Section 8

Geological Data Injection and Confining Zones

Section 8 – Geological Data on Injection and Confining Zone

8.1 Geology

8.1.1 Geologic Setting

The AOR is situated within the central Alleghany Plateau of the Appalachian Basin Province along Pad Fork in the southern portion of Wyoming County in southern West Virginia (see *Figure 8-1 General Location Map)*. The injection zone is stratigraphically located within the upper Devonian clastic sedimentary system, lying approximately 4000 feet below Pad Fork.

8.1.2 Structural Geology

The principal geologic structures of the central Appalachian Basin are broad, gently folded, southwest-northeast trending anticlines and synclines. The injection area is located on the western limb of the Pineville Anticline where strata is westerly dipping at less than five degrees. Minor undulations and flexures are typical, but faulting and tectonic features are generally absent west of the Allegheny Front, the east-facing escarpment of the Allegheny Mountains which forms the Appalachian Structural Front and the eastern extent of the Allegheny Plateau. There are no documented major fault systems in the AOR or evidence of subsurface faulting or fracturing within or in proximity to the injection or confining zones.

8.1.3 Stratigraphy

8.1.3.1 Injection Zone

The Berea sandstone is characterized as a light-grey to greyish-brown fine-grained sandstone of the upper-Devonian system occurring in northeastern Ohio, northwestern Pennsylvania, western West Virginia and eastern Kentucky. The Berea is locally between 40 and 65 feet in thickness but can thicken to more than 250 feet across the extent of the deposit. The basal contact with upper Devonian shale is generally sharp, as is the upper contact with the Sunbury Shale (also called the Coffee Shale). *Figure 8-2 General Stratigraphic Chart* in the *Appendix* shows the general stratigraphy of southern West Virginia and highlights the location of the Berea within the stratigraphic section.

The Berea is generally comprised of an upper and lower section with the lower unit, when present, invariably showing better porosity and permeability. There are no permeability records

for wells within five miles of the AOR, however regional porosities for the Berea have been documented to be between 3 and 18 percent.

8.1.3.2 Confining Zone

The confining zone overlying the Berea sandstone is the Sunbury (also called the Coffee) shale, a brownish-black organic shale that locally ranges between 10 and 25 feet in thickness. The Sunbury is distinctly identifiable, even in areas of West Virginia where the Berea is not present. In the AOR, the Sunbury is overlain by a shale layer in excess of 300 feet thick. (PRICE FORMATION)

The confining zone appears to be laterally continuous across the AOR and adjacent areas. Shale, by nature and in the absence of post depositional deformation, is impervious, preventing upward fluid mobility. There is no evidence from available data that suggests the presence of subsurface faulting or fracturing within the confining zone. The depth to the top of the confining layer is generally more than 3500 feet below the surface.

8.2 Groundwater Use

A groundwater inventory was conducted that showed no water well usage in a one mile radius from the injection well. Two springs were sampled within a one mile radius of the well. Lab data for spring samples is included in *Section 7*.

8.3 Chemical Compatibility

Water analyses (*provided in Section 7*) show the chemical composition of the injection water. Based on current chemical composition and injection history, there are no anticipated compatibility issues between injection fluid and formation fluid, as has been shown historically.

8.4 Seismic

The AOR is designated as a relatively low seismic risk zone (http://earthquake.usgs.gov/earthquakes/states/west_virginia/hazards.php) with no history of major seismic activity. There are no known seismically active features proximal to the AOR and the likelihood of a future seismic event of sufficient magnitude to cause future migration of injection fluid is low. For seismic history and risk mapping relevant to the AOR, *Figure 8-3 Earthquake Epicenters of West Virginia* published by *West Virginia Geological and Economic Survey and Figure 8-4 Seismic Hazard Map of West Virginia* published by the *United States Geological Survey* in the *Appendix*.

8.5 Geologic Data

Geologic data within a one-mile radius of the injection site is limited. There are no other known wells within a one-mile radius that penetrate the confining or injection zones. There is only one

known well within a one-mile radius, located approximately 3400 feet to the southeast. The well is a coalbed methane well with a total depth of 1750 feet and does not penetrate deep enough to provide geologic data on the confining or injection zones.

Only general lithologic logs are available for well A-55 and some regional wells, including only general identification of rock type and thickness observed by the driller from rotary cuttings. Information from these logs were used for geologic interpretation of the AOR, but due to a lack of availability of geophysical logs, could not be confirmed and therefore provide a lower level of geologic assurance.

8.6 Fluid Migration Model

The following is an estimation of the fluid migration given the information available for the study of the Berea formation within the AOR. The calculation utilizes the volumetric method of prediction of reservoir migration of the injection operation. This calculation uses reservoir height, porosity percent and saturation displacement percent to calculate fluid migration from the well over a given amount of fluid injected. Below is the formula used for this calculation, along with the fluid migration distance from the well and the respective values used.

$$R = \sqrt{Q * 5.615 \left(\frac{ft^3}{bbl}\right) / 3.14 * P * H * Sd}$$

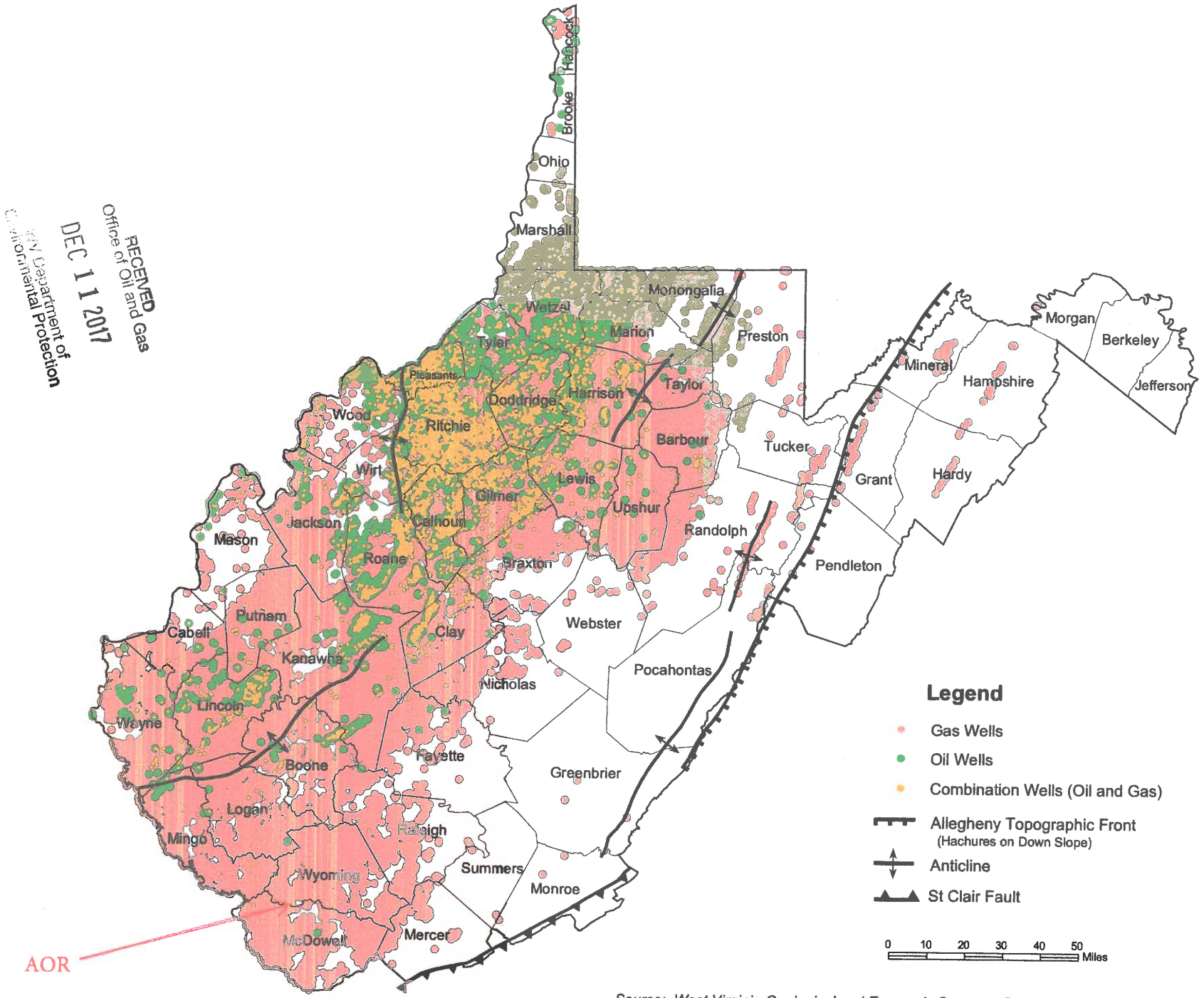
R = Lateral Distance of Fluid Bank from wellbore (ft)
Q = Cumulative Volume (bbls)
P = Porosity Average (%)
H= Reservoir Height (ft)
Sd = Saturation Displacement (%)

The following equation provides the calculation parameters used based on available information for the AOR:

$$R = \sqrt{Q * 5.615 \left(\frac{ft^3}{bbl}\right) / 3.14 * 0.10 * 63 * 0.25}$$

Q = Cumulative Volume	R = Lateral Distance of Fluid Bank From Well Bore
100,000	337.0 ft
250,000	532.8 ft
500,000	753.5 ft
1,000,000	1065.5 ft
1,500,000	1305.0 ft
2,000,000	1506.9 ft

General Lo .on Map

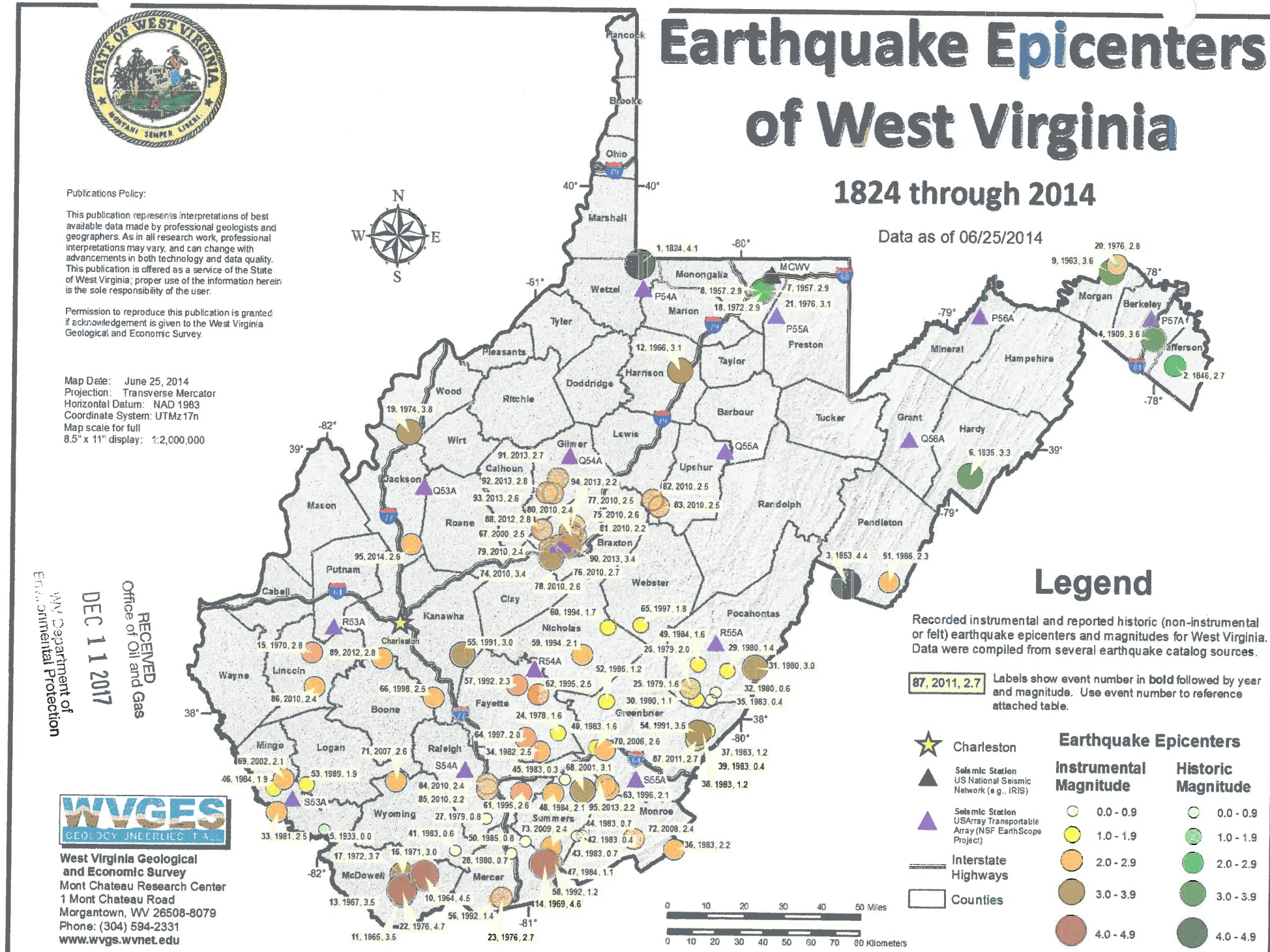


Source: West Virginia Geological and Economic Survey Date: November 2003

Earthquake Epicenters of West Virginia

1824 through 2014

Data as of 06/25/2014



Publications Policy:

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

Map Date: June 25, 2014
Projection: Transverse Mercator
Horizontal Datum: NAD 1983
Coordinate System: UTMz17n
Map scale for full
8.5" x 11" display: 1:2,000,000

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Legend

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

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

- Charleston
- Seismic Station: US National Seismic Network (e.g., IRIS)
- Seismic Station: USArray Transportable Array (NSF EarthScope Project)
- Interstate Highways
- Counties

Earthquake Epicenters

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

0 10 20 30 40 50 Miles
0 10 20 30 40 50 60 70 80 Kilometers

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

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

Data as of **June 25, 2014**. For a more detailed listing, please download the West Virginia Earthquake spreadsheet from WVGES at http://www.wvgs.wvnet.edu/www/earthquakes/seismic.html
If you view this map and data as a PDF, you can click any of the blue hyperlinked text to view further information on a web site.
Please note that USGS Links, above, are considered "beta" at the time of this publication and USGS may change destinations, pages, etc. afterward.

Definition of terms on next page.

WVGES
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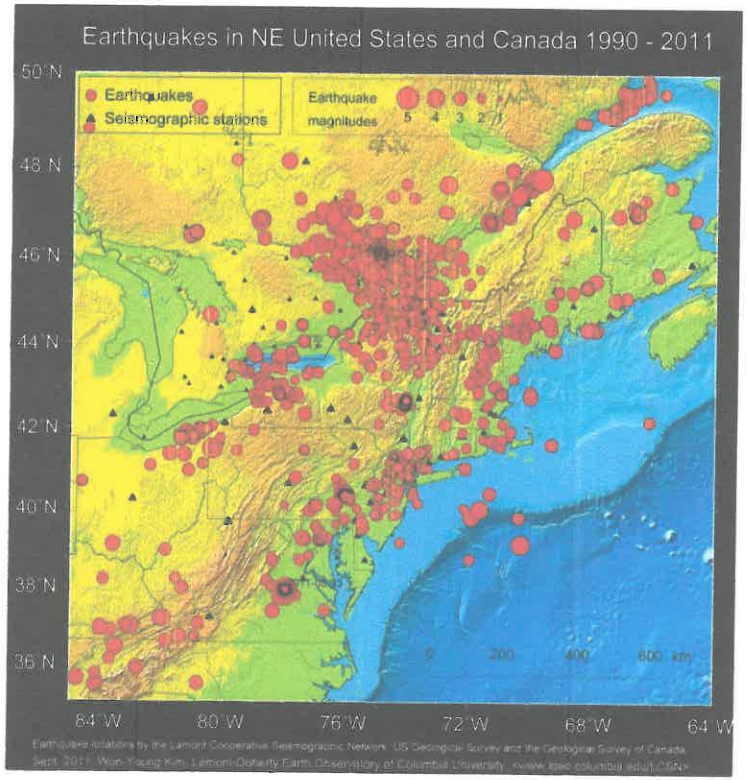
Definitions and Explanations:

- **County**: the name of the county where the epicenter was located, derived from spatial selection.
- Dates and times are in Coordinated Universal Time (UTC) for Year, Month, Day, Hours (HH), Minutes (MM) and Seconds (SS). (For Eastern Standard Time, the offset is - 5 hours).
- **Magnitude (Mag)**: Magnitude numbers indicative of an earthquake's relative size and is the measured maximum motion as recorded by a seismograph. The numbers are pulled from various sources; the primary source whenever possible.
- **Recorded**: refers to the means by which magnitudes were recorded: if they were reported as "felt" (Historical) or recorded via scientific instrumentation (Instrumental) as retrieved from Source1 or Source2.
- **Latitude** (Lat_N) and **Longitude** (Lon_W) values are expressed in decimal degrees for the northern (_N) and western (_W) hemispheres, respectively.
- **MMI**: The Modified Mercalli Intensity scale for epicenter intensity, usually designated with Roman numerals. Visit USGS at http://earthquake.usgs.gov/learn/topics/mercalli.php for further information.
- **Mag_Type**: Magnitude type code; the method used in measuring magnitudes (e.g., *Mb* for "body-wave", *Mc* for "coda amplitude", *Md* for "coda duration").
- **Depth_KM**: The reported depth of the earthquake hypocenter or focus (below the epicenter on the surface) in kilometers.

For other or more detailed earthquake and seismological definitions, please visit the USGS (http://earthquake.usgs.gov/learn/glossary/) and Rapid Earthquake Viewer (http://rev.seis.sc.edu/definition.html).

Sources (Source1 and Source2):

- VTSO – Virginia Tech Seismological Observatory (Primary Source)
- ANSS – Advanced National Seismic System
- CERI – Center for Earthquake Research and Information
- LDEO – Lamont-Doherty Earth Observatory
- NCEER – National Center for Earthquake Engineering Research
- USGS ENS – United States Geological Survey, Earthquake Notification Service
- Wheeler I-2737 – Wheeler, Russell L., *Earthquakes In and Near the Northeastern United States, 1638-1998* (Used only as reference here)



Northeastern United States and southeastern Canadian earthquakes from 1990 to 2011.
Image courtesy of the Lamont-Doherty Earth Observatory (Won-Young Kim)
of Columbia University, New York. Used by permission.

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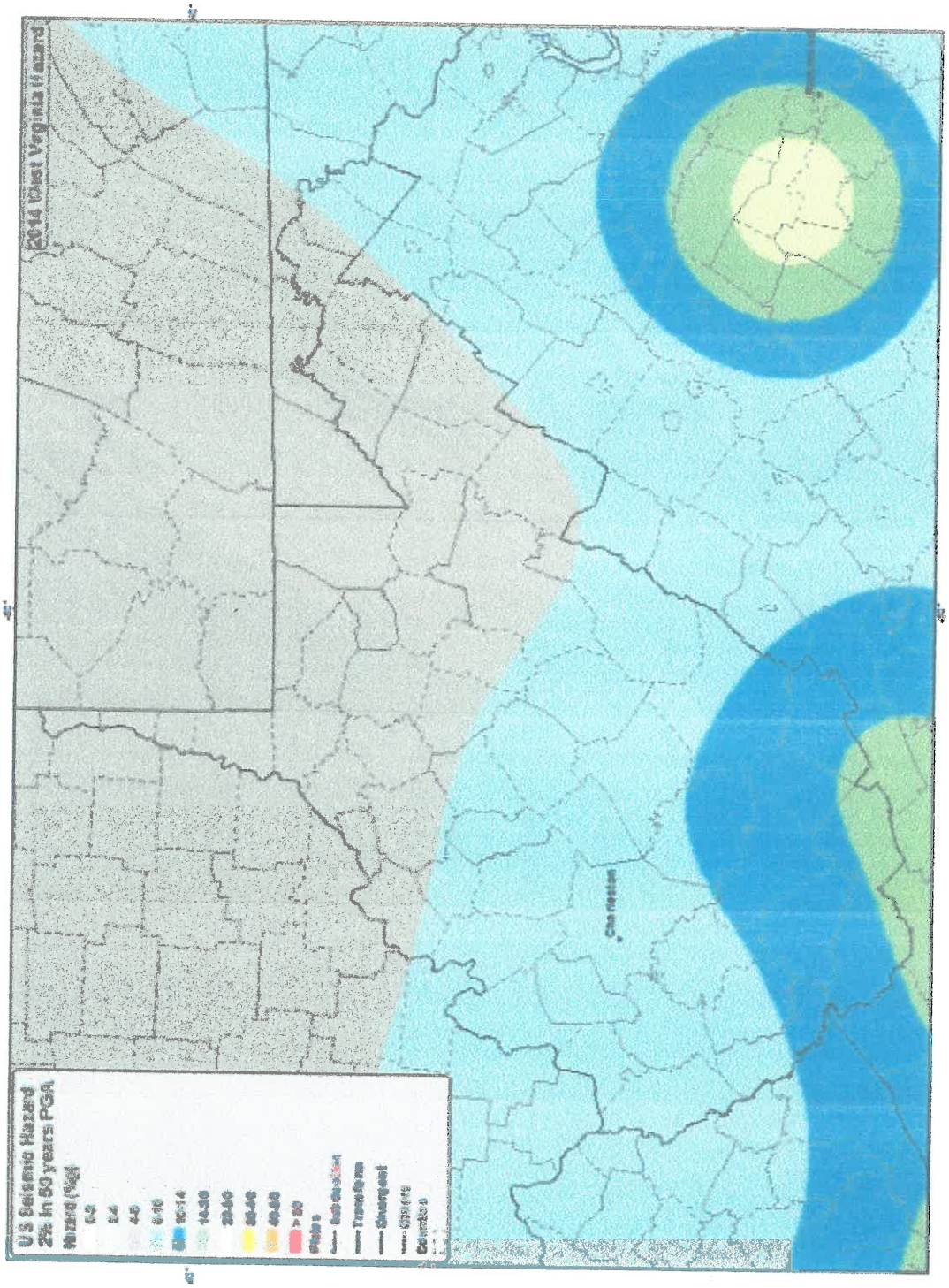
GEOLOGY UNDERLIES IT ALL
West Virginia Geological and
Economic Survey
http://www.wvgs.wvnet.edu/



Generalized Stratigraphic Chart for West Virginia

Era	System	Series/ Stage	Western WV	Eastern WV	Drillers' Terminology
CENOZOIC	Paleogene	Eocene		Igneous Intrusives	
MESOZOIC	Jurassic			Igneous Intrusives	
	PERMIAN		Dunkard Group		
PALEOZOIC	CARBONIFEROUS (PENNSYLVANIAN Subsystem)	Upper	Monongahela Fm.		Carroll, Minshall, Murphy, Moundsville, 1st Cow Run, Little Dunkard, Big Dunkard
		Middle	Conemaugh Group		
			Allegheny Fm.		Burning Springs, 2nd Cow Run, Gas Sands, Horseneck
		Lower	Kanawha Fm., New River Fm., Pocahontas Fm. — Pottsville Group		Salt Sands
	CARBONIFEROUS (MISSISSIPPIAN Subsystem)	Upper	Bluestone Fm., Princeton Ss., Hinton Fm., Bluefield Fm. — Mauch Chunk Group		Pride, Ravencliff, Avis, Maxton, Little Lime, Pencil Cave, Blue Monday
		Middle	Greenbrier Group		Big Lime, Keener, Big Injun
			Maccrady Fm. (south)		
		Lower	Sunbury Sh. / Berea Ss.	Price Fm.	Big Injun, Squaw, Weir, Coffee Sh.
	DEVONIAN	Upper	Ohio Sh. (Cleveland Sh., Chagrin Sh., Huron Sh.); Java Fm. (Hanover Sh., Pipe Creek Sh.); West Falls Fm. (Angola Sh., Rhinestreet Sh.); Sonyea Fm. (Cashaqua Sh., Middlesex Sh.); Genesee Fm./ Harrell Sh. (West River Sh., Geneseo Sh./Burket Sh.)	Hampshire Group; Greenland Gap Group (Foreknobs Fm., Scherr Fm.); Brallier Fm.	Gantz, 50', 30', Gordon, Gordon Stray, 4th, 5th, Bayard, Elizabeth, Warren, Speechley, Balltown, Bradford, Riley, Benson, Alexander, Elk, Haverty, Fox, Sycamore
				Harrell Sh.	
		Middle	Hamilton Group (Tully Ls., Mahantango Fm., Marcellus Sh.)	Millboro Sh. (Mahantango Fm., Marcellus Sh.)	
			Onondaga Ls. (Tioga ash beds)	Huntersville Chert (Tioga ash beds); Needmore Sh.	
		Lower	Oriskany Ss.		
			Helderberg Group		
	SILURIAN	Upper	Bass Islands Fm.	Big Mountain Sh., Clifton Forge Ss., Keyser Fm.	Newburg
			Salina Fm.	Lower Keyser Mbr., Tonoloway Fm.	
			Lockport Dol.	Wills Creek Fm., Williamsport Fm., McKenzie Fm., Bloomsburg Fm.	
			Rochester Sh.		"Big Six"
			Keefer Fm.		
		Lower	Rose Hill Fm.		Clinton
			Tuscarora Ss.		Medina
	ORDOVICIAN	Upper	Juniata Fm.	Juniata Fm., Oswego Fm.	
			"Martinsburg" Fm.	Reedsville Fm., Martinsburg Fm.	
			"Utica Shale"		Point Pleasant
			"Trenton" Ls.	Trenton Group, Dolly Ridge Fm., Nealmont Ls.	Logana
			Black River Group		
		Middle	Wells Creek Fm., St. Peter Ss.	St. Paul Group (Lincolnshire Fm., New Market Ls., Row Park Ls.)	
		Lower	Knox Group: Beekmantown Dol.	Beekmantown Dol. (Pinesburg Station Dol., Rockdale Run Fm., Stonehenge Ls., Stoufferstown Mbr.)	Rose Run
	CAMBRIAN	Upper	Copper Ridge Dol.	Conococheague Fm.	Rogersville
		Middle	Conasauga Group	Elbrook Fm.	
		Lower	Rome Group	Waynesboro Fm.	
				Tomstown Dol.	
			"Chilhowee Group"/ basal ss.	Antietam Fm., Harpers Fm., Weverton Fm.	
PRECAMBRIAN			Catoctin Fm.		
			Swift Run Fm.		

Igneous/ Metamorphic | Coal-bearing interval | Organic shale

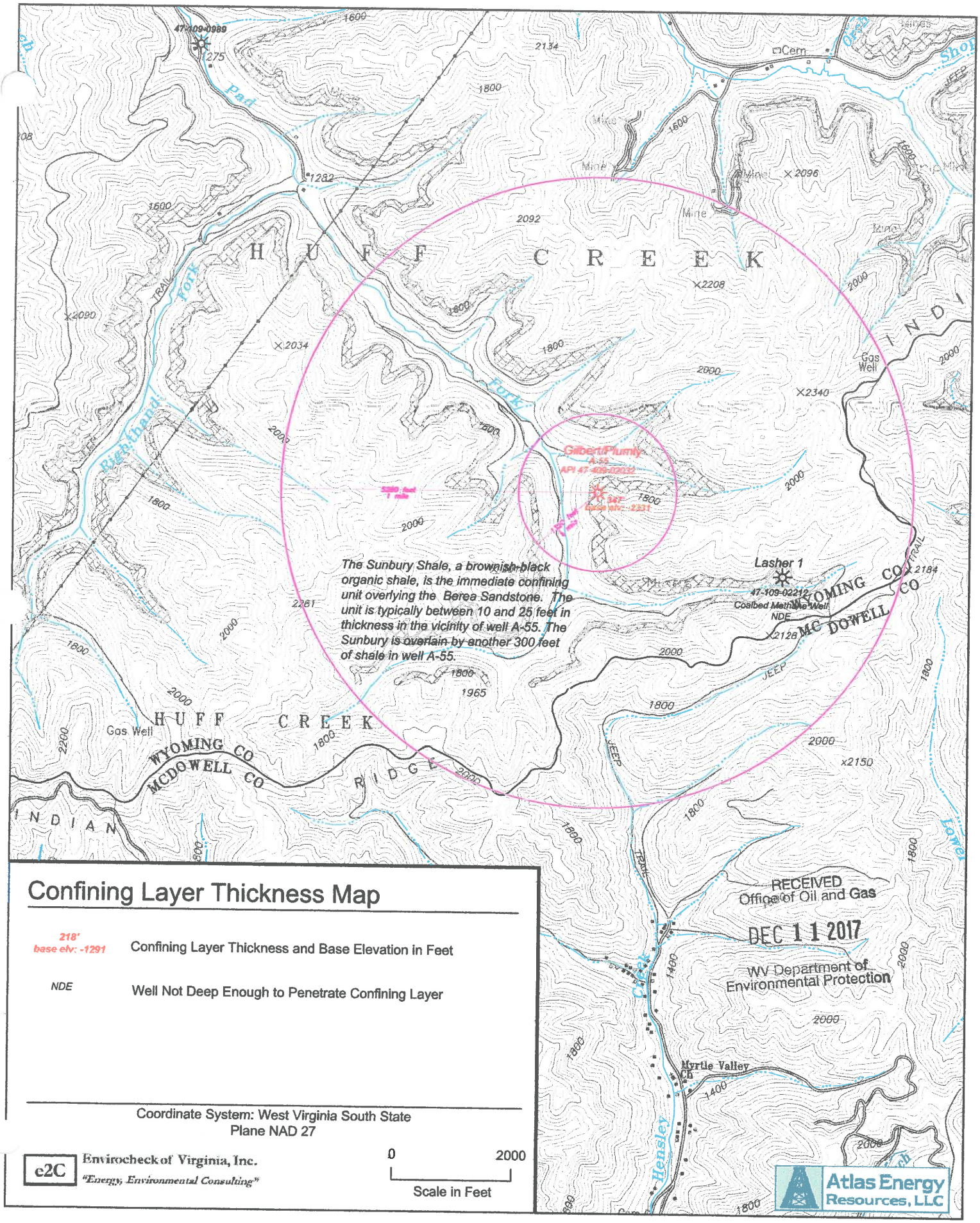
Fm. Formation; Ls. Limestone; Ss. Sandstone; Dol. Dolomite; Sh. Shale; Mbr. Member; unconformity; facies

Note: No vertical scale implied

(This chart uses current WVGES terminology and supercedes stratigraphic unit names used in older publications.)

Map-29A 2014

WVGES West Virginia Geological and Economic Survey



Confining Layer Thickness Map

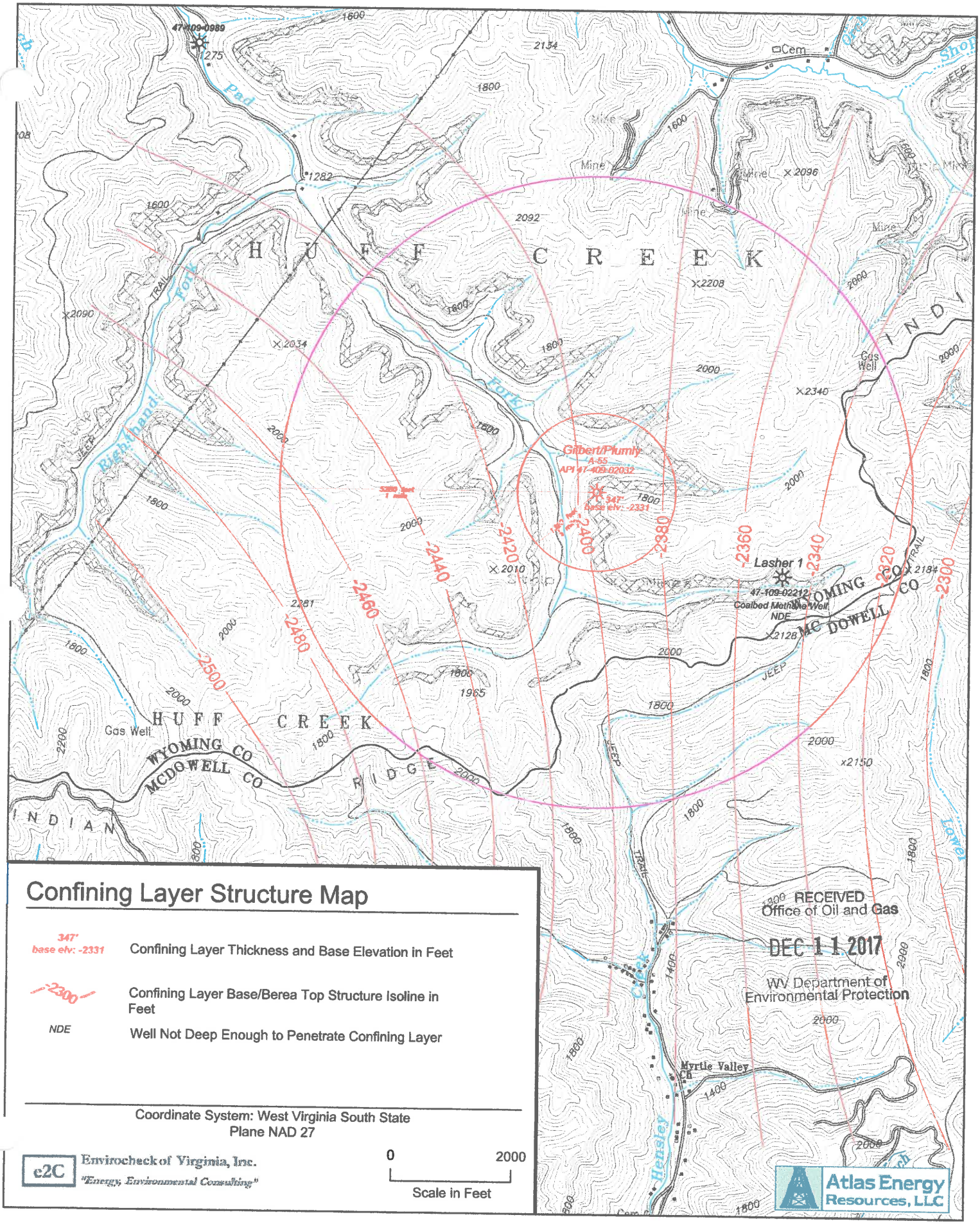
218' base elv: -1291	Confining Layer Thickness and Base Elevation in Feet
NDE	Well Not Deep Enough to Penetrate Confining Layer

Coordinate System: West Virginia South State Plane NAD 27

e2C Envirocheck of Virginia, Inc.
"Energy, Environmental Consulting"

0 2000
Scale in Feet

Atlas Energy Resources, LLC



Confining Layer Structure Map

347' base elv: -2331	Confining Layer Thickness and Base Elevation in Feet
-2300	Confining Layer Base/Berea Top Structure Isoline in Feet
NDE	Well Not Deep Enough to Penetrate Confining Layer

Coordinate System: West Virginia South State Plane NAD 27

e2C Envirocheck of Virginia, Inc.
"Energy, Environmental Consulting"

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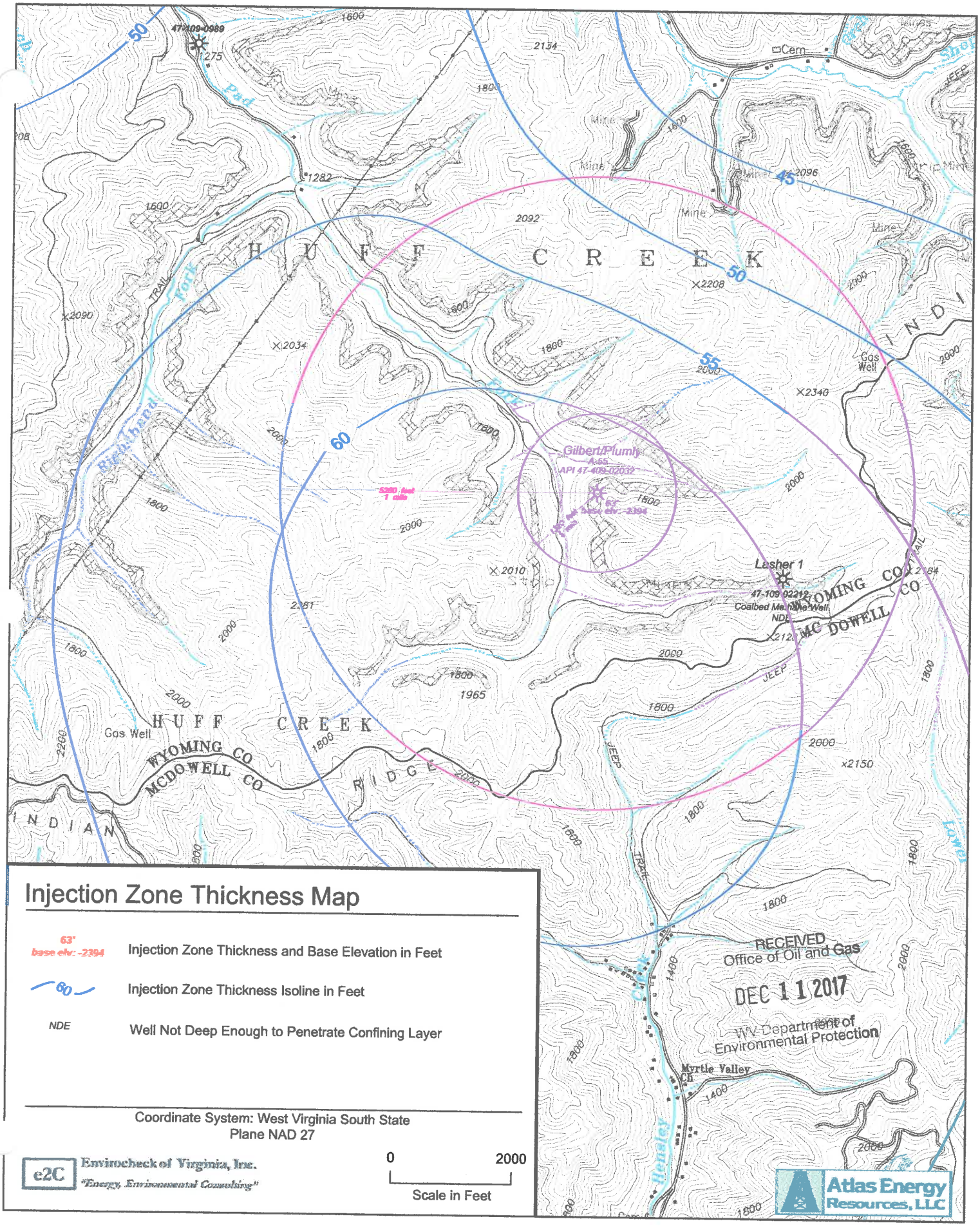
Scale in Feet

Atlas Energy Resources, LLC



Injection Zone Thickness Map

63'
base elv: -2394 — Injection Zone Thickness and Base Elevation in Feet

60 — Injection Zone Thickness Isoline in Feet

NDE — Well Not Deep Enough to Penetrate Confining Layer

Coordinate System: West Virginia South State Plane NAD 27

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"Energy, Environmental Consulting"

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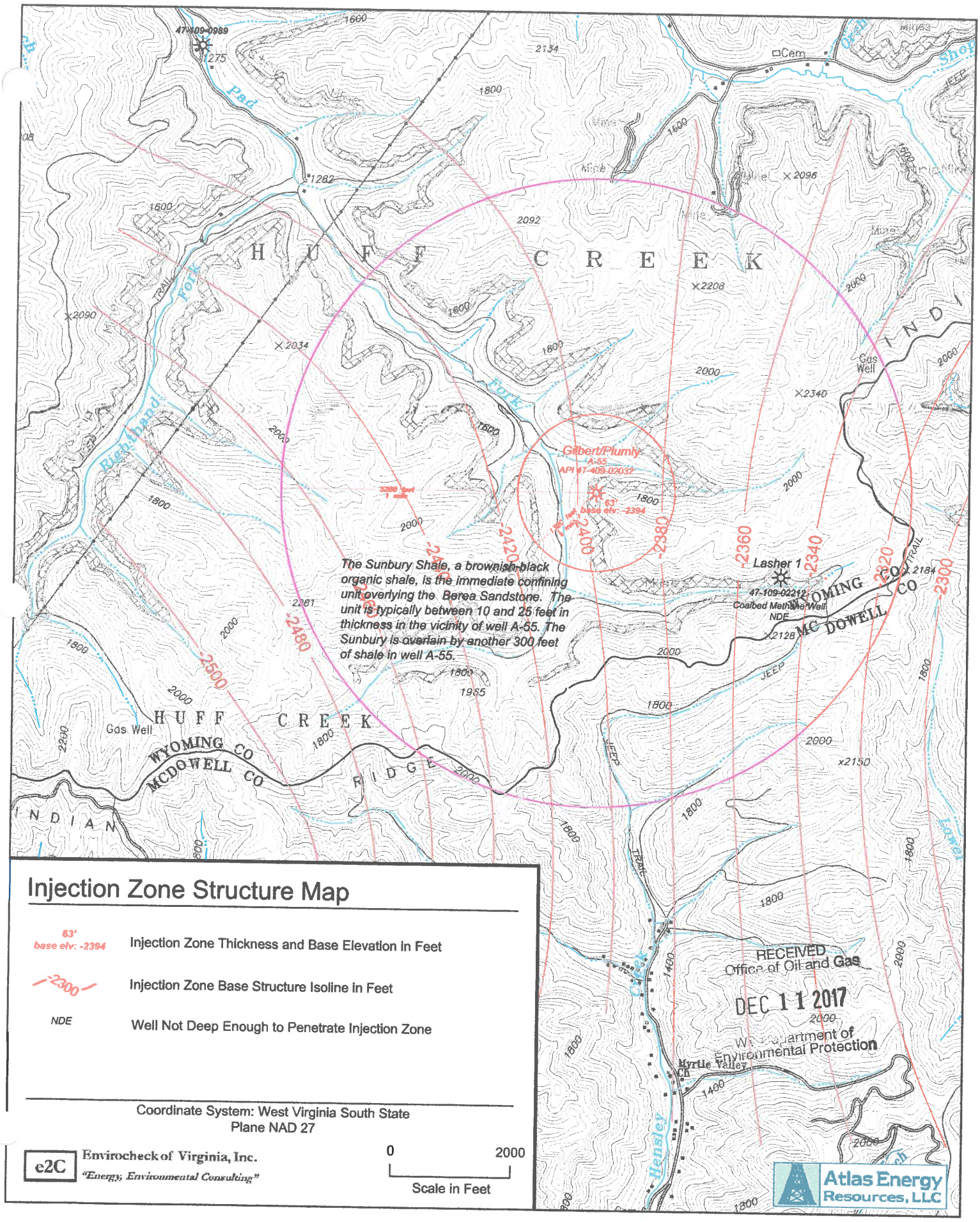
Scale in Feet

Atlas Energy Resources, LLC



Injection Zone Structure Map

63' base elv: -2394	Injection Zone Thickness and Base Elevation in Feet
-2300	Injection Zone Base Structure Isoline in Feet
NDE	Well Not Deep Enough to Penetrate Injection Zone

Coordinate System: West Virginia South State Plane NAD 27

e2C Envirocheck of Virginia, Inc.
"Energy, Environmental Consulting"

0 2000
Scale in Feet

Atlas Energy Resources, LLC

GAMMA RAY CEMENT BOND VDL - CCL

WELL SERVICE LLC.

Company	GEOMET OPERATING COMPANY, INC.
Well	GILBERT AND PLUMLEY A-#55
Field	HUFF CREEK
County	WYOMING
State	WEST VIRGINIA

Company GEOMET OPERATING COMPANY, INC.
Well GILBERT AND PLUMLEY A-#55
Field HUFF CREEK
County WYOMING State WEST VIRGINIA
Location: API #: 47109073032

	SEC	TWP	RGE	Elevation	Elevation
Permanent Datum				1686'	K.B.
Log Measured From					D.F.
Drilling Measured From					G.L. 1626'

Other Services

Date	01-23-03
Run Number	One
Depth Driller	
Depth Logger	4178'
Bottom Logged Interval	4172"
Top Log Interval	
Open Hole Size	6 1/4"
Type Fluid	WATER
Density / Viscosity	
Max. Recorded Temp.	
Estimated Cement Top	
Time Well Ready	
Time Logger on Bottom	
Equipment Number	
Location	
Recorded By	R. L. MOSELEY
Witnessed By	MR CLEARY

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To

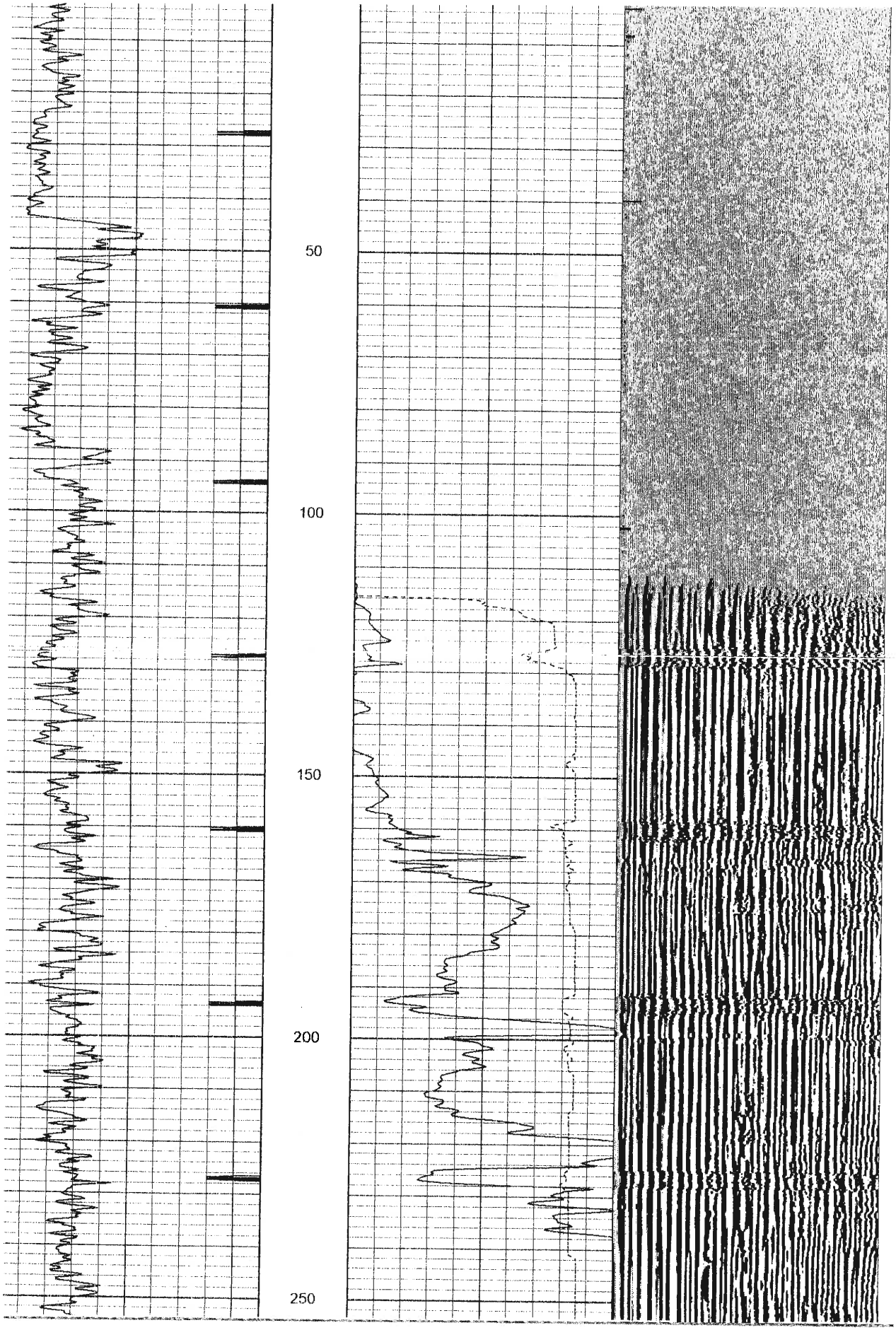
Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String				
Prot. String				
Production String	4.5"		SURFACE	4178'
Liner				

<< Fold Here >>>

Comments

Database File:	55cbl.db
Dataset Pathname:	pass1
Presentation Format:	cbl_sr
Dataset Creation:	Thu Jan 23 11:05:13 2003 by Log 6.2_B4
Charted by:	Depth in Feet scaled 1:240

Collar Locator	-1	0	Amplitude (mV)	100	200	Variable Density	1200
Gamma Ray (GAPI)	200	1200	Travel Time (usec)	200			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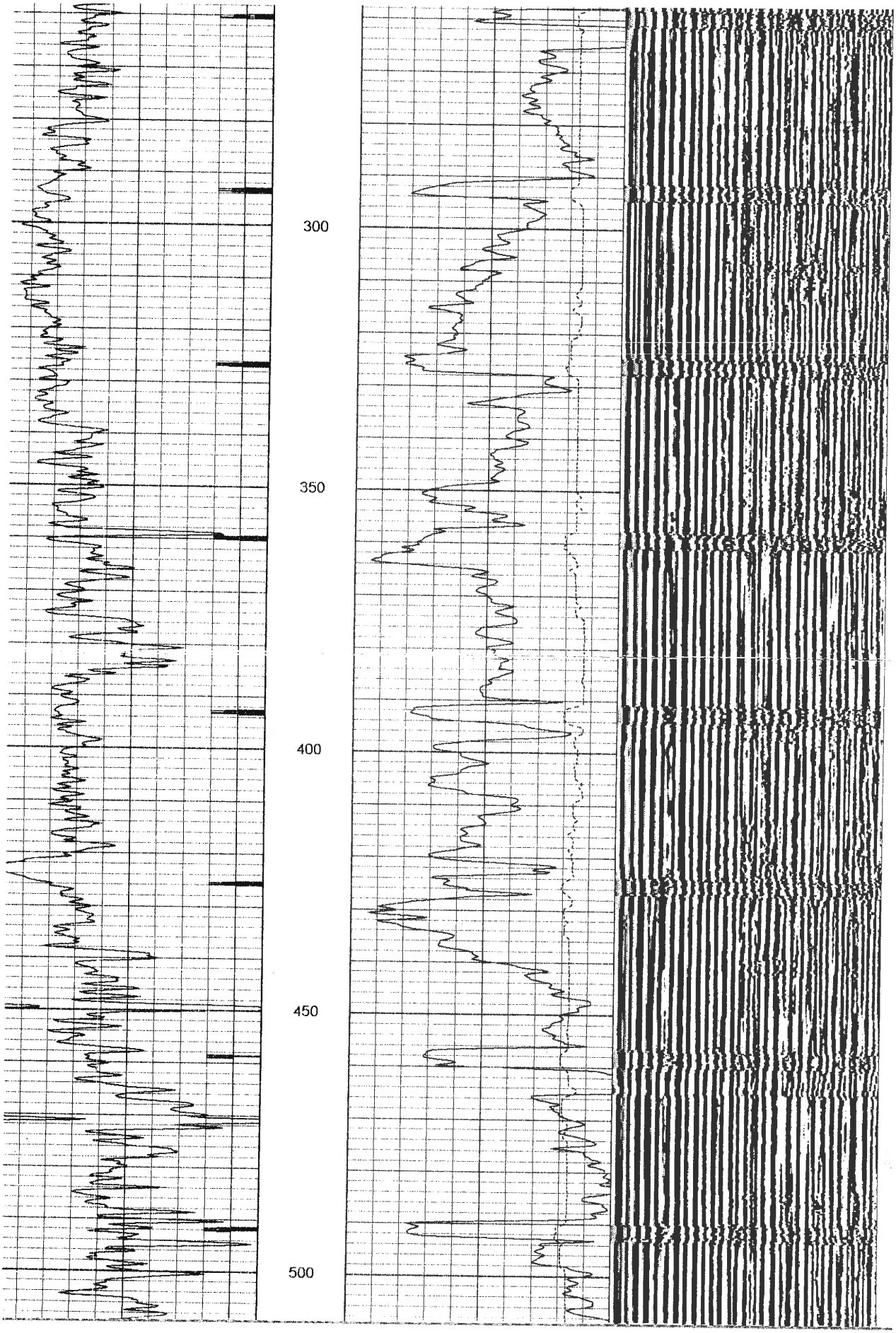
200
250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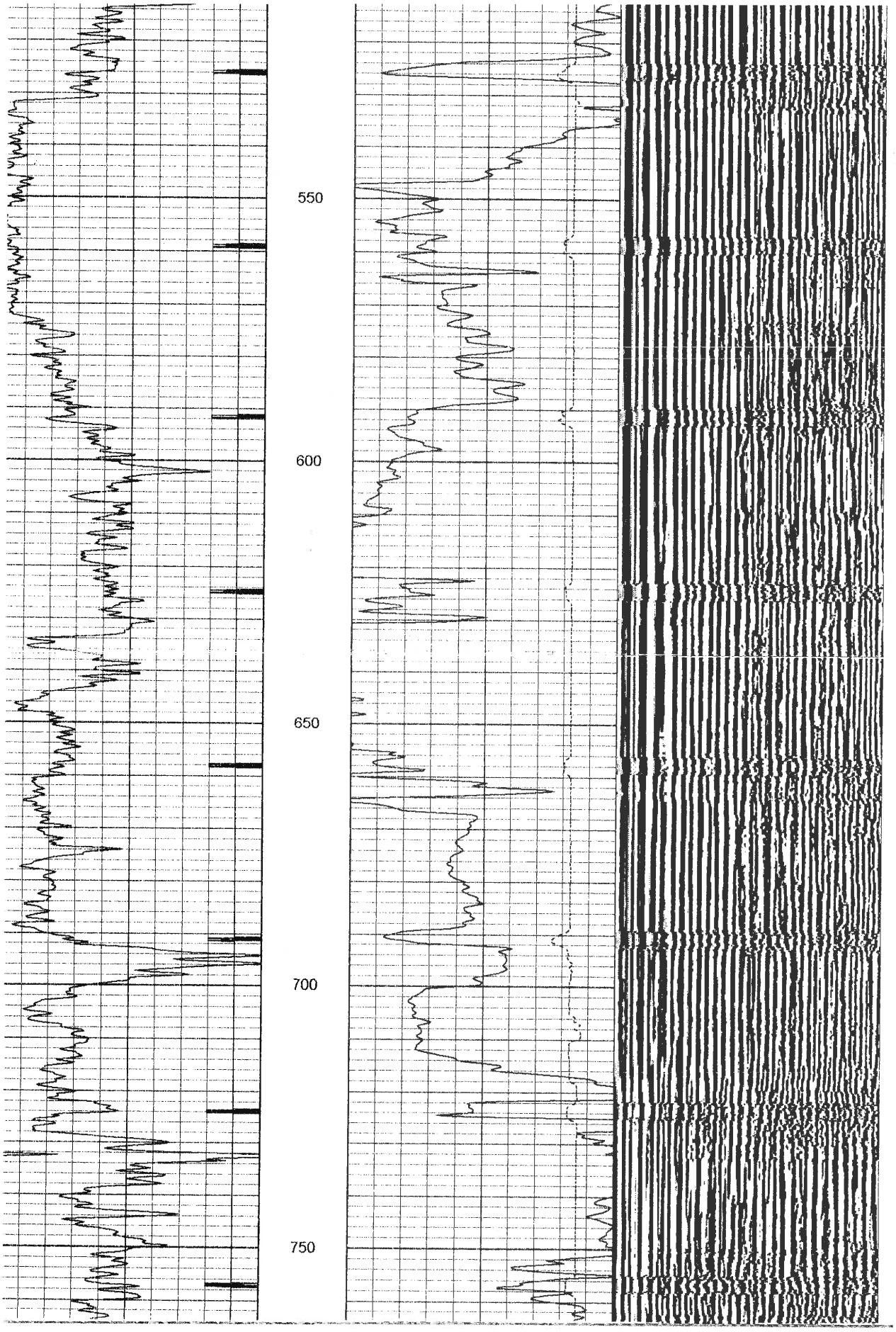
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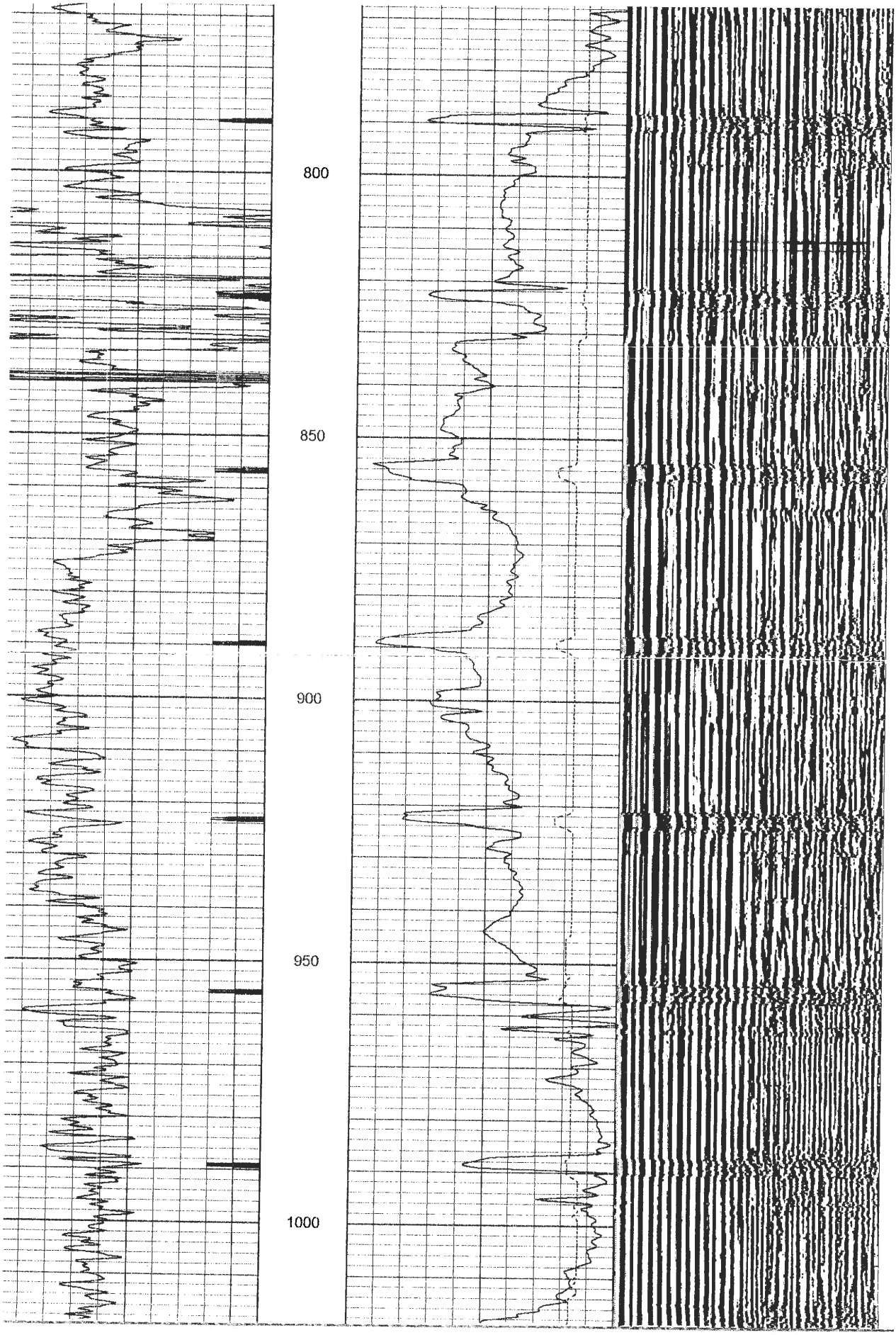
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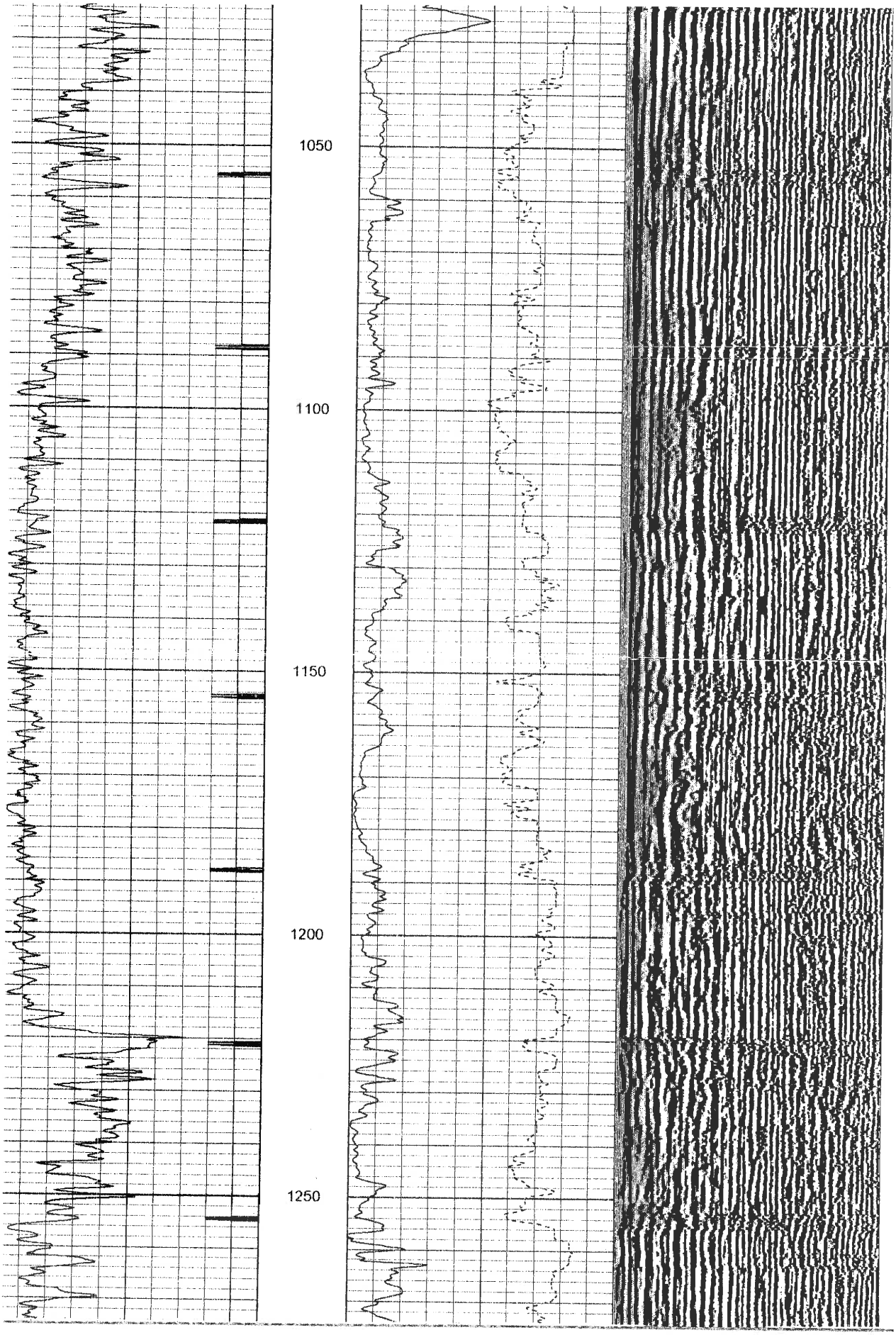
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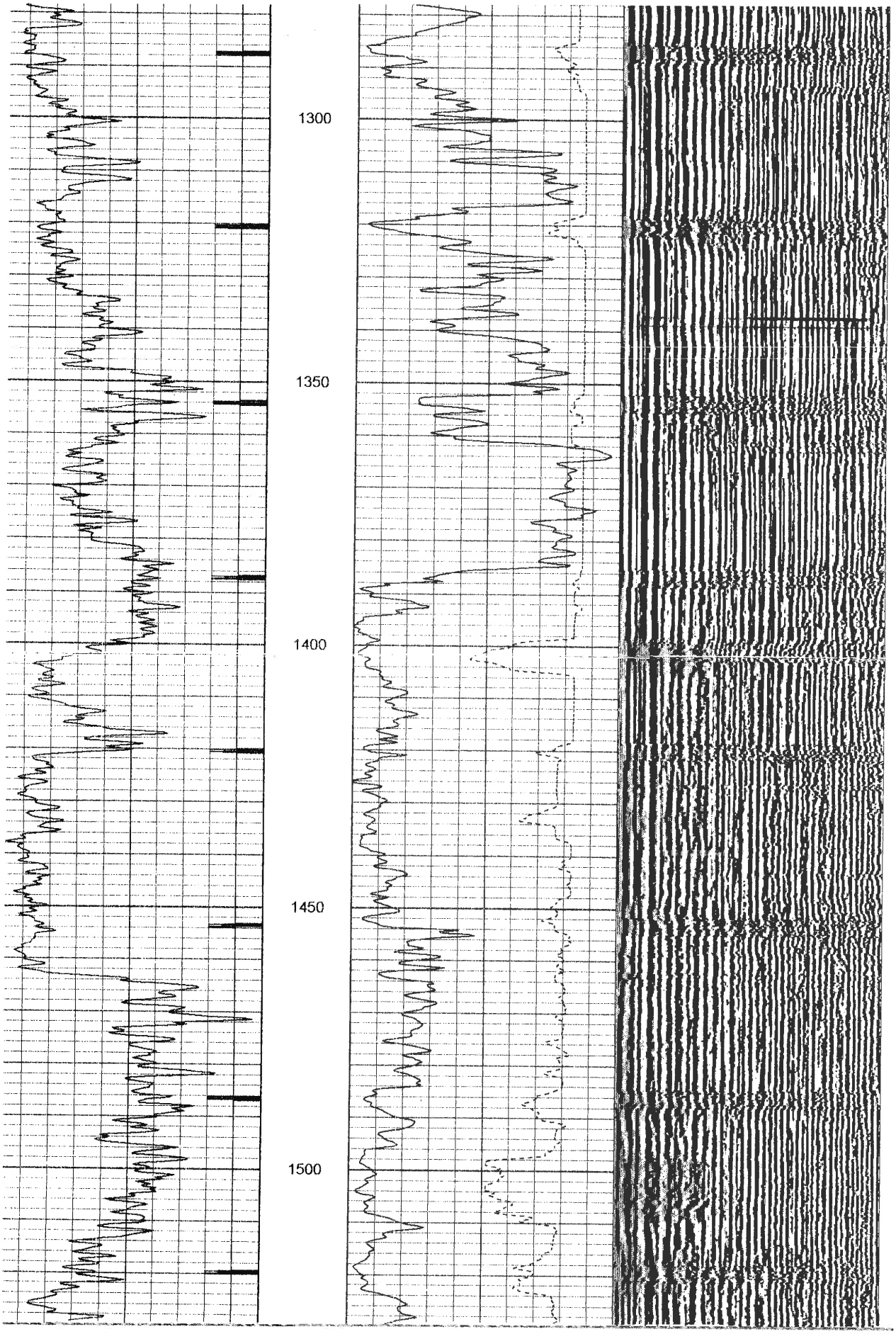
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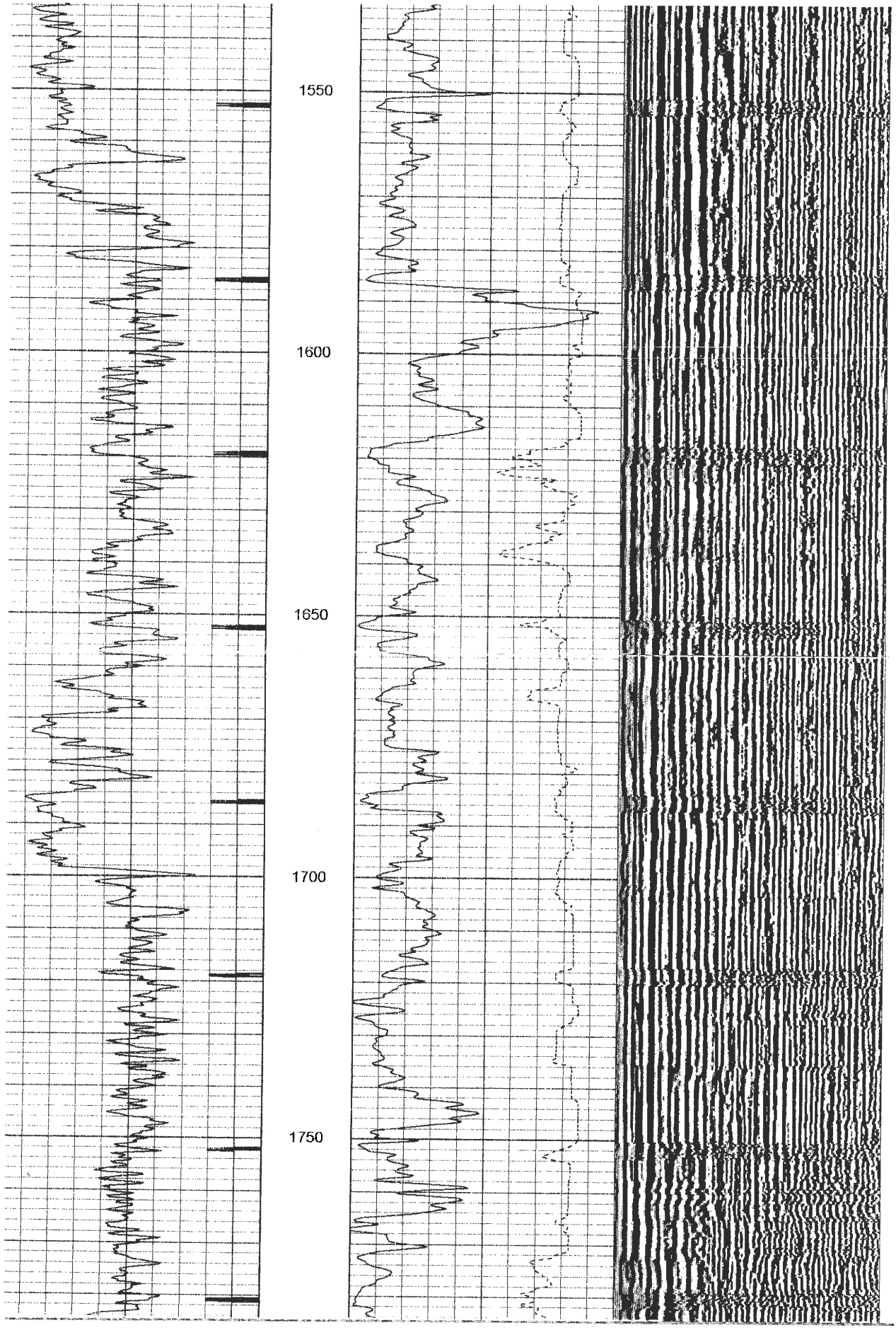
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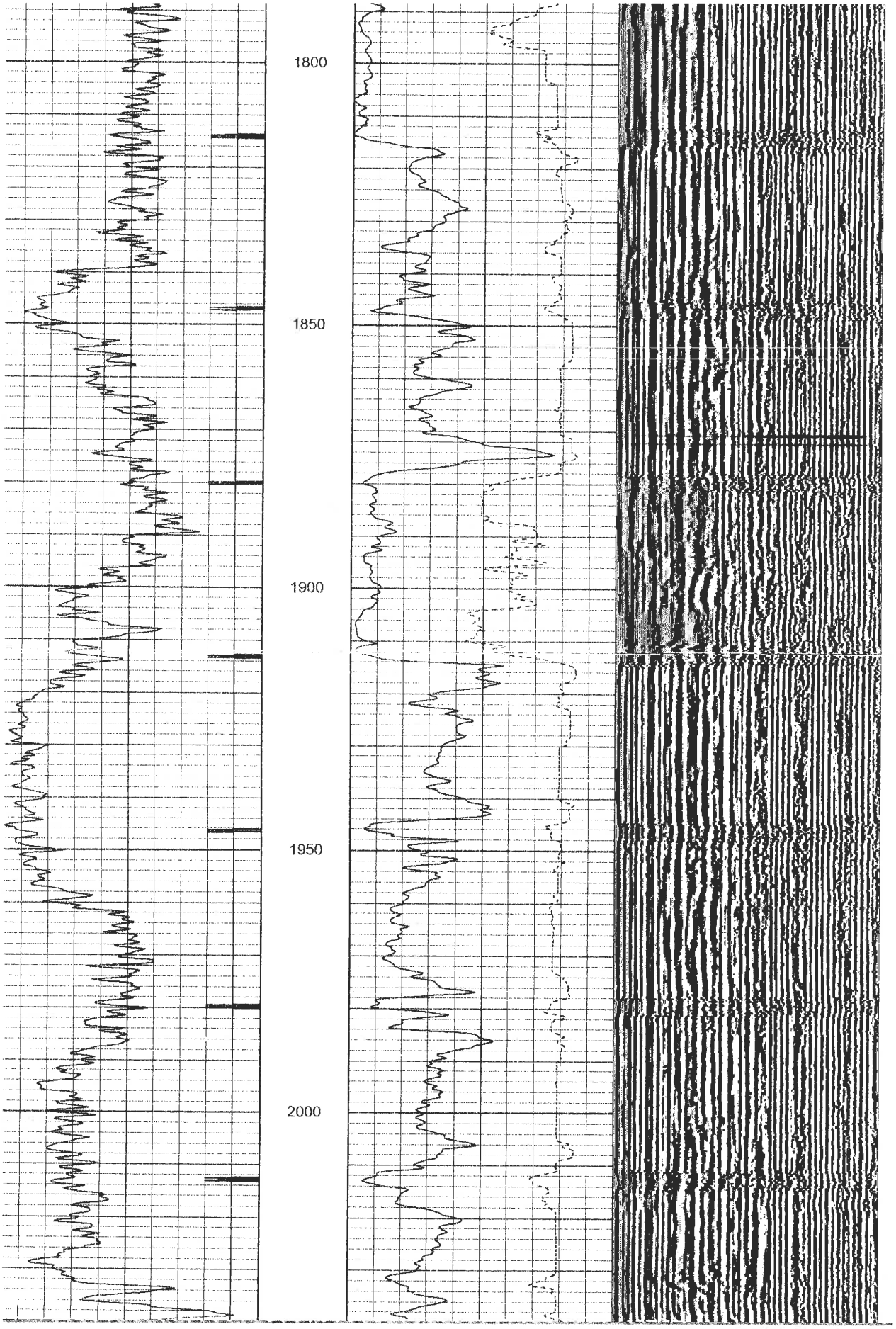
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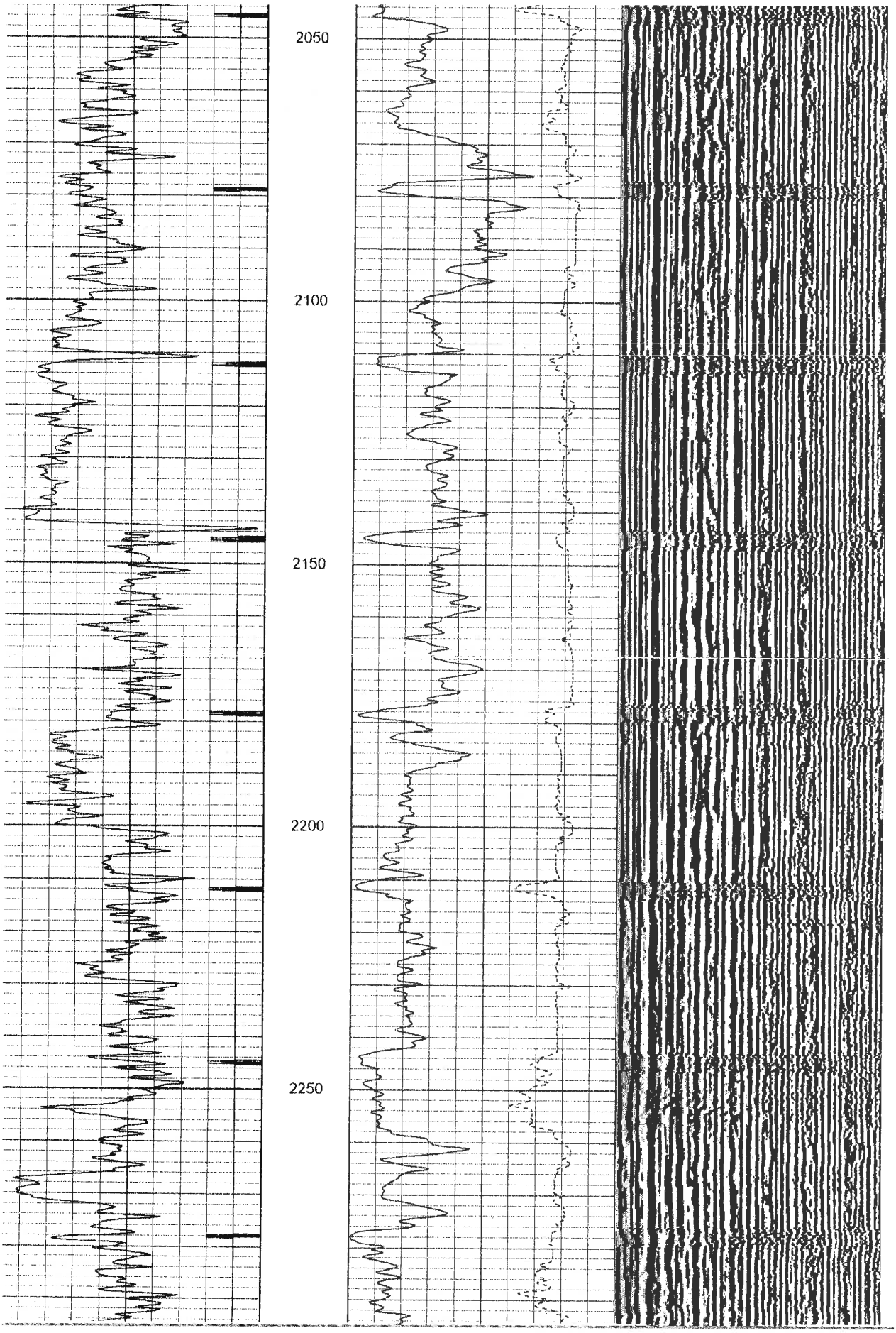
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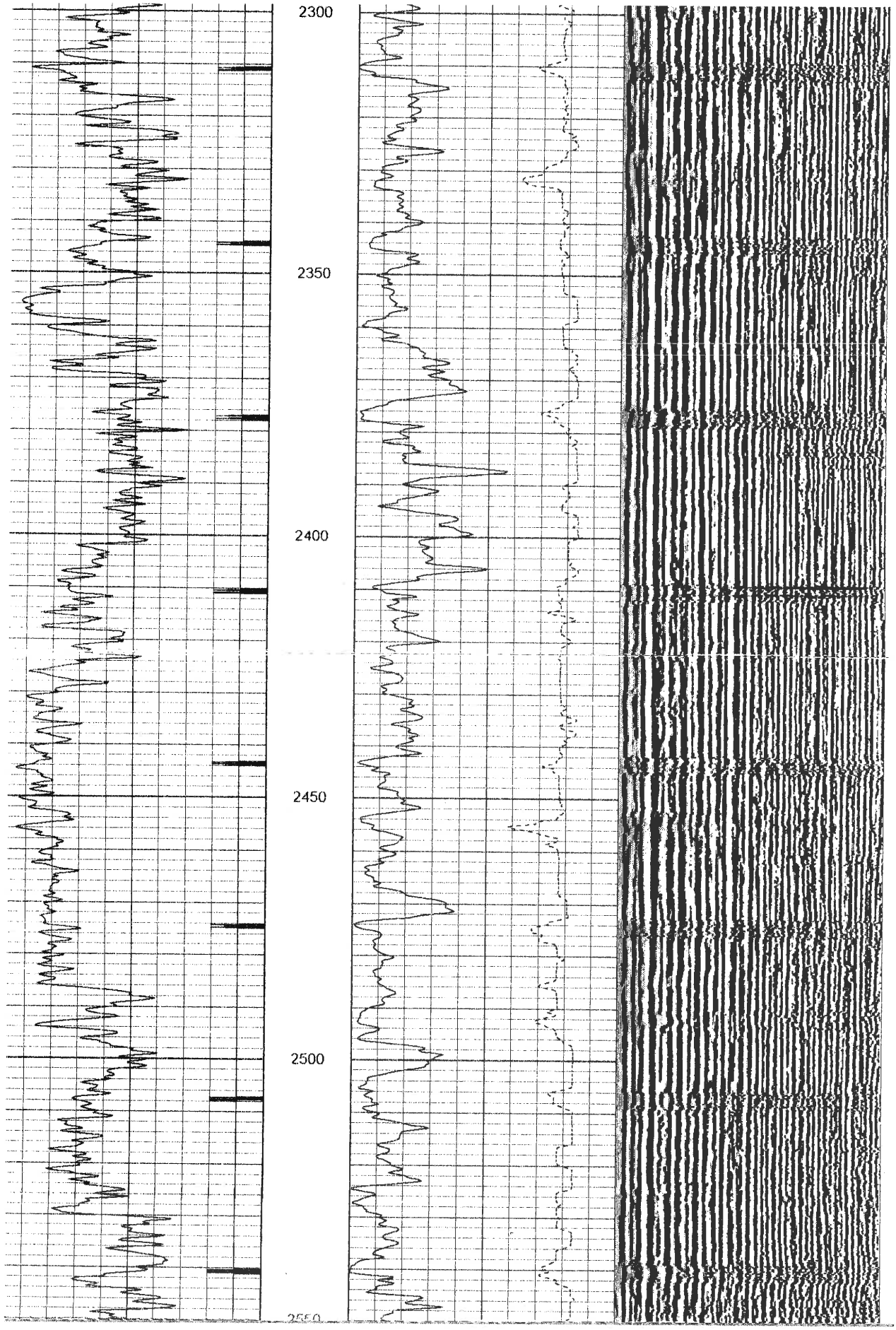
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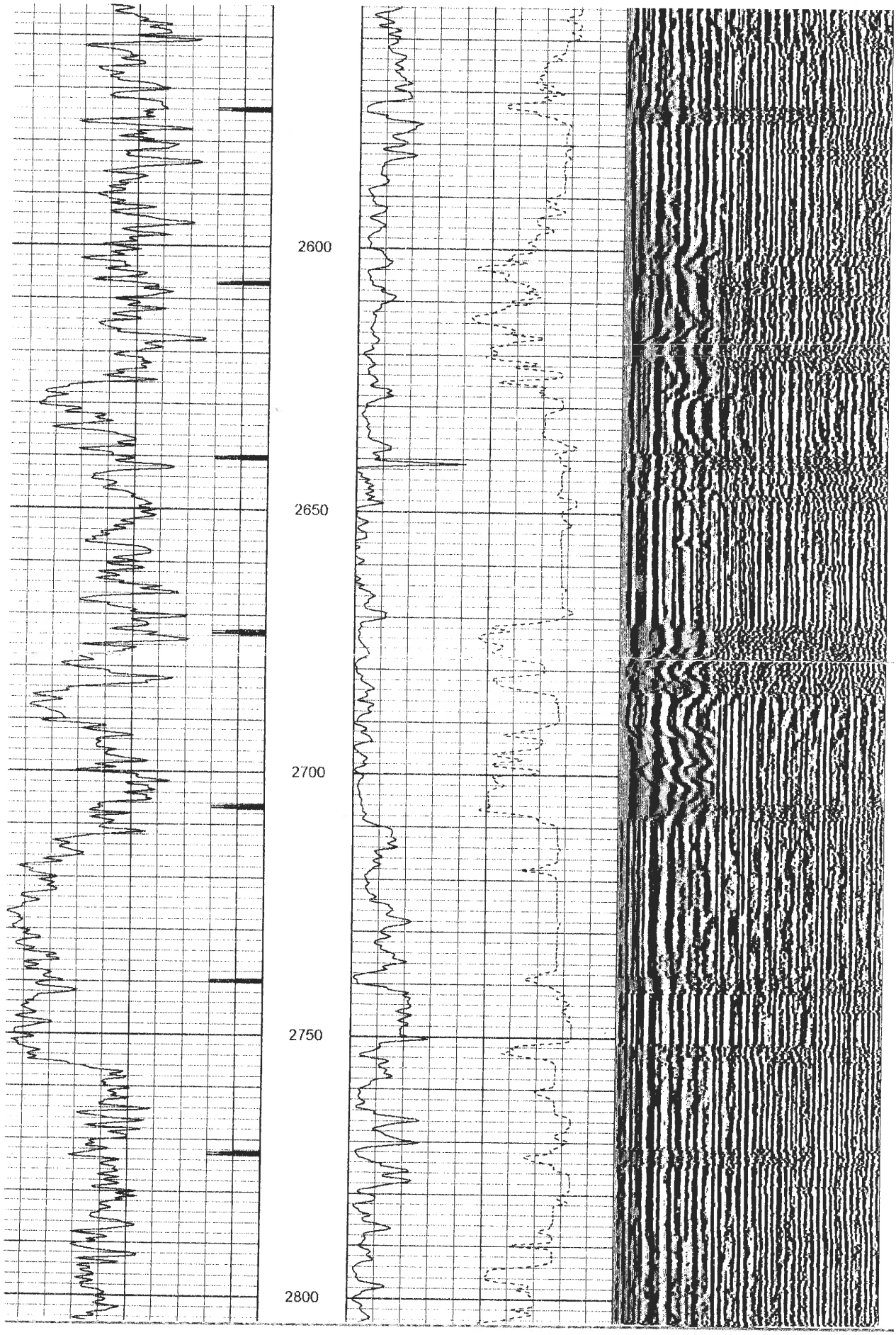
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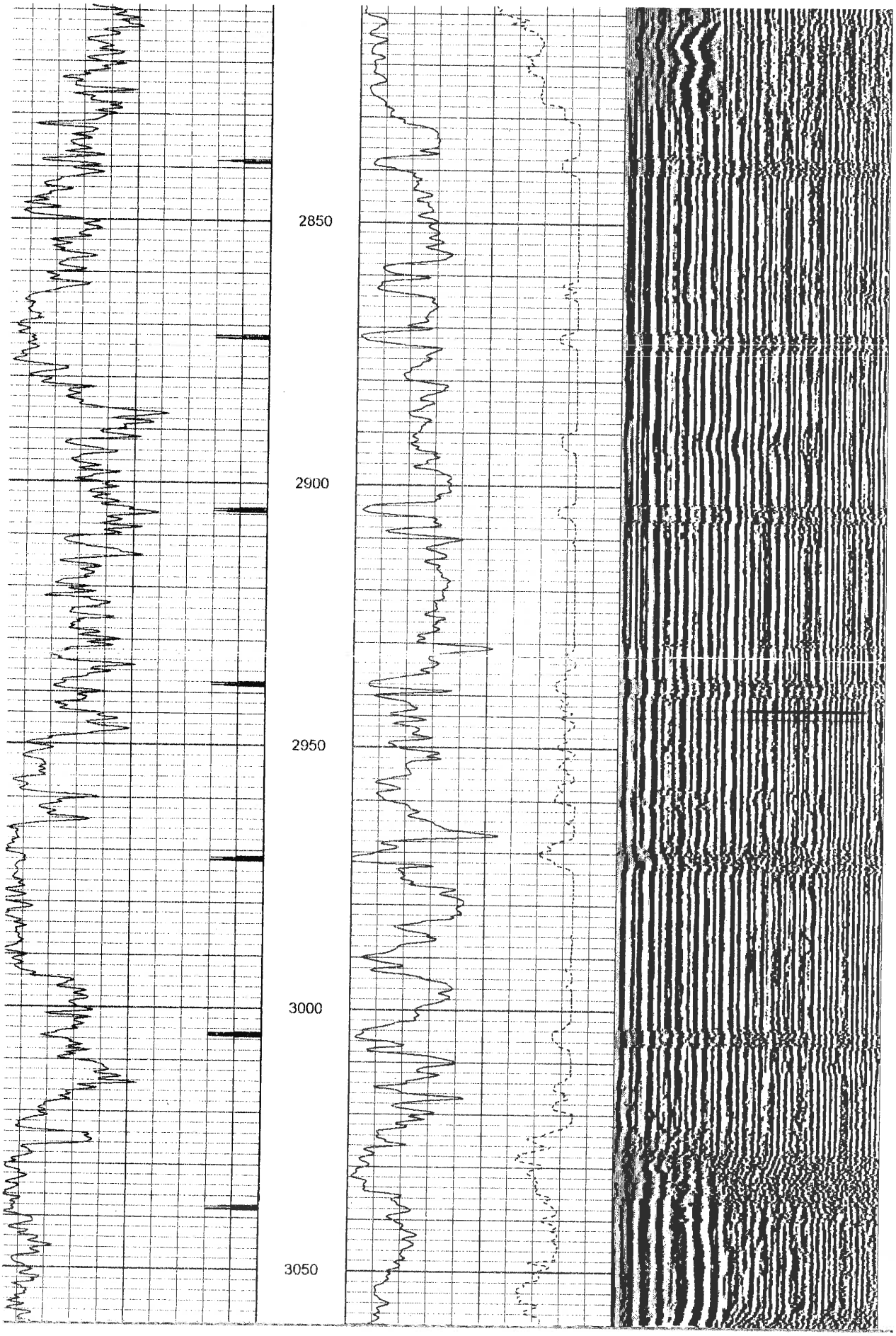
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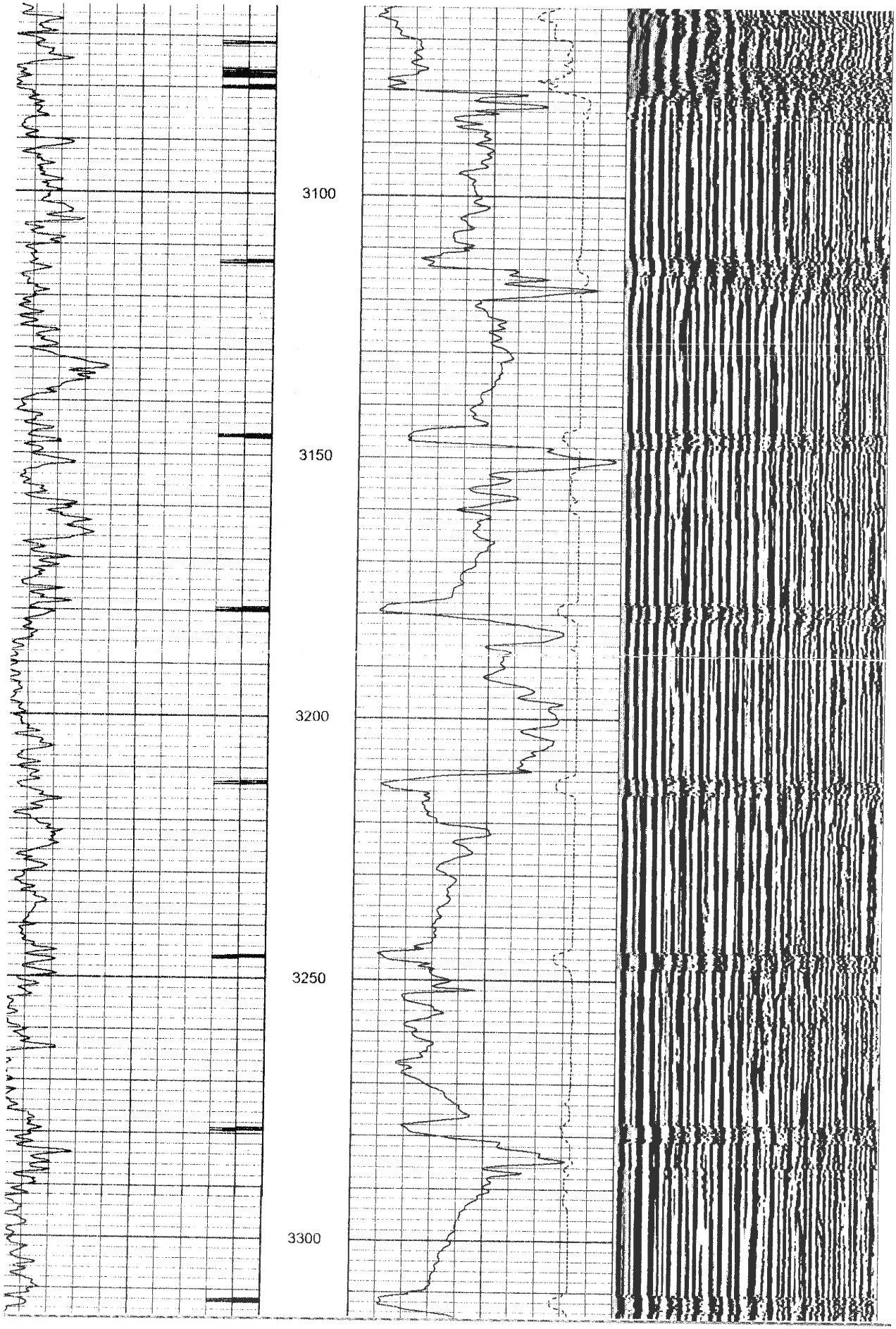
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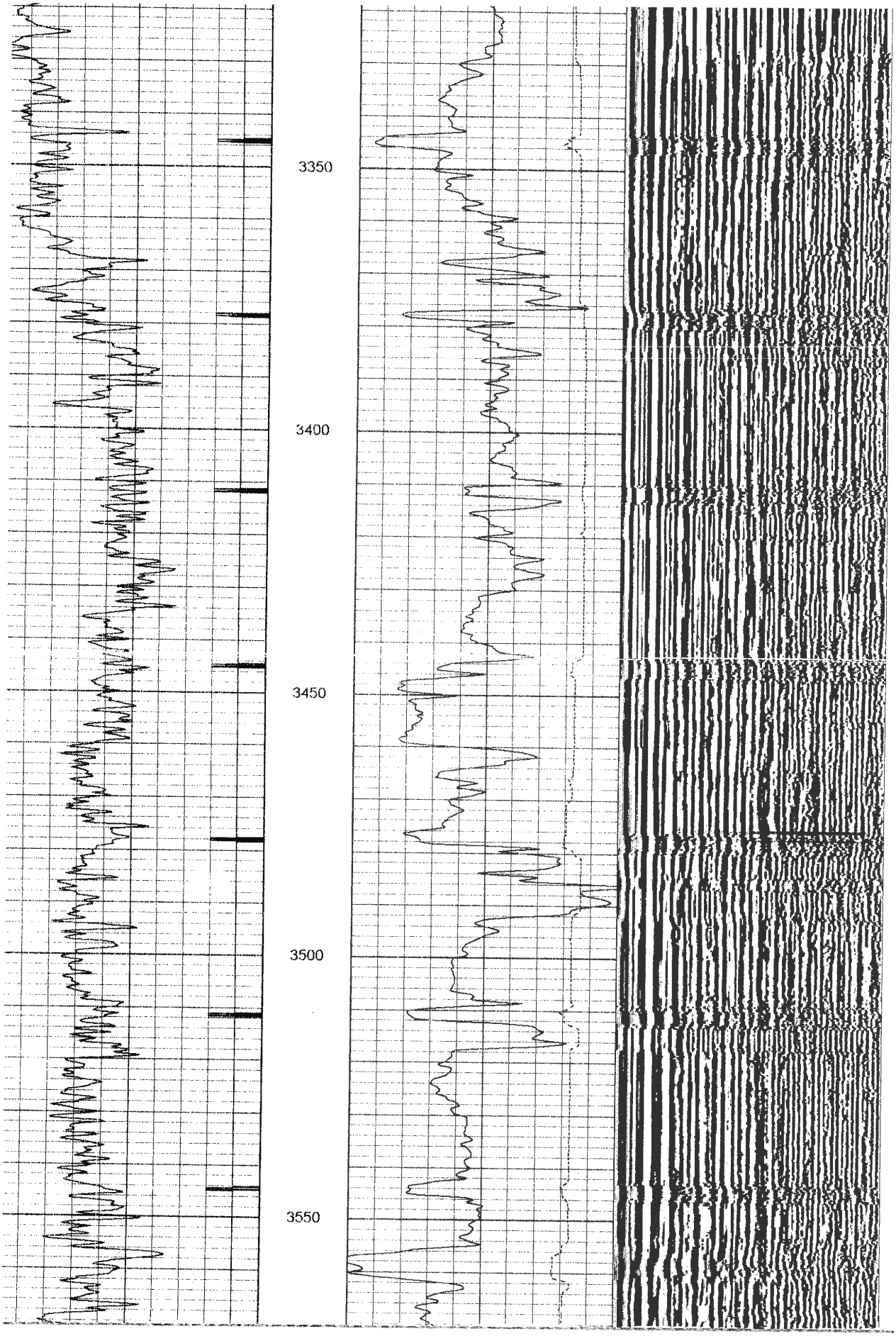
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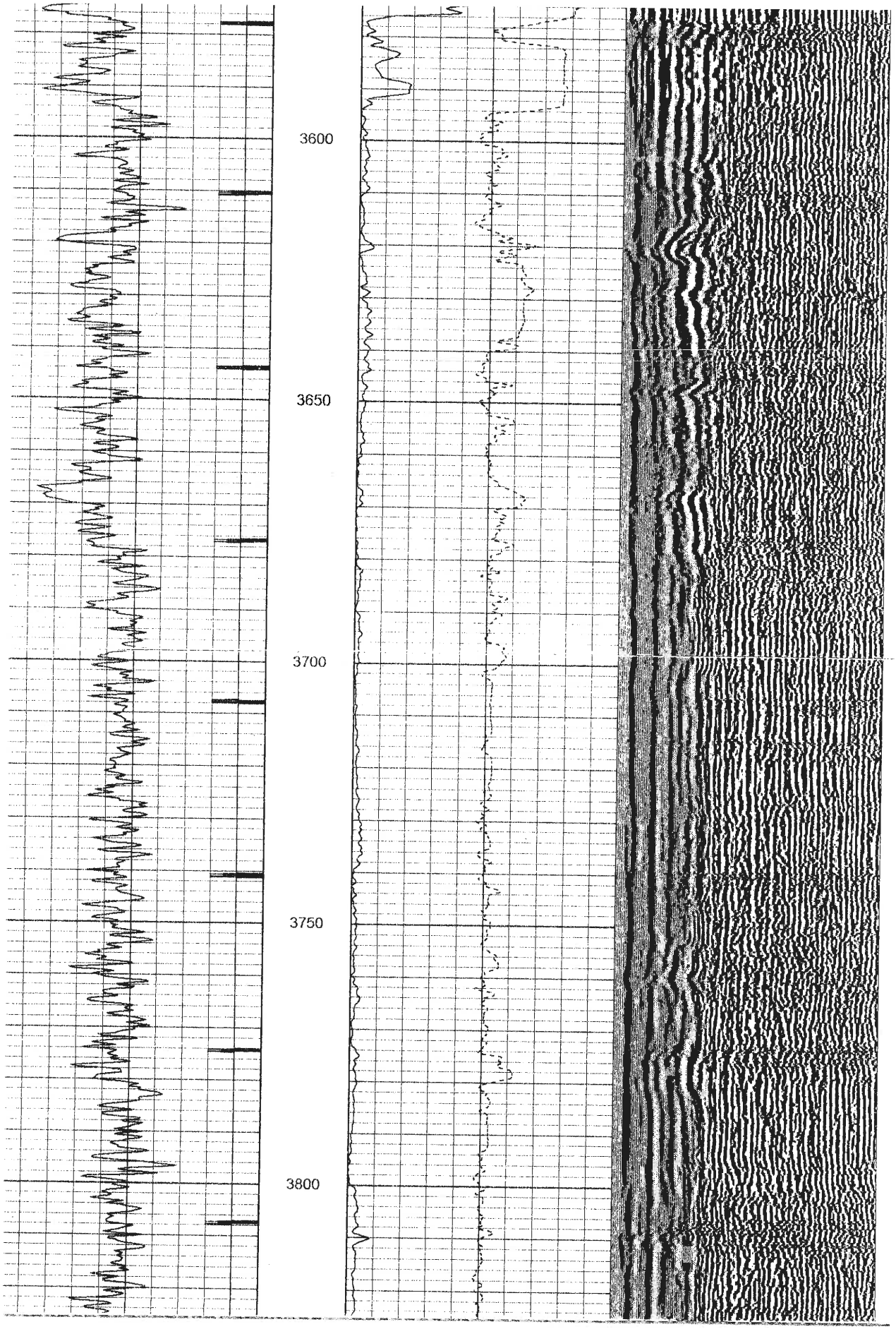
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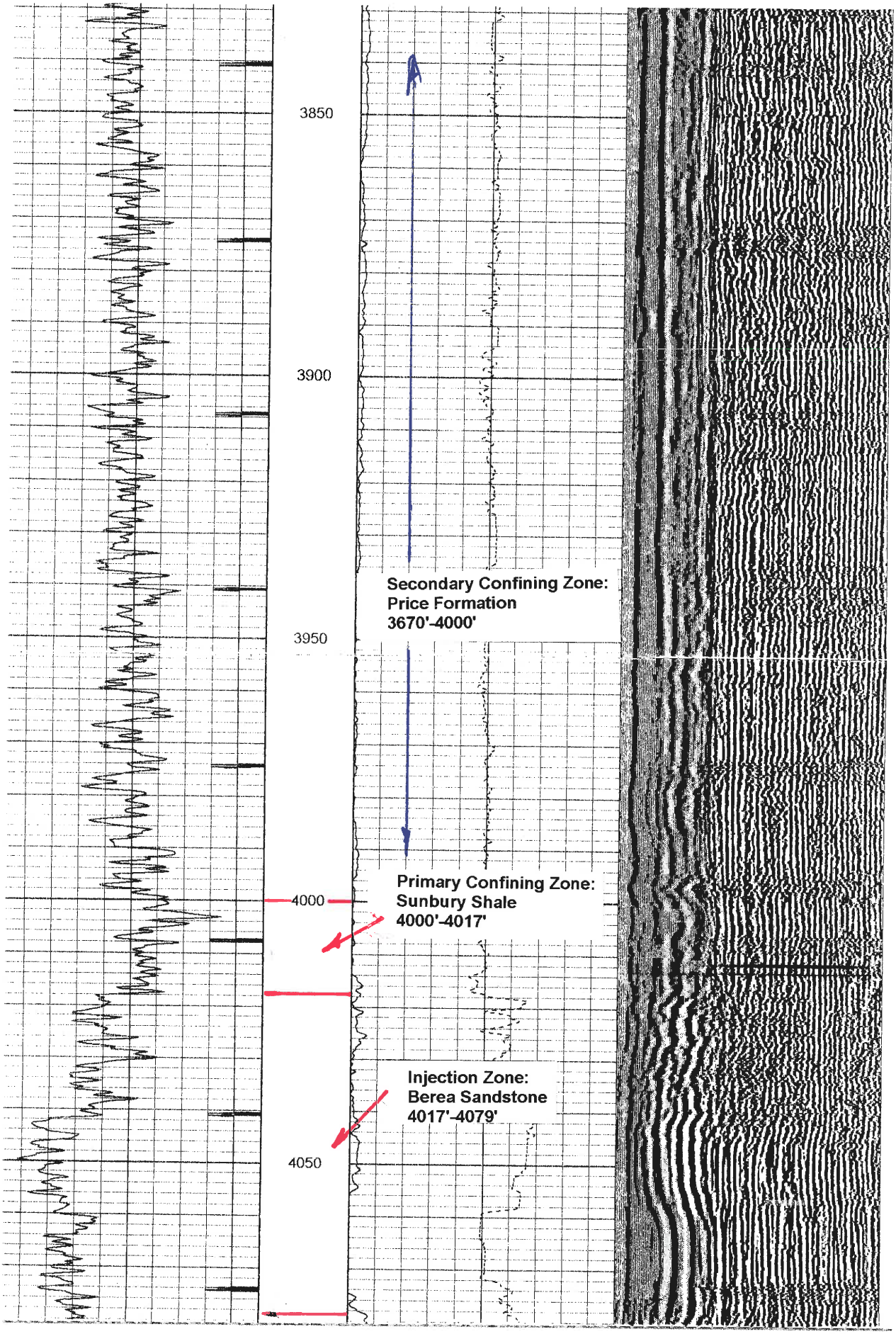
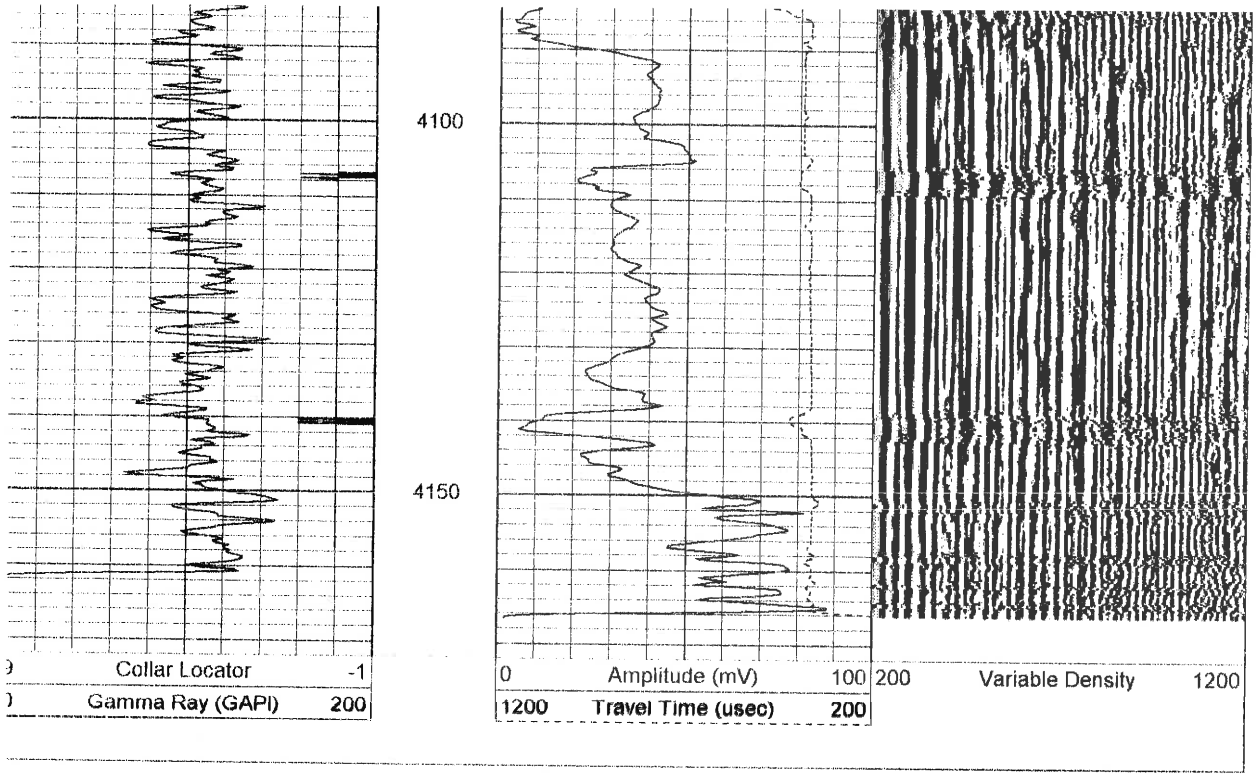

3850
3900
3950
4000
4050
Secondary Confining Zone:
Price Formation
3670'-4000'
Primary Confining Zone:
Sunbury Shale
4000'-4017'
Injection Zone:
Berea Sandstone
4017'-4079'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4150
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0 Amplitude (mV) 100
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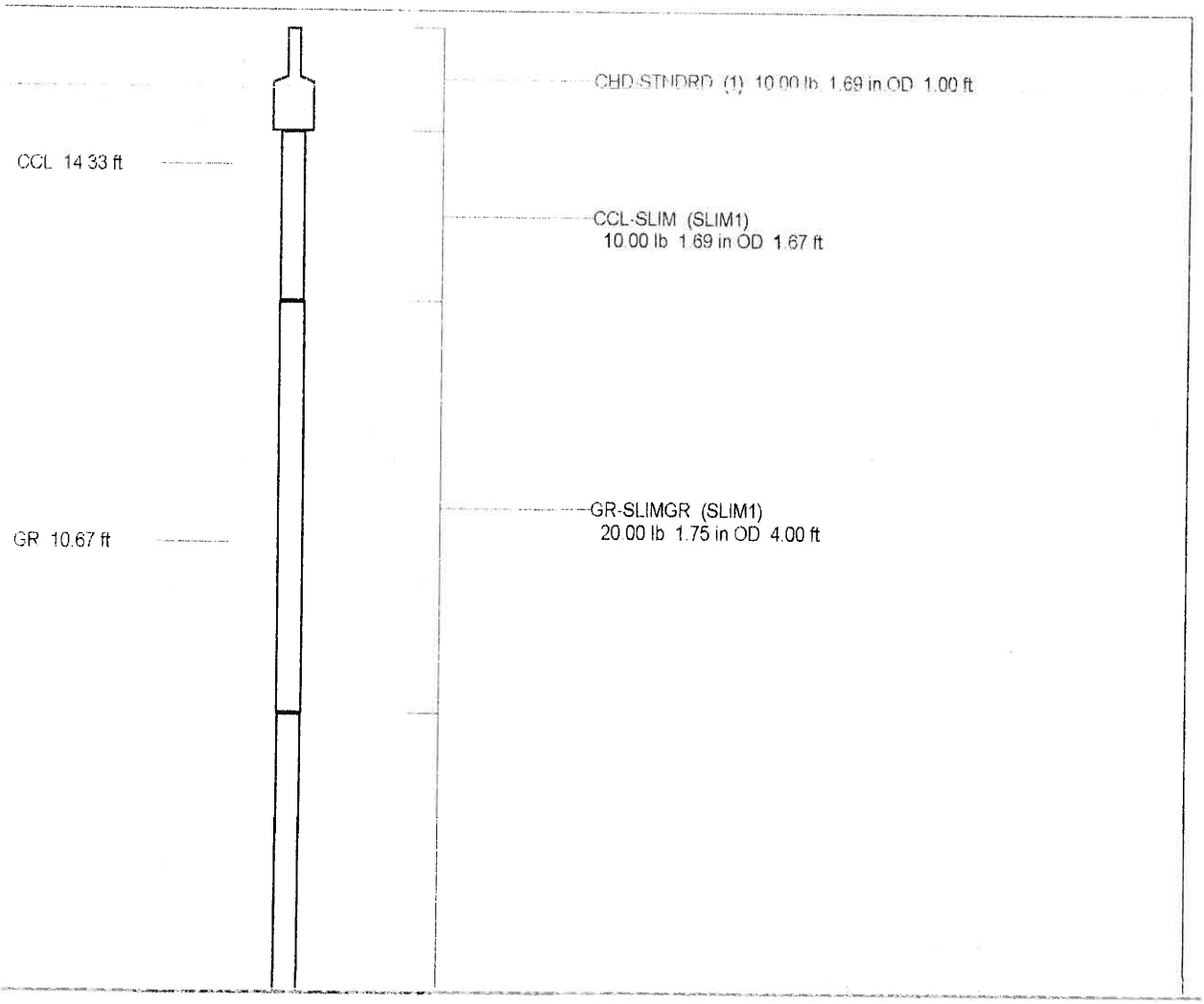
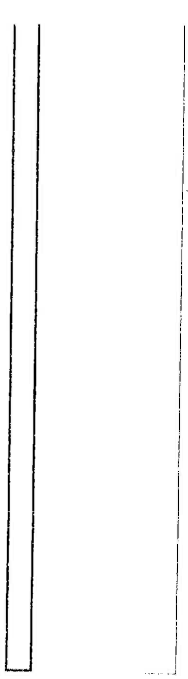
200 Variable Density 1200


CCL 14.33 ft
GR 10.67 ft
CHD-STNDRD (1) 10.00 lb 1.69 in OD 1.00 ft
CCL-SLIM (SLIM1)
10.00 lb 1.69 in OD 1.67 ft
GR-SLIMGR (SLIM1)
20.00 lb 1.75 in OD 4.00 ft

TT3 6.00 ft
WVF3 6.00 ft



CBL-SLIM (SLIM1)
20.00 lb 1.69 in OD 9.00 ft

Dataset:	run1/pass1
Total Length:	15.67 ft
Total Weight:	60.00 lb
O.D.	1.75 in

Section 9

Operating Requirements

Section 9-Operating Requirements/Data

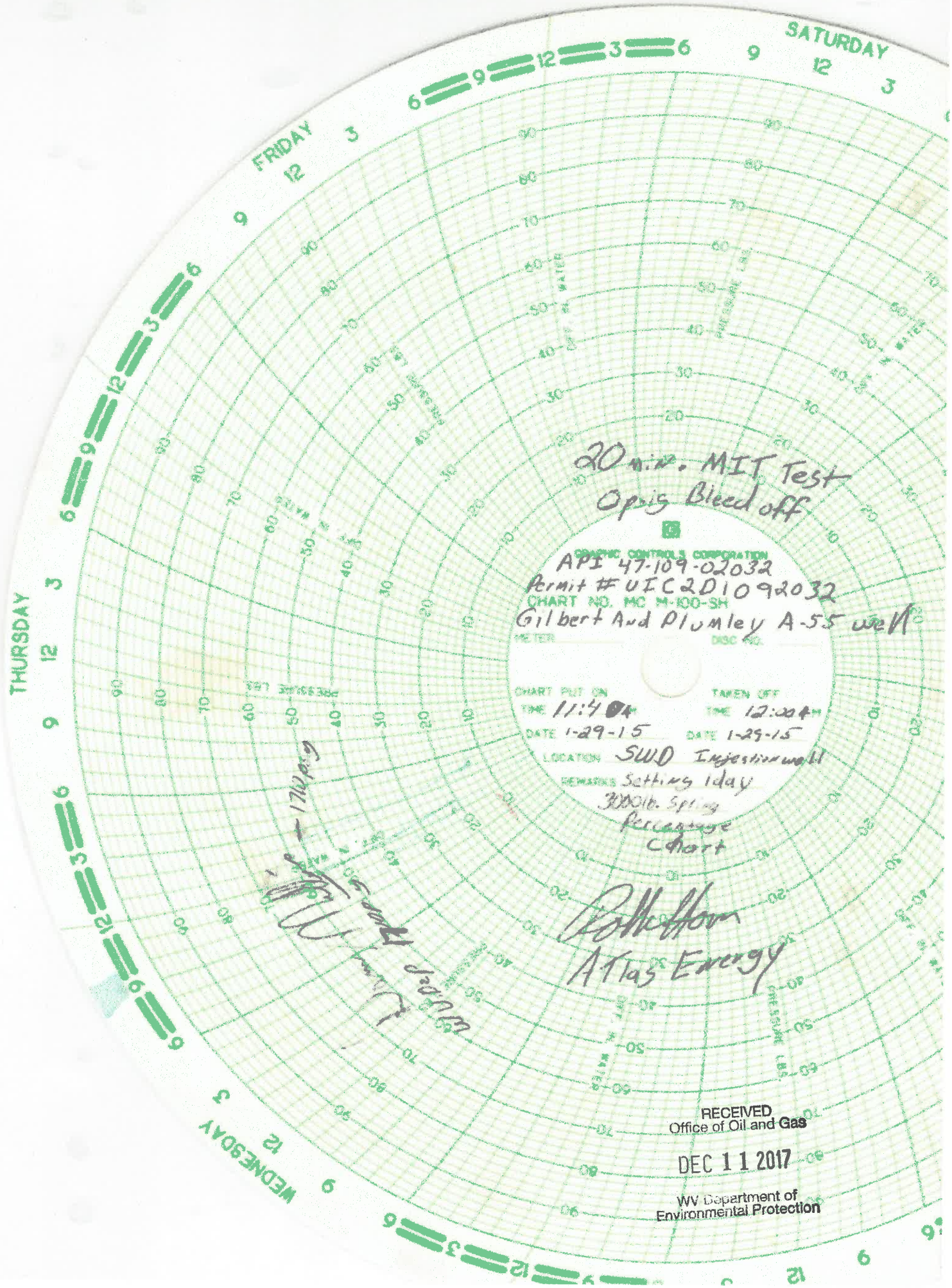
The Gilbert-Plumley A-55 has previously been permitted as a UIC Class 2D injection facility since 2003. Production casing of 4 ½" was run to a total depth of 4, 183' with 2 3/8" tubing and compression packer set at 3,119'. Virgin reservoir pressures obtained from previous reports indicated the Berea formation pressure of 900 psig with a maximum injection pressure of 1,034 psig and 2,300 psig bottom hole pressure. Historically, approximately 85 barrels per hour were injected at this location. Projected use is estimated to be the same. Class II injection fluids stored in the seven ASTs uses use four types of filtration:

1. A 200 micron bag filter for removing heavy particulate matter.
2. A 50 micron bag type filter unit
3. A 20 micron cartridge type filter unit
4. A 5 micron cartridge type filter unit.

MIT inspections shall be performed a minimum of every five years or anytime service work is performed to the well or anytime routine daily/monthly inspections show the possibility of an integrity problem. Routine daily/monthly inspections shall consist of casing and tubing pressures monitoring, equipment and manifold, well head, tanks, containments and equipment inspections for corrosion and potential leaks. Monthly manifold and pipeline integrity step tests to 10% over the maximum permitted injection pressure. All daily/monthly inspections and test shall be recorded, logged and filed in the plant office. In the event of any suspected well, manifold or pipeline integrity problem, the well will be immediately shut in and injection activities shall cease with proper notifications being made to the OOG. In the event of any well integrity problem the well will be made "static" and evaluation of data shall be performed and remedial work will begin once a plan of action has been put into place. Any injection fluids shall be transported and disposed of in an alternated state approved disposal facility or permitted UIC Class 2D well. The MIT test was recently conducted in January 2015 along with setting a new packer at a depth of 4.028 feet. A copy of the WR-37 along with the MIT test chart is provided as an attachment.

Please find enclosed **Appendix G** that provides the list of wells serviced to this UIC permit.

MIT Text and Previous Permit Approval



RECEIVED
Office of Oil and Gas

DEC 11 2017

WV Department of
Environmental Protection

WR-37
REV. 5/01

Date: 2/17/15

Operator's Well Number ARP Mountaineer Production, LLC.

API Well No.: State 47- County 109 - Permit 02032

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

WELL OPERATOR ARP Mountaineer Production, LLC.
Address P.O Box 749
Pounding Mill, Va. 24637

DESIGNATED AGENT CT Corporation Systems
Address 5400 DD Big Tyler Road
Charleston, WV 25313

GEOLOGICAL TARGET FORMATION Berea Depth 4018 feet(top) to 4080 feet(bottom)

Virgin reservoir pressure in target formation 900 psig

Source of information on virgin reservoir pressure: Estimated from near by wells

Perforation intervals 4056-4079 Open-hole intervals

MAXIMUM PERMITTED INJECTION OPERATIONS

Well head injection pressure: 1100 psig Bottom hole pressure: 3245 psig

Volume per hour: 85 bbl.

DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED

Liquids to be injected for oil recovery: n/a

Wastes to be disposed of: Produced Water

Additives (Slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.) Nalco EC6116A (Biocide) . Clearwater International (scale inhibitor)

SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL none

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

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

CASING OR TUBING TYPE	SIZE	GRADE	WEIGHT PER FT.	NEW	USED	FOOTAGE USED IN DRILLING	FOOTAGE LEFT IN WELL	CEMENT USED	PACKERS (KIND, SIZE, DEPTH SET)
CONDUCTOR	16"	LS	65.5	x			40'	18 ft^3 (CTS)	
FRESH WATER	7"	LS	17	x			1333'	295 ft^3 (CTS)	
COAL									
INTERMEDIATE									
PRODUCTION	4 1/2	J-55	9.5	X			4183'	265 sks	
TUBING	2 3/8	J-55	4.7	X			4028'		4028 Lock Set
LINERS									

RECEIVED
Office of Oil and Gas

DEC 11 2017

WV Department of
Environmental Protection

WR37

MECHANICAL INTEGRITY TEST

Test Method: 1/20/15 Rigged the pressure washer truck up to test the 4-1/2" casing annulus including the 2-3/8" tubing and packer , pressured casing up to 1675 psig, the casing started losing pressure at an estimated rate of 45 psig a minute (did not communicate with tubing), pressured the annulus back up and retested three more times, at three times had about the same bleed off rate. (Emergency Cement Squeeze) shut the well down and rigged up a service rig and closed the bottom hole valve and disconnected the tubing from the packer and valve, pulled the tubing out of the hole and went back in with a retrievable plug and packer combination, moved the packer down to 3194' and set it and pressured tested from 3194' to the original injection packer at 4028', Pressured up to 1700 psig with no leak; set the retrievable plug at 3220' and then set the packer at 2996' and tested from 2996'-3220', would not hold pressure; tested above the packer from 2996'-surface and it held, removed packer and spotted 20' of sand on the retrievable plug and ran the tubing back in the hole to 3088' pumped 7.6 bbls of micro matrix cement, pulled tubing out of cement and reversed circulated then pulled out more joints, set another packer near surface to anchor the tubing, pressured the cement up below the packer to 1675 psig three times with little leak off or movement and left at 1675 psig (squeeze pressure), let the cement setup for 3 days; Pulled out of hole with tubing and anchor packer; RIH with bit and scraper, drilled the cement out of the casing and tubing back in the hole and retested the tubing casing packer and piping to the injection pump to 1713 psig on 1/29/15 and passed with no bleed off

The undersigned certifies that the test was performed on 1/29/15, 20___ and demonstrated mechanical integrity of the well. The test was witnessed by Danny Mullins representing the Office of Oil and Gas.

ARP Mountaineer Production, LLC.
Well Operator

1/29/15
Date

THIS WELL IS AUTHORIZED FOR INJECTION.

Signed _____ UIC PROGRAM DIRECTOR

Date 2/23/2015

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

ARP Mountaineer Production, LLC
Well Operator

By: Rocky Stilwell

Its Regulatory Compliance Specialist

Appendix G
Well Serviced by Injection Well

APPENDIX G

Wells Serviced by Injection Wells

API #	Operator	Producing Formation
	See following sheets	

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

Well Names & Permit Numbers

Well #	File orPermit #
GPPC-006	047-01542
GPPC-007	047-01543
GPPC-008	047-01544
GPPC-009	047-01545
GPPC-010	047-01546
GPPC-001	047-01555
GPPC-002	047-01556
GPPC-003	047-01557
GPPC-004	047-01558
GPPC-005	047-01559
104-103-015	047-01616
105-103-016	047-01617
103-104-018	047-01618
103-105-020	047-01619
103-106-022	047-01620
104-106-023	047-01621
105-106-024	047-01622
106-106-025	047-01623
103-107-027	047-01624
104-107-028	047-01625
106-107-029	047-01626
107-107-030	047-01627
104-108-34	047-01628
106-108-035	047-01629
107-108-036	047-01630
106-109-041	047-01661
107-109-042	047-01662
107-110-048	047-01663
107-111-054	047-01664
108-111-055	047-01665
104-109-039	047-01670
105-109-040	047-01671
105-110-046	047-01672
106-110-047	047-01673
108-110-049	047-01674
106-111-053	047-01675
109-111-056	047-01676
107-112-059	047-01677
103-103-014	047-01697
108-108-037	047-01698
108-109-043	047-01699
109-109-044	047-01700
104-110-045	047-01701
109-110-050	047-01702
104-111-051	047-01703
105-111-052	047-01704
106-112-058	047-01705

105-113-061	047-01706
105-112-057	047-01713
106-113-062	047-01715
107-113-063	047-01716
105-112-064	047-01717
109-108-038	047-01727
110-108-065	047-01748
111-108-066	047-01749
109-105-067	047-01750
107-103-068	047-01757
108-103-069	047-01758
109-103-070	047-01759
109-103-071	047-01760
110-103-072	047-01761
111-103-073	047-01762
108-104-076	047-01764
108-104-077	047-01765
110-104-078	047-01766
110-104-079	047-01767
110-104-080	047-01768
110-105-084	047-01770
111-105-085	047-01771
107-104-075	047-01775
111-104-081	047-01776
106-105-082	047-01777
109-107-032	047-01778
110-107-033	047-01779
111-105-087	047-01780
112-105-088	047-01781
106-104-074	047-01782
109-105-098	047-01783
112-103-089	047-01784
113-103-090	047-01785
113-102-102	047-01786
115-104-103	047-01804
114-105-104	047-01805
115-105-105	047-01806
113-106-108	047-01807
115-106-110	047-01808
116-106-111	047-01809
114-106-109	047-01812
116-105-106	047-01814
117-105-107	047-01815
117-106-112	047-01816
102-103-013	047-01819
102-104-017	047-01820
102-105-019	047-01821
109-104-086	047-01824
110-105-083	047-01825
107-106-026	047-01830
108-107-031	047-01831
112-103-091	047-01832

114-102-099	047-01833
115-103-100	047-01834
116-105-101	047-01835
111-107-119	047-01837
111-108-120	047-01838
116-119-090	047-01844
105-106-125	047-01876
107-106-126	047-01877
106-109-127	047-01878
114-102-133	047-01879
114-107-148	047-01894
111-108-149	047-01895
110-108-150	047-01896
103-106-123	047-01901
112-105-132	047-01902
102-104-122	047-01918
101-103-121	047-01926
104-104-152	047-01927
110-106-154	047-01933
110-109-157	047-01934
108-105-135	047-01939
108-106-140	047-01940
112-102-143	047-01941
112-101-145	047-01942
112-102-146	047-01943
107-104-134	047-01952
107-105-136	047-01953
108-105-137	047-01954
108-106-138	047-01955
109-106-139	047-01956
100-104-158	047-01957
102-105-161	047-01958
102-106-162	047-01959
102-107-163	047-01960
108-109-128	047-01981
103-107-124	047-01982
101-102-129	047-02000
102-102-159	047-02006
101-104-203	047-02048
98-104-178	047-02050
98-105-179	047-02051
99-104-172	047-02056
100-104-173	047-02057
100-105-174	047-02058
99-103-216	047-02060
100-103-171	047-02063
CDJ-217	047-02068
99-107-184	047-02069
99-108-185	047-02070
100-108-186	047-02073
101-108-187	047-02078
101-108-188	047-02081

102-108-204	047-02082
102-102-208	047-02083
104-103-130	047-02085
101-106-175	047-02088
102-109-196	047-02089
105-103-131	047-02093
99-106-183	047-02105
POND CREEK 536	047-02174
POND CREEK 537	047-02175
POND CREEK 539	047-02176
POND CREEK 540	047-02177
POND CREEK 538	047-02197
POND CREEK 544	047-02198
PMC SOUTH 541	047-02200
PMC SOUTH 542	047-02201
POND CREEK 545	047-02208
ROGERS 570	047-02212
JEWELL 219	047-02214
POND CREEK 559	047-02215
ROGERS 190	047-02241
ROGERS 205	047-02242
ROGERS 160	047-02246
ROGERS 191	047-02247
CDJ-548	047-02248
CDJ 220 WV-L22	047-02256
CDJ 535 WV-L21	047-02257
ROGERS 182	047-02258
ROGERS 546	047-02264
JEWELL 549	047-02268
ROGERS 575	047-02269
ROGERS 223	047-02277
ROGERS 193	047-02278
ROGERS 230	047-02279
ROGERS 195	047-02280
ROGERS 577	047-02281
ROGERS 533	047-02295
ROGERS 571	047-02296
ROGERS 579	047-02297
ROGERS 572	047-02308
ROGERS 580	047-02313
ROGERS 581	047-02314
ROGERS 194	047-02320
ROGERS 206	047-02321
ROGERS 582	047-02322
254 WV-P21B CDJ	047-02358
225 WV-Q25	047-02387
226 WV-R27	047-02388
228 WV-R23	047-02389
235 WV-Q24	047-02390
259 WV-S16 CDJ	047-02391
261 WV-T17 CDJ	047-02392
300 WV-Q27	047-02394

323 WV-R12B	047-02395
326 WV-R12	047-02396
222 WV-Q26	047-02419
229 WV-R22	047-02420
256 WV-S21	047-02421
257 WV-R22B	047-02435
600 WV-R21	047-02436
234 WV-Q-21B	047-02472
192 WV-O21	047-02556
170 WV-G23	047-02557
176 WV-N26	047-02584
626 WV-G25	047-02585
H21 ROGERS	047-02591
H20 ROGERS	047-02592
624 WV-F24	047-02595
627 WV-H23	047-02596
630 WV-022	047-02612
631 WV-N20	047-02613
632 WV-N19	047-02614
221 WV-026	047-02615
625 WV-F26	047-02625
629 WV-P23	047-02627
377 WV-022	047-02629
634 WV-P23B	047-02630
639 WV-K30C PC	047-02655
560 WV-K35 PMC	047-02657
573 WV-134 PMC	047-02658
640 WV-L30 PC	047-02668
605B WV-F38 PC	047-02687
122-145-002	109-02213
117 WV-III 52	109-02917
049 WV-JJJ	109-02918
038 WV KKK	109-02948
039 WV KKK	109-02949
041 WV KKK	109-02950
050 WV JJJ	109-02951
108 WV JJJ	109-02952
107 WV JJJ	109-02953
040 WV KKK	109-02963
031 WV LLL	109-02965
061 WV III	109-02966
037 WV KKK	109-02968
048 WV JJJ	109-02969
103 WV KKK	109-02970
109 WV JJJ	109-02971
115 WV III	109-02972
116 WV III	109-02973

Appalachian Energy, Inc. **Well Listing: Buchanan & Dickenson Co's, VA & McDowell Co, WV**

March 12, 2013

File or Permit #	Well #	Tank Battery
BUCHANAN CO, VA WELLS (CBM & CONVENTIONAL NAT. GAS)		
BU-0244	EH-8	*
BU-0248	EH-9	AE-156 Tank
BU-0249	EH-10	*
BU-0247	EH-11	*
BU-0251	EH-12	*
BU-0252	EH-13	AE-193 Tank Battery
BU-0250	EH-15	*
BU-0257	EH-16	*
BU-0258	EH-17	*
BU-0262	EH-19	*
BU-0279	EH-28	*
BU-0316	EH-29	*
BU-0291	EH-30	*
BU-0325	EH-31	*
BU-0299	EH-32	*
BU-0281	EH-33	*
BU-0270	EH-34	*
BU-0276	EH-35	*
BU-0314	EH-36	*
BU-0413	EH-42	*
BU-0410	EH-43	*
BU-0414	EH-44	EH-44 Tank Battery
BU-0419	EH-46	EH-46 Tank Battery
BU-0415	EH-47	*
A39BU	EH-58	*
A38BU	EH-59	*
A42BU	EH-60	*
A43BU	EH-61	*
A14BU	EH-62	*
A41BU	EH-63	*
BU-0368	EH-74	*
BU-0659	EH-81	*
BU-0661	EH-82	*
BU-0564	EH-112	*
BU-0572	EH-114	*
BU-0571	EH-116	*
A12BU	EH-135	*
BU-0025	EH-136	*
BU-0015	EH-137	*
BU-0020	EH-138	*
BU-0026	EH-139	*
BU-0030	EH-140	*
A32BU	EH-141	*
A05BU	EH-142	*
BU-0010	EH-143	*
BU-0014	EH-144	*
BU-0022	EH-145	*
BU-2671	AE-146	AE-146 Tank Battery
BU-2952	AE-147	AE-147 Tank Battery

* = produced water tank located at wellsite

File or Permit #	Well #	Tank Battery
BUCHANAN CO. VA WELLS (CBM & CONVENTIONAL NAT. GAS)		**(CONTINUED FROM PAGE 1)**
BU-2953	AE-148	AE-147 Tank Battery
BU-2954	AE-149	AE-147 Tank Battery
BU-3716	AE-150	*
BU-3875	AE-152	AE-166 / Radar Hill Rd Tank Battery
BU-3845	AE-153	AE-166 / Radar Hill Rd Tank Battery
BU-3858	AE-154	AE-154 Tank Battery
BU-3579	AE-155	AE-155 Tank Battery
BU-3243	AE-156	AE-156 Tank
BU-3196	AE-157	*
BU-3245	AE-158	*
BU-3182	AE-159	*
BU-3242	AE-160	*
BU-3867	AE-161	AE-154 Tank Battery
BU-3603	AE-162	AE-191 Tank Battery
BU-3693	AE-163	AE-155 Tank Battery
BU-3211	AE-164	*
BU-3280	AE-165	AE-169 Tank Battery
BU-3246	AE-166	AE-166 / Radar Hill Rd Tank Battery
BU-3262	AE-167	AE-169 Tank Battery
BU-3524	AE-168	AE-169 Tank Battery
BU-3247	AE-169	AE-169 Tank Battery
BU-3888	AE-170	AE-154 Tank Battery
BU-3591	AE-174	AE-154 Tank Battery
BU-3197	AE-175	*
BU-3821	AE-186	*
BU-4104	AE-187	*
BU-3826	AE-188	AE-146 Tank Battery
BU-3604	AE-190	*
BU-3520	AE-191	AE-193 Tank Battery
BU-3605	AE-192	*
BU-3700	AE-193	AE-193 Tank Battery
BU-3871	AE-194	AE-154 Tank Battery
BU-4095	AE-195	AE-154 Tank Battery
BU-3978	AE-196	AE-154 Tank Battery
BU-3979	AE-197	AE-155 Tank Battery
BU-10349	AE-198	AE-155 Tank Battery
BU-4272	AE-201	*
BU-10554	AE-205	AE-207 Tank Battery
BU-3979	AE-206	AE-207 Tank Battery
BU-10610	AE-207	AE-207 Tank Battery
BU-3979	AE-206	AE-207 Tank Battery
BU-4390	AE-209	AE-154 Tank Battery
BU-4194	AE-211	AE-211 Tank Battery
BU-3905	AE-212	AE-214 Tank Battery
BU-3509	AE-213	AE-214 Tank Battery
BU-3721	AE-214	AE-214 Tank Battery
BU-3550	AE-215	*
BU-4240	AE-216	AE-216 Tank Battery
BU-3722	AE-223	*
BU-3720	AE-224	*
BU-4635	AE-229	*
BU-4117	AE-231	*
BU-3825	AE-232	EH-44 Tank Battery
BU-3950	AE-233	AE-146 Tank Battery
BU-4919	AE-239	AE-216 Tank Battery
BU-4517	AE-249	AE-211 Tank Battery
BU-4538	AE-250	AE-211 Tank Battery
BU-4546	AE-259	*

BU-4391	AE-260	EH-46 Tank Battery
BU-4585	AE-261	EH-46 Tank Battery

* = produced water tank located at wellsite

File or Permit #	Well #	Tank Battery
DICKENSON CO. VA WELLS (CBM & CONVENTIONAL NAT. GAS)		
1577-01	EH-14	*
1369-01	EH-18	*
1409-01	EH-20	*
1954-01	EH-21	*
1475-01	EH-23	*
1410-01	EH-24	*
1544-01	EH-25	*
1468-01	EH-26	*
1590-01	EH-27	*
2030-01	EH-37	*
1440-01	EH-40	*
1605-01	EH-50	*
2124-01	EH-51	*
1607-01	EH-52	*
1767-01	EH-53	*
1616-01	EH-54	*
2189-01	EH-55	*
1634-01	EH-65	*
2105-01	EH-69	*
1591-01	EH-84	*
1592-01	EH-85	*
1593-01	EH-86	*
1885-01	EH-108	*
1893-01	EH-118	*
2527-01	EH-120	*
2791-01	EH-128	*
2790-01	EH-129	*
6976	AE-151	*
MCDOWELL CO. WVA WELLS (CONVENTIONAL NAT. GAS)		
0996	EH-3	*
1016	EH-4	*
1008	EH-5	*
389	EH-6	*
1017	EH-7	*

* = produced water tank located at wellsite

Prepared by
Appalachian Energy, Inc.
PO Box 2406, Abingdon, VA 24212
Ph: 276/619-4880 Fax: 276/619-4770

west virginia department of environmental protection

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

Joe Manchin III, Governor
Randy C. Huffman, Cabinet Secretary
www.wvdep.org

September 24, 2010

GeoMet Operating Company, Inc.
Attn: Dallas Nestel
P.O. Box 749
Pounding Mill, VA 24637

Re: Underground Injection Control (UIC) Well Permit Modification

UIC permit/well #2D1092032 is hereby approved to accept Class II fluids as defined in 47CSR13-4.2 from **Appalachian Energy, Inc.** The API#s of wells to be serviced by your injection well and the formation the fluids are coming from must be submitted to this agency.

If you have any questions regarding this matter feel free to contact me at 304-926-0499, ext. 1653.

Sincerely,

James Peterson
Environmental Resources Specialist / Permitting

Section 10

Monitoring

Section 10-Monitoring

Monitoring of all injection parameters shall be reported and logged daily consisting of startup/shutdown pressures, total injection volumes, injection rates, average injection pressures and annulus pressure along with the integrity of all tanks, containments, equipment and manifolds/lines. WR-40's shall be completed and filed in accordance with state regulations and kept on file at the facility office and be made available upon request. Fluids manifests shall be completed documenting every load of fluid delivered to the facility for disposal. These manifests shall report the following:

- Operator
- Well Name, Number, and API number
- Amount of fluid
- Type of fluid
- Contractor Hauling Fluid
- Name of Driver/Truck number
- Fluid Sampling/Testing, if required

Records of this information shall be kept at the facilities office and shall be made available upon request.

Section 11

Groundwater Protection Plan

Appendix H
Ground Water Protection Plan (GPP)

APPENDIX H

GROUNDWATER PROTECTION PLAN

Facility Name: Gilbert-Plumley A-55

County: Wyoming

Facility Location:

Postal Service Address:	4191 Pad Fork Road		
Hanover, WV 24839			
Latitude :	37.704905	Longitude:	-81.421473

Contact Information:

Person:	Rocky Stilwell
Phone Number:	276-455-1773
E-mail Address:	rstilwell@atlasenergy.com

Date: 11/15/2017

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

- Water trucks unloading Class II fluids
- Trucks (petroleum, glycols, road salt)

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

- Secondary containment and enclosure for all pumps and filtration units
- Secondary containment for all tanks.
- Use of concrete unloading bays with cameras.
- All bag filters located in secondary containment unit.
- Proper disposal of all solid waste (filtered/bag filters)

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

-Provide site security to prevent unauthorized entry.
-Use of real time security cameras and alarms.
-Design for secondary containment for all pipelines and storage tanks.
-Consult with WVDEP.

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

-AST Act
-This permit

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

See Section 7 of this report. Springs sampled annually, no groundwater monitoring wells within a mile of the site.

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

It is ARP Mountaineer Production, LLC operating policy that any and all wastes generated at this facility will be properly managed through applicable solid waste regulations. ARP Mountaineer Production, LLC currently maintains a 2 year blanket permit with the Raleigh County Solid Waste Authority.

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.

- ARP Mountaineer Production, LLC provides and conducts monthly environmental meetings for all employees. Contractor training is conducted at annually or more frequently as needed.

- UIC well is inspected daily while in operation. Cameras monitor the facility 24hours.

- All waste generated are placed in containers to prevent surface water or precipitation to affect surficial soils. All solid waste is stored in containers inside the building until disposed at a permitted facility

- Tank battery has overfill and spill alarms that prohibit overfills.

- All contract drivers and employees have understood and agreed to ARP Mountaineer Production, LLC's operational environmental policies.

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

- ARP Mountaineer Production, LLC employees and/or contractors are on-site daily. Any leaks are repaired immediately. Tank battery has overfill and spill alarms that prohibit unauthorized delivery.

- Injection pipeline is inspected daily and injection pressure is monitored in real time.

Signature: Rocky Hilbert

Date: 11-29-2017

Section 12

Plugging and Abandonment

Section 12 -Plugging and Abandonment (Amended 4/10/18)

After completion of injection fluids or in the event the well inspection data concludes that a well integrity issue may occur, the injection well will be plugged and abandoned in accordance with all applicable WVDEP regulations. Prior to abandonment, the small building on-top of the well ahead will be inspected for asbestos containing materials (ACM) and will be properly demolished per applicable regulations. The plan is to have the well in static condition, remove the 2 3/8" tubing and packer. Run a CBL to determine the top of cement and a production backoff point. Tubing will then be ran back into the hole with either a cement plug or bentonite gel balanced over all perforated intervals in the well spacing from 50 feet below the perforations to 50 feet above the perforations. If a bentonite gel is used to plug the perforated intervals, a cement plug will be used to further displace the bentonite gel. The 7" production casing shall then be backed off at free point and a 100 foot balanced cement plug shall be set at the backoff point and a 100 foot cement plug set to the surface. Upon completion of the well abandonment, the well head will be removed, cemented to surface and permanent abandonment monument will be erected. Finally, a completed WR-38 form will be submitted to the OOG within 30 days of well abandonment.

Section 13

Additional Bonding

Section 13 – Additional Bonding

Proper performance bonding is in place for Gilbert-Plumley A-55 well as previously provided by ARP Mountaineer Production, LLC. The OOG has that current information on file.

Section 14

Financial Responsibility

Appendix I
Financial Responsibility

(4/25)

APPENDIX I

Requirement for Financial Responsibility to Plug/Abandon an Injection Well

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

From: ARP Mountaineer Production, LLC
2615 Steelsburg Highway
Cedar Bluff VA 24609

Date: 4-19-18

Subject: Underground Injection Control (UIC) Permit Application
UIC2D10902032
Requirement for Financial Responsibility

I, Christopher Walker, 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: Christopher Walker

Signature:

Date: 4-19-18

Section 15

Site Security Plan

Appendix J
Site Security for Commercial Wells

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.

All valves are locked. Security cameras monitor the truck unloading bays, tank battery, pumpss, and unloading controls. Fluid levels in the tanks are monitored continuously by ARP Mountaineer Production, LLC personnel through telemetry. All valves are locked and only authorized representatives have access to the tank battery.

The injection well pump building is locked at all times. Upon departure from deliveries, valves are locked by the driver.

Section 16

Additional Information

SPCC Plan

TIER I QUALIFIED FACILITY SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

Prepared for:

Atlas Energy, L.P

ARP MOUNTAINEER PRODUCTION, LLC
LASHER INJECTION STATION SITE
PAD FORK, HANOVER WEST VIRGINIA 24839

Prepared By:

Zephyr Environmental Corporation
10440 Little Patuxent Parkway, Suite 750
Columbia, Maryland 21044

November 2014

zephyr

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SELF-CERTIFICATION STATEMENT

TIER I QUALIFIED FACILITY SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN
ARP MOUNTAINEER PRODUCTION LLC
LASHER INJECTION STATION SITE

I certify that each of the following is true and accurate:

(i) I am familiar with the applicable requirements of 40 CFR Part 112;

(ii) I have visited and examined the Facility;

(iii) This Plan was prepared in accordance with accepted and sound industry practices and standards;

(iv) Procedures for required inspections and testing have been established in accordance with industry inspection and testing standards or recommended practices;

(v) This Plan will be fully implemented;

(vi) This Facility meets the following qualification criteria in §112.3(g)(1):

a. The aggregate aboveground oil storage capacity of the Facility is 10,000 U.S. gallons or less;

b. The Facility has had no single discharge as described in §112.1(b) exceeding 1,000 U.S. gallons and no two discharges as described in §112.1(b) each exceeding 42 U.S. gallons within any twelve month period in the three years prior to the SPCC Plan self-certification date, or since becoming subject to 40 CFR Part 112 if the Facility has been in operation for less than three years (not including oil discharges as described in §112.1(b) that are the result of natural disasters, acts of war, or terrorism); and

c. There is no individual oil storage container at the Facility with an aboveground capacity greater than 5,000 U.S. gallons.

(vii) This Plan does not deviate from any requirement of 40 CFR Part 112 as allowed by §112.7(a)(2) (environmental equivalence) and §112.7(d) (impracticability of secondary containment) or include measures pursuant to §112.9(c)(6) for produced water containers and any associated piping; and

(viii) This Plan and individual(s) responsible for implementing this Plan have the full approval of management and I have committed the necessary resources to fully implement this Plan.

(ix) The requirement to prepare and implement a Plan under §112.3 and all of the requirements under §112.6(a) have been satisfied.

Jeffrey Cooper
Signature

Production Foreman
Title

Jeff Cooper
Name

1-5-2018
Date

MANAGEMENT APPROVAL

TIER I QUALIFIED FACILITY SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN
ARP MOUNTAINEER PRODUCTION LLC
LASHER INJECTION STATION SITE

I certify that this SPCC Plan has the full approval of company management at a level of authority to commit the necessary resources to fully implement this Plan. Furthermore, ARP Mountaineer, LLC is committed to the provision of manpower, equipment and materials required to expeditiously control and remove any quantity of oil discharged from the Facility.

Authorized Facility Representative: Jeff Cooper

Signature: Jeff Cooper

Title: Production Foreman

Date: 1-5-2018

Designated Person Accountable for SPCC Plan: Rene St. Pierre
(If different from above)

Signature: Rene St Pierre

Title: V.P. of Operations

Date: 2/13/18

PLAN REVIEW AND AMENDMENT LOG

A summary of scheduled five-year reviews and Plan amendments are recorded on the table below. This log must be completed even if no amendment is made to the Plan. Unless a technical or administrative change prompts an earlier review, the next scheduled review of this Plan must occur within 5 years of the date of the last review.

Revision Made	Page/Section Number	Date	Authorized Individual	P.E. Certification Necessary?
Initial issue	All	11/18/2014	Jessica Nelko	Yes ☒ / No ☐
Annual Review	Page 6	11/04/2015	Jessica Nelko	Yes ☐ / No ☒
Annual Review: Personnel Updates	SPCC Plans and Contingency Plan	12/18/2017	Brian Shpakoff	Yes ☐ / No ☒
				Yes ☐ / No ☐
				Yes ☐ / No ☐
				Yes ☐ / No ☐
				Yes ☐ / No ☐
				Yes ☐ / No ☐
				Yes ☐ / No ☐
				Yes ☐ / No ☐
				Yes ☐ / No ☐
				Yes ☐ / No ☐

Note: If technical amendments are required for the SPCC Plan, attach Professional Engineer Certification to this document.

1.0 INTRODUCTION

1.1 RULE APPLICABILITY

Except as provided in 40 CFR §112.1(d), a "facility" as defined in §112.2 must prepare a Spill Prevention, Control and Countermeasure (SPCC) Plan in accordance with 40 CFR 112 if the facility could reasonably be expected to discharge oil in quantities that may be harmful, as described in 40 CFR 110, into or upon navigable waters of the United States. The purpose of a SPCC Plan is to establish engineering and management procedures, methods, equipment, and other requirements to prevent the discharge of oil. In addition, a SPCC Plan must also address countermeasures for oil discharge discovery, response and cleanup.

The facility covered by this SPCC Plan ("the Facility") does not have aggregate aboveground oil storage capacity in excess of the SPCC rule threshold (1,320 gallons). However, the Facility could potentially discharge oil in quantities that could be harmful, as described in 40 CFR 110, into or upon navigable waters of the United States. Although aggregate aboveground oil storage capacity is less than the SPCC rule threshold, the Facility has prepared a written Tier I Qualified Facility SPCC Plan to address the potential for a discharge from the Facility. The Facility would be subject to requirements for onshore facilities under §112.8, rather than §112.9, because the Facility does not produce oil and is not a "Production Facility" as defined in §112.2.

A facility that is required to prepare a SPCC Plan may also be required to prepare a Facility Response Plan (FRP) under 40 CFR § 112.20. The Substantial Harm criteria checklist in Appendix C of the SPCC rule must be completed to determine whether a Facility must prepare a FRP. As recorded in the Certification of the Applicability of the Substantial Harm Criteria Checklist (Appendix E), the Facility is not required to prepare a FRP.

This SPCC Plan has been prepared in conformance with EPA's SPCC Plan requirements as described in 40 CFR 112, as amended through November 22, 2011. This SPCC Plan also incorporates the following federal and state requirements regarding spill prevention and response:

- 40 CFR 110 – Discharge of Oil
- 35 CSR 1 – Water pollution rules for oil and gas production sites
- 35 CSR 3 – Rules for coal bed methane wells
- WV Code, Chapter 22, Article 30 -- Aboveground Storage Tank Act and associated legislative rules (pending promulgation)

The sections of this Plan are presented in the sequence of the SPCC rule. In the sections, applicable rule requirements are provided in italics, followed by an explanation of how the requirements have been addressed at the Facility.

1.2 SPCC RULE EFFECTIVE DATE

§112.3(a)(1) – Except as otherwise provided in this section, if your facility, or mobile or portable facility, was in operation on or before August 16, 2002, you must maintain your Plan, but must amend it, if necessary to ensure compliance with this part, and implement the amended Plan no later than November 10, 2011. If such a facility becomes operational after August 16, 2002, through November 10, 2011, and could reasonably be expected to have a discharge as described in § 112.1(b), you must prepare and implement a Plan on or before November 10, 2011.

The Facility became operational prior to 2011, therefore the Facility is required to prepare and implement a SPCC Plan on or before November 10, 2011.

1.3 SPCC PLAN AVAILABILITY

§112.3(e) – If you are the owner or operator of for which a Plan is required under this section, you must:
(1) – Maintain a complete copy of the Plan at the facility if the facility is normally attended at least four hours per day, or at nearest field office if the facility is not so attended, and
(2) – Have the Plan available to the Regional Administrator for on-site review during normal working hours.

The Facility is normally attended for less than four hours per day. A complete copy of this SPCC Plan will be maintained at the nearest field office. During normal working hours, the Plan will be available to authorized representatives of State and Federal governing agencies for on-site review.

1.4 SPCC PLAN AMENDMENT BY OWNER/OPERATOR:

§112.5(a) – Amend the SPCC Plan for your facility in accordance with the general requirements in §112.7, and with any specific section of this part applicable to your facility, when there is a change in the facility design, construction, operation, or maintenance that materially affects its potential for a discharge as described in §112.1(b). An amendment made under this section must be prepared within six months, and implemented as soon as possible, but not later than six months following preparation of the amendment.

If there is a change in Facility design, construction, operation, or maintenance that materially affects the potential for a discharge, this SPCC Plan will be amended within six months of the change and the amended Plan will be implemented within six-months of the amendment. Changes that could materially affect the potential for a discharge include addition of oil containers and reduction of secondary containment capacity. All Plan amendments will be recorded on the Record of Plan Review and Amendment Log. *(Note: WV Code §22-30-9 includes additional criteria for Plan amendment, as described in Section 1.5 below).*

§112.5(b) – Notwithstanding compliance with paragraph (a) of this section, complete a review and evaluation of the SPCC Plan at least once every five years from the date your facility becomes subject to this part; or, if your facility was in operation on or before August 16, 2002, five years from the date your last review was required under this part. As a result of this review and evaluation, you must amend your SPCC Plan within six months of the review to include more effective prevention and control technology if the technology has been field-proven at the time of the review and will significantly reduce the likelihood of a discharge as described in §112.1(b) from the facility. You must implement any amendment as soon as possible, but not later than six months following preparation of any amendment. You must document your completion of the review and evaluation, and must sign a statement as to whether you will amend the Plan, either at the beginning or end of the Plan or in a log or an appendix to the Plan.

This Plan will be reviewed at least once every five years from the date the Facility became subject to the SPCC rule (November 10, 2011), or the date of the last five year review for all subsequent reviews. As a result of the review, the Plan will be amended within six months of the review if more effective prevention and control technology has been field-proven at the time of the review and will significantly reduce the likelihood of a discharge. The amended Plan will be implemented within six-months following such an amendment. Each Plan review and amendment will be recorded in the Record of Plan Review and Amendment Log. *(Note: WV Code §22-30-9 requires more frequent review of the Plan, as described in Section 1.5 below).*

§112.5(c) – Except as provided in §112.6, have a Professional Engineer certify any technical amendments to your Plan in accordance with §112.3(d).

Technical amendments made to the Plan will be certified by a Professional Engineer. Technical amendments include any change involving oil containers, secondary containment or inspection procedures. Name and phone number changes do not require a technical amendment.

1.5 WV SPILL PREVENTION RESPONSE PLAN REQUIREMENTS

This Plan has been developed to satisfy WV Code §22-30-9, which requires submission of a site-specific Spill Prevention Response Plan for each aboveground storage tank with capacity greater than 1,320 gallons. The minimum required content for a Spill Prevention Response Plan is summarized in the "WV Code §22-30-9 Cross-Reference to Plan Sections" page. Spill Prevention Response Plan submission requirements are as follows:

- The Plan must be submitted to the WVDEP for approval by December 3, 2014.
- As required by the WVDEP, the approved Plan must be submitted to applicable public water systems and county and municipal emergency management agencies.
- The Plan must be resubmitted every 3 years.
- The Plan must be revised and resubmitted if any of the following occur:
    - There is a substantial modification to an AST, or there are circumstances that increase the potential for fires, explosions or releases of fluids.

- There is a substantial modification in emergency equipment.
- There are substantial changes in emergency response protocols.
- The Plan fails in an emergency.
- Removal or addition of an AST.
- A request from the WVDEP.

2.0 FACILITY INFORMATION

Facility Name:	Lasher Injection Station Site
Facility Address:	Pad Fork, Hanover WV 24839
Facility Location:	N 37° 30' 32", W 81° 42' 10"
Facility County:	Wyoming
Owner/Operator Name:	Atlas Resource Partners (ARP) Mountaineer Production, LLC.
Owner/Operator Address:	425 Houston St, Ft Worth, TX 76102 Ste 300
Process Description:	The Facility accumulates produced water from coal bed methane wells nearby. No gas processing or compression occurs at the site. The produced water does not contain oil.
Initial Operation:	2003
Bulk Storage Containers	• Produced water tanks (7)
Flow-Through Process Vessels:	• None
Oil-Filled Operational Equipment:	• None
Oil-Containing Piping:	• None
Oil Loading Racks:	There is no "loading rack" as defined in the SPCC rule at the Facility.
Facility Drainage:	Runoff from the Facility flows → Pad Fork → Little Huff Creek → Guyandotte River

3.0 GENERAL REQUIREMENTS

3.1 FACILITY LAYOUT

§112.7(a)(3) – Describe in your Plan the physical layout of the facility and include a facility diagram, which must mark the location and contents of each fixed oil storage container and the storage area where mobile or portable containers are located. The facility diagram must identify the location of and mark as "exempt" underground tanks that are otherwise exempted from the requirements of this part under §112.1(d)(4). The facility diagram must also include all transfer stations and connecting pipes.

The location of the Facility is shown in Figure 1. The physical layout of the Facility is shown in Figure 2. The location of each container, vacuum truck loading area and oil-containing connecting pipes are shown in Figure 2. The contents of each container are listed in Table 1.

3.2 OIL STORAGE CAPACITY

§112.7(a)(3)(i) – Address the type of oil in each fixed container and its storage capacity. For mobile or portable containers, either provide the type of oil and storage capacity for each container or provide an estimate of the potential number of mobile or portable containers, the types of oil, and anticipated storage capacities;

The type of fluid in each fixed container and the container storage capacity are listed in Table 1.

3.3 COUNTERMEASURES FOR DISCHARGE DISCOVERY, RESPONSE, AND CLEANUP

§112.7(a)(3)(iv) - Address countermeasures for discharge discovery, response, and cleanup (both the facility's capability and those that might be required of a contractor);

The Facility is capable of discharge discovery, response, and cleanup. Specific countermeasures are discussed in individual sections of this Plan.

- The Facility is monitored on a daily basis by Facility personnel. Any potential discharge from the Facility should be discovered during these observations.
- A Spill Contingency Plan is maintained (Appendix A). Off-site response and cleanup of a discharge will be performed by qualified spill cleanup contractors as described in the Spill Contingency Plan.

3.4 CONTACT LIST AND NOTIFICATION PHONE NUMBERS

§112.7(a)(3)(vi) – Provide contact list and phone numbers for the facility response coordinator, National Response Center, cleanup contractors with whom you have an agreement for response, and all appropriate Federal, State, and local agencies who must be contacted in case of a discharge as described in §112.1(b).

A contact list and phone numbers for Facility responders, government agencies and cleanup contractors is included in the Spill Contingency Plan (Appendix A).

3.5 REPORTING AND NOTIFICATION PROCEDURES

§112.7(a)(4) - Unless you have submitted a response plan under §112.20, provide information and procedures in your Plan to enable a person reporting a discharge as described in §112.1(b) to relate information on the exact address or location and phone number of the facility; the date and time of the discharge, the type of material discharged; estimates of the total quantity discharged; estimates of the quantity discharged as described in §112.1(b); the source of the discharge; a description of all affected media; the cause of the discharge; any damages or injuries caused by the discharge; actions being used to stop, remove, and mitigate the effects of the discharge; whether an evacuation may be needed; and, the names of individuals and/or organizations who have also been contacted.

The Spill Contingency Plan (Appendix A) includes a reporting form that contains information and procedures needed by Facility personnel to report a discharge to government agencies.

3.6 OIL SPILL RESPONSE PROCEDURES

§112.7(a)(5) - Unless you have submitted a response plan under §112.20, organize portions of the Plan describing procedures you will use when a discharge occurs in a way that will make them readily usable in an emergency, and include appropriate supporting material as appendices.

The Spill Contingency Plan (Appendix A) contains discharge response procedures that will be used if a discharge occurs.

3.7 DISCHARGE ANALYSIS

§112.6(a)(3)(i) in lieu of §112.7(b) - Where experience indicates a reasonable potential for equipment failure (such as loading or unloading equipment, tank overflow, rupture, or leakage, or any other equipment known to be a source of a discharge), include in your Plan a prediction of the direction and total quantity of oil which could be discharged from the facility as a result of each type of major equipment failure.

Predictions of the direction and total quantity of material that could be discharged are summarized in the Spill Contingency Plan (Appendix A). Natural drainage patterns from the Facility are depicted in Figures 2 and 3.

3.8 SPILL CONTAINMENT

§112.7(c) - Provide appropriate containment and/or diversionary structures or equipment to prevent a discharge as described in §112.1(b) except as provided in paragraph (k) of this section for qualified oil-filled operational equipment, and except as provided in §112.9(d)(3) for flowlines and intra-facility gathering lines at an oil production facility. The entire containment system, including walls and floor, must be capable of containing oil and must be constructed so that any discharge from a primary containment system, such as a tank or pipe, will not escape the containment system before cleanup occurs. In determining the method, design, and capacity for secondary containment, you need only to address the typical failure mode, and the most likely quantity of oil that would be discharged. Secondary containment may be either active or passive in design. At a minimum, you must use one of the following prevention systems or its equivalent:

(1) For onshore facilities:

(i) Dikes, berms, or retaining walls sufficiently impervious to contain oil;
(ii) Curbing or drip pans;
(iii) Culverting, gutters, or other drainage systems;
(iv) Weirs, booms, or other barriers;
(v) Spill diversion ponds;
(vi) Retention ponds; or
(vii) Sorbent materials.

Appropriate containment to prevent a discharge is provided as described in Table 2.

3.9 INSPECTIONS, TESTS, AND RECORDS

§112.7(e) – Conduct inspections and tests required by this part in accordance with written procedures that you or the certifying engineer develop for the facility. You must keep these written procedures and a record of the inspections and tests, signed by the appropriate supervisor or inspector, with the SPCC Plan for a period of three years. Records of inspections and tests kept under usual and customary business practices will suffice for purposes of this paragraph.

The following monitoring and inspections are performed at the Facility:

- The Facility is monitored on a daily basis by an operator for visible signs of leakage, spills and conditions that could cause a leak or spill.
- Storage tanks are visually inspected quarterly by an operator using an inspection checklist (Appendix B).
- Storage tanks with capacity greater than 1,320 gallons are inspected annually in accordance with West Virginia aboveground storage tank inspection requirements. The inspections are performed by qualified personnel and certified by a registered professional engineer.

If a deficiency is noted during an inspection or test that could result in a discharge of oil or other pollutant, corrective action must be taken to address the deficiency. Records of inspections shall be maintained for at least three years. Records of annual tank inspections shall be maintained for the life of the tank.

3.10 PERSONNEL TRAINING AND DISCHARGE PREVENTION PROCEDURES

§112.7(f)(1) - At a minimum, train your oil-handling personnel in the operation and maintenance of equipment to prevent discharges; discharge procedure protocols; applicable pollution control laws, rules, and regulations; general facility operations; and, the contents of the facility SPCC Plan.

Personnel at the Facility are trained in the operation and maintenance of Facility equipment to prevent discharges. Training covers discharge procedure protocols, applicable pollution control laws and regulations, general Facility operations, and the contents of the SPCC Plan. Training is conducted initially and whenever the Facility is modified, personnel responsibilities are changed, or the SPCC Plan is amended. Training records are maintained for at least three years.

§112.7(f)(2) - Designate a person at each applicable facility who is accountable for discharge prevention and who reports to facility management.

The Production Supervisor is accountable for discharge prevention at the Facility. The Production Supervisor will direct the Production Foreman with regards to discharge prevention. The Environmental Manager will establish the program and provide guidance as needed.

§112.7(f)(3) - Schedule and conduct discharge prevention briefings for your oil-handling personnel at least once a year to assure adequate understanding of the SPCC Plan for that facility. Such briefings must highlight and describe known discharges as described in §112.1(b) or failures, malfunctioning components, and any recently developed precautionary measures.

Personnel at the Facility are briefed in discharges, failures and recently developed precautionary measures during annual spill prevention training. Records of these briefings are maintained for a period of no less than three years.

3.11 SECURITY

§112.7(g) – Describe in your Plan how you secure and control access to the oil handling, processing and storage areas; secure master flow and drain valve; prevent unauthorized access to starter controls on oil pumps; secure out-of-service and loading/unloading connections of oil pipelines; and address the appropriateness of security lighting to both prevent acts of vandalism and assist in the discovery of oil discharges.

The Facility is located in a remote area. The remoteness of the Facility is considered to be sufficient to secure access to the Facility without the need for fencing, gates, locks etc.

Security lighting is not provided because security lighting would not be a deterrent to vandalism. Portable lighting used by Facility operators and fixed lighting within the Facility are adequate to assist in the discovery of a discharge.

3.12 ADDITIONAL STATE REQUIREMENTS

§112.7(j) – In addition to the minimal prevention standards listed under this section, include in your Plan a complete discussion of conformance with the applicable requirements and other effective discharge prevention and containment procedures listed in this part or any applicable more stringent State rules, regulations, and guidelines.

The State of West Virginia has codified several discharge prevention and containment requirements that are equivalent to or more stringent than 40 CFR Part 112. These requirements are summarized as follows:

- 35 CSR 1.3 establishes discharge notification and response rules. In the event of a reportable discharge, the Office of Oil and Gas (1-800-642-3074) must be notified immediately, but in no case later than 24 hours after becoming aware of the discharge. A reportable discharge is any discharge which would be reportable to the National Response Center pursuant to the Federal Clean Water Act, or any upset or bypass causing exceedance of an effluent limitation established under the general permit for the Facility.
- 35 CSR 1.7 establishes spill prevention rules for production facilities. These rules are equivalent to requirements in 40 CFR Part 112.
- 35 CSR 3 establishes rules for coal bed methane wells. These rules require permitting of coal bed methane wells, and include requirements for production and gathering pipelines.
- WV Code, §22-30 establishes requirements for aboveground storage tanks (ASTs) with capacity greater than 1,320 gallons.
    - §22-30-4 requires registration of each AST in a WVDEP inventory.
    - §22-30-5 requires promulgation of legislative rules for ASTs (pending action by the WVDEP and WV legislature).
    - §22-30-6 requires annual inspection and certification of each AST.
    - §222-30-7 requires promulgation of rules for AST financial responsibility (pending action by the WVDEP).
    - §22-30-9 requires submission to the WVDEP of a spill prevention response plan for each AST.

- §22-30-10 requires notification of any local government and water company if an AST is located within a zone of critical protection, as determined by the WVDEP. The notice must include information regarding the type and quantity of fluid in the AST, and the spill prevention response plan for the AST.
- §22-30-11 requires signage to be displayed on each AST, containing information as specified by the WVDEP.

3.13 QUALIFIED OIL-FILLED OPERATIONAL EQUIPMENT

§112.7(k) – Qualified Oil-filled Operational Equipment. The owner or operator of a facility with oil-filled operational equipment that meets the qualification criteria in paragraph (k)(1) of this sub-section may choose to implement for this qualified oil-filled operational equipment the alternate requirements as described in paragraph (k)(2) of this sub-section in lieu of general secondary containment required in paragraph (c) of this section

There is no oil-filled operational equipment at the Facility.

4.0 REQUIREMENTS FOR ONSHORE FACILITIES

4.1 FACILITY DRAINAGE

§112.8(b)(1) - Restrain drainage from diked storage areas by valves to prevent a discharge into the drainage system or facility effluent treatment system, except where facility systems are designed to control such discharge. You may empty diked areas by pumps or ejectors; however, you must manually activate these pumps or ejectors and must inspect the condition of the accumulation before starting, to ensure no oil will be discharged.

Drainage from diked storage areas that are capable of being drained is restrained by either a manually operated valve or plug in the drain line.

§112.8(b)(2) - Use valves of manual, open-and-closed design, for the drainage of diked areas. You may not use flapper-type drain valves to drain diked areas. If your facility drainage drains directly into a watercourse and not into an on-site wastewater treatment plant, you must inspect and may drain uncontaminated retained storm water, as provided in paragraphs (c)(3)(ii), (iii), and (iv) of this section.

Valves and plugs used for drainage from diked areas that are capable of being drained are of manual, open-and-closed design. Rainwater that accumulates in these areas is inspected for contamination before being drained in accordance with procedures in Appendix C.

4.2 BULK STORAGE CONTAINERS

§112.8(c)(1) -- Not use a container for the storage of oil unless its material and construction are compatible with the material stored and the conditions of storage.

Storage containers at the Facility are constructed of carbon steel or plastic material. Carbon steel and plastic are compatible with all materials stored and the conditions of storage. The flash point of all materials stored is greater than 200 °F.

***§112.6(a)(3)(ii) in lieu of §112.8(c)(2)** – Construct all bulk storage container installations (except mobile refuelers and other non-transportation-related tank trucks) so that you provide a secondary means of containment for the entire capacity of the largest single container plus sufficient freeboard to contain precipitation. Dikes, containment curbs, and pits are commonly employed for this purpose. You may also use an alternative system consisting of a drainage trench enclosure that must be arranged so that any discharge will terminate and be safely confined in a facility catchment basin or holding pond.*

Bulk storage containers are provided with sized secondary containment as described in Table 2. Secondary containment calculations are included in Appendix D.

§112.8(c)(3) - Not allow drainage of uncontaminated rainwater from the diked area into a storm drain or discharge of an effluent into an open watercourse, lake, or pond, bypassing the facility treatment system unless you:

(i) Normally keep the bypass valve sealed closed.

(ii) Inspect the retained rainwater to ensure that its presence will not cause a discharge as described in §112.1(b).

(iii) Open the bypass valve and reseal it following drainage under responsible supervision, and

(iv) Keep adequate records of such events, for example, any records required under permits issued in accordance with §§122.41(j)(2) and 122.41(m)(3) of this chapter.

Rainwater that accumulates in diked storage areas is inspected for contamination before being drained in accordance with procedures in Appendix C.

§112.8(c)(4) - Protect any completely buried metallic storage tank installed on or after January 10, 1974 from corrosion by coatings or cathodic protection compatible with local soil conditions. You must regularly leak test such completely buried metallic storage tanks.

There is no buried metallic oil storage tank that is owned or operated by ARP at the Facility.

§112.8(c)(5) - Not use partially buried or bunkered metallic tanks for the storage of oil, unless you protect the buried section of the tank from corrosion. You must protect partially buried and bunkered tanks from corrosion by coatings or cathodic protection compatible with local soil conditions.

There is no partially buried or bunkered metallic oil storage tank that is owned or operated by ARP at the Facility.

§112.8(c)(6) -- Test or inspect each aboveground container for integrity on a regular schedule, and whenever you make material repairs. You must determine, in accordance with industry standards, the appropriate qualifications for personnel performing tests and inspections. The frequency of and type of testing must take into account container size and design (such as containers that are shop-built, field-erected, skid-mounted, elevated, equipped with a liner, double-walled, or partially buried). Examples of these integrity tests include, but are not limited to: visual inspection with another testing technique such as hydrostatic testing, radiographic testing, ultrasonic testing, acoustic emissions testing, or another system of non-destructive shell testing. You must keep comparison records and you must also inspect the container's supports and foundations. In addition, you must frequently inspect the outside of the container for signs of deterioration, discharges, or accumulation of oil inside diked areas. Records of inspections and tests kept under usual and customary business practices will suffice for purposes of this paragraph.

Containers are inspected quarterly by facility personnel. Inspection procedures are contained in Appendix B. In addition, storage tanks with capacity greater than 1,320 gallons are inspected annually by a qualified tank inspector and inspections are certified by a registered professional engineer. If a deficiency is noted during an inspection or test that could result in a discharge, corrective action must be taken to address the deficiency. Records of inspections and corrective actions are maintained for at least three years.

§112.6(a)(3)(iii) in lieu of §112.8(c)(8) – Ensure that each container is provided with a system or documented procedure to prevent overfills of the container, and describe the system or procedure in the SPCC Plan and regularly test to ensure proper operation or efficacy

Storage tanks at the Facility are engineered consistent with §112.9(c)(4)(i) to achieve equivalent environmental protection. Tank capacity is adequate to assure that it will not overfill if a gauger is delayed in making regularly scheduled rounds. This method is considered to be good engineering practice to prevent overfills for this type of facility.

§112.8(c)(10) - Promptly correct visible discharges which result in a loss of oil from the container, including but not limited to seams, gaskets, piping, pumps, valves, rivets, and bolts. You must promptly remove any accumulations of oil in diked areas.

Visible leaks from containers and associated piping are reported upon observation and repaired in a timely manner. Any accumulations of fluid outside of the container will be promptly removed.

§112.6(a)(3)(ii) in lieu of §112.8(c)(11) - Position or locate mobile or portable oil storage containers to prevent a discharge as described in §112.1(b).

There are no mobile or portable oil storage containers at the Facility.

4.3 FACILITY TRANSFER OPERATIONS

§112.8(d)(4) - Regularly inspect all aboveground valves, piping, and appurtenances. During the inspection you must assess the general condition of items, such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces. You must also conduct integrity and leak testing of buried piping at the time of installation, modification, construction, relocation, or replacement.

Aboveground valves, piping and appurtenances are inspected during bulk container inspections as described in Section 4.2.

TABLES

Table 1
Container Inventory
Lasher Injection Station

Registration	ID	Container	Type	Contents	Shell Capacity
055-00000979	1	Produced water tank	Bulk storage tank	*Water - no oil*	8,813 gal
055-00000985	2	Produced water tank	Bulk storage tank	*Water - no oil*	8,813 gal
055-00000981	3	Produced water tank	Bulk storage tank	*Water - no oil*	8,813 gal
055-00000984	4	Produced water tank	Bulk storage tank	*Water - no oil*	8,813 gal
055-00000980	5	Produced water tank	Bulk storage tank	*Water - no oil*	8,813 gal
055-00000982	6	Produced water tank	Bulk storage tank	*Water - no oil*	8,813 gal
055-00000983	7	Produced water tank	Bulk storage tank	*Water - no oil*	8,813 gal
Total aboveground oil capacity					0 gal

Table 2
Secondary Containment Summary
Lasher Injection Station

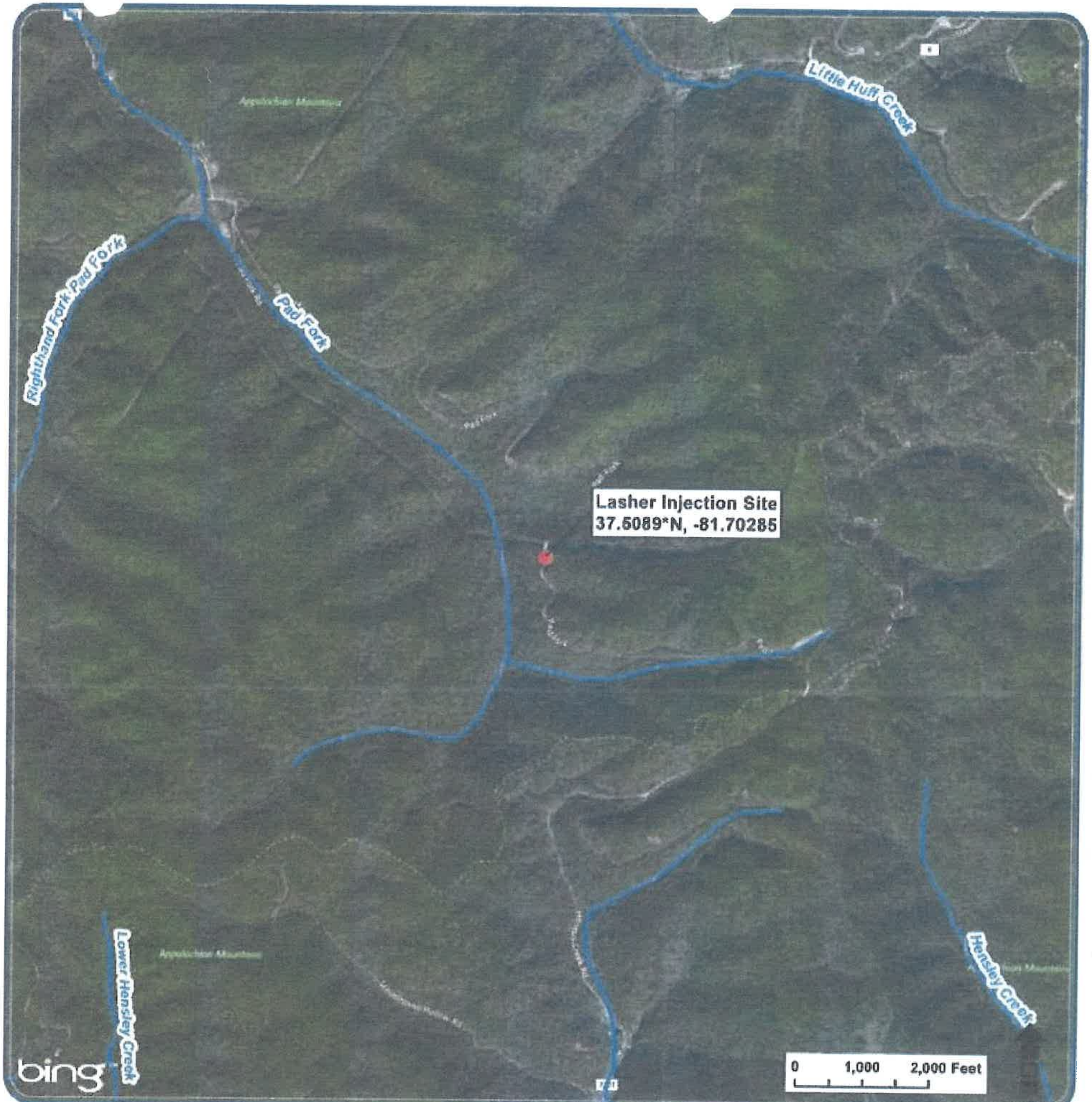
ID	Discharge source	Secondary Containment Standard (40 CFR 112)	Design Failure Mode	Design Discharge Volume (gallons)	Secondary Containment Method	Secondary Containment Capacity (gallons)
1	Produced water tank	*NA - no oil*	Shell failure	8,813	Formed Wall	62,759
2	Produced water tank	*NA - no oil*	Shell failure	8,813		
3	Produced water tank	*NA - no oil*	Shell failure	8,813		
4	Produced water tank	*NA - no oil*	Shell failure	8,813		
5	Produced water tank	*NA - no oil*	Shell failure	8,813		
6	Produced water tank	*NA - no oil*	Shell failure	8,813		
7	Produced water tank	*NA - no oil*	Shell failure	8,813		

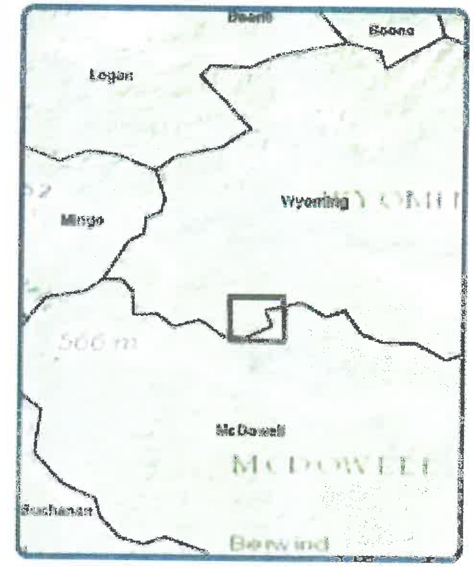
FIGURES

FIGURE 1

LASHER INJECTION SITE

Wyoming County,
West Virginia

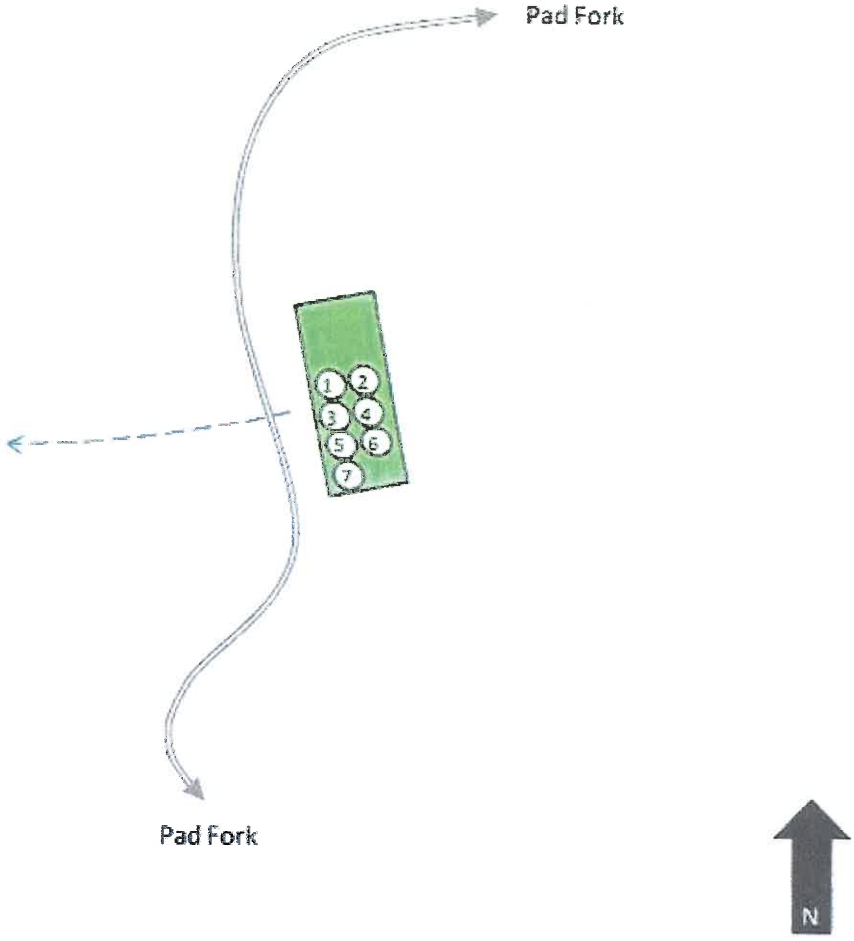




Site
Stream

Data Sources: ESRI- BING Hybrid
& World Topography Basemaps
Datum: GCS WGS 1984
Date: 11/13/2014

Figure 2
Lasher Injection Station Site



Legend

- Oil-containing tank
- Oil-containing equipment
- Non-oil-containing tank or equipment
- Containment berm or wall
- Oil truck loading
- Oil-containing piping
- Sheet runoff direction

Container

1 Produced water tank
2 Produced water tank
3 Produced water tank
4 Produced water tank
5 Produced water tank
6 Produced water tank
7 Produced water tank

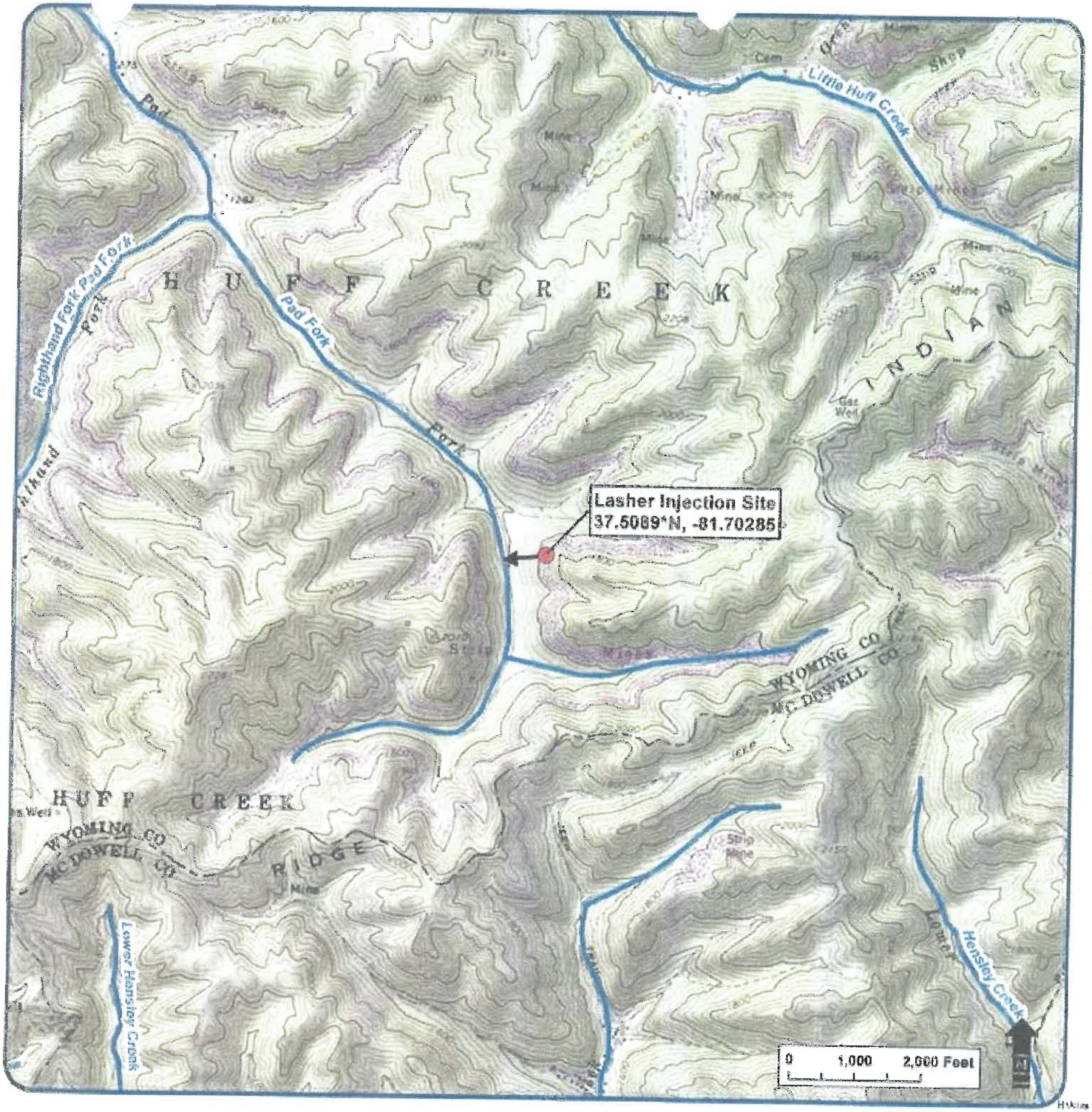
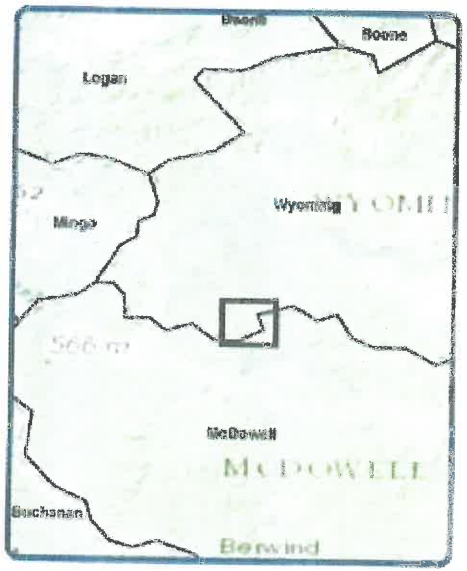


FIGURE 3

DRAINAGE MAP

LASHER INJECTION SITE

Wyoming County, West Virginia



zephyr

- Site
- Drainage Path
- Stream

Data Sources: ESRI- USGS
& World Topography Basemaps;
Datum: GCS WGS 1984
Date: 11/13/2014

H:\Alpha Energy\14300 ARP Mountaineer GIS\ArcMap\Task Maps\Lasher Injection Site.mxd

APPENDIX A

SPILL CONTINGENCY PLAN

SPILL CONTINGENCY PLAN

Prepared for:

ARP MOUNTAINEER PRODUCTION, LLC
LASHER INJECTION STATION SITE
PAD FORK
HANOVER, WEST VIRGINIA 24839

Prepared By:

Zephyr Environmental Corporation
10440 Little Patuxent Parkway, Suite 750
Columbia, Maryland 21044

November 2014

zephyr

CONTENTS

APPENDICES

1.0 INTRODUCTION

The ARP Mountaineer LLC, LASHER INJECTION STATION in Wyoming County, WV produces coal bed methane gas. Facility operations involve separation of liquid water from coal bed methane gas ("produced water") and accumulation of produced water in storage tanks. Although aggregate aboveground oil storage capacity is less than the SPCC rule threshold, the Facility has prepared a Tier I Qualified Facility SPCC Plan and Spill Contingency Plan to address the potential for a discharge from the Facility. The Facility is required to prepare a Spill Prevention Plan Response Plan in accordance with West Virginia Code, §22-30-9.

A Spill Contingency Plan required by 40 CFR 112 must follow the provisions of 40 CFR 109 and address the following elements:

- Definition of the authorities, responsibilities and duties of all persons, organizations or agencies which could be involved in planning or directing oil removal operations.
- Establishment of notification procedures for the purpose of early detection and timely notification of an oil discharge, including:
  - Identification of critical water use areas;
  - Names, telephone numbers and addresses of responsible persons, alternates, organizations and agencies to be notified; and
  - Reliable communication systems for timely notification of an oil discharge.
- Provisions to assure that full resource capability is known and can be committed, including:
  - Identification and inventory of applicable equipment, material and supplies which are available locally and regionally;
  - An estimate of the equipment, materials and supplies which would be required to remove the maximum oil discharge to be anticipated; and
  - Development of agreements and arrangements in advance of an oil discharge for the acquisition of equipment, materials and supplies to be used in responding to a discharge.
- Provisions for well defined and specific actions to be taken after discovery and notification of an oil discharge, including:
  - Specification of an oil discharge response operating team consisting of trained, prepared and available operating personnel; and
  - Pre-designation of a properly qualified oil discharge response coordinator who is charged with the responsibility and authority for directing and coordinating response operations.

A Spill Prevention Response Plan required by WV Code §22-30-9 must address the following elements:

- Site activity information, including:
  - A description of activities and processes at the site;
  - A listing and inventory of fluids stored, amounts stored and wastes generated;
  - Safety Data Sheets (SDSs) for fluids stored; and

- Site drawings.

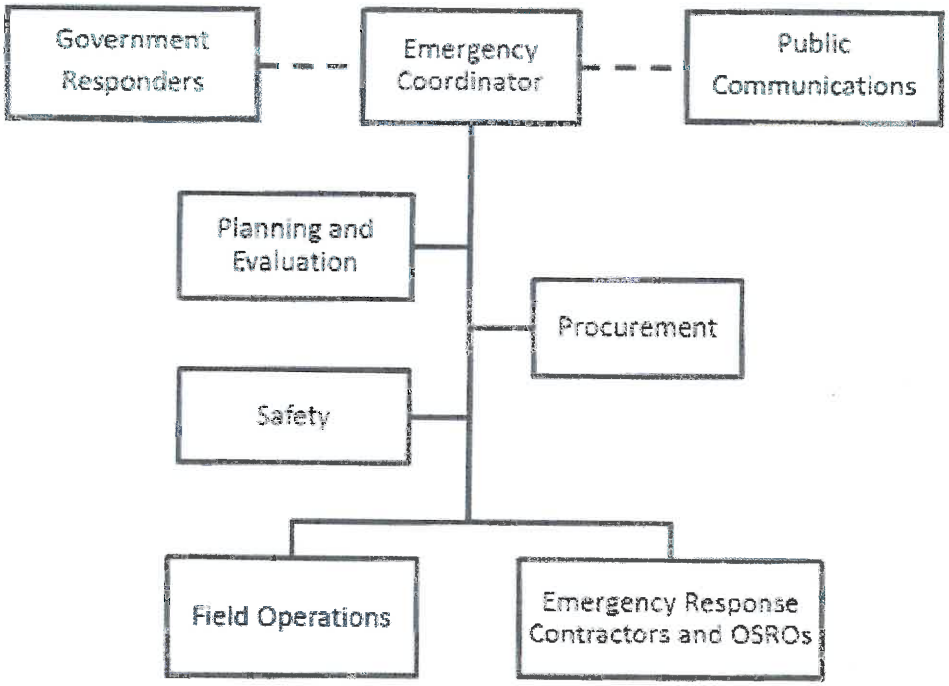
- Preventive maintenance program information, including:
  - Leak detection monitoring;
  - Inspection procedures;
  - Identification of AST stress points;
  - Employee training programs;
  - Corrosion protection and monitoring;
  - Security systems; and
  - Spill prevention measures.
- Emergency response information, including:
  - Facility staff with duties and responsibilities for developing, implementing and maintaining the Plan;
  - Chain of command at the facility;
  - Contact information for facility emergency coordinators;
  - Contact information for emergency response contractors;
  - Specific response that will be taken in the event of a release from the facility;
  - Contact information for county and municipal emergency management agencies;
  - Contact information for the nearest downstream public water supply; and
  - Contact information for the WVDEP.

2.0 EMERGENCY RESPONSE ORGANIZATION

This section defines the persons and organizations that could be involved in planning or directing spill response operations. These persons and organizations consist of:

- A Facility Response Team
- Contract Emergency Responders
- Government Agencies

The Emergency Coordinator for the Facility Response Team has overall responsibility for directing spill response operations. The Emergency Coordinator has direct control over internal Field Operations personnel and Emergency Response Contractors, and receives technical and supply support from internal Planning Evaluation, Safety and Procurement personnel. The Emergency Coordinator also interacts with Government Response Agencies and internal Public Communications personnel.



2.1 FACILITY RESPONSE TEAM

The Facility Response Team is comprised of company employees who fill roles with responsibilities as described below. Different persons may fill different roles, depending on their availability during an incident response.

Table 2.1a Facility Response Team Roles and Responsibilities

Team Role	Responsibilities
Emergency Coordinator	• Ensure notification of Government Agencies, Contract Responders and Facility Response Team members • Assemble a Facility Response Team • Develop and implement an incident action plan • Coordinate response activities and communications • Assess resource needs and coordinate the ordering, deployment and release of needed resources • Direct Field Operations and OSRO activities • Interface with government agency responders
Field Operations	• Perform immediate response activities at the Facility • Perform other on-site response activities as directed by the Emergency Coordinator
Planning and Evaluation	• Assess potential off-site impacts and keep the Emergency Coordinator informed • Assess progress of response activities and determine when response is complete • Maintain incident files for legal and historical purposes • Maintain and update the Plan as necessary
Safety	• Assess safety hazards and keep the Emergency Coordinator informed • Develop measures to ensure personnel safety • Bypass the chain of command when necessary to correct unsafe acts or conditions
Public Communications	• Act as a central clearing point for dissemination of information to the public and news media • Direct employee/family notifications
Procurement	• Procure equipment, services and materials for the incident response • Manage payments and finances

Table 2.1b Facility Response Team Members

Name	Role(s)
Jeff Cooper	Emergency Coordinator
Criss Yates	Alternate Emergency Coordinator
Roger Laxton	Alternate Emergency Coordinator
Johnny Carver	Field Operations
Jake Cook	Field Operations
Ronnie Cook	Field Operations
Robbie Horn	Field Operations
Claude Ray Jr.	Field Operations
Claude Ray III	Field Operations
Rocky Stillwell	Planning and Evaluation & Safety
Brian Shpakoff	Planning and Evaluation & Safety
Jim Amendolea	Planning and Evaluation & Safety
Rene St. Pierre	Public Communications & Procurement of Outside Resources

2.2 CONTRACT EMERGENCY RESPONDERS

Table 2.2 Contract Responders

ERC	Responsibilities
HEPACO Envirocheck, Inc.	• Provide response equipment and trained personnel • Recommend and perform response activities as directed by the Emergency Coordinator • Assess the effectiveness of response strategies and keep the Emergency Coordinator informed

2.3 GOVERNMENT AGENCIES

Table 2.3 Government Agencies

Agency	Responsibilities
West Virginia Department of Environmental Protection (WVDEP)	• Oversee the progress of response activities • Communicate response objectives • Request federal assistance if necessary
Local Emergency Management Services (EMS)	• Emergency rescue services • Fire-fighting assistance as directed by the Emergency Coordinator • Prevent unauthorized access to affected areas • Coordinate community evacuation if necessary
EPA Region III	• Provide federal assistance if requested by WVDEP
National Response Center (US Coast Guard)	• Communicate incident notifications to applicable government agencies

3.0 NOTIFICATION PROCEDURES

This section establishes notification procedures for the purpose of early detection and timely notification of a spill or leak.

3.1 REPORTING REQUIREMENTS

If a leak or spill is detected or discovered, persons, organizations and government agencies must be notified as follows. Phone numbers are listed in Table 3.3.

Table 3.1 Reporting Requirements

Occurrence	Reportable Quantity	Notify	Timing
Leak or spill, not from a registered storage tank	Any amount on ground	Emergency Coordinator Contract Responder(s)	<1 hour of discovery
Leak or spill, from a registered storage tank	>25 gallons within containment, or any amount outside of containment	Emergency Coordinator Contract Responder(s) WVDEP County EMS Public Water Suppliers	<1 hour of discovery
Oil leak or spill to a creek or stream	Visible oil film or sheen on surface of water	All of the above plus the NRC	<1 hour of discovery

3.2 SPILL RESPONSE NOTIFICATION FORM

An example Spill Response Notification Form is provided in Appendix A. The form includes information to pass to response personnel in the event of a reportable discharge.

3.3 EMERGENCY NOTIFICATION PHONE LIST

The following list contains contact information for Government Agencies, Contract Responders, Public Water Suppliers and Facility Response Team members that must be notified in the event of a discharge.

Table 3.3 Emergency Notification Phone List

Name	Address	Organization	24-Hour Number
Government Agencies			
Local police, fire and emergency medical	P.O. Box 568 Pineville, WV 24874	Wyoming County EMS	911
Wyoming County LEPC	P.O. Box 568 Pineville, WV 24874	Local Emergency Planning Committee	304-732-6953

Table 3.3 Emergency Notification Phone List

Name	Address	Organization	24-Hour Number
WVDEP	4994 Elk River Road South Elkview, WV 25071	WVDEP Emergency Response	800--642-3074
National Response Center (NRC)	NA	US Coast Guard	800-424-8802
Contract Emergency Responders			
HEPACO (OSRO)	279 Shipley Ferry Road Blountville, TN 37617	Emergency Response Contractor	800-888-7689
Envirocheck, Inc.	120 Lovelane Street Bluefield, VA 24605	Emergency Response Contractor	866-701-3093
Public Water Suppliers			
Davey Municipal Water Works	P.O. Box 430, Main Street Davey WV 24828	Groundwater Public Water Supply Intake	304-656-7145
Gilbert Water Works	PO Box 1360 Gilbert, WV 25621	Surface Water Public Water Supply Intake	304-664-9625 304-664-3752
Facility Response Team			
Jeff Cooper	2615 Steelsburg Highway Cedar Bluff, VA 24609	Atlas I Titan	276-971-3268
Criss Yates	2615 Steelsburg Highway Cedar Bluff, VA 24609	Atlas I Titan	276-701-7609
Roger Laxton	2388 Harper Road Beckley, WV 25801	Atlas I Titan	304-923-2969
Johnny Carver	2615 Steelsburg Highway Cedar Bluff, VA 24609	Atlas I Titan	276-202-6237
Jake Cook	2388 Harper Road Beckley, WV 25801	Atlas I Titan	304-923-9753
Ronnie Cook	2615 Steelsburg Highway Cedar Bluff, VA 24609	Atlas I Titan	276-202-7448
Robbie Horn	2615 Steelsburg Highway Cedar Bluff, VA 24609	Atlas I Titan	276-701-7610
Claude Ray Jr.	2615 Steelsburg Highway Cedar Bluff, VA 24609	Atlas I Titan	276-971-3318
Claude Ray III	2615 Steelsburg Highway Cedar Bluff, VA 24609	Atlas I Titan	276-210-4174
Rocky Stilwell	2615 Steelsburg Highway Cedar Bluff, VA 24609	Atlas I Titan	276-701-9369
Brian Shpakoff	425 Houston Street Ft. Worth, TX 76102	Atlas I Titan	682-209-2074
Jim Amendolea	425 Houston Street Ft. Worth, TX 76102	Atlas I Titan	405-550-4644
Rene St. Pierre	425 Houston Street Ft. Worth, TX 76102	Atlas I Titan	405-200-7395

3.4 RESPONSE EQUIPMENT

3.4.1 In-House Equipment

Facility Response Team members have been issued cell phones for communications purposes. Cell phones are considered to be a reliable means of communication. The cell phones are tested daily during normal use.

A spill kit that can be used to contain and remove small spills is available to Facility Response Team members.

3.4.2 OSRO Equipment

One or more contracted OSROs listed in this Plan will provide discharge removal equipment and personnel. OSROs listed in this Plan are capable of cleaning up any oil discharge from the Facility. The following types of equipment are available:

- Skimmers and pumps
- Containment boom
- Dispersant
- Sorbents
- Hand tools
- Communication equipment
- Fire fighting and personal protective equipment
- Heavy equipment, boats and motors

OSROs are responsible for testing their response equipment and training their employees in the operation of the equipment, consistent with the US Coast Guard's program for rating of OSRO capabilities.

4.0 RESPONSE ACTIONS

This section defines actions to be taken after discovery of a discharge.

4.1 DISCHARGE DETECTION

The Facility is normally unattended. Facility personnel usually inspect the Facility at least once per day. Any oil or pollutant discharge that could occur should be discovered during daily inspections. Activities that involve a higher risk of a discharge, such as truck loading, gathering line blowdown and Facility maintenance, occur when Facility personnel are present at the Facility.

4.2 IMMEDIATE ACTIONS

Immediate response actions to be taken in the event of an actual or threatened discharge, prior to implementation of removal actions, are as follows.

Table 4.2 Immediate Response Actions

Action	When	Responsibility
Notify the Operations Supervisor and HSE	Immediately, upon discovery of an actual or threatened discharge	Field Operations
Assess the Facility for hazardous conditions	Immediately, upon discovery of an actual or threatened discharge	Field Operations
Evacuate Facility areas where hazardous conditions exist	Immediately, after assessing areas for hazardous conditions	Field Operations
Eliminate ignition sources in hazardous areas	Immediately, after assessing plant areas for hazardous conditions	Field Operations
Stop flow by closing valves and isolating the spill source	Immediately, after determining that the area is safe to enter	Field Operations
Verify that secondary containment drains are tightly closed	Immediately, after determining that the area is safe to enter	Field Operations
Determine whether a discharge is reportable	Immediately, after being notified of an actual or threatened discharge	Emergency Coordinator or designee
Notify Government Agencies, Public Water Suppliers, Contract Responders and Facility Response Team	Immediately, after determining that a discharge is reportable	Emergency Coordinator or designee
Initiate spill containment by deploying absorbent material, containment booms, etc.	As soon as responders mobilize on-site	Field Operations Coordinator and Field Operations

4.3 REMOVAL ACTIONS

Response actions for a discharge are described in Table 4.3. The highest overall priority for response actions should be to prevent the spread of discharged material to the greatest extent possible. Decisions regarding specific actions to contain and remove discharged material need to be made by the Emergency Coordinator based on actual conditions during an incident, taking into account circumstances such as:

- Location. Knowledge of the location of discharged material is essential to an effective response. If the location of discharged material is unknown or uncertain, proactive measures such as deployment of containment boom, barriers or sorbent at more distant locations should be considered.

- Precipitation. Precipitation could spread discharged material at a faster rate and in greater quantities than would occur during dry weather conditions.

- Vulnerability of nearby environmental receptors. Runoff from the Facility flows over land to streams, creeks and rivers. The presence of sensitive environmental receptors in waterways may affect the timing and priority of response actions.

Except for small spills that can be rapidly cleaned-up by Facility personnel on-site, containment and removal actions will be performed by Contract Emergency Responders. Emergency Response Contractors listed in this Plan are capable of responding to a discharge from the Facility. At least one Coast Guard-rated Oil Spill Removal Organization (OSRO) is included.

Required resources and timing shown in Table 4.3 represent minimum levels of response that are anticipated for a discharge. In all cases, steps should be taken to expedite clean-up rapidly and prevent the spread of discharged material. Expeditious response must include consideration of the following additional actions, as appropriate to the incident magnitude:

- Contracting with additional OSROs. In addition to Contract Emergency Responders listed in this Plan, the US Coast Guard maintains a listing of rated OSROs that are capable of responding to an oil discharge in the region. Additional OSROs will be contacted if it is determined that additional containment boom, oil recovery capacity and temporary storage capacity are needed.

- Contracting with general contractors. Shoreline clean-up can be expanded using equipment and laborers provided by general contractors. Training for shore clean-up can be contracted and rapidly provided to laborers. Labor contractors and training resources are readily available in the region.

Table 4.3 Response to a Discharge

Action	Timing	Required Resources	Response Personnel
1. Implement immediate response actions (Table 4.2).	<1 hour of discovery	NA	Facility Response Team
2. Continually assess: • Location and quantity of discharged material • Possible movement of discharged material • Proximity to water intakes • Discharged material containment and removal strategies • Adequacy of resources on-hand • Additional resource needs	On-going	NA	Facility Response Team
3. Continually coordinate communications with: • Government on-scene coordinators • Contracted responders • News media	On-going	NA	Facility Response Team
If Contract Emergency Responder assistance is not needed:			
4. Apply absorbent materials to discharged material.	1 hour	In-house spill kit	Facility Response Team
5. Remove contaminated adsorbent materials, soil and environmental media.	As soon as possible	Hand tools, approved containers	Facility Response Team
If Contract Emergency Responder assistance is needed:			
6. Deploy absorbent materials, containment boom or other temporary barriers in drainage pathways.	2 hours	Up to 1,000 feet of containment boom	Contractor(s) listed in Table 2.2
7. Deploy vacuum trucks and absorbent material as needed to recover discharged material.	2 hours	Up to 2,100 gpd recovery capacity	Contractor(s) listed in Table 2.2
8. Remove oil-contaminated adsorbent materials, soil and environmental media.	As soon as possible	Heavy equipment, hand tools, approved containers	Contractor(s) listed in Table 2.2
Following completion of removal activities:			
9. Perform incident response critique and implement any recommendations.	Removal complete	NA	Facility response team

Table 4.3 Response to a Discharge

Action	Timing	Required Resources	Response Personnel
10. Submit written reports: • To WVDEP, for any reportable spill • To EPA, if 1,000 gals was spilled to water, or if 42+ gals was spilled to water twice in 12 months[1]	10 days 60 days	NA	NA

[1] Refer to 40 CFR 112.4(a) for information that must be reported.

5.0 RESPONSE PLANNING

This section describes provisions to assure that planned resources are adequate to respond to a potential discharge from the Facility.

5.1 DISCHARGE SCENARIOS

The following discharge scenarios are assumed for planning purposes:

Table 5.1 Discharge Scenarios

Scenario	Quantity
Failure of an aboveground storage tank and secondary containment	8,813 gallons
Failure of a vacuum truck hose or hose connection	5 gallons

5.2 VULNERABILITY ANALYSIS

A discharge from the Facility could reach environmental receptors as described in this section. Potentially vulnerable environmental receptors are identified within a planning distance from the Facility as follows.

- For groundwater public water supply, the planning distance is the distance to the nearest groundwater public water supply intake as identified by the WVDEP.
- For surface water public water supply, the planning distance is the distance to the nearest downstream surface water public water supply intake as identified by the WVDEP.
- For all other environmental receptors, the planning distance is the distance that an oil discharge could travel as determined using calculations in Appendix C of 40 CFR 112.

The vulnerability of public water supplies in West Virginia to potential discharge sources is evaluated by the WVDEP in accordance with procedures in WV Code §22-30-9. The evaluation involves calculation of a "source water protection area" for each groundwater public water supply and a "zone of critical concern" for each surface water public water supply. A potential discharge source (i.e. aboveground storage tank) that is located within a source water protection area or a zone of critical concern is considered to pose a higher degree of risk to public health and the environment. The WVDEP has determined that the Facility covered by this Plan is not located within the source water protection area or zone of critical concern for any public water supply in West Virginia.

Surface water pathways within the planning distance downstream from the Facility are described in Table 5.2a. Identified environmental receptors within the planning distance are described in Table 5.2b.

Table 5.2a Surface Water Pathways Within the Planning Distance

Pathway	Distance, miles	Time, hours
Facility → Pad Fork (land)	0.2	<1
Pad Fork → Little Huff Creek	2.8	2
Little Huff Creek → Guyandotte River	11	7
Guyandotte River → Guyandotte River	35	19

The following environmental receptors have been identified within the planning distance.

Table 5.2b Environmental Receptors

Receptor	Description	Location
Groundwater public water supply well	Davey Municipal Water Works	3 miles from Facility
Surface water public water supply intake	Gilbert Water Works	Guyandotte River, 20 miles downstream from Facility

5.3 RESOURCE NEEDS

The US Coast Guard rates the response capabilities of oil spill response organizations. An organization that is rated MMPD (Maximum Most Probable Discharge) response in Rivers and Canals operating environment should be capable of removing any potential discharge from the Facility based on US EPA guidelines for oil spill response resource planning[2]. At least one Contract Responder listed in this Plan is rated MMPD for the region.

5.4 DISPOSAL PLANS

Recovery operations will include pumping the recovered oil/water emulsion directly into tanker trucks to be hauled away. Temporary storage may be arranged in the form of mobile temporary storage tanks. Oil contaminated debris, sorbent materials, disposable suits, and other solid wastes will be collected and contained for proper disposal as industrial waste.

[2] 40 CFR 112, Appendix E.

APPENDIX A
SPILL NOTIFICATION FORM

INFORMATION ON MATERIAL DISCHARGE

It is not necessary to wait for all information before calling the National Response Center.

Reporting party

Name:
Phone:
Company:
Position:
Address:
City:
State:
Zip:
Latitude:
Longitude:

Incident Description

Date: Time:

Source:

Cause:

Materials Involved

Material Discharged:
Quantity Discharged (gallons):
Quantity in Water (gallons):

Response Actions Taken

Impact

Injuries? Fatalities?
Evacuations? Who Evacuated?
Damage? What Damaged?

Additional Information

Caller Notifications

	Phone Number	Report Date	Report Time	Report No.
National Response Center	800-424-8802			
WVDEP	800-642-3074			
Local Emergency Agencies	911			
Other (specify)				

APPENDIX B

INSPECTION PROCEDURES

Titan Energy

Titan Energy, LLC
425 Houston Street, Suite 300
Fort Worth, Texas 76102

No.:

SPCC Field Inspections - Virginia/West Virginia

Date: 12/19/2017

BASIC INFORMATION

Name
Title
Location Name
Inspection Date
Time

INSPECTION INLET SLUG CATCHER (TANK CONTAINMENT)

Is there any standing water in the containment area?
Is there any debris or fire hazards in the containment area?
Are containment walls eroded or deteriorated?
Is staining evident in the containment area?
Tank Containment - Comments (Be specific)
Photo

INSPECTION INLET SLUG CATCHER (PIPING & VALVES)

Is there an indication of any leak by sight, smell, or sound?
Is any valve, pipe, or pipe connection leaking?
Are piping supports damaged or corroded?
Is piping corroded?
Piping & Valves - Comments (Be specific)
Photo

INSPECTION ELECTRIC TRANSFORMER (TANK CONTAINMENT)

Is staining evident in the containment area?
Comments (Be specific)
Photo

INSPECTION PIPELINE DRIP TANK (TANK CONTAINMENT)

Is there standing water in the containment area?
Is there any debris or fire hazards in the containment area?
Are containment walls eroded or deteriorated?
Is staining evident in the containment area?
Tank Containment - Comments (Be specific)
Photo

INSPECTION PIPELINE DRIP TANK (TANKS)

Is there noticeable distortion or bulging of the tank?
Is the shell or roof corroded?
Are there any obvious holes?
Tanks - Comments (Be specific)
Photo

INSPECTION PIPELINE DRIP TANK (PIPING AND VALVES)

Is there an indication of any leak by sight, smell, or sound?
Piping and Valves - Comments (Be specific)
Photo

INSPECTION LUBE/USED OIL TOTES (TANK CONTAINMENT)

Is there any standing water in the containment area?
Is there any debris or fire hazards in the containment area?
Are containment walls eroded or deteriorated?
Is staining evident in the containment area?
Tank Containment - Comments (Be specific)
Photo

INSPECTION FRAC TANK (TANK CONTAINMENT)

Is there any standing water in the containment area?
Is there any debris or fire hazards in the containment area?
Are containment walls eroded or deteriorated?
Is staining evident in the containment area?
Tank Containment - Comments (Be specific)
Photo

INSPECTION FRAC TANK (TANKS)

Is there noticeable distortion or bulging of the tank?
Is the shell or roof corroded?
Are there any obvious holes present?
Tanks - Comments (Be specific)
Photo

INSPECTION FRAC TANK (PIPING AND VALVES)

Is there an indication of any leak by sight, smell, or sound?
Piping and Valves - Comments (Be specific)
Photo

INSPECTION USED OIL TANK (TANK CONTAINMENT)

Is there any standing water in the containment area?
Is there any debris or fire hazards in the containment area?
Are containment walls eroded or deteriorated?
Is staining evident in the containment area?
Tank Containment - Comments (Be specific)
Photo

INSPECTION USED OIL TANK (TANKS)

Is there noticeable distortion or bulging of the tank?
Is the shell or roof corroded?

Are there any obvious holes present?
Tanks - Comments (Be specific)
Photo

INSPECTION USED OIL TANK (PIPING AND VALVES)

Is there an indication of any leak by sight, smell, or sound?
Piping and Valves - Comments (Be specific)
Photo

INSPECTION LUBE OIL TANK (TANK CONTAINMENT)

Is there standing water in the containment area?
Is there any debris or fire hazards in the containment area?
Are containment walls eroded or deteriorated?
Is staining evident in the containment area?
Tank Containment - Comments (Be specific)
Photo

INSPECTION LUBE OIL TANK (TANKS)

Is there noticeable distortion or bulging of the tank?
Is the shell or roof corroded?
Are there any obvious holes present?
Tanks - Comments (Be specific)
Photo

INSPECTION LUBE OIL TANK (PIPING AND VALVES)

Is there an indication of any leak by sight, smell, or sound?
Piping and Valves - Comments (Be specific)
Photo

INSPECTION METHANOL TANK (TANK CONTAINMENT)

Is there standing water in the containment area?
Is there any debris or fire hazards in the containment area?
Are containment walls eroded or deteriorated?
Is staining evident in the containment area?
Tank Containment - Comments (Be specific)
Photo

INSPECTION METHANOL TANK (TANKS)

Is there noticeable distortion or bulging of the tank?
Is the shell or roof corroded?
Are there any obvious holes present?
Tanks - Comments (Be specific)
Photo

INSPECTION METHANOL TANK (PIPING AND VALVES)

Is there an indication of any leak by sight, smell, or sound?
Piping and Valves - Comments (Be specific)
Photo

INSPECTION SULFIDE TREATER SEPARATOR

Is any valve, pipe, or pipe connection leaking?
Are piping supports damaged or corroded?
Is piping corroded?
Piping & Valves - Comments (Be specific)
Photo
Is the separator or scrubber corroded?
Is staining evident under the separator or scrubber?
Separator & Compressor - Comments (Be specific)
Photo

INSPECTION DISCHARGE SEPARATOR

Is any valve, pipe, or pipe connection leaking?
Are piping supports damaged or corroded?
Is piping corroded?
Piping & Valves - Comments (Be specific)
Photo
Is the separator or scrubber corroded?
Is staining evident under the separator or scrubber?
Separator & Compressor - Comments (Be specific)
Photo

INSPECTION COMPRESSOR ENGINE

Compressor Name (Please Type)
Is there any staining or discoloration of the tank due to corrosion?
Tanks - Comments (Be specific)
Photo
Is there an indication of any leaks from piping and/or valves by sight, smell, or sound?
Piping and Valves - Comments (Be specific)
Photo
Is staining evident under the separator or compressor?
Separators and Compressor - Comments (Be specific)
Photo

INSPECTION SCRUBBER

Is there any staining or discoloration of the tank due to corrosion?
Tanks - Comments (Be specific)
Photo
Is there an indication of any piping/valve leak by sight, smell, or sound?
Piping and Valves - Comments (Be specific)
Photo

Is there staining evident under the separator or scrubber?
Separators and Dump Valves - Comments (Be specific)
Photo

ADDITIONAL COMMENTS AND PHOTOS

Additional Comments (if needed)
Photo
Photo
Photo

APPENDIX C

CONTAINMENT DRAINING PROCEDURES

Secondary Containment Area Draining Form

		2			3			4
	Site	Date Opened	Time Opened	Operator Initials	Date Closed	Time Closed	Operator Initials	Observations
1								

Secondary Containment Area Draining Instructions

1	a. Complete a row of this form for each time period when a secondary containment area is drained. b. Drains are to remain closed at all times, except when necessary to remove uncontaminated rainwater. c. Accumulated rainwater must be drained as soon as possible, but no later than within 72 hours.
2	a. Before opening a containment area drain, visually inspect accumulated rainwater for visible oil or an oil sheen. b. Do not drain water that is visibly contaminated. If contamination is evident, notify supervision and arrange for prompt removal of the c. Record the date and time when a containment area drain is opened, and initial the form.
3	a. Drains must be promptly closed after accumulated rainwater has been drained. b. Record the date and time when a containment area drain valve is closed, and initial the form.
4	a. Note any observations on the form.

APPENDIX D

SECONDARY CONTAINMENT CALCULATIONS

Calculation of Secondary Containment Capacity
Lasher Injection Well

Tank Dimensions

Tank ID	Diameter	Height	Volume	Volume	Comments
Lasher Injection 1	10.0 ft	15.0 ft	1,178 cf	8,813 gal	
Lasher Injection 2	10.0 ft	15.0 ft	1,178 cf	8,813 gal	
Lasher Injection 3	10.0 ft	15.0 ft	1,178 cf	8,813 gal	
Lasher Injection 4	10.0 ft	15.0 ft	1,178 cf	8,813 gal	
Lasher Injection 5	10.0 ft	15.0 ft	1,178 cf	8,813 gal	
Lasher Injection 6	10.0 ft	15.0 ft	1,178 cf	8,813 gal	
Lasher Injection 7	10.0 ft	15.0 ft	1,178 cf	8,813 gal	

Containment Dimensions

		Volume	Volume	Comments
Shape	Rectangle			
Wall slope	0:1			As observed in the field
Height	3.3 ft			As measured in the field
Top length	99.0 ft			As measured in the field
Top width	30.8 ft			As measured in the field
Bottom length	99.0 ft			Top length - (height x slope x 2)
Bottom width	30.8 ft			Top width - (height x slope x 2)
Gross capacity		9,921 cf	74,216 gal	

Precipitation

	Depth	Volume	Volume	Comments
25-yr, 24-hr rain	4.5 in	1,145 cf	8,563 gal	NWS Technical Paper 40 (TP-40)

Other Tank Displacement

Tank ID	Diameter	Height	Volume	Volume	Comments
Lasher Injection 2	10.0 ft	3.3 ft	255 cf	1,910 gal	
Lasher Injection 3	10.0 ft	3.3 ft	255 cf	1,910 gal	
Lasher Injection 4	10.0 ft	3.3 ft	255 cf	1,910 gal	
Lasher Injection 5	10.0 ft	3.3 ft	255 cf	1,910 gal	
Lasher Injection 6	10.0 ft	3.3 ft	255 cf	1,910 gal	
Lasher Injection 7	10.0 ft	3.3 ft	255 cf	1,910 gal	

Containment Capacity Check

	Volume	Volume	Comments
Gross capacity	9,921 cf	74,216 gal	
Other tank displacement	1,532 cf	11,457 gal	
Net capacity	8,389 cf	62,759 gal	
Largest tank capacity	1,178 cf	8,813 gal	
Precipitation	1,145 cf	8,563 gal	
Net capacity - tank capacity - precipitation	6,066 cf	45,382 gal	Capacity is Adequate

APPENDIX E

SAFETY DATA SHEETS

Produced water that is stored at the Facility is not a "Hazardous Chemical" as defined by OSHA's Hazard Communication Standard (29 CFR 1910.1200). A Safety Data Sheet (SDS) for produced water is not required to be prepared and is not available.

APPENDIX F

SUBSTANTIAL HARM CERTIFICATION

CERTIFICATION OF THE APPLICABILITY OF THE SUBSTANTIAL HARM CRITERIA CHECKLIST

FACILITY NAME: Lasher Injection Station Site
FACILITY ADDRESS: Pad Fork, Hanover WV 24839

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons? ☐ Yes ☒ No

2. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground oil storage tank area? ☐ Yes ☒ No

3. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the formula in Attachment C-III, Appendix C, 40 CFR 112 or a comparable formula[1]) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments? For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's "Guidance for Facility and Vessel Response Environments" (Section 10, Appendix E, 40 CFR 112 for availability) and the applicable Area Contingency Plan. ☐ Yes ☒ No

4. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula (Attachment C-III, Appendix C, 40 CFR 112 or a comparable formula[1]) such that a discharge from the facility would shut down a public drinking water intake[2] ? ☐ Yes ☒ No

[1] If a comparable formula is used, documentation of the reliability and analytical soundness of the comparable formula must be attached to this form.

[2] For the purposes of 40 112, public drinking water intakes are analogous to public water systems as described at 40 CFR 143.2(c).

5. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last 5 years? ☐ Yes ☒ No

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate and complete.

Signature Jeffrey Cooper

Name (print or type) Jeff Cooper

Title Production Foreman

Date 1-5-2018

Appendix K
Other Permit Approvals

APPENDIX K

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

Permit/approvals	ID Number
Hazardous Waste Management Program under RCRA	NA
NPDES Program	NA
Prevention of Significant Deterioration (PSD)	NA
Nonattainment Program	NA
Dredge or Fill	NA
NPDES/NPDES – Stormwater	NA
WVDEP – Office of Waste Management (OWM) – Solid Waste Facility	Blanket permit with Raleigh County Landfill
WVDEP – OWM – RCRA (Hazardous Waste TSD or Transporter)	NA
WVDEP – OWM – UST	NA
CERCLA – Superfund	NA
WV Voluntary Remediation – Brownfields	NA
FIFRA – Federal Insecticide, Fungicide and Rodenticide Act	NA
Well Head Protection Program (WHPP)	NA
Underground Injection Control (UIC)	UIC 2D10902032
Toxic Substances Control Act (TSCA)	NA
Best Management Plans	NA
Management of Used Oil	Recycled as needed
Other Relevant Permits (Specify):	
AST Act	Tanks registered with DWWM
	055-00000979-985
	(attached)

INTERIM ANNUAL INSPECTION CERTIFICATION
Aboveground Storage Tank
(tank, associated equipment, leak detection system and secondary containment structure, if applicable)
Is Fit for Service

AST Facility Name	**Lasher LITB-1**
Address	RIDC Park West, Park Place Corporate Center One 1000 Commerce Drive, 4th Floor
City, State, Zip	Pittsburgh, PA 15275
Tank Owner Name	**ARP Mountaineer Production, LLC**
Telephone Number	724-301-9089
Email Address	KElkin@atlasenergy.com
Certifying Individual	Amy L. Veltri, P.E.
Address	171 Montour Run Road
City, State, Zip	Moon Township, PA 15108
Telephone Number	412-719-6300
Email Address	aveltri@ngeconsulting.com
Facility's/Owner's Tank ID #	**LITB-1**
DEP Tank Registration Number (if issued)	**055-00000979**

I certify that I have personally examined and/or am familiar with the inspection performed on the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, and that I am a person eligible to perform such inspection pursuant to W.Va. Code § 22-30-6 and/or 47 CSR 62-3. As no minimum standards have been adopted by the Act or by legislative rule as of the date of this certification, I certify pursuant to W.Va. Code § 22-30-6(a), based on my direct knowledge and/or my inquiry of those individuals immediately responsible for obtaining the information, that the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, is fit for service and no apparent threat of leakage exists. Deficiencies, if any, found during the inspection of the AST, including its associated equipment, leak detection system and secondary containment structure, if applicable, are described in the attached document(s) along with my recommendations and a schedule for abating said deficiencies.

*Signature of Certifying Individual

12/01/2014
Date Signed

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Environmental Protection

WV PE#14241
P.E. Registration #, STI Certification # or API Certification # (if applicable)

06/30/2015
Registration/Certification Expiration Date (if applicable)

See back page for noted deficiencies and recommendations.

*Please refer to Interpretive Rule §47-62-3 to determine who must certify your tank.

AST Recommendations & Containment Conditions

The AST Act requires that aboveground storage tank maintenance work shall commence within six months from the date a permit (if necessary) is issued and must be completed within one year of commencement. Although permits are not necessary for the ASTs associated with this project, for the purposes of the Engineer's Certification, we are proposing to meet this schedule. As such, maintenance work, including any required additional evaluation efforts, for the items which are noted on the Fit for Service Form, shall be completed no later than June 30, 2016.

AST Facility Name	**ARP Mountaineer Production, LLC** **Lasher LITB-1**

Deficiencies and Recommendations:

- Continue periodic visual inspections of tank and associated systems for leak detection.
- Signage needs installed (NFPA label or standard WVDEP required signage)
- Elevate tank to reduce corrosion potential and facilitate leak detection and future inspections
- Security issues need addressed, as appropriate, to minimize potential unauthorized release (e.g., remove handles from valves, install plugs in lines, install lock on tank valves, fence area around tank, or other security measures)
- Stairway repair needed
- Install piping support
- Repair heat tracing and insulation on associated piping systems
- Cracks or holes noted in containment - repair noted areas
- Drain associated with containment has no valve (containment has some type of opening that can't be closed) or is left open
- Stability of dike questionable - ensure dike stability
- Cannot be determined if containment is sufficiently impervious – complete evaluation of permeability of containment area and upgrade as needed, in conformance with developing regulatory guidance

INTERIM ANNUAL INSPECTION CERTIFICATION
Aboveground Storage Tank
(tank, associated equipment, leak detection system and secondary containment structure, if applicable)
Is Fit for Service

AST Facility Name	**Lasher LITB-2**
Address	RIDC Park West, Park Place Corporate Center One 1000 Commerce Drive, 4th Floor
City, State, Zip	Pittsburgh, PA 15275
Tank Owner Name	**ARP Mountaineer Production, LLC**
Telephone Number	724-301-9089
Email Address	KElkin@atlasenergy.com
Certifying Individual	Amy L. Veltri, P.E.
Address	171 Montour Run Road
City, State, Zip	Moon Township, PA 15108
Telephone Number	412-719-6300
Email Address	aveltri@ngeconsulting.com
Facility's/Owner's Tank ID #	**LITB-2**
DEP Tank Registration Number (if issued)	**055-00000985**

I certify that I have personally examined and/or am familiar with the inspection performed on the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, and that I am a person eligible to perform such inspection pursuant to W.Va. Code § 22-30-6 and/or 47 CSR 62-3. As no minimum standards have been adopted by the Act or by legislative rule as of the date of this certification, I certify pursuant to W.Va. Code § 22-30-6(a), based on my direct knowledge and/or my inquiry of those individuals immediately responsible for obtaining the information, that the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, is fit for service and no apparent threat of leakage exists. Deficiencies, if any, found during the inspection of the AST, including its associated equipment, leak detection system and secondary containment structure, if applicable, are described in the attached document(s) along with my recommendations and a schedule for abating said deficiencies.

Amy L. Veltri

*Signature of Certifying Individual

12/01/2014
Date Signed

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P.E. Registration #, STI Certification # or API Certification # (if applicable)

06/30/2015
Registration/Certification Expiration Date (if applicable)

See back page for noted deficiencies and recommendations.

*Please refer to Interpretive Rule §47-62-3 to determine who must certify your tank.

AST Recommendations & Containment Conditions

The AST Act requires that aboveground storage tank maintenance work shall commence within six months from the date a permit (if necessary) is issued and must be completed within one year of commencement. Although permits are not necessary for the ASTs associated with this project, for the purposes of the Engineer's Certification, we are proposing to meet this schedule. As such, maintenance work, including any required additional evaluation efforts, for the items which are noted on the Fit for Service Form, shall be completed no later than June 30, 2016.

AST Facility Name	**ARP Mountaineer Production, LLC** **Lasher LITB-2**

Deficiencies and Recommendations:

- Continue periodic visual inspections of tank and associated systems for leak detection.
- Signage needs installed (NFPA label or standard WVDEP required signage)
- Elevate tank to reduce corrosion potential and facilitate leak detection and future inspections
- Security issues need addressed, as appropriate, to minimize potential unauthorized release (e.g., remove handles from valves, install plugs in lines, install lock on tank valves, fence area around tank, or other security measures)
- Stairway repair needed
- Install piping support
- Repair heat tracing and insulation on associated piping systems
- Cracks or holes noted in containment - repair noted areas
- Drain associated with containment has no valve (containment has some type of opening that can't be closed) or is left open
- Stability of dike questionable - ensure dike stability
- Cannot be determined if containment is sufficiently impervious – complete evaluation of permeability of containment area and upgrade as needed, in conformance with developing regulatory guidance

INTERIM ANNUAL INSPECTION CERTIFICATION
Aboveground Storage Tank
(tank, associated equipment, leak detection system and secondary containment structure, if applicable)
Is Fit for Service

AST Facility Name	**Lasher LITB-3**
Address	RIDC Park West, Park Place Corporate Center One 1000 Commerce Drive, 4th Floor
City, State, Zip	Pittsburgh, PA 15275
Tank Owner Name	**ARP Mountaineer Production, LLC**
Telephone Number	724-301-9089
Email Address	KElkin@atlasenergy.com
Certifying Individual	Amy L. Veltri, P.E.
Address	171 Montour Run Road
City, State, Zip	Moon Township, PA 15108
Telephone Number	412-719-6300
Email Address	aveltri@ngeconsulting.com
Facility's/Owner's Tank ID #	**LITB-3**
DEP Tank Registration Number (if issued)	**055-00000981**

I certify that I have personally examined and/or am familiar with the inspection performed on the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, and that I am a person eligible to perform such inspection pursuant to W.Va. Code § 22-30-6 and/or 47 CSR 62-3. As no minimum standards have been adopted by the Act or by legislative rule as of the date of this certification, I certify pursuant to W.Va. Code § 22-30-6(a), based on my direct knowledge and/or my inquiry of those individuals immediately responsible for obtaining the information, that the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, is fit for service and no apparent threat of leakage exists. Deficiencies, if any, found during the inspection of the AST, including its associated equipment, leak detection system and secondary containment structure, if applicable, are described in the attached document(s) along with my recommendations and a schedule for abating said deficiencies.

*Signature of Certifying Individual	12/01/2014 Date Signed
WV PE#14241 P.E. Registration #, STI Certification # or API Certification # (if applicable)	06/30/2015 Registration/Certification Expiration Date (if applicable)

See back page for noted deficiencies and recommendations.

*Please refer to Interpretive Rule §47-62-3 to determine who must certify your tank.

AST Recommendations & Containment Conditions

The AST Act requires that aboveground storage tank maintenance work shall commence within six months from the date a permit (if necessary) is issued and must be completed within one year of commencement. Although permits are not necessary for the ASTs associated with this project, for the purposes of the Engineer's Certification, we are proposing to meet this schedule. As such, maintenance work, including any required additional evaluation efforts, for the items which are noted on the Fit for Service Form, shall be completed no later than June 30, 2016.

AST Facility Name	**ARP Mountaineer Production, LLC** **Lasher LITB-3**

Deficiencies and Recommendations:

- Continue periodic visual inspections of tank and associated systems for leak detection.
- Signage needs installed (NFPA label or standard WVDEP required signage)
- Elevate tank to reduce corrosion potential and facilitate leak detection and future inspections
- Security issues need addressed, as appropriate, to minimize potential unauthorized release (e.g., remove handles from valves, install plugs in lines, install lock on tank valves, fence area around tank, or other security measures)
- Stairway repair needed
- Install piping support
- Repair heat tracing and insulation on associated piping systems
- Cracks or holes noted in containment - repair noted areas
- Drain associated with containment has no valve (containment has some type of opening that can't be closed) or is left open
- Stability of dike questionable - ensure dike stability
- Cannot be determined if containment is sufficiently impervious – complete evaluation of permeability of containment area and upgrade as needed, in conformance with developing regulatory guidance

dep

INTERIM ANNUAL INSPECTION CERTIFICATION
Aboveground Storage Tank
(tank, associated equipment, leak detection system and secondary containment structure, if applicable)
Is Fit for Service

AST Facility Name	**Lasher LITB-4**
Address	RIDC Park West, Park Place Corporate Center One 1000 Commerce Drive, 4th Floor
City, State, Zip	Pittsburgh, PA 15275
Tank Owner Name	**ARP Mountaineer Production, LLC**
Telephone Number	724-301-9089
Email Address	KElkin@atlasenergy.com
Certifying Individual	Amy L. Veltri, P.E.
Address	171 Montour Run Road
City, State, Zip	Moon Township, PA 15108
Telephone Number	412-719-6300
Email Address	aveltri@ngeconsulting.com
Facility's/Owner's Tank ID #	**LITB-4**
DEP Tank Registration Number (if issued)	**055-00000984**

I certify that I have personally examined and/or am familiar with the inspection performed on the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, and that I am a person eligible to perform such inspection pursuant to W.Va. Code § 22-30-6 and/or 47 CSR 62-3. As no minimum standards have been adopted by the Act or by legislative rule as of the date of this certification, I certify pursuant to W.Va. Code § 22-30-6(a), based on my direct knowledge and/or my inquiry of those individuals immediately responsible for obtaining the information, that the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, is fit for service and no apparent threat of leakage exists. Deficiencies, if any, found during the inspection of the AST, including its associated equipment, leak detection system and secondary containment structure, if applicable, are described in the attached document(s) along with my recommendations and a schedule for abating said deficiencies.

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*Signature of Certifying Individual	12/01/2014 Date Signed
WV PE#14241 P.E. Registration #, STI Certification # or API Certification # (if applicable)	06/30/2015 Registration/Certification Expiration Date (if applicable)

See back page for noted deficiencies and recommendations.

*Please refer to Interpretive Rule §47-62-3 to determine who must certify your tank.

AST Recommendations & Containment Conditions

The AST Act requires that aboveground storage tank maintenance work shall commence within six months from the date a permit (if necessary) is issued and must be completed within one year of commencement. Although permits are not necessary for the ASTs associated with this project, for the purposes of the Engineer's Certification, we are proposing to meet this schedule. As such, maintenance work, including any required additional evaluation efforts, for the items which are noted on the Fit for Service Form, shall be completed no later than June 30, 2016.

AST Facility Name	**ARP Mountaineer Production, LLC** **Lasher LITB-4**

Deficiencies and Recommendations:

- Continue periodic visual inspections of tank and associated systems for leak detection.
- Signage needs installed (NFPA label or standard WVDEP required signage)
- Elevate tank to reduce corrosion potential and facilitate leak detection and future inspections
- Security issues need addressed, as appropriate, to minimize potential unauthorized release (e.g., remove handles from valves, install plugs in lines, install lock on tank valves, fence area around tank, or other security measures)
- Stairway repair needed
- Install piping support
- Repair heat tracing and insulation on associated piping systems
- Cracks or holes noted in containment - repair noted areas
- Drain associated with containment has no valve (containment has some type of opening that can't be closed) or is left open
- Stability of dike questionable - ensure dike stability
- Cannot be determined if containment is sufficiently impervious – complete evaluation of permeability of containment area and upgrade as needed, in conformance with developing regulatory guidance

dep

INTERIM ANNUAL INSPECTION CERTIFICATION
Aboveground Storage Tank
(tank, associated equipment, leak detection system and secondary containment structure, if applicable)
Is Fit for Service

AST Facility Name	**Lasher LITB-5**
Address	RIDC Park West, Park Place Corporate Center One 1000 Commerce Drive, 4th Floor
City, State, Zip	Pittsburgh, PA 15275
Tank Owner Name	**ARP Mountaineer Production, LLC**
Telephone Number	724-301-9089
Email Address	KElkin@atlasenergy.com
Certifying Individual	Amy L. Veltri, P.E.
Address	171 Montour Run Road
City, State, Zip	Moon Township, PA 15108
Telephone Number	412-719-6300
Email Address	aveltri@ngeconsulting.com
Facility's/Owner's Tank ID #	**LITB-5**
DEP Tank Registration Number (if issued)	**055-00000980**

I certify that I have personally examined and/or am familiar with the inspection performed on the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, and that I am a person eligible to perform such inspection pursuant to W.Va. Code § 22-30-6 and/or 47 CSR 62-3. As no minimum standards have been adopted by the Act or by legislative rule as of the date of this certification, I certify pursuant to W.Va. Code § 22-30-6(a), based on my direct knowledge and/or my inquiry of those individuals immediately responsible for obtaining the information, that the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, is fit for service and no apparent threat of leakage exists. Deficiencies, if any, found during the inspection of the AST, including its associated equipment, leak detection system and secondary containment structure, if applicable, are described in the attached document(s) along with my recommendations and a schedule for abating said deficiencies.

*Signature of Certifying Individual

12/01/2014
Date Signed

WV PE#14241
P.E. Registration #, STI Certification # or API Certification # (if applicable)

06/30/2015
Registration/Certification Expiration Date (if applicable)

See back page for noted deficiencies and recommendations.

*Please refer to Interpretive Rule §47-62-3 to determine who must certify your tank.

AST Recommendations & Containment Conditions

The AST Act requires that aboveground storage tank maintenance work shall commence within six months from the date a permit (if necessary) is issued and must be completed within one year of commencement. Although permits are not necessary for the ASTs associated with this project, for the purposes of the Engineer's Certification, we are proposing to meet this schedule. As such, maintenance work, including any required additional evaluation efforts, for the items which are noted on the Fit for Service Form, shall be completed no later than June 30, 2016.

AST Facility Name	**ARP Mountaineer Production, LLC** **Lasher LITB-5**

Deficiencies and Recommendations:

- Continue periodic visual inspections of tank and associated systems for leak detection.
- Signage needs installed (NFPA label or standard WVDEP required signage)
- Elevate tank to reduce corrosion potential and facilitate leak detection and future inspections
- Security issues need addressed, as appropriate, to minimize potential unauthorized release (e.g., remove handles from valves, install plugs in lines, install lock on tank valves, fence area around tank, or other security measures)
- Tank needs to be re-painted (spot corrosion removal and repaint or sandblast tank and repaint)
- Paint tank nozzle weld
- Stairway repair needed
- Install piping support
- Repair heat tracing and insulation on associated piping systems
- Cracks or holes noted in containment - repair noted areas
- Drain associated with containment has no valve (containment has some type of opening that can't be closed) or is left open
- Stability of dike questionable - ensure dike stability
- Cannot be determined if containment is sufficiently impervious – complete evaluation of permeability of containment area and upgrade as needed, in conformance with developing regulatory guidance

dep

INTERIM ANNUAL INSPECTION CERTIFICATION

Aboveground Storage Tank

(tank, associated equipment, leak detection system and secondary containment structure, if applicable)

Is Fit for Service

AST Facility Name	**Lasher LITB-6**
Address	RIDC Park West, Park Place Corporate Center One 1000 Commerce Drive, 4th Floor
City, State, Zip	Pittsburgh, PA 15275
Tank Owner Name	**ARP Mountaineer Production, LLC**
Telephone Number	724-301-9089
Email Address	KElkin@atlasenergy.com
Certifying Individual	Amy L. Veltri, P.E.
Address	171 Montour Run Road
City, State, Zip	Moon Township, PA 15108
Telephone Number	412-719-6300
Email Address	aveltri@ngeconsulting.com
Facility's/Owner's Tank ID #	**LITB-6**
DEP Tank Registration Number (if issued)	**055-00000982**

I certify that I have personally examined and/or am familiar with the inspection performed on the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, and that I am a person eligible to perform such inspection pursuant to W.Va. Code § 22-30-6 and/or 47 CSR 62-3. As no minimum standards have been adopted by the Act or by legislative rule as of the date of this certification, I certify pursuant to W.Va. Code § 22-30-6(a), based on my direct knowledge and/or my inquiry of those individuals immediately responsible for obtaining the information, that the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, is fit for service and no apparent threat of leakage exists. Deficiencies, if any, found during the inspection of the AST, including its associated equipment, leak detection system and secondary containment structure, if applicable, are described in the attached document(s) along with my recommendations and a schedule for abating said deficiencies.

RECEIVED
Office of Oil and Gas
DEC 11 2017
WV Department of
Environmental Protection

*Signature of Certifying Individual

12/01/2014
Date Signed

WV PE#14241
P.E. Registration #, STI Certification # or API Certification # (if applicable)

06/30/2015
Registration/Certification Expiration Date (if applicable)

See back page for noted deficiencies and recommendations.

*Please refer to Interpretive Rule §47-62-3 to determine who must certify your tank.

AST Recommendations & Containment Conditions

The AST Act requires that aboveground storage tank maintenance work shall commence within six months from the date a permit (if necessary) is issued and must be completed within one year of commencement. Although permits are not necessary for the ASTs associated with this project, for the purposes of the Engineer's Certification, we are proposing to meet this schedule. As such, maintenance work, including any required additional evaluation efforts, for the items which are noted on the Fit for Service Form, shall be completed no later than June 30, 2016.

AST Facility Name	**ARP Mountaineer Production, LLC** **Lasher LITB-6**

Deficiencies and Recommendations:

- Continue periodic visual inspections of tank and associated systems for leak detection.
- Signage needs installed (NFPA label or standard WVDEP required signage)
- Elevate tank to reduce corrosion potential and facilitate leak detection and future inspections
- Security issues need addressed, as appropriate, to minimize potential unauthorized release (e.g., remove handles from valves, install plugs in lines, install lock on tank valves, fence area around tank, or other security measures)
- Tank needs to be re-painted (spot corrosion removal and repaint or sandblast tank and repaint)
- Paint tank nozzle weld
- Stairway repair needed
- Install piping support
- Repair heat tracing and insulation on associated piping systems
- Cracks or holes noted in containment - repair noted areas
- Drain associated with containment has no valve (containment has some type of opening that can't be closed) or is left open
- Stability of dike questionable - ensure dike stability
- Cannot be determined if containment is sufficiently impervious – complete evaluation of permeability of containment area and upgrade as needed, in conformance with developing regulatory guidance

INTERIM ANNUAL INSPECTION CERTIFICATION

Aboveground Storage Tank

(tank, associated equipment, leak detection system and secondary containment structure, if applicable)

Is Fit for Service

AST Facility Name	**Lasher LITB-7**
Address	RIDC Park West, Park Place Corporate Center One 1000 Commerce Drive, 4th Floor
City, State, Zip	Pittsburgh, PA 15275
Tank Owner Name	**ARP Mountaineer Production, LLC**
Telephone Number	724-301-9089
Email Address	KElkin@atlasenergy.com
Certifying Individual	Amy L. Veltri, P.E.
Address	171 Montour Run Road
City, State, Zip	Moon Township, PA 15108
Telephone Number	412-719-6300
Email Address	aveltri@ngeconsulting.com
Facility's/Owner's Tank ID #	**LITB-7**
DEP Tank Registration Number (if issued)	**055-00000983**

I certify that I have personally examined and/or am familiar with the inspection performed on the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, and that I am a person eligible to perform such inspection pursuant to W.Va. Code § 22-30-6 and/or 47 CSR 62-3. As no minimum standards have been adopted by the Act or by legislative rule as of the date of this certification, I certify pursuant to W.Va. Code § 22-30-6(a), based on my direct knowledge and/or my inquiry of those individuals immediately responsible for obtaining the information, that the AST listed above, including its associated equipment, leak detection system and secondary containment structure, if applicable, is fit for service and no apparent threat of leakage exists. Deficiencies, if any, found during the inspection of the AST, including its associated equipment, leak detection system and secondary containment structure, if applicable, are described in the attached document(s) along with my recommendations and a schedule for abating said deficiencies.

*Signature of Certifying Individual	12/01/2014 Date Signed
WV PE#14241 P.E. Registration #, STI Certification # or API Certification # (if applicable)	06/30/2015 Registration/Certification Expiration Date (if applicable)

See back page for noted deficiencies and recommendations.

*Please refer to Interpretive Rule §47-62-3 to determine who must certify your tank.

AST Recommendations & Containment Conditions

The AST Act requires that aboveground storage tank maintenance work shall commence within six months from the date a permit (if necessary) is issued and must be completed within one year of commencement. Although permits are not necessary for the ASTs associated with this project, for the purposes of the Engineer's Certification, we are proposing to meet this schedule. As such, maintenance work, including any required additional evaluation efforts, for the items which are noted on the Fit for Service Form, shall be completed no later than June 30, 2016.

AST Facility Name	**ARP Mountaineer Production, LLC** **Lasher LITB-7**

Deficiencies and Recommendations:

- Continue periodic visual inspections of tank and associated systems for leak detection.
- Signage needs installed (NFPA label or standard WVDEP required signage)
- Elevate tank to reduce corrosion potential and facilitate leak detection and future inspections
- Security issues need addressed, as appropriate, to minimize potential unauthorized release (e.g., remove handles from valves, install plugs in lines, install lock on tank valves, fence area around tank, or other security measures)
- Tank needs to be re-painted (spot corrosion removal and repaint or sandblast tank and repaint)
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