Number: 490-131746-1

Login Number: 131746
List Number: 1
Creator: Vest, Laura E

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-131748-1
Client Project/Site: SVOC & PCB / 269570

For:
Reliance Laboratories Inc
PO BOX 4657
Bridgeport, West Virginia 26330

Attn: Tenley Miller

Jennifer Gambill

Authorized for release by:
7/10/2017 2:34:00 PM

Jennifer Gambill, Project Manager I
(615)301-5044
jennifer.gambill@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

Table of Contents

Sample Summary

Client: Reliance Laboratories Inc
Project/Site: SVOC & PCB / 269570

TestAmerica Job ID: 490-131748-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-131748-1	269570-2017-W	Water	06/23/17 15:30	06/28/17 10:00

Job ID: 490-131748-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-131748-1

Comments
No additional comments.

Receipt
The sample was received on 6/28/2017 10:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.4° C.

GC/MS Semi VOA
Method(s) 8270D: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 490-441467 and analytical batch 490-441666.

Method(s) 8270D: Surrogate recovery for the following sample was outside control limits: 269570-2017-W (490-131748-1). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method(s) 8270D: The laboratory control sample and laboratory control sample duplicate (LCS/LCSD) for preparation batch 490-441467 and analytical batch 490-441666 recovered outside control limits for Hexachlorocyclopentadiene. This compound has been identified as a poor performing analyte when analyzed using this method; therefore, re-extraction was not performed. These results have been reported and qualified.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Method(s) 8082A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 490-443064 and analytical batch 490-443344.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
*	LCS or LCSD is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample ID: 269570-2017-W

Date Collected: 06/23/17 15:30
Date Received: 06/28/17 10:00

Lab Sample ID: 490-131748-1

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		10.2	2.77	ug/L		06/29/17 12:43	06/30/17 06:21	1
1,2-Dichlorobenzene	ND		10.2	3.00	ug/L		06/29/17 12:43	06/30/17 06:21	1
1,3-Dichlorobenzene	ND		10.2	3.16	ug/L		06/29/17 12:43	06/30/17 06:21	1
1,4-Dichlorobenzene	ND		10.2	3.12	ug/L		06/29/17 12:43	06/30/17 06:21	1
1-Methylnaphthalene	ND		2.04	0.648	ug/L		06/29/17 12:43	06/30/17 06:21	1
2,4,5-Trichlorophenol	ND		10.2	1.94	ug/L		06/29/17 12:43	06/30/17 06:21	1
2,4,6-Trichlorophenol	ND		10.2	1.61	ug/L		06/29/17 12:43	06/30/17 06:21	1
2,4-Dichlorophenol	ND		10.2	2.03	ug/L		06/29/17 12:43	06/30/17 06:21	1
2,4-Dimethylphenol	ND		10.2	1.83	ug/L		06/29/17 12:43	06/30/17 06:21	1
2,4-Dinitrophenol	ND		25.5	7.11	ug/L		06/29/17 12:43	06/30/17 06:21	1
2,4-Dinitrotoluene	ND		10.2	1.93	ug/L		06/29/17 12:43	06/30/17 06:21	1
2,6-Dinitrotoluene	ND		10.2	1.92	ug/L		06/29/17 12:43	06/30/17 06:21	1
2-Chloronaphthalene	ND		10.2	2.37	ug/L		06/29/17 12:43	06/30/17 06:21	1
2-Chlorophenol	ND		10.2	1.62	ug/L		06/29/17 12:43	06/30/17 06:21	1
2-Methylnaphthalene	ND		2.04	0.650	ug/L		06/29/17 12:43	06/30/17 06:21	1
2-Methylphenol	ND		10.2	1.64	ug/L		06/29/17 12:43	06/30/17 06:21	1
2-Nitroaniline	ND		25.5	1.49	ug/L		06/29/17 12:43	06/30/17 06:21	1
2-Nitrophenol	ND		10.2	2.08	ug/L		06/29/17 12:43	06/30/17 06:21	1
3 & 4 Methylphenol	**5.62**	**J**	10.2	1.17	ug/L		06/29/17 12:43	06/30/17 06:21	1
3,3'-Dichlorobenzidine	ND		10.2	1.76	ug/L		06/29/17 12:43	06/30/17 06:21	1
3-Nitroaniline	ND		25.5	1.59	ug/L		06/29/17 12:43	06/30/17 06:21	1
4,6-Dinitro-2-methylphenol	ND		25.5	2.69	ug/L		06/29/17 12:43	06/30/17 06:21	1
4-Bromophenyl phenyl ether	ND		10.2	1.94	ug/L		06/29/17 12:43	06/30/17 06:21	1
4-Chloro-3-methylphenol	ND		10.2	1.73	ug/L		06/29/17 12:43	06/30/17 06:21	1
4-Chloroaniline	ND		10.2	2.77	ug/L		06/29/17 12:43	06/30/17 06:21	1
4-Chlorophenyl phenyl ether	ND		10.2	1.92	ug/L		06/29/17 12:43	06/30/17 06:21	1
4-Nitroaniline	ND		25.5	1.76	ug/L		06/29/17 12:43	06/30/17 06:21	1
4-Nitrophenol	ND		25.5	2.44	ug/L		06/29/17 12:43	06/30/17 06:21	1
Acenaphthene	ND		2.04	0.537	ug/L		06/29/17 12:43	06/30/17 06:21	1
Acenaphthylene	ND		2.04	0.460	ug/L		06/29/17 12:43	06/30/17 06:21	1
Anthracene	ND		2.04	0.487	ug/L		06/29/17 12:43	06/30/17 06:21	1
Benzo[a]anthracene	ND		2.04	0.493	ug/L		06/29/17 12:43	06/30/17 06:21	1
Benzo[a]pyrene	ND		2.04	0.422	ug/L		06/29/17 12:43	06/30/17 06:21	1
Benzo[b]fluoranthene	ND		2.04	0.263	ug/L		06/29/17 12:43	06/30/17 06:21	1
Benzo[g,h,i]perylene	ND		2.04	0.377	ug/L		06/29/17 12:43	06/30/17 06:21	1
Benzo[k]fluoranthene	ND		2.04	0.631	ug/L		06/29/17 12:43	06/30/17 06:21	1
bis (2-chloroisopropyl) ether	ND		10.2	1.82	ug/L		06/29/17 12:43	06/30/17 06:21	1
Bis(2-chloroethoxy)methane	ND		10.2	2.12	ug/L		06/29/17 12:43	06/30/17 06:21	1
Bis(2-chloroethyl)ether	ND		10.2	1.93	ug/L		06/29/17 12:43	06/30/17 06:21	1
Bis(2-ethylhexyl) phthalate	ND		10.2	2.60	ug/L		06/29/17 12:43	06/30/17 06:21	1
Butyl benzyl phthalate	ND		10.2	2.15	ug/L		06/29/17 12:43	06/30/17 06:21	1
Carbazole	ND		10.2	1.72	ug/L		06/29/17 12:43	06/30/17 06:21	1
Chrysene	ND		2.04	0.473	ug/L		06/29/17 12:43	06/30/17 06:21	1
Cresols	**5.62**	**J**	20.4	2.81	ug/L		06/29/17 12:43	06/30/17 06:21	1
Dibenz(a,h)anthracene	ND		2.04	0.450	ug/L		06/29/17 12:43	06/30/17 06:21	1
Dibenzofuran	ND		10.2	2.03	ug/L		06/29/17 12:43	06/30/17 06:21	1
Diethyl phthalate	ND		10.2	1.96	ug/L		06/29/17 12:43	06/30/17 06:21	1
Dimethyl phthalate	ND		10.2	1.70	ug/L		06/29/17 12:43	06/30/17 06:21	1
Di-n-butyl phthalate	ND		10.2	2.04	ug/L		06/29/17 12:43	06/30/17 06:21	1

Client Sample ID: 269570-2017-W

Date Collected: 06/23/17 15:30
Date Received: 06/28/17 10:00

Lab Sample ID: 490-131748-1

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Di-n-octyl phthalate	ND		10.2	2.06	ug/L		06/29/17 12:43	06/30/17 06:21	1
Fluoranthene	ND		2.04	0.458	ug/L		06/29/17 12:43	06/30/17 06:21	1
Fluorene	ND		2.04	0.502	ug/L		06/29/17 12:43	06/30/17 06:21	1
Hexachlorobenzene	ND		10.2	1.80	ug/L		06/29/17 12:43	06/30/17 06:21	1
Hexachlorobutadiene	ND		10.2	3.01	ug/L		06/29/17 12:43	06/30/17 06:21	1
Hexachlorocyclopentadiene	ND	*	10.2	2.66	ug/L		06/29/17 12:43	06/30/17 06:21	1
Hexachloroethane	ND		10.2	3.27	ug/L		06/29/17 12:43	06/30/17 06:21	1
Indeno[1,2,3-cd]pyrene	ND		2.04	0.393	ug/L		06/29/17 12:43	06/30/17 06:21	1
Isophorone	ND		10.2	1.90	ug/L		06/29/17 12:43	06/30/17 06:21	1
Naphthalene	ND		2.04	0.642	ug/L		06/29/17 12:43	06/30/17 06:21	1
Nitrobenzene	ND		10.2	1.94	ug/L		06/29/17 12:43	06/30/17 06:21	1
N-Nitrosodi-n-propylamine	ND		10.2	2.08	ug/L		06/29/17 12:43	06/30/17 06:21	1
n-Nitrosodiphenylamine(as diphenylamine)	ND		10.2	1.47	ug/L		06/29/17 12:43	06/30/17 06:21	1
Pentachlorophenol	ND		25.5	3.55	ug/L		06/29/17 12:43	06/30/17 06:21	1
Phenanthrene	ND		2.04	0.460	ug/L		06/29/17 12:43	06/30/17 06:21	1
Phenol	ND		10.2	3.40	ug/L		06/29/17 12:43	06/30/17 06:21	1
Pyrene	ND		2.04	0.404	ug/L		06/29/17 12:43	06/30/17 06:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*65*		*10 - 120*	*06/29/17 12:43*	*06/30/17 06:21*	*1*
2-Fluorobiphenyl (Surr)	*60*		*29 - 120*	*06/29/17 12:43*	*06/30/17 06:21*	*1*
2-Fluorophenol (Surr)	*0*	*X*	*10 - 120*	*06/29/17 12:43*	*06/30/17 06:21*	*1*
Nitrobenzene-d5 (Surr)	*53*		*27 - 120*	*06/29/17 12:43*	*06/30/17 06:21*	*1*
Phenol-d5 (Surr)	*27*		*10 - 120*	*06/29/17 12:43*	*06/30/17 06:21*	*1*
Terphenyl-d14 (Surr)	*56*		*13 - 120*	*06/29/17 12:43*	*06/30/17 06:21*	*1*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.651	0.560	ug/L		07/06/17 12:35	07/07/17 15:39	1
PCB-1221	ND		0.651	0.443	ug/L		07/06/17 12:35	07/07/17 15:39	1
PCB-1232	ND		0.651	0.521	ug/L		07/06/17 12:35	07/07/17 15:39	1
PCB-1242	ND		0.651	0.286	ug/L		07/06/17 12:35	07/07/17 15:39	1
PCB-1248	ND		0.651	0.195	ug/L		07/06/17 12:35	07/07/17 15:39	1
PCB-1254	ND		0.651	0.221	ug/L		07/06/17 12:35	07/07/17 15:39	1
PCB-1260	ND		0.651	0.234	ug/L		07/06/17 12:35	07/07/17 15:39	1
PCB-1262	ND		0.651	0.247	ug/L		07/06/17 12:35	07/07/17 15:39	1
PCB-1268	ND		0.651	0.208	ug/L		07/06/17 12:35	07/07/17 15:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*68*		*10 - 150*	*07/06/17 12:35*	*07/07/17 15:39*	*1*
Tetrachloro-m-xylene	*62*		*10 - 150*	*07/06/17 12:35*	*07/07/17 15:39*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 490-441467/1-A
Matrix: Water
Analysis Batch: 441666

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 441467

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		10.0	2.71	ug/L		06/29/17 12:43	06/30/17 05:25	1
1,2-Dichlorobenzene	ND		10.0	2.94	ug/L		06/29/17 12:43	06/30/17 05:25	1
1,3-Dichlorobenzene	ND		10.0	3.10	ug/L		06/29/17 12:43	06/30/17 05:25	1
1,4-Dichlorobenzene	ND		10.0	3.06	ug/L		06/29/17 12:43	06/30/17 05:25	1
1-Methylnaphthalene	ND		2.00	0.635	ug/L		06/29/17 12:43	06/30/17 05:25	1
2,4,5-Trichlorophenol	ND		10.0	1.90	ug/L		06/29/17 12:43	06/30/17 05:25	1
2,4,6-Trichlorophenol	ND		10.0	1.58	ug/L		06/29/17 12:43	06/30/17 05:25	1
2,4-Dichlorophenol	ND		10.0	1.99	ug/L		06/29/17 12:43	06/30/17 05:25	1
2,4-Dimethylphenol	ND		10.0	1.79	ug/L		06/29/17 12:43	06/30/17 05:25	1
2,4-Dinitrophenol	ND		25.0	6.97	ug/L		06/29/17 12:43	06/30/17 05:25	1
2,4-Dinitrotoluene	ND		10.0	1.89	ug/L		06/29/17 12:43	06/30/17 05:25	1
2,6-Dinitrotoluene	ND		10.0	1.88	ug/L		06/29/17 12:43	06/30/17 05:25	1
2-Chloronaphthalene	ND		10.0	2.32	ug/L		06/29/17 12:43	06/30/17 05:25	1
2-Chlorophenol	ND		10.0	1.59	ug/L		06/29/17 12:43	06/30/17 05:25	1
2-Methylnaphthalene	ND		2.00	0.637	ug/L		06/29/17 12:43	06/30/17 05:25	1
2-Methylphenol	ND		10.0	1.61	ug/L		06/29/17 12:43	06/30/17 05:25	1
2-Nitroaniline	ND		25.0	1.46	ug/L		06/29/17 12:43	06/30/17 05:25	1
2-Nitrophenol	ND		10.0	2.04	ug/L		06/29/17 12:43	06/30/17 05:25	1
3 & 4 Methylphenol	ND		10.0	1.15	ug/L		06/29/17 12:43	06/30/17 05:25	1
3,3'-Dichlorobenzidine	ND		10.0	1.72	ug/L		06/29/17 12:43	06/30/17 05:25	1
3-Nitroaniline	ND		25.0	1.56	ug/L		06/29/17 12:43	06/30/17 05:25	1
4,6-Dinitro-2-methylphenol	ND		25.0	2.64	ug/L		06/29/17 12:43	06/30/17 05:25	1
4-Bromophenyl phenyl ether	ND		10.0	1.90	ug/L		06/29/17 12:43	06/30/17 05:25	1
4-Chloro-3-methylphenol	ND		10.0	1.70	ug/L		06/29/17 12:43	06/30/17 05:25	1
4-Chloroaniline	ND		10.0	2.71	ug/L		06/29/17 12:43	06/30/17 05:25	1
4-Chlorophenyl phenyl ether	ND		10.0	1.88	ug/L		06/29/17 12:43	06/30/17 05:25	1
4-Nitroaniline	ND		25.0	1.72	ug/L		06/29/17 12:43	06/30/17 05:25	1
4-Nitrophenol	ND		25.0	2.39	ug/L		06/29/17 12:43	06/30/17 05:25	1
Acenaphthene	ND		2.00	0.526	ug/L		06/29/17 12:43	06/30/17 05:25	1
Acenaphthylene	ND		2.00	0.451	ug/L		06/29/17 12:43	06/30/17 05:25	1
Anthracene	ND		2.00	0.477	ug/L		06/29/17 12:43	06/30/17 05:25	1
Benzo[a]anthracene	ND		2.00	0.483	ug/L		06/29/17 12:43	06/30/17 05:25	1
Benzo[a]pyrene	ND		2.00	0.414	ug/L		06/29/17 12:43	06/30/17 05:25	1
Benzo[b]fluoranthene	ND		2.00	0.258	ug/L		06/29/17 12:43	06/30/17 05:25	1
Benzo[g,h,i]perylene	ND		2.00	0.369	ug/L		06/29/17 12:43	06/30/17 05:25	1
Benzo[k]fluoranthene	ND		2.00	0.618	ug/L		06/29/17 12:43	06/30/17 05:25	1
bis (2-chloroisopropyl) ether	ND		10.0	1.78	ug/L		06/29/17 12:43	06/30/17 05:25	1
Bis(2-chloroethoxy)methane	ND		10.0	2.08	ug/L		06/29/17 12:43	06/30/17 05:25	1
Bis(2-chloroethyl)ether	ND		10.0	1.89	ug/L		06/29/17 12:43	06/30/17 05:25	1
Bis(2-ethylhexyl) phthalate	ND		10.0	2.55	ug/L		06/29/17 12:43	06/30/17 05:25	1
Butyl benzyl phthalate	ND		10.0	2.11	ug/L		06/29/17 12:43	06/30/17 05:25	1
Carbazole	ND		10.0	1.69	ug/L		06/29/17 12:43	06/30/17 05:25	1
Chrysene	ND		2.00	0.464	ug/L		06/29/17 12:43	06/30/17 05:25	1
Cresols	ND		20.0	2.75	ug/L		06/29/17 12:43	06/30/17 05:25	1
Dibenz(a,h)anthracene	ND		2.00	0.441	ug/L		06/29/17 12:43	06/30/17 05:25	1
Dibenzofuran	ND		10.0	1.99	ug/L		06/29/17 12:43	06/30/17 05:25	1
Diethyl phthalate	ND		10.0	1.92	ug/L		06/29/17 12:43	06/30/17 05:25	1
Dimethyl phthalate	ND		10.0	1.67	ug/L		06/29/17 12:43	06/30/17 05:25	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 490-441467/1-A
Matrix: Water
Analysis Batch: 441666

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 441467

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Di-n-butyl phthalate	ND		10.0	2.00	ug/L		06/29/17 12:43	06/30/17 05:25	1
Di-n-octyl phthalate	ND		10.0	2.02	ug/L		06/29/17 12:43	06/30/17 05:25	1
Fluoranthene	ND		2.00	0.449	ug/L		06/29/17 12:43	06/30/17 05:25	1
Fluorene	ND		2.00	0.492	ug/L		06/29/17 12:43	06/30/17 05:25	1
Hexachlorobenzene	ND		10.0	1.76	ug/L		06/29/17 12:43	06/30/17 05:25	1
Hexachlorobutadiene	ND		10.0	2.95	ug/L		06/29/17 12:43	06/30/17 05:25	1
Hexachlorocyclopentadiene	ND		10.0	2.61	ug/L		06/29/17 12:43	06/30/17 05:25	1
Hexachloroethane	ND		10.0	3.20	ug/L		06/29/17 12:43	06/30/17 05:25	1
Indeno[1,2,3-cd]pyrene	ND		2.00	0.385	ug/L		06/29/17 12:43	06/30/17 05:25	1
Isophorone	ND		10.0	1.86	ug/L		06/29/17 12:43	06/30/17 05:25	1
Naphthalene	ND		2.00	0.629	ug/L		06/29/17 12:43	06/30/17 05:25	1
Nitrobenzene	ND		10.0	1.90	ug/L		06/29/17 12:43	06/30/17 05:25	1
N-Nitrosodi-n-propylamine	ND		10.0	2.04	ug/L		06/29/17 12:43	06/30/17 05:25	1
n-Nitrosodiphenylamine(as diphenylamine)	ND		10.0	1.44	ug/L		06/29/17 12:43	06/30/17 05:25	1
Pentachlorophenol	ND		25.0	3.48	ug/L		06/29/17 12:43	06/30/17 05:25	1
Phenanthrene	ND		2.00	0.451	ug/L		06/29/17 12:43	06/30/17 05:25	1
Phenol	ND		10.0	3.33	ug/L		06/29/17 12:43	06/30/17 05:25	1
Pyrene	ND		2.00	0.396	ug/L		06/29/17 12:43	06/30/17 05:25	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*78*		*10 - 120*	*06/29/17 12:43*	*06/30/17 05:25*	*1*
2-Fluorobiphenyl (Surr)	*71*		*29 - 120*	*06/29/17 12:43*	*06/30/17 05:25*	*1*
2-Fluorophenol (Surr)	*39*		*10 - 120*	*06/29/17 12:43*	*06/30/17 05:25*	*1*
Nitrobenzene-d5 (Surr)	*66*		*27 - 120*	*06/29/17 12:43*	*06/30/17 05:25*	*1*
Phenol-d5 (Surr)	*25*		*10 - 120*	*06/29/17 12:43*	*06/30/17 05:25*	*1*
Terphenyl-d14 (Surr)	*83*		*13 - 120*	*06/29/17 12:43*	*06/30/17 05:25*	*1*

Lab Sample ID: LCS 490-441467/2-A
Matrix: Water
Analysis Batch: 441666

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 441467

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,4-Trichlorobenzene	50.0	33.98		ug/L		68	24 - 127
1,2-Dichlorobenzene	50.0	30.42		ug/L		61	27 - 120
1,3-Dichlorobenzene	50.0	31.60		ug/L		63	22 - 120
1,4-Dichlorobenzene	50.0	31.31		ug/L		63	24 - 120
1-Methylnaphthalene	50.0	35.63		ug/L		71	36 - 131
2,4,5-Trichlorophenol	50.0	39.66		ug/L		79	10 - 150
2,4,6-Trichlorophenol	50.0	39.88		ug/L		80	10 - 150
2,4-Dichlorophenol	50.0	35.04		ug/L		70	10 - 150
2,4-Dimethylphenol	50.0	24.48		ug/L		49	10 - 150
2,4-Dinitrophenol	100	67.22		ug/L		67	10 - 150
2,4-Dinitrotoluene	50.0	41.36		ug/L		83	36 - 138
2,6-Dinitrotoluene	50.0	38.43		ug/L		77	41 - 137
2-Chloronaphthalene	50.0	37.79		ug/L		76	32 - 127
2-Chlorophenol	50.0	31.43		ug/L		63	10 - 150
2-Methylnaphthalene	50.0	36.17		ug/L		72	31 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 490-441467/2-A
Matrix: Water
Analysis Batch: 441666

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 441467

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Methylphenol	50.0	27.52		ug/L		55	10 - 133
2-Nitroaniline	50.0	39.94		ug/L		80	35 - 147
2-Nitrophenol	50.0	35.55		ug/L		71	10 - 150
3 & 4 Methylphenol	50.0	25.35		ug/L		51	10 - 135
3,3'-Dichlorobenzidine	50.0	39.50		ug/L		79	46 - 143
3-Nitroaniline	50.0	38.28		ug/L		77	36 - 128
4,6-Dinitro-2-methylphenol	100	87.63		ug/L		88	10 - 150
4-Bromophenyl phenyl ether	50.0	40.05		ug/L		80	36 - 135
4-Chloro-3-methylphenol	50.0	35.94		ug/L		72	10 - 150
4-Chloroaniline	50.0	27.24		ug/L		54	27 - 131
4-Chlorophenyl phenyl ether	50.0	38.18		ug/L		76	36 - 131
4-Nitroaniline	50.0	39.04		ug/L		78	38 - 139
4-Nitrophenol	100	31.43		ug/L		31	10 - 110
Acenaphthene	50.0	39.09		ug/L		78	36 - 129
Acenaphthylene	50.0	37.89		ug/L		76	36 - 120
Anthracene	50.0	39.40		ug/L		79	42 - 130
Benzo[a]anthracene	50.0	39.82		ug/L		80	41 - 131
Benzo[a]pyrene	50.0	41.56		ug/L		83	45 - 131
Benzo[b]fluoranthene	50.0	44.02		ug/L		88	43 - 132
Benzo[g,h,i]perylene	50.0	41.68		ug/L		83	38 - 138
Benzo[k]fluoranthene	50.0	42.33		ug/L		85	44 - 129
bis (2-chloroisopropyl) ether	50.0	30.60		ug/L		61	24 - 136
Bis(2-chloroethoxy)methane	50.0	35.49		ug/L		71	35 - 127
Bis(2-chloroethyl)ether	50.0	32.64		ug/L		65	27 - 132
Bis(2-ethylhexyl) phthalate	50.0	40.54		ug/L		81	41 - 147
Butyl benzyl phthalate	50.0	40.29		ug/L		81	34 - 146
Carbazole	50.0	42.24		ug/L		84	42 - 130
Chrysene	50.0	41.40		ug/L		83	39 - 130
Cresols	100	52.87		ug/L		53	10 - 132
Dibenz(a,h)anthracene	50.0	44.19		ug/L		88	43 - 140
Dibenzofuran	50.0	38.75		ug/L		78	35 - 127
Diethyl phthalate	50.0	40.11		ug/L		80	31 - 136
Dimethyl phthalate	50.0	38.44		ug/L		77	34 - 134
Di-n-butyl phthalate	50.0	42.88		ug/L		86	42 - 140
Di-n-octyl phthalate	50.0	43.50		ug/L		87	42 - 142
Fluoranthene	50.0	41.98		ug/L		84	31 - 132
Fluorene	50.0	39.22		ug/L		78	37 - 130
Hexachlorobenzene	50.0	41.98		ug/L		84	36 - 140
Hexachlorobutadiene	50.0	35.53		ug/L		71	18 - 136
Hexachlorocyclopentadiene	50.0	2.970	J *	ug/L		6	17 - 128
Hexachloroethane	50.0	29.34		ug/L		59	23 - 120
Indeno[1,2,3-cd]pyrene	50.0	44.13		ug/L		88	40 - 136
Isophorone	50.0	29.67		ug/L		59	39 - 120
Naphthalene	50.0	34.32		ug/L		69	32 - 120
Nitrobenzene	50.0	35.23		ug/L		70	10 - 150
N-Nitrosodi-n-propylamine	50.0	32.91		ug/L		66	32 - 136
n-Nitrosodiphenylamine(as diphenylamine)	42.5	41.68		ug/L		98	44 - 123

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 490-441467/2-A
Matrix: Water
Analysis Batch: 441666

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 441467

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Pentachlorophenol	100	86.57		ug/L		87	10 - 150
Phenanthrene	50.0	41.53		ug/L		83	39 - 126
Phenol	50.0	13.78		ug/L		28	10 - 110
Pyrene	50.0	43.03		ug/L		86	37 - 129

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*80*		*10 - 120*
2-Fluorobiphenyl (Surr)	*72*		*29 - 120*
2-Fluorophenol (Surr)	*41*		*10 - 120*
Nitrobenzene-d5 (Surr)	*69*		*27 - 120*
Phenol-d5 (Surr)	*27*		*10 - 120*
Terphenyl-d14 (Surr)	*85*		*13 - 120*

Lab Sample ID: LCSD 490-441467/3-A
Matrix: Water
Analysis Batch: 441666

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 441467

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	50.0	33.00		ug/L		66	24 - 127	3	50
1,2-Dichlorobenzene	50.0	31.09		ug/L		62	27 - 120	2	50
1,3-Dichlorobenzene	50.0	31.72		ug/L		63	22 - 120	0	50
1,4-Dichlorobenzene	50.0	32.10		ug/L		64	24 - 120	2	50
1-Methylnaphthalene	50.0	35.40		ug/L		71	36 - 131	1	50
2,4,5-Trichlorophenol	50.0	37.86		ug/L		76	10 - 150	5	50
2,4,6-Trichlorophenol	50.0	40.90		ug/L		82	10 - 150	3	50
2,4-Dichlorophenol	50.0	35.18		ug/L		70	10 - 150	0	50
2,4-Dimethylphenol	50.0	24.78		ug/L		50	10 - 150	1	50
2,4-Dinitrophenol	100	64.38		ug/L		64	10 - 150	4	50
2,4-Dinitrotoluene	50.0	40.20		ug/L		80	36 - 138	3	50
2,6-Dinitrotoluene	50.0	38.64		ug/L		77	41 - 137	1	50
2-Chloronaphthalene	50.0	37.76		ug/L		76	32 - 127	0	50
2-Chlorophenol	50.0	32.49		ug/L		65	10 - 150	3	49
2-Methylnaphthalene	50.0	35.52		ug/L		71	31 - 120	2	50
2-Methylphenol	50.0	27.53		ug/L		55	10 - 133	0	45
2-Nitroaniline	50.0	39.18		ug/L		78	35 - 147	2	50
2-Nitrophenol	50.0	35.41		ug/L		71	10 - 150	0	50
3 & 4 Methylphenol	50.0	26.09		ug/L		52	10 - 135	3	46
3,3'-Dichlorobenzidine	50.0	39.20		ug/L		78	46 - 143	1	50
3-Nitroaniline	50.0	37.28		ug/L		75	36 - 128	3	27
4,6-Dinitro-2-methylphenol	100	86.31		ug/L		86	10 - 150	2	50
4-Bromophenyl phenyl ether	50.0	39.81		ug/L		80	36 - 135	1	50
4-Chloro-3-methylphenol	50.0	34.91		ug/L		70	10 - 150	3	50
4-Chloroaniline	50.0	26.39		ug/L		53	27 - 131	3	34
4-Chlorophenyl phenyl ether	50.0	38.50		ug/L		77	36 - 131	1	50
4-Nitroaniline	50.0	37.20		ug/L		74	38 - 139	5	42
4-Nitrophenol	100	29.91		ug/L		30	10 - 110	5	40
Acenaphthene	50.0	39.05		ug/L		78	36 - 129	0	50
Acenaphthylene	50.0	37.80		ug/L		76	36 - 120	0	50

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 490-441467/3-A
Matrix: Water
Analysis Batch: 441666

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 441467

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Anthracene	50.0	39.02		ug/L		78	42 - 130	1	50
Benzo[a]anthracene	50.0	38.79		ug/L		78	41 - 131	3	50
Benzo[a]pyrene	50.0	39.31		ug/L		79	45 - 131	6	50
Benzo[b]fluoranthene	50.0	41.07		ug/L		82	43 - 132	7	50
Benzo[g,h,i]perylene	50.0	40.00		ug/L		80	38 - 138	4	50
Benzo[k]fluoranthene	50.0	41.52		ug/L		83	44 - 129	2	50
bis (2-chloroisopropyl) ether	50.0	32.44		ug/L		65	24 - 136	6	50
Bis(2-chloroethoxy)methane	50.0	35.34		ug/L		71	35 - 127	0	50
Bis(2-chloroethyl)ether	50.0	34.10		ug/L		68	27 - 132	4	50
Bis(2-ethylhexyl) phthalate	50.0	39.25		ug/L		79	41 - 147	3	47
Butyl benzyl phthalate	50.0	38.99		ug/L		78	34 - 146	3	50
Carbazole	50.0	40.86		ug/L		82	42 - 130	3	50
Chrysene	50.0	39.46		ug/L		79	39 - 130	5	50
Cresols	100	53.62		ug/L		54	10 - 132	1	50
Dibenz(a,h)anthracene	50.0	42.44		ug/L		85	43 - 140	4	50
Dibenzofuran	50.0	38.17		ug/L		76	35 - 127	2	50
Diethyl phthalate	50.0	39.15		ug/L		78	31 - 136	2	50
Dimethyl phthalate	50.0	37.47		ug/L		75	34 - 134	3	50
Di-n-butyl phthalate	50.0	41.95		ug/L		84	42 - 140	2	50
Di-n-octyl phthalate	50.0	41.63		ug/L		83	42 - 142	4	49
Fluoranthene	50.0	40.73		ug/L		81	31 - 132	3	50
Fluorene	50.0	39.19		ug/L		78	37 - 130	0	50
Hexachlorobenzene	50.0	41.32		ug/L		83	36 - 140	2	50
Hexachlorobutadiene	50.0	33.76		ug/L		68	18 - 136	5	50
Hexachlorocyclopentadiene	50.0	3.104	J *	ug/L		6	17 - 128	4	50
Hexachloroethane	50.0	30.03		ug/L		60	23 - 120	2	50
Indeno[1,2,3-cd]pyrene	50.0	41.87		ug/L		84	40 - 136	5	50
Isophorone	50.0	29.80		ug/L		60	39 - 120	0	50
Naphthalene	50.0	34.01		ug/L		68	32 - 120	1	50
Nitrobenzene	50.0	34.38		ug/L		69	10 - 150	2	50
N-Nitrosodi-n-propylamine	50.0	34.44		ug/L		69	32 - 136	5	50
n-Nitrosodiphenylamine(as diphenylamine)	42.5	41.32		ug/L		97	44 - 123	1	50
Pentachlorophenol	100	83.65		ug/L		84	10 - 150	3	50
Phenanthrene	50.0	40.54		ug/L		81	39 - 126	2	50
Phenol	50.0	13.87		ug/L		28	10 - 110	1	36
Pyrene	50.0	40.98		ug/L		82	37 - 129	5	50

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*78*		*10 - 120*
2-Fluorobiphenyl (Surr)	*73*		*29 - 120*
2-Fluorophenol (Surr)	*42*		*10 - 120*
Nitrobenzene-d5 (Surr)	*69*		*27 - 120*
Phenol-d5 (Surr)	*28*		*10 - 120*
Terphenyl-d14 (Surr)	*81*		*13 - 120*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 490-443064/1-A
Matrix: Water
Analysis Batch: 443344

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 443064

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.625	0.538	ug/L		07/06/17 12:35	07/07/17 13:34	1
PCB-1221	ND		0.625	0.425	ug/L		07/06/17 12:35	07/07/17 13:34	1
PCB-1232	ND		0.625	0.500	ug/L		07/06/17 12:35	07/07/17 13:34	1
PCB-1242	ND		0.625	0.275	ug/L		07/06/17 12:35	07/07/17 13:34	1
PCB-1248	ND		0.625	0.188	ug/L		07/06/17 12:35	07/07/17 13:34	1
PCB-1254	ND		0.625	0.213	ug/L		07/06/17 12:35	07/07/17 13:34	1
PCB-1260	ND		0.625	0.225	ug/L		07/06/17 12:35	07/07/17 13:34	1
PCB-1262	ND		0.625	0.238	ug/L		07/06/17 12:35	07/07/17 13:34	1
PCB-1268	ND		0.625	0.200	ug/L		07/06/17 12:35	07/07/17 13:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*86*		*10 - 150*	*07/06/17 12:35*	*07/07/17 13:34*	*1*
Tetrachloro-m-xylene	*88*		*10 - 150*	*07/06/17 12:35*	*07/07/17 13:34*	*1*

Lab Sample ID: LCS 490-443064/2-A
Matrix: Water
Analysis Batch: 443344

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 443064

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
PCB-1016	5.00	3.797		ug/L		76	47 - 144
PCB-1260	5.00	3.734		ug/L		75	45 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*76*		*10 - 150*
Tetrachloro-m-xylene	*79*		*10 - 150*

Lab Sample ID: LCSD 490-443064/3-A
Matrix: Water
Analysis Batch: 443344

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 443064

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
PCB-1016	5.00	3.734		ug/L		75	47 - 144	2	50
PCB-1260	5.00	3.532		ug/L		71	45 - 144	6	50

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*69*		*10 - 150*
Tetrachloro-m-xylene	*79*		*10 - 150*

QC Association Summary

Client: Reliance Laboratories Inc
Project/Site: SVOC & PCB / 269570

TestAmerica Job ID: 490-131748-1

GC/MS Semi VOA

Prep Batch: 441467

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-131748-1	269570-2017-W	Total/NA	Water	3510C	
MB 490-441467/1-A	Method Blank	Total/NA	Water	3510C	
LCS 490-441467/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 490-441467/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 441666

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-131748-1	269570-2017-W	Total/NA	Water	8270D	441467
MB 490-441467/1-A	Method Blank	Total/NA	Water	8270D	441467
LCS 490-441467/2-A	Lab Control Sample	Total/NA	Water	8270D	441467
LCSD 490-441467/3-A	Lab Control Sample Dup	Total/NA	Water	8270D	441467

GC Semi VOA

Prep Batch: 443064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-131748-1	269570-2017-W	Total/NA	Water	3510C	
MB 490-443064/1-A	Method Blank	Total/NA	Water	3510C	
LCS 490-443064/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 490-443064/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 443344

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-131748-1	269570-2017-W	Total/NA	Water	8082A	443064
MB 490-443064/1-A	Method Blank	Total/NA	Water	8082A	443064
LCS 490-443064/2-A	Lab Control Sample	Total/NA	Water	8082A	443064
LCSD 490-443064/3-A	Lab Control Sample Dup	Total/NA	Water	8082A	443064

Lab Chronicle

Client: Reliance Laboratories Inc
Project/Site: SVOC & PCB / 269570

TestAmerica Job ID: 490-131748-1

Client Sample ID: 269570-2017-W

Date Collected: 06/23/17 15:30
Date Received: 06/28/17 10:00

Lab Sample ID: 490-131748-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			980 mL	1 mL	441467	06/29/17 12:43	SAT	TAL NSH
Total/NA	Analysis	8270D		1			441666	06/30/17 06:21	LEG	TAL NSH
Total/NA	Prep	3510C			960 mL	5 mL	443064	07/06/17 12:35	SAT	TAL NSH
Total/NA	Analysis	8082A		1			443344	07/07/17 15:39	NMB	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Reliance Laboratories Inc
Project/Site: SVOC & PCB / 269570

TestAmerica Job ID: 490-131748-1

Method	Method Description	Protocol	Laboratory
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL NSH
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	TAL NSH

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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Accreditation/Certification Summary

Client: Reliance Laboratories Inc
Project/Site: SVOC & PCB / 269570

TestAmerica Job ID: 490-131748-1

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
West Virginia DEP	State Program	3	219	02-28-18

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Nashville, TN

COOLER RECEIPT FORM

490-131748 Chain of Custody

Cooler Received/Opened On 6/28/2017 @ 1000

Time Samples Removed From Cooler 1800 Time Samples Placed In Storage 1835 (2 Hour Window)

1. Tracking # 9241 (last 4 digits, FedEx) Courier: FedEx

   IR Gun ID 17960353 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 5.4 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

   If yes, how many and where: None

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) [illegible]

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

   Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

   b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (initial) [illegible]

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

   b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) [illegible]

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) [illegible]

I certify that I attached a label with the unique LIMS number to each container (initial) [illegible]

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment

Cooler Receipt Form.doc

LF-1

End of Form

Revised 12 15 15

RELIANCE LABORATORIES, INC. - CHAIN OF CUSTODY RECORD

☒ 2044 MEADOWBROOK ROAD
POST OFFICE BOX 4657
BRIDGEPORT, WV 26330
TEL. (304) 842-5285 • FAX (304) 842-5351
E-MAIL reliancelabs@wvdsl.net
INTERNET www.RelianceLabs.net

☐ RIDGEFIELD BUSINESS CENTER
25 CRIMSON CIRCLE
MARTINSBURG, WV 25403
TEL. (304) 596-2084 • FAX (304) 596-2086

7/10/2017

*CLIENT NAME Reliance Laboratories

*ADDRESS

CUSTOMER #

*TEL. #

FAX #

*SAMPLER (S) A. Wilson

E-MAIL

SHEET NO. 1 OF 1

LABORATORY #	*DATE	*TIME	*COMP.	*GRAB	MATRIX W, DW, S, O, M	TEMP. ≤ 4°C Yes No	*# OF CONTAIN.	HNO3	H2SO4	HCL	NaOH	BAC-T	NO PRES.		BTEX	Semi-VOCs	PCBs					*PROJECT/REMARKS
	6/23/17	1530			W		2						2G		X	X						269570-2017-W

490-131748

SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR HOLDING TIMES
SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR CHEMICAL PRESERVATIVES
SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR SAMPLE CONTAINERS
SAMPLES ARE ____ ARE NOT ____ FOR REGULATORY COMPLIANCE PURPOSES

*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: C. Grant SIGN:	DATE: 6/26/17 TIME: 1600	PRINT: FedEx SIGN:
*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: FedEx SIGN:	DATE: TIME:	S.U. TAN PRINT: SIGN: 6/28/17 @ 1000
*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: SIGN:	DATE: TIME:	PRINT: SIGN:
*COURIER:	*DATE/TIME	*RECEIVED BY:
TRACKING #:	DATE: TIME:	PRINT: SIGN:

REMARKS:

PWS#

WEATHER/TEMPERATURE:

☐ ***RUSH STATUS*** (INITIAL ACCEPTANCE ____)

*** ADDITIONAL LABORATORY FEES MAY APPLY***

EXTENT OF LIABILITY

SHOULD RELIANCE LABORATORIES, INC. BE AT FAULT AND ANY DISPUTE ARISE REGARDING ANALYTICAL DATA GENERATED BY THE LABORATORY, THE EXTENT OF THE LIABILITY TO RELIANCE WILL BE A DUPLICATE ANALYSIS OF THAT SAMPLE (PROVIDING ADEQUATE SAMPLE REMAINS) OR A REFUND OF THE ANALYTICAL FEE. IN NO EVENT WILL RELIANCE LABORATORIES BE LIABLE FOR DAMAGES INCLUDING BUT NOT LIMITED TO DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING FROM SUCH DISPUTE.

NOTE: TYPICAL SAMPLE TURN AROUND FOR ROUTINE SAMPLES IS 5 TO 10 WORKING DAYS. THIS IN NOT A GUARANTEE THAT SAMPLES WILL BE COMPLETED IN THIS TIME FRAME, HOWEVER. NON-ROUTINE SAMPLES MAY REQUIRE ADDITIONAL TIME.

*** TO BE COMPLETED BY CLIENT ***

ORIGINAL CHAIN OF CUSTODY DOCUMENT MUST BE EXECUTED IN INK

WHITE - LABORATORY YELLOW - CLIENT

RELIANCE LABORATORIES, INC.

ENVIRONMENTAL ANALYSTS AND CONSULTANTS

BRIDGEPORT, WV www.RelianceLabs.net *MARTINSBURG, WV*

Certifications: WV Department of Health #: 00354, 00433 | WV Department of Environmental Protection #: 158, 181 | MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

Monday, June 26, 2017

TestAmerica - Nashville
2960 Foster Creighton Drive
Nashville, TN 37204

Please analyze the following sample(s) for: **8270 SemiVolatiles + PCBs**

Please identify as:

269570-2017-W DATE/TIME SAMPLED: 6/23/2017 15:30

Sampled by: A.Wilson

PLEASE SEND RESULTS & INVOICE TO:

RELIANCE LABORATORIES, INC.
ATTN: TENLEY MILLER
P.O. BOX 4657
BRIDGEPORT, WV 26330
tmiller@wvdsl.net

Loc: 490
131748

Thank You

2044 MEADOWBROOK ROAD | P.O. BOX 4657 | BRIDGEPORT, WV 26330 | VOICE: 304-842-5285 | FAX: 304-842-5351
RIDGEFIELD BUSINESS CENTER | 25 CRIMSON CIRCLE | MARTINSBURG, WV 25403 | VOICE: 304-596-2084 | FAX: 304-596-2086

Login Sample Receipt Checklist

Client: Reliance Laboratories Inc

Job Number: 490-131748-1

Login Number: 131748
List Number: 1
Creator: Vest, Laura E

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

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Nottingham, Justin E

From: Jamie Andrews <jandrews@mountainvoilandgas.com>
Sent: Thursday, August 17, 2017 10:10 AM
To: Nottingham, Justin E
Subject: UIC2D0973737
Attachments: C00117-072817.pdf

Justin here is the corrected water analysis for the recently submitted UIC well referenced above. Please let me know if you need anything else.

Thanks

Jamie Andrews
Land & Business Development
Mountain V Oil & Gas, Inc.
304.842.6320 ext. 107 (O)
304.203.7555 (C)

RELIANCE LABORATORIES, INC. - CHAIN OF CUSTODY RECORD

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25 CRIMSON CIRCLE
MARTINSBURG, WV 25403
TEL. (304) 596-2084 • FAX (304) 596-2086

*CLIENT NAME SLS

*ADDRESS

CUSTOMER # C00117 *TEL.# FAX #

*SAMPLER (S) M. Shiflet E-MAIL

SHEET NO. ____ OF ____

LABORATORY #	*DATE	*TIME	dTOC	GRAS	MATRIX W, DW, S, O, M	TEMP. ≤ 4°C Yes No	*# OF CONTAIN.	HN03	H2S04	HCL	NaOH	BAC-T	NO PRES.		Norm	Specific gravity	bacteria	methane	ethane	butane	propane	*PROJECT/REMARKS
271354	7/28/17	14:45			W	2.2°	6			2		1	3									Mary Hawn Injection fluid.

SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR HOLDING TIMES
SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR CHEMICAL PRESERVATIVES
SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR SAMPLE CONTAINERS
SAMPLES ARE ✓ ARE NOT ____ FOR REGULATORY COMPLIANCE PURPOSES

*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: Mike Shiflet	DATE: 7-28-17	PRINT: T Miller
SIGN:	TIME: 1614	SIGN:
*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT:	DATE:	PRINT:
SIGN:	TIME:	SIGN:
*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT:	DATE:	PRINT:
SIGN:	TIME:	SIGN:
*COURIER:	*DATE/TIME	*RECEIVED BY:
TRACKING #:	DATE:	PRINT:
	TIME:	SIGN:

REMARKS:

PWS#

WEATHER/TEMPERATURE:

☐ ***RUSH STATUS*** (INITIAL ACCEPTANCE ____)

*** ADDITIONAL LABORATORY FEES MAY APPLY***

EXTENT OF LIABILITY

SHOULD RELIANCE LABORATORIES, INC. BE AT FAULT AND ANY DISPUTE ARISE REGARDING ANALYTICAL DATA GENERATED BY THE LABORATORY, THE EXTENT OF THE LIABILITY TO RELIANCE WILL BE A DUPLICATE ANALYSIS OF THAT SAMPLE (PROVIDING ADEQUATE SAMPLE REMAINS) OR A REFUND OF THE ANALYTICAL FEE. IN NO EVENT WILL RELIANCE LABORATORIES BE LIABLE FOR DAMAGES INCLUDING BUT NOT LIMITED TO DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING FROM SUCH DISPUTE.

NOTE: TYPICAL SAMPLE TURN AROUND FOR ROUTINE SAMPLES IS 5 TO 10 WORKING DAYS. THIS IN NOT A GUARANTEE THAT SAMPLES WILL BE COMPLETED IN THIS TIME FRAME, HOWEVER. NON-ROUTINE SAMPLES MAY RECUIRE ADDITIONAL TIME.

*TO BE COMPLETED BY CLIENT

ORIGINAL CHAIN OF CUSTODY DOCUMENT MUST BE EXECUTED IN INK

WHITE - LABORATORY YELLOW - CLIENT

Reliance Laboratories, Inc.
2044 Meadowbrook Road | P.O. Box 4657
Bridgeport, WV 26330
Phone: 304.842.5285 | Fax: 304.842.5351

Martinsburg Laboratory
Ridgefield Business Center | 25 Crimson Circle
Martinsburg, WV 25403
Phone: 304.596.2084 | Fax: 304.596.2086

Certifications: WV Department of Health #: 00354, 00443 | WV Department of Environmental Protection #: 158, 181
MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

LABORATORY REPORT SUMMARY

Client: C00117

SMITH LAND SURVEYING, INC.
P.O. BOX 150
GLENVILLE WV 26351-

Monday, August 14, 2017

Total Number of Pages: 2
(Not Including C.O.C.)

Lab ID	Sample ID	Sample ID 2	Sample Date
271354-2017-W	MT. V HAUN	INJECTION FLUID	7/28/2017

The enclosed results have been analyzed according to the referenced method and SOP. Any deviations to the method have been noted on the report. Unless otherwise noted, all results have been verified to meet quality control requirements of the method. All analysis performed by Reliance Laboratories, Bridgeport, WV unless otherwise noted. Parameters analyzed by Reliance Laboratories, Martinsburg, WV are noted with @ on laboratory report.This report may not be reproduced, except in full, without written approval of Reliance Laboratories, Inc.

Report Reviewed By: Tenley Miller Digitally signed by Tenley Miller Date: 2017.08.17 09:52:49 -04'00'

Reliance Laboratories, Inc.
2044 Meadowbrook Road | P.O. Box 4657
Bridgeport, WV 26330
Phone: 304.842.5285 | Fax: 304.842.5351

Martinsburg Laboratory
Ridgefield Business Center | 25 Crimson Circle
Martinsburg, WV 25403
Phone: 304.596.2084 | Fax: 304.596.2086

Certifications: WV Department of Health #: 00354, 00443 | WV Department of Environmental Protection #: 158, 181
MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

SMITH LAND SURVEYING, INC.
P.O. BOX 150

GLENVILLE, WV 26351-

Monday, August 14, 2017

Lab Number: 271354-2017-W **Sample ID:** MT. V HAUN
INJECTION FLUID

Parameter	Value	Units	Method	Date/Time Analyzed		Analyst	MDL	MRL
Analyte Group: **Inorganics**								
E.coli(MPN)**	< 1	Index/100ml	SM9223B-97	7/28/2017	16:30	CP		
Total Coliform(MPN)**	< 1	Index/100ml	SM9223B-97	7/28/2017	16:30	CP		
Specific Gravity	1.04	g/cc	ASTM D1429-08	8/14/2017	15:33	TM		

Remarks:

Date Sample Collected: 7/28/2017 14:45
Sample Submitted By: M. SHIFLET
Date Sample Received: 7/28/2017 16:14
Sample temp. upon receipt: 2.2 Deg C
MDL - Minimum Detectable Limit
MCL - Maximum Contaminant Level, USEPA Regulated

ND = Not Detected at the MDL or MRL
MRL - Minimum Reporting Limit
J = Reported value is an estimate because concentration is less than the MRL

***Method Code: STANDARD METHODS ONLINE ED; US EPA METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES, Rev. 83; US EPA METHODS FOR THE DETERMINATION OF METALS IN ENVIRONMENTAL SAMPLES, May 1994; TEST METHODS FOR EVALUATING SOLID WASTE, SW-846, 3rd ED; USEPA Manual for Certification of Laboratories Analyzing Drinking Water, 5th ED. In accordance with EPA Regulations, all reports, including raw data and quality control data, are maintained by the laboratory for a minimum of 5 years.**

Pace Analytical®
www.pacelabs.com

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

August 17, 2017

Ms. Tenley Miller
Reliance Laboratories, Inc.
2044 Meadowbrook Road
P.O. Box 4657
Bridgeport, WV 26330

RE: Project: 271354-2017
Pace Project No.: 30226012

Dear Ms. Miller:
Enclosed are the analytical results for sample(s) received by the laboratory on August 02, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Revision 1 - This report replaces the Aug. 12, 2017 report. This report has been reissued on Aug. 17, 2017 to correct the client's project and sample ID. Please replace the original report with the revised report enclosed.

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

Sincerely,

Robbin Robl

Robbin Robl
robbin.robl@pacelabs.com
(724)850-5613
Project Manager

Enclosures

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

CERTIFICATIONS

Project: 271354-2017
Pace Project No.: 30226012

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

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

SAMPLE SUMMARY

Project: 271354-2017
Pace Project No.: 30226012

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30226012001	**271354-2017-W**	Water	07/28/17 14:45	08/02/17 11:30

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

SAMPLE ANALYTE COUNT

Project: 271354-2017
Pace Project No.: 30226012

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30226012001	271354-2017-W	EPA 901.1	MAH	10

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

PROJECT NARRATIVE

Project: 271354-2017
Pace Project No.: 30226012

Method: **EPA 901.1**
Description: 901.1 Gamma Spec
Client: Reliance Laboratories, Inc.
Date: August 17, 2017

General Information:
1 sample was analyzed for EPA 901.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

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

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

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

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

Additional Comments:

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

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 271354-2017
Pace Project No.: 30226012

Sample: 271354-2017-W **Lab ID: 30226012001** Collected: 07/28/17 14:45 Received: 08/02/17 11:30 Matrix: Water
PWS: Site ID: Sample Type:

Comments:
- Sample collection dates and times were not present on the sample containers.
- Upon receipt at the laboratory, 9 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Bismuth-212	EPA 901.1	**90.104 ± 168.940 (187.600) C:NA T:NA**	pCi/L	08/09/17 12:51	14913-49-6	
Bismuth-214	EPA 901.1	**1326.800 ± 154.440 (29.200) C:NA T:NA**	pCi/L	08/09/17 12:51	14733-03-0	
Lead-212	EPA 901.1	**320.960 ± 62.614 (34.400) C:NA T:NA**	pCi/L	08/09/17 12:51	15092-94-1	
Lead-214	EPA 901.1	**1405.900 ± 162.530 (43.870) C:NA T:NA**	pCi/L	08/09/17 12:51	15067-28-4	
Potassium-40	EPA 901.1	**565.070 ± 185.200 (157.600) C:NA T:NA**	pCi/L	08/09/17 12:51	13966-00-2	
Radium-226	EPA 901.1	**906.720 ± 375.440 (423.000) C:NA T:NA**	pCi/L	08/09/17 12:51	13982-63-3	
Radium-228	EPA 901.1	**193.280 ± 57.880 (48.050) C:NA T:NA**	pCi/L	08/09/17 12:51	15262-20-1	
Thallium-208	EPA 901.1	**0.000 ± 9.353 (21.400) C:NA T:NA**	pCi/L	08/09/17 12:51	14913-50-9	
Thorium-234	EPA 901.1	**0.000 ± 363.540 (685.100) C:NA T:NA**	pCi/L	08/09/17 12:51	15065-10-8	
Uranium-235	EPA 901.1	**31.093 ± 109.030 (132.200) C:NA T:NA**	pCi/L	08/09/17 12:51	15117-96-1	

Pace Analytical Services, LLC
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 271354-2017
Pace Project No.: 30226012

QC Batch: 267828 | Analysis Method: EPA 901.1
QC Batch Method: EPA 901.1 | Analysis Description: 901.1 Gamma Spec
Associated Lab Samples: 30226012001

METHOD BLANK: 1318098 | Matrix: Water
Associated Lab Samples: 30226012001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Bismuth-212	-21.558 ± 129.990 (151.000) C:NA T:NA	pCi/L	08/09/17 10:58	
Bismuth-214	10.467 ± 14.120 (17.420) C:NA T:NA	pCi/L	08/09/17 10:58	
Lead-212	2.078 ± 11.890 (15.280) C:NA T:NA	pCi/L	08/09/17 10:58	
Lead-214	15.821 ± 12.114 (13.690) C:NA T:NA	pCi/L	08/09/17 10:58	
Potassium-40	3.093 ± 108.270 (140.300) C:NA T:NA	pCi/L	08/09/17 10:58	
Radium-226	15.414 ± 158.350 (210.000) C:NA T:NA	pCi/L	08/09/17 10:58	
Radium-228	14.800 ± 21.351 (25.700) C:NA T:NA	pCi/L	08/09/17 10:58	
Thallium-208	0.000 ± 4.241 (13.180) C:NA T:NA	pCi/L	08/09/17 10:58	
Thorium-234	39.778 ± 232.070 (295.800) C:NA T:NA	pCi/L	08/09/17 10:58	
Uranium-235	8.433 ± 41.621 (52.040) C:NA T:NA	pCi/L	08/09/17 10:58	

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

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

QUALIFIERS

Project: 271354-2017
Pace Project No.: 30226012

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

RELIANCE LABORATORIES, INC. - CHAIN OF CUSTODY RECORD

☒ 2044 MEADOWBROOK ROAD
POST OFFICE BOX 4657
BRIDGEPORT, WV 26330
TEL. (304) 842-5285 • FAX (304) 842-5351
E-MAIL reliancelabs@wvdsl.net
INTERNET www.RelianceLabs.net

☐ RIDGEFIELD BUSINESS CENTER
25 CRIMSON CIRCLE
MARTINSBURG, WV 25403
TEL. (304) 596-2084 • FAX (304) 596-2086

*CLIENT NAME Reliance Laboratories

*ADDRESS

CUSTOMER # *TEL.# FAX#

*SAMPLER (S) M. Shiflet E-MAIL

SHEET NO. 1 OF 1

LABORATORY #	*DATE	*TIME	*COMP	*GRAB	MATRIX W, DW, S, O, M	TEMP. ≤ 4°C Yes No	*# OF CONTAIN.	HN03	H2S04	HCL	NaOH	BAC-T	NO PRES.		NOBM							*PROJECT/REMARKS
	7/28/17	14:45			W		1						1		X							271354-2017-WQM

WO#:30226012

SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR HOLDING TIMES
SAMPLES DO ____ DO NOT ____ MEET USEPA GUIDELINES FOR CHEMICAL PRESERVATIVES
SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR SAMPLE CONTAINERS
SAMPLES ARE ✓ ARE NOT ____ FOR REGULATORY COMPLIANCE PURPOSES

REMARKS:

PWS#

*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: M Hand SIGN:	DATE: 8/1/17 TIME: 1600	PRINT: FedEx SIGN:
*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: SIGN:	DATE: 8/2/17 TIME: 1130	PRINT: Zac Hutchinson SIGN:
*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: SIGN:	DATE: TIME:	PRINT: SIGN:
*COURIER: TRACKING#:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: SIGN:

WEATHER/TEMPERATURE:

☐ ***RUSH STATUS*** (INITIAL ACCEPTANCE _____)

*** ADDITIONAL LABORATORY FEES MAY APPLY***

EXTENT OF LIABILITY

SHOULD RELIANCE LABORATORIES, INC. BE AT FAULT AND ANY DISPUTE ARISE REGARDING ANALYTICAL DATA GENERATED BY THE LABORATORY, THE EXTENT OF THE LIABILITY TO RELIANCE WILL BE A DUPLICATE ANALYSIS OF THAT SAMPLE (PROVIDING ADEQUATE SAMPLE REMAINS) OR A REFUND OF THE ANALYTICAL FEE. IN NO EVENT WILL RELIANCE LABORATORIES BE LIABLE FOR DAMAGES INCLUDING BUT NOT LIMITED TO DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING FROM SUCH DISPUTE.

NOTE: TYPICAL SAMPLE TURN AROUND FOR ROUTINE SAMPLES IS 5 TO 10 WORKING DAYS. THIS IN NOT A GUARANTEE THAT SAMPLES WILL BE COMPLETED IN THIS TIME FRAME, HOWEVER. NON-ROUTINE SAMPLES MAY REQUIRE ADDITIONAL TIME.

*TO BE COMPLETED BY CLIENT

ORIGINAL CHAIN OF CUSTODY DOCUMENT MUST BE EXECUTED IN INK

WHITE - LABORATORY YELLOW - CLIENT

RELIANCE LABORATORIES, INC.

ENVIRONMENTAL ANALYSTS AND CONSULTANTS

BRIDGEPORT, WV www.RelianceLabs.net *MARTINSBURG, WV*

Certifications: WV Department of Health #: 00354, 00433 | WV Department of Environmental Protection #: 158, 181
MD Department of Environment #: 336, 337 | US Environmehtal Protection Agency #: WV00042, WV00901

Tuesday, August 01, 2017

30226012

Pace Analytical Services
1638 Roseytown Road
Suites 2,3,4
Greensburg, PA 15601

Please analyze the following sample for: **NORM**

Please identify as:
271432-2017-W Date/Time Sampled: 7/31/2017 13:10

Sampled by: G.Turner

PLEASE SEND RESULTS & INVOICE TO:

RELIANCE LABORATORIES, INC.
ATTN: TENLEY MILLER
P.O. BOX 4657
BRIDGEPORT, WV 26330
tmiller@wvdsl.net

Thank You

Abby Heena

Sample Condition Upon Receipt Pittsburgh

30226012

Pace Analytical

Client Name: RLI Project #

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

Label Z.H.
LIMS Login AMV

Tracking #: 7797 8265 2554

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

Thermometer Used 8 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 4.1 °C Correction Factor: 0.0 °C Final Temp: 4.1 °C

Temp should be above freezing to 6°C

Date and initials of person examining contents: ZH 8/2/17

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. no date/time on samples
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered				12.
Organic Samples checked for dechlorination:			✓	13.
Filtered volume received for Dissolved tests			✓	14.
All containers have been checked for preservation.	✓			15. Added 9 mls of HNO3 to sample
All containers needing preservation are found to be in compliance with EPA recommendation.		✓		
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed ZH; Date/time of preservation 8/2/17 1520; Lot # of added preservative DL170873
Headspace in VOA Vials (>6mm):			✓	16.
Trip Blank Present:			✓	17.
Trip Blank Custody Seals Present			✓	
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed: ZH Date: 8/2/17

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

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

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

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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-133878-1
Client Project/Site: RSK / 271354

For:
Reliance Laboratories Inc
PO BOX 4657
Bridgeport, West Virginia 26330

Attn: Tenley Miller

Jennifer Gambill

Authorized for release by:
8/14/2017 4:52:55 PM

Jennifer Gambill, Project Manager I
(615)301-5044
jennifer.gambill@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

Table of Contents

Sample Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 271354

TestAmerica Job ID: 490-133878-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-133878-1	271354-2017-W	Water	07/28/17 14:45	08/02/17 10:05

Job ID: 490-133878-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-133878-1

Comments
No additional comments.

Receipt
The sample was received on 8/2/2017 10:05 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.2° C.

GC Semi VOA
Method(s) RSK-175: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 490-449967.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Reliance Laboratories Inc
Project/Site: RSK / 271354

TestAmerica Job ID: 490-133878-1

Client Sample ID: 271354-2017-W

Date Collected: 07/28/17 14:45
Date Received: 08/02/17 10:05

Lab Sample ID: 490-133878-1

Matrix: Water

Method: RSK-175 - Dissolved Gases in Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			08/03/17 12:03	1
Ethane	ND		5.00	2.70	ug/L			08/03/17 12:03	1
Methane	ND		5.00	1.70	ug/L			08/03/17 12:03	1
Propane	ND		5.00	3.30	ug/L			08/03/17 12:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*101*		*62 - 124*		*08/03/17 12:03*	*1*

QC Sample Results

Client: Reliance Laboratories Inc
Project/Site: RSK / 271354

TestAmerica Job ID: 490-133878-1

Method: RSK-175 - Dissolved Gases in Water

Lab Sample ID: MB 490-449967/5
Matrix: Water
Analysis Batch: 449967

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			08/03/17 11:36	1
Ethane	ND		5.00	2.70	ug/L			08/03/17 11:36	1
Methane	ND		5.00	1.70	ug/L			08/03/17 11:36	1
Propane	ND		5.00	3.30	ug/L			08/03/17 11:36	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*85*		*62 - 124*		*08/03/17 11:36*	*1*

Lab Sample ID: LCS 490-449967/6
Matrix: Water
Analysis Batch: 449967

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Butane	1020	945.4		ug/L		93	80 - 120
Ethane	527	480.7		ug/L		91	80 - 120
Methane	287	257.8		ug/L		90	80 - 120
Propane	771	708.2		ug/L		92	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Acetylene (Surr)	*85*		*62 - 124*

Lab Sample ID: LCSD 490-449967/7
Matrix: Water
Analysis Batch: 449967

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Butane	1020	823.3		ug/L		81	80 - 120	14	33
Ethane	527	440.8		ug/L		84	80 - 120	9	30
Methane	287	240.3		ug/L		84	80 - 120	7	33
Propane	771	639.6		ug/L		83	80 - 120	10	33

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Acetylene (Surr)	*90*		*62 - 124*

QC Association Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 271354

TestAmerica Job ID: 490-133878-1

GC VOA

Analysis Batch: 449967

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-133878-1	271354-2017-W	Total/NA	Water	RSK-175	
MB 490-449967/5	Method Blank	Total/NA	Water	RSK-175	
LCS 490-449967/6	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 490-449967/7	Lab Control Sample Dup	Total/NA	Water	RSK-175	

Lab Chronicle

Client: Reliance Laboratories Inc
Project/Site: RSK / 271354

TestAmerica Job ID: 490-133878-1

Client Sample ID: 271354-2017-W

Date Collected: 07/28/17 14:45
Date Received: 08/02/17 10:05

Lab Sample ID: 490-133878-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	449967	08/03/17 12:03	AAB	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 271354

TestAmerica Job ID: 490-133878-1

Method	Method Description	Protocol	Laboratory
RSK-175	Dissolved Gases in Water	RSK	TAL NSH

Protocol References:

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 271354

TestAmerica Job ID: 490-133878-1

Laboratory: TestAmerica Nashville

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
West Virginia DEP	State Program	3	219	02-28-18

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Nashville, TN

COOLER RECEIPT FORM

490-1338 8 Chain of Custody

Cooler Received/Opened On 8/2/2017 @1005

Time Samples Removed From Cooler_____ Time Samples Placed In Storage_____ (2 Hour Window)

1. Tracking # 4444 (last 4 digits, FedEx) Courier: FEDEX

   IR Gun ID 17960353_____ pH Strip Lot_____ Chlorine Strip Lot_____

2. Temperature of rep. sample or temp blank when opened: 5.2 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

   If yes, how many and where:_____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) ES

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

   Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

   b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # NA

I certify that I unloaded the cooler and answered questions 7-14 (intial) ELA

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

   b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) ELA

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) ELA

I certify that I attached a label with the unique LIMS number to each container (intial) ELA

21. Were there Non-Conformance Issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment

RELIANCE LABORATORIES, INC. - CHAIN OF CUSTODY RECORD

☒ 2044 MEADOWBROOK ROAD
POST OFFICE BOX 4657
BRIDGEPORT, WV 26330
TEL. (304) 842-5285 • FAX (304) 842-5351
E-MAIL reliancelabs@wvdsl.net
INTERNET www.RelianceLabs.net

☐ RIDGEFIELD BUSINESS CENTER
25 CRIMSON CIRCLE
MARTINSBURG, WV 25403
TEL. (304) 596-2084 • FAX (304) 596-2086

8/14/2017

*CLIENT NAME Reliance Laboratories

*ADDRESS

CUSTOMER # *TEL.# FAX #

*SAMPLER (S) M. Shiflet E-MAIL

SHEET NO. 1 OF 1

LABORATORY #	*DATE	*TIME	COLIF.	ENTER.	MATRIX W, DW, S, O, M	TEMP. ≤ 4°C Yes No	*# OF CONTAIN.	HN03	H2S04	HCL	NaOH	BAC-T	NO PRES.		Dissolved Methane	Ethane/ Ethane	Butane/ Propane				*PROJECT/REMARKS
	8/11	14:45			W		1			1					X	X	X	X			271354-2017-W
																					Loc: 490 133878

SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR HOLDING TIMES
SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR CHEMICAL PRESERVATIVES
SAMPLES DO ✓ DO NOT ____ MEET USEPA GUIDELINES FOR SAMPLE CONTAINERS
SAMPLES ARE ____ ARE NOT ____ FOR REGULATORY COMPLIANCE PURPOSES

*RELINQUISHED BY:	*DATE/TIME	*RECEIVED BY:
PRINT: SIGN: [signature]	DATE: 8/11/17 TIME: 1600	PRINT: FedEx SIGN:
*RELINQUISHED BY: PRINT: FedEx SIGN:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: SIGN:
*RELINQUISHED BY: PRINT: SIGN:	*DATE/TIME DATE: 8-2-17 TIME: 1005	*RECEIVED BY: PRINT: SIGN: [signature]
*COURIER: TRACKING#:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: SIGN:

REMARKS:

PWS#

WEATHER/TEMPERATURE:

☐ ***RUSH STATUS*** (INITIAL ACCEPTANCE _____)

*** ADDITIONAL LABORATORY FEES MAY APPLY***

EXTENT OF LIABILITY

SHOULD RELIANCE LABORATORIES, INC. BE AT FAULT AND ANY DISPUTE ARISE REGARDING ANALYTICAL DATA GENERATED BY THE LABORATORY, THE EXTENT OF THE LIABILITY TO RELIANCE WILL BE A DUPLICATE ANALYSIS OF THAT SAMPLE (PROVIDING ADEQUATE SAMPLE REMAINS) OR A REFUND OF THE ANALYTICAL FEE. IN NO EVENT WILL RELIANCE LABORATORIES BE LIABLE FOR DAMAGES INCLUDING BUT NOT LIMITED TO DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING FROM SUCH DISPUTE.

NOTE: TYPICAL SAMPLE TURN AROUND FOR ROUTINE SAMPLES IS 5 TO 10 WORKING DAYS. THIS IN NOT A GUARANTEE THAT SAMPLES WILL BE COMPLETED IN THIS TIME FRAME, HOWEVER. NON-ROUTINE SAMPLES MAY REQUIRE ADDITIONAL TIME.

*TO BE COMPLETED BY CLIENT

ORIGINAL CHAIN OF CUSTODY DOCUMENT MUST BE EXECUTED IN INK

WHITE - LABORATORY YELLOW - CLIENT

RELIANCE LABORATORIES, INC.

ENVIRONMENTAL ANALYSTS AND CONSULTANTS

BRIDGEPORT, WV www.RelianceLabs.net ***MARTINSBURG, WV***

Certifications: WV Department of Health #: 00354, 00433 | WV Department of Environmental Protection #: 158, 181 | MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

August 1, 2017

Loc: 490
133878

TestAmerica - Nashville
2960 Foster Creighton Drive
Nashville, TN 37204

Please analyze the following sample(s) for: **Dissolved Methane/Ethane/Butane/Propane**

Please identify as:

271354-2017-W DATE/TIME SAMPLED: 7/28/2017 14:45

Sampled by: M.Shiflet

PLEASE SEND RESULTS & INVOICE TO:

RELIANCE LABORATORIES, INC.
ATTN: TENLEY MILLER
P.O. BOX 4657
BRIDGEPORT, WV 26330
tmiller@wvdsl.net

Thank You

2044 MEADOWBROOK ROAD | P.O. BOX 4657 | BRIDGEPORT, WV 26330 | VOICE: 304-842-5285 | FAX: 304-842-5351
RIDGEFIELD BUSINESS CENTER | 25 CRIMSON CIRCLE | MARTINSBURG, WV 25403 | VOICE: 304-596-2084 | FAX: 304-596-2086

Login Sample Receipt Checklist

Client: Reliance Laboratories Inc

Job Number: 490-133878-1

Login Number: 133878
List Number: 1
Creator: Abernathy, Eric

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX F

Area Permit Wells

API #	Well Type (Injection, Production, Observation, Monitoring)	Well Status (Active, Abandoned, Shut-in, Plugged)	Northing (UTM NAD 83 Meters)	Easting (UTM NAD 83 Meters)

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

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

SECTION 8

UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

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

- See attached Geological Report

Nottingham, Justin E

From: Jamie Andrews <jandrews@mountainvoilandgas.com>
Sent: Wednesday, July 19, 2017 11:48 AM
To: Nottingham, Justin E
Subject: UIC 2D0973737 Geological Report
Attachments: UIC 2D0973737 - Geological Report.pdf

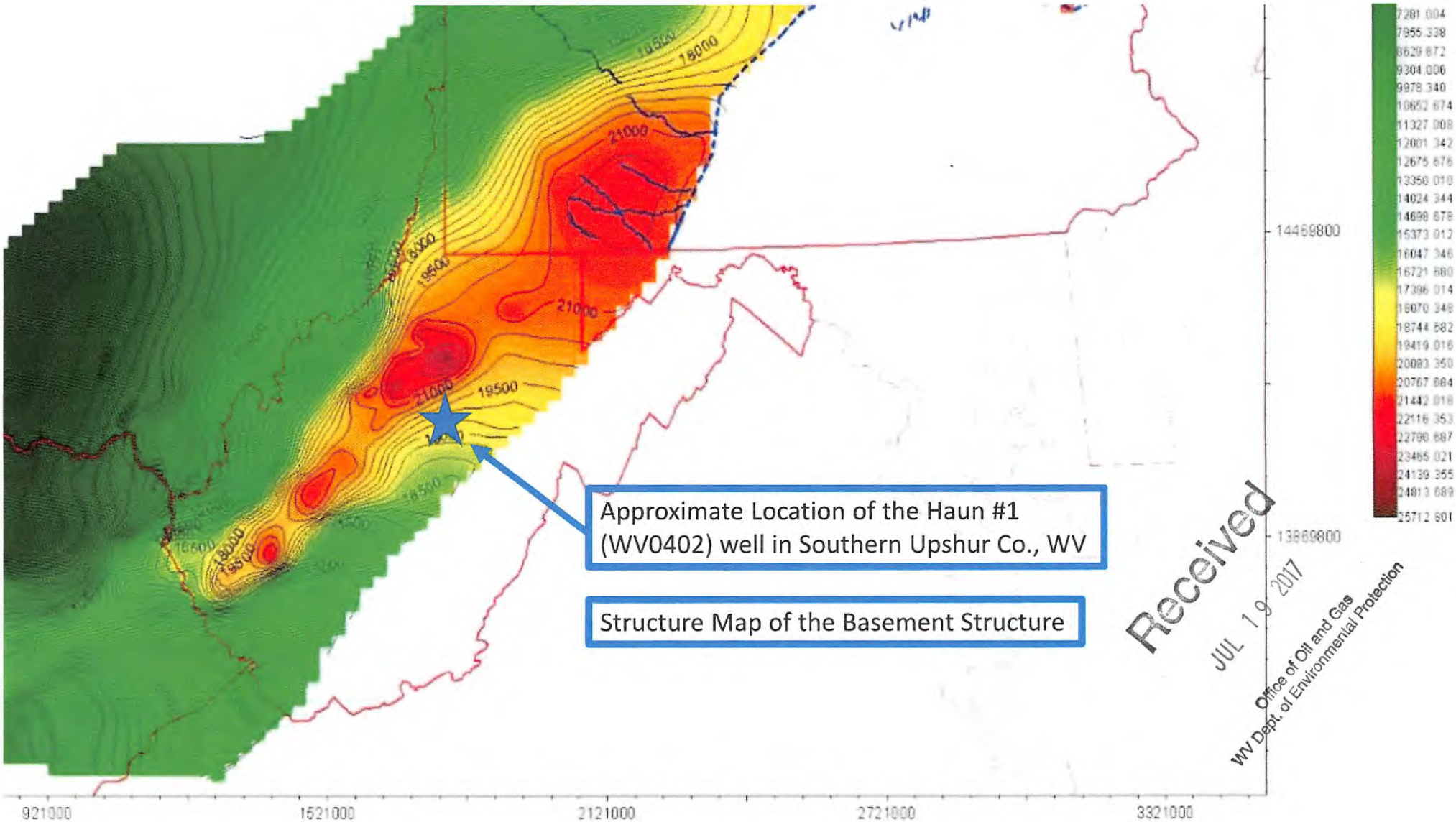
Importance: High

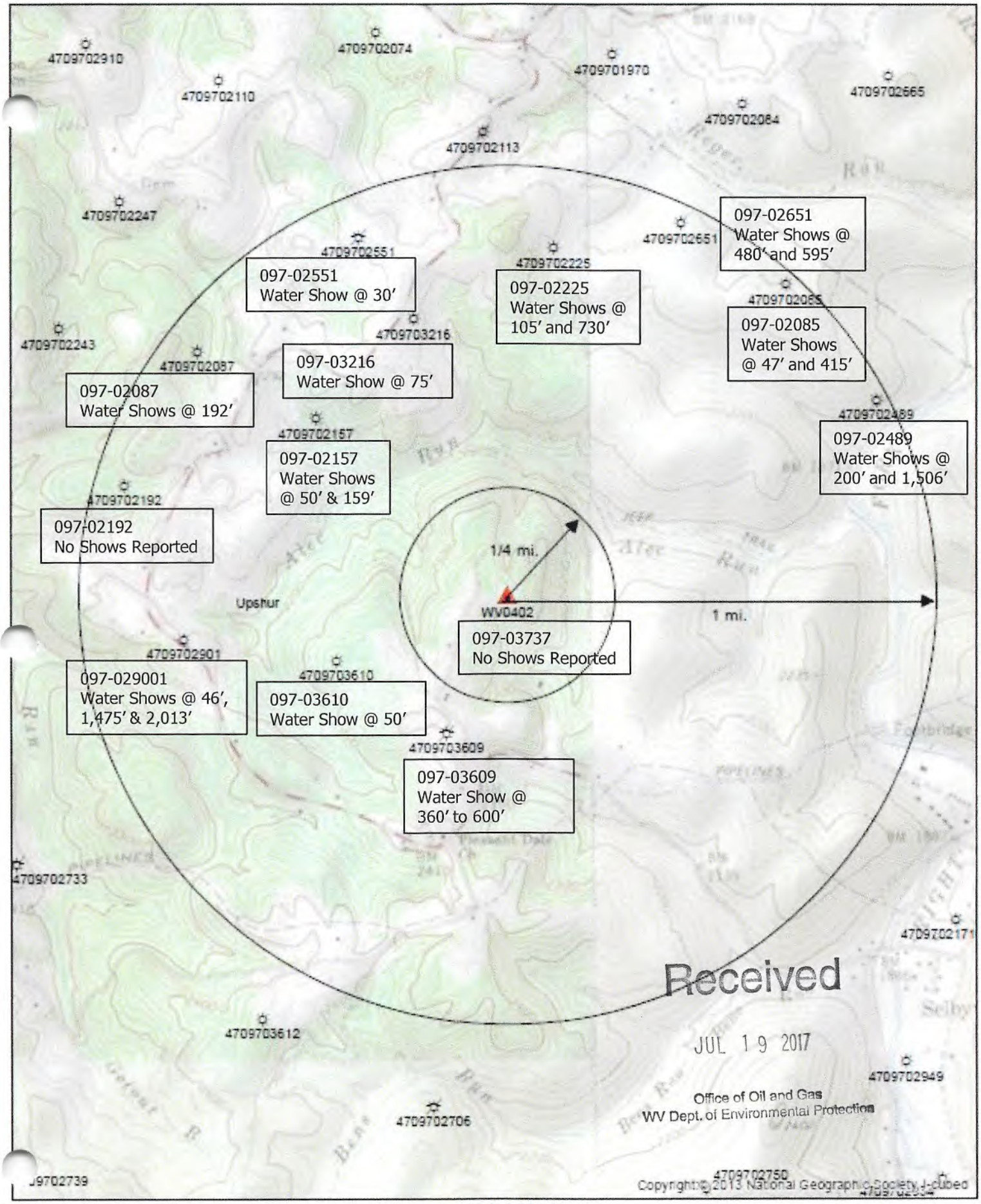
Justin,

Please see attached geological report to insert into the UIC permit we submitted for renewal named above. Will this suffice for submittal or do you need a hard copy?

Thanks

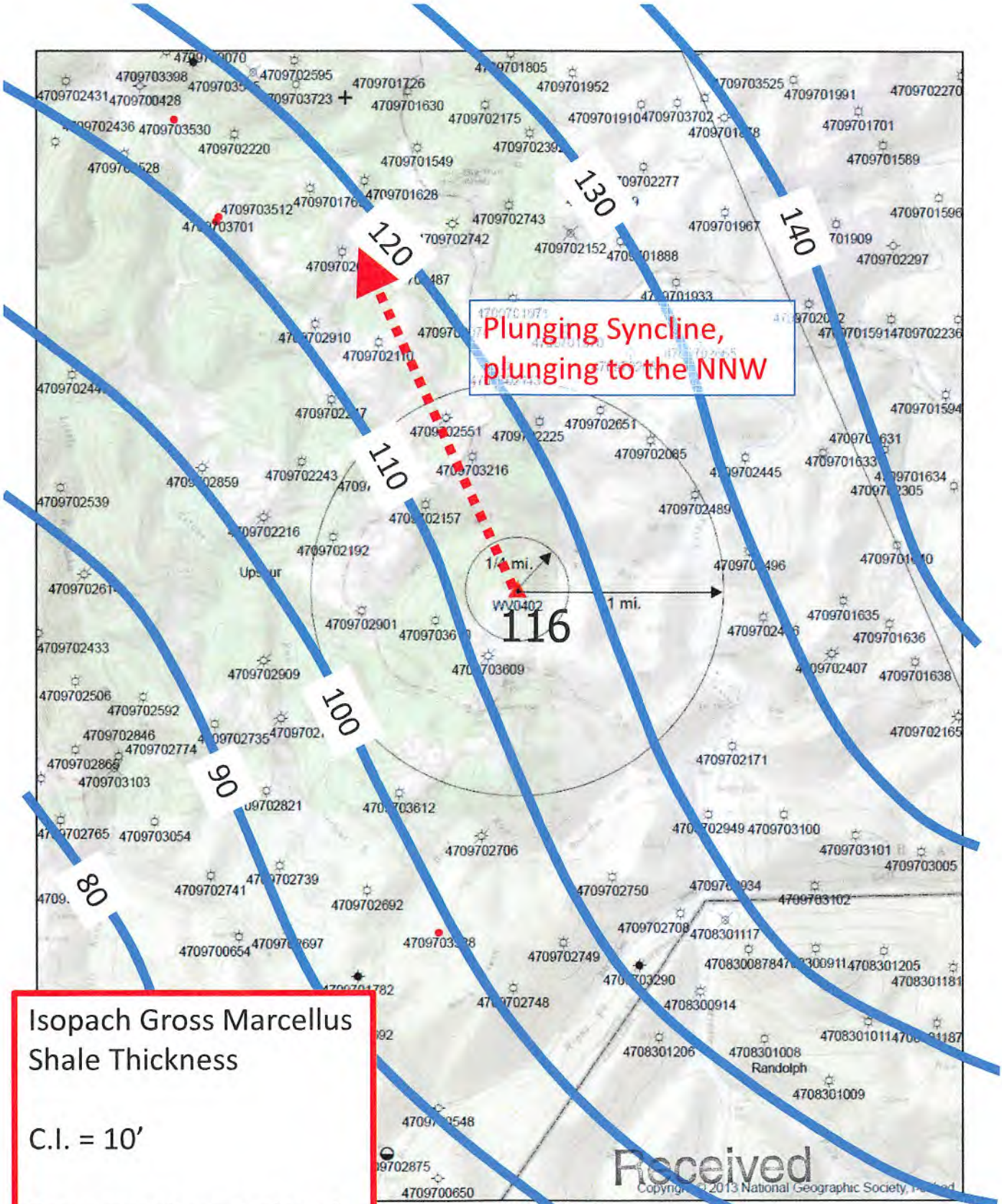
Jamie Andrews
Land & Business Development
Mountain V Oil & Gas, Inc.
304.842.6320 ext. 107 (O)
304.203.7555 (C)





Haun #1 WV042
UIC 2D0973737

1 inch = 1,500 feet



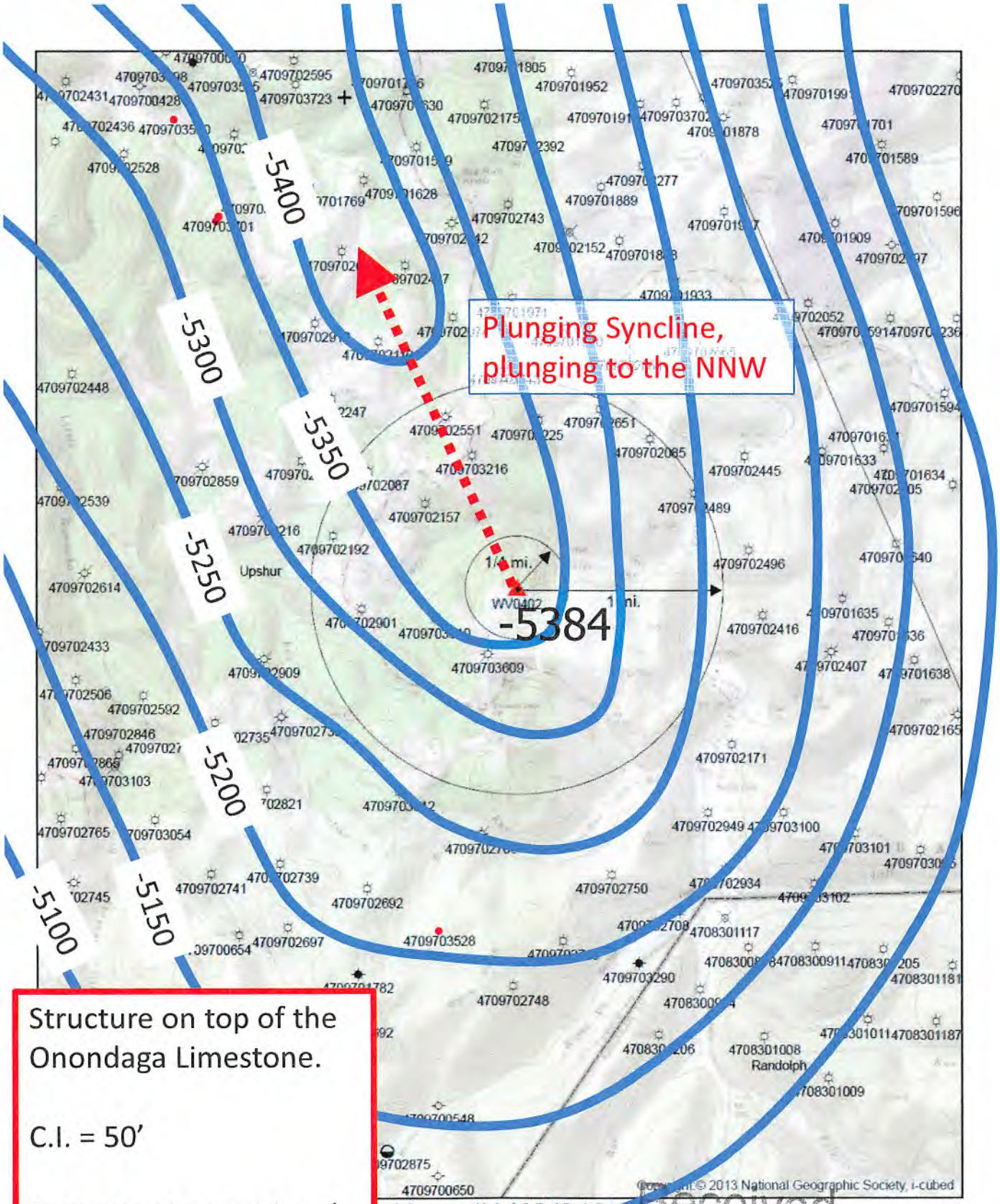
Isopach Gross Marcellus Shale Thickness

C.I. = 10'

From previous regional mapping by William Hayward, C.P.G.

Haun #1 WV042
UIC 2D0973737

1 inch = 3,000 feet



Structure on top of the Onondaga Limestone.

C.I. = 50'

From previous regional mapping by William Hayward, C.P.G.

Haun #1 WV042
UIC 2D0973737

1 inch = 3,000 feet

Weatherford®

Photo Density
Compensated Neutron
Array Induction

COMPANY	Mountain V Oil and Gas Incorporated
WELL	Haun # 1 WV0402
FIELD	Banks District
PROVINCE/COUNTY	Upshur County
COUNTRY/STATE	U.S.A / West Virginia
LOCATION	Rock Cave 7.5' Quadrangle
	Watershed : Trib of Alec Run

FIELD PRINT

SEC	TWP	RGE	Other Services	
			Temperature	Density Caliper
API Number			Gamma Ray	Gamma Ray
Permit Number 47-097-03737			Gamma Ray	Gas Detector

Permanent Datum Ground Level, Elevation 2368 feet
Log Measured From Ground Level above Permanent Datum
Drilling Measured From K.B.10 ft.

Elevations:	feet
KB	2378.00
DF	2378.00
GL	2368.00

Date	11-Aug-2010			
Run Number	1			
Depth Driller	7760.00	feet		
Depth Logger	7760.00	feet		
First Reading	7760.00	feet		
Last Reading	0.00	feet		
Casing Driller	2239.00	feet		
Casing Logger	2244.00	feet		
Bit Size	6.500	inches		
Hole Fluid Type	Dusted			
Density / Viscosity				
PH / Fluid Loss				
Sample Source				
Rm @ Measured Temp				
Rmf @ Measured Temp				
Rmc @ Measured Temp				
Source Rmf / Rmc				
Rm @ BHT				
Time Since Circulation	5 Hours			
Max Recorded Temp	153.00	deg F		
Equipment Name	Compact			
Equipment / Base	13036	Weston		
Recorded By	Frank Lattea			
Witnessed By	Mike Shaver		Luke Sands	
Field Ticket #	3524155		.	

BOREHOLE RECORD

Last Edited: 11-AUG-2010 22:24

Bit Size inches	Depth From feet	Depth To feet
6.500	2244.00	7760.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
	7.000	0.00	2244.00	17.00

REMARKS

Density Matrix was ran on 2.71 GG/CC from TD at 7760' to 2244' casing shoe
Gamma-neutron ran from casing shoe at 2244' to 0.0' ground level
Crew : Bryan West
Log was measured from ground level
Logging speed was ran at customers request
4.5 inch surface casing used to calculate annular hole volume.
Filtrate density was ran on 1.0 GM/CC.
Fluid level : None
Longitude : 80-15-00
Latitude : 38-47-30
Temperature and gas detector were recorded on inhole pass

Temperature and gas detector were recorded on inhole pass
Inhole temperature was displayed on main log section as requested by customer
Main log spliced at 7000' due to second trip in well
Petty Drilling Rig # 1

Thank You For Using Weatherford Wireline Services

5 Inch Main Log

Depth Based Data - Merged File — Plotted on 11-JUL-2017 11:07
Filename: C:\Users\Dan\AppData\Local\Temp\Weatherford PreView\0\Main Data 2.mge — Merged on 11-AUG-2010 22:30
System Versions: Logged with 10.07.0791 Merged with 10.07.0791 Plotted with 13.03.7074

Depth in Feet

Timing Marks every 60.0 sec

Gamma Ray API: 0 100 200 / 200 300 400

Differential Temperature degrees F/sample: -0.10 0 0.10

Density Caliper inches: 5 10 15

Bit Size

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Upper Gas Detector: 1000 750 500 250 0 / 10000 7500 5000 2500 0

Lower Gas Detector: 0 250 500 750 1000 / 0 2500 5000 7500 10000

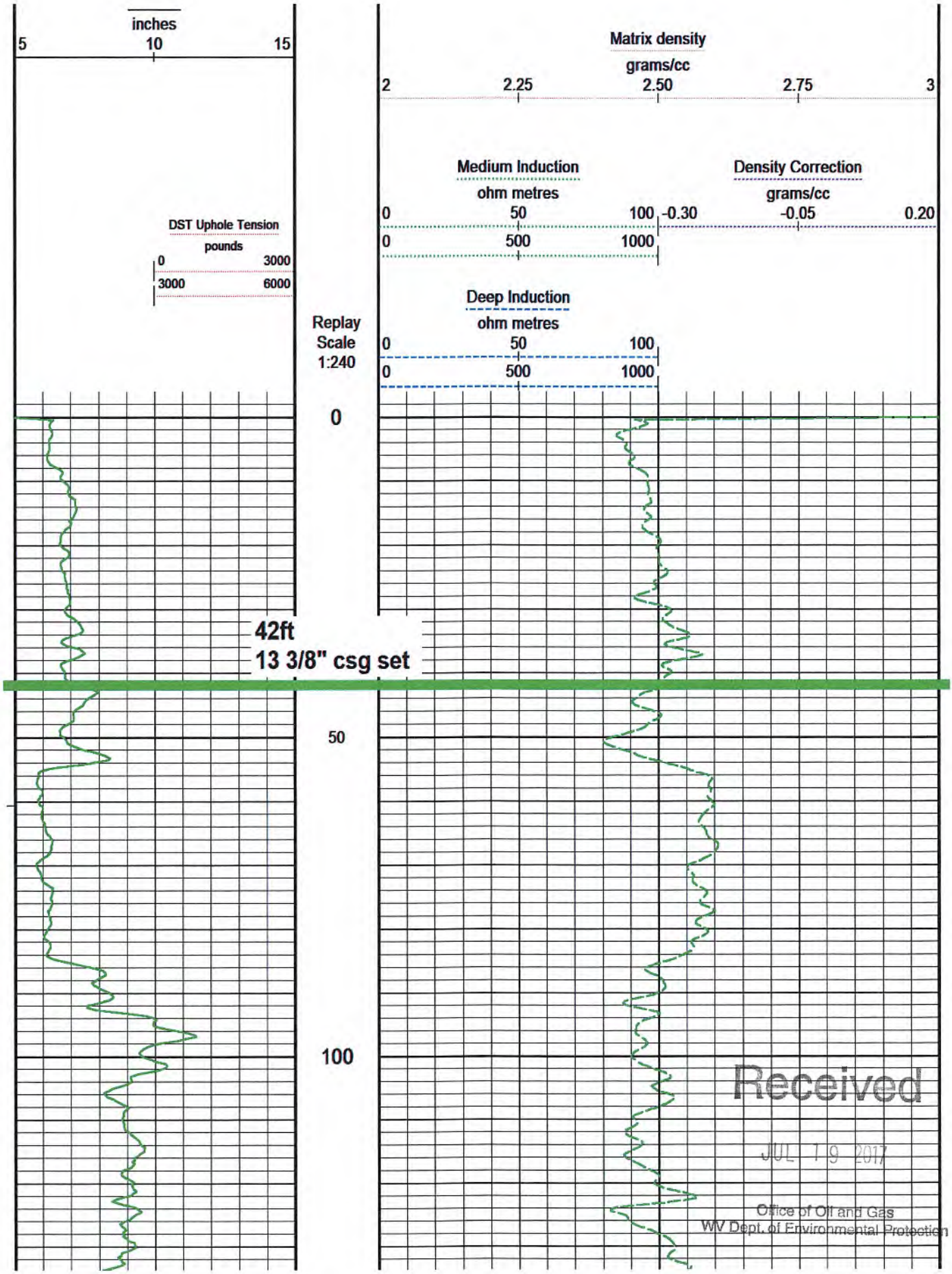
Borehole Temperature degrees F: 70 71.25 72.50 73.75 75

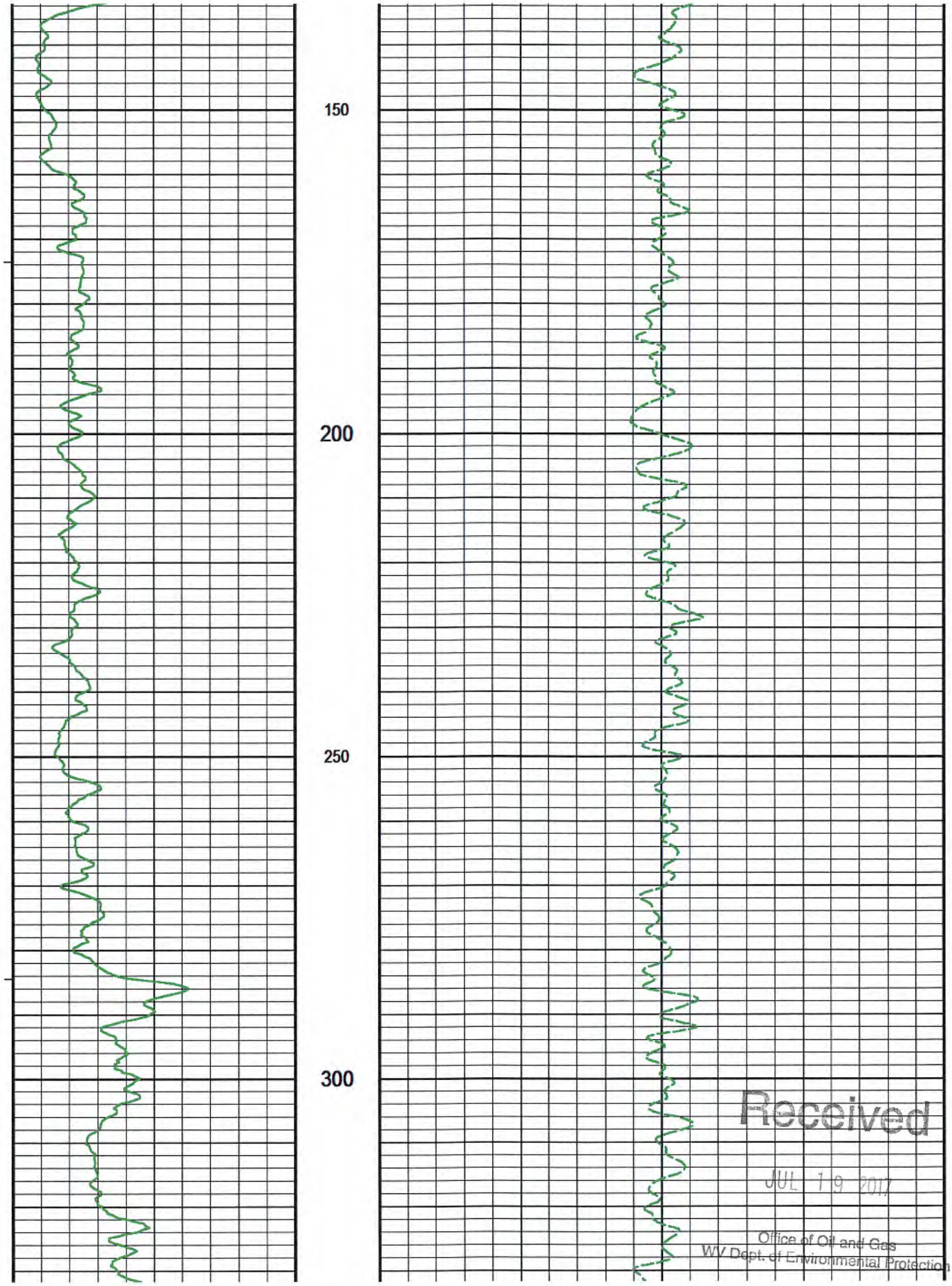
Limestone Neutron Por. percent: 30 20 10 0 -10

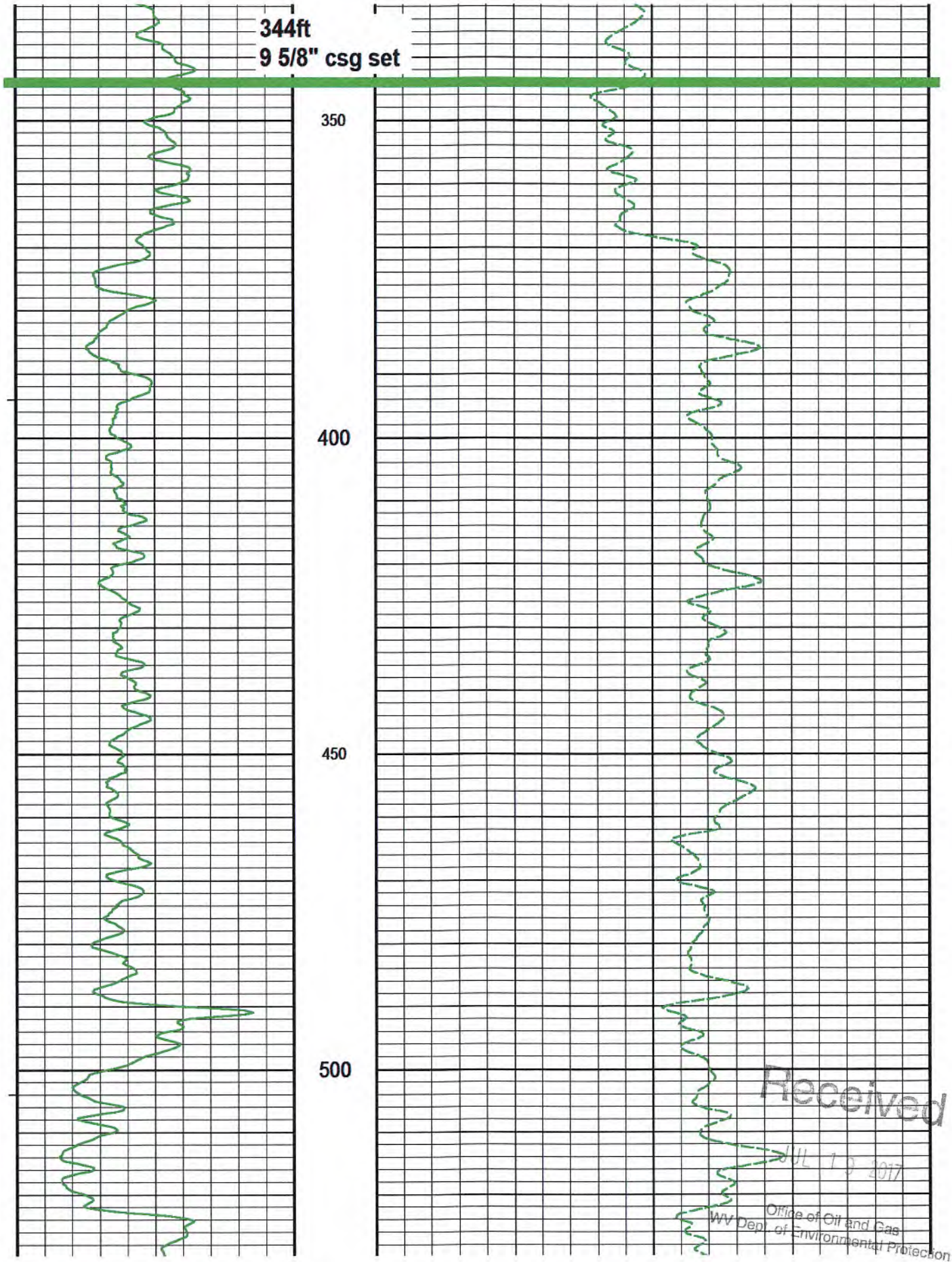
Compensated Density grams/cc: 2 2.25 2.50 2.75 3

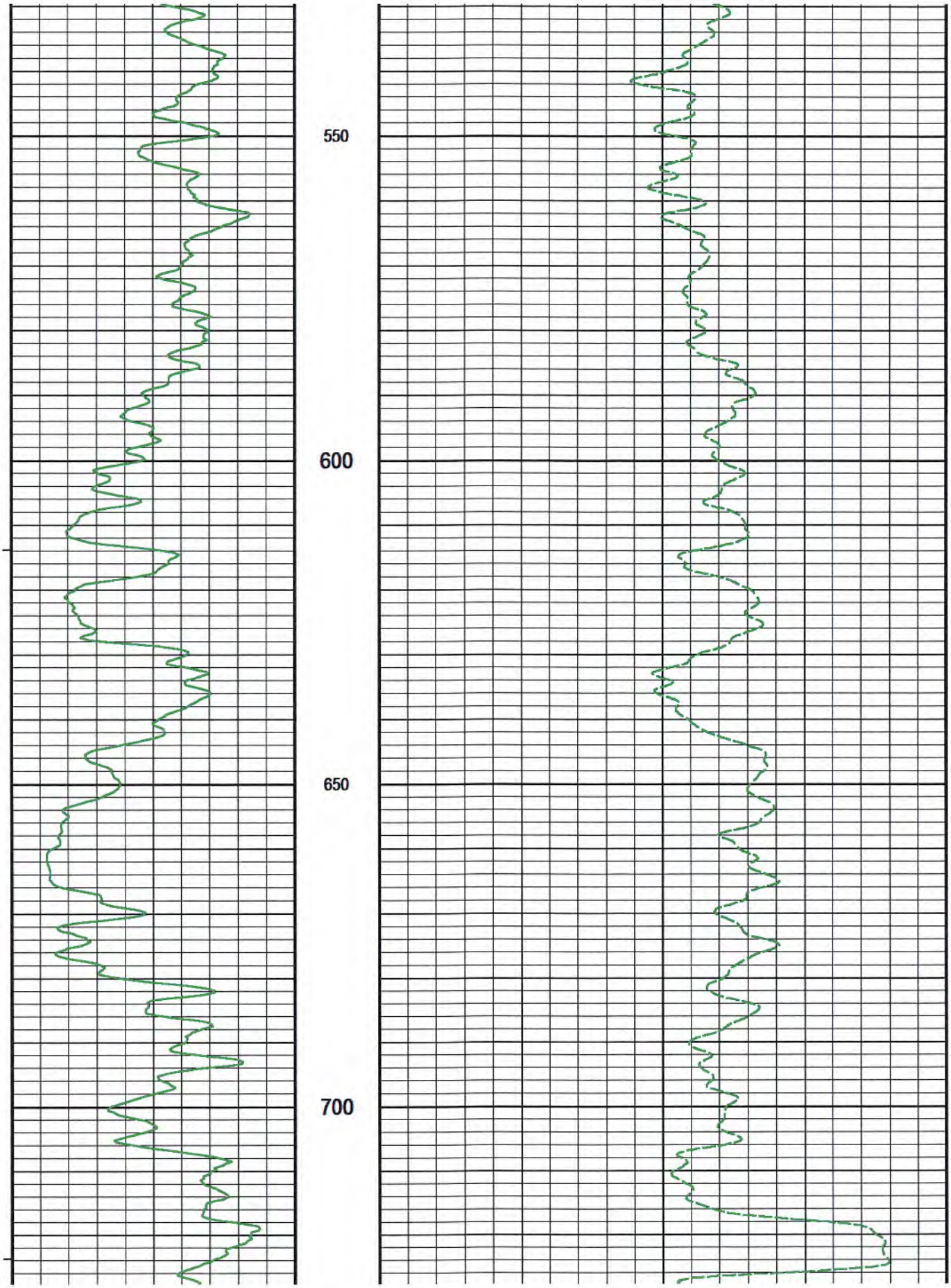
PE barns/electron: 0 2.50 5 7.50 10

Base Density Porosity percent: 30 20 10 0 -10





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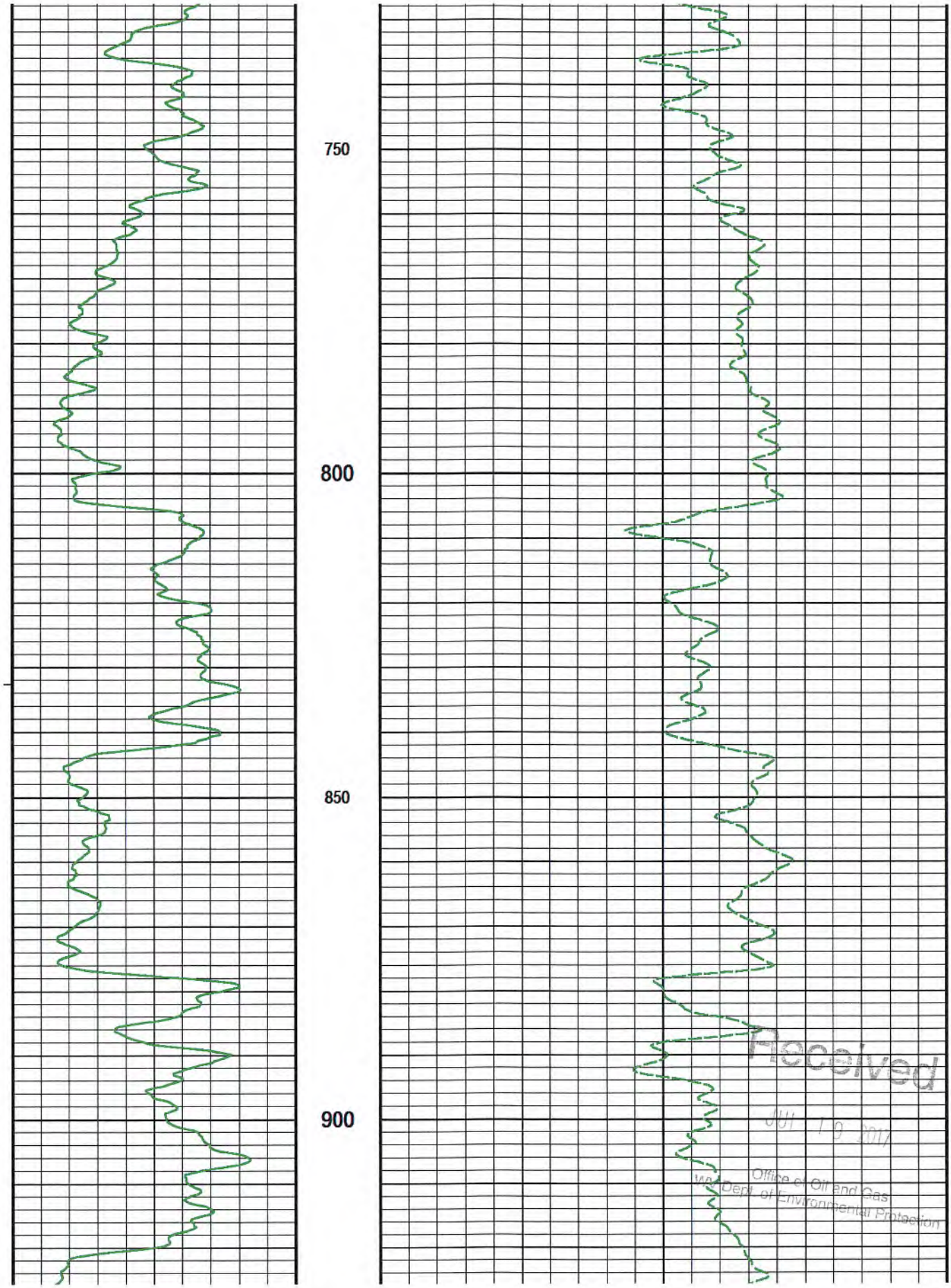
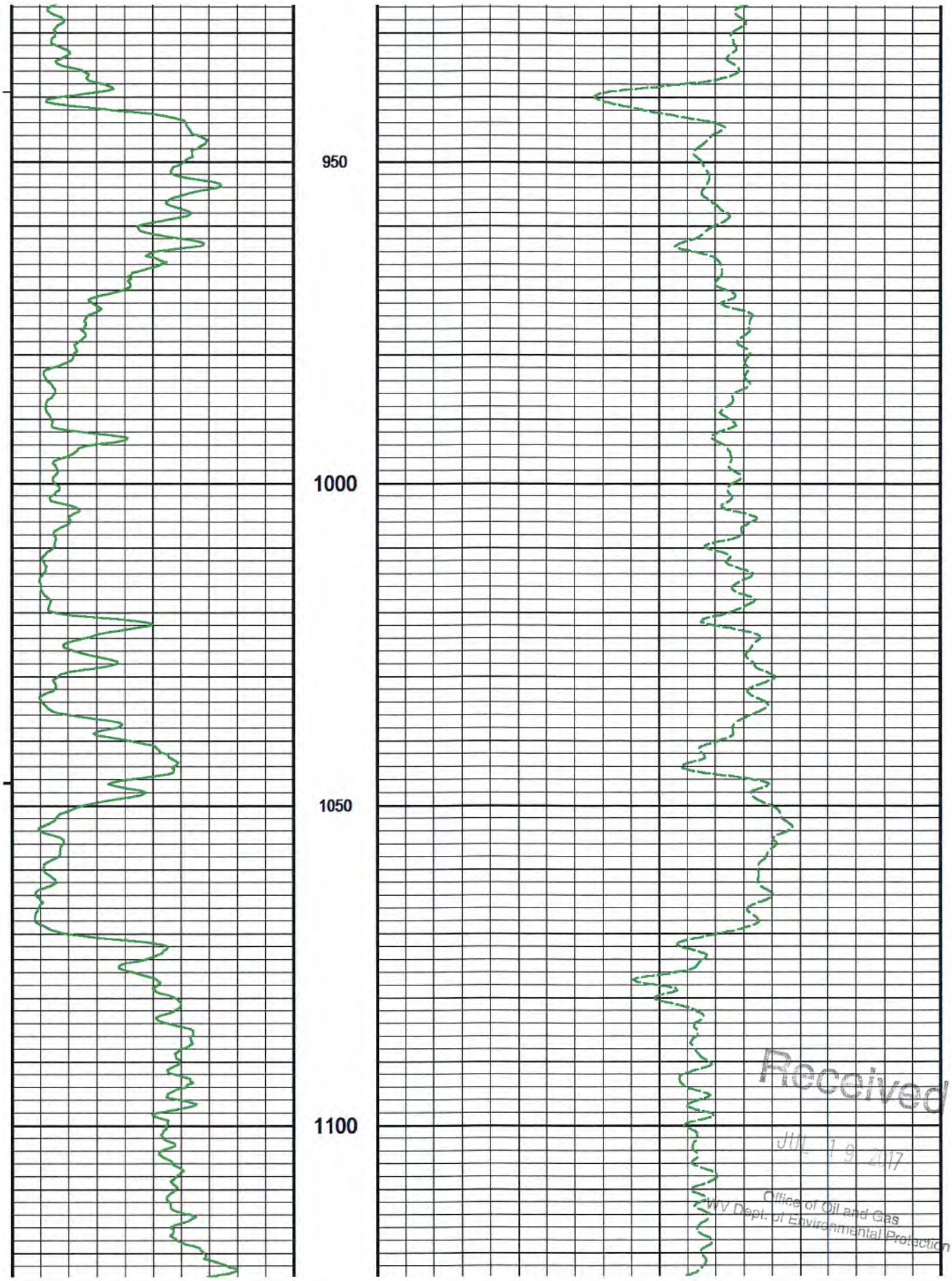
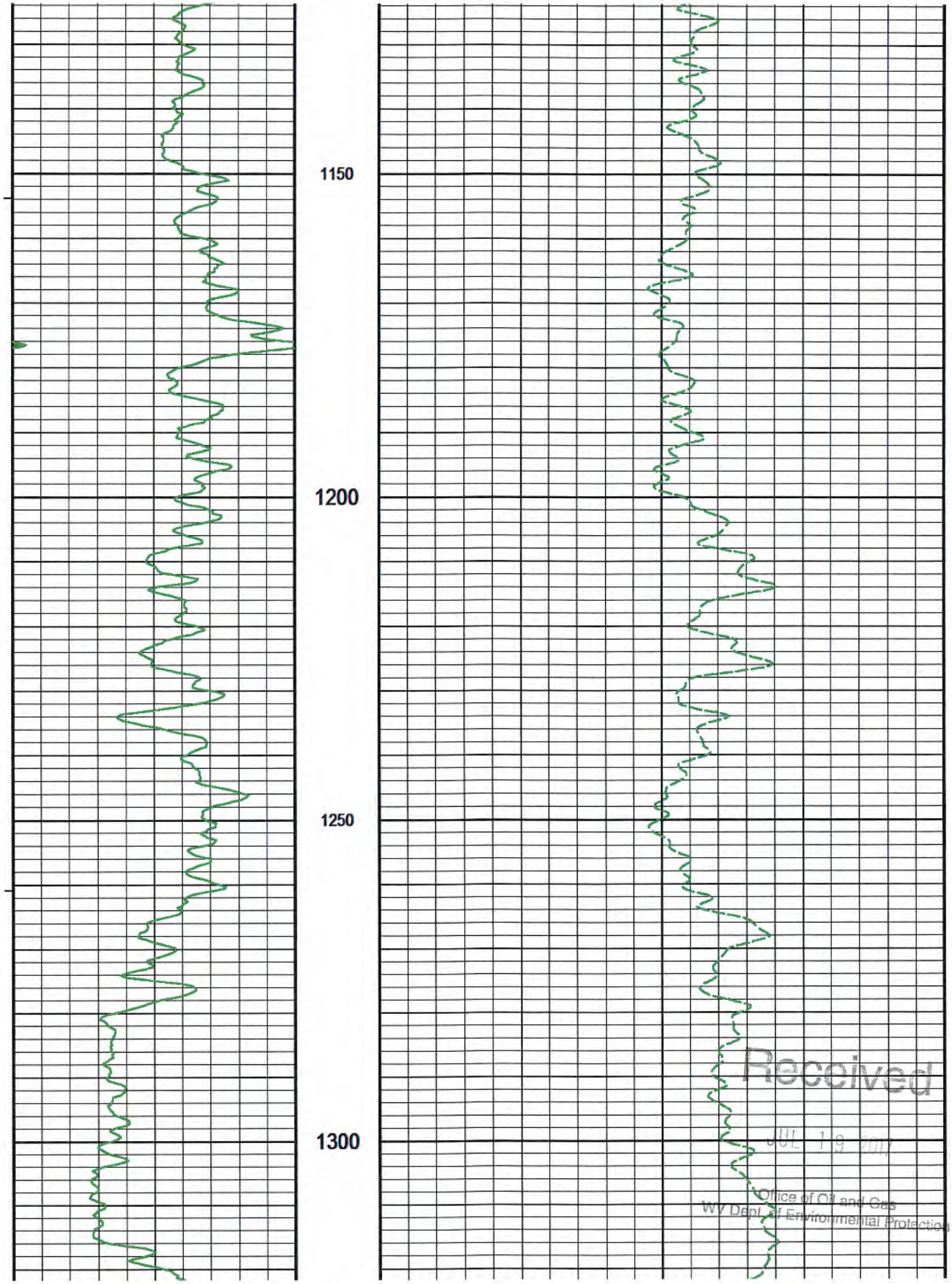
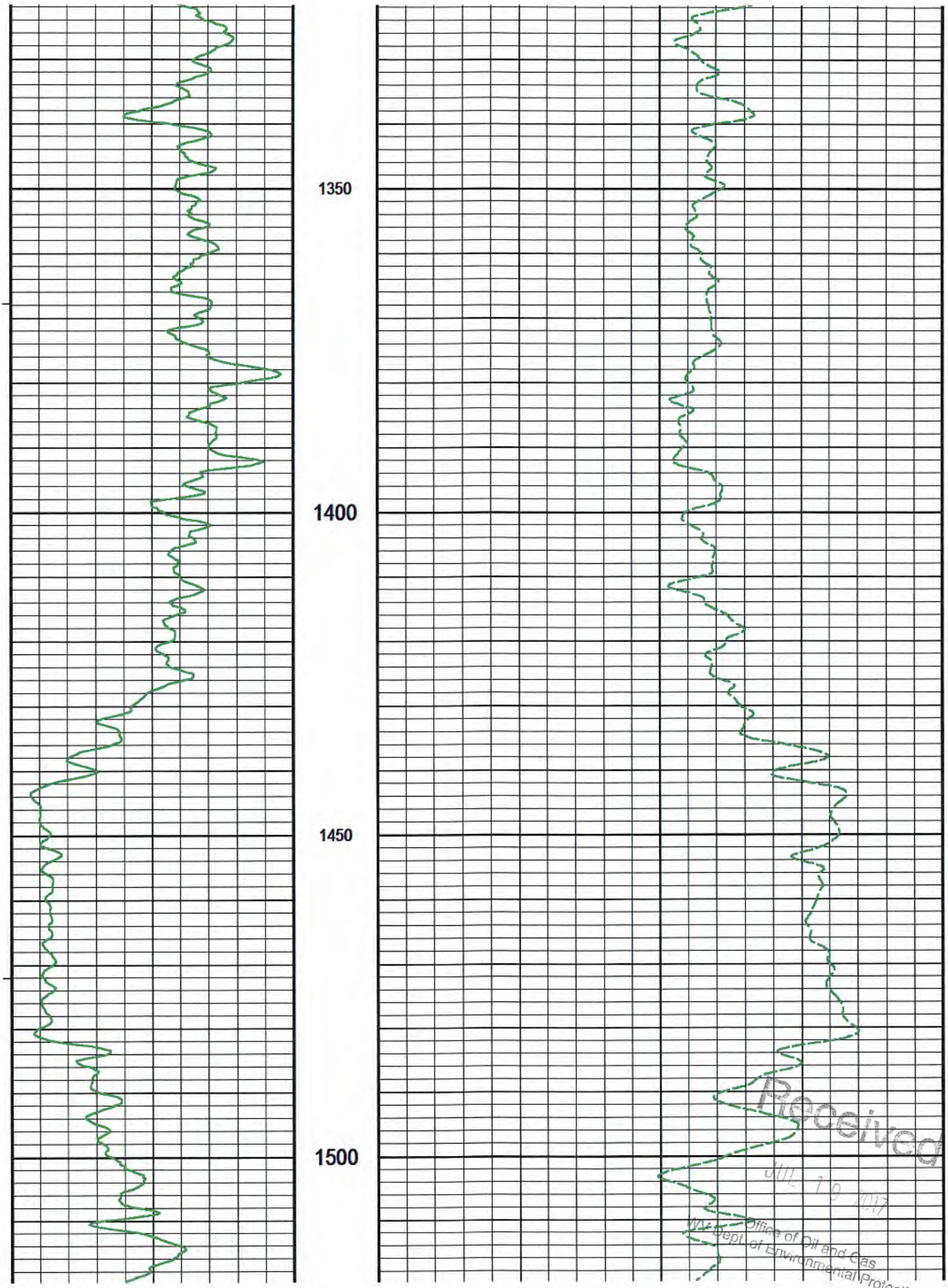
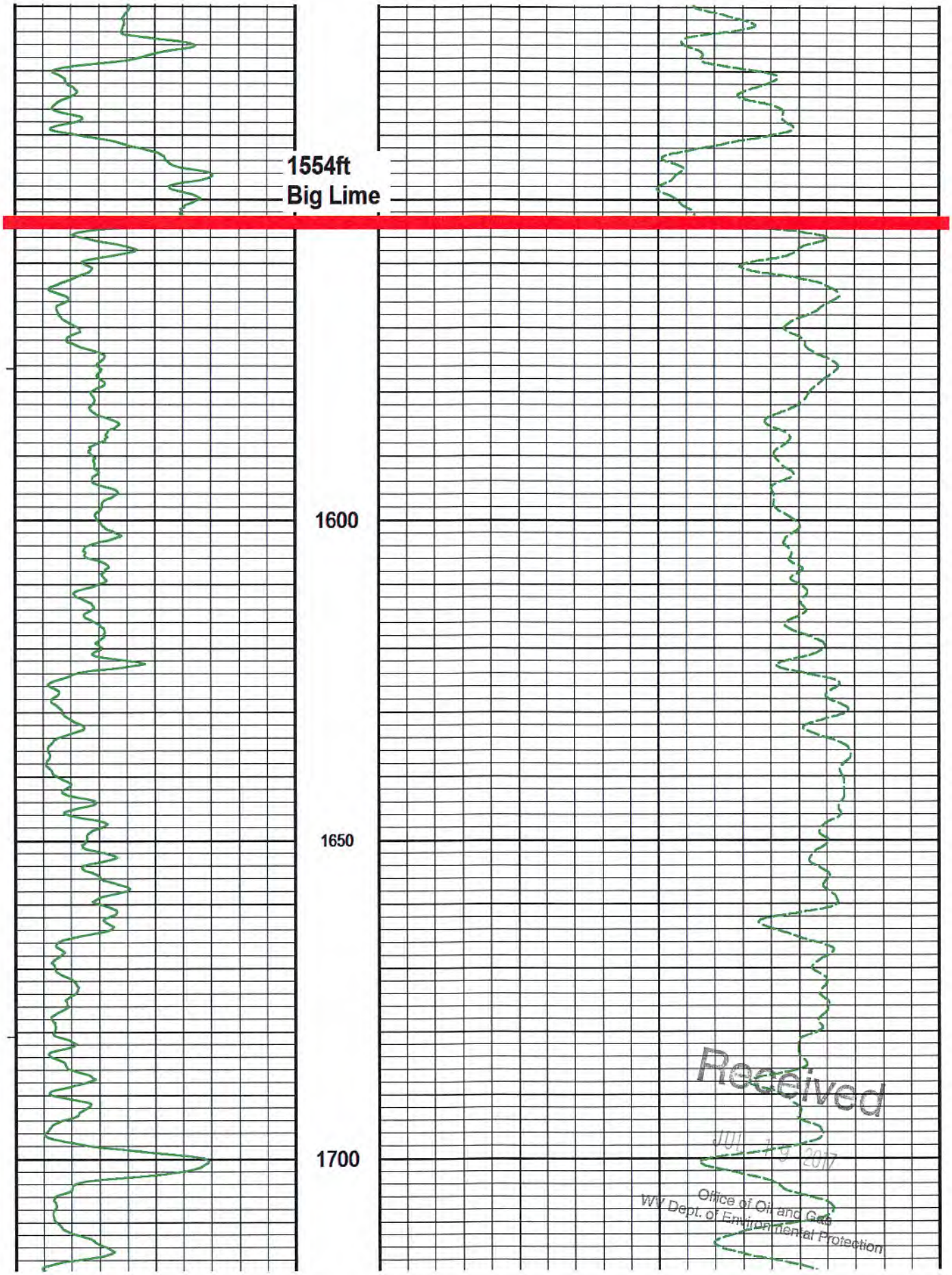
700

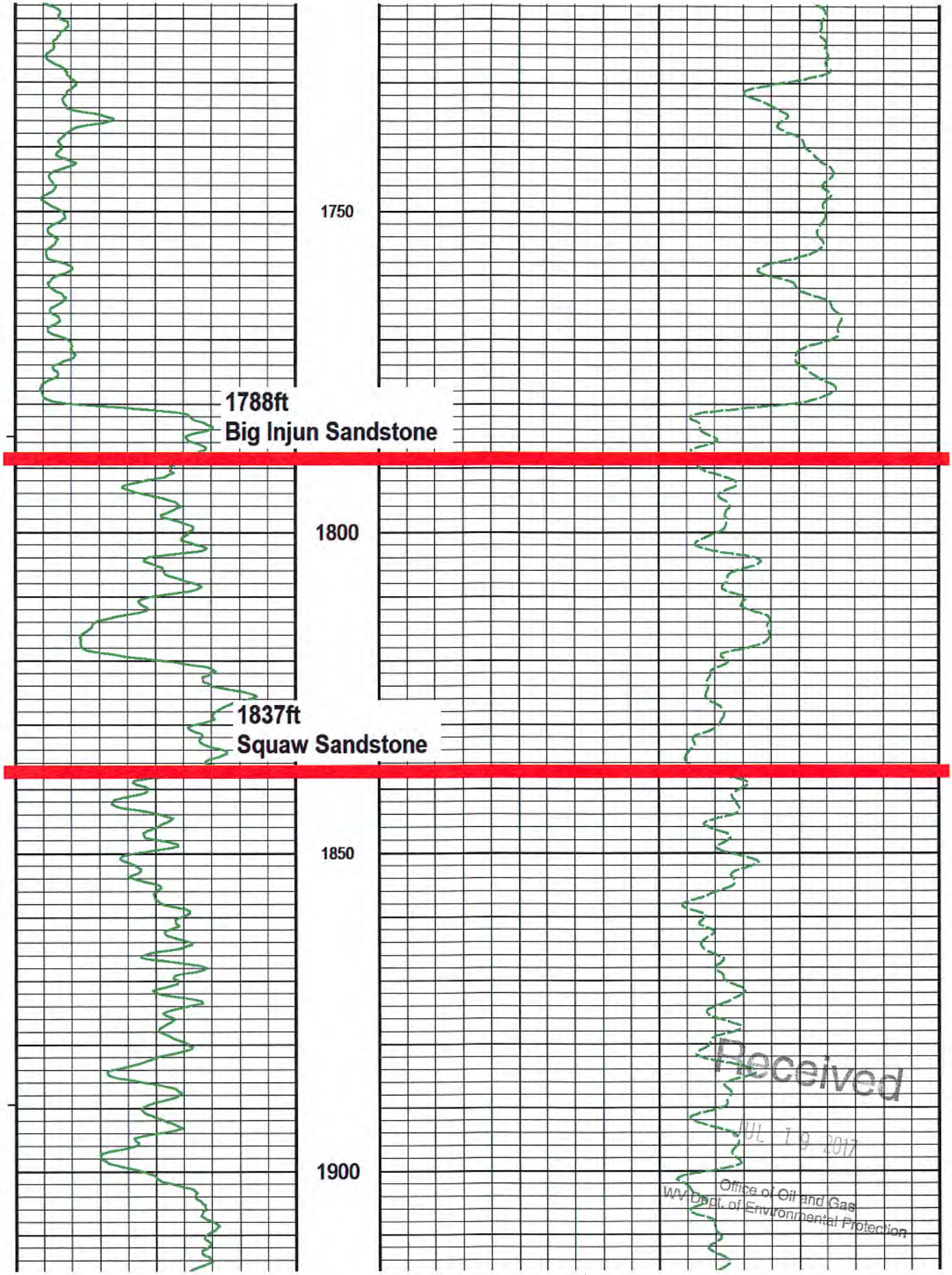


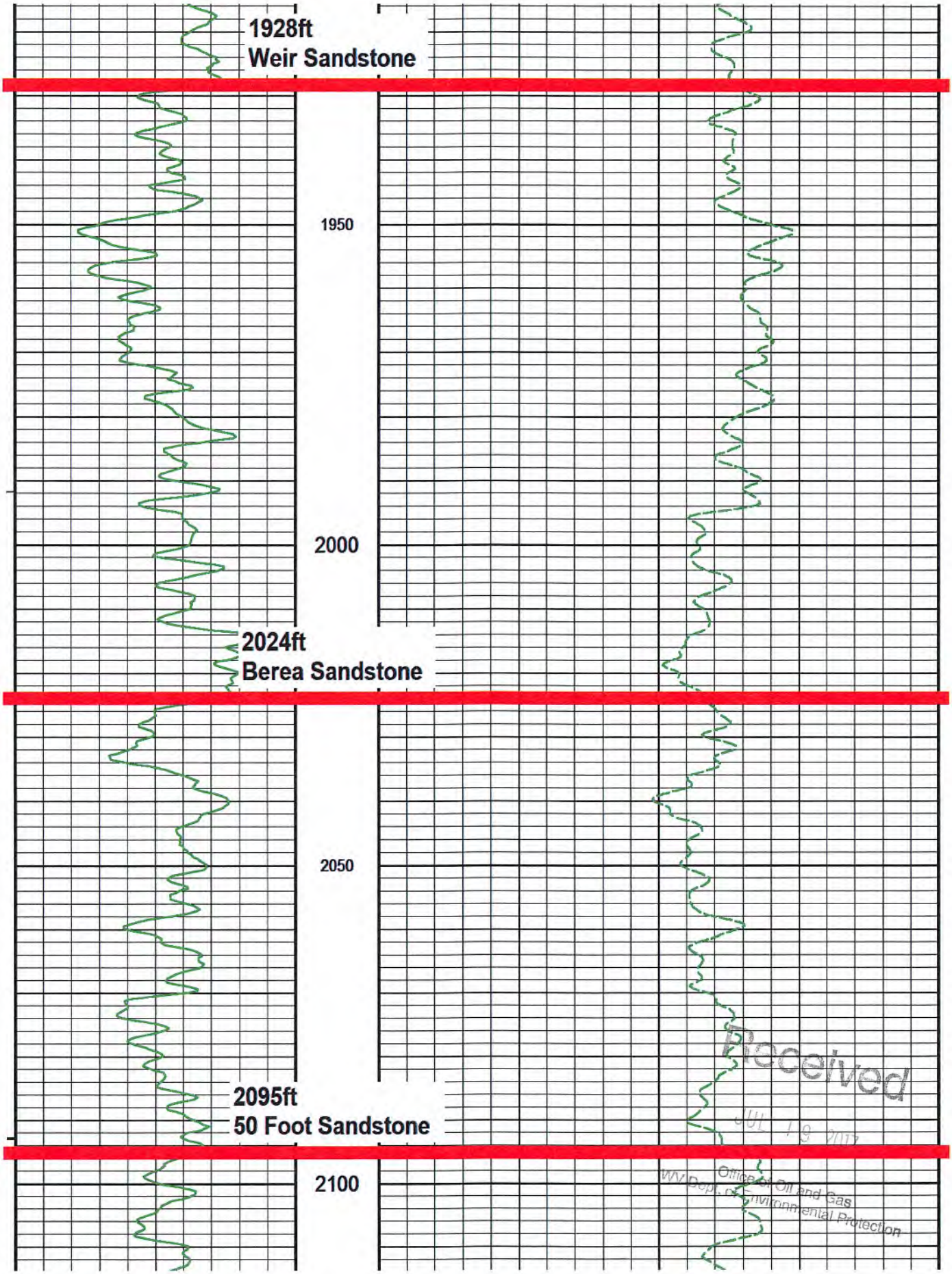


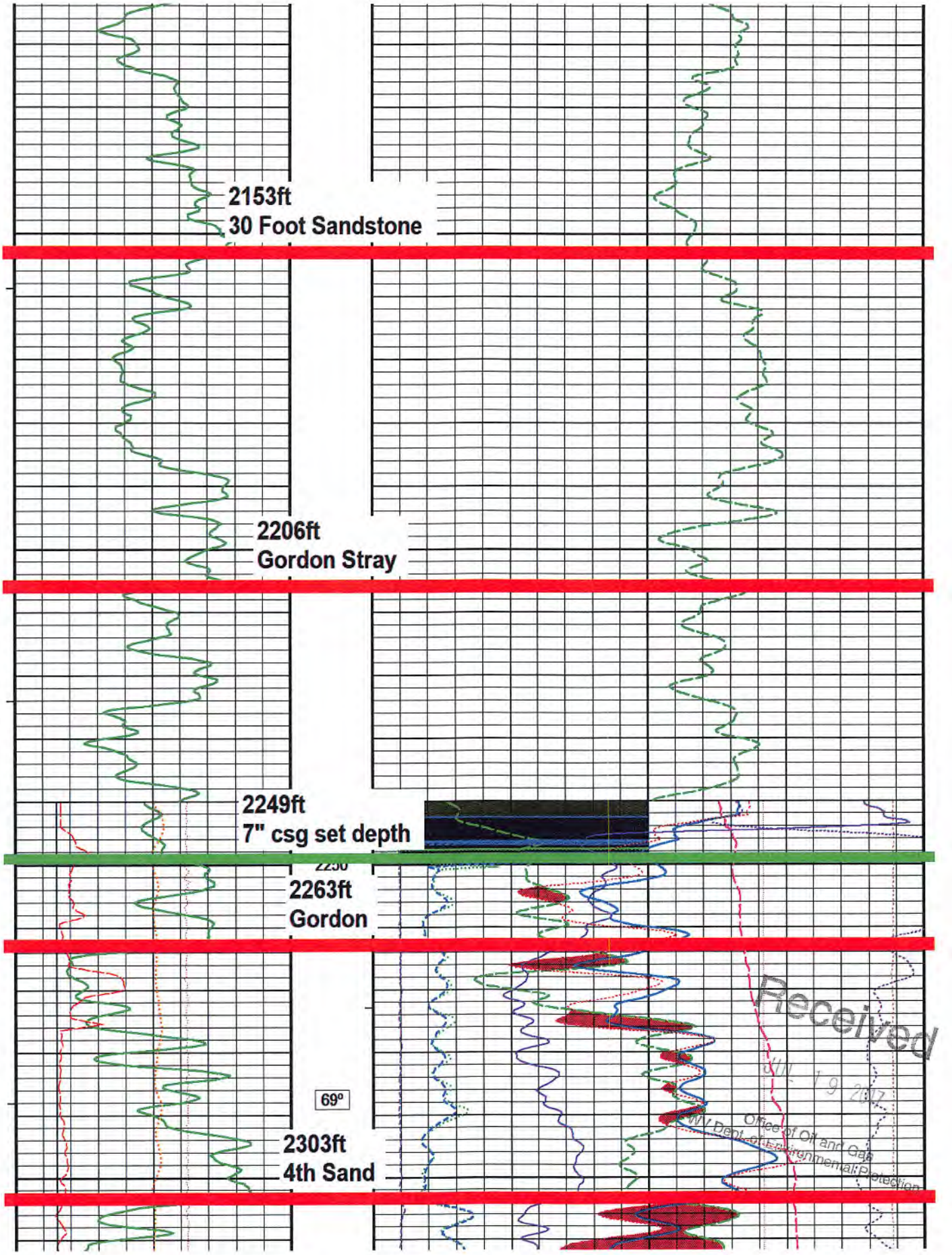


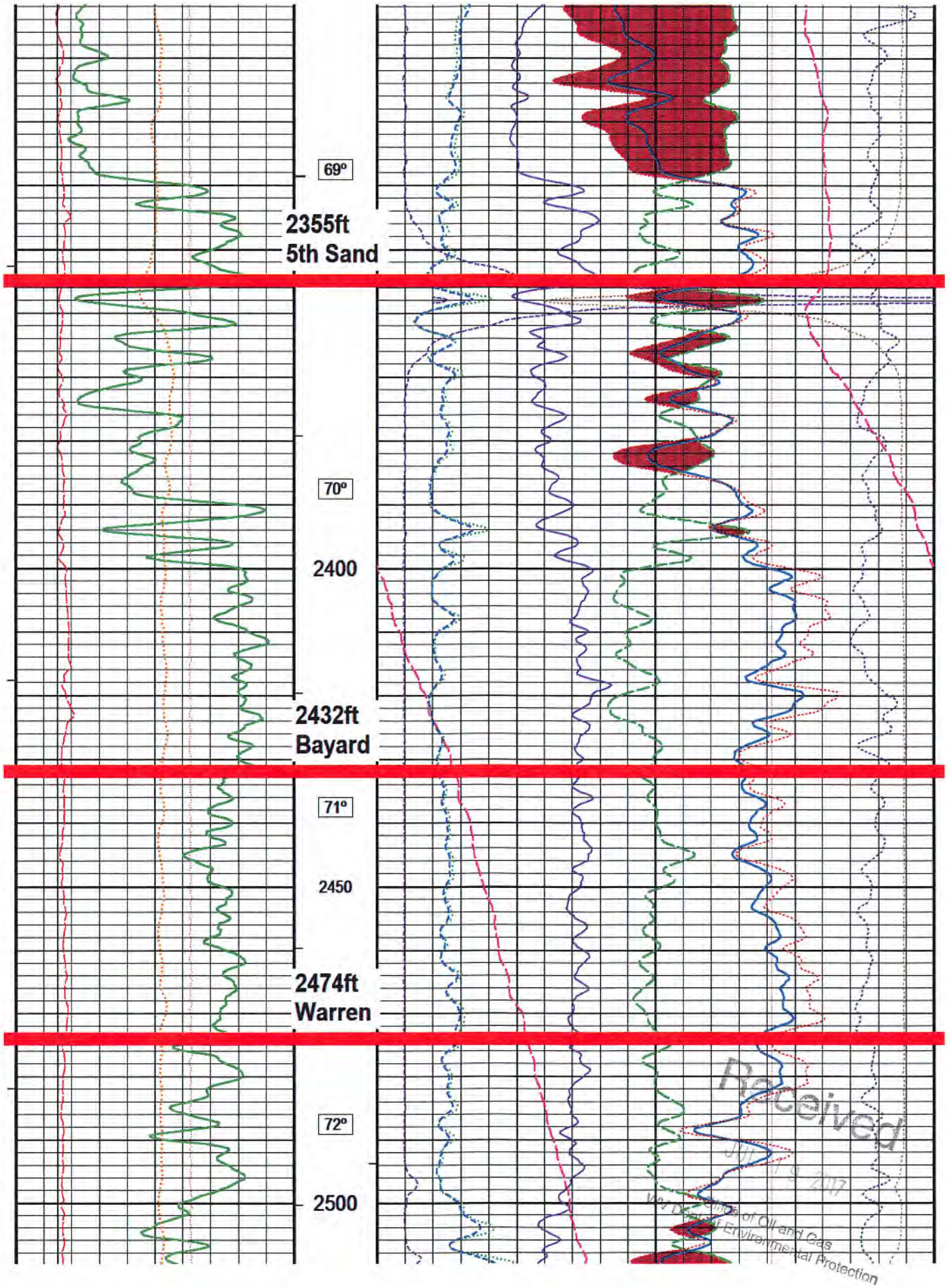


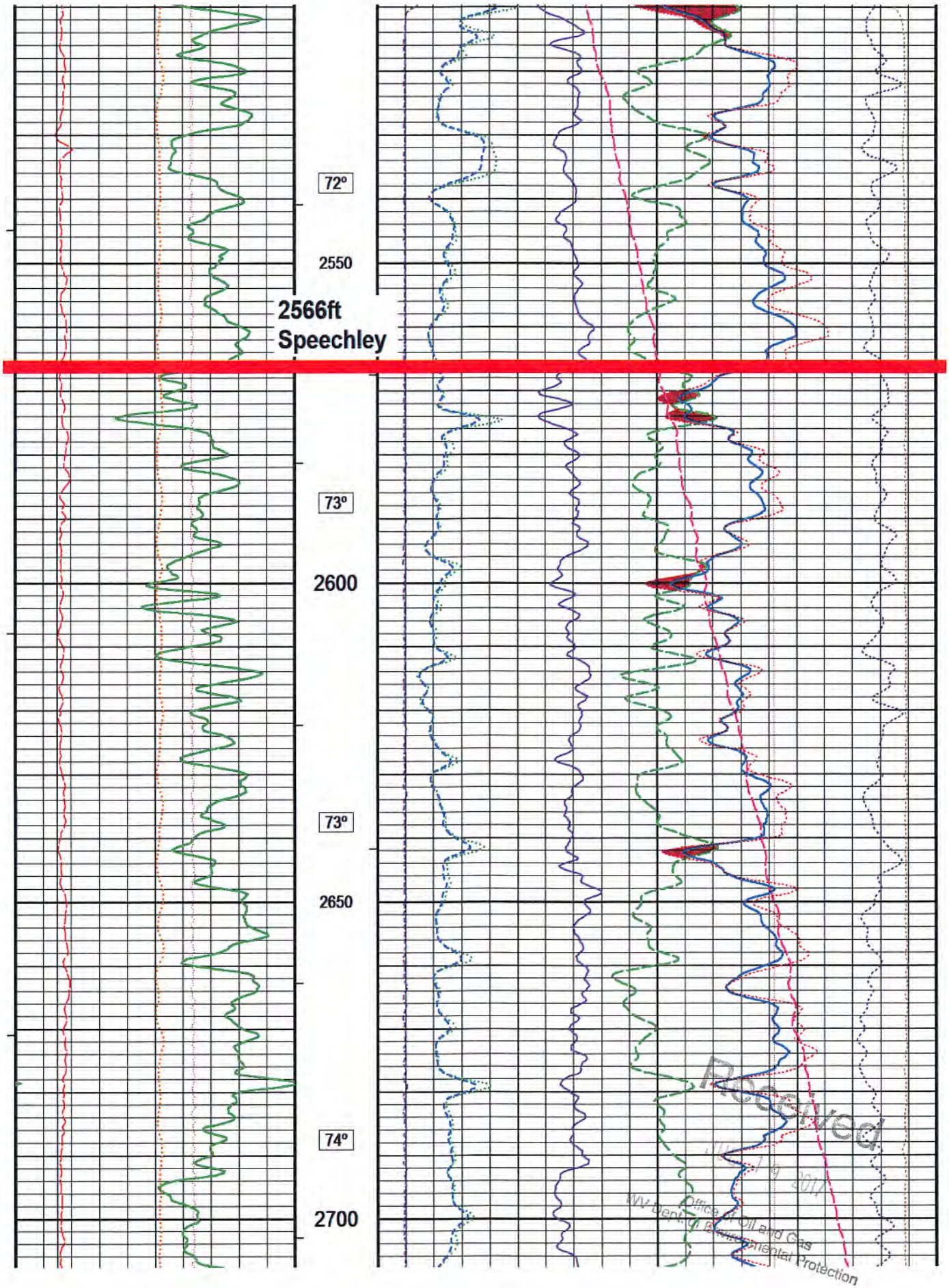


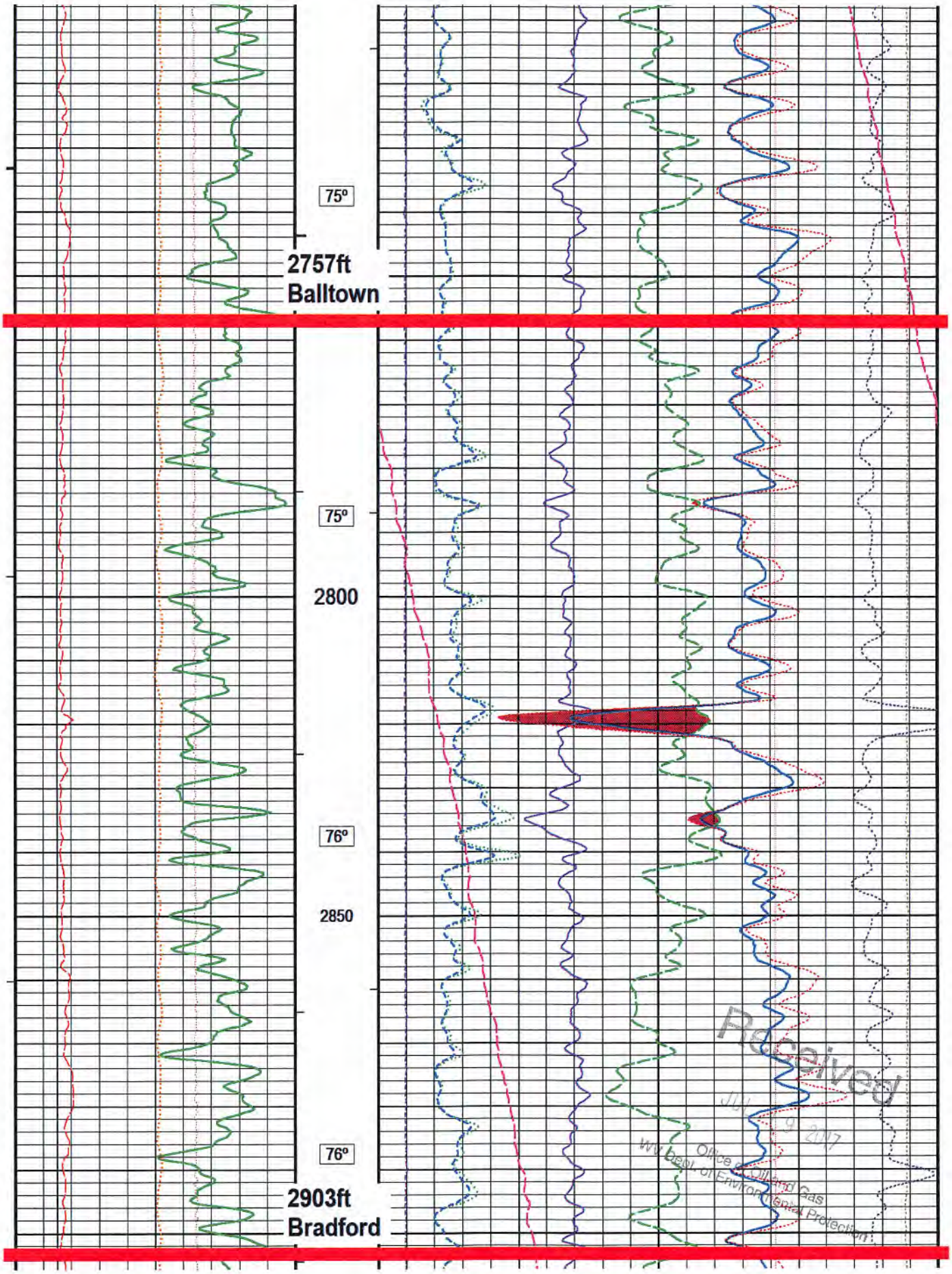


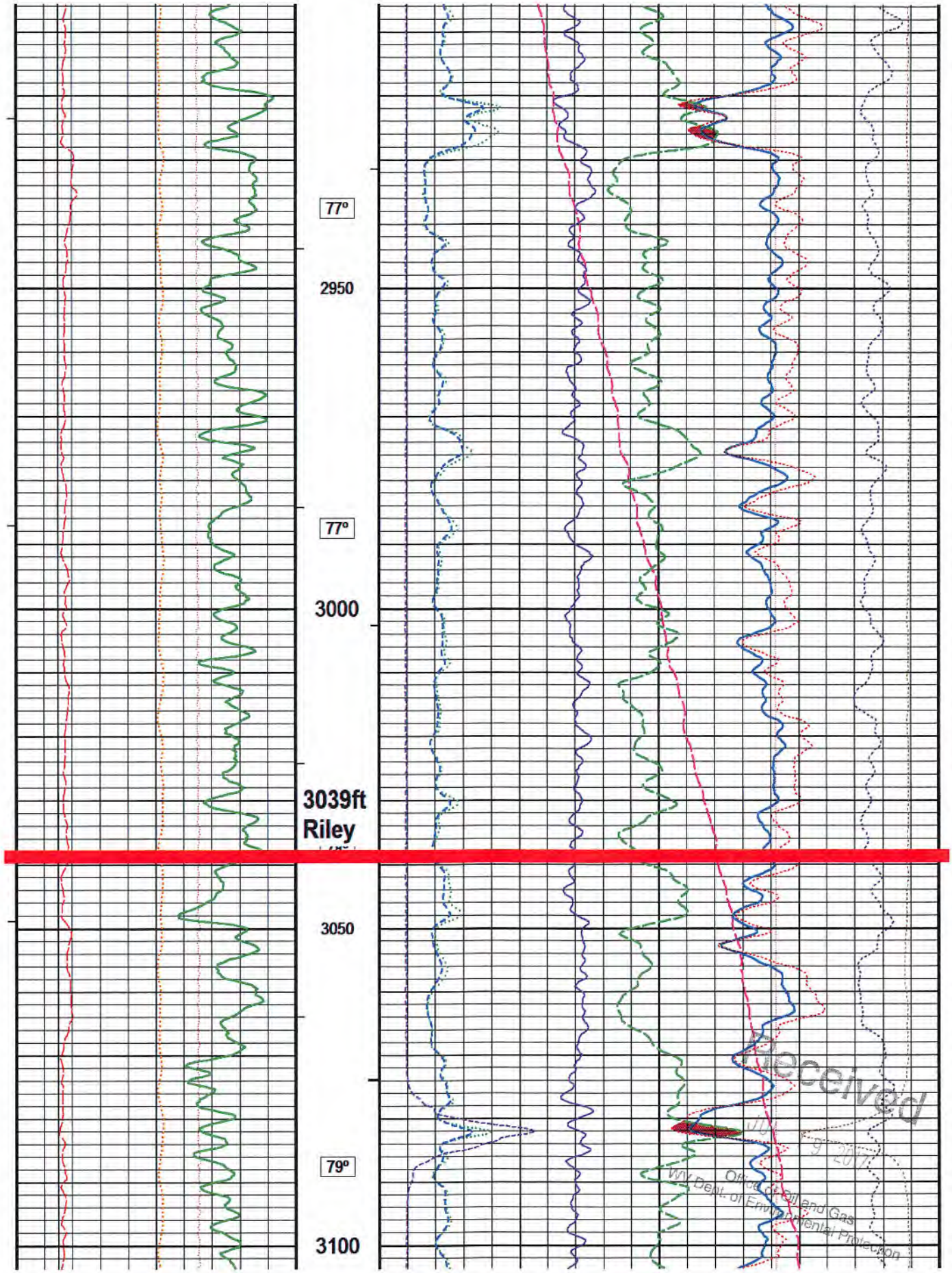


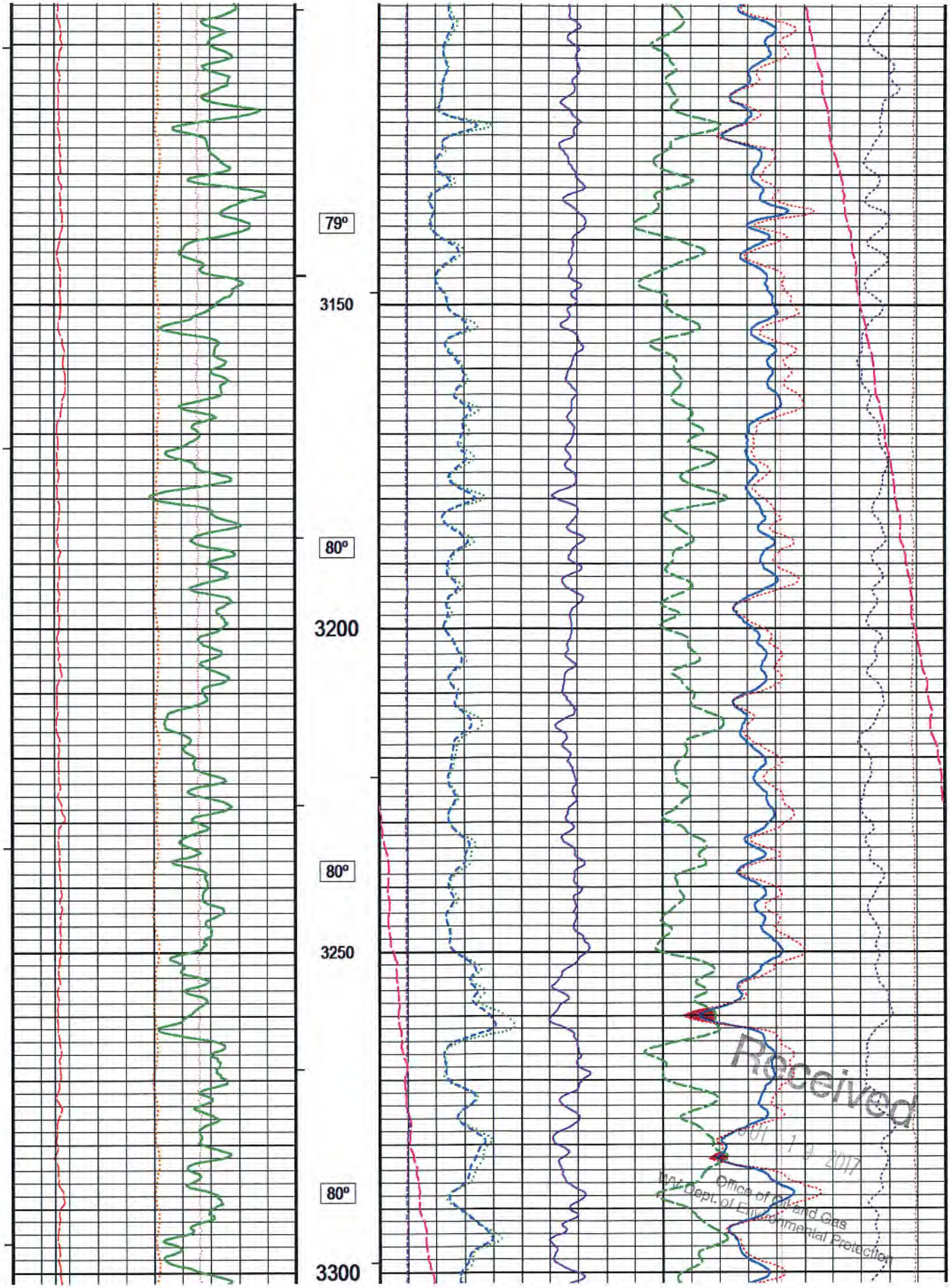


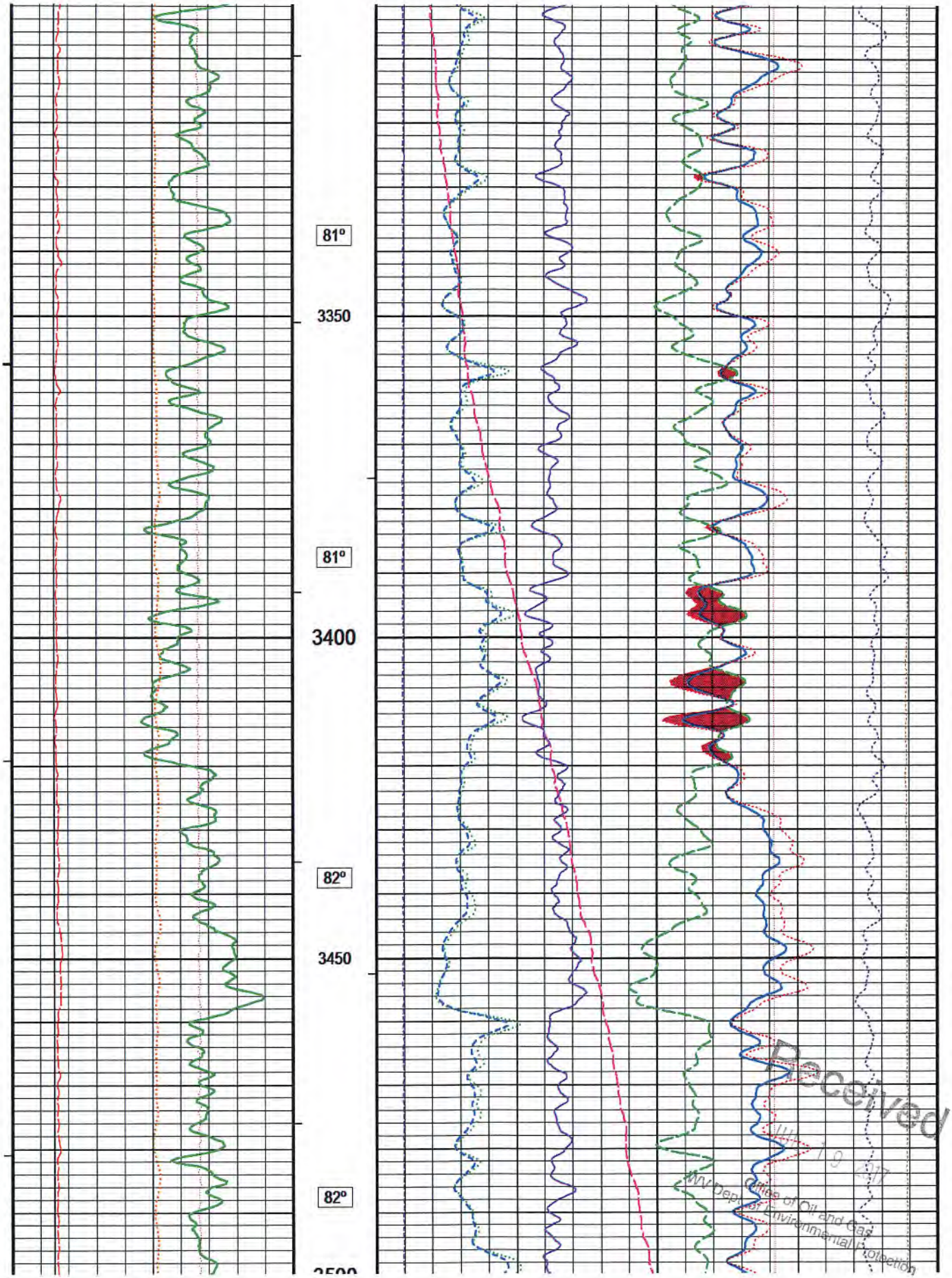


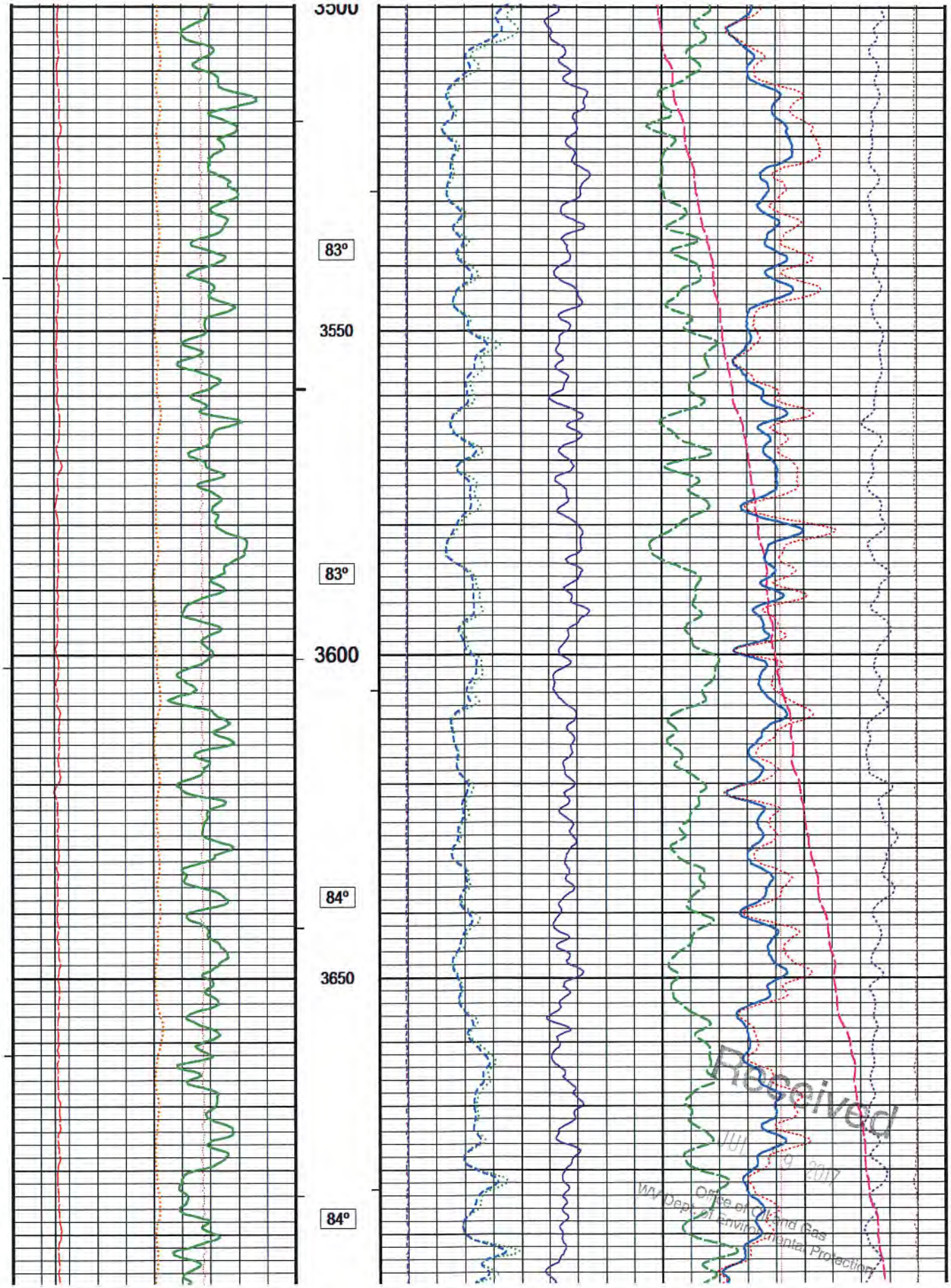


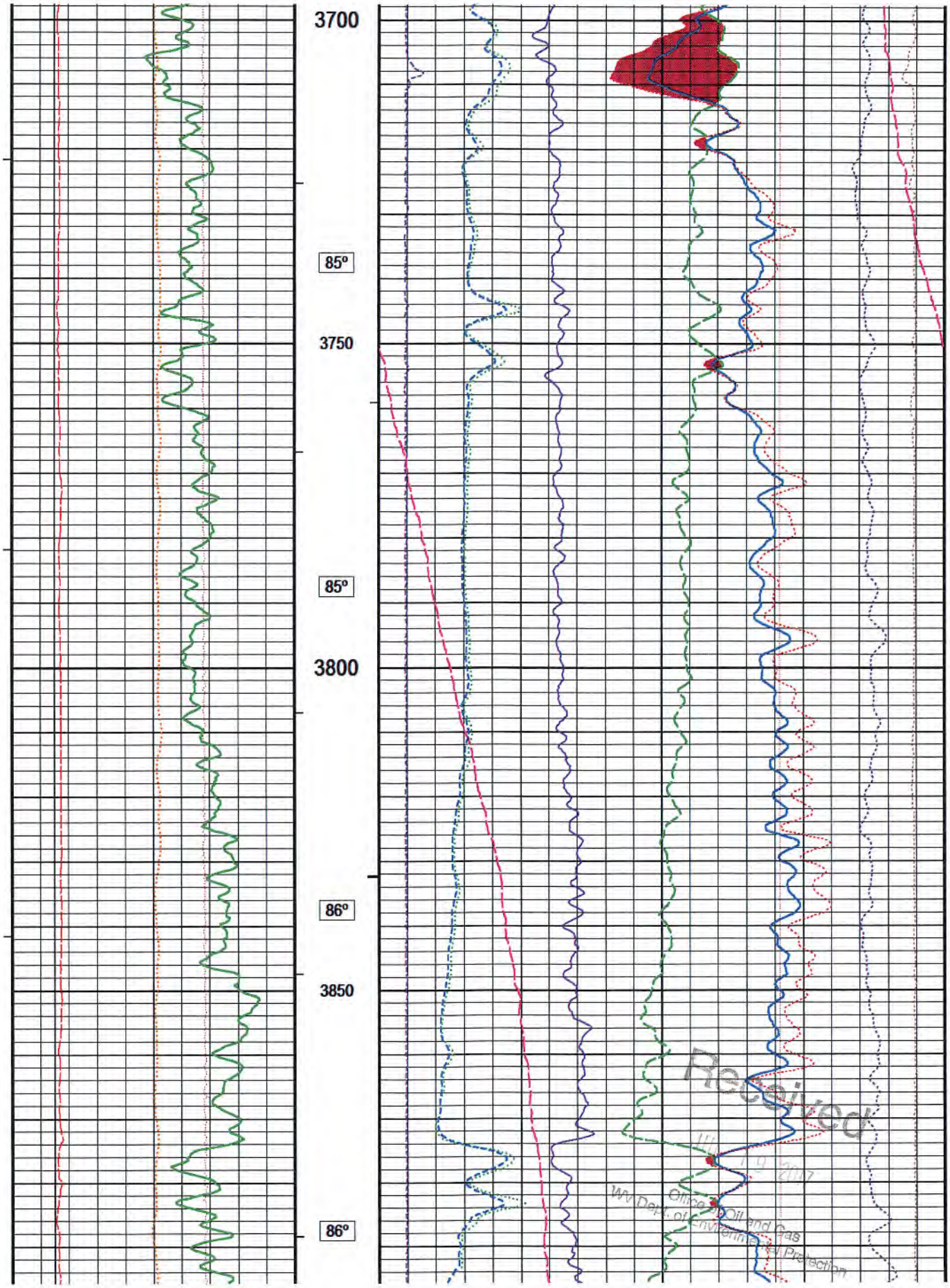


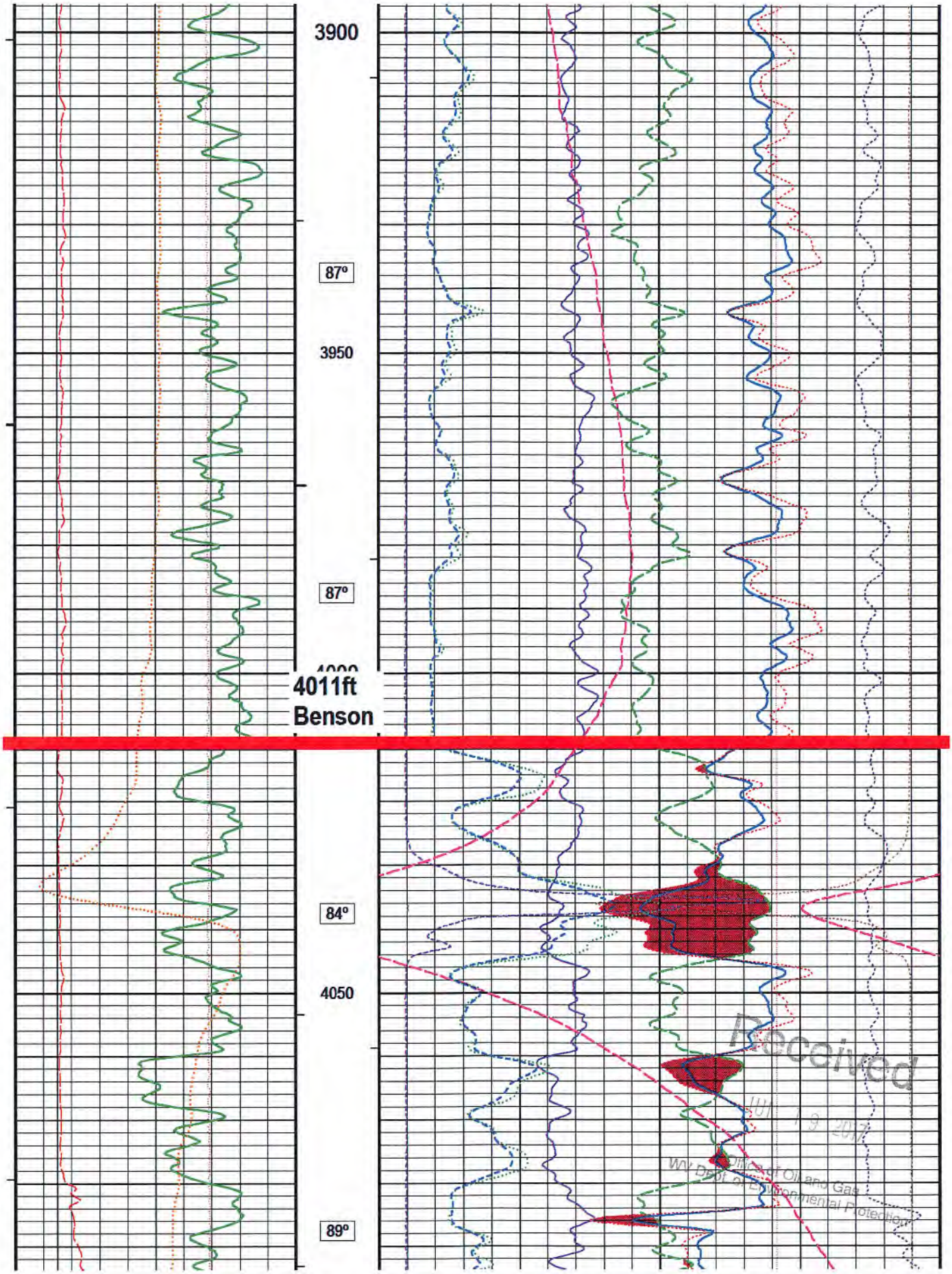


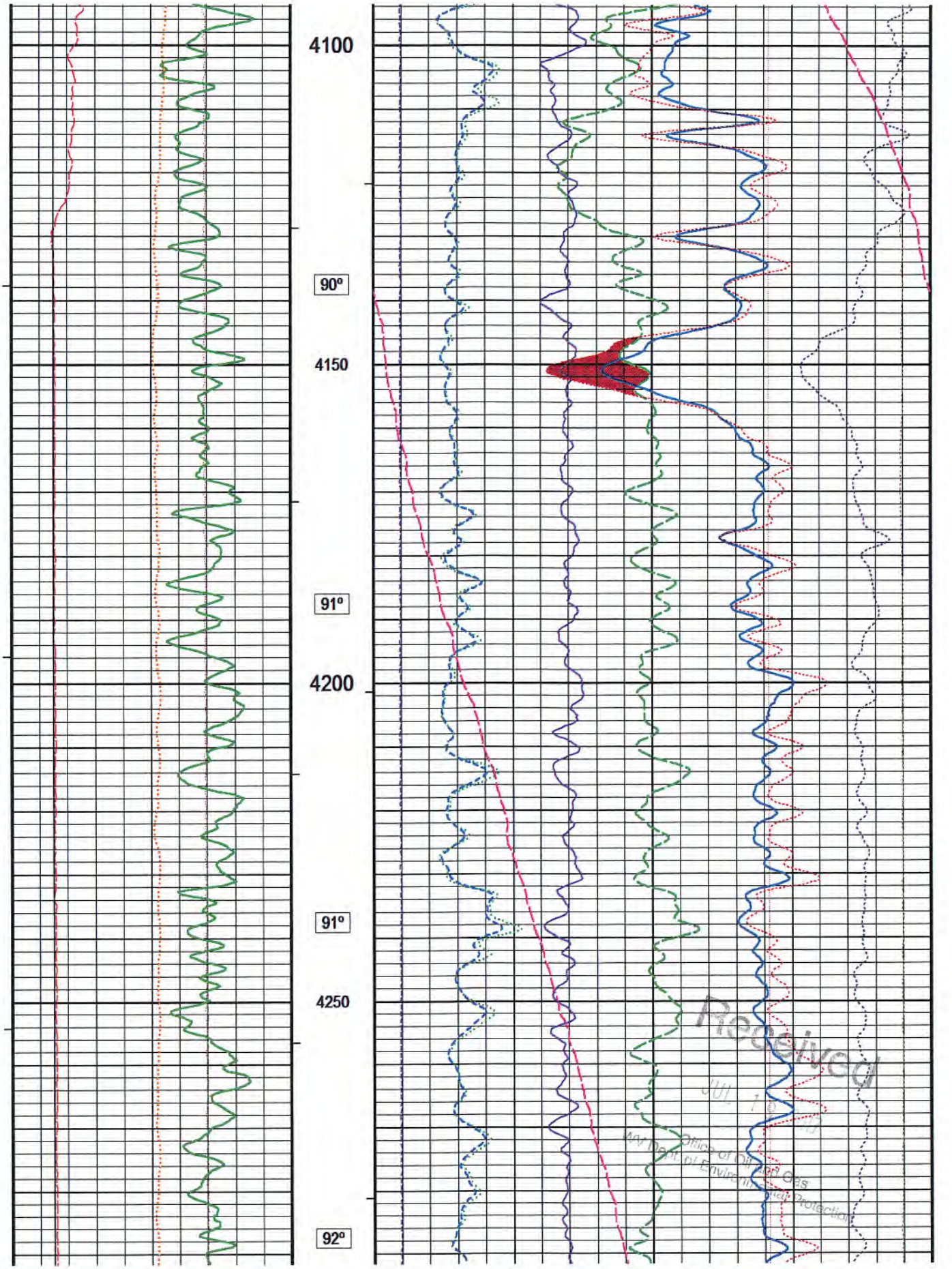


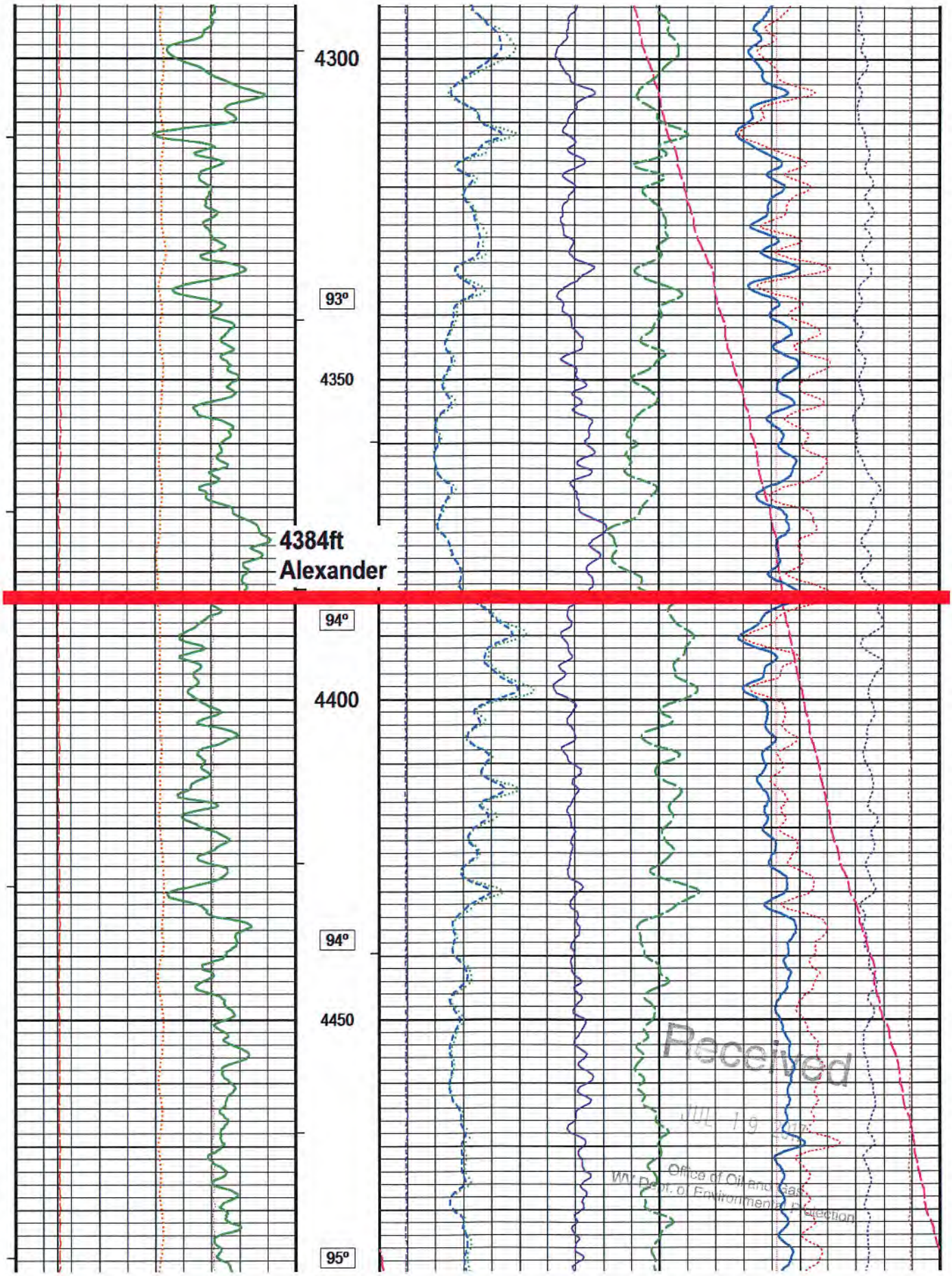


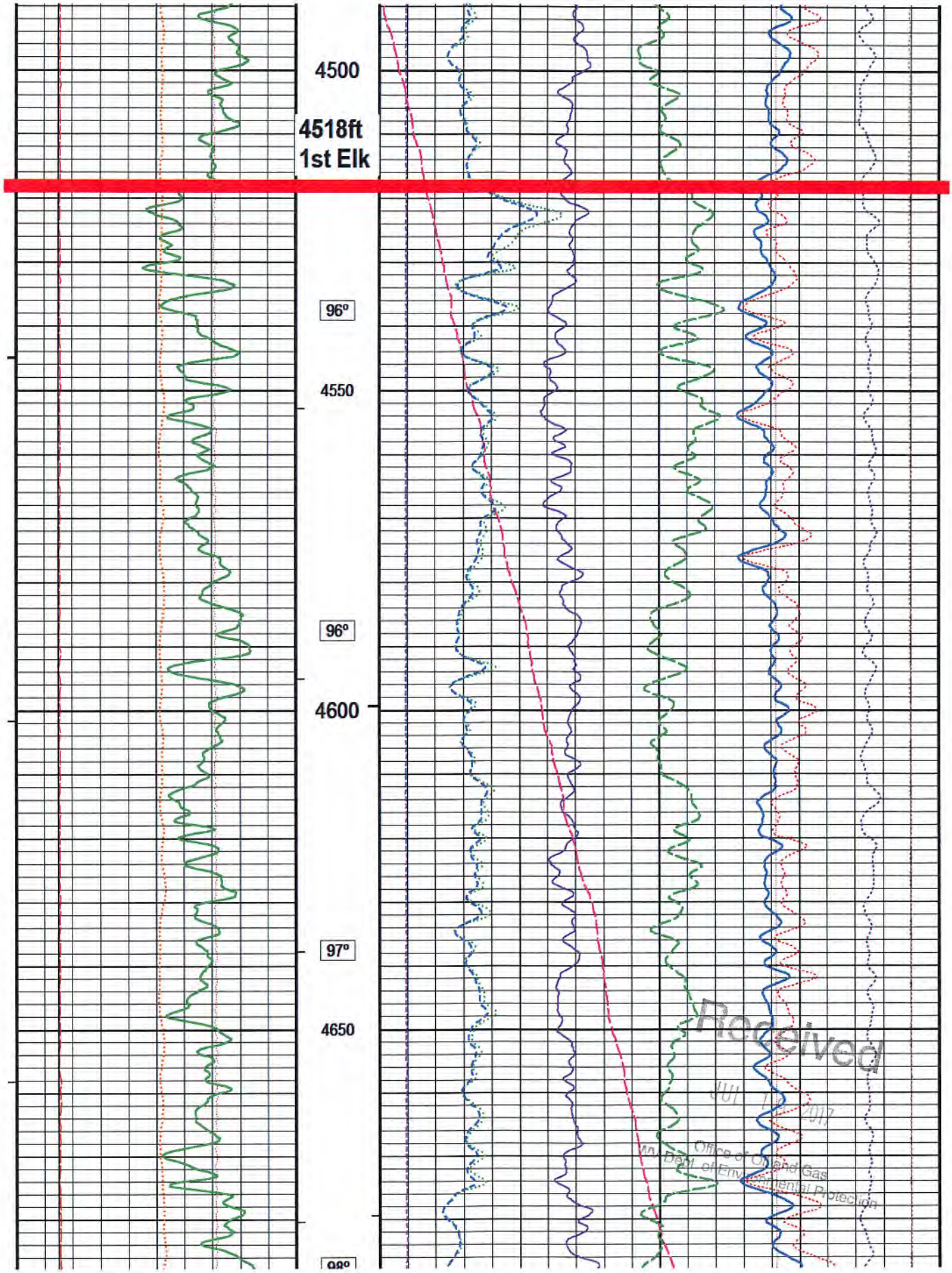


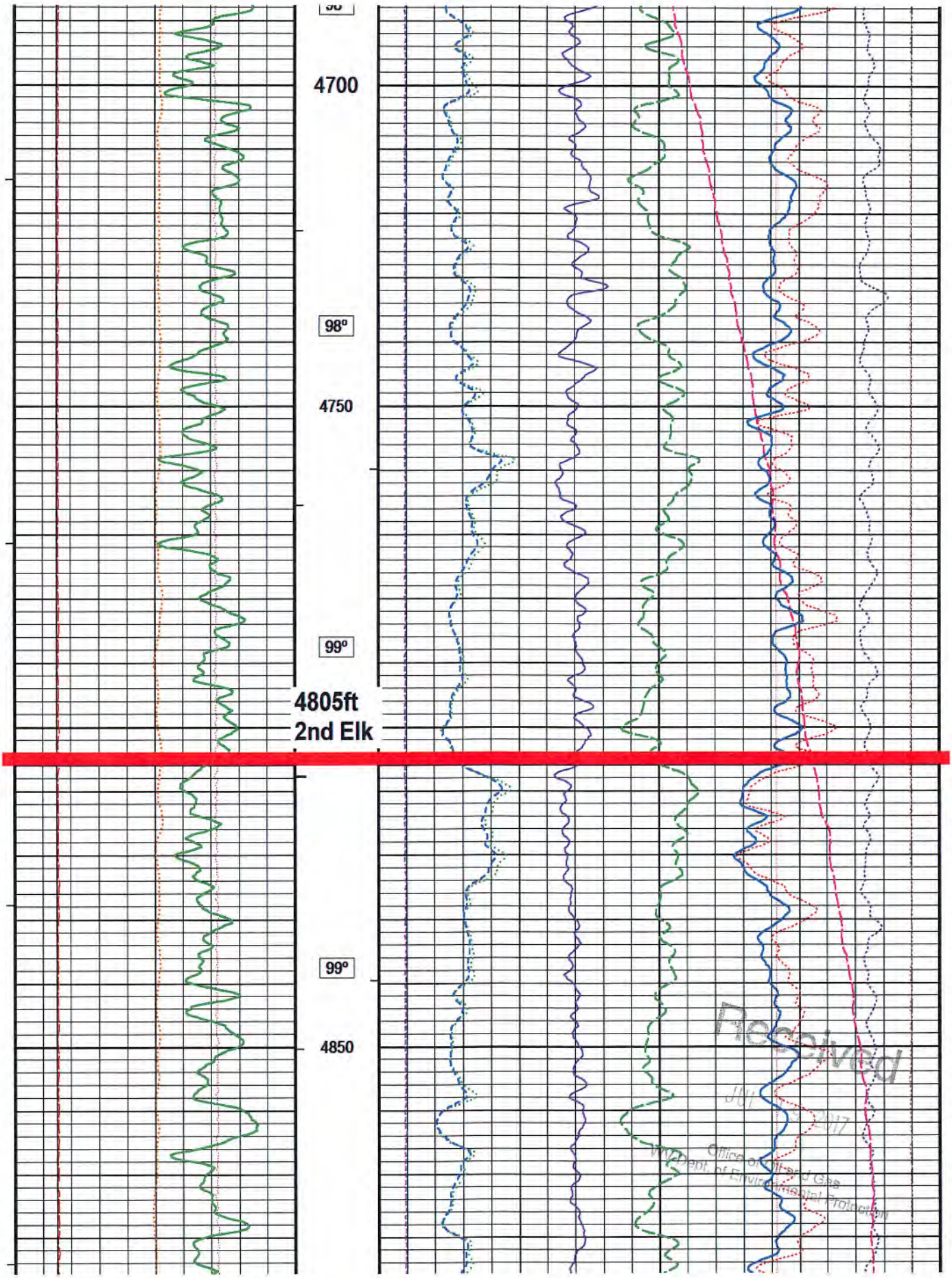


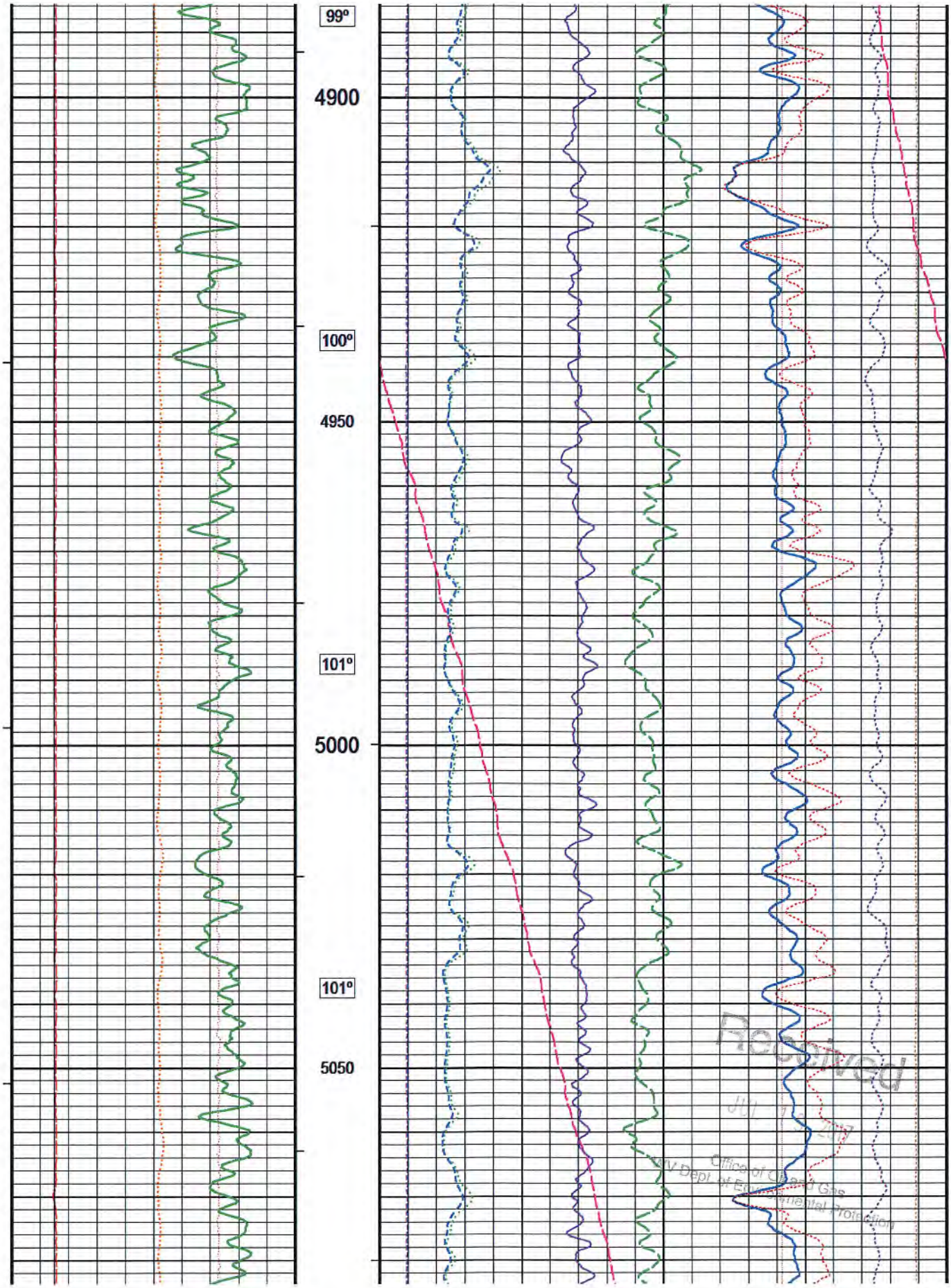


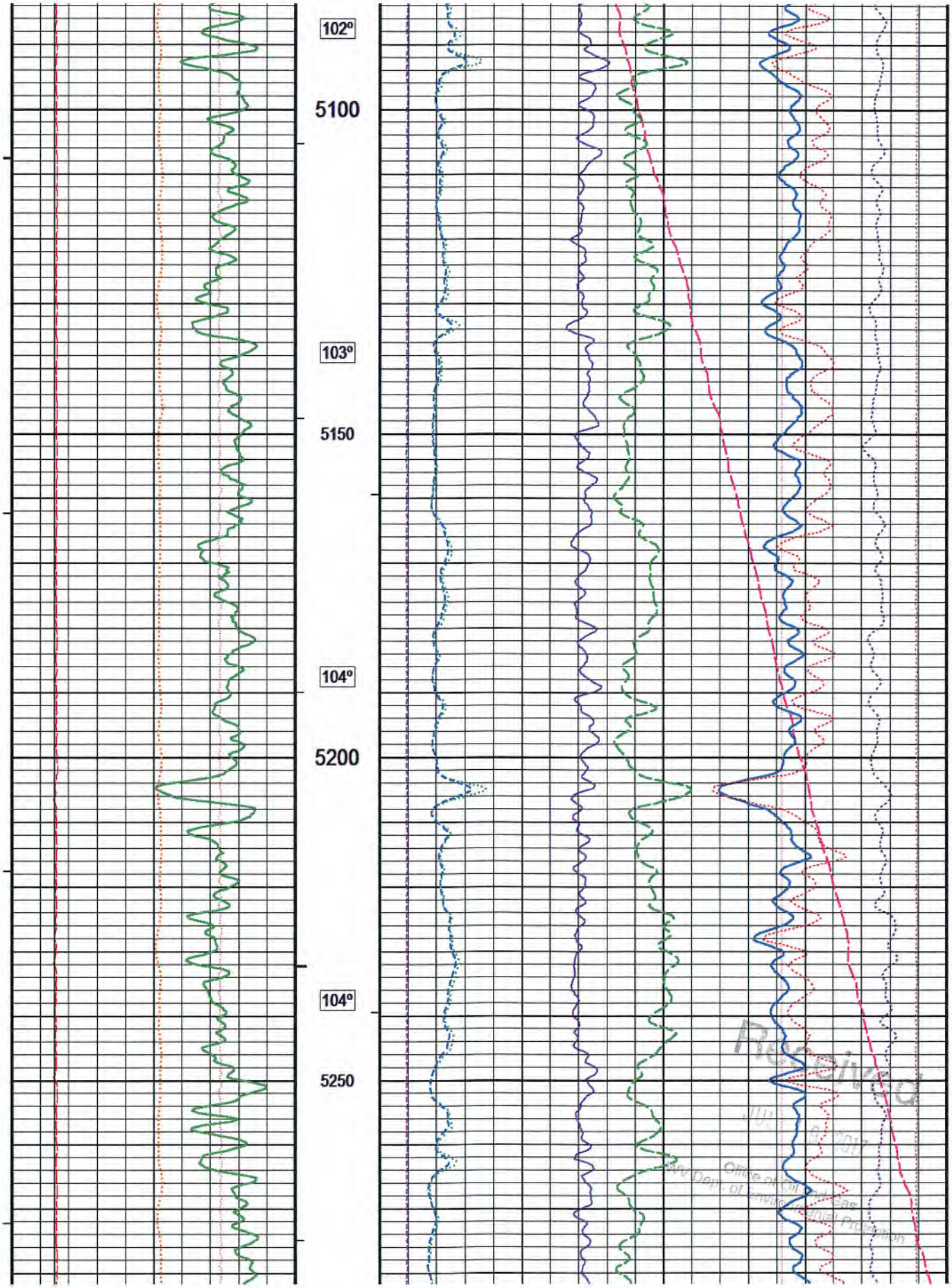


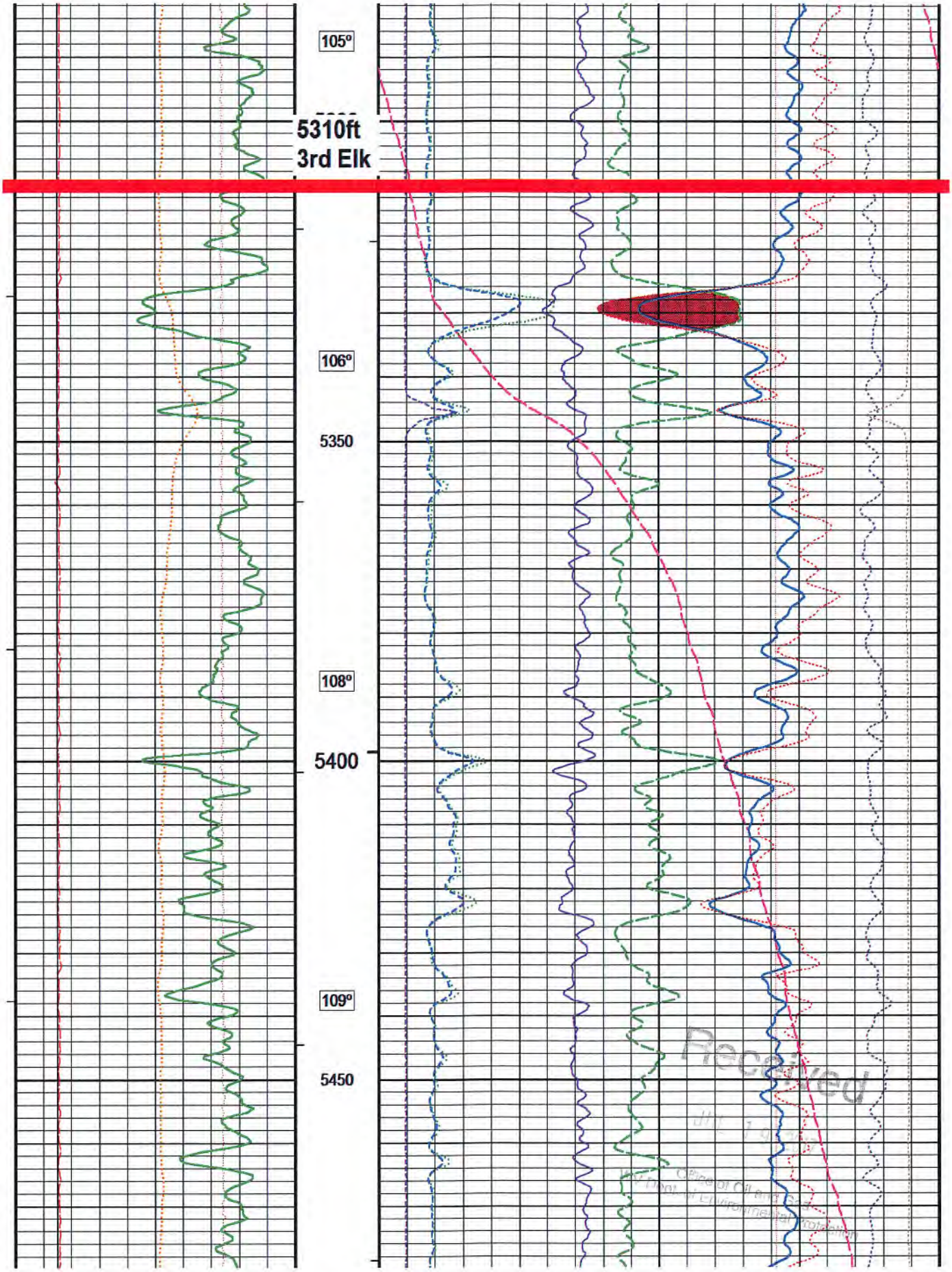


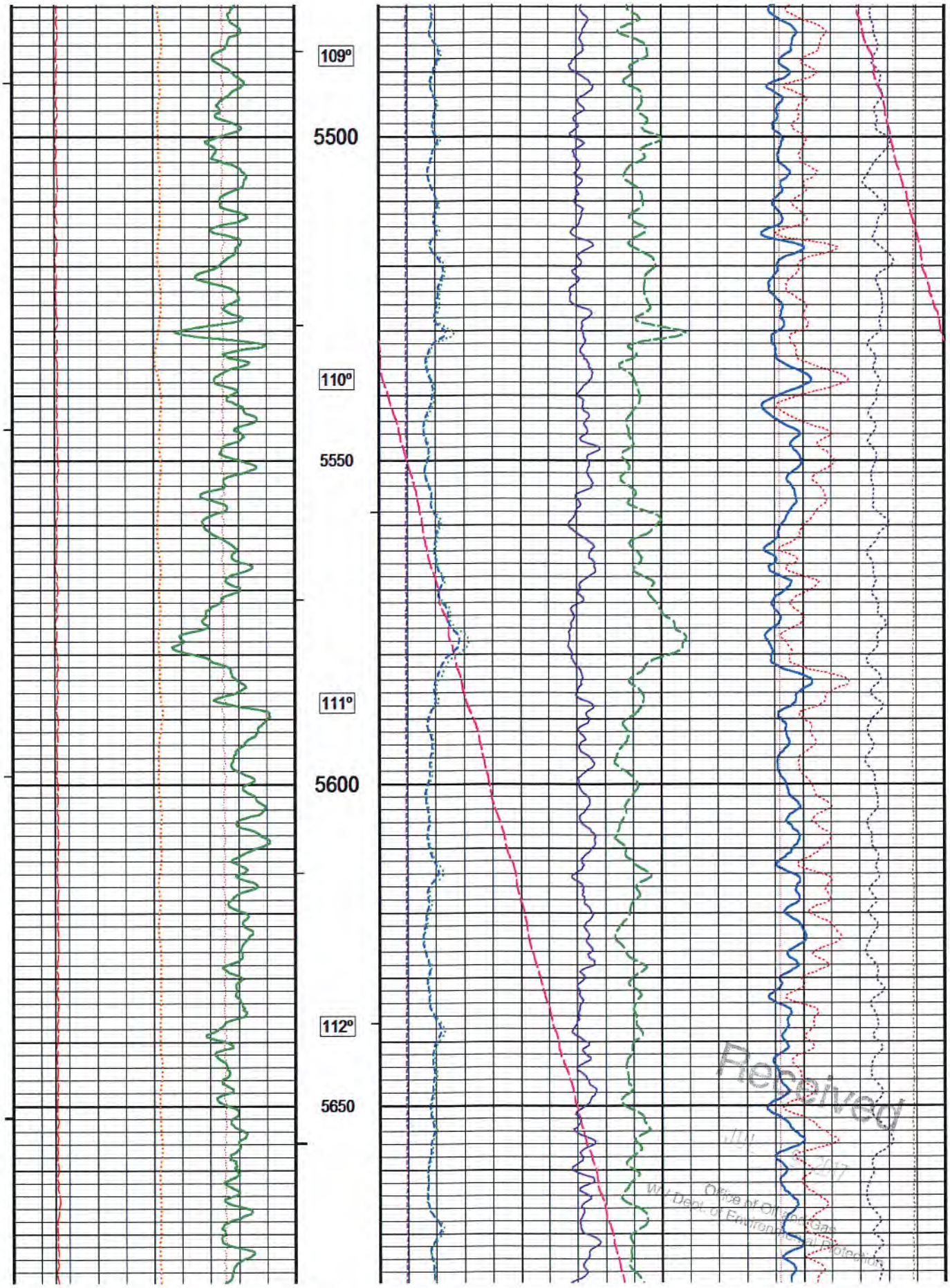


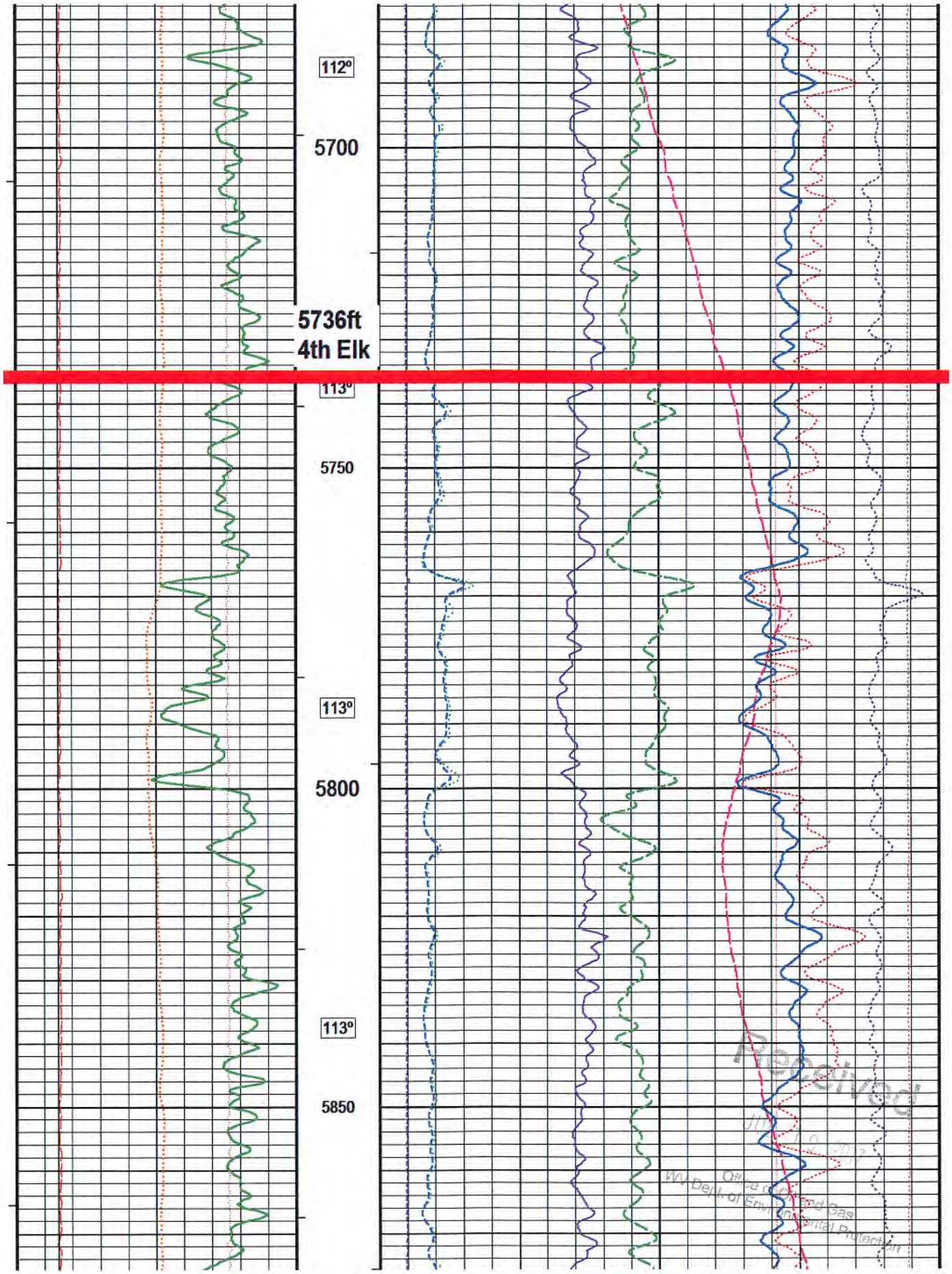


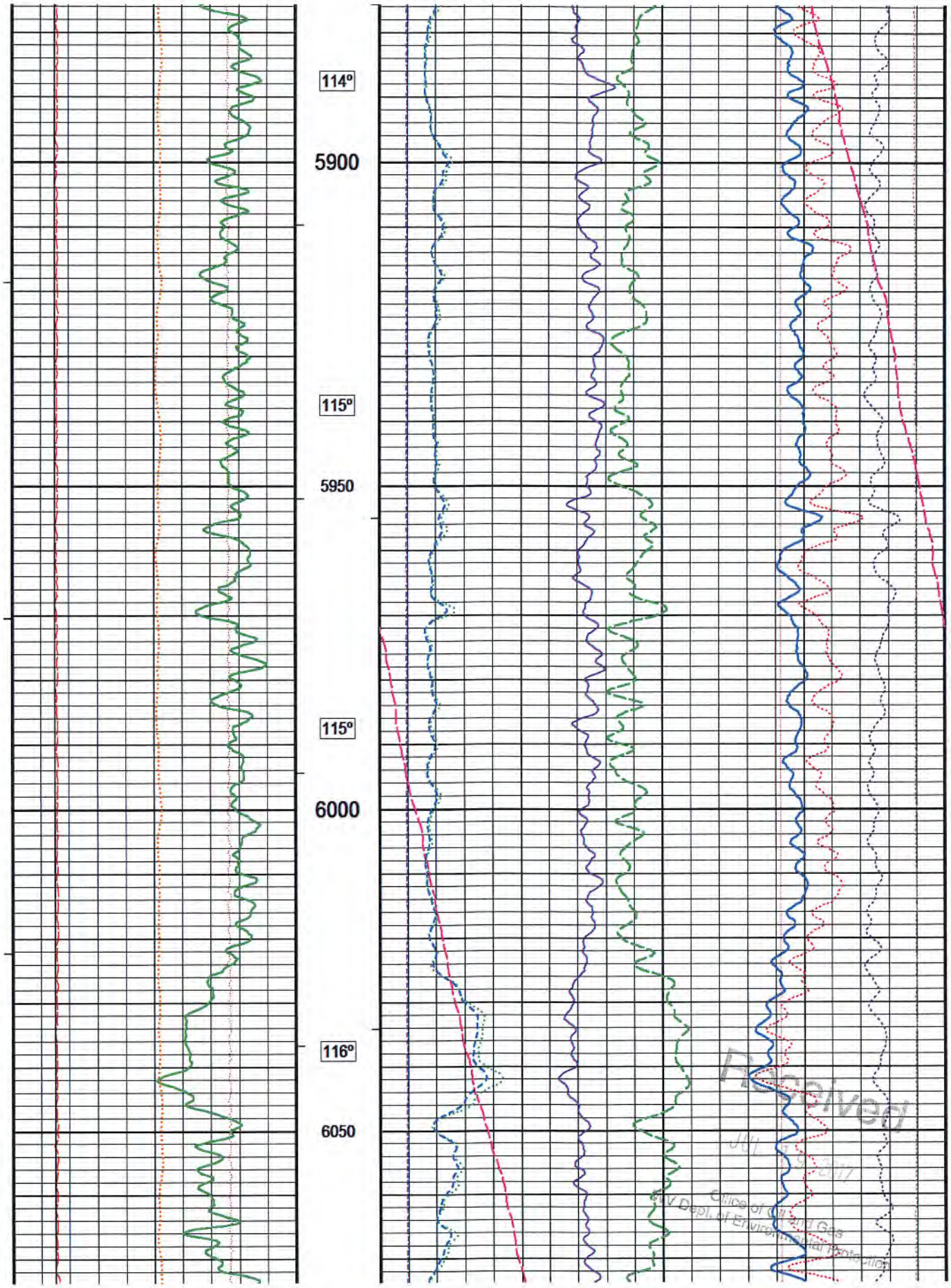


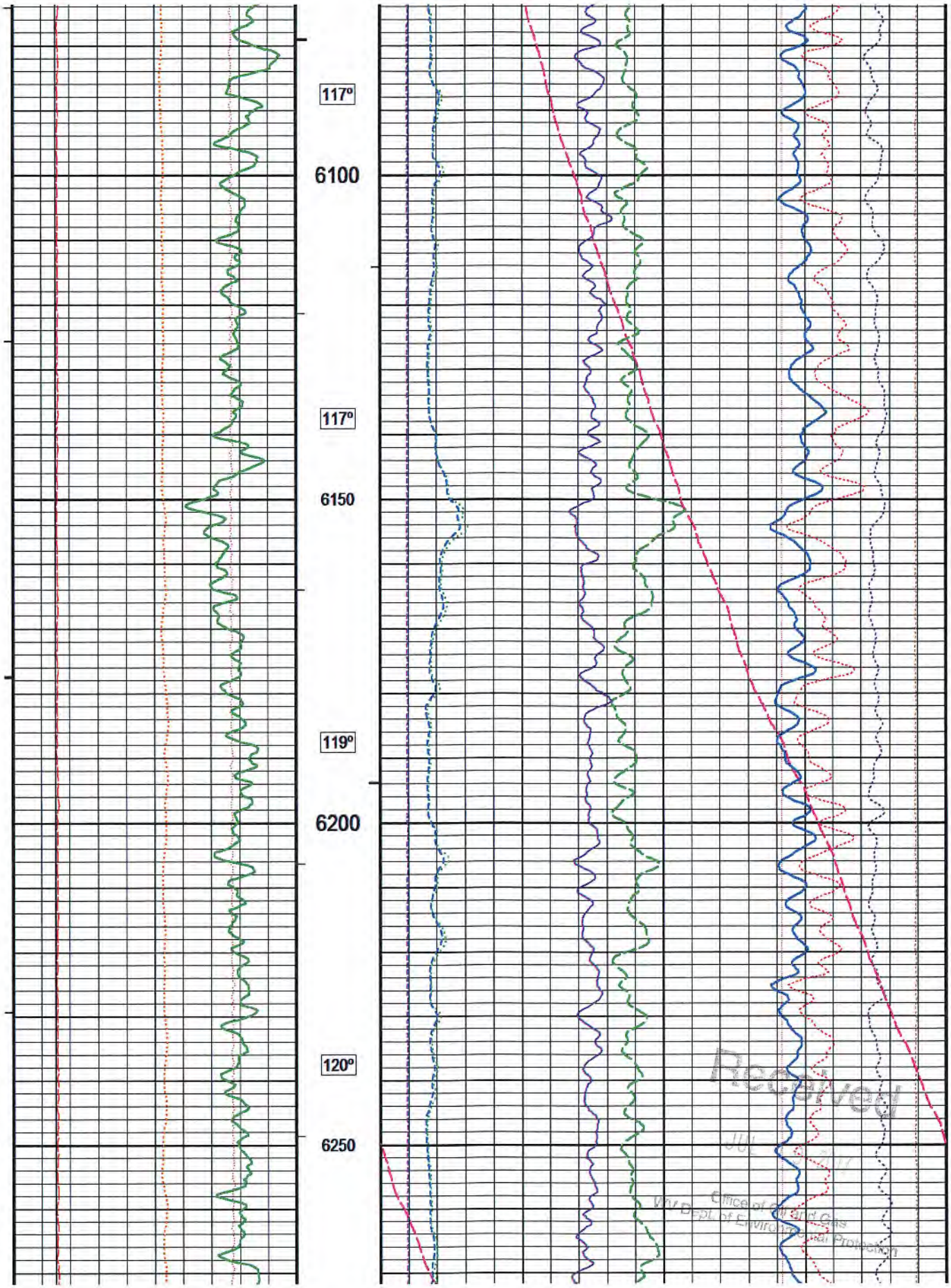


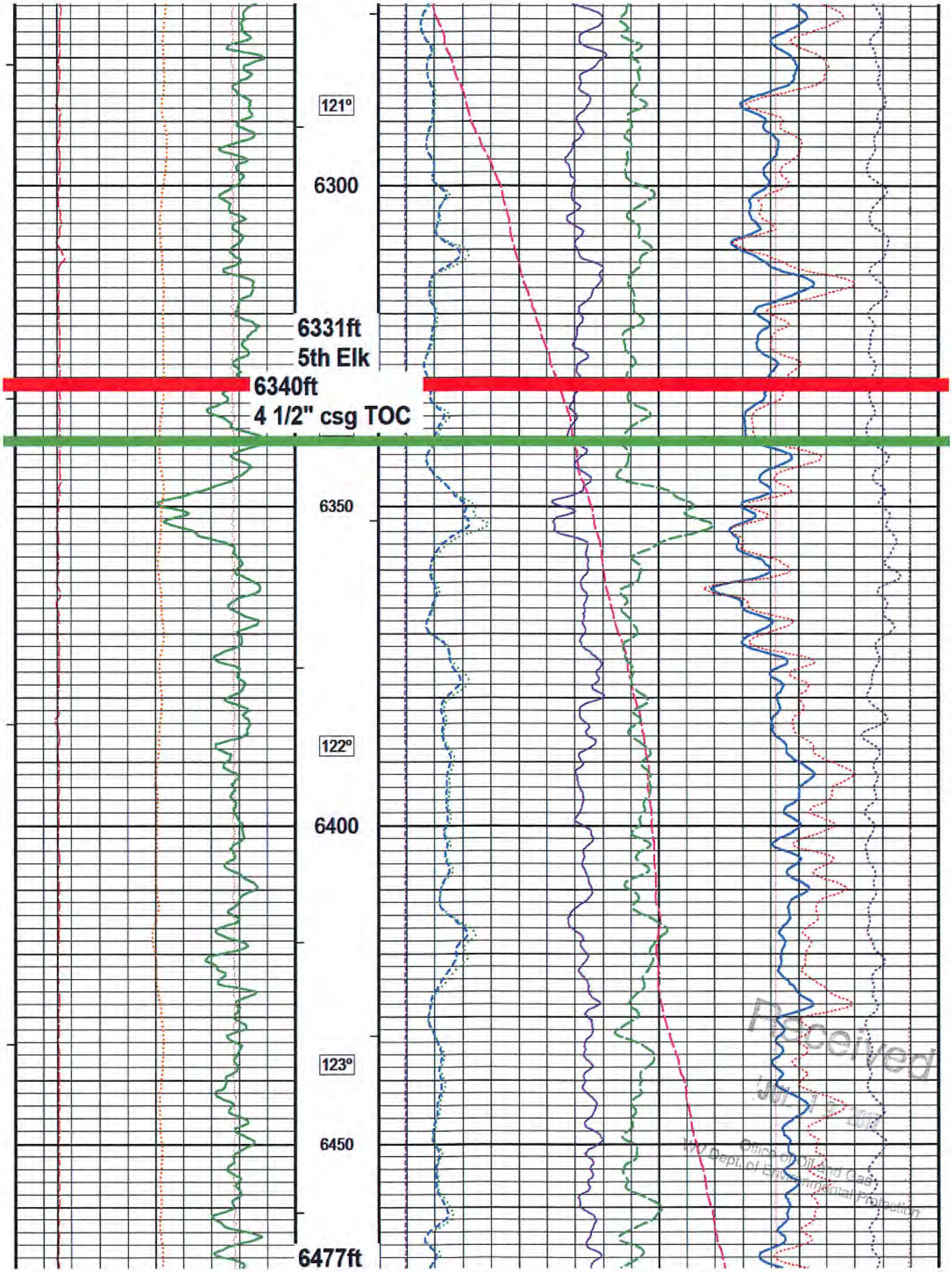


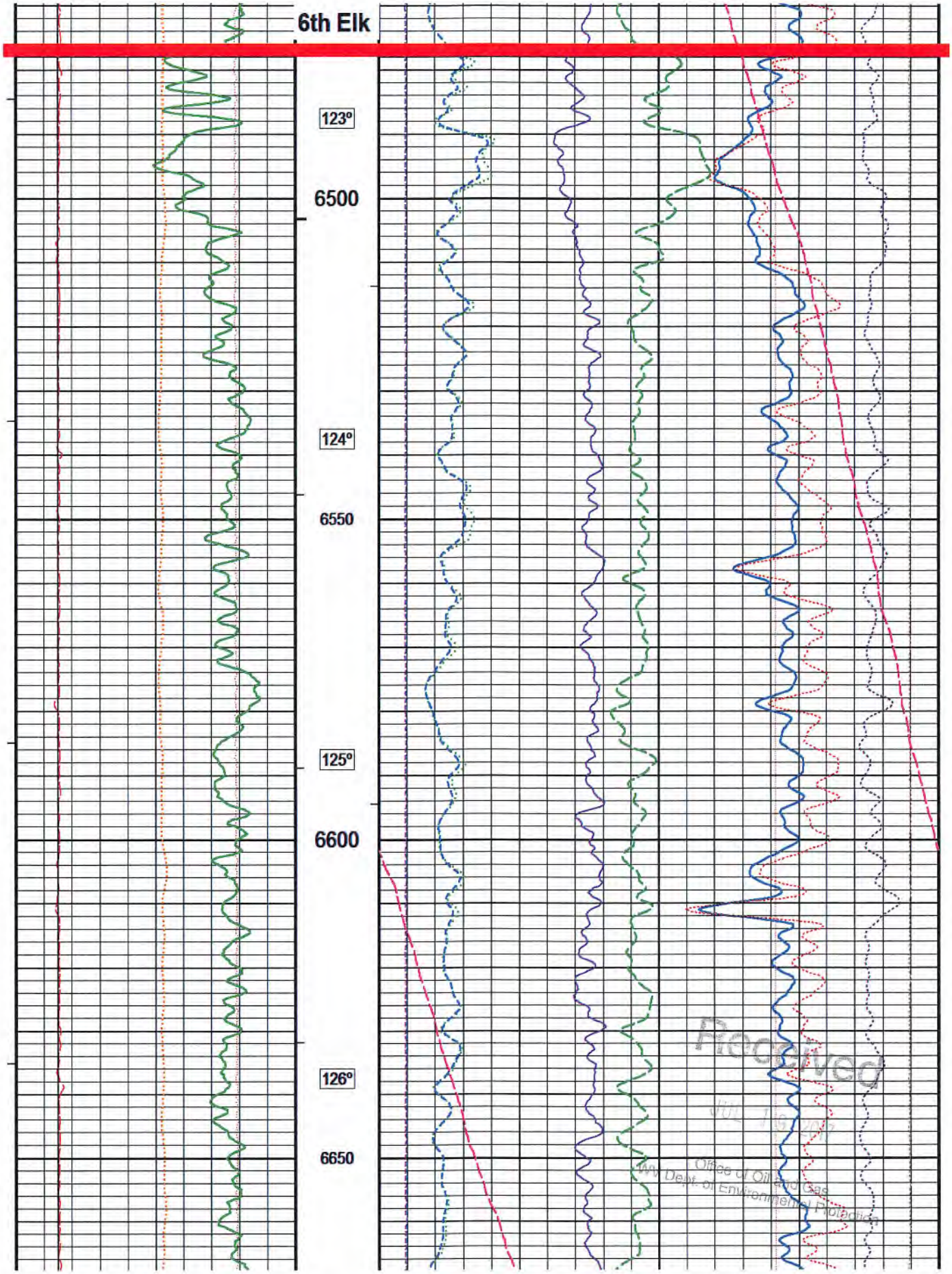


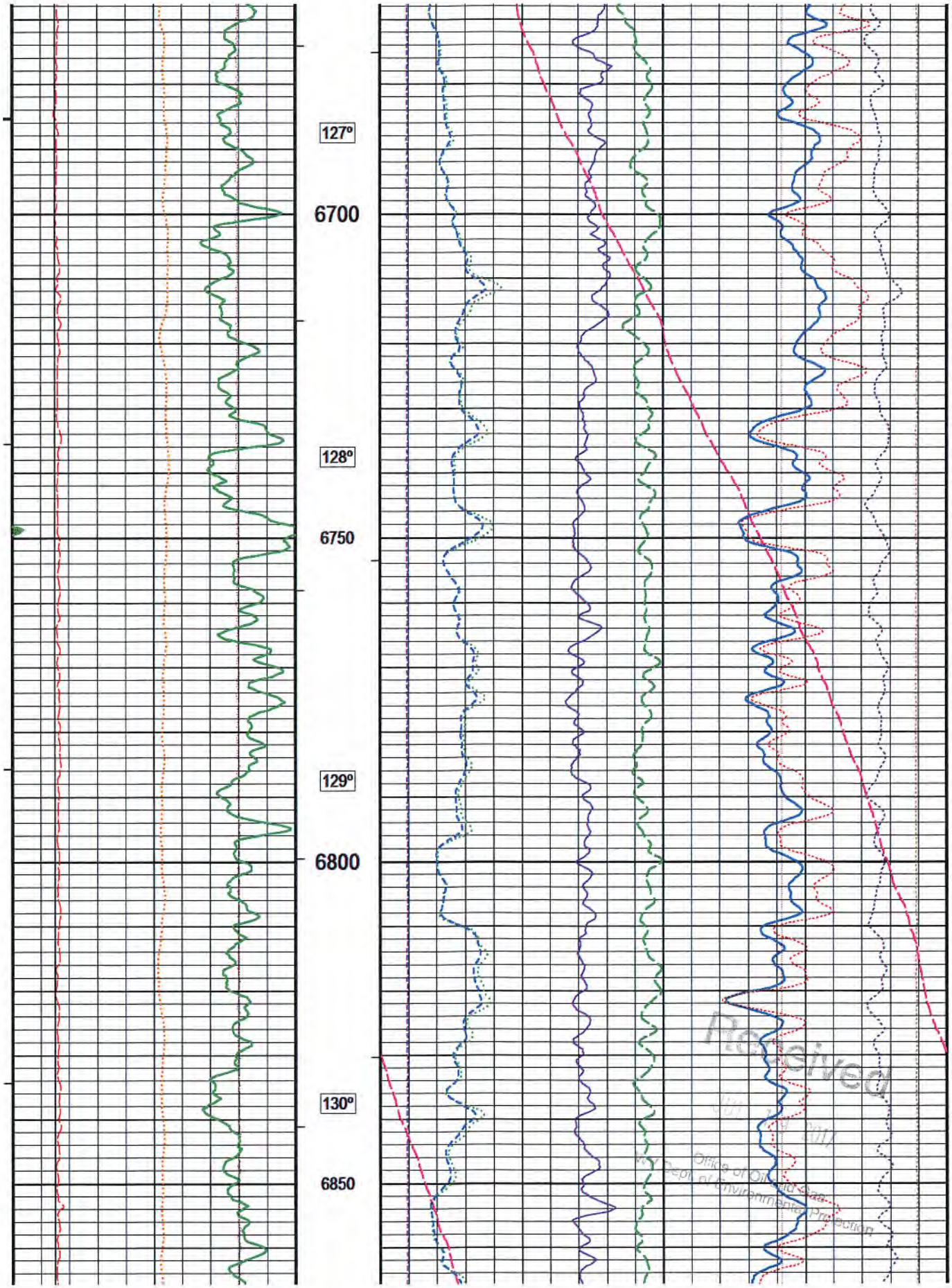


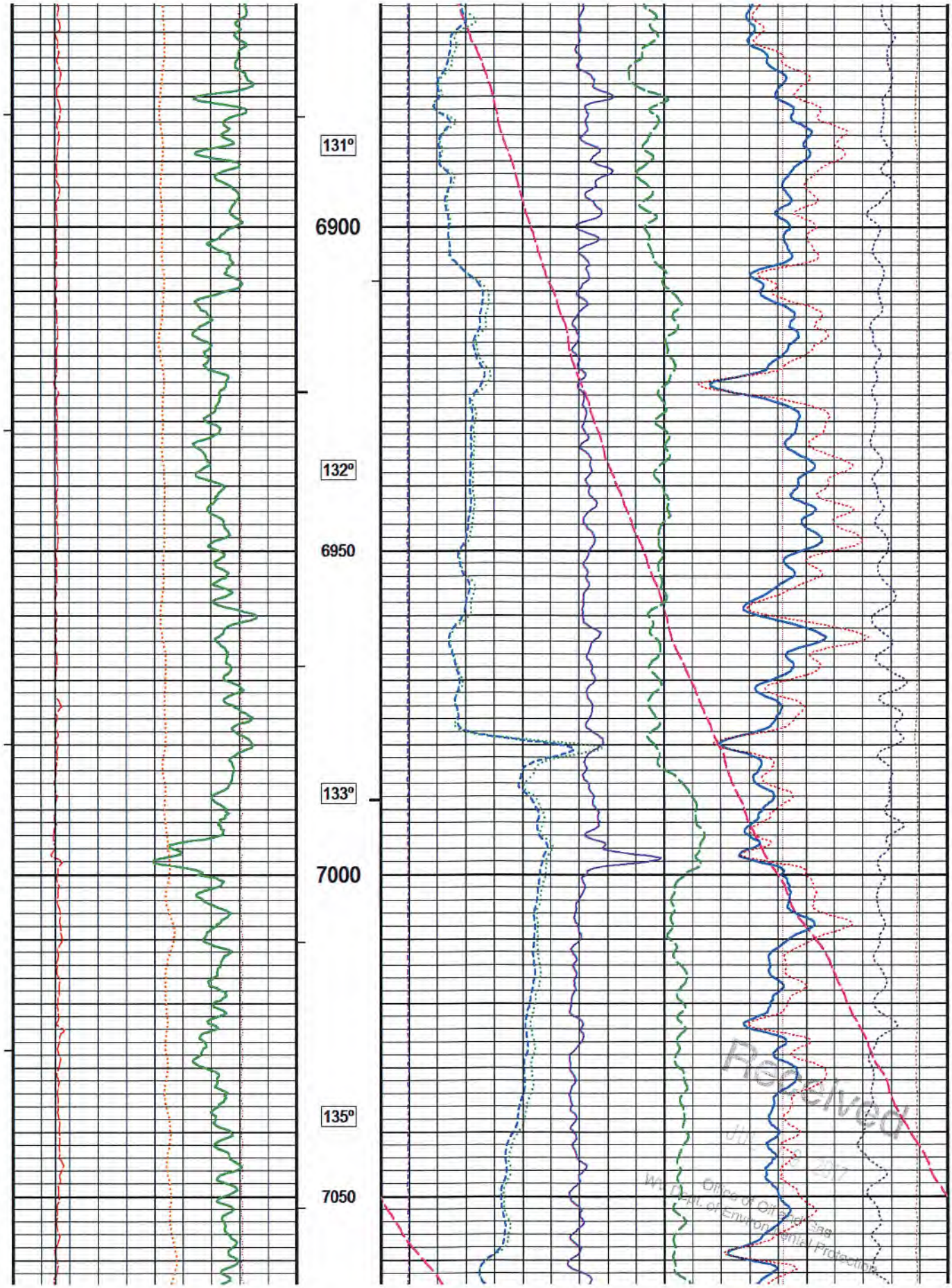


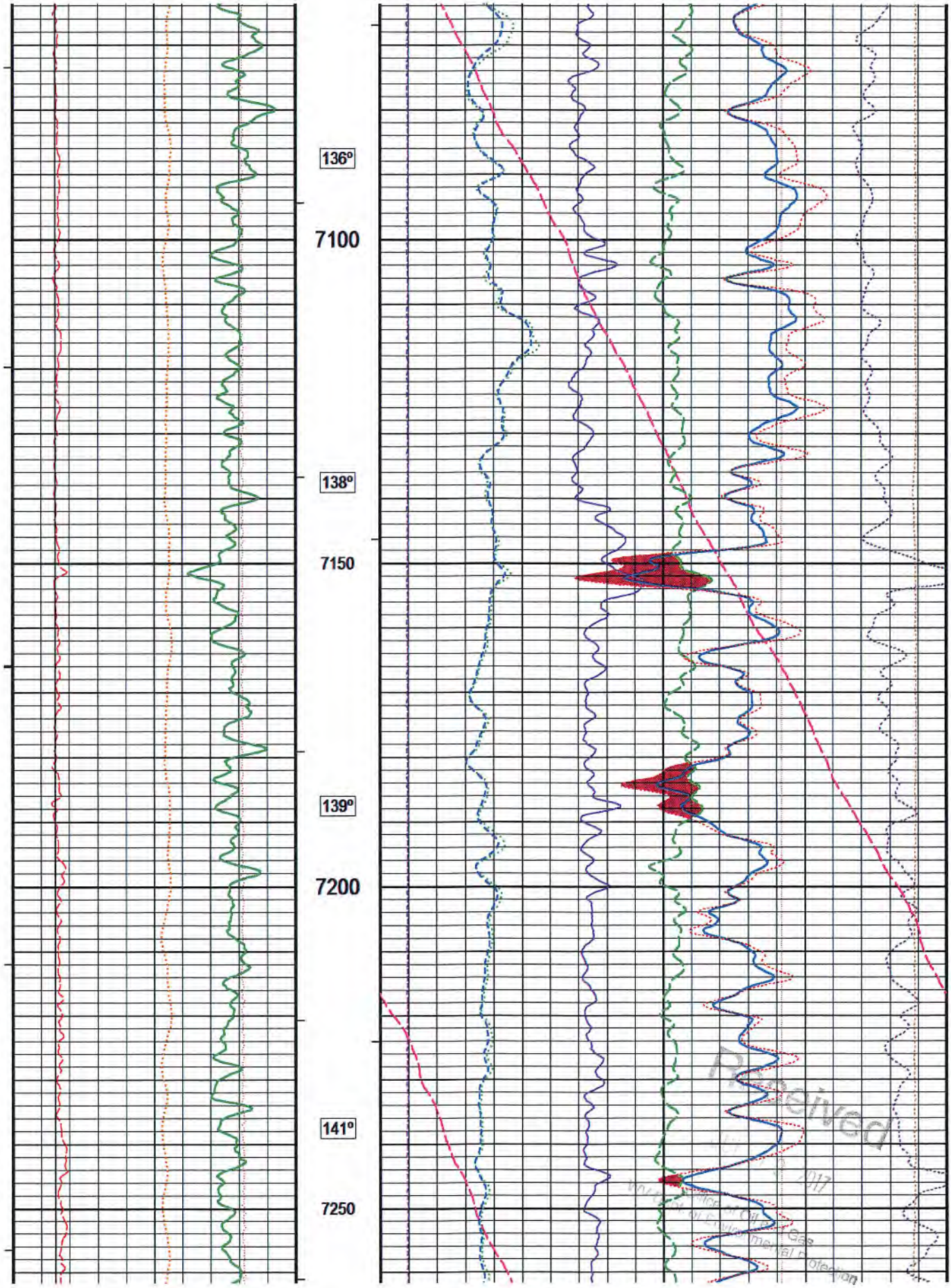


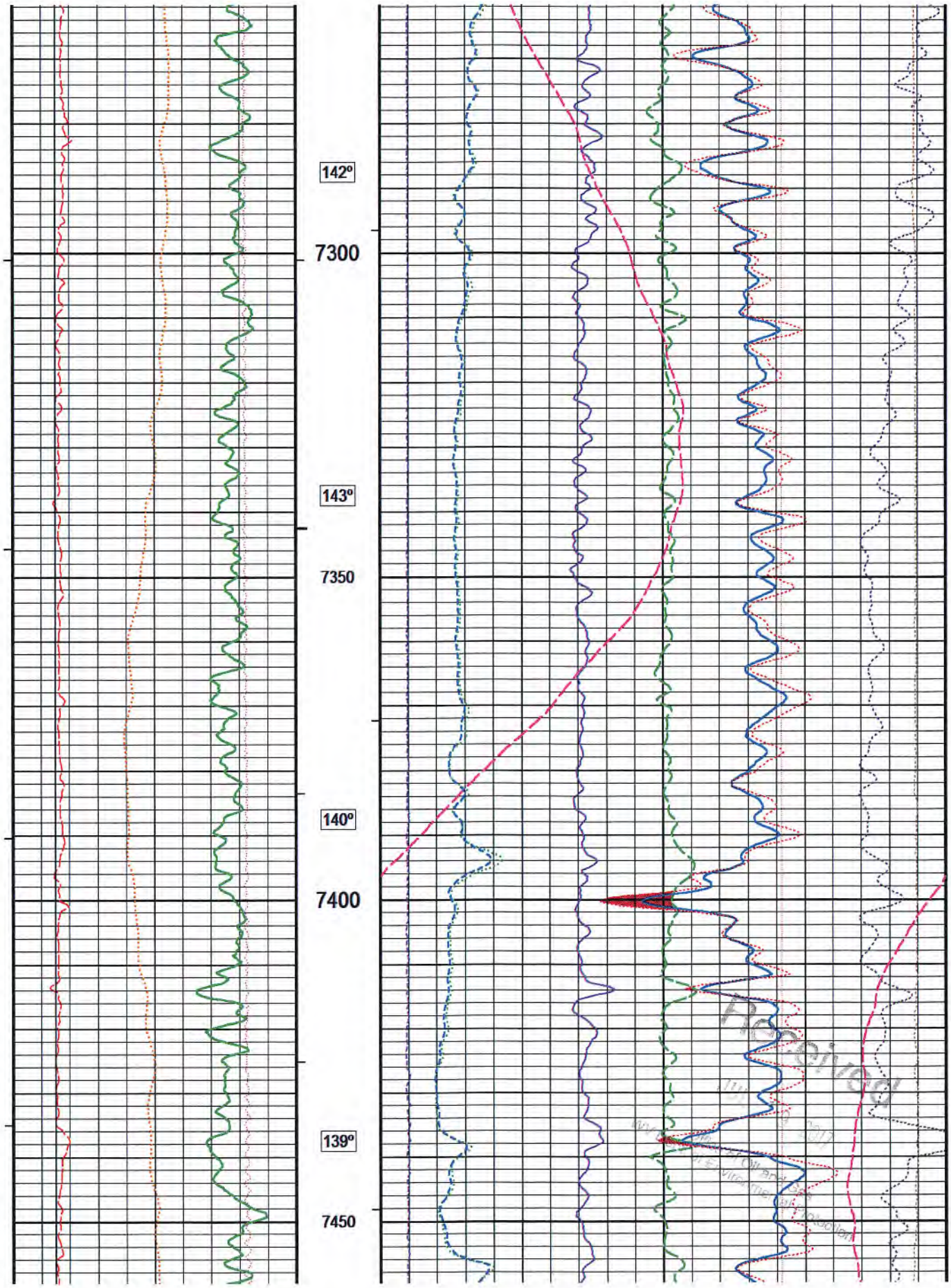


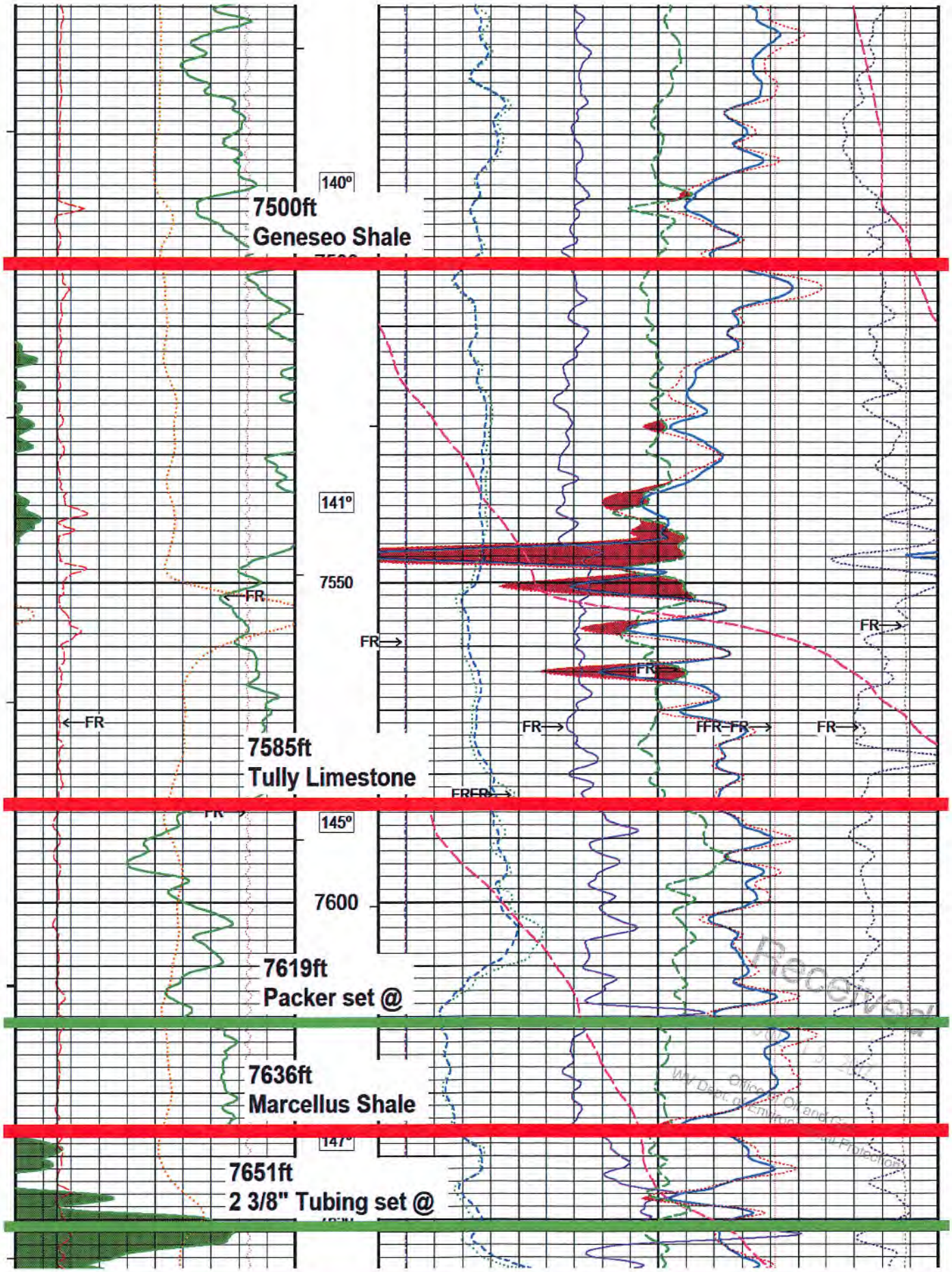


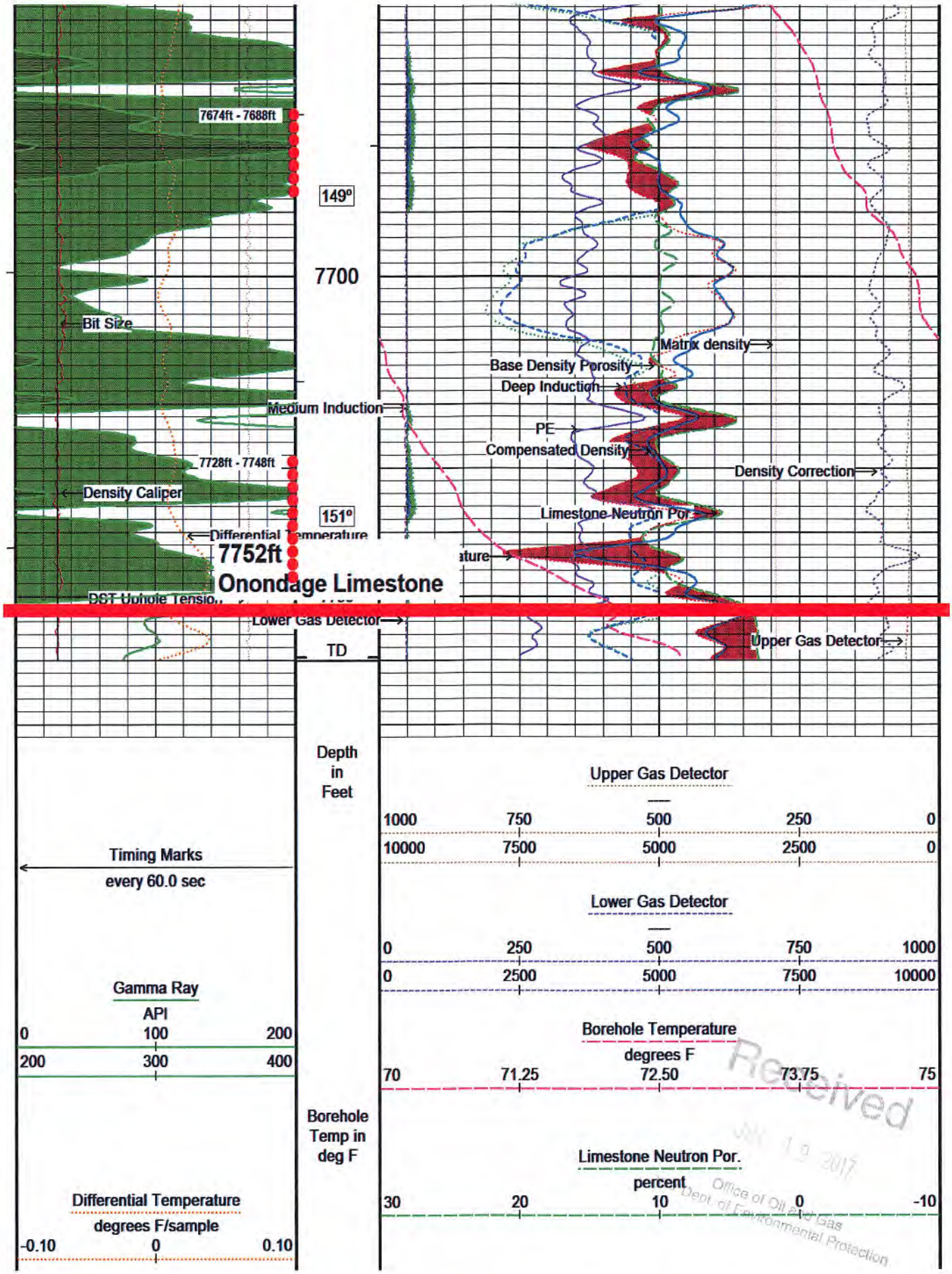


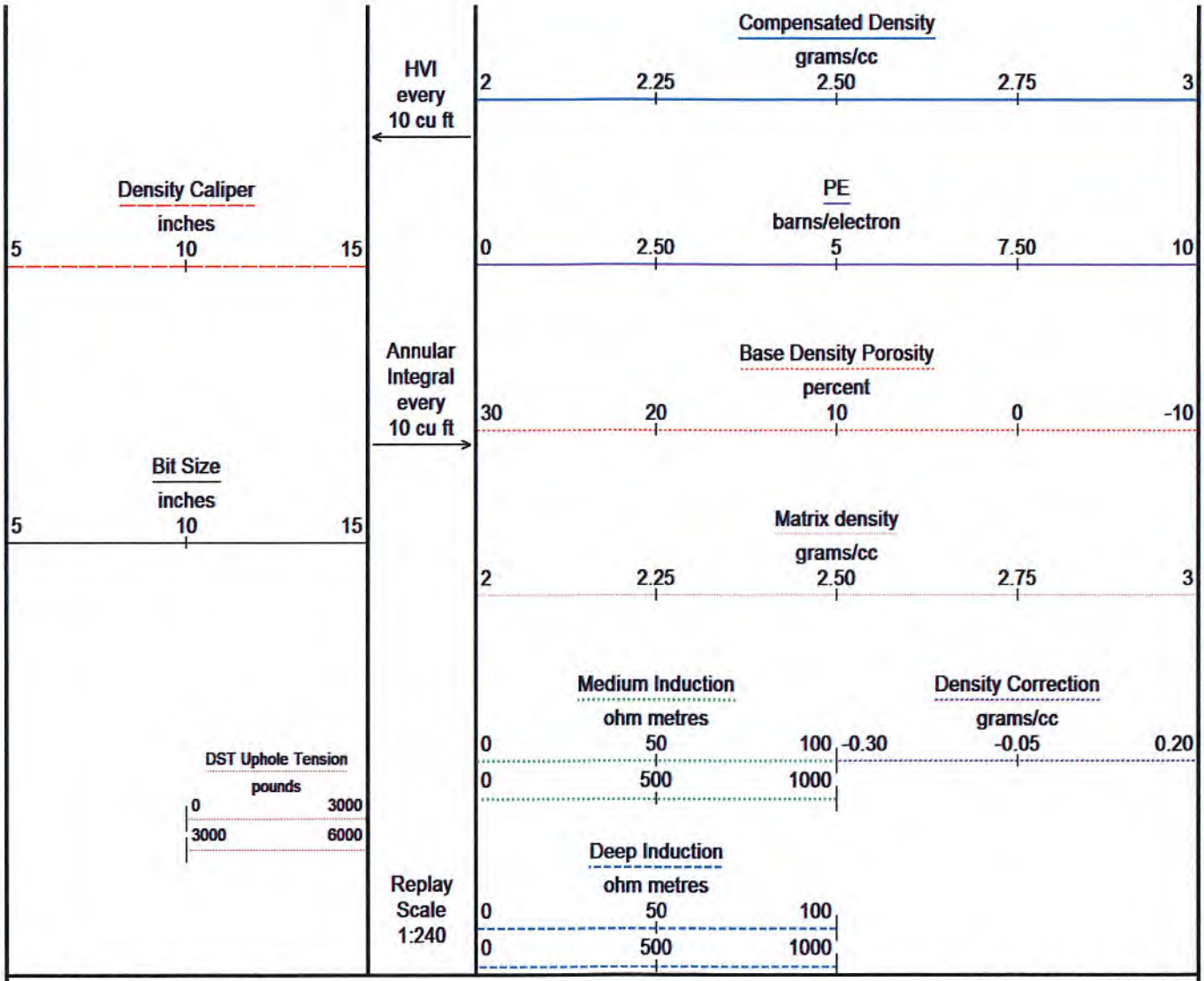












Depth Based Data - Merged File — Plotted on 11-JUL-2017 11:07

Filename: C:\Users\Dan\AppData\Local\Temp\Weatherford PreView\0\Main Data 2.mge — Merged on 11-AUG-2010 22:30

System Versions: Logged with 10.07.0791 Merged with 10.07.0791 Plotted with 13.03.7074

5 Inch Main Log

BEFORE SURVEY CALIBRATION

C:\Users\Dan\AppData\Local\Temp\Weatherford PreView\0\Main Data 2.mge

General Constants All 000 — Last Edited on 10-AUG-2010,06:03

General Parameters		
Mud Resistivity	3.800	ohm-metres
Mud Resistivity Temperature	1000.000	degrees F
Water Level	10000.000	feet
Density/Neutron Processing	Water Level Switch	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	Density Caliper	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Deep Induction	
RWA Constant A	0.610	
RWA Constant M	2.150	

Gamma Calibration MCG 060

Field Calibration on 16-JUL-2010,09:44

	Measured	Calibrated (API)
Background	62	34
Calibrator (Gross)	2263	1227
Calibrator (Net)	2201	1194

Gamma Constants MCG 060

Last Edited on 08-JUN-2010,05:13

Gamma Calibrator Number	44	
Mud Density	1.00	gm/cc
Caliper Source for Processing	Bit Size	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

SP Calibration MCG 060

Field Calibration on 14-JUL-2010,08:55

	Measured	Calibrated (mV)
Reference 1	100.0	101.0
Reference 2	-100.0	99.0

High Resolution Temperature Calibration MCG 060

Field Calibration on 14-JUL-2010,08:55

	Measured	Calibrated(Deg F)
Lower	60.00	61.00
Upper	160.00	161.00

High Resolution Temperature Constants MCG 060

Last Edited on

Pre-filter Length	11

Neutron Calibration MDN 151

Base Calibration on 14-JUL-2010,09:29
Field Check on

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3334	101	3714	110
Ratio	33.037		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	1517	2279
Ratio	0.666	

Field Check

	Calibrated (cps)
Ratio	

Neutron Constants MDN 151

Last Edited on 09-AUG-2010,10:57

Neutron Source Id	811	
Neutron Jig Number	Water Tank	
Epithermal Neutron	No	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	4.26	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	Constant Value	
Formation Pressure	0.00	kpsi
Temperature Source	Constant Value	

Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Salinity Correction		
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

Induction Calibration MAI 056

Base Calibration on 14-JUL-2010,09:29
Field Check on

Base Calibration

Test Loop Calibration	Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	16.5	464.5	9.3	966.2
2	6.1	377.9	7.6	821.4
3	3.5	253.3	5.2	566.0
4	2.1	130.7	2.6	279.2

Array Temperature 74.3 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1				
2				
3				
4				
Deep				
Medium				
Shallow				
Array Temperature		0.0		0.0 Deg F

Induction Constants MAI 056

Last Edited on 10-AUG-2010,06:07

Induction Model	VECTAR	
Caliper for Borehole Corr.	Constant Value	
Hole Size for Borehole Correction	6.500	inches
Tool Centred	No	
Stand-off Type	Pineapple	
Stand-off	0.49	inches
Number of Fins on Stand-off	5.0000	
Stand-off Fin Angle	72.00	degrees
Stand-off Fin Width	1.3878	inches
Borehole Corr. Rm Source	Constant Value	
Temp. for Rm Corr.	N/A	
Squasher Start	0.0020	mhos/metre
Squasher Offset	0.0000	mhos/metre

Borehole Normalisation

DRM1	35.0000	DRC1	35.0000
DRM2	1933.0000	DRC2	200.0000
MRM1	34.0000	MRC1	36.0000
MRM2	1317.0000	MRC2	300.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000

Calibration Site Corrections

Channel 1	0.00	mmhos/metre
Channel 2	0.00	mmhos/metre
Channel 3	0.00	mmhos/metre
Channel 4	0.00	mmhos/metre

Apparent Porosity and Water Saturation Constants

Archie Constant (A)	1.00
Cementation Exponent (M)	2.00

Saturation Exponent (N)	2.00	
Saturation of Water for Apor	100.00	percent
Resistivity of Water for Apor and Sw	0.05	ohm-m
Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

High Resolution Temperature Calibration MAI 056

Field Calibration on 17-FEB-2010,16:22

	Measured	Calibrated(Deg F)
Lower	60.00	61.00
Upper	100.00	101.00

High Resolution Temperature Constants MAI 056

Last Edited on

Pre-filter Length	11

Photo Density Calibration MPD 084

Base Calibration on 14-JUL-2010 09:28
Field Check on

Density Calibration

Base Calibration	Measured Near	Measured Far	Calibrated (sdu) Near	Calibrated (sdu) Far
Reference 1	48032	15755	53306	19389
Reference 2	21848	1912	24963	2524
Field Check at Base	732.7	804.7		
Field Check				

PE Calibration

Base Calibration	Measured WS	Measured WH	Ratio	Calibrated Ratio
Background	130	640		
Reference 1	16056	47901	0.337	0.321
Reference 2	5897	21744	0.273	0.273
Field Check at Base	129.9	640.2		
Field Check				

Density Constants MPD 084

Last Edited on 10-AUG-2010,06:07

Density Source Id	NSD-L-297	
Nylon Calibrator Number	DNC-D-526	
Aluminium Calibrator Number	DAC-D-526	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.00	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Advanced	

Matrix Density (gm/cc)	Depth (ft)
2.71	0.00
0.00	0.00
0.00	0.00
0.00	0.00

0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

Caliper Calibration MPD 084

Base Calibration on 14-JUL-2010 09:07
Field Calibration on 14-JUL-2010 09:09

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	12115	3.99
2	22082	5.97
3	32224	8.00
4	42662	10.03
5	53153	11.98
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.96	5.97

DOWNHOLE EQUIPMENT

C:\Users\Dan\AppData\Local\Temp\Weatherford PreView\0\Haun 1 up.dta

Compact Gamma
MCG 60 Length: 8.70 ft Weight: 63.9 lb

Compact Gas detector
MGD 29 Length: 4.87 ft Weight: 35.3 lb

Compact Neutron
MDN 151 Length: 5.04 ft Weight: 50.7 lb

Compact Density/Caliper
MPD 84 Length: 9.59 ft Weight: 90.4 lb

Compact Induction
MAI 56 Length: 10.81 ft Weight: 48.5 lb

Total Length: 39.01 ft Weight: 288.8 lb

33.72 ft	GRGC - Gamma Ray
29.17 ft	GDUP - Upper Gas Detector
26.63 ft	GDLO - Lower Gas Detector
-0.13 ft	SMTU - DST Uphole Tension
22.40 ft	NPRL - Limestone Neutron Por.
13.92 ft	AVOL - Annular Volume
13.92 ft	HVOL - Hole Volume
13.92 ft	CLDC - Density Caliper
13.23 ft	DEN - Compensated Density
13.23 ft	DCOR - Density Correction
13.23 ft	MTXD - Matrix density
13.23 ft	DPOR - Base Density Porosity
13.16 ft	PDPE - PE
2.58 ft	RILM - Medium Induction
2.58 ft	RILD - Deep Induction
Tool Zero	(0.13ft from bottom)
0.00 ft	IHTD - Differential Temperature
0.00 ft	IHTF - Borehole Temperature

All measurements relative to tool zero.

COMPANY	Mountain V Oil and Gas Incorporated
WELL	Haun # 1 WV0402
FIELD	Banks District

PROVINCE/COUNTY	Upshur County
COUNTRY/STATE	U.S.A / West Virginia

Elevation Kelly Bushing	2378.00	feet	First Reading	7760.00	feet
Elevation Drill Floor	2378.00	feet	Depth Driller	7760.00	feet
Elevation Ground Level	2368.00	feet	Depth Logger	7760.00	feet

Weatherford®

Photo Density

Compensated Neutron

Array Induction

BILLMAN GEOLOGIC CONSULTANTS, INC.

TO: MR. JAMIE ANDREWS, MOUNTIN V OIL & GAS, INC.

FROM: DAN A. BILLMAN, PG, CPG, PRESIDENT, BILLMAN GEOLOGIC CONSULTANTS, INC.

SUBJECT: GEOLOGIC REVIEW OF THE HAUN #1 WV0402 (47-097-03737), UPSHUR COUNTY, WEST VIRGINIA.

DATE: 7/17/17

CC:

Mr. Jamie Andrews of Mountain V Oil & Gas, Inc. has requested that Billman Geologic Consultants, Inc. (BGC) discuss the geologic conditions of the proposed Haun #1 WV0402 salt water disposal (SWD) well (47-097-03737), located in Banks District, Upshur County, West Virginia. The well is also located on Rock Cave 7.5-minute quadrangle.

Correlated and Marked Copy of the Open Hole Electric Log

Included as an attachment to this report is a paginated and correlated, marked copy of the J.T. Law #1 (47-041-03175) electric log (File name: Mtn V Haun 1 WV0402 Annotated.pdf). The well was initially drilled to a total depth of 7,760′, as a vertical Marcellus shale test, by Mountain V Oil and Inc. The well was logged by Weatherford on 8/11/2010.

The well log includes the tops of the proposed injection zone (the Marcellus Shale), other pertinent shallower and deeper formation tops, and the confining layers above the proposed injection zones. Also, included on the marked log are the perforated intervals in the proposed storage horizon and proposed packer set depth (also included in the presented well schematic). Lastly, the annotated log includes casing set depths and the 4 1/2″ top of cement depth.

Characterization of the Injection and Confining Intervals via Log Data

The following discussion will begin with the upper confining interval and proceed through the lower confining interval, discussing both the confining and injection intervals from shallowest to deepest. The log for the Haun #1 WV0402 salt water disposal (SWD) well (47-097-03737) includes a Gamma Ray, Caliper, Compensated Density, Bulk Density Porosity, Neutron Porosity, Shallow and Deep Induction, Photoelectric Effect (PE), Density Correction and Temperature curves.

Upper Confining Interval:
The upper confining interval is from roughly 6,500' (the base of the 6th Elk) to roughly 7,500' (the top of the Geneseo Shale). The upper confining interval is a 1,000' shale interval. The interval, based on log interpretation is a shale/silty shale section. The bulk density log indicates a consistent 2.70 grams/cc ready. This is indicative of a "tight", limited porosity and limited permeability formation. There are a few "washed out" zones, in the caliper log. These may be drilling induced or natural fractures, but do not appear pervasive across the 1,000' interval. These thin "wash outs" are also seen in the Compensation and Bulk Density logs. The induction resistivity log appears to show a "base line" resistivity of approximately 20 to 40 ohms, similar to other shales above the upper confining interval and indicative of non-reservoir quality, "tight" shales.

The Geneseo Shale, from 7,500' to 7,585' (85' total thickness) appears to be fractured and/or washed out. This may be drilling induced or naturally fractured or a combination of the two. Neither the induction log or the neutron porosity log appear to show significant "gas effect" through the interval, suggesting that any porosity and permeability development may be limited.

Also, serving as an upper confining interval is the Tully Limestone, from 7,585' through 7,620'. The Tully Limestone is approximately 35' in thickness. The density porosity curve and neutron porosity curve indicates the carbonate is fairly "tight".

Marcellus Shale (Disposal Interval):
The Marcellus Shale is located from 7,636' through 7,752'. The interval is 116' in thickness. The Marcellus Shale, in the original treatment of the well, was perforated in two stages. The upper stage from 7,674' to 7,688' and a lower stage from 7,728' to 7,748'. The Marcellus Shale shows reservoir development within the high Gamma Ray curve readings, within the Marcellus Shale. Density porosity curve readings indicates electric log measured porosity of approximately 10% to 16% through the reservoir portions of the Marcellus Shale.

Lower Interval:
The Lower interval (below the disposal interval) is the Onondaga Limestone at 7,752'. As the well only encountered (and logged) 10' to 12' feet of the Onondaga Limestone it is difficult to assess its reservoir properties.

Structural and Isopach Mapping

BGC has reviewed the previous mapping completed William Hayward, CPG (consultant to Mountain V Oil & Gas), Inc. Anticline and syncline axes were projected, based on the structure mapping and potential water flow paths were projected.

Included as an attachment to this report is a structural map on the top of the Onondaga Limestone, stratigraphically, immediately below the proposed injection interval in the Marcellus Shale. The mapping presented was taken from regional mapping completed by the consultant. The structure was interpreted and water flow direction(s) from the

proposed injection well was interpreted. Those same proposed water flow paths were plotted on the included isopach maps for the "Gross Thickness" mapping of the Marcellus Shale.

Referencing the Onondaga Limestone structure map, the Haun well appears to sit within a plunging syncline. The syncline, plunging to the north-northwest. Based on the provided maps and the BGC interpretation, water in the proposed SWD well would likely move in the same north-northwest direction, down dip from the proposed well (as seen in the including mapping). Within the proposed injection reservoir, water would likely be moving along strike of the Marcellus Shale, roughly along the 115' contour (between the 110' and 120' contour interval).

Tectonic Position of the Law #1

The Haun #1 WV0402, proposed UIC SWD well, located in southern Upshur County, is located a very deep portion of the Rome Trough (http://www.wvgs.wvnet.edu/www/tbr/41856R02.asp) (Refer to map included as an attachment to this report). The top of the Pre-Cambrian basement in the area of the Haun #1 well is approximately 19,000 feet below sea level, were as the base of the proposed injection interval is located at approximately 7,750 feet below sea level. This equates to a distance of approximately 11,250-foot difference between the basement and the proposed injection interval. Or, said differently, slightly more than 2 miles between the base of the Marcellus and the Pre-Cambrian basement. There is no evidence that waters are mixing from these great depths, with waters closer to the surface (or vice versa). There is no evidence of through going structures in this area. Between the proposed injection interval and the basement are 100's of feet of impermeable/low permeability Salina Salts and Evaporites and the impermeable/low permeability Ordovician shales.

Water Show Mapping in the Area of Review

Completion reports were reviewed to catalog the water shows reported in wells within a mile of the Haun #1 SWD well. This mile radius adequately covers the quarter mile radius area of review. Those findings are posted on a map included with this report and listed below. The Table begins with the Haun #1 Well, followed by the southernmost well and then includes all wells, working "clockwise" around the radius.

(Table included on next page)

Well Permit #:	Report:
097-03737 (Haun #1 SWD well)	No Show Reported
097-03609	Water Show at 360′ to 600′
097-03610	Water Show at 50′
097-02901	Water Shows at 46′, 1,475′ & 2,013′
097-02192	No Show Reported
097-02157	Water Shows at 50′ & 159′
097-02087	Water Show at 192′
097-03216	Water Show at 75′
097-02551	Water Show at 30′
097-02225	Water Shows at 105′ & 730′
097-02651	Water shows at 480′ & 595′
097-02085	Water Shows at 47′ & 415′
097-02489	Water Shows at 200′ & 1,506′

Conclusion

BGC has reviewed the data provided and has provided sound geologic interpretations, based on that data. BGC reserves the right to reinterpret based on the inclusion of new or uncovered data not previously provided.

Respectfully submitted by:

Dan A. Billman

Dan A. Billman, PG, CPG
President, Billman Geologic Consultants, Inc.

DISCLAIMER

This document includes forward-looking statements as well as historical information. Forward-looking statements include, but are not limited to statements relating to geological and seismic data interpretations, prospect reserve estimates and prospect risk. Although BGC believes that its expectations reflected in these forward-looking statements are reasonable, such statements involve risks and uncertainties, and no assurance can be given that actual results will be consistent with these forward-looking statements. Investment in oil and gas exploration is high risk by its very nature. Important factors that could cause actual results to differ from these forward-looking statements include, but are not limited to: erroneous interpretations of the seismic and geological data; the inability to acquire leases on identified prospects; mechanical problems while drilling and producing wells which prevent completion of a well or result in plugging of a well; dry holes; less reserves than originally estimated due to poor sand development or drainage by offsetting wells; non-commercial wells; and the variations in future gas pricing. BGC cannot and has not beyond normal due diligence care standards confirmed the accuracy and completeness of all the information we have reviewed in the course of this consulting engagement. Data for this review has been provided by Mountain V Oil & Gas, Inc., LLC, its clients or is publicly available and BGC, Inc. cannot be held responsible for errors in this provided data. Further, we express no opinion regarding any legal or securities issues. BGC shall assume no liability whatsoever for the use or reliance there upon by Mountain V Oil & Gas, Inc., their clients and/or their investors, of information, opinions and interpretations provided by BGC. BGC reserves the right to adjust these findings and interpretations with the discovery of relevant data or future production data.

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

SECTION 9

UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

Section 9 – Operating Requirements / Data:

- Average daily rate or volume of fluid to be injected: 1200 BBL
- Maximum daily rate or volume of fluid to be injected: 8500 BBL
- Average injection pressure: 1350 psi
- Maximum Injection pressure: 2746 psi (permitted)

2. See attached Appendix G.

3. Results analysis of injection fluid:
   - Total TPH = TBA
   - pH = TBA
   - Total Chloride = TBA
   - Total Dissolved Solids = TBA
   - Total Suspended Solids = TBA
   - See attached sample results.

4. See number 3.

5. Annulus fluid consists of fresh water. There are no chemicals being used in the annulus between the tubing and the casing, and the annulus has a pressure on average of zero (0) psi.

6. There are two scenarios that could potentially allow fluids to migrate to a USDW: 1) a failure within the wellbore itself and 2) a failure of surface equipment. In order for fluids to migrate to any USDW from a wellbore failure, three different casing tubing systems would all have to fail at the same time: 1) A hole could develop in the tubing which would allow fluids to migrate into the space between the tubing and the production casing or 2) the packer on the tubing could lose its sealing ability which could allow fluids to migrate into the space between the tubing and the production casing, and 3) only if 1 or 2 happens then the production casing would be breached only if a hole develops in the production casing above the top of the cement behind the production casing, and 4) Only if 1 or 2 and 3 occur then the fresh water casing would have to be breached as a result of a hole in that casing and cement in order for fluids to migrate from the injection well to a USDW.

   Contingency plan in case of a wellbore failure:

   The pressure between the tubing and the production casing will be monitored, so any failure of the tubing or the packer should be promptly identified. If a tubing or packer failure occurs: 1) injection would immediately cease, 2) the WVDEP would be immediately notified of the failure, 3) the tubing and packer would be pulled utilizing a stripper head that confines wellbore fluids to the wellbore, 4) the faulty packer or damaged tubing would be identified and replaced, 5) the repaired tubing/packer assembly

would be run back into the well and set utilizing the stripper head, and 6) a mechanical integrity test would be performed prior to resuming injection operations.

Contingency plan in case of a production casing failure:

The pressure between the tubing and the production casing will be monitored, so any failure of the production casing should be promptly identified. If a potential hole in the production casing is detected: 1) injection would immediately cease, 2) the WVDEP would be immediately notified of the potential failure, 3) the tubing and packer would be pulled utilizing a stripper head that confines wellbore fluids to the wellbore, 4) a pipe integrity log would be secured to identify the location of the leak, 5) a retrievable bridge plug would be immediately placed into the production casing at a point below the hole which would block any fluids from migrating up the wellbore from the injection zone, 6) the production casing hole would be repaired using whichever method is suitable for the size and type of hole, 7) the production casing would be pressure tested to ensure that the production casing is not leaking, 8) the bridge plug would be removed, 9) the tubing/packer assembly would be run back into the well and set utilizing the stripper head, and 10) a mechanical integrity test would be performed prior to resuming injection operations.

Contingency plan in case of a surface equipment leak:

The field will be visited daily by operations personnel, so any failure of surface equipment should be promptly identified. If a leak is detected in any surface equipment: 1) injection would cease immediately, 2) the WVDEP would be immediately notified of the leak if reportable, 3)the tubing valve would be immediately shut to prevent injected fluids from returning to surface through the tubing, 4) if the leak occurred outside of secondary containment, berms, ditches, or other means of diversion would be immediately employed to prevent the spilled fluids from migrating beyond the location, 5) the location of the leak would be identified and isolated from the remainder of the surface facilities, 6) any spilled fluids would be returned to tankage on or off location, 7) the leaking equipment will be repaired or replaced, 8) the surface equipment will be pressure tested for leaks, and 8) the tubing valve will be opened and injection operations resumed.

Fluid Injection Alternative:

Should this disposal well be taken out of service due to a necessary implementation of the Contingency Plan, fluids will either be 1) held in storage for later injection in the repaired well, 2) injected into other injection company owned disposal wells, or 3) if additional company owned injection capacity is unavailable, hauled to a commercial disposal facility servicing oil and gas operators in West Virginia.

APPENDIX G

Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-001-00320	Mountain V Oil & Gas, Inc.	Benson
47-001-00323	Mountain V Oil & Gas, Inc.	Benson
47-001-00336	Mountain V Oil & Gas, Inc.	Benson
47-001-00342	Mountain V Oil & Gas, Inc.	Benson
47-001-00362	Mountain V Oil & Gas, Inc.	Benson
47-001-00446	Mountain V Oil & Gas, Inc.	Benson
47-001-00472	Mountain V Oil & Gas, Inc.	Benson
47-001-00477	Mountain V Oil & Gas, Inc.	Benson
47-001-00482	Mountain V Oil & Gas, Inc.	Benson
47-001-00489	Mountain V Oil & Gas, Inc.	Benson
47-001-00515	Mountain V Oil & Gas, Inc.	Benson
47-001-00543	Mountain V Oil & Gas, Inc.	Benson
47-001-00567	Mountain V Oil & Gas, Inc.	Benson
47-001-02796	Mountain V Oil & Gas, Inc.	Balltown, Riley, Benson, Elk
47-001-02811	Mountain V Oil & Gas, Inc.	Balltown, Riley, Benson, Elk
47-001-02812	Mountain V Oil & Gas, Inc.	Balltown, Riley, Benson, Elk
47-001-02813	Mountain V Oil & Gas, Inc.	Balltown, Riley, Benson, Elk
47-001-02881	Mountain V Oil & Gas, Inc.	Balltown, Riley, Benson, Elk
47-001-02893	Mountain V Oil & Gas, Inc.	Squaw, 5th, Balltown, Riley, Benson
47-001-02918	Mountain V Oil & Gas, Inc.	Balltown, Riley, Benson
47-001-02974	Mountain V Oil & Gas, Inc.	Haverty, Elk, Benson-Riley, Gordon
47-001-02975	Mountain V Oil & Gas, Inc.	Haverty, Elk, Benson-Riley, Gordon
47-017-05455	Mountain V Oil & Gas, Inc.	Gordon, Benson
47-033-00430	Mountain V Oil & Gas, Inc.	Benson
47-033-00446	Mountain V Oil & Gas, Inc.	Benson
47-033-00481	Mountain V Oil & Gas, Inc.	Benson
47-033-04607	Mountain V Oil & Gas, Inc.	30ft, Gordon, Balltown

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APPENDIX G

Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-033-04898	Mountain V Oil & Gas, Inc.	Gordon, Benson
47-033-04899	Mountain V Oil & Gas, Inc.	Gordon, Benson
47-033-04900	Mountain V Oil & Gas, Inc.	Gordon, Benson
47-033-04901	Mountain V Oil & Gas, Inc.	Gordon, Benson
47-033-04902	Mountain V Oil & Gas, Inc.	Gordon, Benson
47-033-05092	Mountain V Oil & Gas, Inc.	Gordon, Benson
47-033-05093	Mountain V Oil & Gas, Inc.	Gordon, Benson
47-033-05094	Mountain V Oil & Gas, Inc.	Gordon, Benson
47-033-05095	Mountain V Oil & Gas, Inc.	Gordon, Benson
47-033-05096	Mountain V Oil & Gas, Inc.	Gordon, Benson
47-033-05145	Mountain V Oil & Gas, Inc.	30ft., Gordon, 5th, Balltown
47-039-02055	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-02133	Mountain V Oil & Gas, Inc.	Injun
47-039-02463	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05694	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05810	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05811	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05812	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05813	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05814	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05815	Mountain V Oil & Gas, Inc.	Weir, Berea
47-039-05816	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05817	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05818	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05819	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05820	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05830	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05831	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea

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Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-039-05832	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05833	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05834	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05943	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05944	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05945	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05946	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05947	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05948	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-05949	Mountain V Oil & Gas, Inc.	Injun, Squaw, Weir, Berea
47-039-06256	Mountain V Oil & Gas, Inc.	Big Injun Horizontal
47-041-04053	Mountain V Oil & Gas, Inc.	Injun
47-041-04054	Mountain V Oil & Gas, Inc.	Injun
47-041-04449	Mountain V Oil & Gas, Inc.	Injun
47-041-04976	Mountain V Oil & Gas, Inc.	Speechely, Balltown, Riley, Benson
47-041-05045	Mountain V Oil & Gas, Inc.	Bayard, Benson
47-041-05046	Mountain V Oil & Gas, Inc.	Bayard, Benson
47-041-05047	Mountain V Oil & Gas, Inc.	Bayard, Benson
47-041-05048	Mountain V Oil & Gas, Inc.	Bayard, Benson
47-041-05057	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-041-05058	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-041-05059	Mountain V Oil & Gas, Inc.	Gordon,5th,Riley, Benson
47-041-05060	Mountain V Oil & Gas, Inc.	Gordon,5th,Riley, Benson
47-041-05343	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-041-05375	Mountain V Oil & Gas, Inc.	Gordon, 5th, Benson
47-041-05421	Mountain V Oil & Gas, Inc.	5th, Balltown, Benson
47-041-05427	Mountain V Oil & Gas, Inc.	Marcellus Vertical

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Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-043-02545	Mountain V Oil & Gas, Inc.	Huron Shale
47-043-03233	Mountain V Oil & Gas, Inc.	Berea
47-097-00140	Mountain V Oil & Gas, Inc.	5th Sand
47-097-00163	Mountain V Oil & Gas, Inc.	5th Sand
47-097-01015	Mountain V Oil & Gas, Inc.	Benson
47-097-01144	Mountain V Oil & Gas, Inc.	Gordon
47-097-01998	Mountain V Oil & Gas, Inc.	Benson
47-097-01999	Mountain V Oil & Gas, Inc.	Benson
47-097-02007	Mountain V Oil & Gas, Inc.	Benson
47-097-02008	Mountain V Oil & Gas, Inc.	Benson
47-097-02145	Mountain V Oil & Gas, Inc.	Benson
47-097-02146	Mountain V Oil & Gas, Inc.	Benson
47-097-02417	Mountain V Oil & Gas, Inc.	Benson
47-097-02418	Mountain V Oil & Gas, Inc.	Benson
47-097-02420	Mountain V Oil & Gas, Inc.	Benson
47-097-02421	Mountain V Oil & Gas, Inc.	Benson
47-097-02568	Mountain V Oil & Gas, Inc.	Benson
47-097-02569	Mountain V Oil & Gas, Inc.	Benson
47-097-02571	Mountain V Oil & Gas, Inc.	Benson
47-097-02618	Mountain V Oil & Gas, Inc.	Benson
47-097-02717	Mountain V Oil & Gas, Inc.	Benson
47-097-02718	Mountain V Oil & Gas, Inc.	Benson
47-097-02720	Mountain V Oil & Gas, Inc.	Benson
47-097-03168	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03178	Mountain V Oil & Gas, Inc.	Gordon, Riley, Benson
-097-03179	Mountain V Oil & Gas, Inc.	Natural not stimulated
47-097-03183	Mountain V Oil & Gas, Inc.	Speechely, Balltown, Riley, Benson, Elk

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Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-097-03184	Mountain V Oil & Gas, Inc.	Speechely, Balltown, Riley, Benson, Elk
47-097-03185	Mountain V Oil & Gas, Inc.	Speechely, Balltown, Riley, Benson, Elk
47-097-03189	Mountain V Oil & Gas, Inc.	Speechely, Balltown, Riley, Benson, Elk
47-097-03199	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03204	Mountain V Oil & Gas, Inc.	Speechely, Balltown, Riley, Benson, Elk
47-097-03205	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03208	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03211	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03212	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03213	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03214	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03215	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03216	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03225	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03226	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03227	Mountain V Oil & Gas, Inc.	Gordon,5th,Riley, Benson
47-097-03228	Mountain V Oil & Gas, Inc.	Gordon,5th,Riley, Benson
47-097-03229	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03230	Mountain V Oil & Gas, Inc.	Natural not stimulated
47-097-03231	Mountain V Oil & Gas, Inc.	Gordon,5th,Riley, Benson
47-097-03232	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03233	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03238	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03239	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03240	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03241	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03242	Mountain V Oil & Gas, Inc.	5th, Riley, Benson

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Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-097-03243	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03266	Mountain V Oil & Gas, Inc.	Speechely, Balltown, Riley, Benson, Elk
47-097-03267	Mountain V Oil & Gas, Inc.	Gordon, 5th, Balltown, Riley, Benson
47-097-03268	Mountain V Oil & Gas, Inc.	Gordon,5th,Riley, Benson
47-097-03269	Mountain V Oil & Gas, Inc.	Gordon,5th,Riley, Benson
47-097-03270	Mountain V Oil & Gas, Inc.	Gordon,5th,Riley, Benson
47-097-03271	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03272	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03273	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03274	Mountain V Oil & Gas, Inc.	Gordon,5th,Riley, Benson
47-097-03276	Mountain V Oil & Gas, Inc.	Natural not stimulated
47-097-03283	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03284	Mountain V Oil & Gas, Inc.	Speechely, Balltown, Riley, Benson, Elk
47-097-03285	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03298	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03299	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03303	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03304	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03344	Mountain V Oil & Gas, Inc.	Gordon,5th,Riley, Benson
47-097-03345	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03346	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03347	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03360	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03361	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03362	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03367	Mountain V Oil & Gas, Inc.	Gordon,5th,Riley, Benson
47-097-03375	Mountain V Oil & Gas, Inc.	5th, Riley, Benson

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Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-097-03376	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03379	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03380	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03382	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03383	Mountain V Oil & Gas, Inc.	5th,Benson
47-097-03384	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03391	Mountain V Oil & Gas, Inc.	5th, Riley
47-097-03394	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03395	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03396	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03397	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03401	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03402	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03404	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03405	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03406	Mountain V Oil & Gas, Inc.	5th, Riley
47-097-03411	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03412	Mountain V Oil & Gas, Inc.	5th,Riley
47-097-03415	Mountain V Oil & Gas, Inc.	Marcellus, Oriskany
47-097-03416	Mountain V Oil & Gas, Inc.	Marcellus, Oriskany
47-097-03417	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03418	Mountain V Oil & Gas, Inc.	Natural not stimulated
47-097-03419	Mountain V Oil & Gas, Inc.	5th, Benson
47-097-03421	Mountain V Oil & Gas, Inc.	Balltown, Riley, Benson
47-097-03423	Mountain V Oil & Gas, Inc.	5th, Benson
47-097-03425	Mountain V Oil & Gas, Inc.	5th, Riley
47-097-03426	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson

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APPENDIX G

Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-097-03429	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03436	Mountain V Oil & Gas, Inc.	Balltown, Riley, Benson
47-097-03438	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03447	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03453	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03456	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03457	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03458	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03459	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03460	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03461	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03462	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03463	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03470	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03473	Mountain V Oil & Gas, Inc.	Gordon, 5th, Riley, Benson
47-097-03474	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03478	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03485	Mountain V Oil & Gas, Inc.	Riley, 5th, Bayard
47-097-03492	Mountain V Oil & Gas, Inc.	Benson, Riley, Injun, Squaw
47-097-03493	Mountain V Oil & Gas, Inc.	Benson, Bayard, 4th
47-097-03495	Mountain V Oil & Gas, Inc.	Gordon, Riley, Benson
47-097-03507	Mountain V Oil & Gas, Inc.	Riley, 5th, Gordon, 30 ft
47-097-03508	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03519	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03520	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03524	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03532	Mountain V Oil & Gas, Inc.	Riley

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Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-097-03533	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03534	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03536	Mountain V Oil & Gas, Inc.	Benson, Riley, Gordon
47-097-03538	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03539	Mountain V Oil & Gas, Inc.	Benson, Riley, 5th, Injun
47-097-03540	Mountain V Oil & Gas, Inc.	Benson, Riley
47-097-03549	Mountain V Oil & Gas, Inc.	Benson Bayard 5th
47-097-03550	Mountain V Oil & Gas, Inc.	Benson Riley 4th 5th Speechley
47-097-03551	Mountain V Oil & Gas, Inc.	Riley, Benson, Alexander
47-097-03552	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03553	Mountain V Oil & Gas, Inc.	Benson
47-097-03560	Mountain V Oil & Gas, Inc.	Benson Riley 4th 5th
47-097-03566	Mountain V Oil & Gas, Inc.	Benson, Bayard, 4th 5th, Gordon
47-097-03567	Mountain V Oil & Gas, Inc.	Benson, Riley
47-097-03575	Mountain V Oil & Gas, Inc.	Benson Riley
47-097-03585	Mountain V Oil & Gas, Inc.	Benson Riley Gordon Injun
47-097-03589	Mountain V Oil & Gas, Inc.	Benson Speechley 5th
47-097-03590	Mountain V Oil & Gas, Inc.	5th, Benson
47-097-03592	Mountain V Oil & Gas, Inc.	Benson Riley 4th 5th
47-097-03597	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03598	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03603	Mountain V Oil & Gas, Inc.	Benson Riley 4th 5th
47-097-03626	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03633	Mountain V Oil & Gas, Inc.	Riley, Benson, Alexander
47-097-03638	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03646	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03655	Mountain V Oil & Gas, Inc.	5th, Riley, Benson

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APPENDIX G

Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-097-03656	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03657	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03659	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03660	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03661	Mountain V Oil & Gas, Inc.	5th, Riley, Benson
47-097-03713	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03715	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03717	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03732	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03733	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03736	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03738	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03740	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03741	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03742	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03746	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03753	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03754	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03762	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03763	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03765	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03766	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03767	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03779	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03780	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03781	Mountain V Oil & Gas, Inc.	Marcellus Horizontal
47-097-03782	Mountain V Oil & Gas, Inc.	Marcellus Horizontal

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

APPENDIX G

Wells Serviced by Injection Wells

API #	Operator	Producing Formation
47-097-03798	Mountain V Oil & Gas, Inc.	Marcellus Horizontal
47-097-03801	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03808	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03809	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03810	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03812	Mountain V Oil & Gas, Inc.	Marcellus Horizontal
47-097-03822	Mountain V Oil & Gas, Inc.	Marcellus Horizontal
47-097-03835	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03841	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03842	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03843	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03844	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03845	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03853	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03854	Mountain V Oil & Gas, Inc.	Marcellus Vertical
47-097-03855	Mountain V Oil & Gas, Inc.	Marcellus Vertical

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

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

SECTION 10

UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

Section 10 – Monitoring:

1. On a daily basis Mountain V's personnel visits the facility, and accounts for all the information required to fill-in the WR-40 "Report for Waste Disposal Wells", and on a monthly basis sends the department records of those reports.

2. For every barrel of fluid that is received at this facility, Mountain V receives a haul ticket from the trucking company hauling the fluid; on that ticket will be the oil and/or gas well where the fluid was hauled from and the quantity. This allows Mountain V to tract where the fluid is from, and when it was received at the facility.

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

SECTION 11

UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

APPENDIX H

GROUNDWATER PROTECTION PLAN

Facility Name: Haun D Well

County: Upshur

Facility Location:

Postal Service Address:		
Latitude and Longitude:		

Contact Information:

Person:	Jamie Andrews
Phone Number:	304-203-7555
E-mail Address:	jandrews@mountainvoilandgas.com

Date:_____

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

   1. Storage of produced formation brine.
   2. Injection of produced formation brine.
   3. Improper Transfers of fluids

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

   1. All storage facilities have secondary containment.
   2. Injected fluids are confined to the tubing in the injection well by utilizing, an isolation packer. The annulus pressure is continuously monitored to check for leaks.
   3. MIT's

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

   No new equipment or operations will be added to this facility.

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

~~None~~ 1 Injection of waste
2 Secondary containment
3 Above ground storage tanks

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

See attached map and water analysis results. Section 7.4.

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 at the facility, unless allowed by some other regulation or permit.

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.

1. Employees are trained in secondary containment construction, maintenance, and monitoring.
2. Employees are trained in leak detection.
3. Employees are trained in spill prevention and counter measure procedures.

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

1. Secondary containment is inspected monthly. 2. Tubing / casing annulus pressure is monitored continuously. 3. Piping and fitting are inspected monthly for leaks.

Signature: _____

Date: _____

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

SECTION 12

UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

Section 12 – Plugging and Abandonment:

1. The tubing/production casing annulus will be filled with gelled fresh water.
2. The packer will be released.
3. The tubing/packer assembly will be removed from the well and the packer will be removed from the tubing.
4. The open-ended tubing will be placed back into the well and will be lowered to 7750'. perforation.
5. A 200 feet cement plug will be spotted through the tubing that will cover the perforated injection zone followed by gelled water.
6. The tubing will be pulled from the well.
7. The production casing will be cut above the cement top and will be pulled up a few feet to make sure the casing is free.
8. A 100 feet cement plug will be pumped down and spotted at the bottom of the production casing above the casing cut point followed by gelled water.
9. The production casing will be pulled to 2299', 50 feet below the bottom of the 7" casing.
10. A 100 feet cement plug will be spotted through the production casing such that the top of the cement plug will be 50 feet up into the 7" casing followed by gelled water.
11. The production casing will be pulled to 200 feet.
12. A 200 feet cement plug will be spotted from 200 feet to the surface and all of the production casing will be removed from the well.
13. A plugging monument will be erected that is 6" in diameter and 30" tall with the API number noted on the monument.
14. The location will be reclaimed.

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

SECTION 13

UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

Section 13 – Additional Bonding:

No additional bonding is required the department has in it's possession under the original permit, a bond in the amount of Five Thousand Dollars ($5,000.00) to cover the additional bond amount for UIC2D0973737.

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

SECTION 14

UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

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: Mountain V Oil & Gas, Inc.
PO Box 470
Bridgeport, WV 26330

Date: 6-28-17

Subject: Underground Injection Control (UIC) Permit Application
2D0973737
Requirement for Financial Responsibility

I, Mike Shaver, 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: Mike Shaver

Signature: Mike Shaver

Date: 6-28-17

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

SECTION 15
UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

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.

Security at the site is maintained by a locked gate at the entrance of the facility. The site is located approximately 0.6 of a mile from County Route 44 and is not visible from County Route 44.

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

SECTION 16

UIC #: 2D0973737
FACILITY NAME: Haun D Well
OPERATOR: Mountain V Oil & Gas, Inc.

APPENDIX K

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

Permit/approvals	ID Number
Hazardous Waste Management Program under RCRA	
NPDES Program	
Prevention of Significant Deterioration (PSD)	
Nonattainment Program	
Dredge or Fill	
NPDES/NPDES – Stormwater	
WVDEP – Office of Waste Management (OWM) – Solid Waste Facility	
WVDEP – OWM – RCRA (Hazardous Waste TSD or Transporter)	
WVDEP – OWM – UST	
CERCLA – Superfund	
WV Voluntary Remediation – Brownfields	
FIFRA – Federal Insecticide, Fungicide and Rodenticide Act	
Well Head Protection Program (WHPP)	
Underground Injection Control (UIC)	2D0973737
Toxic Substances Control Act (TSCA)	
Best Management Plans	
Management of Used Oil	
Other Relevant Permits (Specify):	