Class II-D UIC Permit Application
for
Roulette Oil & Gas Co., LLC
Clara Field #20 Well
37-105-21374-00-00
Clara Township, Potter Co., PA

Submitted by:
Roulette Oil & Gas Co., LLC
1140 Route 44 South
Shinglehouse, PA 16748

Prepared by:
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StratResources
Geologic Consulting, PLLC

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Project Description

Roulette Oil & Gas Co., LLC (ROGC) requests approval for a Class II-D Underground Injection Control Permit from the Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Protection (PADEP) for a disposal well. ROGC plans to convert an existing production well (Clara Field Well #20, API # 37-105-21374-00-00) into an injection well for disposal of produced waters from wells from nearby ROGC wells. Brine water from the surrounding wells will be injected into the Cooper 5-0, Sheffield 3-1 and Kane 3-0 sandstone reservoirs. The brine intended for disposal comes from approximately 60 conventional oil and gas wells on the lease and another 50 conventional oil and gas wells on ROGC operated leases in the general area. The Clara #20 well is located in Clara Township in the northwestern portion of Potter County, Pennsylvania.

Additionally, two wells within the Area of Review will be designated as monitor wells. These wells are:

Clara Field #11 (API No. 37-105-21136-00-00),
Clara Field #19 (API No. 31-105-21359-00-00).

Lease Description

Roulette Oil & Gas Co., LLC owns 96.75 percent of the leasehold interest in the lease, known as the Pine Lot Lease, containing the Clara #20 well. The remaining 3.25 percent of mineral rights is owned by North East Natural Resources. Lyme Emporium Highlands II, LLC owns 100 percent of the surface. ROGC's leasehold was acquired from Exco Appalachia, Inc. on 12/9/2013. It is known as the Pine Lot Lease #100688181 and recorded in BK 111 pages 826 and 835 in the Potter County Courthouse, Coudersport, Pennsylvania.

The mineral property containing the Clara #20 well is located in Clara Township, just east of the Clara-Pleasant Valley Township line on the Shinglehouse USGS 7.5 Minute Topographic Quadrangle Map. The lease in question is approximately 3,000 acres in area and lies in portions of both Clara and Pleasant Valley Townships.

Attachment A: Maps & Area of Review

Part I. Well Location

The Clara Field #20 well (API No. 37-105-21374-00-00) is located in Clara Township of Potter County, Pennsylvania within the Potato Oswago Creeks watershed within the larger Ohio River watershed. The map coordinates for the well are 41.894586N latitude and –78.148143W longitude. The Clara Field #20 is a vertical well with a total depth of 2,310 feet and located within the USGS Shinglehouse 7.5 Minute Quadrangle Map.. The nearest municipality to the well is Millport, located approximately 2.5 miles north-east of the well location.

Part II. Area of Review Size Determination

Roulette Oil & Gas Co., LLC (ROGC) used a fixed radius method of one-quarter mile for determining the Area of Review (AOR). No streams, water wells, or springs exist within the AOR. There are no hazardous waste facilities within the AOR, but within the AOR are found three gas wells, including the Clara Field #20, the proposed Class II-D well. Also found are proposed monitor wells Clara Field #11 and Clara Field #19. Specific data about these wells is found in Part IV of this Attachment. The AOR is shown in the following maps. A surveyed map of the AOR is found in ***Appendix A***. Maps showing a one-quarter mile and a one mile extension beyond the AOR are also shown on the following pages. A Legend for the well symbols used in those maps is shown on Page 5 of this application.

OMB No. 2040-0042 Approval Expires 4/30/2022

United States Environmental Protection Agency

EPA

Underground Injection Control
Permit Application for a Class II Well

(Collected under the authority of the Safe Drinking Water Act, Sections 1421, 1422, and 40 CFR Part 144)

For Official Use Only

Date Received

Permit Number

Read Attached Instructions Before Starting

I. Owner Name, Address, Phone Number and/or Email

Roulette Oil & Gas Company, LLC
1140 Route 44 South
Shinglehouse, PA 16748
814-697-7891
jrgasmanpa@yahoo.com

II. Operator Name, Address, Phone Number and/or Email

Same as Owner

III. Commercial Facility

- [ ] Yes
- [X] No

IV. Ownership

- [X] Private
- [ ] Federal
- [ ] State/Tribal/ Municipal

V. Permit Action Requested

- [X] New Permit
- [ ] Permit Renewal
- [ ] Modification
- [ ] Add Well to Area Permit
- [ ] Other

VI. SIC Code(s)

1311

VII. Indian Country

- [ ] Yes
- [X] No

VIII. Type of Permit (For multiple wells, use additional page(s) to provide the information requested for each additional well)

- [X] A. Individual
- [ ] B. Area

Number of Wells: 1

Well Field and/or Project Names: Clara Hill Field

IX. Class and Type of Well (see reverse)

A. Class	B. Type (enter code(s))	C. If type code is "X," explain.
II	D	

X. Well Status

- [ ] A. Operating
- [X] B. Conversion
- [ ] C. Proposed

Date Injection Started:

Date Well Constructed:

XI. Well Information

API Number: 37-105-21374-00-00

Permit (or EPA ID) Number:

Full Well Name: Clara Field #20

XII. Location of Well or, for Multiple Wells, Approximate Center of Field or Project

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location

____ 1/4 of ____ 1/4 of Section ____ Township ____ Range ____

____ ft. from (N/S) ____ Line of quarter section

____ ft. from (E/W) ____ Line of quarter section.

Latitude: 41.894586

Longitude: -78.148143

XIII. Attachments

In addition to this form, complete Attachments A-U (as appropriate for the specific well class) on separate sheets. Submit complete information, as required in the instructions and list all attachments, maps or other figures, by the applicable letter.

XIV. Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR § 144.32)

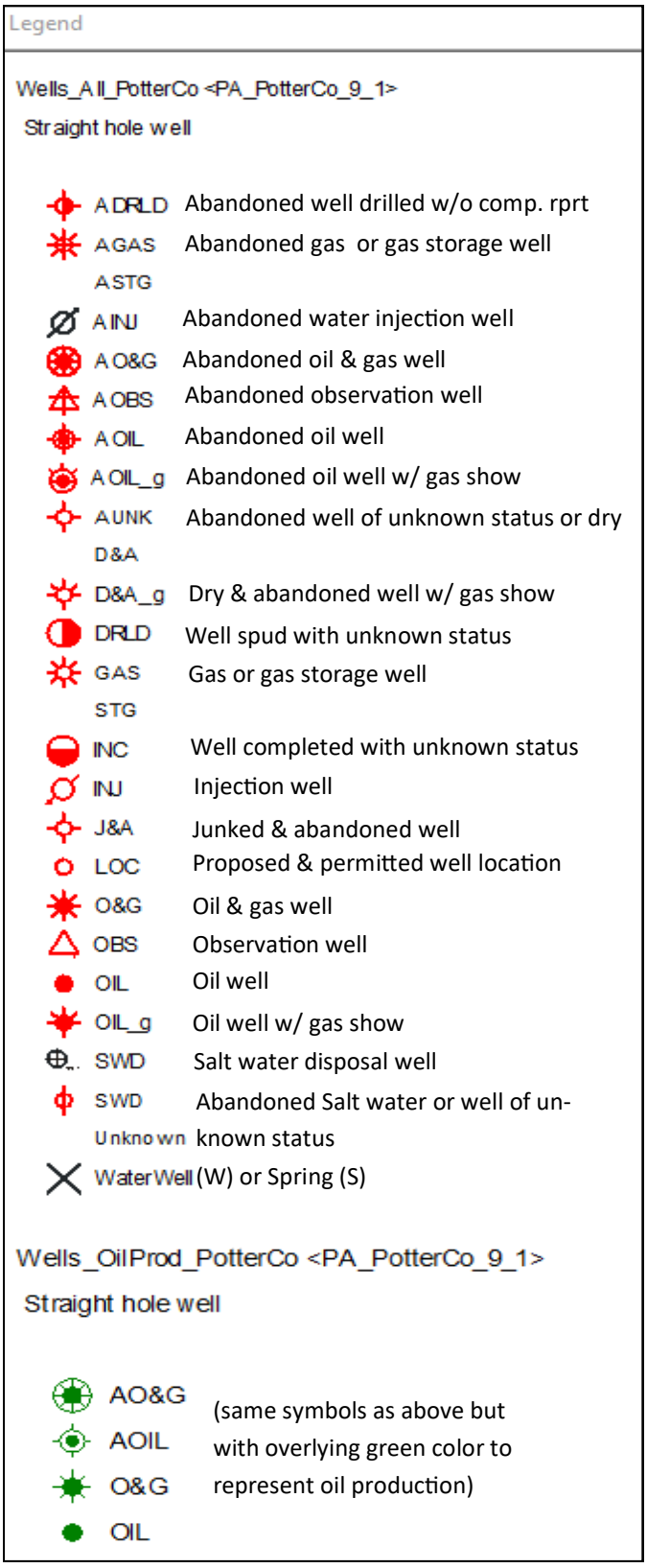
Name and Official Title (Please Type or Print)	Signature	Date Signed
James Roy Kells managing Partner		8-17-20

EPA Form 7520-6 (Rev. 4-19)

Attachment A: Maps & Area of Review

Part III. Maps:

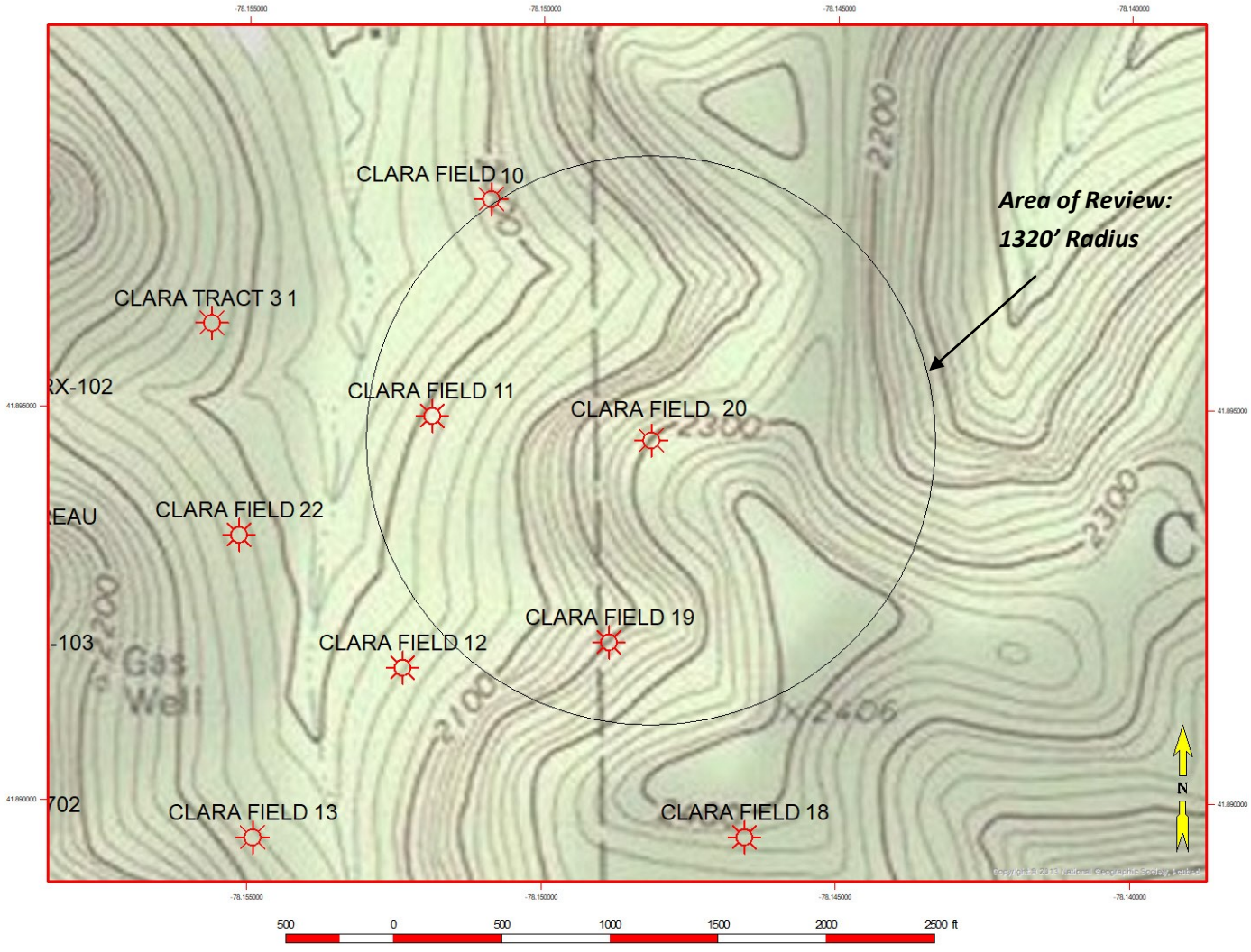
Map Legend



Attachment A: Maps & Area of Review

Part III. Maps (Continued)

AOR of quarter-mile radius. No water wells, springs, or hazardous waste facilities within the AOR.

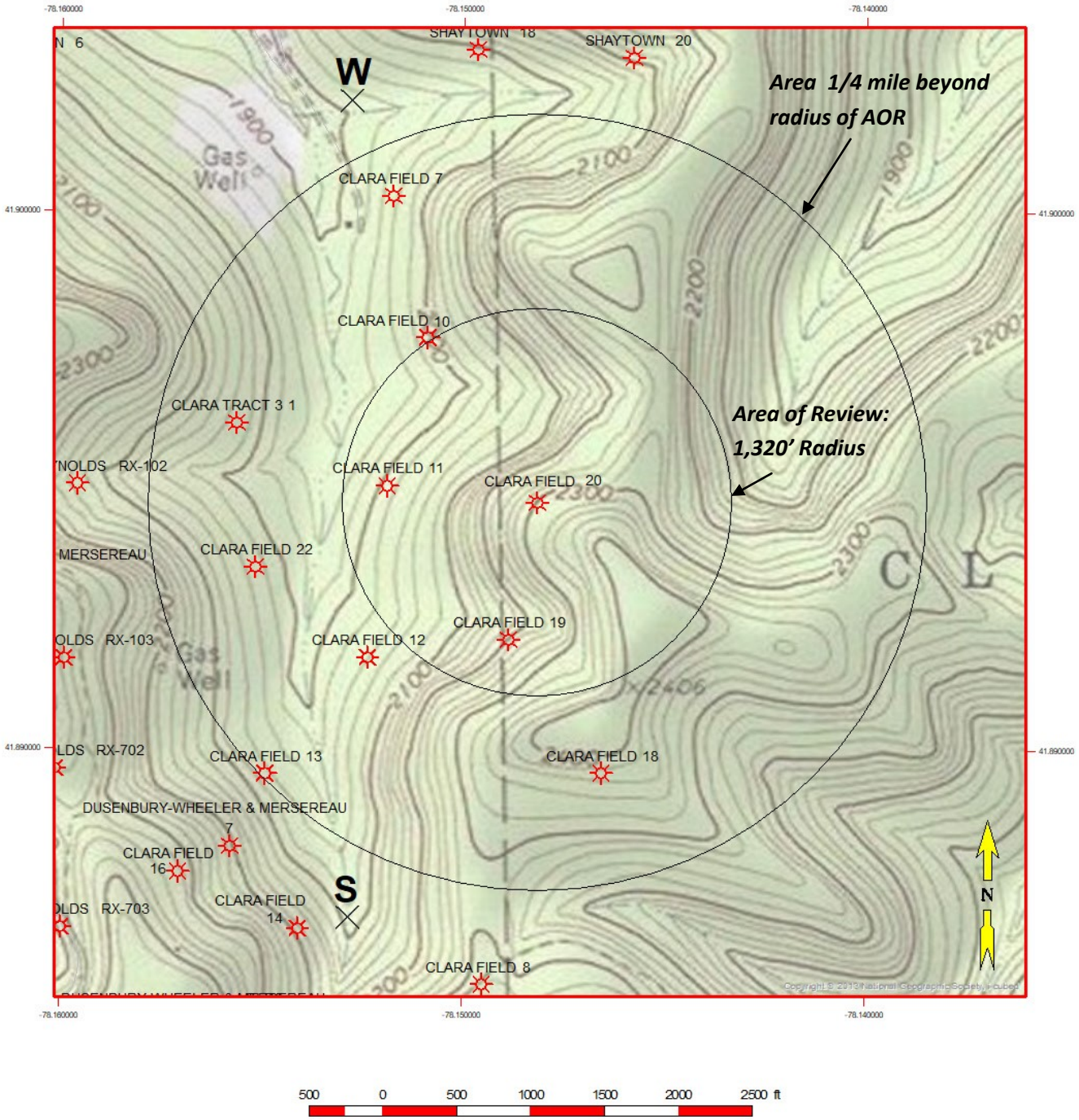


Attachment A: Maps & Area of Review

Part III. Maps (Continued)

The topographic map below shows the location of the Clara Field #20 well, its one-quarter mile AOR and a larger circle with a radius one-quarter mile beyond the radius of the AOR. Within this second radius are found ten gas wells including the Clara Field #20. Specific data about the three wells in the AOR is found In Part IV of this Attachment. No wells, springs, or hazardous waste facilities found with the radius of the circle that is one quarter-mile beyond the boundaries of the AOR.

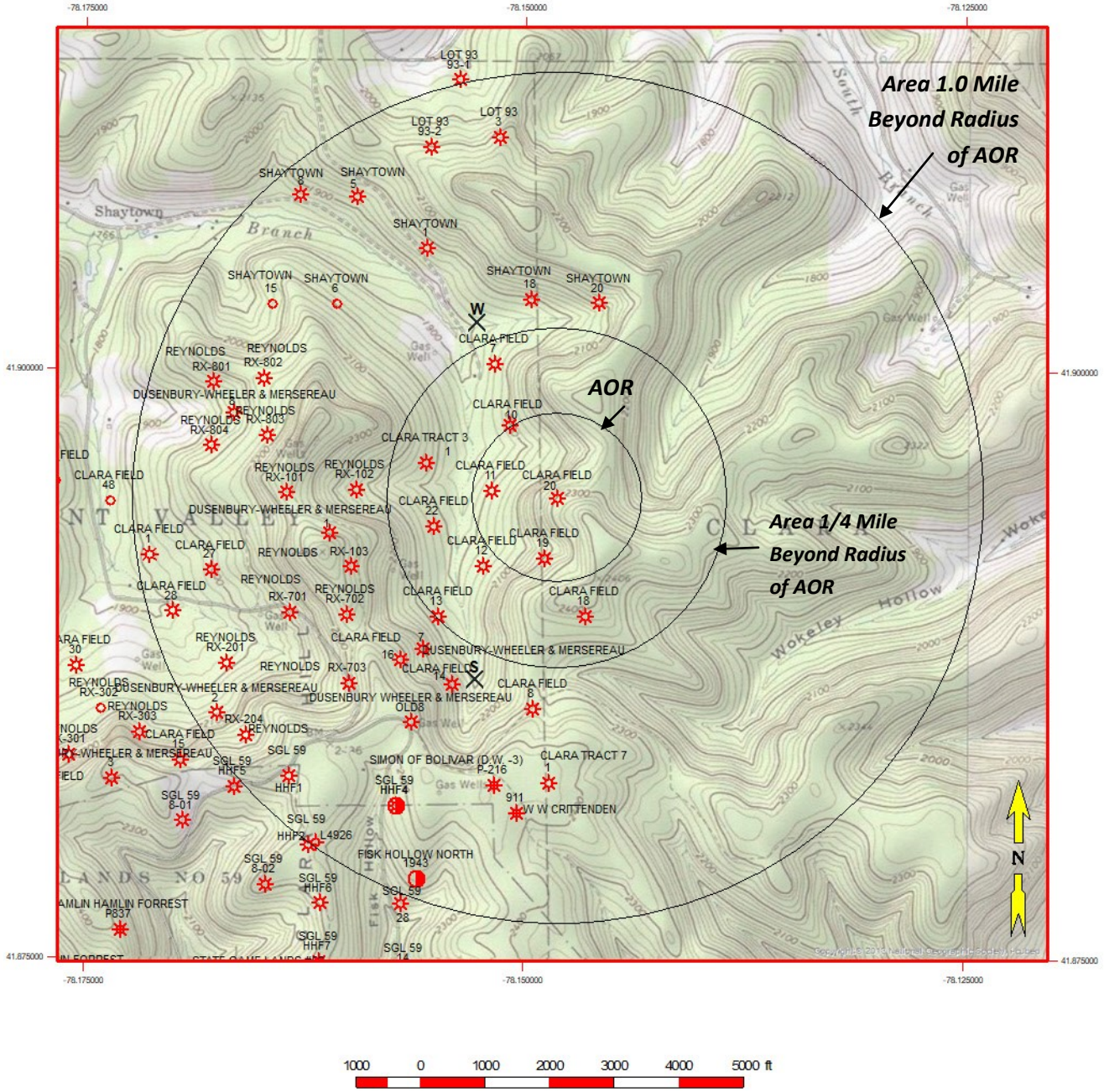
Within this larger radius there occur two intermittent stream drainages and no permanent streams. The map below shows that the only water well (**W**) and spring (**S**) in the area exist beyond the circle



Attachment A: Maps & Area of Review

Part III. Maps (Continued)

The topographic map below shows the location of the Clara Field #20 well, its one-quarter mile AOR, a larger circles with a radius one-quarter mile beyond the radius of the AOR and a still larger circle with radius of 1.0 mile beyond the radius of the AOR. No hazardous waste facilities are found with the radius of the circle that is one and one quarter miles beyond the radius of the AOR, but a single water will and a spring do exist within the broader radius as shown on the map below.



Attachment A: Maps & Area of Review

Part IV. Area of Review (AOR) Wells and Corrective Action Plan

There are three wells within the Area of Review. These wells are listed in the table below and well details are listed in the following three pages

Well Name	Proposed Well Type	Depth (ft)	API Number	Latitude	Longitude
Clara Field #11	Monitor	2,000	37-105-21136	41.894891	-78.151893
Clara Field #19	Monitor	2,300	37-105-21359	41.892030	-78.148837
Clara Field #20	Class II-D	2,310	37-105-21374	41.894586	-78.148143

No corrective action plan is needed for these wells. The Clara Field #11 and #19 wells will serve as monitor wells for the Clara Field #20 Class !!-D well.

Copies of the Well Records and Completion Reports for these wells can be found in ***Appendix B*** of this application.

Attachment A: Maps & Area of Review

Part IV. Area of Review (AOR) Wells and Corrective Action Plan (Continued)

Clara Field #11	37-105-21136 (Proposed Monitor Well)
Original Operator:	EOG Resources, Inc
Current Operator:	Roulette Oil & Gas Co, LLC
Ground Level:	2,010’
Spud Date:	8/2/2005
Deepest FW:	271’
Shallowest FW:	148’
Total Depth:	2,000’ (Driller TD)
Completion Date:	11/1/2005 (date of stimulation)
Completion Method:	Hydraulic Fracture (15 stages)
Well Status:	Gas
Casing /Depth:	9 5/8” at 31’ (Sanded in) 7” (19#) at 500’ (Cemented in with 85 SX Class A, 3%,1/4#) 4 1/2” at 1,160’
Top of Cement: (TOC)	**32.2 bbls pumped including 35% excess** **(Calculation: Cmt Vol (bbl) / [Casing Capacity (bbl/ft) + Annular Capacity (bbl/ft)]** **Casing Capacity = 0.0405 bbl/ft (Universal Well Services Field Book)** **Annular Capacity = 0.0268 bbl/t (Universal Well Services Field Book)** **TOC = 32.2 / (0.0405 + 0.0268) = 479’ of cement length with no cement returns reported by operator.**
Log Curves:	Gamma Ray, Caliper, Temperature, Medium & Deep Induction, Neutron Porosity, Bulk Density, Density Porosity, Density Correction
Log Depth Range:	412’-2,000’ (Logger TD)

Attachment A: Maps & Area of Review

Part IV. Area of Review (AOR) Wells and Corrective Action Plan (Continued)

Clara Field #19	37-105-21359 (Proposed Monitor Well)
Original Operator:	North Coast Energy, Inc
Current Operator:	Roulette Oil & Gas Co, LLC
Ground Level:	2,231’
Spud Date:	6/9/2008
Deepest FW:	275’
Shallowest FW:	175’
Total Depth:	2,200’ (Driller TD)
Completion Date:	8/25/2008 (date of stimulation)
Completion Method:	Hydraulic Fracture (27 stages; 5 stages not treated)
Well Status:	Gas
Casing /Depth:	9 5/8” at 23’ (Sanded in) 7” (17#) at 501’ (Cemented in with 110 SX 50/50 POZ) 3 1/2” at 900’
Top of Cement: (TOC)	**32.7 bbls pumped including 35% excess** **(Calculation: Cmt Vol (bbl) / [Casing Capacity (bbl/ft) + Annular Capacity (bbl/ft)]** **Casing Capacity = 0.0415 bbl/ft (Universal Well Services Field Book)** **Annular Capacity = 0.0289 bbl/t (Universal Well Services Field Book)** **TOC = 32.7 / (0.0415 + 0.0289) = 536’ of cement length with no cement returns reported by operator. Assume voids and fractures between 0’ and 501’**
Logs Curves:	Gamma Ray, Caliper, Temperature, Medium & Deep Induction, Neutron Porosity, Bulk Density, Density Porosity, Density Correction
Log Depth Range:	24’-2,208’ (Logger TD)

Attachment A: Maps & Area of Review

Part IV. Area of Review (AOR) Wells and Corrective Action Plan (Continued)

Clara Field #20	37-105-21374 (Proposed UIC Class II-D Well)
Original Operator:	North Coast Energy Inc
Current Operator:	Roulette Oil & Gas Co, LLC
Ground Level:	2,305’
Spud Date:	5/27/2008
Deepest FW:	340’
Shallowest FW:	340’
Total Depth:	2,310’ (Driller TD)
Completion Date:	8/12/2008 (date of stimulation)
Completion Method:	Hydraulic Fracture (21 stages: five stages would not break)
Well Status:	Gas
Casing /Depth:	9 5/8” at 23’ (Sanded in) 7” (17#) at 501’ (Cemented in with 110 SX 50/50 POZ) 1 1/2” at 2151.9’
Top of Cement: (TOC)	**37.7 bbls pumped including 35% excess** **(Calculation: Cmt Vol (bbl) / [Casing Capacity (bbl/ft) + Annular Capacity (bbl/ft)]** **Casing Capacity = 0.0415 bbl/ft (Universal Well Services Field Book)** **Annular Capacity = 0.0289 bbl/t (Universal Well Services Field Book)** **TOC = 37.7 / (0.0415 + 0.0289) = 535’ of cement length with cement returns reported by operator**
Logs Curves:	Gamma Ray, Caliper, Temperature, Medium & Deep Induction, Neutron Porosity, Bulk Density, Density Porosity, Density Correction
Log Depth Range:	34’-2,319’ (Logger TD)

Attachment A: Maps & Area of Review

Part V: Landowner Information

Lyme Emporium Highlands II, LLC owns 100 percent of the surface. This company was incorporated in Pennsylvania on 5/1/2018.

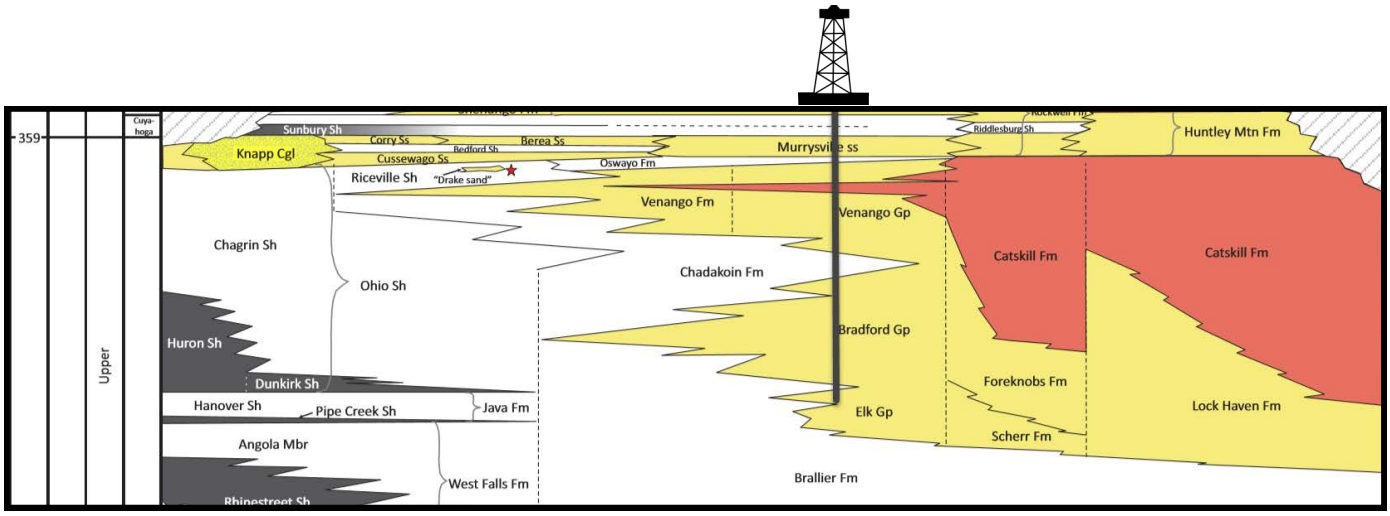
The parent company of Lyme Emporium Highlands II, LLC is The Lyme Timber Company, LP whose address is: 23 South Main Street, 3rd Floor
Hanover, NH 03755

Attachment B: Geological and Geophysical Information

Part I: Geological Data: Formation Data

The Clara Field #20 well begins at the surface in undifferentiated Mississippian-Upper Devonian rocks and reaches a total depth of 2,310' (Driller TD) in Upper Devonian Elk Group strata. In between the surface and total depth it penetrates the sandstones and shales of the Upper Devonian Venango and Bradford Groups. A portion of the Pennsylvania DCNR's stratigraphic, schematic cross-section illustrates the gross stratigraphy of this area of the Appalachian basin.

Approximate location of the Clara Field #20 wellbore & its generalized stratigraphy



Upper Devonian formation names are informal in Pennsylvania and nomenclature for the same reservoirs varies from area to area and from operator to operator. This UIC Class II-D application, its well logs, cross-sections and maps will apply the Bradford Group nomenclature used by StratResources Geologic Consulting, PLLC (SRGC) as listed in the stratigraphic nomenclature table below, along with approximate industry equivalents. Most of these zones, also known as sequences and sequence sets, were penetrated by the Clara Field #20 wellbore. Correlations were made by tying-in to SRGC's regional cross-sections.

The well log from the Clara Field #20 well was scanned and its most relevant curves, with respect to log analysis, were digitized and an LAS file was created. The Group and Zone names based on the diagram above and the stratigraphic chart below are annotated on the digitized well log along with any lithology data that was available. No cores were taken in this well and the cuttings were not available for viewing.

The expanded scale bar used in the digital image shows the six curves that were digitized. They are the Gamma Ray (GR), Caliper (CALI), Deep Resistivity (ILD), Temperature (TEMP), Neutron Porosity (NPHI) and Bulk Density (RHOB). The scale bar also shows the calculated Neutron Porosity corrected for sandstone (PHINss) and the Density Porosity (PHID) curves. Zones hydrofractured are also shown in the log.

Attachment B: Geological and Geophysical Information

Part I: Geological Data: Formation Data (continued)

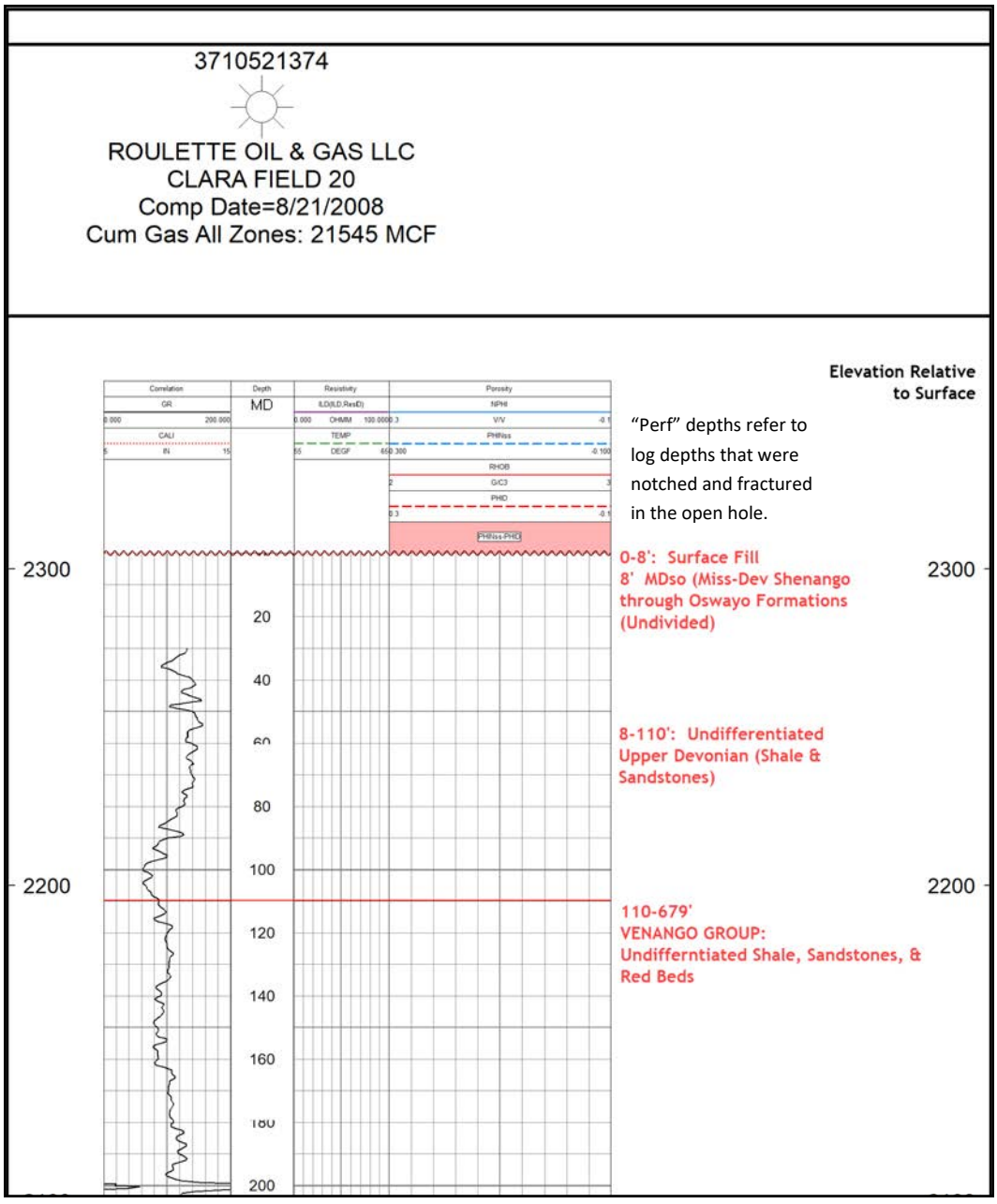
Denotes Proposed Injection Zones

West	Bradford Group NY &PA Oil Region Names		East
Approximate Industry Terms	***SRGC Sequence*** *(Where Present)*	***SRGC Sequence Set***	***Approximate Industry Terms***
Base of Pink Rock, Warren 1st	***Terms*** WRRN1-0	Warren	Base of Pink Rock Warren 1st
Warren 2nd	WRRN2-0		Warren 2nd
	WRRN3-0		
	WRRN4-0		
	WRRN5-0		
	WRRN6-0		
	WRRN6-1		
	WRRN6-2		
	WRRN6-3		
Queen, Glade	WRRN7-0		Speechley Stray, Bradford 1st
	SPCH1-0	Speechley	
	SPCH2-0		Bradford 1st, Glade
Clarendon, Balltown	SPCH3-0		Bradford 1st
	SPCH4-0		Watsonville
	SPCH5-0		Watsonville, Kinzua
	SPCH6-0		Clarendon
	SPCH7-0		Dewdrop
Cherry Grove, Tiona	TION1-0	Tiona	Chipmunk, Clarendon
	TION2-0		Chipmunk
	TION3-0		
	TION4-0		
	TION5-0		
Cooper	CPR1-0	Cooper	Bradford 2nd, Cooper, Penny
	CPR2-0		
	CPR3-0		
	CPR4-0		
	CPR5-0		
Klondike	SHF1-0	Sheffield	Harrisburg Run, Deerlick, Richburg
	SHF2-0		
	SHF3-0		
	SHF3-1		
	SHF4-0		
Not usually present or penetrated	BDFD1-0	Bradford	
	BDFD2-0		
	BDFD3-0		
	KANE1-0	Kane	Bradford 3rd Richburg
	KANE2-0		
	KANE2-1		
	KANE3-0		
	KANE4-0		
	KANE5-0		Lewis Run, W&P
	ELK1-0	Elk	Waugh & Porter, Kane, Haskill
	ELK2-0		
	ELK3-0		
	ELK3-1		
	ELK4-0		
	ELK5-0		
	ESTR1	Elk Stray	Sartwell
	ESTR2		
	ESTR3		Haskill
	HSKL1	Haskill (Elk Group)	

Attachment B: Geological and Geophysical Information

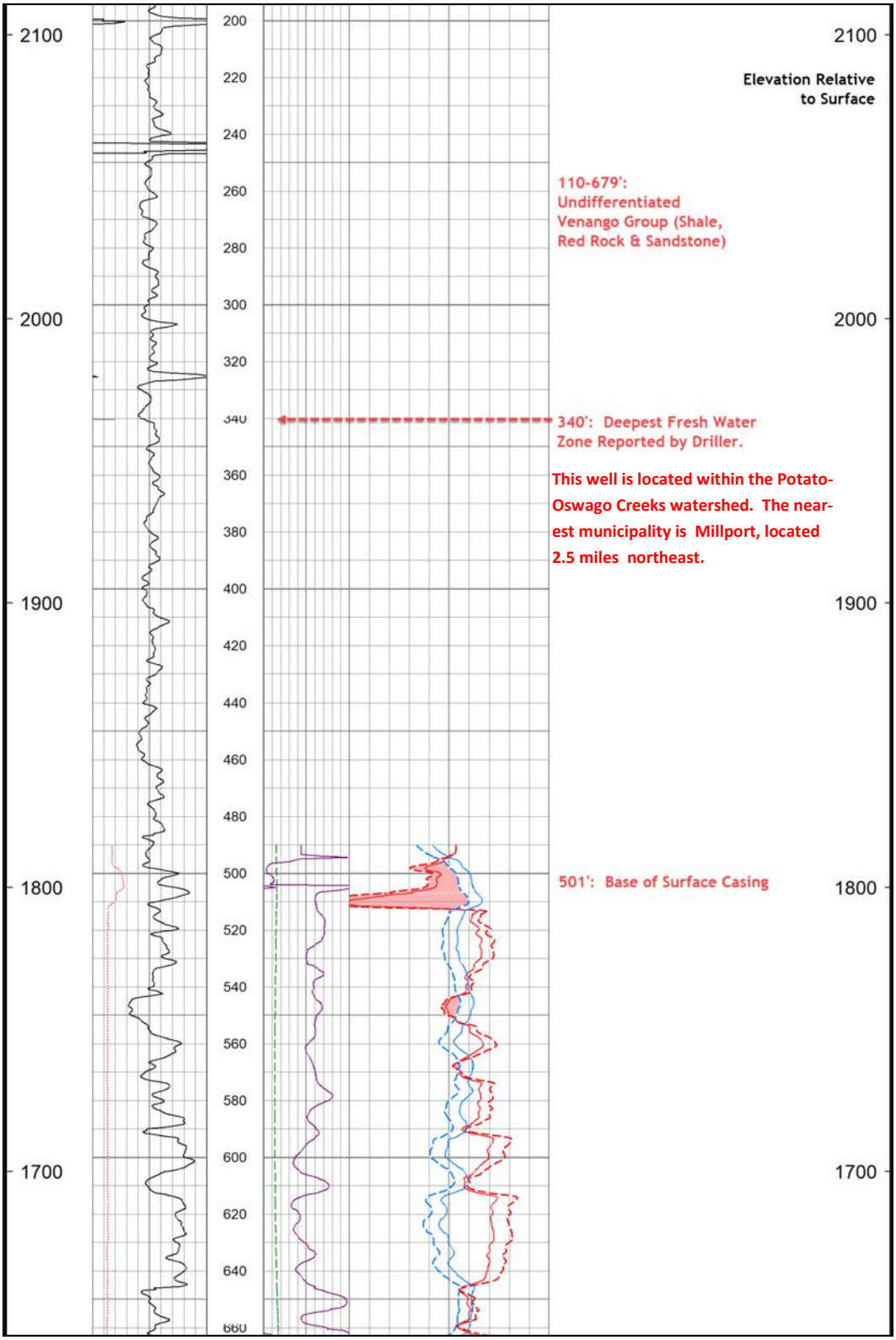
Part I: Geological Data: Formation Data (continued)

Correlation	Depth	Resistivity	Porosity
GR	MD	ILD(ILD,ResD)	NPHI
0.000 200.000		0.000 OHMM 100.000	0.3 V/V -0.1
CALI		TEMP	PHINss
5 IN 15		55 DEGF 65	0.300 -0.100
			RHOB
			2 G/C3 3
			PHID
			0.3 -0.1
			PHINss-PHID



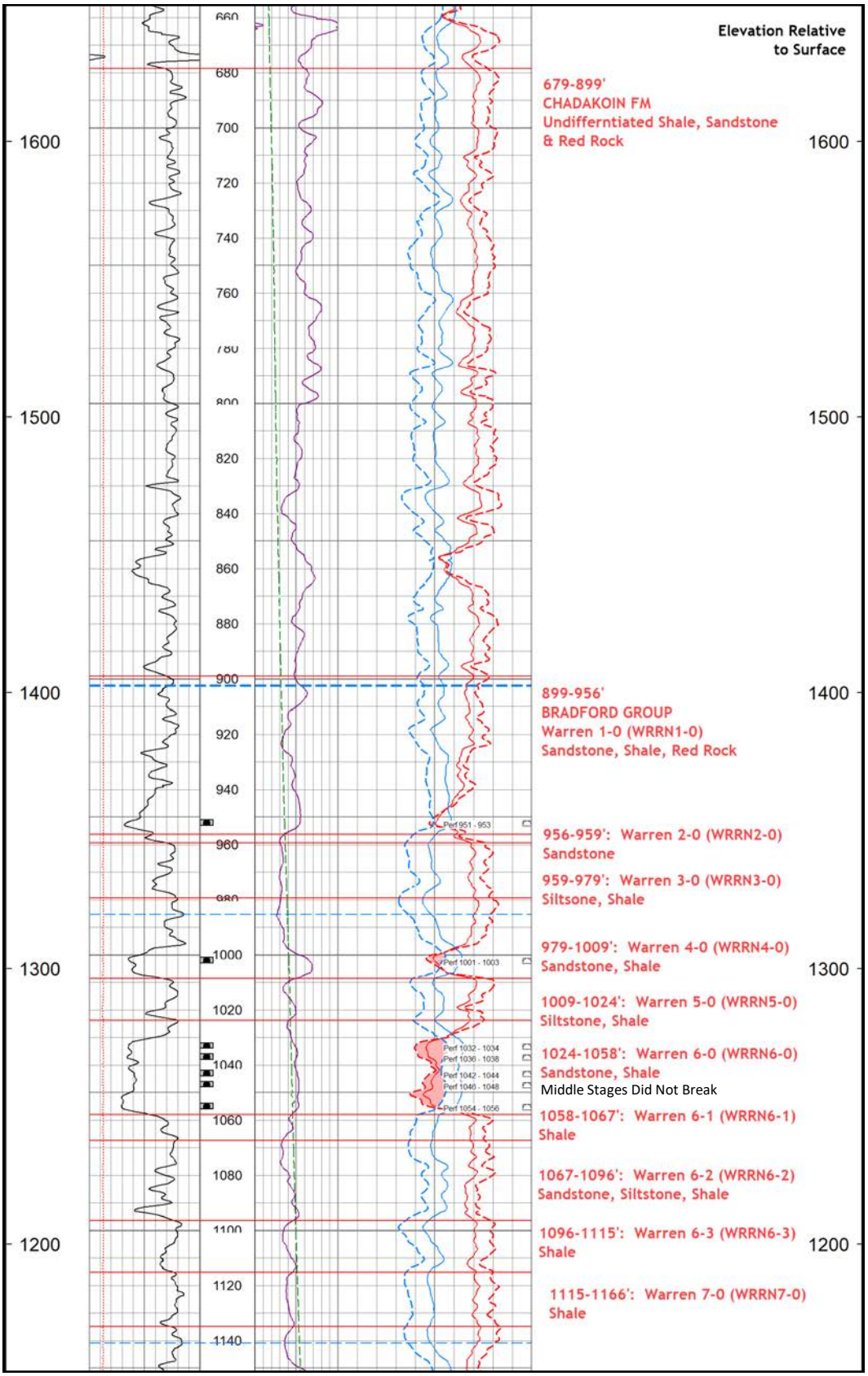
Attachment B: Geological and Geophysical Information

Part I: Geological Data: Formation Data (continued)



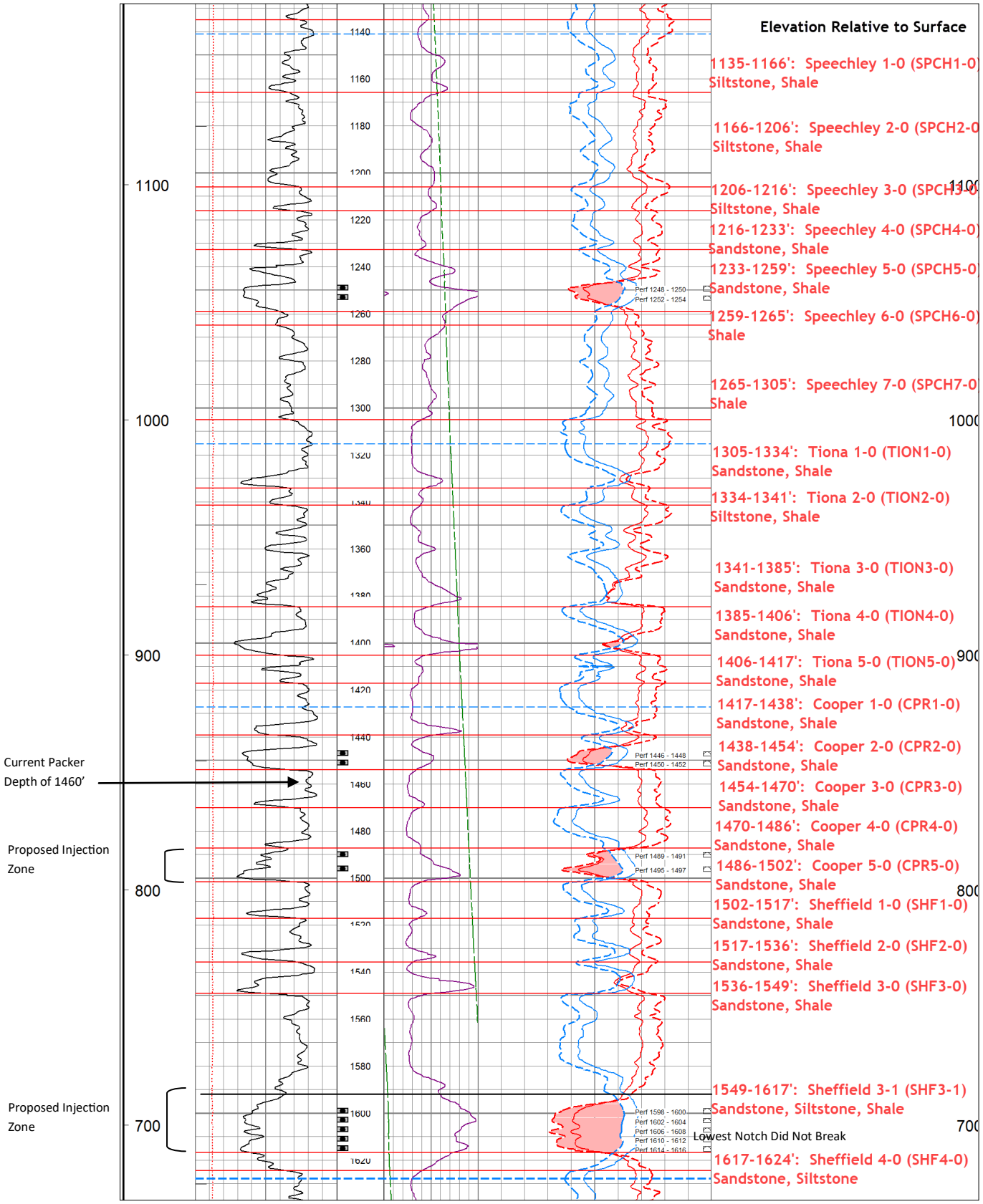
Attachment B: Geological and Geophysical Information

Part I: Geological Data: Formation Data (continued)



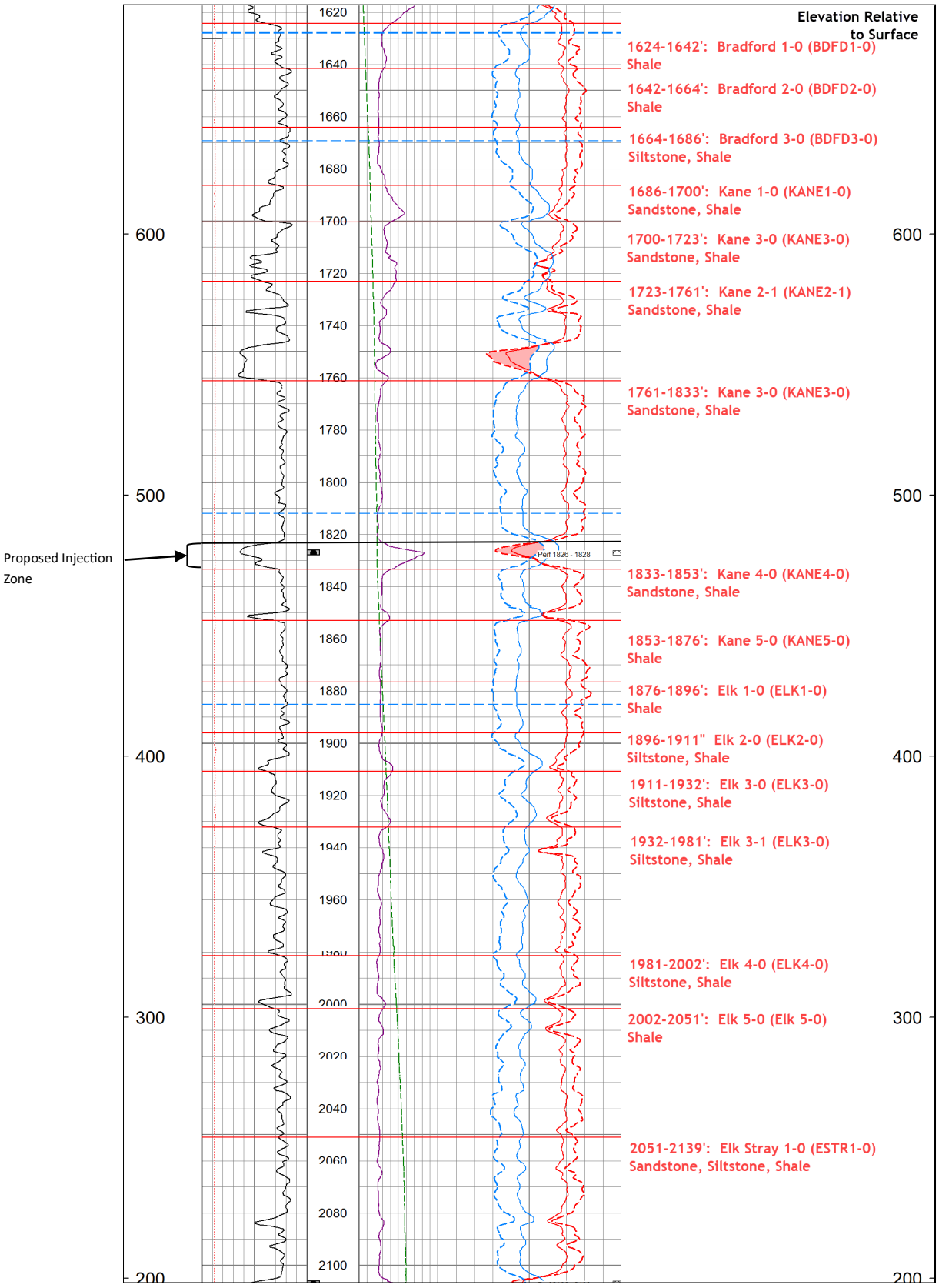
Attachment B: Geological and Geophysical Information

Part I: Geological Data: Formation Data (continued)



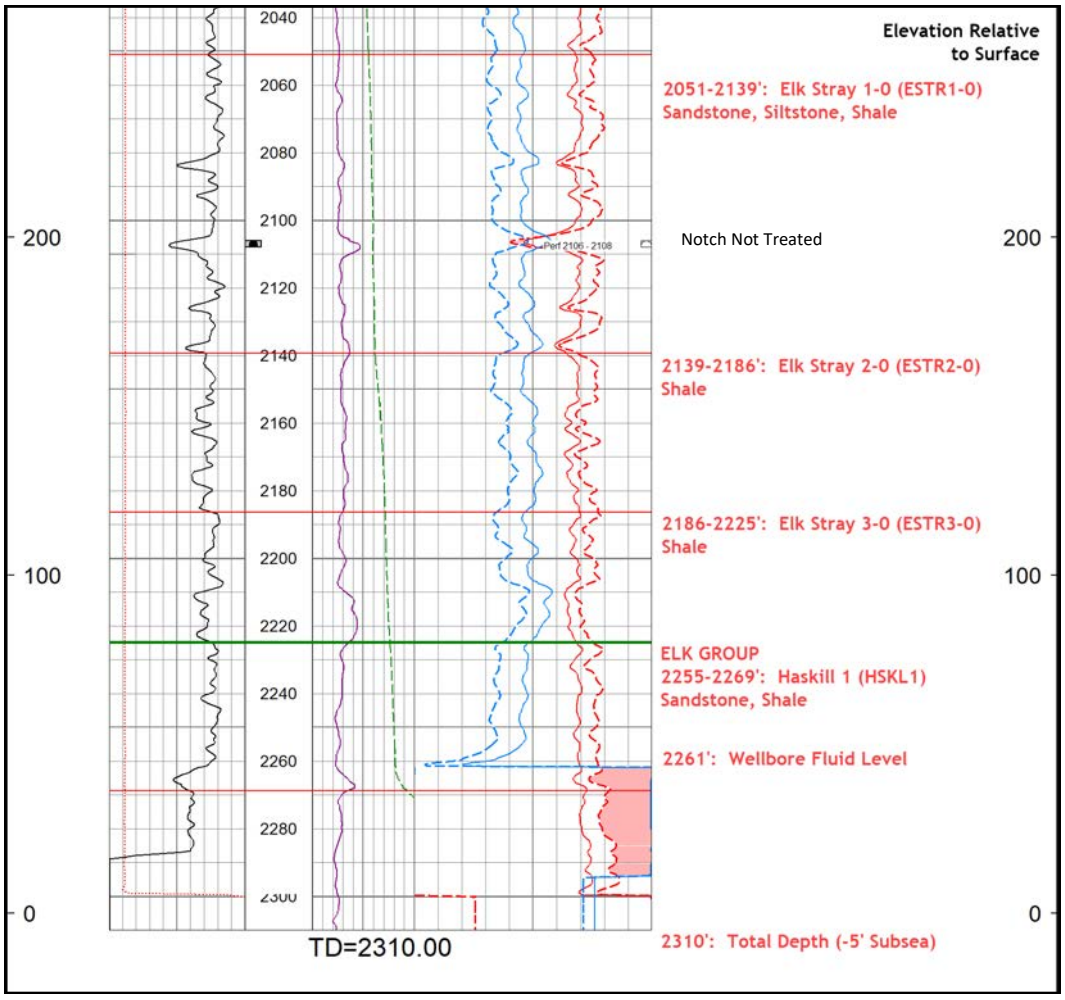
Attachment B: Geological and Geophysical Information

Part I: Geological Data: Formation Data (continued)



Attachment B: Geological and Geophysical Information

Part I: Geological Data: Formation Data (continued)



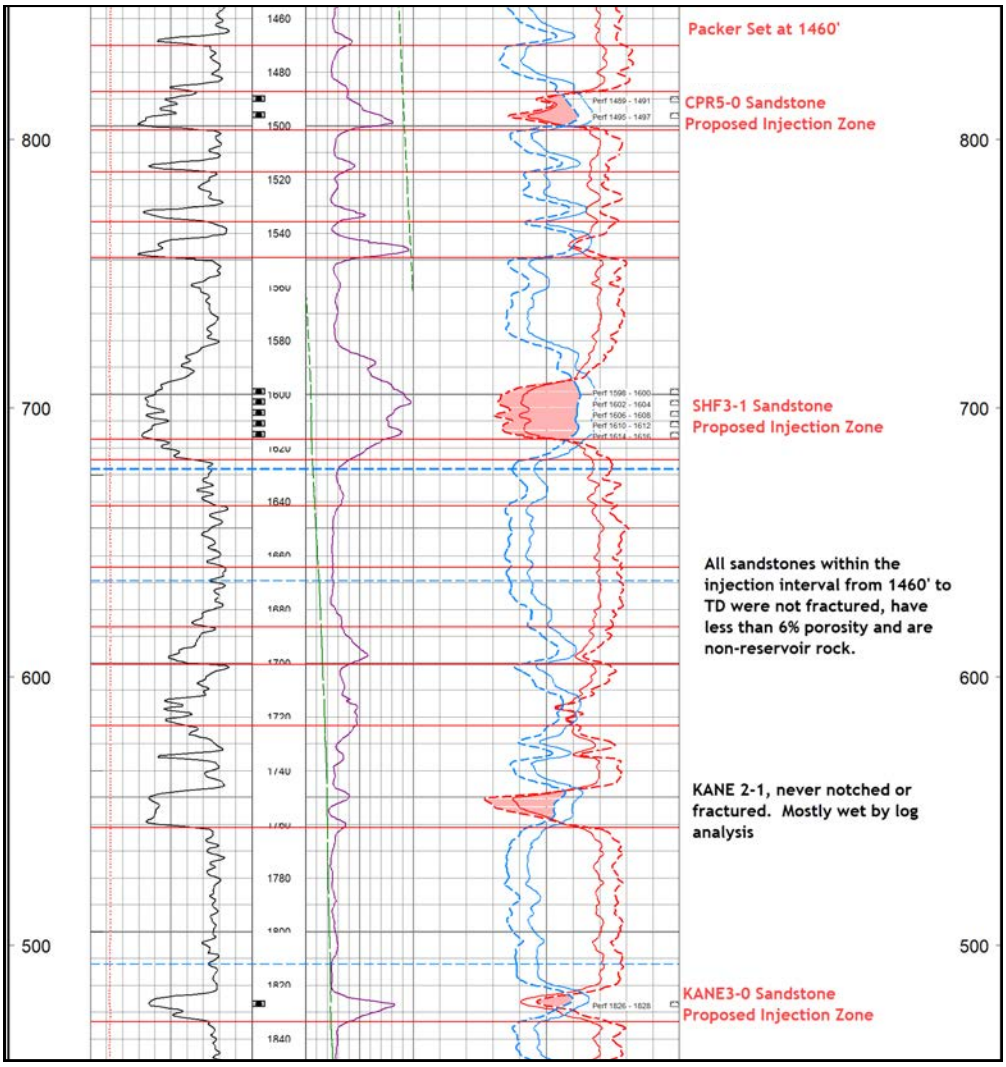
The deepest USDW zone reported by driller was at 340’ with a fresh water flow of 0.5”. Surface casing was set and cemented at 501’ or 161’ deeper than the fresh water zone. Cement returns were noted at the surface and confirmed by calculation (see Page 12). There is no available chemical analysis of the water from this USDW zone and it is now behind pipe. There are three proposed injection zones in this well. They are the sandstone reservoirs within the Cooper 5-0 (CPR5-0) sequence penetrated from 1486’ - 1502’; the Sheffield 3-1 (SHF3-1) sequence penetrated from 1594’ - 1617’; and the Kane 3-0 (KANE3-0) sequence, penetrated from 1823-1833’.

A laboratory analysis of brine from several wells on ROGC’s Clara Field lease (personal communication, Jim Reynolds) dated 2/27/2014 is found in ***Appendix C.*** The analysis shows that the produced brine from all commingled zones from similar wells in the area had a measured TDS (Total Dissolved Solid) concentration of 173,000 mg/L.

Attachment B: Geological and Geophysical Information

Part I: Geological Data: Formation Data (continued)

The confining zone for the three proposed injection zones consists of numerous unnamed shale beds (defined as intervals with Gamma Ray values greater than 140 API units) from the Bradford and Venango Groups having a total thickness of 461’ between the depths of 1445’ and base of the surface casing at 501’. Several individual shale beds within this interval are more than 20’ thick.



Zone	Purpose	Top (MD)	Base (MD)	Frac’d
Numerous Shales (461’ total thickness)	Confining	501’	1445’	No
CPR5-0 Sandstone	Injection	1486’	1502’	Yes
SHF3-1 Sandstone	Injection	1594’	1617’	Yes
KANE3-0 Sandstone	Injection	1823’	1833’	Yes

Attachment B: Geological and Geophysical Information

Part I: Geological Data: Source of Data

The geologic information for the formation names and lithologies was derived from regional correlated geologic cross-sections and log analysis of the digital curves from the Clara Field #20 well itself.

Part I: Geological Data: Porosity & Permeability

Quantitative log analysis of the digitized well log curves uses various, reasonable and accepted assumptions regarding the computation of porosity from the Bulk Density and Neutron Porosity curves, as well as Volume of Shale in each formation, calculated from the Gramma Ray curve. The analysis computes three types of porosity using the following algorithms for a wellbore without water across the reservoir, in other words an "empty hole:"

Total Porosity (PHID)

Where, RhoM = Grain Density (assumed to be 2.68 g/cc)
RhoB = Bulk Density (from the well log)
RhoF = Fluid Density within the first few inches of the wellbore, a weight average of the gas and water saturations times their respective assumed densities

PHID = (RhoM-RhoB)/(RhoM-RhoF)

Average Porosity (PHIA) for empty holes, using the density & neutron logs

(from "Logging Empty Holes," Rodermund et al, 1961)

Where, PHINss = Neutron Porosity corrected for sandstone

PHIA = ((RhoM-RhoB) + PHINss)/RhoM)

Effective Porosity (PHIE)

Where, Vshl = volume of clay or shale within the reservoir determined from the Gamma Ray

PHIE = (PHIA x (1-Vshl))

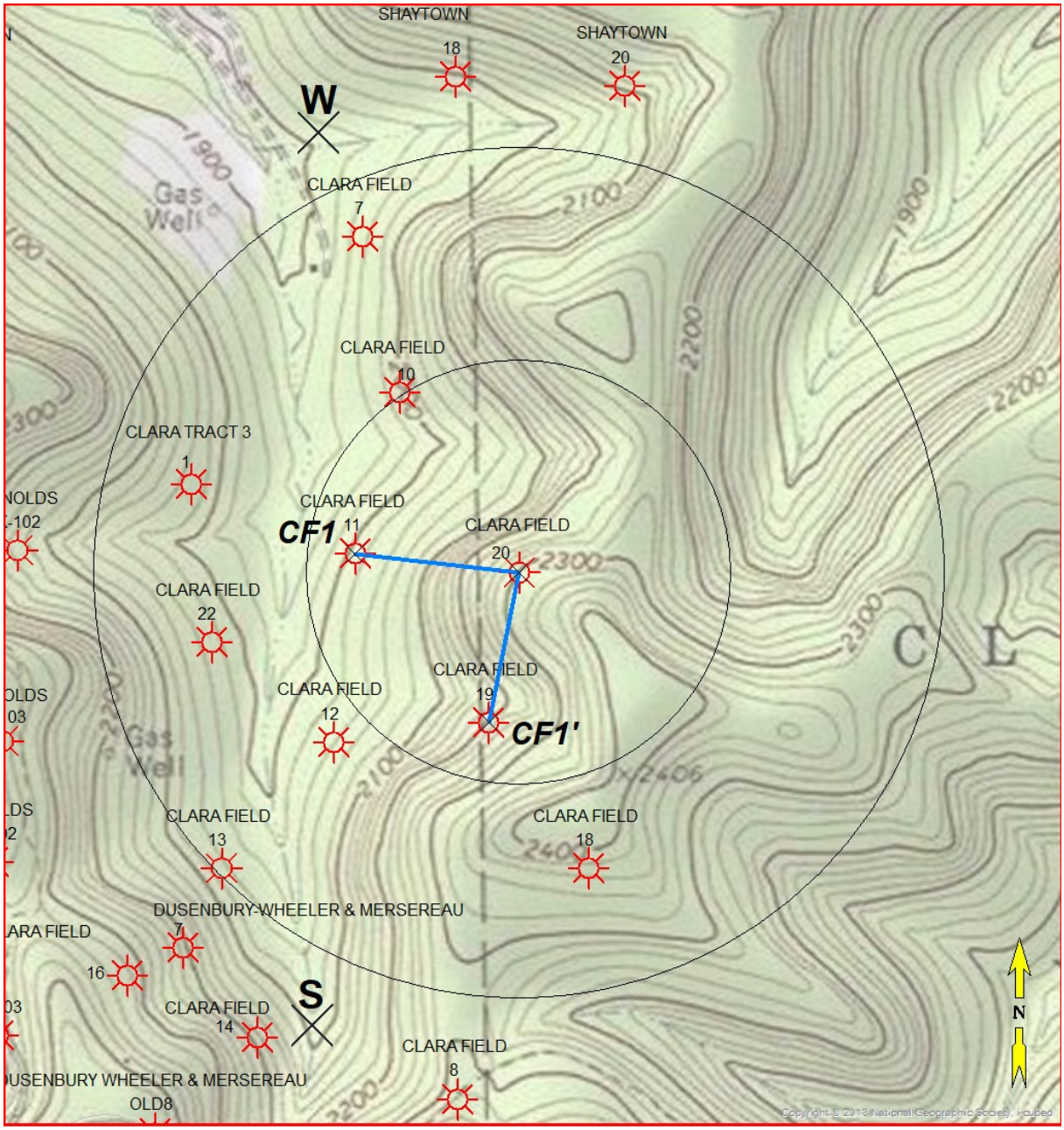
The calculation of the various average porosities, which exceed at a cutoff value of six percent, the cutoff of the proposed injection reservoirs that were fractured stimulated, is summarized in the table below:

Injection Zone	Thickness (ft) w/PHI ≥ 6%	PHID (%)	PHIA (%)	PHIE (%)
Cooper 5-0	2.5	9.3	10.0	6.4
Sheffield 3-1	15.0	16.3	11.6	7.1
Kane 3-0	3.0	10.9	12.2	7.3

No cores were cut in this well for analysis, so the permeabilities are unknown.

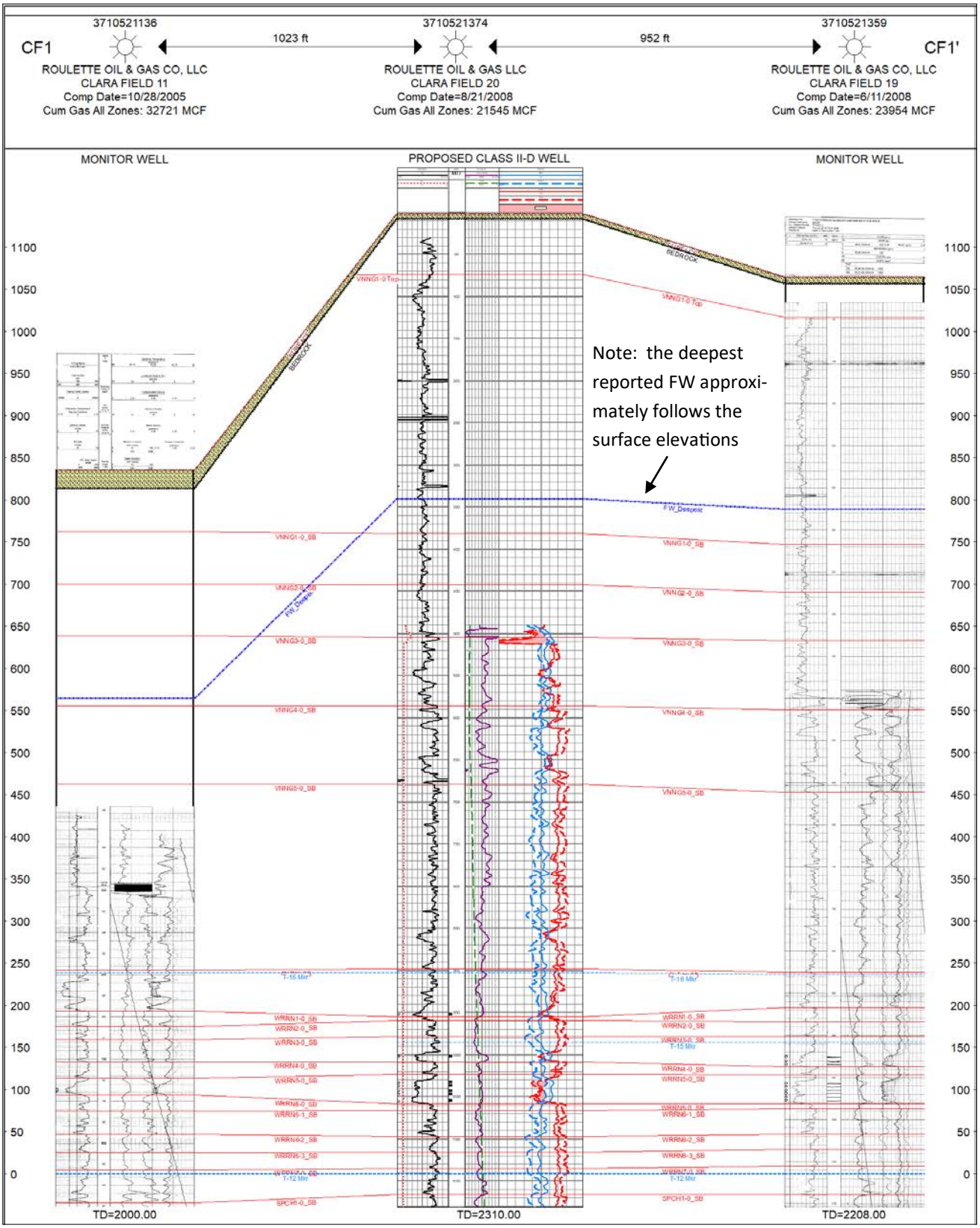
Attachment B: Geological and Geophysical Information

Part I: Geological Data: Geologic Cross-Section (line of cross-section)

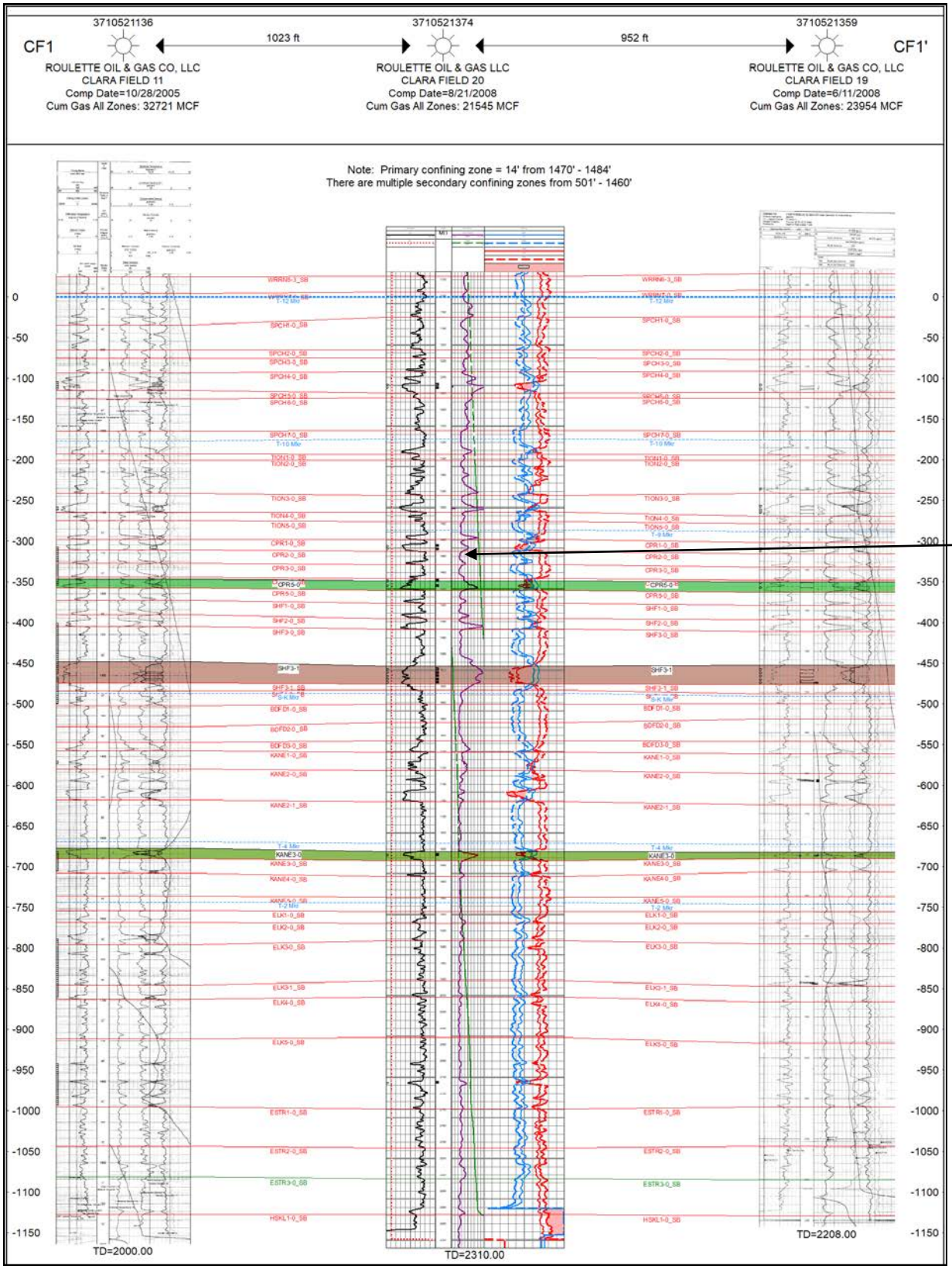


Attachment B: Geological and Geophysical Information

Part I: Geological Data: AOR Stratigraphic Cross-Section (upper formations—Datum = T-12 Marker)



Attachment B: Geological and Geophysical Information



T-12 Marker

Packer Set @ 1460'

CPR5-0

SHF3-1

KANE3-0

Injection Zones

Attachment B: Geological and Geophysical Information

Part I: Geological Data: Suspected Faults, Seismic Activity, and Depth to Basement

The Clara Field #20 well lies approximately 8,300' northwest of the subsurface trace of the Clermont syncline and approximately 17,300' southeast of the subsurface trace of the Smethport anticline. These folds and the areas adjacent to them are not associated with any known faults in the shallow Upper Devonian section, particularly those associated with the injection zones within this area (Faill, 2011. *Folds Map of Pennsylvania*. Open File Report, OFGG 11-01-0)

The nearest inferred fault to the Clara Field #20 well, trends SW to NE and is located approximately 12,000' southeast of the Clara Field #20 well (Faill, 2011 as above), but this inferred fault is associated with much deeper Cambrian and Lower Ordovician Rocks (Wagner, 1976. *Growth faults in Cambrian and Lower Ordovician rocks of Western Pennsylvania*. AAPG Bulletin v60, 3 pp.414-427).

There has been no measureable seismic activity recorded in Potter County, based on the map of Pennsylvania Earthquake Epicenters (Faill, 2004) and the source *Seismicity in Pennsylvania and the Pennsylvania State Seismic Network* (Nyblade & Homman, 2017).

The depth to the top of the crystalline basement from the surface elevation of the Clara Field #20 well is approximately 5,900' (TVD) based on the PA-DCNR Open File Report (Gold et al, 2004. *Basement depth and related geospatial database for Pennsylvania*. PA Geological Survey, 4th sur., Open File Report, OFGG 05.01.0). This is approximately 3,600' **below** the total depth of the Clara Field #20 well.

ERRATUM by Author (June 8, 2021)

The depth to the crystalline basement taken from the PA Geological Survey, 4th sur., Open File Report, OFGG 05.01.0 (see above) was incorrectly interpreted by the author to be in feet rather than in meters, which the basement contour map in that source used as its unit of measurement. Therefore, the estimated depth to crystalline basement, based on the cited source, is subsea 3,600 ***meters*** or 11,811 feet below sealevel, which is 14,116 feet below the ground level elevation of 2,305 feet.

Therefore, the distance from the total depth of the Clara #20 well (2,310 feet) to basement is approximately 14,116 feet minus 2,310 feet for a calculated distance of 11,806 feet.

Attachment B: Geological and Geophysical Information

Part II: Formation Testing

The Clara Field #20 well was hydraulically fractured on 8/21/2008 by the original operator, North Coast Energy using Superior Well Services. Frac Treatment Summaries and a formation table with ISIP value are shown below. It should be noted that Stages 5, 6, and 19 did not break; and Stages 7 and 21 were not treated. The CPR5-0, SHF3-1 and KANE3-0 are the proposed injection zones.

Many of the Upper Devonian sandstones in the northern Appalachian basin are subnormally pressured and have an original pressure gradient of approximately 0.350 psi/ft. Using this value the original shut-in casing pressure at the midpoint of the CPR5-0 sandstone is 522 psi; the SHF3-1 sandstone is 562 psi; and the KANE3-0 sandstone is its 639 psi/ft.

Stage #	Formation	Notch Depth (ft)	ISIP (psi)
1	WRRN1-0	952	779
2	WRRN4-0	1002	654
3	WRRN6-0	1033	688
4	WRRN6-0	1037	791
5	WRRN6-0	1043	Did Not Break
6	WRRN6-0	1047	Did Not Break
7	WRRN6-0	1051	Did Not Treat
8	WRRN6-0	1055	801
9	SPCH5-0	1249	879
10	SPCH5-0	1253	942
11	CPR2-0	1447	923
12	CPR2-0	1451	942
13	CPR5-0	1490	1045
14	CPR5-0	1496	1069
15	SHF3-1	1599	1089
16	SHF3-1	1603	1167
17	SHF3-1	1607	1080
18	SHF3-1	1611	1187
19	SHF3-1	1615	Did Not Break
20	KANE3-0	1827	1221
21	ESTR2-0	2107	Did Not Treat

Attachment B: Geological and Geophysical Information

Part II: Formation Testing Plan (continued)

CLARA FIELD 20
105-21374

COMPLETION REPORT									
PERFORATION RECORD			STIMULATION RECORD						
	PERFORATED			INTERVAL	FLUID		PROPPING AGENT		AVERAGE
DATE	FROM	TO	DATE	TREATED	TYPE	AMOUNT	TYPE	AMOUNT	INJECTION
8/18/2008	952	952	8/21/2008	952	WATER	3846 G	SAND	50 SX	18
8/18/2008	1002	1002	8/21/2008	1002	WATER	5554 G	SAND	80 SX	19.2
8/18/2008	1033	1033	8/21/2008	1033	WATER	6060 G	SAND	100 SX	18.2
8/18/2008	1037	1037	8/21/2008	1037	WATER	7722 G	SAND	100 SX	18
8/18/2008	1043	1043	8/21/2008	1043	WATER	243 G	SAND		1.4
8/18/2008	1047	1047	8/21/2008	1047	WATER	115 G	SAND		4.5
8/18/2008	1051	1051	8/21/2008	1051	NOT TREATED				
8/18/2008	1055	1055	8/21/2008	1055	WATER	6385 G	SAND	90 SX	18.5
8/18/2008	1249	1249	8/21/2008	1249	WATER	6508 G	SAND	80 SX	18.7
8/18/2008	1253	1253	8/21/2008	1253	WATER	6026 G	SAND	80 SX	18.4
8/18/2008	1447	1447	8/21/2008	1447	WATER	6509 G	SAND	80 SX	19.4
8/18/2008	1451	1451	8/21/2008	1451	WATER	6066 G	SAND	80 SX	18.7
8/18/2008	1490	1490	8/21/2008	1490	WATER	6035 G	SAND	80 SX	18.2
8/18/2008	1496	1496	8/21/2008	1496	WATER	4753 G	SAND	80 SX	18.8
8/18/2008	1599	1599	8/21/2008	1599	WATER	6025 G	SAND	80 SX	18.3

Data from an additional 5 frac'd stages at 1603', 1605', 1607', 1611', and 1827', not recorded in this table by the original operator, North Coast Energy, Inc.

Attachment B: Geological and Geophysical Information

Part II: Formation Testing Plan (continued)

Superior Well Services
350 High St.
Bradford,Pa. 16701
Telephone 814-368-6228
Fax 814-368-6231
Website: www.superiorwells.com

CUSTOMER & WELL INFORMATION

Date: 8/21/2008	Invoice # 21-00 9129
Customer: NORTH COAST ENERGY	Lease & Well Name: CLARA FIELD #20
County: POTTER	State: PA
Size & Weight-Pipe 3.5	Frac Supervisor: DANIEL HEMPHILL

Frac Treatment Summary

Stage #	Formation	Notch Depth	Sand-SKS.	Treatment	Flush	SAS/CW	Breaker	*ISIP	Time
1	N/A	952	50	3550	750	12.0	0.2	779	5:53 AM
2	N/A	1002	80	5550	750	17.0	0.3	654	6:16 AM
3	N/A	1033	100	6550	750	20.0	0.4	688	6:44 AM
4	N/A	1037	100	8200	800	25.0	0.4	791	7:16 AM
5	N/A	1043							7:41 AM
6	N/A	1047							8:08 AM
7	N/A	1051							8:52 AM
8	N/A	1055	90	6850	800	21.0	0.3	801	9:16 AM
9	N/A	1249	80	6500	1000	20.0	0.2	879	10:00 AM
10	N/A	1253	80	6500	1000	20.0	0.2	942	10:23 AM
11	N/A	1447	80	6500	1000	20.0	0.2	923	11:05 AM
12	N/A	1451	80	6500	1000	20.0	0.2	942	11:29 AM
13	N/A	1490	80	6500	1000	20.0	0.2	1045	11:56 AM
14	N/A	1496	80	5200	1000	16.0	0.2	1069	12:17 PM
15	N/A	1599	80	6500	1000	20.0	0.2	1089	12:48 PM
16	N/A	1603	80	6500	1000	20.0	0.2	1167	1:08 PM
17	N/A	1607	80	6500	1000	27.0	0.2	1080	1:30 PM
18	N/A	1611	25	3500	1000	15.0			2:05 PM
19	N/A	1615							2:37 PM
20	N/A	1827	80	6500	1100	21.0	0.3	1221	3:56 PM
21	N/A	2107							5:15 PM
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
	Job Totals:		1245	97900	14950	314.0	3.7		

*Note: ISIP values were taken from frac reports for each individual depth and inserted in the Frac Treatment Summary

Attachment B: Geological and Geophysical Information

Part II: Formation Testing (continued)

A 51 day injection test was run by Roulette Oil & Gas Co, LLC in the Clara Field #20 from 8/3/2015 through 9/31/2015 through 2.375" tubing on a packer at 1460'. The results of this test are summarized in the table on the next two pages. The total brine injected was 3320 Bbls or an average of 65 BWPD. The longest consecutive time of injection was 19 days from 8/3/2015 through 8/21/2015. The range of injection volumes during all 51 days of the testing was 20 bbls (9/4/2015) to 215 bbls (9/15/2015).

To perform the injection test the well was kept filled with water and the volume of water taken by the formations below the 2.375" packer depth of 1460' was measured during each day of the test. The maximum injection pressure therefore, was equal to the hydrostatic pressure (HP) at each proposed injection zone and calculated using the formula :

HP (psi) = Pressure Gradient (PG) per foot (psi) x Depth to midpoint of zone.

Where the PG (psi/ft) = Fluid Specific Gravity x 0.433 with the Fluid Specific Gravity assumed to be 1.1 for the injected salty formation fluid.

Therefore, ***PG (psi/ft) = (1.1 x 0.433) x Depth (ft) = 0.476 psi/ft x Depth (ft)***

The hydrostatic pressure at the shallowest hydraulic fracture depth of the Cooper 5-0 (CPR5-0) (proposed injection zone) was:

HP (psi) = PG (psi/ft) x Depth (ft) = 0.476 psi/ft x 1490 ft = 709 psi

The hydrostatic pressure at the shallowest hydraulic fracture depth of the Sheffield 3-1 (SHF3-1) (proposed injection zone) was:

HP (psi) = PG (psi/ft) x Depth (ft) = 0.476 psi/ft x 1599 ft = 761 psi

The hydrostatic pressure at the shallowest hydraulic fracture depth of the Kane 3-0 (KANE3-0) (proposed injection zone) was:

HP (psi) = 0.476 (psi/ft) x 1827 ft = 870 psi

Attachment B: Geological and Geophysical Information

Part II: Formation Testing (continued): Injection Test Results for Clara Field #20 Well

Date	Meter Reading	Gallons per day	BBLS
8/3/2015	0	2115	50
8/4/2015	0	2115	50
8/5/2015	6,346	2115	51
8/6/2015	10,700	4354	105
8/7/2015	15,045	4345	103
8/8/2015	17,060	2015	45
8/9/2015	19,310	2250	54
8/10/2015	24,250	4940	118
8/11/2015	29,780	5530	132
8/12/2015	33,700	3920	93
8/13/2015	36,610	2910	69
8/14/2015	40,525	3915	93
8/15/2015	43,400	2875	68
8/16/2015	45,900	2500	60
8/17/2015	47,610	1710	41
8/18/2015	52,475	4865	116
8/19/2015	56,100	3625	86
8/20/2015	60,210	4110	98
8/21/2015	63,604	3394	81
8/22/2015	0	0	0
8/23/2015	69,577	5973	142
8/24/2019	72,478	2901	69
8/25/2015	76,450	3972	95

Attachment B: Geological and Geophysical Information

Part II: Formation Testing (continued)

Date	Meter Reading	Gallons per day	BBLS
8/26/2015	77,960	1510	36
8/27/2015	78,897	937	22
8/28/2015	80,312	1415	35
8/29/2015	81,300	988	24
8/30/2015	85,090	3790	90
8/31/2015	88,310	3220	77
9/1/2015	90,932	2622	62
9/2/2015	93,125	2193	52
9/3/2015	95,000	1875	45
9/4/2015	95,849	849	20
SHUT DOWN			
9/8/2015	96,967	1118	27
9/9/2015	100,046	3079	73
9/10/2015	103,983	3937	94
9/11/2015	106,434	2451	58
9/15/2015	115,450	9016	215
9/16/2015	117,272	1822	43
9/17/2015	118,946	1674	40
9/18/2015	120,173	1227	29
9/21/2015	124,698	4525	108
9/22/2015	126,395	1697	40
9/23/2015	128,007	1612	38
9/24/2015	129,673	1666	40
9/25/2015	131,040	1367	33
9/26/2015	132,915	1875	46
9/27/2015	134,030	1425	34
9/28/2015	135,510	1170	28
9/29/2015	136,468	958	23
9/31/2015	139,450	2982	71

Attachment B: Geological and Geophysical Information

Part II: Formation Testing (continued)

The Fracture Gradient (FG) and Maximum Allowable Injection Pressure (MIP) were calculated for each of the proposed injection zones using the formulas below:

FG = [ISIP + (0.433 x Specific Gravity of the Frac fluid (SG) x Depth)] / Depth, where

ISIP = Initial Shut-in Pressure taken from Frac report with SG = 1.0 (frac fluid)

MIP = [FG - (0.433 x Specific Gravity of the Disposal fluids (SG))] x Depth

CPR5-0: FG = [1045 psi + (0.433 x 1.0 x 1490 ft)] / 1490 ft = 1.13 psi/ft
CPR5-0: MIP = [1.13 - (0.433 x 1.1)] x 1490 ft = 974 psi

SHF3-1: FG = [1089 psi + (0.433 x 1.0 x 1599 ft)] / 1599 ft = 1.11 psi/ft
SHF3-1: MIP = [1.11 - (0.433 x 1.1)] x 1599 ft = 1013 psi

KANE3-0: FG = [1221 psi + (0.433 x 1.0 x 1827 ft) / 1827 ft = 1.10 psi/ft
KANE3-0: MIP = [1.10 - (0.433 x 1.1)] x 1827 ft = 1139 psi

Therefore, the allowable MIP below the packer at 1460' should be **974 psi.** The injection pressures used during the test did not exceed 870 psi (see Page 31).

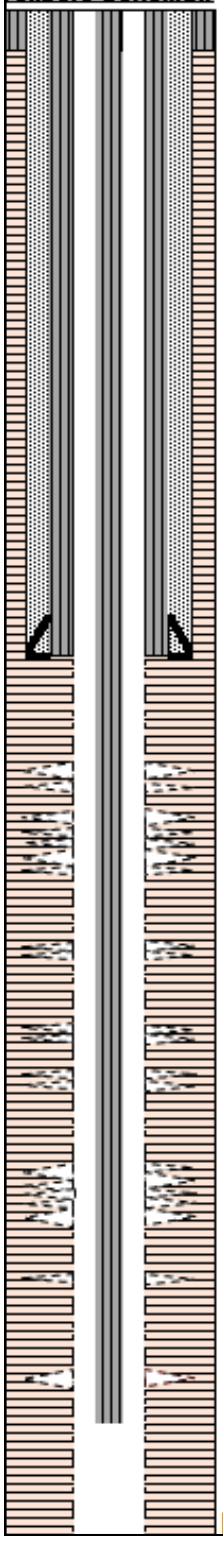
The physical characteristics of the injection zones are found on Page 23 and were determined by quantitative log analysis, since cores and cuttings were not available for inspection.

Attachment C: Well Construction/Conversion Information

Part I: Well Schematic Diagram

Shown below is the well schematic as drilled and completed by North Coast Energy, Inc. in 2008.

Wellbore Schematic as Originally Completed *(measured depths)*
(No Vertical Scale)



Wellbore Data	
API #	37-105-21374-00-00
Orig. Operator	North Coast Energy, Inc.
Current Oper.	Roulette Oil & Gas Co, LLC
Well Name & #	Clara Field #20
Ground Elev	2305'
Datum Elev	2305'
Measured From	Ground Level
Csg Size - lb. per foot	9 5/8" - 26#
Csg Size - lb. per foot	7" - 17#
Tbg Size - lb. per foot	1.5" - 2.75#
Fluid in Hole	Air & Formation Fluid
Fluid Level	2261'
Spud Date	5/27/2008
Logging Date	6/28/2008
Completion Date	8/21/2008

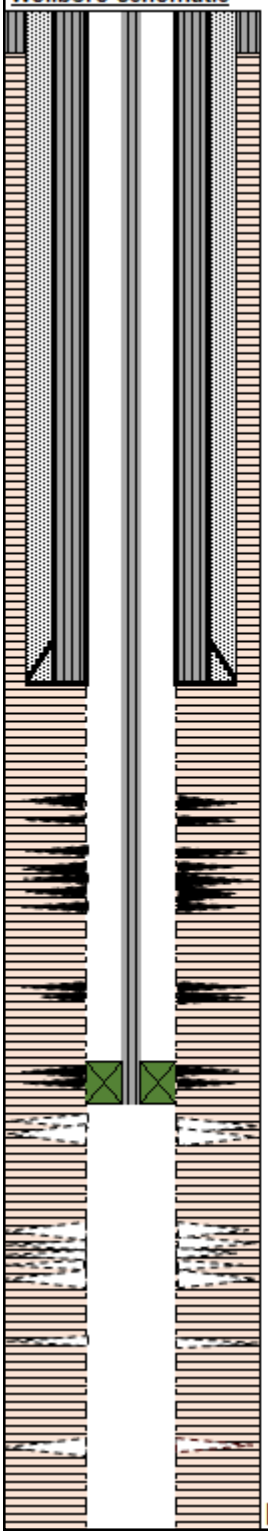
Titan Logging Service		
Service	**Logs**	**Scale(s)**
Gamma Ray	X	5" / 20"
Caliper (density)	X	5" / 20"
Induction	X	5" / 20"
Neutron Porosity	X	5" / 20"
Bulk Density	X	5" / 20"
Density Porosity	X	5" / 20"
Temperature	X	5"

Attachment C: Well Construction/Conversion Information

Part I: Well Schematic Diagram

Wellbore Current Schematic *(measured depths)*
(No Vertical Scale)

Wellbore Schematic



Cement returned on surf. csg

9-5/8" conductor set @ 23'

denotes cement
denotes formation
denotes tubulars
denotes packer
denotes open hole
notches behind tbg

USDW @ 340'

7" Csg @ 501'

Notch & Frac @ 952'

Notch & Frac @ 1033' & 1037'
Notch @ 1043', 1047' & 1051'
Notch @ Frac @ 1055'

Notch @ Frac @ 1249' & 1253'

Notch @ Frac @ 1447' & 1451'
2.375" Tbg @ 1460'
Primary Confining Zone from 1470' to 1484'
Notch @ Frac @ 1490' & 1496'

Notch @ Frac @ 1599', 1603', 1607', & 1611' *(SHF3-1 Proposed Injection Zone)*
Notch @ 1615'

Notch @ Frac @ 1827' *(KANE3-0 Proposed Injection Zone)*

Notch @ 2107'

Driller TD = 2,310'; No plug back planned

Wellbore Data	
API #	**37-105-21374-00-00**
Orig. Operator	**North Coast Energy, Inc.**
Current Oper.	**Roulette Oil & Gas Co, LLC**
Well Name & #	**Clara Field #20**
Ground Elev	**2305'**
Datum Elev	**2305'**
Measured From	**Ground Level**
Conductor size - lb/ft	**9 5/8" - 26#**
Csg Size - lb/ft	**7" - 17#**
Csg Size	**4.5"**
Tbg Size	**2.38"**
Fluid in Hole	**Air & Formation Fluid**
Fluid Level	**2261'**
Spud Date	**5/27/2008**
Logging Date	**6/28/2008**
Completion Date	**8/21/2008**

Titan Logging Service

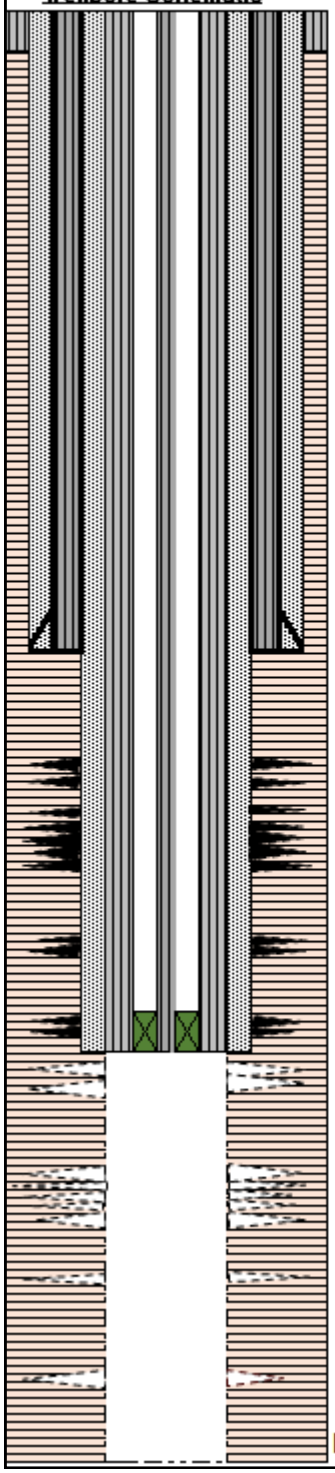
Service	Logs	Scale(s)
Gamma Ray	X	5" / 20"
Caliper (density)	X	5" / 20"
Induction	X	5" / 20"
Neutron Porosity	X	5" / 20"
Bulk Density	X	5" / 20"
Density Porosity	X	5" / 20"
Temperature	X	5"

Attachment C: Well Construction/Conversion Information

Part I: Well Schematic Diagram

Shown below is the well schematic for the proposed Class II-D well.

Proposed Wellbore Schematic *(measured depths)*
(No Vertical Scale)



Wellbore Data	
API #	**37-105-21374-00-00**
Orig. Operator	**North Coast Energy, Inc.**
Current Oper.	**Roulette Oil & Gas Co, LLC**
Well Name & #	**Clara Field #20**
Ground Elev	**2305'**
Datum Elev	**2305'**
Measured From	**Ground Level**
Conductor size - lb/ft	**9 5/8" - 26#**
Csg Size - lb/ft	**7" - 17#**
Csg Size	**4.5"**
Tbg Size	**2.38"**
Fluid in Hole	**Air & Formation Fluid**
Fluid Level	**2261'**
Spud Date	**5/27/2008**
Logging Date	**6/28/2008**
Completion Date	**8/21/2008**

Titan Logging Service

Service	Logs	Scale(s)
Gamma Ray	X	5" / 20"
Caliper (density)	X	5" / 20"
Induction	X	5" / 20"
Neutron Porosity	X	5" / 20"
Bulk Density	X	5" / 20"
Density Porosity	X	5" / 20"
Temperature	X	5"

Attachment C: Well Construction/Conversion Information

Part II: Well Construction or Conversion Procedures

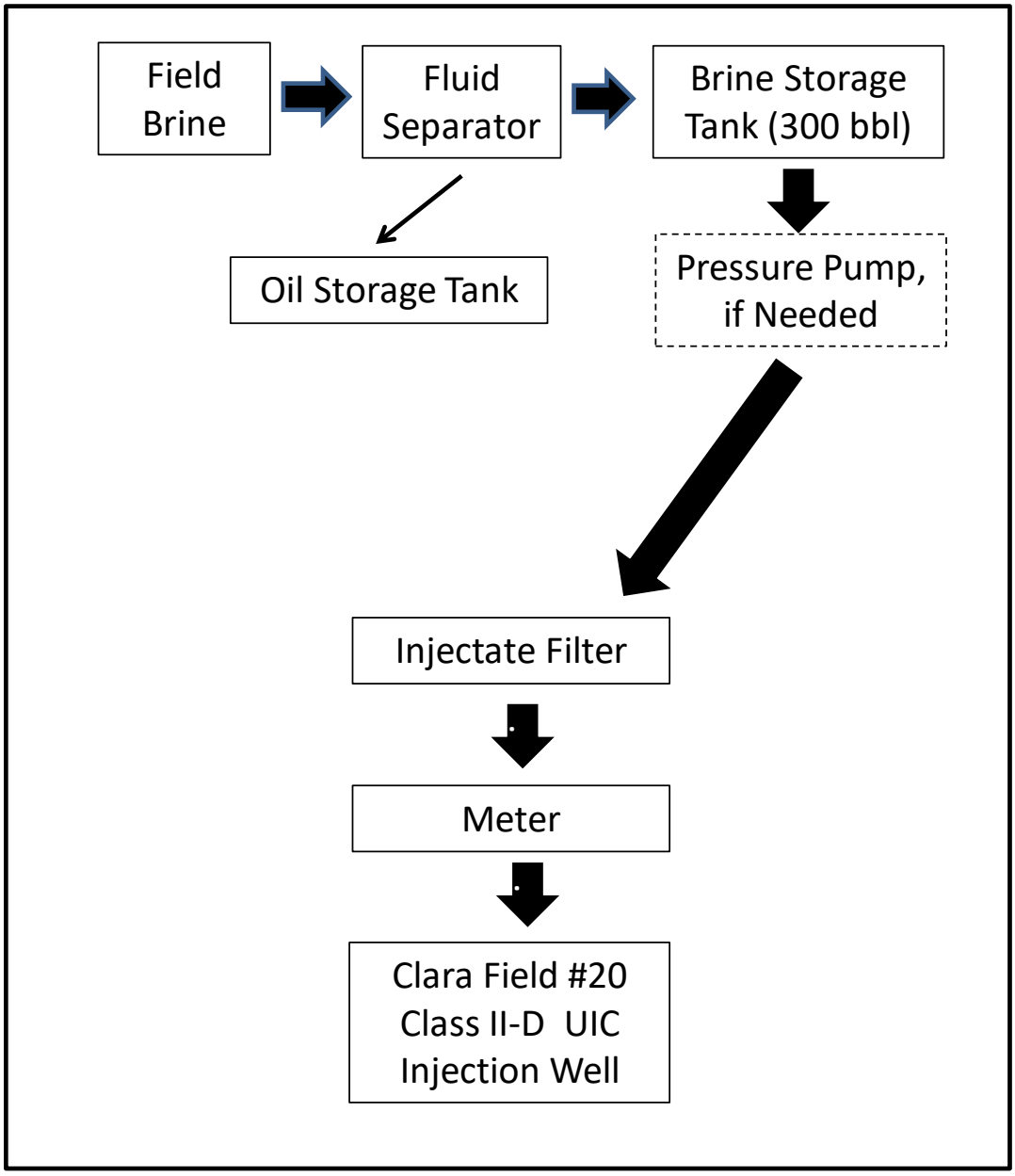
No new well logs are proposed to be run in the Clara #20 well. New stimulation or re-stimulation of the existing well is also not planned. A plug back from original Total Depth (TD) of 2310' is not planned.

Roulette Oil & Gas Co, LLC will remove the 2.375" tubing and packer at their current depth of 1460'. An intermediate string of 4.5" casing will be run to 1460' and cemented back to surface. 2.375" tubing and packer will be run to a depth of 1460'. Injection will then take place in three zones, which were hydraulically fractured by the original operator in 2008.

A copy of the original log (5" = 100' Scale) may be found in ***Appendix D.*** Completion & cementing records are found in ***Appendix B*** and in Pages 28-30 of this application.

Attachment D: Injection Operation and Monitoring Program

Flow Diagram of Fluid Flow
Through the Clara Field #20 Facility



Attachment D: Injection Operation and Monitoring Program

To prevent well failure that might cause migration of contaminating fluids into a USDW, the 7" casing was cemented from approximately 501' to the surface (with cement returns noted at the surface). With the conversion of the Clara Field #20 well from a gas producer to a Class II-D disposal well, 4.5" casing will be run to a depth of 1460'. The 4.5" casing will be cemented back to the surface. This provides two strings of cemented casing protecting the lowest known USDW in this well, which is at 340'. 2.375" tubing on a packer will be run within the 4.5" casing also to a depth of 1460'.

With respect to monitoring the well, , the annulus of the 2.375" tubing will be kept full of fluid and monitored with a pressure gauge for any pressure anomalies or changes in the fluid level due to packer or tubing failure. If that happens the tubing will be pulled, inspected, and replaced as needed.

A well failure procedure will be initiated once a failure observed or received or if the monitor wells show fluid or pressure anomalies. If that happens the operator will cease injection operations immediate and notify the PADEP office in Meadville, PA and the EPA in Philadelphia, PA to assist in investigating this occurrence. Producer wells, with the possible exception of the monitor wells, will continue to operate, but injection operations will be suspended until the operator gains approval from all regulating agencies to continue operation.

For well monitoring the operator will install a float switch with an indicating light within the 4.5" casing, to stop the injection should that casing begin to fill with injection fluid, indicating a failure of the 2.375" injection string. A pressure relief valve will be installed on the 2.375" tubing and fluids piped back to the tank. Should the injection tubing become obstructed for any reason, all fluid would return to the tank and an indicating light on the operating panel will signal the operator of the problem. Also, should the pressure relief valve open, injection will cease until the valve is manually closed. Spill clean-up materials will be stored within the operations shed on the lease.

Roulette Oil & Gas Co, LLC will monitor the well on a daily basis during injection by visually monitoring and recording injection pressures and volumes and any leaks in the annulus. When pumping the monitor wells in the Area of Review, the operator will monitor the production volumes and pressure to identify any anomalies. The operator plans to have personnel physically on site on a daily basis to monitor the wells in the Area of Review.

Finally, mechanical integrity tests on the 2.375" tubing in the injection well will be performed on a regular basis by pressuring up the annulus.

Attachment D: Injection Operation and Monitoring Program (continued)

The injection rates based on the injection test (pages 32-33) are summarized in the table below.

	Minimum Rate (BWPD)	Maximum Rate (BWPD)	Average Rate (BWPD)
Injection Test	20	215	62
Anticipated Actual Operations	5	500	20

However, under actual operations ROGC anticipates that the Average brine disposal rate will be approximately 20 BWPD with a Maximum Rate of 500 BWPD. The daily injection pressures are expected to range from 50 - 750 psi and average 400 psi with a maximum surface pressure of 974 psi (page 34). The source of the injection fluid will be from Roulette Oil & Gas Co, LLC's approximately 60 wells from the Pine Lot lease within Clara Field and 50 nearby wells, also operated by ROGC. The geologic formations which sources the injection brine are the multiple, productive Upper Devonian sandstones within the field.

The analysis of the chemical and physical characteristics of a sample of mixed brine mixed from multiple wells in the field is found in ***Appendix C.*** This analysis included most anions and cations within the fluid, but did not include bicarbonate or strontium, common in oilfield brines. For this reason the total dissolved solids (TDS) of the individual substances in the analysis equaled 164,470 mg/l or 164,658 ppm, while the reported TDS in the analysis was 173,000 mg/l or 173,198 ppm. This is a difference of 8,540 ppm, which must come from other dissolved solids in the fluid that were not measured; possibly bicarbonate and strontium.

The specific gravity was not reported in this brine water analysis, but given the NaCl concentration of the brine a specific gravity of approximately 1.1 is expected. The brine was analyzed at a temperature of 20.6°C. The conductivity of the brine was not measured. The density of the NaCl in the brine (the major component) was 142,800 mg/l (equivalent to 142,963 ppm) producing a resistivity of 0.06 ohm-meters calculated from a Schlumberger *NaCl versus Resistivity* nomogram (Schlumberger, 1998. *Log interpretation Charts*, *Chart Gen-9*. Schlumberger Wireline & Testing).

A resistivity of 0.06 ohm-meters is equivalent to a conductivity of 16,667 micromhos/cm using the formula:

Conductivity (micromhos/cm) **= 1000 / Resistivity** (ohm-meter).

Attachment E: Plugging and Abandonment Plan

The general steps for the Plugging and Abandonment of the Clara Field #20 well are listed below:

1. Remove the tubing and packer.
2. Run new tubing and pump gel from total depth to surface.
3. Using Class 1 cement, place 50 feet of cement above and below each potential or actual gas producing zone. Use tubing to place cement and pull tubing to keep spotting cement plugs.
4. Place cement 50 feet above the 7 inch casing seat.
5. Fill well with pea gravel to surface.
6. Tag well with 8-foot cemented monument to include the well's API Number.

The plug placement is summarized in the Table below:

Plug Number	Top Depth (ft)	Bottom Depth (ft)	Thickness (ft)
1	2055	2159	104
2	1773	1903	130
3	1198	1883	685
4	805	916	111
5	450	602	154
TOTAL			1184

A schematic of the plugged well is on Page 44. The cost estimate for this plugging is found on Pages 45 and 46.

Attachment E: Plugging and Abandonment Plan (continued)

OMB No. 2040-0042 Approval Expires 4/30/2022

United States Environmental Protection Agency

EPA **WELL REWORK RECORD, PLUGGING AND ABANDONMENT PLAN, OR PLUGGING AND ABANDONMENT AFFIDAVIT**

Name and Address, Phone Number and/or Email of Permittee

Roulette Oil & Gas Company, LLC
1140 Route 44 South
Shinglehouse, PA 16748
814 697 7891
jrgasman@yahoo.com

Permit or EPA ID Number	API Number	Full Well Name
	37 105 21374 00 00	Clara Field #20

State	County
Pennsylvania	Porter

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location

Latitude 41.894586

Longitude -78.148143

1/4 of 1/4 of Section Township Range

ft. from (N/S) Line of quarter section

ft. from (E/W) Line of quarter section.

Well Class	Timing of Action (pick one)	Type of Action (pick one)
☐ Class I ☑ Class II ☐ Class III ☐ Class V	☑ Notice Prior to Work Date Expected to Commence ☐ Report After Work Date Work Ended	☐ Well Rework ☐ Plugging and Abandonment ☑ Conversion to a Non-Injection Well

Provide a narrative description of the work planned to be performed, or that was performed. Use additional pages as necessary. See instructions.

1) Remove the tubing and packer.
2) Run new tubing and pump gel from total depth to surface.
3) Using Class 1 cement, place 50 feet of cement above and below each potential or actual gas producing zone. Use tubing to place cement and pull tubing to keep spotting cement plugs.
4) Place cement 50 feet above the 7 inch casing seat.
5) Fill well with pea gravel to surface.
6) Tag well with 8 foot cemented monument to include the well's API Number.

No change to the current casing in the well is planned.

No new stimulation of the well is planned. Plugging intervals will be from:
1) 2055' to 2159'
2) 1773' to 1903'
3) 1198' to 1883'
4) 805' to 916'
5) 450' to 602'

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR § 144.32)

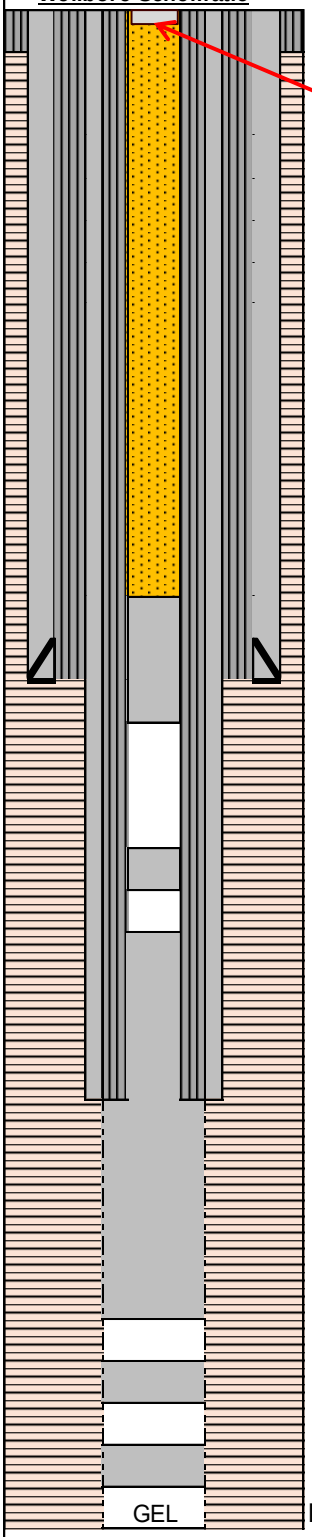
Name and Official Title (Please type or print)	Signature	Date Signed
James Reynolds managing partner		8-17-20

EPA Form 7520-19 (Rev. 4-19)

Attachment E: Plugging and Abandonment Plan (continued)

Wellbore Schematic as Proposed *(measured depths)*
(No Vertical Scale)

Wellbore Schematic



Cement returned on surf. csg

9-5/8" conductor set @ 23'

Cemented Monument w/API#

denotes cement
denotes formation
denotes tubulars
denotes packer
denotes open hole
pea gravel

USDW @ 340'

Clara Field #20 Plugging Plan Schematic

7" Csg @ 501'

Plug #5 602' - 450'

Plug #4 805' - 916'

4.5" Csg @ 1460'

Plug #3 1198' - 1883'

Plug #2 1773' - 1903'

Plug #1 2055'- 2159'

Driller TD = 2,310'; No plug back planned

Attachment E: Plugging and Abandonment Plan (continued)

Plug & Abandonment

Rig and Cement Services

Company	Roulette Oil & Gas Co, LLC
Prepared For	Jim Reynolds
Well Name	Clara Field #20
Service District	East Appalachia
Proposal Number	0001
Date	8/7/2020
Primary Contact	Luke Plants (814) 203-3820
Alternate Contact	Steve Plants (814) 598-1474
Objective	Provide proposal to provide plug and abandonment services for one conventional Gas/oil well in Northern Pennsylvania

Plants & Goodwin INC.

Project Proposal

Enclosed is our proposed commercial submission for Plants and Goodwin intervention. This price provided represents an estimated amount and is meant to serve as a budgeting tool. Any work determined to be outside the provided scope may be subject to additonal charges. Time and material rates at which work will be completed are provided.

Plants and Goodwin has a safety policy to which all Plants and Goodwin personnel must adhere. A pre-job safety meeting will be held with customer representatives and other personnel on location to familiarize everyone with existing and anticipated hazards and safety procedures. We would appreciate close cooperation between the customer representative and the Plants and Goodwin representative to ensure a safe operation.

The estimated cost of our services is $5,500. Final costs will be dependent on work performed. Taxes are not included to the terms and conditions of a Master Service Agreement if one is in effect between Plants and Goodwin and Client. This quote is valid for a period of thirty (30) days from the date submitted. Work under this proposal shall not begin until an agreement regarding commercial terms and conditions has been executed. In the event work begins without a commercial agreement in place, all work done shall be subject to Plants and Goodwin standard commercial terms which can be provided upon request.

Thank you for considering Plants and Goodwin for your oilfield needs. Please do not hesitate to contact me with any questions or concerns.

Luke J. Plants
Chief Operating Officer
lplants@plantsgoodwin.com
Office: (814) 697-6330
Cell: (814) 203-3820

Plants & Goodwin INC.

Attachment F: Financial Assurance

Roulette Oil & Gas Company, LLC will bond the plugging cost of the well with the purchase of a Certificate of Deposit (CD) to cover the cost of the plugging. The bond will be in place upon the approval of this application and documentation of the bond will be provided at that time.

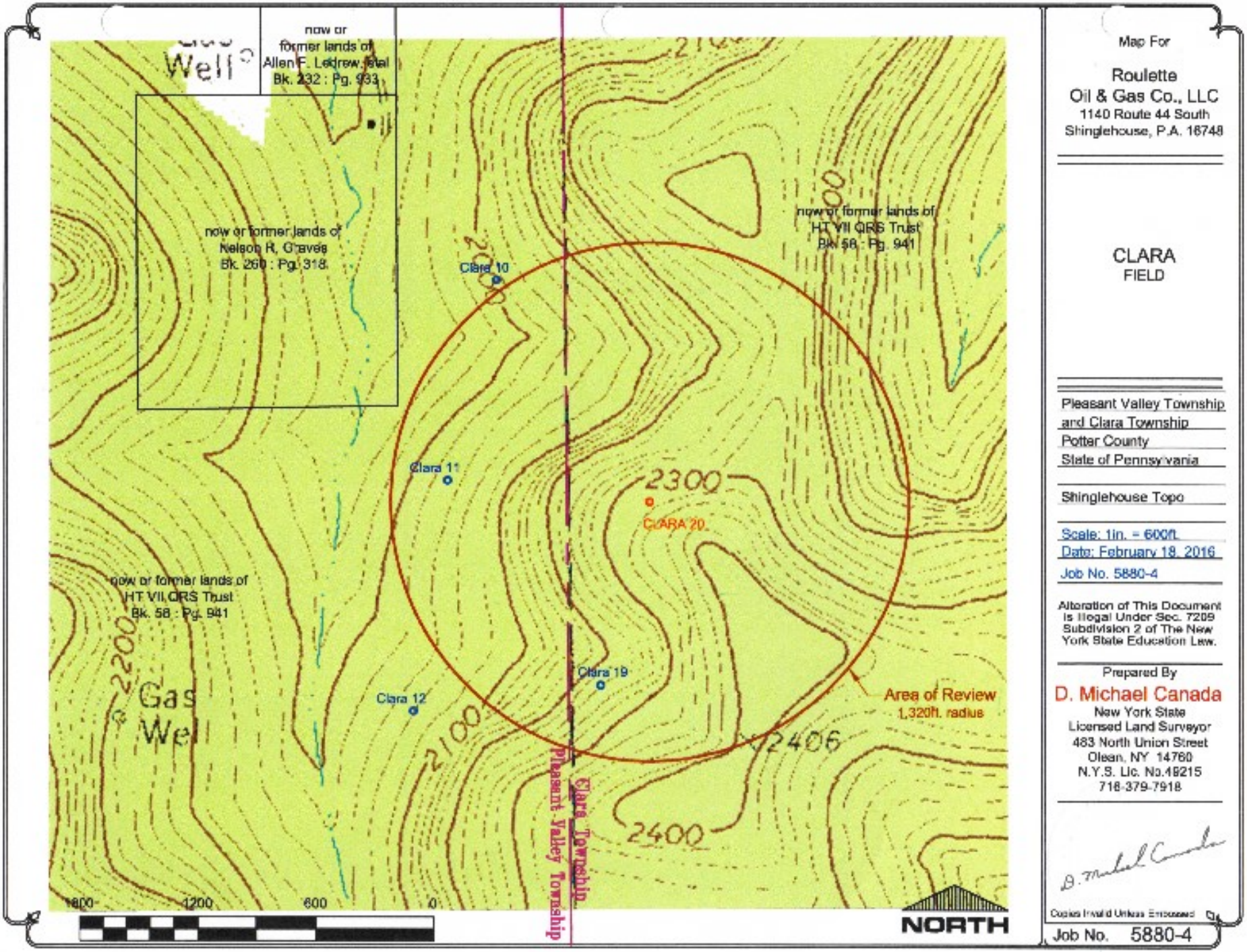
Attachments G, H, and I are not applicable

Attachment J: Business Description

Roulette Oil & Gas Co., LLC (ROGC) is a small oil and gas producer. Gas is produced from approximately 300 wells in Potter County and sold to UGI Energy in Roulette, PA and through the M&M pipeline into National Fuel Gas Company's YM-2 line in Port Allegany, PA. ROGC also produces oil in McKean County, PA and Allegany County, NY.

Appendix A

Surveyed AOR Map



Appendix B

Well Records & Completion Reports

- ***Clara Field #20 (37-105-21374)***
- ***Clara Field #19 (37-105-21359)***
- ***Clara Field #11 (37-105-21136)***

5500-FM-OG0004 Rev. 1/2007

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS MANAGEMENT PROGRAM

WELL RECORD AND COMPLETION REPORT

DEP USE ONLY	
Site Id	Primary Facility Id
Client Id	Sub-facility Id

Well Operator: NORTH COAST ENERGY, INC.	DEP ID#: 48277	Well API # (Permit / Reg): 105-21374	Project Number:	Acres: 3300+-
Address: ONE GOJO PLAZA, SUITE 325		Well Farm Name: CLARA FIELD	Well #: 20	Serial #:
City: AKRON	State: OH / Zip Code: 44311	County: POTTER	Municipality: CLARA	
Phone: (330) 572 - 8500	Fax: (330) 252 - 0199	USGS 7.5 min. quadrangle map: SHINGLEHOUSE		

Check all that apply: ☒ Original Well Record ☒ Original Completion Report ☐ Amended Well Record ☐ Amended Completion Report

WELL RECORD

Well Type: ☒ Gas ☐ Oil ☐ Combination Oil & Gas ☐ Injection ☐ Storage ☐ Disposal

Drilling Method: ☒ Rotary – Air ☐ Rotary – Mud ☐ Cable Tool

Date Drilling Started	Date Drilling Completed	Surface Elevation	Total Depth – Driller	Total Depth – Logger
5/27/2008	5/30/2008	2305 ft.	2310 ft.	2319 ft.

Casing and Tubing

Cement returned on surface casing? ☐ Yes ☒ No

Cement returned on coal protective casing? ☐ Yes ☐ No ☒ N/A

Hole Size	Pipe Size	Wt.	Thread / Weld	Amount in Well (ft)	Material Behind Pipe Type and Amount	Packer / Hardware / Centralizers Type	Size	Depth	Date Run
12 1/4	9 5/8	26	T	23	SANDED IN				5/27/2008
8 7/8	7	17	T	501	110 SX 50/50 POZ	SHOE	7	501	5/28/2008
						CENT	7	470,376	5/28/2008
						CENT	7	282	5/28/2008
6 1/4	1 1/2	2.75	T	2151.9	HUNG				6/22/2008

COMPLETION REPORT

Perforation Record

Date	Interval Perforated From	To

Stimulation Record

Date	Interval Treated	Fluid Type	Fluid Amount	Propping Agent Type	Propping Agent Amount	Average Injection
	SEE ATTACHED STIMULATION RECORD					

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Natural Open Flow	SHOW GAS	Natural Rock Pressure	NT	Hours	Days
After Treatment Open Flow	800 MAF	After Treatment Rock Pressure	500	72 Hours	Days

Well Service Companies – Provide the name, address, and phone number of all well service companies involved.

Name: PLANTS & GOODWIN INC	Name: SUPERIOR WELL SERVICES	Name: TITAN WIRELINE
Address: 1034 ROUTE 44	Address: 346 HIGH ST	Address: ROUTE 219 S
City - State - Zip: SHINGLEHOUSE, PA 16748	City - State - Zip: BRADFORD, PA 16701	City - State - Zip: ELDERTON, PA 15736
Phone: (814)697-6330	Phone: (814)368-3137	Phone: (724)354-2629

5500-FM-OG0004 Rev. 1/2007

LOG OF FORMATIONS

Well API#: 105-21374

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
SURFACE FILL	0	8				DRILLER LOG
SHALE	8	35				"
SANDSTONE	35	85				"
SHALE	85	120				"
RED ROCK	120	140				"
SANDSTONE	140	180				"
RED ROCK	180	210				"
SHALE	210	225				"
RED ROCK	225	320				"
SANDSTONE	320	360			1/2" F 340'	"
RED ROCK	360	420				"
SHALE	420	460				"
RED ROCK	460	485				"
SANDSTONE	485	520				"
SHALE & RED ROCK	520	1170				"
SAND	1170	1185	1180'			"
SHALE	1185	1370				"
SAND	1370	1380	1375'			"
SHALE	1380	1440				"
LT BROWN SANDSTONE	1440	1455	1450'			"
SHALE	1455	1540				"
SAND	1540	1560				"
SHALE	1560	1625				"
SAND	1625	1640	1630'			"
SHALE	1640	1735				"
BROWN SANDSTONE	1735	1743	1740'			"
SHALE	1743	1790				"
BROWN SANDSTONE	1790	1830	1800'			"
SHALE	1830	2035				"
SAND	2035	2045				"
SHALE	2045	2060				"
SAND	2060	2080				"
SHALE	2080	2105				"
BROWN SANDSTONE	2105	2130	2110'			"
SHALE	2130	2180				"
SAND	2180	2190				"
SHALE	2190	2310				"
DTD		2310				"

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Please delete empty rows if necessary to make all of page 2 fit on one page.

Well Operator's Signature:

Title: SR GEOLOGIST

Date: 10/15/2008

DEP USE ONLY

Reviewed by:

Date:

Comments:

CLARA FIELD 20
105-21374

COMPLETION REPORT									
PERFORATION RECORD			STIMULATION RECORD						
	PERFORATED			INTERVAL	FLUID		PROPPING AGENT		AVERAGE
DATE	FROM	TO	DATE	TREATED	TYPE	AMOUNT	TYPE	AMOUNT	INJECTION
8/18/2008	952	952	8/21/2008	952	WATER	3846 G	SAND	50 SX	18
8/18/2008	1002	1002	8/21/2008	1002	WATER	5554 G	SAND	80 SX	19.2
8/18/2008	1033	1033	8/21/2008	1033	WATER	6060 G	SAND	100 SX	18.2
8/18/2008	1037	1037	8/21/2008	1037	WATER	7722 G	SAND	100 SX	18
8/18/2008	1043	1043	8/21/2008	1043	WATER	243 G	SAND		1.4
8/18/2008	1047	1047	8/21/2008	1047	WATER	115 G	SAND		4.5
8/18/2008	1051	1051	8/21/2008	1051	NOT TREATED				
8/18/2008	1055	1055	8/21/2008	1055	WATER	6385 G	SAND	90 SX	18.5
8/18/2008	1249	1249	8/21/2008	1249	WATER	6508 G	SAND	80 SX	18.7
8/18/2008	1253	1253	8/21/2008	1253	WATER	6026 G	SAND	80 SX	18.4
8/18/2008	1447	1447	8/21/2008	1447	WATER	6509 G	SAND	80 SX	19.4
8/18/2008	1451	1451	8/21/2008	1451	WATER	6066 G	SAND	80 SX	18.7
8/18/2008	1490	1490	8/21/2008	1490	WATER	6035 G	SAND	80 SX	18.2
8/18/2008	1496	1496	8/21/2008	1496	WATER	4753 G	SAND	80 SX	18.8
8/18/2008	1599	1599	8/21/2008	1599	WATER	6025 G	SAND	80 SX	18.3

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS MANAGEMENT PROGRAM

WELL RECORD AND COMPLETION REPORT

DEP USE ONLY

Site Id	Primary Facility Id
Client Id	Sub-facility Id

Well Operator: NORTH COAST ENERGY, INC.	DEP ID#: 48277	Well API # (Permit / Reg): 105-21359	Project Number:	Acres: 3300+-
Address: ONE GOJO PLAZA, SUITE 325		Well Farm Name: CLARA FIELD	Well #: 19	Serial #:
City: AKRON	State: OH	Zip Code: 44311	County: POTTER	Municipality: CLARA
Phone: (330) 572 - 8500	Fax: (330) 252 - 0199	USGS 7.5 min. quadrangle map: SHINGLEHOUSE ✓		

Check all that apply: ☒ Original Well Record ☒ Original Completion Report ☐ Amended Well Record ☐ Amended Completion Report

WELL RECORD

Also complete Log of Formations on back (page 2)

Well Type: ☒ Gas ☐ Oil ☐ Combination Oil & Gas ☐ Injection ☐ Storage ☐ Disposal

Drilling Method: ☒ Rotary – Air ☐ Rotary – Mud ☐ Cable Tool

Date Drilling Started	Date Drilling Completed	Surface Elevation	Total Depth – Driller	Total Depth Logger
6/9/2008	6/11/2008	2231 ft.	2200 ft.	2208 ft.

Casing and Tubing

Cement returned on surface casing? ☐ Yes ☒ No

Cement returned on coal protective casing? ☐ Yes ☐ No ☒ N/A

Hole Size	Pipe Size	Wt.	Thread / Weld	Amount In Well (ft)	Material Behind Pipe Type and Amount	Packer / Hardware / Centralizers Type	Size	Depth	Date Run
12 1/4	9 5/8	26	T	23	SANDED IN				6/9/2008
8 7/8	7	17	T	501	110 SX 50/50 POZ	SHOE	7	501	6/9/2008
						CENT	7	470,376	6/9/2008
						CENT	7	283	6/9/2008
6 1/4	3 1/2	9	T	900	ON PACKER	PACKER	3 1/2	900	6/28/2008

COMPLETION REPORT

Perforation Record

Date	Interval Perforated From	To

Stimulation Record

Date	Interval Treated	Fluid Type	Fluid Amount	Propping Agent Type	Propping Agent Amount	Average Injection
	SEE ATTACHED STIMULATION RECORD					

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Natural Open Flow	SHOW GAS	Natural Rock Pressure	NT	Hours	Days
After Treatment Open Flow	1100 MAF	After Treatment Rock Pressure	465	24 Hours	Days

Well Service Companies -- Provide the name, address, and phone number of all well service companies involved.

Name: PLANTS & GOODWIN INC	Name: SUPERIOR WELL SERVICES	Name: TITAN WIRELINE
Address: 1034 ROUTE 44	Address: 348 HIGH ST	Address: ROUTE 219 S
City - State – Zip: SHINGLEHOUSE, PA 16748	City - State – Zip: BRADFORD, PA 16701	City - State – Zip: ELDERTON, PA 15736
Phone: (814)697-6330	Phone: (814)368-3137	Phone: (724)354-2629

5600-FM-OG0004 Rev. 1/2007

LOG OF FORMATIONS

Well API#: 105-21359

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine: ft.)	Source of Data
SURFACE FILL	0	8				DRILLER LOG
SANDSTONE	8	55				"
RED ROCK	55	85				"
SHALE	85	110				"
SANDSTONE	110	125				"
RED ROCK	125	160				"
SANDSTONE	160	185			DAMP 175'	"
SHALE	185	220				"
RED ROCK	220	260				"
SANDSTONE	260	285			1/4" F 275'	"
RED ROCK	285	320				"
SHALE	320	360				"
SANDSTONE	360	385				"
RED ROCK	385	460				"
SHALE	460	530				"
RED ROCK	530	560				"
SHALE & SANDSTONE	560	1295				"
SAND	1295	1300	1295'			"
SHALE	1300	1420				"
BROWN SANDSTONE	1420	1440	1430'			"
SHALE	1440	1535				"
BROWN SANDSTONE	1535	1595				"
SHALE	1595	1645				"
SAND	1645	1660				"
SHALE	1660	1745				"
SAND	1745	1760				"
SHALE	1760	1810				"
SAND	1810	1825				"
SHALE	1825	1880				"
SAND	1880	1910	1900'			"
SHALE	1910	1950				"
SAND	1950	1965				"
SHALE	1965	2095				"
SAND	2095	2110				"
SHALE	2110	2200				"
DTD		2200				"

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Please delete empty rows if necessary to make all of page 2 fit on one page.

Well Operator's Signature:

Title: Sr. Geologist

Date: 10/13/2008

DEP USE ONLY

Reviewed by:

Date: 9-14-09

Comments:

CLARA FIELD 19
105-21359

COMPLETION REPORT									
PERFORATION RECORD			STIMULATION RECORD						
	PERFORATED			INTERVAL	FLUID		PROPPING AGENT		AVERAGE
DATE	FROM	TO	DATE	TREATED	TYPE	AMOUNT	TYPE	AMOUNT	INJECTION
8/25/2008	925	925	8/28/2008	925	WATER	4557 G	SAND	50 SX	19.1
8/25/2008	930.5	630.5	8/28/2008	630.5	WATER	4057 G	SAND	60 SX	20.1
8/25/2008	934.5	934.5	8/28/2008	934.5	WATER	5060 G	SAND	60 SX	19.2
8/25/2008	957	957	8/28/2008	957	WATER	5223 G	SAND	60 SX	20.3
8/25/2008	961	961	8/28/2008	961	WATER	4573 G	SAND	60 SX	19.3
8/25/2008	965	965	8/28/2008	965	WATER	4289 G	SAND	50 SX	20.3
8/25/2008	969	969	8/28/2008	969	WATER	4558 G	SAND	50 SX	18.8
8/25/2008	973	973	8/28/2008	973	WATER	5078 G	SAND	50 SX	19.5
8/25/2008	977	977	8/28/2008	977	WATER	4898 G	SAND	70 SX	20.3
8/25/2008	1174	1174	8/28/2008	1174	WATER	5026 G	SAND	70 SX	20.2
8/25/2008	1178	1178	8/28/2008	1178	WATER	5010 G	SAND	70 SX	20.1
8/25/2008	1301	1301	8/28/2008	1301	WATER	5369 G	SAND	70 SX	20.2
8/25/2008	1322	1322	8/28/2008	1322	WATER	8497 G	SAND	80 SX	19.2
8/25/2008	1326	1326	8/28/2008	1326	WATER	7455 G	SAND	91 SX	19.6
8/25/2008	1330.5	1330.5	8/28/2008	1330.5	NOT TREATED				

Note: This partial list was available at the DCNR's EDWIN website. The full list of 27 notch points and their stimulation record is shown on the following page.

Superior Well Services
350 High St.
Bradford,Pa. 16701
Telephone 814-368-6228
Fax 814-368-6231
Website: www.superiorwells.com

19

CUSTOMER & WELL INFORMATION

Date: 8/28/2008	Invoice # 21-00 9266
Customer: NORTH COAST ENERGY	Lease & Well Name: CLARA FIELD #19
County: POTTER	State: PA
Size & Weight-Pipe 3.5	Frac Supervisor: MARK WRIGHT/DAN HEMPHILL

Frac Treatment Summary

Stage #	Formation	Notch	Sand	Treatment	Flush	Cw-3k	100NE	OW3	Time
1		925	60	4700	1000	14.0	0	0.0	5:03 AM
2		930.5	60	4700	1000	14.0	0	0.0	5:23 AM
3		934.5	60	4700	850	14.0	0	0.0	5:52 AM
4		957	60	4700	850	14.0	0	0.0	7:16 AM
5		961	60	4700	850	14.0	0	0.0	7:37 AM
6		965	50	4050	850	12.0	0	0.0	7:55 AM
7		969	50	4050	850	12.0	0	0.0	8:20 AM
8		973	50	4050	850	12.0	0	0.0	8:40 AM
9		977	70	5400	850	15.0	0	0.0	10:38 AM
10		1174	70	5400	850	15.0		0.0	11:16 AM
11		1178	70	5400	850	15.0			11:39 AM
12		1301	70	5400	850	15.0			12:10 PM
13		1322	80	6050	850	18.0			12:37 PM
14		1326	62	4700	850	14.0			1:27 PM
15		1330.5	0	0	0	0.0			1:34 PM
16		1374	81	6100	850	18			2:01 PM
17		1377	50	4050	850	12			2:37 PM
18		1416	50	4050	850	12			3:08 PM
19		1422	50	4050	850	12			3:38 PM
20		1523	70	5400	1300	15			4:15 PM
21		1527	60	4700	1300	14			4:45 PM
22		1531	70	5400	1300	15			5:17 PM
23		1535	60	4700	1300	14			5:43 PM
24		1539	0	0	0	5			6:31 PM
25		1659.5	0	0	0				
26		1751	0	0	0				
27		1909	0	0	0				
28									
29									
30									
31									

8500-FM-OG0004 Rev. 2/2001

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS MANAGEMENT PROGRAM

2/14/06 JRS

Pat FEB 28 2006

DEP USE ONLY

Site Id	Primary Facility Id
Client Id	Sub-facility Id

WELL RECORD AND COMPLETION REPORT

Well Operator	DEP ID#	Well API # (Permit / Reg)	Project Number	Acres
EOG Resources, Inc	149263	37-105-21136	n/a	1410+lease

Address	Well Farm Name	Well #	Serial #
400 Southpointe Blvd., Suite 300	Clara Field	11	n/a

City	State	Zip Code	County	Municipality
Canonsburg	PA	15317	Potter	Pleasant Valley

Phone	Fax	USGS 7.5 min. quadrangle map
(724) 745-1102	(724)743-2780	Shinglehouse

Check all that apply: ☒ Original Well Record ☒ Original Completion Report ☐ Amended Well Record ☐ Amended Completion Report

WELL RECORD

Also complete Log of Formations on back (page 2)

Well Type ☒ Gas ☐ Oil ☐ Combination Oil & Gas ☐ Injection ☐ Storage ☐ Disposal

Drilling Method ☒ Rotary – Air ☐ Rotary – Mud ☐ Cable Tool

Date Drilling Started	Date Drilling Completed	Surface Elevation	Total Depth – Driller	Total Depth - Logger
08/02/2005	08/08/2005	2010 ft.	2000 ft.	2000 ft.

Casing and Tubing

Cement returned on surface casing? ☒ Yes ☐ No
Cement returned on coal protective casing? ☐ Yes ☐ No ☒ N/A

Hole Size	Pipe Size	Wt.	Thread / Weld	Amount in Well (ft)	Material Behind Pipe Type and Amount	Packer / Hardware / Centralizers Type	Size	Depth	Date Run
12 ¼"	9 5/8"	26#	Thread	31'	Sanded in				08/02/2005
8 ¾"	7"	19#	Thread	500'	85 sks, Class A, 3%, ¼#	Centralizers	7"	252', 376', 469'	08/03/2005
6 ¼"	4 ½"	10.5#	Thread	1160'	Hung in, no cement				11/01/2005

COMPLETION REPORT

Perforation Record

Date	Interval Perforated From	To
10/28/2005	735'	739'
10/28/2005	939.5'	949'
10/28/2005	1093.5'	1097.5'
10/28/2005	1142.5'	1190'
10/28/2005	1236'	1298.5'
10/28/2005	1302.5'	1335.5'
10/28/2005	1407.5'	
10/28/2005	1517.5'	1541'
10/28/2005	1624.5'	1697'
10/28/2005	1777.5'	1829.5'

Stimulation Record

Date	Interval Treated	Fluid Type	Fluid Amount	Propping Agent Type	Propping Agent Amount	Average Injection
11/01/2005	Upper Devonian	Gel water	168 bbl	20/40	80 sks	16.5 BPM
11/01/2005	1st Bradford	Gel water	442 bbl	20/40	172 sks	17 BPM
11/01/2005	Kinzua	Gel water	258 bbl	20/40	100 sks	18 BPM
11/01/2005	Dewdrop	Gel water	290 bbl	20/40	120 sks	18.3 BPM
11/01/2005	2nd Bradford	Gel water	609 bbl	20/40	260 sks	17 BPM
	Harrisburgh Run	NO TREATMENT				
	Richburg SD	NO TREATMENT				
	3rd Bradford	NO TREATMENT				
	Lewis Run	NO TREATMENT				
	Kane	NO TREATMENT				

RECEIVED
FEB 10 2006

Natural Open Flow	Natural Rock Pressure	After Treatment Open Flow	After Treatment Rock Pressure
37 mcfpd	360 psig	350 mcfpd	500 psig

Hours 11 Days
Hours 84 Days

Well Service Companies -- Provide the name, address, and phone number of all well service companies involved.

Name	Address	City - State - Zip	Phone
Gas Field Specialists, Inc.	RR #1 Box 1228	Shinglehouse, PA 16748	(814) 698-2122
Allegheny Wireline	PO Box 129	Elderton, PA 15736	(724) 354-3090
Appalachian Well Services	PO. 636	Indiana, Pa 15701	(724-354-4400

FEB 27 2006

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LOG OF FORMATIONS

Well API#: 37-105-21136

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
ROCKS & DIRT	0	3		NONE		DRILLER'S LOG
RED ROCK	3	18				
GRAVEL	18	22				
SHALE	22	38				
RED ROCK	38	148				
SANDSTONE	148	171			10 GPM FRESH WATER	DRILLER'S LOG
SHALE	171	248				
SANDSTONE	248	271			10 GPM FRESH WATER	DRILLER'S LOG
RED ROCK	271	314				
SHALE	314	856				
SAND	856	865	SHOW OF GAS			
SHALE	865	1068				
SAND	1068	1079				
SHALE	1079	1143				
SAND	1143	1150	SHOW OF GAS			DRILLER'S LOG
SHALE	1150	1408				
SAND	1408	1416				
SHALE	1416	1444				
SAND	1444	1457	SHOW OF GAS			DRILLER'S LOG
SHALE	1457	1516				
SAND	1516	1527	SHOW OF GAS			DRILLER'S LOG
SHALE	1527	1597				
SAND	1597	1608				
SHALE	1608	1642				
SAND	1642	1646				
SHALE	1646	1782				
SAND	1782	1786				
SHALE	1786	1802				
SAND	1802	1808				
SHALE	1808	2000				
D.T.D.	2000					

Please delete empty rows if necessary to make all of page 2 fit on one page.

Well Operator's Signature: Barbara L. Goulson

Title: Sr. Operations Asst.

Date: 02/02/2006

DEP USE ONLY

Reviewed by: David Bird

Date: 2-23-06

Comments:

Appendix C

Clara Field Water Analysis

LAB ID # 11216 °SA
LAB ID # 11827 °CV

BENCHMARK ANALYTICS
A MICROBAC LABORATORY
2566 Pennsylvania Ave. • Sayre, PA 18840
(570) 888-0169 • Fax: (570) 888-0717

SEND DATA TO:
NAME: Jim Reynolds
COMPANY: Roulette Oil & Gas
ADDRESS: 1140 Rte 44 South
Shinglehouse, PA 16748

PHONE:
FAX:

WO#: 14022427
PAGE: 1 of 2
PO#:
PWS ID#

TEST REPORT

Brine Water
RECEIVED FOR LAB BY: ASV DATE: 02/19/2014 17:00

SAMPLE: Brine Lab ID: 14022427-001A Composite
SAMPLED BY: JB Sample Time: 02/18/2014 11:00

Test	Result		Method	Req Limit	Analysis Start	Analysis End	Analyst *
Oil & Grease	< 5 mg/L		EPA 1664A		02/25/14 10:00	02/26/14	NSF-SA

SAMPLE: Brine Lab ID: 14022427-001B Grab
SAMPLED BY: JB Sample Time: 02/18/2014 11:00

Test	Result		Method	Req Limit	Analysis Start	Analysis End	Analyst *
Chloride	99100 mg/L		EPA 300.0		02/25/14 2:05	02/25/14	NSF-SA
Sulfate	627 mg/L		EPA 300.0		02/25/14 2:33	02/25/14	NSF-SA
pH	5.61@20.6°C	K	SM4500H+B		02/20/14 15:12	02/20/14	NSF-SA
Total Dissolved Solids	173000 mg/L		SM2540C		02/21/14 17:45	02/24/14	KED-SA

Sample Note: >200mg dried residue was produced in TDS analysis.

SAMPLE: Brine Lab ID: 14022427-001C Grab
SAMPLED BY: JB Sample Time: 02/18/2014 11:00

Test	Result		Method	Req Limit	Analysis Start	Analysis End	Analyst *
Barium	0.636 mg/L		EPA 200.7		02/25/14 9:10	02/26/14	SPC-CV
Calcium	18400 mg/L		EPA 200.7		02/25/14 9:10	02/26/14	SPC-CV
Iron	30.7 mg/L		EPA 200.7		02/25/14 9:10	02/26/14	SPC-CV
Lead	< 1.70 mg/L		EPA 200.7		02/25/14 9:10	02/26/14	SPC-CV
Magnesium	2510 mg/L		EPA 200.7		02/25/14 9:10	02/26/14	SPC-CV
Sodium	43700 mg/L	L	EPA 200.7		02/25/14 9:10	02/26/14	SPC-CV

REMARKS:
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of NELAP unless otherwise noted on the Analytical Report.
* CV = Benchmark Analytics, Inc. Center Valley, PA; SA = Benchmark Analytics, Inc. Sayre, PA
K Sample was received past holding time.
Value above calibration range but within annually verified linear range
LFB % recovery above acceptance limits. The result may be biased high.

MANAGER Carrie M. Davis DATE: 2/27/2014
Carrie Davis, Quality Assurance Officer

LAB ID # 11216 *SA
LAB ID # 11827 *CV

BENCHMARK ANALYTICS
A MICROBAC LABORATORY
2566 Pennsylvania Ave. • Sayre, PA 18840
(570) 888-0169 • Fax: (570) 886-0717

SEND DATA TO:
NAME: Jim Reynolds
COMPANY: Roulette Oil & Gas
ADDRESS: 1140 Rte 44 South
Shinglehouse, PA 16748

PHONE:
FAX:

WO#: 14022427
PAGE: 2 of 2
PO#:
PWS ID#

TEST REPORT

Brine Water
RECEIVED FOR LAB BY: ASV DATE: 02/19/2014 17:00

SAMPLE: **Brine** Lab ID: 14022427-001D Grab
SAMPLED BY: JB Sample Time: 02/18/2014 11:00

Test*	Result		Method	Req Limit	Analysis Start	Analysis End	Analyst*
Benzene	0.537 mg/L		EPA 624		02/25/14 8:36	02/25/14	PMD-SA
Toluene	0.747 mg/L	QH	EPA 624		02/25/14 8:36	02/25/14	PMD-SA
Ethylbenzene	0.0239 mg/L		EPA 624		02/21/14 10:34	02/21/14	PMD-SA
Xylenes, Total	0.781 mg/L		EPA 624		02/25/14 8:36	02/25/14	PMD-SA

REMARKS:
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of NELAP unless otherwise noted on the Analytical Report.
* CV = Benchmark Analytics, Inc. Center Valley, PA; SA = Benchmark Analytics, Inc. Sayre, PA
K Sample was received past holding time.
Value above calibration range but within annually verified linear range
LFB % recovery above acceptance limits. The result may be biased high.

MANAGER Carrie M. Davis DATE: 2/27/2014
Carrie Davis, Quality Assurance Officer

Appendix D

Well Log from Clara Field #20

37-105-21374-00-00

Note: the hard copy of the well log is included with the hard copy of this permit application; the tif image below can be opened with IrfanView or IrfanView 64 or any tif image file viewer.

3710521374_GRND_nli.tif