

ATTACHMENT 9



**UIC Application
SEDAT #4A
Plum Borough
Allegheny County
Pennsylvania**

Binder #1

Penneco Environmental Solutions, LLC
Sedat #4A

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 United States Environmental Protection Agency Underground Injection Control Permit Application for a Class II Well <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, and 40 CFR Part 144)</i>		For Official Use Only	
		Date Received 	
		Permit Number 	
Read Attached Instructions Before Starting			
I. Owner Name, Address, Phone Number and/or Email		II. Operator Name, Address, Phone Number and/or Email	
Penneco Environmental Solutions, LLC 6608 Route 22 Delmont, PA 15626 724-468-8232 dmarcj@penneco.com		Penneco Environmental Solutions, LLC 6608 Route 22 Delmont, PA 15626 724-468-8232 dmarcj@penneco.com	
III. Commercial Facility	IV. Ownership	V. Permit Action Requested	VI. SIC Code(s)
☒ Yes ☐ No	☒ Private ☐ Federal ☐ State/Tribal/Municipal	☒ New Permit ☐ Permit Renewal ☐ Modification ☐ Add Well to Area Permit ☐ Other	1311
VII. Indian Country			
☐ Yes ☒ No			
VIII. Type of Permit (For multiple wells, use additional page(s) to provide the information requested for each additional well)			
☒ A. Individual ☐ B. Area	Number of Wells 1	Well Field and/or Project Names Sedat	
IX. Class and Type of Well (see reverse)			
A. Class II	B. Type (enter code(s)) D	C. If type code is "X," explain.	
X. Well Status		XI. Well Information	
☐ A. Operating Date Injection Started		☒ B. Conversion Date Well Constructed 06/21/2004	
☐ C. Proposed		API Number 37-003-21644 Permit (or EPA ID) Number Full Well Name Sedat #4A	
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 5,366.42 ft. from (N/S) 40.542 Line of quarter section 749.80 ft. from (E/W) 79.708 Line of quarter section.		Latitude 40.526916 Longitude -79.711027	
XIII. Attachments			
<i>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.</i>			
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
D. Marc Jacobs, Jr. Senior Vice President			

INSTRUCTIONS FOR FORM 7520-6 (CLASS II WELLS)

A permit application must be completed by all owners or operators of current or proposed Class I, II, and III wells, and some Class V injection wells subject to the requirement to obtain an Underground Injection Control (UIC) permit as described at 40 CFR 144.31 and others directed by a UIC official to apply for a UIC permit. Please note that the information needs vary by well class. These instructions are specific to Class III wells; other versions are available for other well classes. Please note that this form must be signed by a responsible entity as described at 40 CFR 144.32, even if the attachments are prepared by contractors or service companies. If the application covers multiple wells, use additional pages as necessary to provide all the requested information.

I. OWNER NAME, ADDRESS, PHONE AND/OR EMAIL: Enter the name and street address, city/town, state, and ZIP code of the owner of the well, well field, or company. Also provide an email address (if available) and/or a phone number.

II. OPERATOR NAME, ADDRESS, PHONE AND/OR EMAIL: Enter the name and street address, city/town, state, and ZIP code of the operator of well or well field; also provide an email address (if available) and/or a phone number. If the operator is the same as the owner, enter "same as owner."

III. COMMERCIAL FACILITY: Check the appropriate box to indicate the type of facility. A commercial facility is a single or multiple well facility that is specifically engaged in the business of injecting waste fluids generated by third party producers that is originated off-site and transported to the facility by truck for a fee or compensation.

IV. OWNERSHIP: Check the appropriate box to indicate whether the owner of the well/facility is a private, Federal, or State/Tribal/Municipal entity.

V. TYPE OF PERMIT ACTION REQUESTED: Check "new permit" if the well has never been subject to a UIC permit (e.g., for a newly constructed or converted well). Check "permit renewal" for an application associated with extending an expiring UIC permit. Check "modification" for an application to modify an existing permit that is not expiring. Check "add well to area permit" if additional wells are to be covered under an existing UIC area permit. Check "other," if needed and describe the situation.

VI. SIC CODES: List at least one and no more than four Standard Industrial Classification (SIC) Codes that best describe the nature of the business in order of priority. A list of SIC codes is available from the U.S. Department of Labor at <https://www.osha.gov/pls/imis/sicsearch.html>.

VII. INDIAN COUNTRY: Check yes if the well is located in Indian country. Indian country (as defined in 18 U.S.C. 1151) includes: all land within the limits of any Indian reservation under the jurisdiction of the U.S. government; all dependent Indian communities within the borders of the U.S.; and all Indian allotments, the Indian titles to which have not been extinguished.

VIII. TYPE OF PERMIT: Check "Individual" or "Area" to indicate the type of permit requested. Individual permits cover a single injection well, while area permits may cover more than one injection well. Note that area permits are issued at the discretion of the Director and that wells covered by an area permit must: be at one contiguous site, be under the control of one entity, and may not inject hazardous waste. If an area permit is requested, enter the **number of wells** to be included in the permit. In the case of a project or field that crosses State lines, it may be possible to consider an area permit if EPA has jurisdiction in all affected States (each such case will be considered individually). Also provide the **name of the well field or project**.

IX. CLASS AND TYPE OF WELL: Enter the class (as defined in 40 CFR 144.6) and type of injection well for which a permit is requested. Use the most pertinent code selected from the table below. When selecting type "X", please explain in the space provided.

TABLE OF CLASS II WELL TYPES

A	Annular Disposal Well.
D	Produced Fluid Disposal Well.
H	Hydrocarbon Storage Well (excluding natural gas).
R	Enhanced Recovery Well.
X	Other Class II Wells (not included in Type "A," "D," "H," or "R").

X. WELL STATUS: Check **Box A, Operating** if the well currently operates as an injection well (e.g., if a permit renewal is requested or a permit is sought for an existing rule-authorized injection well). Check **Box B, Conversion** for an existing well not currently being utilized for injection that is proposed to be converted to an injection well. Check **Box C, Proposed** for an underground injection well not yet constructed or completed. Provide relevant dates if A or B are checked.

XI. WELL INFORMATION: Enter the **API number** (the number assigned by the local jurisdiction (usually a State Oil and Gas Agency) using the American Petroleum Institute standard numbering system). Enter the **Permit or EPA ID number** assigned to the injection well by the EPA or the permitting authority. If you do not have a number (e.g., for a new well), this will be provided by EPA or the permitting authority, and you can leave the field blank. Also enter the **Full Name of the Well** or project.

XII. LOCATION: For individual permit applications, in the fields provided, enter the location of the well using latitude and longitude and/or the Public Land Survey System. When using latitude and longitude, use decimal degrees to five or six places after the decimal, if possible; be sure to include a negative sign for the longitude of a well in the Western Hemisphere and a

negative sign for the latitude of a well in the Southern Hemisphere. When using the Public Land Survey System, fill in the complete township, range, and section to the nearest quarter-quarter section. A township is north or south of the baseline, and a range is east or west of the principal meridian (e.g., T12N, R34W). Also include the distance, in feet, from the nearest north or south line and nearest east or west line of the quarter-section. For area permit applications, provide the latitude and longitude of the approximate center of the area.

XIII. ATTACHMENTS: Specific instructions for completing the attachments are presented on pages 3 through 6. Place the permit or EPA ID number (or, if none has been assigned, other identifying information such as an API number or the project name) in the upper right hand corner of each page of the attachments.

XIV. CERTIFICATION: All permit applications must be signed by either: a responsible corporate officer for a corporation, by a general partner for a partnership, by the proprietor of a sole proprietorship, or by a principal executive or ranking elected official for a public agency, or a duly authorized representative of that person.

PAPERWORK REDUCTION ACT NOTICE: The public reporting and recordkeeping burden for this collection of information is estimated to average 61 hours per response for a Class II well permit application. Burden means the total time, effort, or financial resource expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, DC 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

Instructions for Completing Attachments to Form 7520-6 (Class II Wells)

The Underground Injection Control (UIC) program, as promulgated under the Safe Drinking Water Act (SDWA), is designed to prevent injection activity from allowing the movement of fluid containing any contaminant into underground sources of drinking water (USDWs), if the presence of that contaminant may cause a violation of any primary drinking water regulation or may otherwise adversely affect the health of persons as found at Title 40 of the Code of Federal Regulations (40 CFR) section 144.12. Any applicant for a permit under this program shall have the burden of showing that their proposed construction, operation, maintenance, conversion, plugging, abandonment, and injection activity, does not endanger USDWs.

The attachments below have been constructed to provide applicants with clear expectations as to what information EPA needs to make a determination that an applicant's proposed activities will not endanger USDWs.

Pre-Application Coordination

Coordination between the UIC program and the permit applicant prior to submittal of the permit application is an important step for efficient and effective permitting. Early discussions will ensure that the applicant is aware of all the permit application requirements, including state specific requirements found at 40 CFR part 147. These discussions may also help the applicant plan how to invest time and resources needed to develop a comprehensive and complete permit application.

Applicants are encouraged to contact their EPA regional UIC program for a pre-application coordination meeting.

Note: If the owner or operator of *existing rule authorized Class II UIC well(s)* is required by the EPA to apply for a permit (40 CFR § 144.25), consult with EPA staff during the pre-application coordination for additional requirements that may apply.

When completing each attachment, please be sure to specify the units reported, e.g., of depth, pressure, temperature, etc.

Attachment A. Map(s) and Area of Review

Part I. Well Location(s)

For Individual Permits: If the surface location provided in the accompanying 7520-6 form does not adequately describe the well location (i.e., due to deviation, directional, or horizontal drilling), please describe the well's orientation and provide the top- and bottom-hole coordinates, as appropriate. If any monitoring wells are proposed as part of this permit application, provide coordinates for all monitoring wells.

For Area Permits (40 CFR § 144.33): Provide information similar to what is outlined above for individual permits for each well (existing or proposed) to be covered by this permit. In addition, provide a description of the proposed permitted area. At a minimum, this area should include all the proposed or existing wells known at the time of permit application submittal. For circular areas, this description should consist of a defined-radius from a singular point whose coordinates have been given. For polygonal areas, use a series of coordinates describing the vertices or corners of the area. Submit a Geographic Information System (GIS) file, if available.

Part II. Area of Review Size Determination (40 CFR § 146.6)

For All Permits. Give the method (fixed radius or equation) and, if appropriate, all calculations used to determine the size of the area of review (AOR). If you are uncertain as to which method to use, consult with your regional EPA office.

The AOR must be a minimum radius of one-fourth (1/4) mile from the well bore, including a well's lateral, or the proposed area permit boundary for area permits, unless the use of an equation is approved by the Director.

In addition, for Class II enhanced oil recovery well(s). The AOR will be at a minimum the larger of the following: one-fourth (1/4) mile radius or the distance to the nearest active producer in the production formation.

Part III. Map(s) (40 CFR §§ 144.31 & 146.24)

Submit a topographic map (or other map if a topographic map is unavailable) extending one mile beyond the facility property boundary showing:

- project injection well(s), well pad(s) and/or project area,
- applicable area of review,
- all outcrops of injection and confining formations,
- all surface water intake and discharge structures, and
- all hazardous waste treatment, storage, or disposal facilities.

Consult with your EPA regional office for the definition of the facility property boundary.

The information below does not apply to existing rule authorized Class II well(s).

Within the one-fourth (1/4) mile beyond the facility property boundary or the AOR, whichever is larger, the map will also show the:

- name and location of all production wells, injection wells, abandoned wells, dry holes, and all water wells, noting their types (public water system, domestic drinking water, stock, etc.),

- springs and surface bodies of water,
- mines (surface and subsurface) and quarries, and
- other pertinent surface features, including residences, schools, hospitals, and roads.

Only information of public record and pertinent information known to the applicant is required to be included on this map. Multiple maps may be needed to display this information clearly. If a certain feature is not present in the area covered, please state so definitively (e.g., *"There are no known outcrops of the confining formation in the mapped area."*).

Part IV, below does not apply to existing rule authorized Class II well(s).

Part IV. Area of Review Wells and Corrective Action Plans (40 CFR §§ 144.55 & 146.24)

Submit a tabulation of data and wellbore diagrams reasonably available from public records or otherwise known to the applicant on all wells within the AOR included on the map, which penetrate the proposed confining zone(s). Such information will include:

- well name, location and depth,
- well type,
- date well was drilled,
- well construction that includes casing and cement details, including demonstrated or calculated top of cement,
- cement bond logs (if available), and
- record of well completion and plugging (if applicable).

For such wells which are improperly sealed, completed, or abandoned, also submit a plan consisting of such steps or modifications as are necessary to prevent movement of fluid into USDWs.

Part V. Landowners Information (40 CFR § 144.31 and part 147)

Identify and submit a list with the names and addresses of all owners of record of land within one-fourth (1/4) mile of the facility property boundary. This requirement may be waived by the Regional Administrator if the site is in a populous area and the Regional Administrator determines that the requirement would be impracticable.

Consult with your regional EPA office, as additional state landowner notification requirements may apply (40 CFR part 147).

Attachment B. Geological and Geophysical Information

Part I. Geological Data (40 CFR § 146.24)

Provide the following information:

- geological data on all formations from the surface to the base of the injection well, identifying all USDWs and confining and injection zone(s). This data includes the lithologic description, geological name, thickness, depth, and total dissolved solids (TDS) concentrations from these formations (if known),
- source of information for the geologic data and formation TDS,
- porosity and permeability of injection formation (if available),
- geological cross-sections (if available) proximate to the injection well that includes the confining and injection zones. The cross-sections should illustrate the regional geologic setting and show the thickness and lateral continuity of the confining zone(s) through the area of review,
- within the AOR, identify known or suspected faults and fracture systems. If identified, provide proximity to the injection zone and the effect the fault/fracture system may have on the injection activities, and
- a history of seismic activity in the area and proximity to crystalline (i.e., granitic) basement.

Part II. Proposed Formation Testing Program (40 CFR § 146.22)

Provide a formation testing program to obtain data on:

- fluid pressure,
- estimated fracture pressure, and
- physical and chemical characteristics of the injection zone.

Attachment C. Well Construction/Conversion Information

Part I. Well Schematic Diagram (40 CFR § 146.24)

Provide a detailed proposed well schematic diagram that includes:

- identification of USDWs and confining and injection zones,
- casing and cementing details, including demonstrated or calculated top of cement,
- tubing and packer (if applicable),
- open hole or perforated intervals, and

- surface trace (if horizontal or deviated well).

For wells that are drilled and to be converted to an injection well, also provide the current well schematic diagram.

Part II. Well Construction or Conversion Procedures (40 CFR §§ 144.52, 146.22, & 146.24)

Provide detailed description of well construction or conversion procedures, that includes:

- proposed logs and other tests conducted during the drilling and construction of new well(s),
- proposed stimulation plan(s), if planned, and
- description of alarms and shut-down systems at the well (if applicable).

For wells that are drilled and to be converted to an injection well, also provide:

- well completion and cementing records, and
- previously run logs/tests.

Attachment D. Injection Operation and Monitoring Program (40 CFR §§ 146.23 & 146.24)

Submit the following information:

- flow diagram of fluid flow through the facility,
- contingency plan(s) to cope with well failure, so as to prevent migration of contaminating fluids into a USDW,
- drawing of the surface construction,
- locations of all monitoring devices (show on the map(s) referenced in section A.III. above), and
- description of sampling and monitoring devices to monitor the nature of the injected fluids, injection pressure, annulus pressure (if applicable), flowrate, and cumulative volume.

Hydrocarbon storage and enhanced recovery may be monitored on a field or project basis rather than on an individual well basis by manifold monitoring. If a manifold monitoring program is utilized, describe details of the monitoring program and how the program is comparable to individual well monitoring. Also, include on the map in section A.III.B, the distribution manifold applying injection fluid to all wells in the area, including location of all system monitoring locations.

Additionally, submit the following proposed operating data for each well in the individual or area permit:

- average and maximum daily rate and volume of fluids to be injected,
- average and maximum injection pressure,
- source(s) of injection fluids (including field and formation names),
- proposed annular fluid, and
- analysis of the chemical and physical characteristics of the injection fluid. At a minimum, this should include pH, specific gravity, TDS, and conductivity. Consult with the regional EPA office for additional guidance.

Attachment E. Plugging and Abandonment Plan (40 CFR §§ 144.31, 144.51 & 146.24)

Submit a plugging and abandonment (P&A) plan of the well on EPA Form 7520-19 along with a P&A diagram. The plan should include:

- type, and number of plugs to be used,
- placement of each plug including the elevation of top and bottom,
- type, grade, and quantity of cement to be used, and
- method of placement of the plugs.

Provide one or more cost estimates from an independent firm in the business of plugging and abandoning wells to conduct the work proposed in the P&A plan for EPA to contract plugging of the well. This is to ensure that EPA has adequate funding to plug the well(s) if the operator is unable to plug the well(s).

Consult with the regional EPA office for additional guidance on developing the P&A plan and cost estimate calculations.

Attachment F. Financial Assurance (40 CFR § 144.52)

Submit evidence of financial resources, such as a surety bond or financial statement, necessary for a third party to close, plug, or abandon the well in the event an owner or operator is unable to do so. The monetary amount is based on the P&A plan cost estimate provided in Attachment E.

Attachment G. Site Security and Manifest Requirements (Commercial Wells Only)

Provide a proposed site security plan. This could include fencing around the perimeter of the facility. Consult with the regional EPA office for additional guidance on manifest requirements.

Attachment H. Aquifer Exemptions (40 CFR §§ 144.7 & 146.4)

If an aquifer exemption (AE) is requested, submit the information required at 40 CFR § 144.7 and to demonstrate that the criteria found at 40 CFR § 146.4 are met. Consult with your regional EPA office for additional guidance.

Attachment I. Existing EPA Permits (40 CFR § 144.31)

Submit a listing of all permits or construction approvals received or applied for under any of the following programs:

- Hazardous Waste Management program under RCRA,
- UIC program under SDWA,
- NPDES program under CWA,
- Prevention of Significant Deterioration (PSD) program under the Clean Air Act,
- Nonattainment program under the Clean Air Act,
- National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act.
- Ocean dumping permits under the Marine Protection Research and Sanctuaries Act,
- Dredge and fill permits under section 404 of CWA, and
- Other relevant environmental permits, including State permits.

Attachment J. Description of Business (40 CFR § 144.31)

Provide a brief description of the nature of the business.

Attachment K. Optional Additional Project Information (40 CFR § 144.4)

The following is a list of Federal laws that may apply prior to the issuance of permits. When any of these laws are applicable, EPA must ensure that they are followed. The optional additional information requested below will assist EPA in its analyses to satisfy these laws.

- The Wild and Scenic Rivers Act, 16 U.S.C. 1273 et seq.

Identify any national wild and scenic river that may be impacted by the activities associated with the proposed project.

- The National Historic Preservation Act of 1966, 16 U.S.C. 470 et seq.

Identify properties listed or eligible for listing in the National Register of Historic Places that may be affected by the activities associated with the proposed project. If previous historic and cultural resource survey(s) have been conducted, provide the results of the survey(s).

- The Endangered Species Act, 16 U.S.C. 1531 et seq.

Identify any endangered or threatened species that may be affected by the activities associated with the proposed project. If a previous endangered or threatened species survey has been conducted, provide the results of the survey.

- The Coastal Zone Management Act, 16 U.S.C. 1451 et seq.

Identify any coastal zones that may be affected by the activities associated with the proposed project.



United States Environmental Protection Agency
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			II. Operator Name, Address, Phone Number and/or Email		
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III. Commercial Facility		IV. Ownership		V. Permit Action Requested	
☒ Yes ☐ No		☒ Private ☐ Federal ☐ State/Tribal/ Municipal		☒ New Permit ☐ Permit Renewal ☐ Modification ☐ Add Well to Area Permit ☐ Other _____	
				VI. SIC Code(s) 1311	
VII. Indian Country ☐ Yes ☒ No					
VIII. Type of Permit (For multiple wells, use additional page(s) to provide the information requested for each additional well)					
☒ A. Individual ☐ B. Area		Number of Wells 1		Well Field and/or Project Names Sedat	
IX. Class and Type of Well (see reverse)					
A. Class II		B. Type (enter code(s)) D		C. If type code is "X," explain. _____	
X. Well Status			XI. Well Information		
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☐ C. Proposed			API Number 37-003-21644 Permit (or EPA ID) Number _____ Full Well Name Sedat #4A		
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 _____ 5,366.42 ft. from (N/S) 40.542 Line of quarter section 749.80 ft. from (E/W) 79.708 Line of quarter section.				Latitude 40.526916 Longitude -79.711027	
XIII. Attachments					
<i>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.</i>					
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) D. Marc Jacobs, Jr. Senior Vice President			Signature 		Date Signed 5/4/21



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil and Gas Management Program
WELL LOCATION PLAT

DEP USE ONLY	DEP Application Tracking #	G:
	Permit #	C:
	Project #	

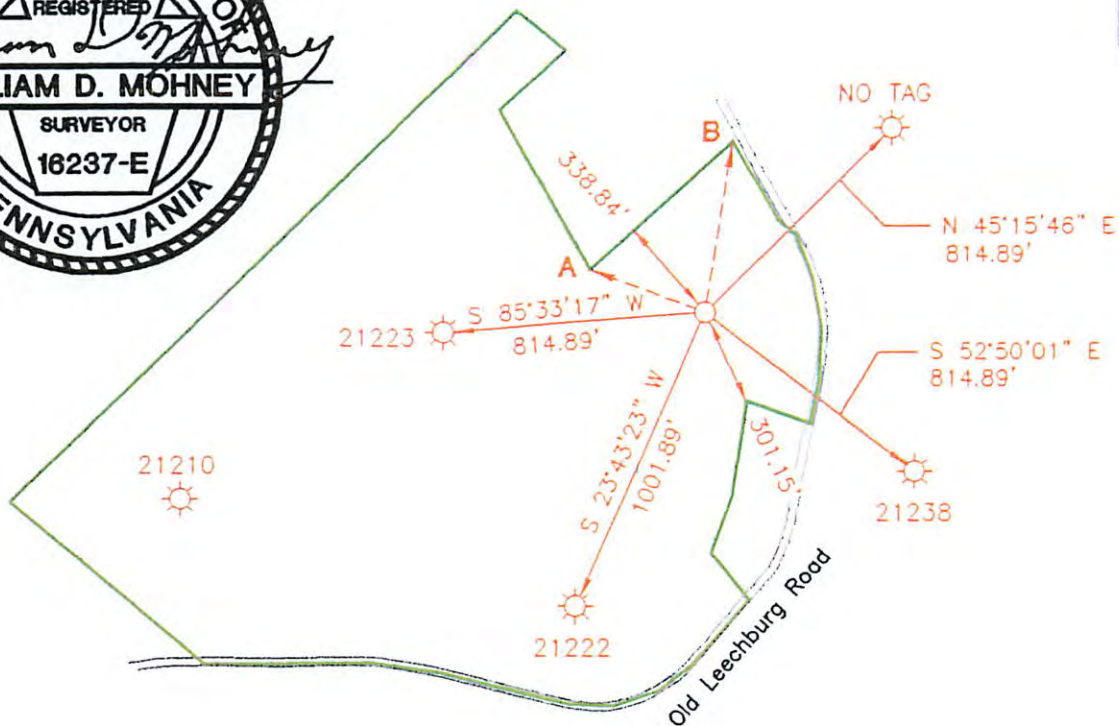
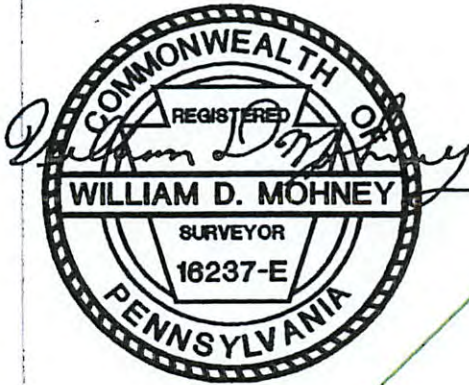
Well is located on topo map 5366.42 feet south of latitude 40 • 32 • 30 "

☐	Denotes location of well on topo map.
True Latitude: NORTH	
<u>40</u> °	<u>31</u> ' <u>36.9</u> "
True Longitude: WEST	
<u>79</u> °	<u>42</u> ' <u>39.7</u> "

Loc-A N 70°03'58" W 384.91'
Loc-B N 09°11'04" E 537.62'
A-B N 48°15'12" E 600.00'

○ Proposed Well Location
⊙ Existing Well
⊙ Plugged Well

— Lease Line
— Property Line
— Roads
— Streams/Water



Well is located on topo map

749.80

feet west of longitude

79 • 42 • 30 "

Surveyor of Engineer	W.D. Mohney & Associates	Reg. #	sedatplum	Date	December 15, 2003	Scale	1" = 600'	Tract Acreage	69.54 Acres	
Applicant / Well Operator Name	Penneco Oil Company, Inc.	DEP ID#	7674	Well (Farm) Name	SEDAT	Well #	4 A	Serial #	PS-748	
Address	P.O. Box 300, 200 US Route 22, Delmont PA 15626			County - Code	Allegheny - 65	Municipality	Plum Borough			
Surface Owner	Sedat Inc.			USGS 7 1/2 Quadrangle Map Name	New Kensington East, PA			Map Section	7	
Surface Lessor	n/a			Angle & Course of Deviation (Drilling)	None		Surface Elevation	1068 ft.	Anticipated Total Depth	3800' ft.
Surface Owner or Water Purveyor with a Water Supply within 1000'	See Attached Sheet			Approximate Course and Distance to Water Supply	Noncoal Area		Owner, Lessee, or Operator of Workable Coal Seam	Name of Coal Seam Owned, Leased, or Operated		

SURFACE OWNER OR WATER PURVEYOR
WITH A WATER SUPPLY WITHIN 1000'
OF THE SEDAT #4A GAS WELL LOCATION

	<u>SURFACE OWNER OR</u> <u>WATER PURVEYOR</u>	<u>APPROXIMATE COURSE &</u> <u>DISTANCE TO WATER SUPPLY</u>
1.	JOHN & MARTHA SLACK	N 5° E 1,000'
2.	MARY C. SCHWARTZ	N 10° E 900'
3.	MATTHEW W. PODOBNIK	N 25° E 700'
4.	EDWARD TAYLOR	N 45° E 500'
5.	BEVERLY SISKOS	N 70° E 600'
6.	RALPH & ETHELYN ANKROM	S 85° E 900'
7.	HERMAN & IRENE VANHORN	N 80° E 800'
8.	JANET & RUSSELL MITCHELL	S 70° E 800'
9.	EARL & JEAN WILKERSON	S 40° E 400'
10.	FRANK T. & MARCIA SMOLENSKI	S 30° E 700'
11.	THEODORE & VIRGINIA SMOLENSKI	S 20° E 600'

SEDAT #4A SURFACE OWNERS IN THE AREA OF REVIEW

Tax Parcel Number	COUNTY	MUNICIPALITY	Property Owner	Street Address	City & Zip
1233-P-00036	Allegheny	Plum	ROSENBERG NANCY	2032 Old Leechburg Road	New Kensington, PA 15068
1234-G-00148	Allegheny	Plum	SPROUSE SHIRLEY ANN & EDDIE LION (H)	1927 Drennen Road	New Kensington, PA 15068
1234-G-00155	Allegheny	Plum	SMITH JAMES & SHIRLEY (W)	1933 Drennen Road	New Kensington, PA 15068
1234-G-00219	Allegheny	Plum	KOZUCH ROMAINE E	229 5th Ave	New Kensington, PA 15068
1234-G-00230	Allegheny	Plum	KOZUCH ROMAINE E	229 5th Ave	New Kensington, PA 15068
1234-L-00142	Allegheny	Plum	DZIUBAN ROBERT J & MARY LEE	P.O. Box 961252	Fort Worth, TX 76161
1234-L-00184	Allegheny	Plum	OSWALT LARA BETH ROBINSON	1924 Drennen Road	New Kensington, PA 15068
1234-M-00208	Allegheny	Plum	BOBICK RANDALL D & TERRI LYNN (W)	1965 Drennen Road	New Kensington, PA 15068
1234-M-00208	Allegheny	Plum	BOBICK STEPHEN C	1965 Drennen Road	New Kensington, PA 15068
1234-M-00211	Allegheny	Plum	BOBICK STEPHEN C	1965 Drennen Road	New Kensington, PA 15068
1234-M-00237	Allegheny	Plum	TWIDWELL ROBERT L	1977 Drennen Road	New Kensington, PA 15068
1234-M-00263	Allegheny	Plum	BABINSACK VICTOR K & KATHLEEN E (W)	1985 Drennen Road	New Kensington, PA 15068
62-80-00-0-001	Westmoreland	Upper Burrell	CALLENDER JESSALIN M	1920 Greensburg Road	New Kensington, PA 15068
1233-P-00003	Allegheny	Plum	PATTOCK JAMES D & SUZANNE (W)	2029 Old Leechburg Road	New Kensington, PA 15068
1234-A-00160	Allegheny	Plum	PATTOCK KIRT E & LISA M (W)	4059 Seventh Street Road	New Kensington, PA 15068
1234-F-00085	Allegheny	Plum	BUCHHOLZ BENJAMIN F	1924 Old Leechburg Road	New Kensington, PA 15068
1096-M-00010	Allegheny	Plum	VISNANSKY A WILLIAM BALAZIK SUSAN M MILKO JEAN A	9517 Ferry Harbour Court	Alexandria, VA 22309
1097-M-00126	Allegheny	Plum	PALOMBO BENEDICT PALOMBO FERDINAND PALOMBO ANDREW	370 Hamilton Drive Ext	Pittsburgh, PA 15235
1098-D-00277	Allegheny	Plum	JOYCE PETER R	1730 Old Leechburg Road	New Kensington, PA 15068
1233-N-00269	Allegheny	Plum	ROSALYN CHRISTOPHERSON	1770 Greensburg Road	New Kensington, PA 15068
1233-N-00285	Allegheny	Plum	MATT ROBERT W & BARBARA L (W)	1750 Greensburg Road	New Kensington, PA 15068
1233-N-00303	Allegheny	Plum	NATHAN KOSOWSKI	1746 Faulk Road	New Kensington, PA 15068
1233-N-00326	Allegheny	Plum	OTLANO PHILLIP JR & ALLENE C (W)	5137 Butler Street	Pittsburgh, PA 15201
1233-N-00362	Allegheny	Plum	WILLIAMS MARVIN H	431 Markle Road	Apollo, PA 15613
1233-N-00375	Allegheny	Plum	STRANO ANDREW R & LINDA E (W)	1823 Greensburg Road	New Kensington, PA 15068
1233-N-00384	Allegheny	Plum	DAUGHERTY JENNIE E & LOUIS R DAUGHERTY	1769 Greensburg Road	New Kensington, PA 15068
1233-P-00069	Allegheny	Plum	PARK LOTTIE E PHILLIPS ARTHUR D PHILLIPS ANNA	1804 Greensburg Road	New Kensington, PA 15068
1233-P-00109	Allegheny	Plum	SWEENY MARK M & JUDITH ANN BLACK SWEENY (W)	2024 Old Leechburg Road	New Kensington, PA 15068
1233-P-00129	Allegheny	Plum	JOHN L PATER	2016 Old Leechburg Road	New Kensington, PA 15068
1234-B-00160	Allegheny	Plum	PODOBNIK MATTHEW W	1932 Old Leechburg Road	New Kensington, PA 15068
1234-B-00198	Allegheny	Plum	SCHWARTZ MARY C	4198 Brittany Drive	Ellicott, MD 21043
1234-B-00217	Allegheny	Plum	LARIS GEORGE	2008 Old Leechburg Road	New Kensington, PA 15068
1234-B-00227	Allegheny	Plum	LARIS GEORGE	2008 Old Leechburg Road	New Kensington, PA 15068
1234-B-00293	Allegheny	Plum	LABELLA JOHN R & MARGARET J (W)	77 South Main Street	Washington, PA 15301
1234-B-00322	Allegheny	Plum	HUSKA PAUL JR	864 Hill Street	New Kensington, PA 15068
1234-F-00242	Allegheny	Plum	GIACCO LEWIS R	P.O. Box 327	West Sunbury, PA 16061
1234-G-00071	Allegheny	Plum	ANKROM RALPH & ETHELYN (W)	38 Terrace Road	Carnegie, PA 15106
1234-G-00098	Allegheny	Plum	PODOBNIK MATTHEW W	1932 Old Leechburg Road	New Kensington, PA 15068
1234-H-00270	Allegheny	Plum	HIPPLE JOSHUA	1958 Greensburg road	New Kensington, PA 15068
1234-J-00010	Allegheny	Plum	SCHEETZ THOMAS W	1730 Old Leechburg Road	New Kensington, PA 15068
1234-L-00073	Allegheny	Plum	FAVERO SHAWN L & MELISSA A (W)	1957 Drennen Road	New Kensington, PA 15068
1234-L-00165	Allegheny	Plum	HOEY JAMES J & DONNA J (W)	P.O. Box 8469	Canton, OH 44711

1234-M-00133	Allegheny	Plum	DEMAO RAYMOND LEONARD BARTLETT KELLY MARIE	1982 Drennen Road	New Kensington, PA 15068
1234-M-00192	Allegheny	Plum	FAVERO DAVID L & KATHLEEN L (W)	1961 Drennen Road	New Kensington, PA 15068
1234-M-00221	Allegheny	Plum	THE RICHARD F OSKIN FAMILY TRUST (RICHARD F OSKIN (TRUSTEE)	1969 Drennen Road	New Kensington, PA 15068
1234-M-00251	Allegheny	Plum	PASTUCHA JOANN G	450 Woodlawn Ave	Verona, PA 15147
1234-M-00274	Allegheny	Plum	LUCIANA JONATHAN R	1989 Drennen Road	New Kensington, PA 15068
62-07-00-0-014	Westmoreland	Upper Burrell	HOUSEHOLDER DWIGHT E II+KENNA	101 Myers Drive	New Kensington, PA 15068
62-08-00-0-010	Westmoreland	Upper Burrell	MCVEY JEFFREY	621 Cleveland Drive	Lower Burrell, PA 15068
1097-M-00142	Allegheny	Plum	ASPDEN ANNA	1781 Old Leechburg Road	New Kensington, PA 15068
62-08-00-0-006	Westmoreland	Upper Burrell	CRAFT CLINT W.	520 Menk Road	New Kensington, PA 15068
62-08-00-0-008	Westmoreland	Upper Burrell	RESNIK MATTHEW R	1501 Menk Road	New Kensington, PA 15068
1096-H-00355	Allegheny	Plum	CHAMBERS CLARENCE	1609 Greensburg Road	New Kensington, PA 15068
1096-M-00016	Allegheny	Plum	HARRIS MABLE	Undelivarable	
1097-S-00348	Allegheny	Plum	PALOMBO BENEDICT & KATHY ANN (W)	1778 Old Leechburg Road	New Kensington, PA 15068
1098-D-00128	Allegheny	Plum	MILLER ALVIN R III & DIANE ELIZABETH (W)	Undeliverable	
1233-J-00342	Allegheny	Plum	MILLER ANNA LOUISE COSTA KATHLEEN	2240 Freeport Road	New Kensington, PA 15068
1233-N-00346	Allegheny	Plum	SRK REAL PROPEERTIES	3160 Chestnut Street	Murrysville, PA 15668
1233-P-00044	Allegheny	Plum	MACRO KLINT L & JENNIFER S (W)	1814 Greensburg Road	New Kensington, PA 15068
1234-C-00347	Allegheny	Plum	FRERE LUCILLE CHRISTINA FRERE RAYMOND ARMOUL LOGAN FRERE	1206 5th Avenue	New Kensington, PA 15068
1234-C-00377	Allegheny	Plum	HALL LUKE	232 Fairhaven Drive	Monroeville, PA 15146
1234-F-00206	Allegheny	Plum	PENNECO ENVIRONMENTAL SOLUTIONS	6608 Route 22	Delmont, PA 15626
1234-G-00077	Allegheny	Plum	TTMAR INC	Undeliverable	Undeliverable
1234-G-00126	Allegheny	Plum	VAGLIA JOSEPH & MICHELLE (W)	418 Willowbrook Road	Apollo, PA 15613
1234-K-00134	Allegheny	Plum	SMOLENSKI THEODORE & VIRGINIA	14 Tenby Chase Drive	Newark, DE 19711
1234-K-00154	Allegheny	Plum	SMOLENSKI THEODORE & VIRGINIA	14 Tenby Chase Drive	Newark, DE 19711
1234-L-00106	Allegheny	Plum	ZEBRAK JOSHUA F	3520 Ivy Drive	Murrysville, PA 15668
1234-M-00379	Allegheny	Plum	HAMILTON JOHN	Undeliverable	
62-07-00-0-015	Westmoreland	Upper Burrell	LOMBARDO LOUIS ANTHONY & SANDY	1550 Menk Road	New Kensington, PA 15068
62-08-00-0-007	Westmoreland	Upper Burrell	TRZECIAK LOUIS JR CYNTHIA LOU	1500 Menk Road	New Kensington, PA 15068
62-08-00-0-009	Westmoreland	Upper Burrell	SANTUCCI JOSEPH & PAMELA	437 5th Ave	New Kensington, PA 15068
62-08-00-0-086	Westmoreland	Upper Burrell	TRZECIAK LOUIS CYNTHIA LOUISE	1500 Menk Road	New Kensington, PA 15068
1234-G-00086	Allegheny	Plum	VANHORN HERMAN E & IRENE B	1920 Drennen Road	New Kensington, PA 15068
1234-M-00154	Allegheny	Plum	DEMAO RAYMOND LEONARD BARTLETT KELLY MARIE	1982 Drennen Road	New Kensington, PA 15068
1234-G-00026	Allegheny	Plum	MITCHELL JANET ANN & RUSSELL WILLIAM MITCHELL	504 Clarendon St	Pittsburgh, PA 15238
1233-N-00241	Allegheny	Plum	TEORSKY ROBERT M	1 Home Campus	Des Moines, IA 50328
1233-P-00086	Allegheny	Plum	MACRO KLINT L & JENNIFER S (W)	1814 Greensburg Road	New Kensington, PA 15068
1233-P-00198	Allegheny	Plum	HASSON LEONARD J & NINA E (W)	1823 Greensburg Road	New Kensington, PA 15068
1233-P-00215	Allegheny	Plum	MARTIN RICHARD A & MARY JANE (W)	1819 Greensburg Road	New Kensington, PA 15068
1233-P-00227	Allegheny	Plum	DAUGHERTY LOUIS R & PAMELA E (W)	1815 Greensburg Road	New Kensington, PA 15068
1233-P-00245	Allegheny	Plum	DAUGHERTY LOUIS R	1815 Greensburg Road	New Kensington, PA 15068
1233-P-00258	Allegheny	Plum	DAUGHERTY DAVID R	1801 Greensburg Road	New Kensington, PA 15068
1233-P-00262	Allegheny	Plum	DAUGHERTY DAVID R	1801 Greensburg Road	New Kensington, PA 15068
1234-B-00254	Allegheny	Plum	PLANCE DAVID A & STEPHANIE (W)	2013 Old Leechburg Road	New Kensington, PA 15068
1234-B-00258	Allegheny	Plum	PLANCE DAVID A & STEPHANIE (W)	2013 Old Leechburg Road	New Kensington, PA 15068
1234-F-00159	Allegheny	Plum	COOPER DANIEL S	1855 Old Leechburg Road	New Kensington, PA 15068
1234-G-00164	Allegheny	Plum	AMY J ROSSWOG	1930 Greensburg Road	New Kensington, PA 15068
1234-G-00204	Allegheny	Plum	ANUSKIEWICZ DONALD J & FLORENCE M (W)	1938 Greensburg Road	New Kensington, PA 15068
1234-J-00087	Allegheny	Plum	CHOLTKO FRANK III	1820 Old Leechburg Road	New Kensington, PA 15068

1234-K-00185	Allegheny	Plum	SMOLENSKI FRANK T & MARCIA MARIE (W)	1900 Old Leechburg Road	New Kensington, PA 15068
1234-K-00222	Allegheny	Plum	SMOLENSKI, FRAND & SHEEHAN, KATIE MARIE	1835 Old Leechburg Road	New Kensington, PA 15068
62-07-00-0-015	Westmoreland	Upper Burrell	LOMBARDO LOUIS ANTHONY & SANDY	1550 Menk road	New Kensington, PA 15068
62-07-00-0-030	Westmoreland	Upper Burrell	MILLER SHANE		
62-08-00-0-086	Westmoreland	Upper Burrell	TRZECIAK LOUIS CYNTHIA LOUISE		
1233-N-00354	Allegheny	Plum	Combined with other parcel.		

ATTACHMENT “A”
Area of Review Methods

Attachment A
Area of Review Methods
Sedat #4A Injection Well

Area of Review Methods:

The size of the area of review was determined by a fixed radius of one quarter mile as required by permit application. Maps with a half mile, and one mile radius were also prepared. Maps detailing the area of review are in Attachment B. Research was conducted by:

- 1) Survey by Fox and Fox, Inc. registered professional surveyors
- 2) Conversation with surface landowners by Fox and Fox, representatives of Penneco Environmental Solutions LLC.
- 3) Research of Pennsylvania Bureau of Oil and Gas Management's well records
- 4) Research of Pennsylvania Geological Survey publications covering the area of review
- 5) Research of USGS publications covering the area of review.
- 6) Master Thesis (Two) From West Virginia University
- 7) Series of reservoir test by HFrac Consulting Services.

Using the results from the above research, along with topographic and tax maps displaying surface features such as buildings, and streams, maps of the AOR were prepared for and included in Attachment B.

The same research used to map the area of review was used to provide data on the geology of the injection zone and the confining formations described in Attachment G.

As part of larger study to assess its lease acreage in the area of the Sedat lease Penneco ran a series of reservoir tests using HFrac Consulting Services to determine the character of the Murrysville reservoir and the results are included in Attachment H.

ATTACHMENT "B"
Maps of Well Area/Area of Review Methods

ATTACHMENT "B"

Maps of Well Area /Area of Review Methods Sedat #4A Injection Well

Maps of Well Area Sedat #4A Injection Well

This section contains topographical maps of the ¼ mile AOR, the AOR with a ¼ mile radius buffer, the AOR with a 1-mile radius buffer, well records for wells within the AOR, an AOR Water Supply Inventory list, and Water Supply Survey Map.

Also relevant to the Area of Review is a property-search history of "phantom wells" noted on 1970's vintage coal mine maps. Over the years, as the property and surrounding area was developed for oil and gas, multiple surveys were conducted to satisfy the health, safety, and environmental interests of the Pennsylvania Department of Environmental Protection. Each time a new well was permitted in the proximity of one of the phantom wells, another search was required and executed. One developmental well was drilled within mere feet of a phantom plot and the other, a shallow, horizontal oil well, intersected another. Penneco drilled a third well outside of the Area of Review, on an adjacent property, right on top of another phantom plot. No communication with any previously constructed extraction conduit was ever realized. During the PA DEP phase of permitting for the Sedat 3A UIC well, the Department requested another surface search using metal detection equipment confirming once again that no signs of legacy oil and gas activities were present (ie. paths suitable for vehicle access, level areas supportive of drilling, wellhead/casing evidence, surface appurtenances, pipelines, etc.). The Department was satisfied and the permit was issued. It is based on this 30-year history of regulatory scrutiny and oil and gas production on the property that we can confidently assert that the wells alleged by the mine maps were only forecast and never drilled. Also included in this section are maps representing the phantom well locations, the Penneco Summary of Finding submitted to the PA DEP, and the Department's Geologic Review issued with the permit.



May 31, 2018

RE:SUMMARY OF FINDING

In response to Andrea Mullen's Notice of Incomplete Application dated April 17, 2018 and the DEP/Penneco meeting on April 24, 2018, Penneco submits the following summary of finding with regard to additional research into unknown gas/oil wells in the area of review;

1. The Environmental Protection Agency (EPA) has identified the area of review as a ¼ mile fixed radius around the center of the Sedat #3A Well (See attachment).
2. Historical farm maps from EQT and Peoples Natural Gas Company seem to indicate that some wells were drilled within the area of review which are not represented on Penneco's maps. We have found that gas wells shown on these maps are historically inaccurate and cannot be relied on as factual.
3. The DEP mine maps of the Renton Coal Mine indicate the presence of 2 gas wells within the area of review which are not represented on Penneco's maps. We have found that the mine maps are generally a good representation of the wells drilled, plugged or abandoned at the time the coal was mined. Penneco has conducted a field investigation, including metal detecting instruments, and has not found any evidence of the 2 wells indicated on the mine map which are within the area of review. On May 22, 2018, I visited the offices of the DEP California District Mining Office in California, PA and met with Joseph Stepusin, Mining Specialist. Mr Stepusin and I reviewed the Renton Mine maps for further detail on the 2 wells in question. The 2 wells were identified on the mine maps as Well #80 (Abandoned) and Well #81 (Abandoned). No other information was listed and I was told by Mr. Stepusin that there is no reference in the mine documents to the wells identified by #80 & #81.

As evidenced above, Penneco has conducted a thorough due diligence review and investigation into existing, abandoned and plugged wells within the established area of review.

Respectfully submitted,

PENNECO ENVIRONMENTAL SOLUTIONS

David T. Smail
Land & Engineering Supervisor



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Response to Comments
for
The Issuance of an Underground Injection Control (UIC) Permit
for
Penneco Environmental Solutions, LLC

On June 22, 2017, the U.S. Environmental Protection Agency Region III (EPA or the Region) issued a public notice in the Pittsburgh Tribune-Review requesting comment and announcing the opportunity for a public hearing for the proposed issuance of an Underground Injection Control (UIC) permit, PAS2D701BALL, to Penneco Environmental Solutions, LLC (Penneco) for one Class II-D underground injection well. EPA received numerous requests for a hearing which was held on July 26, 2017 at the Plum Community Center in Plum Borough, Pennsylvania. About 200 people attended the public hearing and EPA received oral comments from people in attendance at the hearing. At the hearing, EPA extended the public comment period until August 9, 2017, and invited the submission of any additional written comments. In total, EPA received approximately 400 comments from over 120 people. During the public comment period, all the information submitted by the applicant was available for review at the Plum Community Library in Plum Borough and at the EPA regional office in Philadelphia and online at the EPA web site.

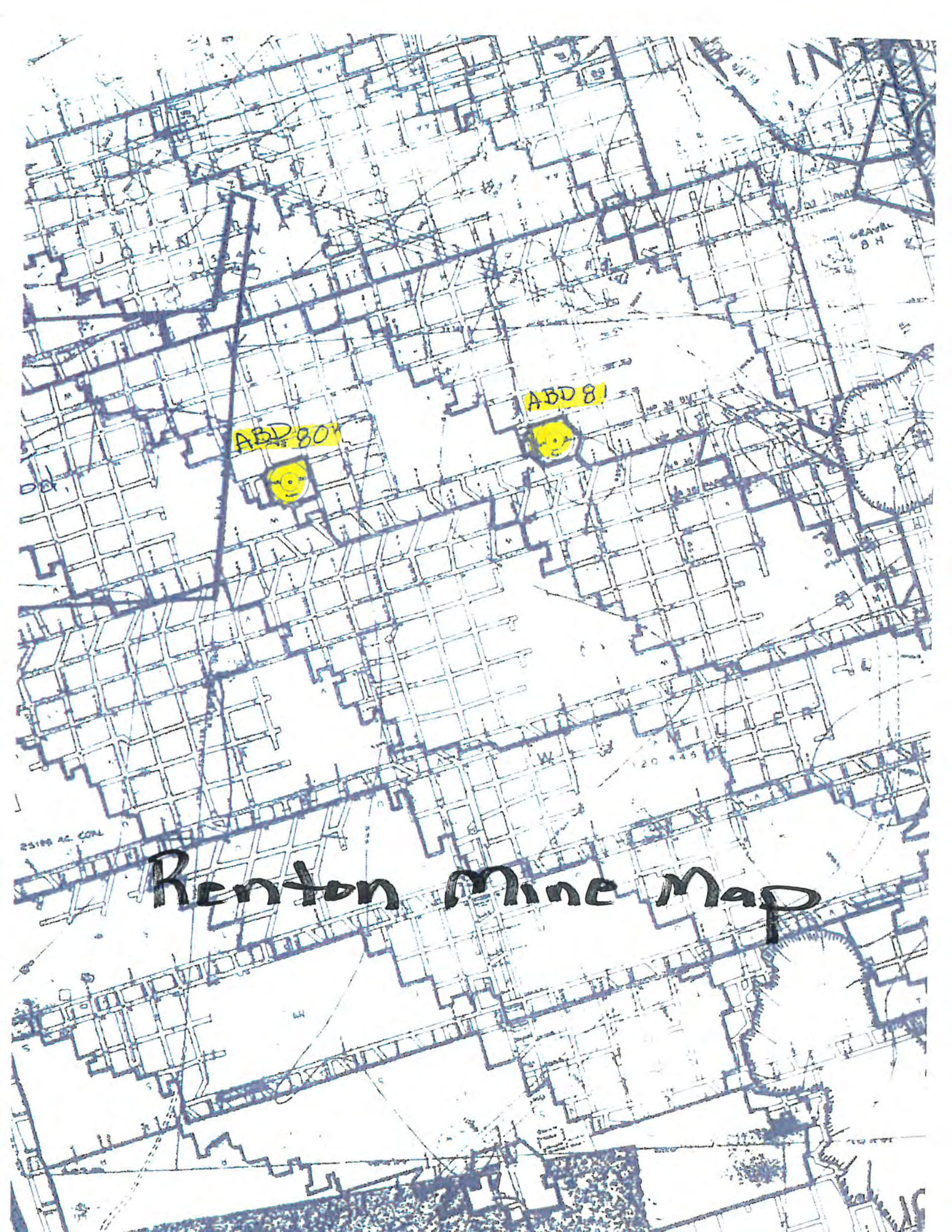
The response to comments and questions which follows consolidates and provides responses to questions and issues raised by people who sent timely written public comment during the public comment period and who provided oral comments at the public hearing. EPA wishes to thank the public for their informative and thoughtful comments and to thank the people from the Plum Community Center and Public Library that assisted EPA in hosting the public hearing.

- 8) **The wells in the Area of Review were not thoroughly evaluated. The method and data used for calculating the Zone of Endangering Influence and the Area of Review is questionable.**

40 C.F.R. §§ 144.3 and 146.6(b), defines the Area of Review (AOR) as "the area surrounding an injection well described according to the criteria set forth in § 146.06..." 40 C.F.R. § 144.3. Section 146.06 provides that the area of review for each injection well shall be determined according to either the zone of endangering influence (ZEI) or by a fixed radius. Penneco proposed a fixed radius of ¼-mile (1,320 feet) for the AOR and a maximum injection volume of 54,000 barrels per month.

EPA does not specify a method for determining porosity and permeability because there is more than one accepted method for determining such values. Based on the information provided and other relevant data, EPA calculated the zone of endangering influence (ZEI) in accordance with 40 C.F.R. § 146.6(a)(2) using the modified Theis equation and confirmed the adequacy of the ¼-mile fixed radius AOR. This evaluation also considered the chemistry and specific gravity of the fluids to be injected, proposed injection pressures and volumes and the injection formation permeability and porosity. EPA confirmed, based on the ZEI calculation, that the ¼-mile fixed radius AOR was acceptable.

The applicant must then research and then develop a program for corrective action to address any wells which penetrate the injection zone and which may provide conduits for fluid migration within the AOR. Penneco provided information on the well population within the AOR by conducting reviews of Pennsylvania Department of Environmental Protection Bureau of Oil and Gas well records and conducting a field survey of the area. After extensive research of company, local, county and state well records, five wells were identified that penetrate the injection zone within this AOR. Additionally, detailed well completion records were evaluated for approximately 60 wells which penetrate the injection zone within a one-mile radius. The permit requires Penneco to perform corrective action on any unplugged/abandoned wells that penetrate the injection zone within the Area of Review if they are identified at a future date.



Renton Mine Map



pennsylvania

DEPARTMENT OF ENVIRONMENTAL
PROTECTION

BB 4/14/2020

TO Brian Babb, PG
Subsurface Permits Environmental Program Manager
Department of Environmental Protection
District Oil and Gas Operations

THRU Thomas E. Donohue, PG TD 4/10/20
Professional Geologist Manager
Department of Environmental Protection
District Oil & Gas Operations

FROM Andrea Mullen, PG AM 4/10/20
Licensed Professional Geologist
Department of Environmental Protection
District Oil and Gas Operations

Harry C. Wise, PG HCW 4-10-20
Professional Geologist Manager
Bureau of Oil & Gas Planning and Program Management

DATE March 31, 2020

RE Geologic Review of Proposed Disposal Well
Penneco Environmental Solutions – Sedat #3A Well
Plum Borough, Allegheny County

Introduction

This technical review assesses the suitability of the geologic structure and setting for waste disposal via injection in the vicinity of the Sedat 3A gas well in Plum Borough, Allegheny County, Pennsylvania, owned and operated by Penneco Environmental Solutions (Penneco). The conclusions of this report are based on a review of all documents submitted by Penneco, published maps and reports from the DCNR and others, and my experience as a licensed professional geologist.

Background

The Sedat 3A (API #003-21223) was originally drilled and constructed as a gas well targeting the Bradford Formation. The Sedat 3A was drilled from January 25, 1989 to February 1, 1989 to a total



vertical depth (TVD) of 4,320 feet below grade (fbg). The Sedat 3A produced gas until 2015, when Penneco plugged it back to 1,940 fbg, targeting the Murrysville Formation as a disposal stratum. Currently, the Sedat 3A has 13 3/8 in diameter casing set from 0-16 fbg and sanded in, 9 5/8 in casing set from 0-643 fbg and cemented, 7 in diameter casing set from 0-1,948 fbg, and a 4 1/2 in injection string set from 0-1,796 fbg, held in place with a Parmaco Tension Packer. A bridge plug is set in the Sedat 3A at 1,940 fbg, and the 7 in casing is perforated from 1,896-1,936 fbg.

On March 13, 2018, the Department received a permit application from Penneco to change the designation of the Sedat 3A from a gas well to an injection disposal well. Attached was an EPA permit and approved EPA permit application and required related documentation submitted for the disposal well to the EPA.

Geologic Setting

The Sedat 3A is located in the Pittsburgh Low Plateau Section of the Allegheny Plateau Physiographic Province, which is characterized by high local relief, deep valleys, and relatively flat-lying strata relative to other areas of the state. The surface is characterized by rocks of Pennsylvanian age, mostly the Monongahela Group, the Casselman Formation, and the Glenshaw Formation (Figure 1). The Sedat 3A is sited approximately 630 ft northwest of the mapped axis of the Duquesne Syncline, and locally beds dip towards the southeast. There are no local mapped faults, although faults are inferred approximately 5 miles to the southeast and 8 miles to the northwest. The Blairsville-Broadtop Lineament is located approximately 6 miles to the northeast.

The Murrysville Formation is the target stratum for the injection well. Also referred to as the Cussewago Sandstone, the Murrysville is characterized by a coarse-grained, poorly cemented sandstone, fining upward and interbedded with siltstone. The basal portion of the Murrysville has high permeability, while the finer-grained tightly cemented sand at the top of the Murrysville has low porosity and permeability. The Murrysville grades upwards into the Riddlesburg Shale. The Riddlesburg Shale is composed of interbedded shales, siltstones and scour-based fine-grained sandstones (Bjerstedt and Kammer, 1988). Gamma logs submitted by Penneco appear to show a distinctly lower porosity in the Riddlesburg as compared to the Murrysville; however, the locations of where the gamma logs were collected were not shown on the map, and an examination of the metadata indicate they may be located several miles outside of the area of review (AOR). Isopach maps submitted by Penneco indicate that the Riddlesburg has an approximate thickness in the area of the Sedat 3A of approximately 50 ft. The thickness and low porosity of the Riddlesburg in this area indicate that it is an effective upper confining layer.

Water and Groundwater Resources

Penneco's application identified no streams or wetlands within the quarter mile AOR. This is consistent with the Department's records.

The Department has no record of public water supplies within the AOR. Penneco conducted a survey of property owners within 1 mile of the Sedat 3A to identify owners of private water supplies. Five wells and two springs were identified as being within the quarter mile AOR. The sources of the springs are likely shallow water bearing zones in the Casselman Formation. The identified wells and springs are situated on the edge of the quarter mile AOR.



In the permit application, Penneco identified underground sources of drinking water (USDWs) as the Monongahela Group, the Conemaugh Group, and the Allegheny Group, a section which can be as thick as 1,300 ft. According to the Pennsylvania Groundwater Information System (PAGWIS), wells for domestic and industrial use in Plum Borough and Upper Burrell Township have depths ranging from 18 fbg to 500 fbg, but the median depths appear to be between 125 fbg and 150 fbg. The Pennsylvania Geologic Survey identifies formations below the bottommost member of the Allegheny Group (Worthington Formation) as producing water too high in salt to be considered adequate drinking water sources.

The Monongahela Group (to a small extent) and the top two members of the Conemaugh Group (the Casselman Formation and Glenshaw Formation), are mapped at the surface. This indicates that the total thickness of the USDWs is approximately 710 ft. With the thickness of the Riddlesburg Shale of 50 ft with its base at 1,822 fbg, this provides sufficient separation between any USDWs and the Murrysville Sand.

Given the distances and depths, and absent any mechanical integrity issues of the Sedat 3A, the private water supplies are unlikely to be affected by UIC activities at the Sedat 3A. However, because domestic use water wells and springs are within the quarter mile AOR, additional monitoring beyond the EPA permit is warranted. The proposed Sedat 1A is located approximately 1,010 ft to the southwest and was proposed as a monitoring well for the injection formation. This distance is closer to the injection well than any identified or suspected water supply well. Monitoring of water levels at this well would provide an early warning if fluid injected into the Murrysville Formation could migrate via unidentified abandoned wells or fractures into an area where it would pose a risk to USDWs. Suggested special permit conditions are included as Appendix B.

Mining

Mining, particularly of coal, is common in Allegheny County. Three abandoned underground mines are present within 1 mi of the Sedat 3A. The boundary of the Renton No. 5, targeting the Pittsburgh Coal Seam, is approximately 3,500 ft to the southwest of the Sedat 3A. The Springdale Mine, formerly operated by the Allegheny Pittsburgh Coal Company and targeting the Upper Freeport, is located approximately 1,500 ft to the northwest. The Sedat 3A was drilled through the former Renton Mine, operated by Villa Coal Company, also targeting the Upper Freeport Formation. All three mines have been sealed, and no active mining permits currently exist in the 1 mi area of review. All other coal seams are either absent or inferred.

Abandoned underground coal mines may provide pathways for groundwater flow, including from injection and disposal wells. However, the top of the injection zone is located at approximately 720 ft below mean sea level. The elevation of the mined-out area is at 560 ft above mean sea level, separating it from the injection zone by 1,280 ft, at least 50 ft of which is the Riddlesburg Shale confining layer. Absent mechanical integrity issues with the cementing and casing, fluid migration into the mined-out area is unlikely due to the distance of separation.

Oil and Gas

In this geologic review, two major areas of concern are storage field locations and other oil and gas wells within the area of review. The Murrys ville has been identified as a candidate for oil and gas storage, and operation of a disposal well in this formation could interfere with the operation of a storage field. Other oil and gas wells in the area of review could also interfere with the operation of the disposal well, possibly presenting a pathway for disposed fluids to return to the surface.

The nearest active gas storage field to the Sedat 3A is the Murrys ville Storage field, approximately 4 mi south. The Murrys ville Storage Field targets the Venango Group. The Venango group is below the Murrys ville stratigraphically, and should not be affected by activities at the Sedat 3A. The nearest active storage field that targets the Murrys ville formation is the Oakford Storage Field, approximately 11.5 miles to the southeast. The distance between the Sedat 3A and the Oakford Storage Field likely prohibits any interaction between the storage field and the disposal well.

DEP records identify sixteen oil & gas wells within a half mile of the Sedat #3A. One well is in DEP records as being Operator Reported Not Drilled (ORND), and one is recorded as Plugged. Of the remaining wells, four are located in the quarter mile AOR- the Sedat 1, the Sedat 5H, the Sedat 4A, and the Sedat 2A, all owned by Penneco. The Sedat 1 will be converted into the Sedat 1A monitoring point. The status, depth, depth of casing, and locations of all sixteen wells were all verified by a DEP Oil and Gas Inspector. The Inspector also found that the active wells had adequate mechanical integrity and were unlikely to provide a pathway for injected fluid to reach USDWs.

Penneco's application also correctly identified 66 oil & gas wells within a mile radius of the Sedat 3A. However, a number of wells from sources other than eFACTS are unaccounted for. Such wells can be located on EQT and People's Natural Gas Company historic farm maps, as well as on the mine maps from the former Renton Mine, and in the original Sedat 3A permit file. On May 31, 2018, Penneco submitted a summary of findings in response to the PADEP notice of deficiency dated April 17, 2018, stating that they had investigated the site with metal detecting equipment in search of these wells, and were unable to locate them.

Seismic events (prepared by Harry Wise, P.G.):

The Department's review indicates there are no historical seismic events within the quarter mile radius area of review. There are no historical earthquakes (since 1970) of magnitude two (2M) or greater within Allegheny County.

In EPA's Response to Comments for The Issuance of an Underground Injection Control (UIC) Permit for Penneco Environmental Solutions, LLC Question 10 notes "Injection wells may increase seismic activity which could cause fluid migration and USDW contamination and mine subsidence. One commentator specifically referenced the proximity of the injection well to the Blairsville-Broadtop (Mahoning River) Lineament" as problematic. In response to this statement, EPA discusses how induced seismic events associated with injection wells in Ohio were created by disposal in Precambrian basement rock. These rocks are often cross-cut by blind faults or are crystalline in nature. Additional studies by the State of Oklahoma (<http://earthquakes.ok.gov/>) and within the geologic community appear to corroborate the belief that injecting fluid into brittle, crystalline basement rock can induce seismicity. The EPA comment response document noted that the "Blairsville-Broadtop (Mahoning River) Lineament is part of this deep



Precambrian fault system approximately 7,000 feet below the Murrysville Sand injection zone and thus will not allow fluid movement into USDWs." The Department's review of the basement rock (depths of approximately 18,000 to 19,000 feet below land surface) confirmed a separation distance of thousands of feet, in this case of approximately 17,000 feet.

The Department also reviewed the maps from "Topographic and Geologic Atlas of Pennsylvania, No. 36, Freeport Quadrangle", 1933, prepared by H. Herbert Hughes, for the Commonwealth of Pennsylvania, Department of Internal Affairs and the Topographic and Geologic Survey. This review indicates the site is located on the northwestern side of the axis of the Duquesne-Fairmount Syncline. No other structural geologic features were noted around the proposed well with the closest structure being an inferred fault located approximately 4.8 miles to the southeast of the site. Based on this review, the Department concurs with EPA's statement in their comment response document that injection will not occur within, or should not flow into, the deeper Precambrian crystalline rocks.

Induced seismicity relating to the operation of injection wells results from the interrelationship of factors such as depth to basement rock, distance to existing faults, fault plane orientation and pore pressure regimes. This geologic analysis has not revealed indicators suggestive of a heightened potential for induced seismicity; however, there are some reported structural geologic anomalies that have been noted within the area surrounding the well. Based upon the review of all available information, it is my professional opinion that injection activities at this well pose a very low risk with regards to induced seismicity. It is recommended that to better understand the response of the Murrysville sandstone to injection fluids and to best manage any seismic risk, the application of the specific permit conditions addressing seismic monitoring and mitigation listed in Appendix A should be implemented.

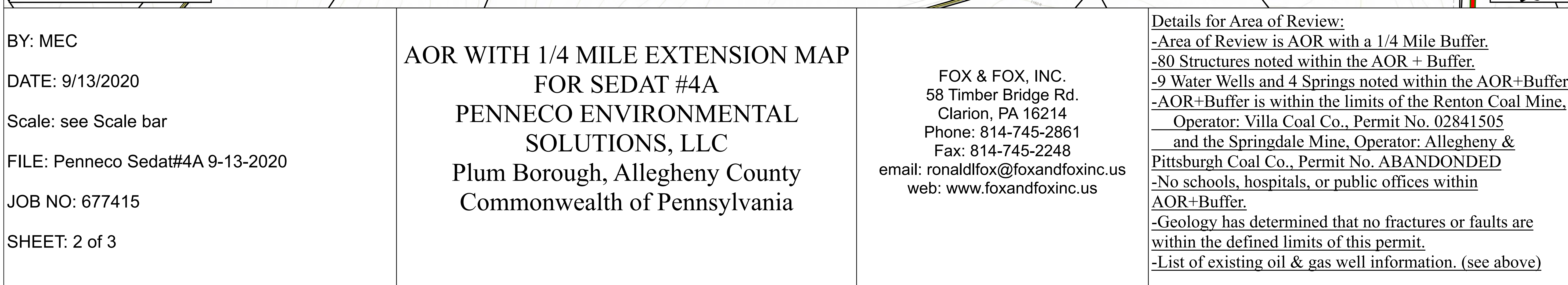
Conclusions

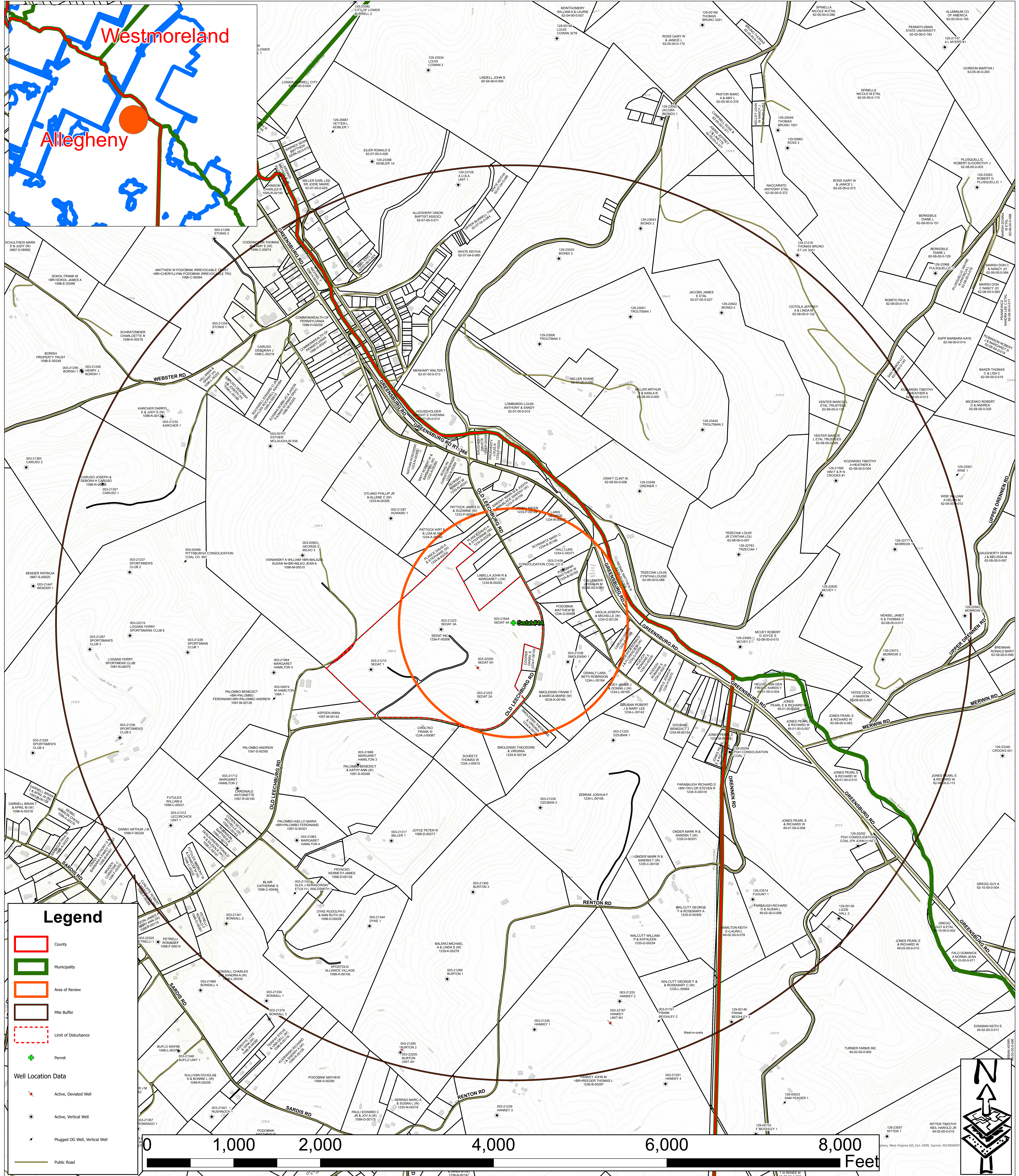
The Sedat 3A is completed in the Murrysville Formation, which is approximately 17,000 ft above basement rock, and is not located within a mile of any known or inferred faults. Seismic risk of injection into the Murrysville Formation is therefore low. The Murrysville formation has an upper confining layer of Riddlesburg Shale approximately 50 ft thick, and is separated from known USDWs by approximately 1,800 ft. There are no known faults or lineaments within the quarter mile AOR. The risk of injected fluid migrating from the Murrysville through natural pathways is therefore low.

Sixteen oil & gas wells were identified within a half mile of the Sedat 3A. Of these, one was ORND, and another was in DEP records as Plugged. The remaining wells were found to have mechanical integrity. The risk of fluid migration through known oil and gas wells to USDWs is therefore low.

The deepest underground mining in the area is located approximately 1,280 ft above the injection zone, which includes 50 ft of the Riddlesburg Shale. The risk of fluid migration from the Murrysville Formation to USDWs mediated by underground mining is low.

Due to the low risk of fluid migration to USDWs and induced seismicity, operation of the Sedat 3A as a Class III disposal well is unlikely to be prejudicial to the public interest. However, to mitigate risks, I recommend the special conditions outlined in Appendix A and B to be included on the permit. I hold these opinions with a reasonable degree of scientific certainty.





BY: MEC

DATE: 9/13/2020

Scale: see Scale Bar

FILE: Penneco Sedat#4A 9-13-2020

JOB NO: 677415

SHEET: 3 of 3

AOR WITH 1 MILE EXTENSION

MAP

FOR SEDAT #4A

PENNECO ENVIRONMENTAL SOLUTIONS, LLC

Plum Borough, Allegheny County

Commonwealth of Pennsylvania

FOX & FOX, INC.

58 Timber Bridge Rd.

Clarion, PA 16214

Phone: 814-745-2861

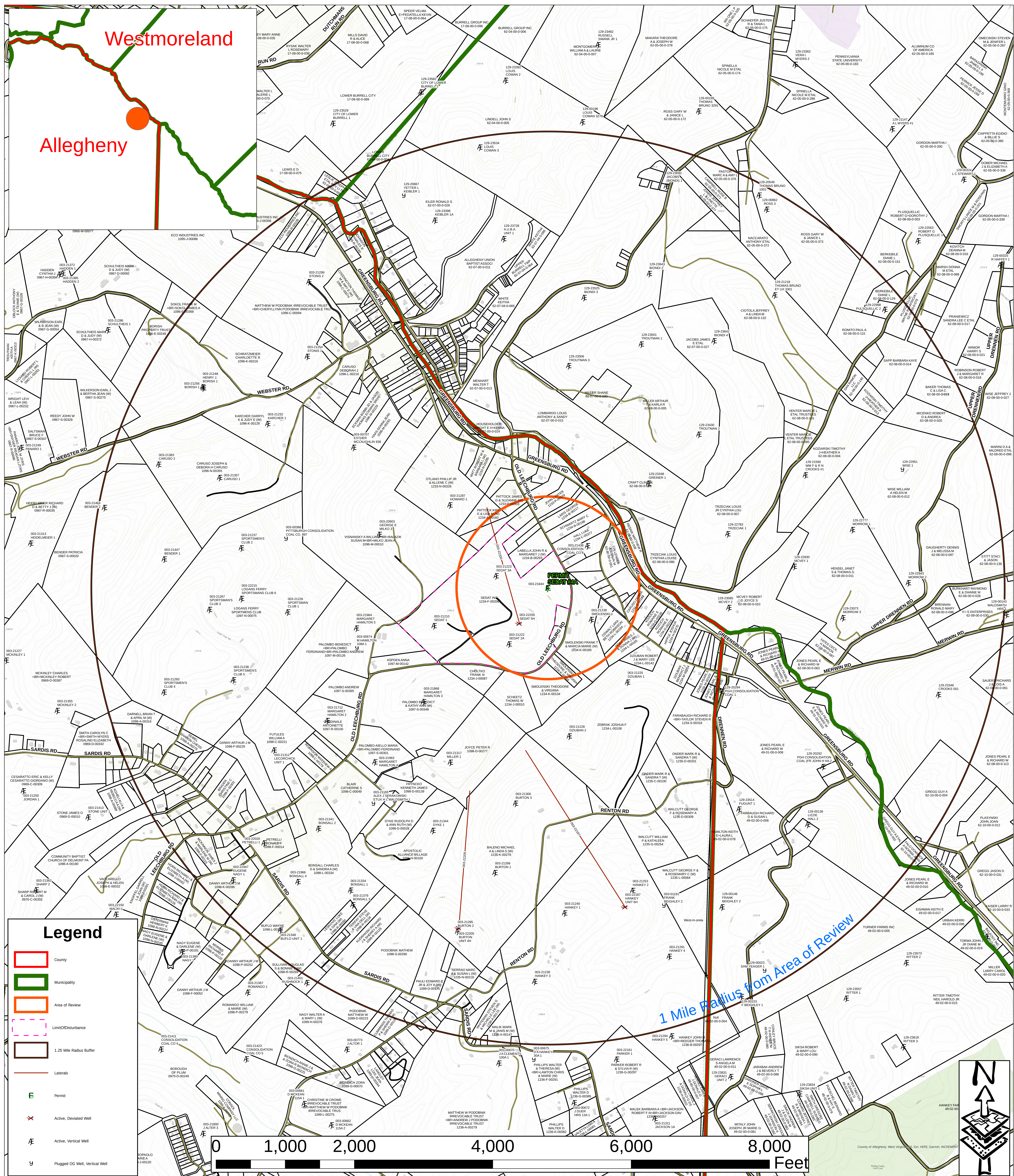
Fax: 814-745-2248

email: ronaldfox@foxandfoxinc.us

web: www.foxandfoxinc.us

Details for Area of Review:

- Area of Review is AOR with a 1 Mile Buffer.
- No hazardous waste treatment, storage, or disposal facilities within AOR+Buffer.
- Geology has determined that no outcrops of injection formations are within the defined limits of this permit.

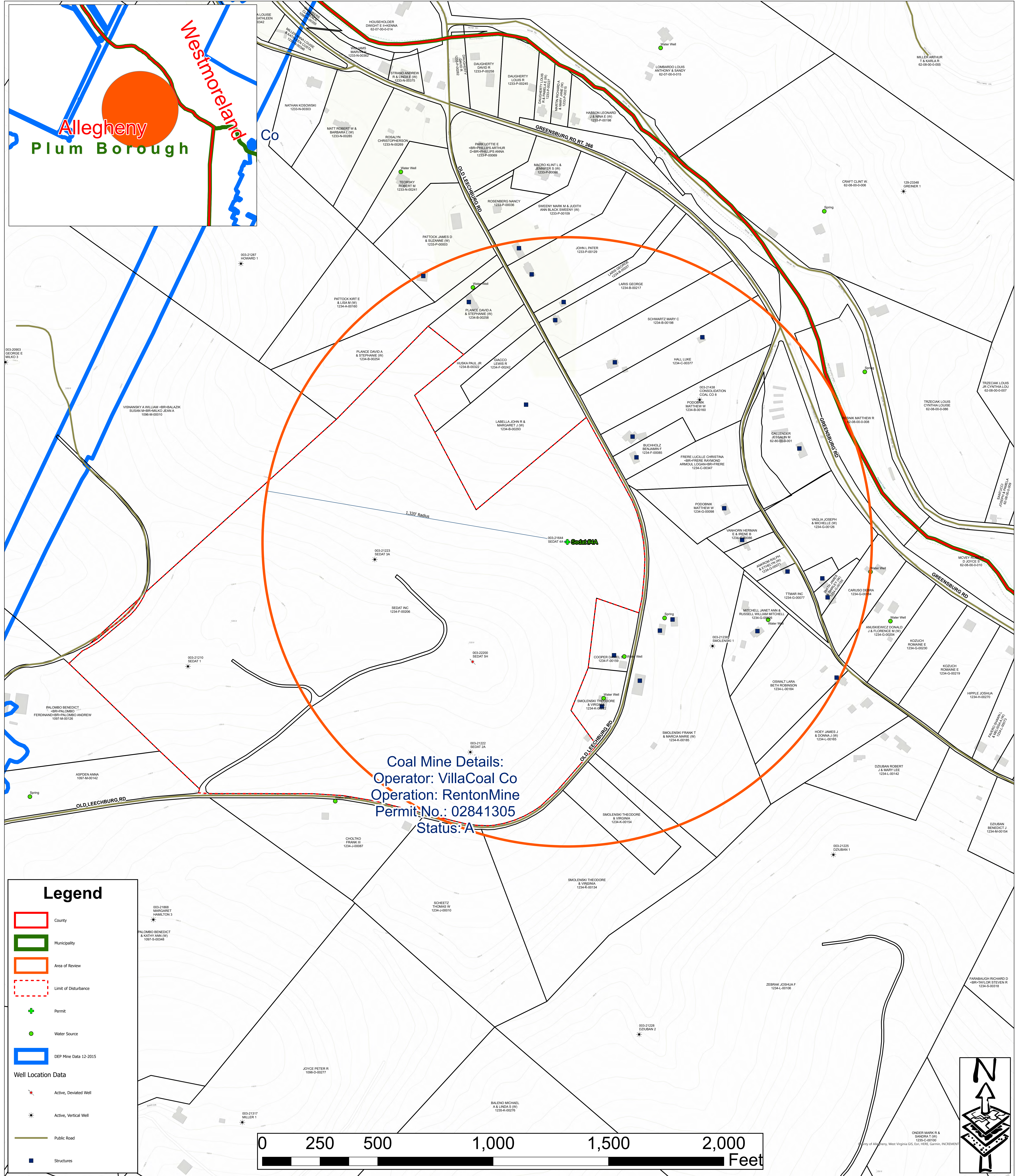


BY: MEC
DATE: 5/13/2021
Scale: see Scale Bar
FILE: Penneco
JOB NO: 677415
SHEET: 3 of 3

AREA OF REVIEW WITH ADDITIONAL 1 MILE BUFFER FOR SEDAT #4A PENNECO ENVIRONMENTAL SOLUTIONS, LLC Plum Borough, Allegheny County Commonwealth of Pennsylvania

FOX & FOX, INC.
58 Timber Bridge Rd.
Clarion, PA 16214
Phone: 814-745-2861
Fax: 814-745-2248
email: ronaldfox@foxandfoxinc.us
web: www.foxandfoxinc.us

Details for Area of Review:
-Area of Review is AOR with an additional 1 Mile Buffer.
-No hazardous waste treatment, storage, disposal facilities within AOD or 1 Mile Additional Buffer.
-Geology has determined that no outcrops of injection formations are within the defined limits of this permit.



BY: MEC

DATE: 9/13/2020

Scale: see Scale Bar

FILE: Penneco Sedat#4A 9-13-2020

JOB NO: 677415

SHEET: 1 of 3

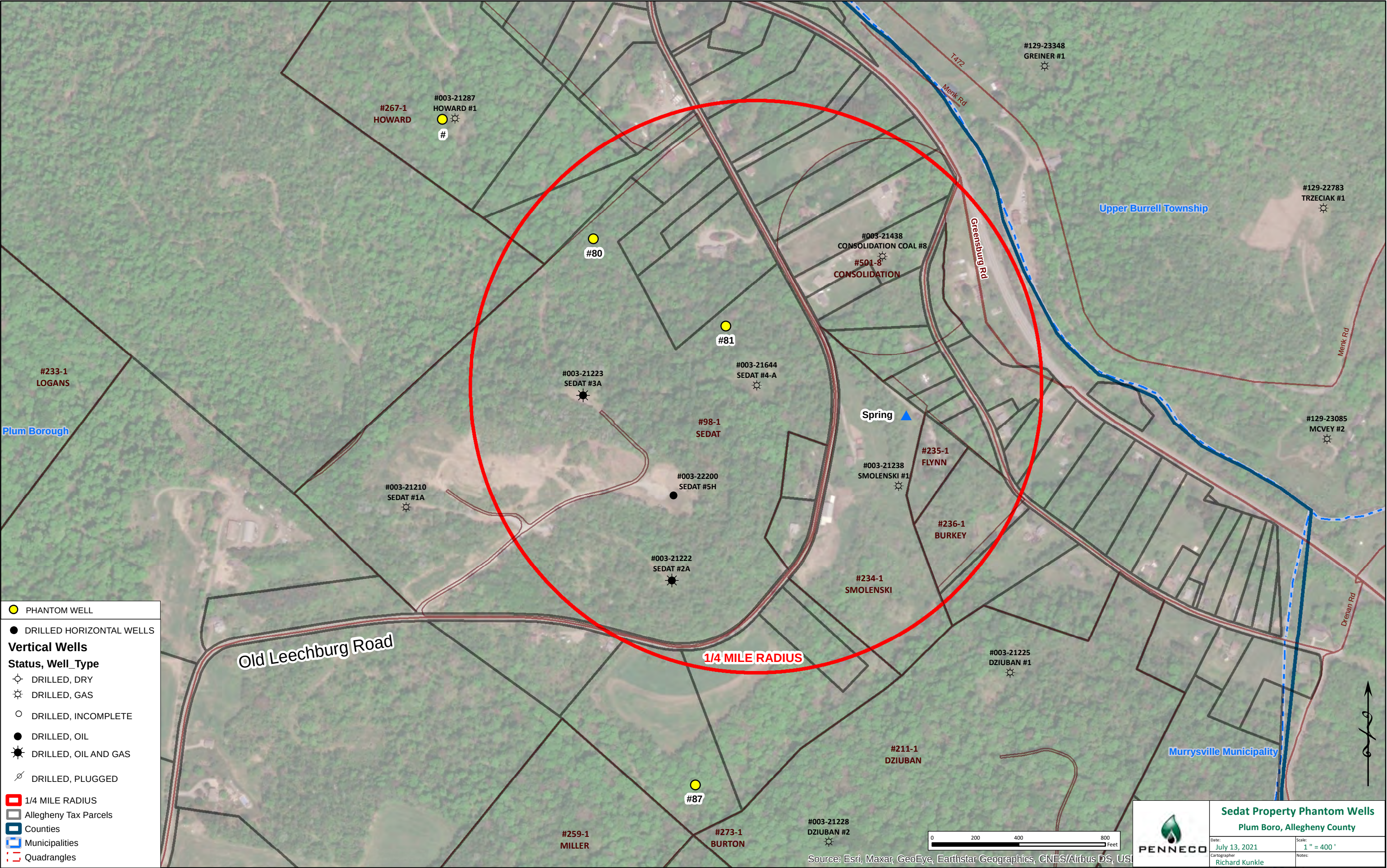
AREA OF REVIEW MAP FOR SEDAT #4A PENNECO ENVIRONMENTAL SOLUTIONS, LLC Plum Borough, Allegheny County Commonwealth of Pennsylvania

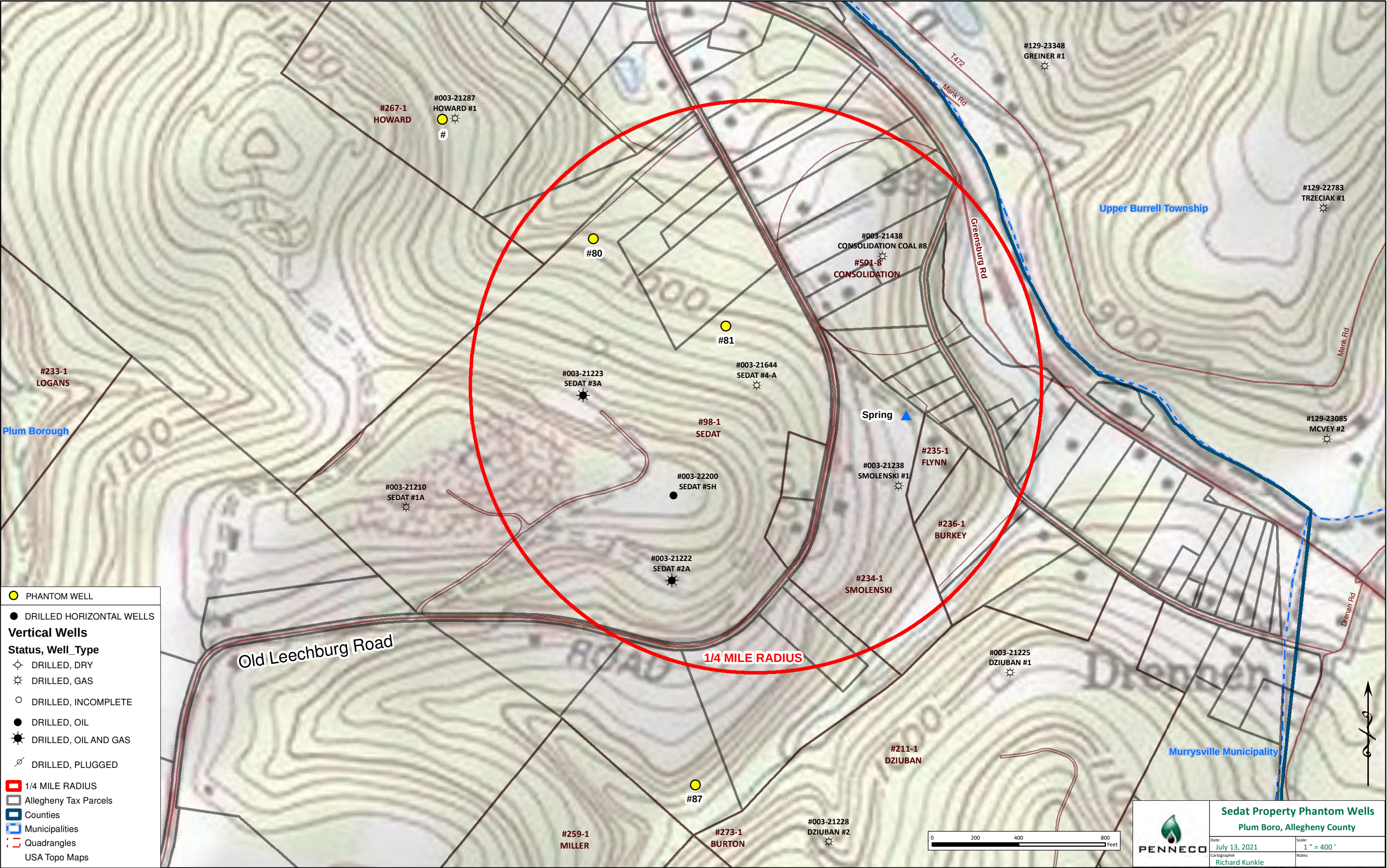
FOX & FOX, INC.
58 Timber Bridge Rd.
Clarion, PA 16214
Phone: 814-745-2861
Fax: 814-745-2248
email: ronaldfox@foxandfoxinc.us
web: www.foxandfoxinc.us

Details for Area of Review:

- AOR is 1/4 Mile Radius from Well Surface Location
- 24 Structures noted within the AOR.
- 4 Water Wells and 1 Spring noted within the AOR.
- AOR is within the limits of the Renton Coal Mine, Operator: Villa Coal Co., Permit No. 02841505.
- No schools, hospitals, or public offices within AOR.
- Geology has determined that no fractures or faults are within the defined limits of this permit.
- List of existing wells:

API	WELL STATUS	OPERATOR	FARM NAME	WELL CODE_DESC	SPUD_DATE	CONFIGURATION	UNCONVENTIONAL
003-21222	Active	PENNECO OIL CO INC	SEDAT 2A	GAS	1/12/1989	Vertical Well	No
003-21223	Active	PENNECO OIL CO INC	SEDAT 3A	GAS	1/29/1989	Vertical Well	No
003-21228	Active	PENNECO OIL CO INC	SMOLENSKI J	GAS	11/13/1989	Vertical Well	No
003-21438	Active	PENNECO OIL CO INC	CONSOLIDATION COAL CO 8	GAS	1/4/1999	Vertical Well	No
003-21644	Active	PENNECO OIL CO INC	SEDAT 4A	GAS	6/18/2004	Vertical Well	No
003-22200	Active	PENNECO OIL CO INC	SEDAT SH	OIL	1/10/2012	Deviated Well	No





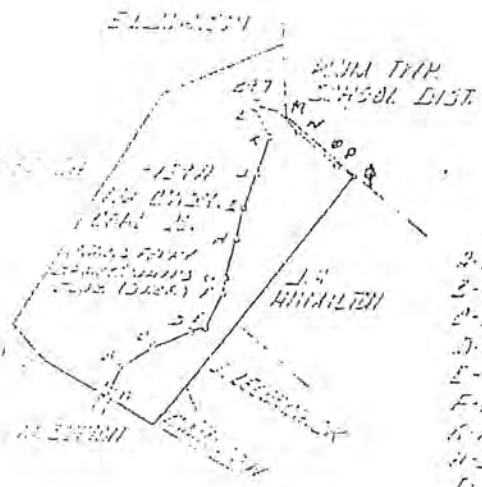
Sedat #4H Injection Well Inventory

	API	SPUD_DATE	OPERATOR	COUNTY	MUNICIPALITY	FARM_NAME	WELL_CODE_DESC	WELL_STATUS	LATITUDE	LONGITUDE	CONFIGURATION	UNCONVENTIONAL
1	003-00366	1/1/1800 0:00:00	PEOPLES NATURAL GAS CO LLC	Allegheny	Plum Boro	PITTSBURGH CONSOLIDATION COAL CO. 897	GAS	Plugged OG Well	40.528646	-79.724456	Vertical Well	No
2	003-00674	1/1/1800 0:00:00	PHILLIPS EXPLORATION INC	Allegheny	Plum Boro	M HAMILTON 108A 1	GAS	Plugged OG Well	40.524366	-79.720644	Vertical Well	No
3	003-00707	1/1/1800 0:00:00	PEOPLES NATURAL GAS CO LLC	Allegheny	Plum Boro	ESTHER MCLAUGHLIN 938	GAS	Active	40.532352	-79.721039	Vertical Well	No
4	003-01191	1/1/1800 0:00:00	PEOPLES TWP LLC	Allegheny	Plum Boro	FRANK BEIGHLEY 2	GAS	Plugged OG Well	40.514433	-79.704377	Vertical Well	No
5	003-20903	12/28/1976	PETRO SVC PARTNERS INC	Allegheny	Plum Boro	GEORGE E MILKO 3	GAS	Active	40.528921	-79.7196	Vertical Well	No
6	003-21165	1/1/1800 0:00:00	PEOPLES TWP LLC	Allegheny	Plum Boro	ALEX J SERAKOWSKI ETUX H L WALDSMITH 1	GAS	Plugged OG Well	40.518216	-79.719598	Vertical Well	No
7	003-21210	3/5/1988	DAKOTA OIL & GAS CO	Allegheny	Plum Boro	SEDAT 1	COMB. OIL&GAS	Active	40.525353	-79.71665	Vertical Well	No
8	003-21222	1/12/1989	PENNECO OIL CO INC	Allegheny	Plum Boro	SEDAT 2A	GAS	Active	40.524694	-79.712729	Vertical Well	No
9	003-21223	1/25/1989	PENNECO OIL CO INC	Allegheny	Plum Boro	SEDAT 3A	GAS	Active	40.527384	-79.713484	Vertical Well	No
10	003-21225	11/30/1988	PENNECO OIL CO INC	Allegheny	Plum Boro	DZIUBAN 1	GAS	Active	40.523287	-79.706527	Vertical Well	No
11	003-21226	12/30/1988	PENNECO OIL CO INC	Allegheny	Plum Boro	SPORTSMAN CLUB 1	OIL	Active	40.525764	-79.724275	Vertical Well	No
12	003-21228	3/21/1989	PENNECO OIL CO INC	Allegheny	Plum Boro	DZIUBAN 2	GAS	Active	40.521099	-79.709491	Vertical Well	No
13	003-21232	10/17/1989	DAKOTA OIL & GAS CO	Allegheny	Plum Boro	KARCHER 1	GAS	Active	40.533216	-79.725536	Vertical Well	No
14	003-21236	11/2/1989	DAKOTA OIL & GAS CO	Allegheny	Plum Boro	SPORTSMEN'S CLUB 5	GAS	Active	40.523019	-79.727008	Vertical Well	No
15	003-21237	10/25/1989	PENNECO OIL CO INC	Allegheny	Plum Boro	SPORTSMEN'S CLUB 2	GAS	Active	40.528261	-79.726758	Vertical Well	No
16	003-21238	11/13/1989	PENNECO OIL CO INC	Allegheny	Plum Boro	SMOLENSKI 1	GAS	Active	40.525737	-79.708484	Vertical Well	No
17	003-21240	12/5/1989	PENNECO OIL CO INC	Allegheny	Plum Boro	HANKEY 1	GAS	Active	40.514072	-79.709527	Vertical Well	No
18	003-21253	3/5/1991	DAKOTA OIL & GAS CO	Allegheny	Plum Boro	HANKEY 2	GAS	Active	40.515026	-79.706018	Vertical Well	No
19	003-21254	10/19/1990	PENNECO OIL CO INC	Allegheny	Plum Boro	STONIS 1	GAS	Active	40.53592	-79.723558	Vertical Well	No
20	003-21266	2/22/1991	DAKOTA OIL & GAS CO	Allegheny	Plum Boro	BURTON 1	GAS	Active	40.515609	-79.713196	Vertical Well	No
21	003-21267	3/13/1991	PENNECO OIL CO INC	Allegheny	Plum Boro	SPORTSMAN'S CLUB 3	GAS	Active	40.52579	-79.72834	Vertical Well	No
22	003-21285	10/18/1991	PENNECO OIL CO INC	Allegheny	Plum Boro	BURTON 2	GAS	Active	40.513248	-79.715066	Vertical Well	No
23	003-21287	9/24/1991	PENNECO OIL CO INC	Allegheny	Plum Boro	HOWARD 1	GAS	Active	40.530156	-79.715967	Vertical Well	No
24	003-21300	3/9/1992	PENNECO OIL CO INC	Allegheny	Plum Boro	BURTON 3	GAS	Active	40.518381	-79.712207	Vertical Well	No
25	003-21312	10/27/1992	PENNECO OIL CO INC	Allegheny	Plum Boro	LECORCHICK UNIT 1	GAS	Active	40.520274	-79.724814	Vertical Well	No
26	003-21317	12/31/1992	DAKOTA OIL & GAS CO	Allegheny	Plum Boro	MILLER 1	GAS	Active	40.519946	-79.715642	Vertical Well	No
27	003-21334	11/9/1993	DAKOTA OIL & GAS CO	Allegheny	Plum Boro	BONSALL 1	GAS	Active	40.514785	-79.720676	Vertical Well	No
28	003-21341	3/4/1994	PENNECO OIL CO INC	Allegheny	Plum Boro	BONSALL 2	GAS	Active	40.517203	-79.722417	Vertical Well	No
29	003-21344	5/11/1994	PENNECO OIL CO INC	Allegheny	Plum Boro	DYKE 1	GAS	Active	40.517228	-79.716469	Vertical Well	No
30	003-21357	10/21/1994	PENNECO OIL CO INC	Allegheny	Plum Boro	CARUSO 1	GAS	Active	40.531035	-79.727969	Vertical Well	No
31	003-21438	1/4/1999	PENNECO OIL CO INC	Allegheny	Plum Boro	CONSOLIDATION COAL CO 8	GAS	Active	40.52866	-79.708772	Vertical Well	No
32	003-21644	6/18/2004	PENNECO OIL CO INC	Allegheny	Plum Boro	SEDAT 4A	GAS	Active	40.526935	-79.710783	Vertical Well	No
33	003-21712	12/30/2005	XTO ENERGY INC	Allegheny	Plum Boro	MARGARET HAMILTON 2	GAS	Active	40.521494	-79.722083	Vertical Well	No
34	003-21868	11/30/2007	XTO ENERGY INC	Allegheny	Plum Boro	MARGARET HAMILTON 3	GAS	Active	40.522332	-79.7171	Vertical Well	No
35	003-21963	11/13/2008	XTO ENERGY INC	Allegheny	Plum Boro	MARGARET HAMILTON 4	GAS	Active	40.519891	-79.719567	Vertical Well	No
36	003-21964	6/22/2009	XTO ENERGY INC	Allegheny	Plum Boro	MARGARET HAMILTON 5	GAS	Active	40.525188	-79.72068	Vertical Well	No
37	003-22187	6/13/2011	PENNECO OIL CO INC	Allegheny	Plum Boro	HANKEY UNIT 6H	OIL	Active	40.514333	-79.706388	Deviated Well	No
38	003-22200	1/10/2012	PENNECO OIL CO INC	Allegheny	Plum Boro	SEDAT 5H	OIL	Active	40.525486	-79.712216	Deviated Well	No
39	003-22205	6/14/2012	PENNECO OIL CO INC	Allegheny	Plum Boro	BURTON UNIT 4H	OIL	Active	40.513358	-79.715013	Deviated Well	No
40	003-22215	3/29/2012	PENNECO OIL CO INC	Allegheny	Plum Boro	LOGANS FERRY SPORTSMANS CLUB 6	GAS	Active	40.526255	-79.726688	Vertical Well	No
41	129-00136	10/1/1918	DAKOTA OIL & GAS CO	Westmorelar	Upper Burrell Twp	LIZZIE HALL #2	GAS	Active	40.517807	-79.697005	Vertical Well	No
42	129-20294	1/1/1800 0:00:00	XTO ENERGY INC	Westmorelar	Murrysville Boro	PGH CONSOLIDATION COAL 1	GAS	Active	40.523	-79.70168	Vertical Well	No
43	129-21590	1/1/1800 0:00:00	ECONOMY NATURAL GAS INC	Westmorelar	Upper Burrell Twp	WM F & R N CROOKS #1	GAS	Active	40.531666	-79.697527	Vertical Well	No
44	129-22777	2/24/1986	DAKOTA OIL & GAS CO	Westmorelar	Upper Burrell Twp	MORROW 1	COMB. OIL&GAS	Active	40.529535	-79.695019	Vertical Well	No
45	129-22783	6/2/1986	PENNECO OIL CO INC	Westmorelar	Upper Burrell Twp	TRZECIAK 1	GAS	Active	40.529259	-79.701494	Vertical Well	No
46	129-22830	1/26/1987	DAKOTA OIL & GAS CO	Westmorelar	Upper Burrell Twp	MCVEY 1	GAS	Active	40.528025	-79.698004	Vertical Well	No
47	129-22943	1/30/1987	PENNECO OIL CO INC	Westmorelar	Upper Burrell Twp	MORROW #2	GAS	Active	40.527402	-79.692575	Vertical Well	No
48	129-23073	2/19/1988	PENNECO OIL CO INC	Westmorelar	Upper Burrell Twp	MORROW 3	GAS	Active	40.526036	-79.695413	Vertical Well	No

49	129-23085	11/5/1988	PENNECO OIL CO INC	Westmorelar Upper Burrell Twf MCVEY 2	GAS	Active	40.526336	-79.701349	Vertical Well	No
50	129-23348	7/26/1991	DAKOTA OIL & GAS CO	Westmorelar Upper Burrell Twf GREINER 1	GAS	Active	40.531193	-79.705668	Vertical Well	No
51	129-23430	9/6/1991	PENNECO OIL CO INC	Westmorelar Upper Burrell Twf TROUTMAN 2	GAS	Active	40.533184	-79.703115	Vertical Well	No
52	129-23501	5/14/1992	PENNECO OIL CO INC	Westmorelar Upper Burrell Twf TROUTMAN 1	GAS	Active	40.53671	-79.706211	Vertical Well	No
53	129-23506	8/3/1992	PENNECO OIL CO INC	Westmorelar Upper Burrell Twf TROUTMAN 3	GAS	Active	40.535784	-79.709959	Vertical Well	No
54	129-23514	7/7/1992	DAKOTA OIL & GAS CO	Westmorelar Murrys ville Boro FUGUNT 1	GAS	Active	40.518349	-79.700589	Vertical Well	No
55	129-23525	8/11/1992	PENNECO OIL CO INC	Westmorelar Upper Burrell Twf BIONDI 3	GAS	Active	40.538501	-79.70924	Vertical Well	No
56	129-23642	10/21/1993	DAKOTA OIL & GAS CO	Westmorelar Upper Burrell Twf BIONDI 4	GAS	Active	40.536903	-79.702433	Vertical Well	No
57	129-23643	10/14/1993	PENNECO OIL CO INC	Westmorelar Upper Burrell Twf BIONDI 2	GAS	Active	40.539513	-79.705874	Vertical Well	No
58	129-23728	8/11/1994	PENNECO OIL CO INC	Westmorelar Upper Burrell Twf A.U.B.A. UNIT 1	GAS	Active	40.540765	-79.713485	Vertical Well	No

003-00366

Map No. N. E.
 Pg. Bl. Sk. Pg. 7
 Date



⊕ WELLS

WELL	BEARING	DISTANCE
A-B	N 85° 22' E	321.5'
B-C	N 55° 34' 30" E	417.3'
C-D	N 58° 15' 30" E	351.5'
D-E	N 73° 5' 30" E	140.5'
E-F	N 26° 25' E	232.5'
F-G	N 12° 15' 30" E	152.5'
G-H	N 12° 15' 30" E	211.5'
H-I	N 12° 15' 30" E	212.5'
I-J	N 12° 15' 30" E	345.2'
J-K	N 12° 15' 30" E	252.7'
K-L	N 22° 34' 30" E	370.4' WELL END
L-M	S 71° 15' E	215.5'
M-N	S 53° 14' 30" E	222.5'
N-O	S 41° 13' E	212.5'
O-P	S 43° 14' 30" E	147.4'
P-Q	S 52° 17' 30" E	152.8' WELL END

135
 146.4
 133.8
 132.3
 246.4

Well Location No.
 Well Depth
 Well Diameter
 Well Status

County Acres 127 Lease No. 6228
 Well Name No. 1 Co. Serial No. 177
 Name of Deviation, if any
 Location Quadrangle
 Township
 Registration No.
 Drawing No.
 Scale

COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF MINES
 Oil and Gas Division
 HARRISBURG
 WELL LOCATION MAP
 Dept. File No. 366-7-ALL
 ⊕ Denotes Values of Well on United States Topographic Maps.
 Scale 15' = 1" 7 1/2"
 WORKABLE COAL SEAMS TO BE PENETRATED
 Name of Seam Owner of Seam

003-00366 280

Locate by Sketch

COL. NAME	THICK-NESS	FROM		TO	GEOLOG. NAME	Quad.	Locate by Sketch		
		THICK-NESS	FROM				THICK-NESS	FROM	TO
UF		334	341						
LK		535	538						
Murrayville		1548	1662		gas water	1548			
4th		2115	2130		gas	2115			
T.D.		2141							

TO: OIL AND GAS DIVISION
DEPARTMENT OF MINES AND MINERAL INDUSTRIES
1203-05 STATE OFFICE BUILDING
300 LIBERTY AVENUE
PITTSBURGH, PENNSYLVANIA 15222

4750' S 40° 32' 30"
4650' W 79° 42' 30"
(G)

003-00366

FROM: The Peoples Natural Gas Company

FMTO - } Vanning
PROD FM - }
FIELD - Ranton
ELEV. 900'

DATE: June 23, 1964

SUBJECT: "PROPOSED ALTERNATE METHOD OF PLUGGING AND VENTING"

Well No. 897 Farm Pgh. Consolidation Coal Co. #1 Township Plum Boro County Allegheny

Permit No. or File No. 366-P-ALL

"PROPOSED ALTERNATIVE METHOD" is subject to provisions stated in Act 225, Section 207 (A)

PRESENT WELL STATUS

<u>Formation</u>	<u>Top</u>	<u>Bott.</u>	<u>Gas/Oil</u> <u>Water</u>	<u>Pipe</u> <u>Size</u>	<u>Amt.</u> <u>Run</u>	<u>Remarks</u>
Upper Freeport Coal	334	341		10"	136'	
Lower Kittanning Coal	535	538		8-1/4"	568'	
2nd Salt Sand	776	820				
Patton	860	1364				
Murrysville	1548	1662	H ₂ O 1548			
100' Sand	1702	1811				
Snee Sand	1804	1915		6-5/8"	1830'	
Gordon Stray	1936	1946				
Gordon Sand	1962	1976				
" "	2000	2070				
4th Sand	2075	2081				
" "	2115	2130	Gas 2115	3"	2093'	6-5/8" x 3" Hook
" "	2131	2141				Wall packed off @
Total Depth	2134					2065'

PROCEDURE

2093' of 3" tubing in well.

Pulled on 3" tubing and pulled apart at 50' below surface, due to surface movement.

Ran 1931'-91 joints 1-1/2" pour pipe. Pumped 100 sacks of cement. Pulled 386'-18 joints of pour pipe and pipe parted. Left in hole 1545'-1-1/2" pour pipe. Cement filled the inside of 3" tubing.

Pumped 100 sacks of cement and filled to surface, but cement dropped down hole. Pumped 150 sacks of cement and filled hole to surface. Cemented to ground level. 350 sacks of cement in hole. Swedge nipple on top of 10" casing with 2" pipe for monument.

Plugged & Abandoned June 23, 1964.

SIGNED: [Signature]
Well Owner & Operator

Approved: [Signature]
Coal Owner or Operator

Approved: [Signature]
Division Representative

Date: June 23 1964

Date: [Signature]

003-00366

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION

CERTIFICATE OF PLUGGING WELL THROUGH WORKABLE COAL SEAMS

Consolidation Coal Company
Coal Operator or Owner
J. N. Palin

Library, Pa.
Address
Allegheny-Pittsburgh Coal Co.
Coal Operator or Owner
R. J. Walters, Chief Engineer

Casin Hill, Greensburg, Pa.
Address
Coal Operator or Owner

The Peoples Natural Gas Company
Well Operator
Two Gateway Center

Pittsburgh, Pennsylvania 15222
Address
July 23, 1964
Date

Plum Boro
Township
Allegheny
County

Pittsburgh Consolidation Coal Company
Farm

Well (Farm) No. 1 Serial No. 197

Richard F. Malthus
Division Representative Supervising

Coal Representative Observing

We, the undersigned representatives of the well operator certify that we participated in the plugging of the above well, and that the work was started June 23, 1964, and that the well was plugged as follows:

Filling Material and Plug	From	To	Casing and Tubing		
			Size	Pulled	Left
Pulled on 3" tubing and pulled about 50' below surface, due to surface movement.			10 1/4"	Kong	136'
Run 1021' - 12 joints of 1 1/2" casing pipe.			8 5/8"	Kong	56' - 3"
Pumped 100 sacks of cement.			6 3/4"	Kong	105' - 10"
Pulled 286' - 12 joints of 1 1/2" casing pipe and pipe parted.			3"	56'	223'
Left in hole 1545' of 1 1/2" casing pipe.			Depth of Coal Seams		
Cement filled the inside of 3" tubing.			24 - 34'		
Pumped 100 sacks of cement and filled to surface, but cement dropped down hole.			32 - 43'		
Pumped 100 sacks of cement and filled hole to surface.			Description of Monument		
			3" x 2" Swedge		
			6' of 2" Pipe		

and that the work of plugging and filling said well was completed on the 23 day of June, 1964.

Qualified Participants (Robert E. Lupton)
(Thos C. Hauer)

Permit No. 360-P-411

The Peoples Natural Gas Company
Well Operator

By [Signature]
Title Assistant General Superintendent

One copy of this certificate to be mailed to each coal operator or owner, and one to the Division, by registered mail, upon completion of plugging.

003-00674

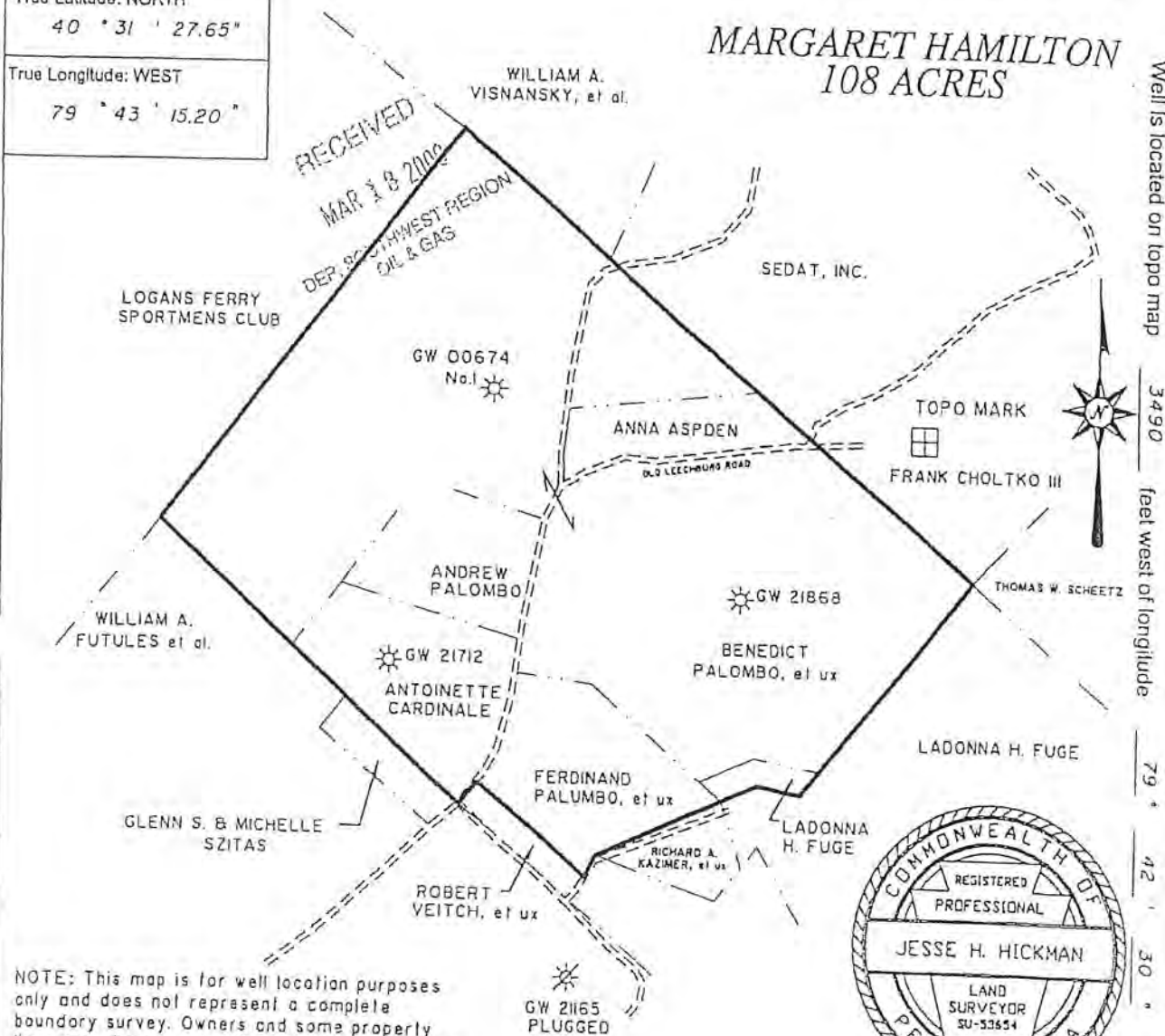
DEP USE ONLY	DEP Application Tracking #	785717	G: <i>GRB</i>
	Perm #	37-003-00674	<i>7/1/02</i>
	Project #		C: <i>7/1/02</i>

saw 1/

saw 1/14/09

	Denotes location of well on topo map.
True Latitude: NORTH 40 ° 31 ' 27.65 "	
True Longitude: WEST 79 ° 43 ' 15.20 "	

Well is located on topo map 6310 feet south of latitude 40° 32' 30"



NOTE: This map is for well location purposes only and does not represent a complete boundary survey. Owners and some property lines are shown as per tax assessment records.

Surveyor *Jesse H. Hickman* Phone # 412-549-0733 Dwg. # *BK 1B PG 43*
Engineer *SU - 53654*

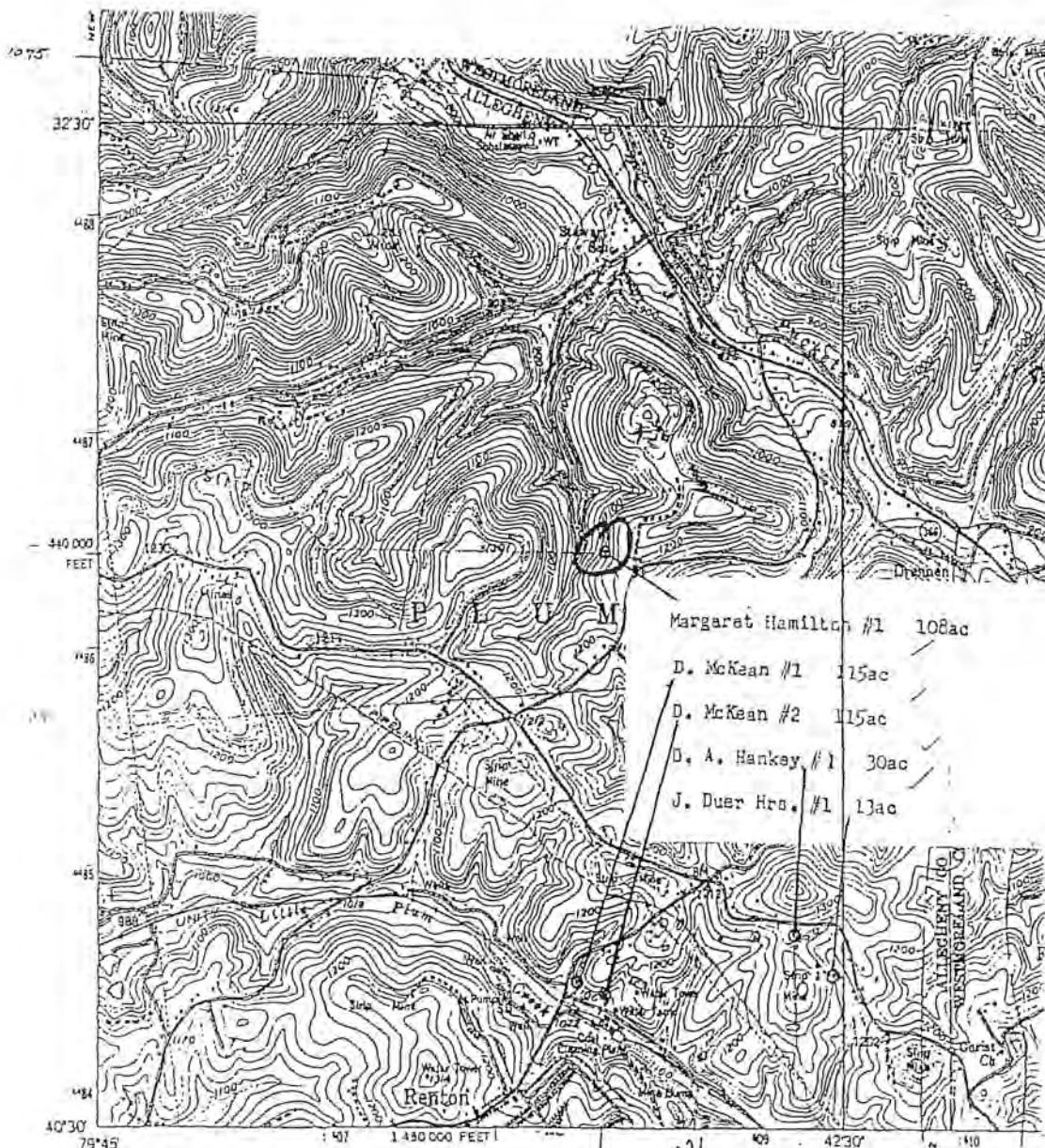
Date 5-2-08

Scale 1" = 600 FEET Tract N/A
Acres 108

List & Long Metadata Method ITPMP Accuracy 0.20" ft. Datum NAD 1927		Elevation Metadata Method TOPO Accuracy +/- 20' ft. Datum NAD 27		Survey Date 5-1-08	
Applicant / Well Owner Name P C EXPLORATION INC.		Well(Farm) Name MARGARET HAMILTON		Sheet 1	
Address 502 KEYSTONE DRIVE WARRENDALE, PA. 15088		County - Code ALLEGHENY-02		Municipality PLUM BOROUGH	
Surface Landowner BENEDICT PALUMBO, et ux.		USGS 7 1/2 Quadrangle Map Name NEW KENSINGTON EAST		Map Section 7	
Surface Lessor N/A		Angle & Course of Deviation (Drilling) 0		Surface Elevation 1180	
Surface Owner or Water Surveyor with a Water Supply within 1,000 ft.		Approximate Course and Distance to Water Supply N 54-02 W 845'		Indrilled Total Depth 5000	
W-58 ANNA ASPDEN		Owner, Lessee, or Operator of Workable Coal Seam NO WORKABLE COAL SEAMS		Name of Coal Seam Owned, Leased, or Operated	
		60B		Up - Freeport	

Att-00674
003

6400' W
3700' (G)



Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS

Topography from aerial photographs by multiplex methods
Aerial photographs taken 1952. Field check 1953

Polyconic projection. 1927 North American datum
10,000-foot grid based on Pennsylvania coordinate system, south
1000-meter Universal Transverse Mercator grid ticks, zone 17,
shown in blue

Red tint indicates areas in which only landmark buildings are shown
Revisions shown in purple compiled in cooperation with
State of Pennsylvania agencies from aerial photographs taken 1969
This information not field checked

New Kensington East Quad

T. W. Phillips Gas And Oil Co.

UTM GRID AND 1969 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

THIS IS
FOR SALE
A FOLDER DESCRIBE

003-60674

003-00674

Well No. 1, on Margaret L. Harrison Farm, Plum Township, Allegheny Co., Pa.
Operations commenced May 9, 1938. Drilling started May 29, 1938. Drilling stopped Aug. 27, 1938.
Driller on morning tour, W. H. Neill. Tool dresser on morning tour, H. L. Hile.
Driller on morning tour, Tool dresser on morning tour.
Driller on afternoon tour, H. E. Bussard. Tool dresser on afternoon tour, J. B. Holliday.
Driller on afternoon tour, W. E. Dutton. Tool dresser on afternoon tour.
Total depth of well 272 feet. Depth of water well 150 feet.
Deepened to feet from in.
Driller on morning tour. Tool dresser on morning tour.
Driller on morning tour. Tool dresser on morning tour.
Driller on afternoon tour. Tool dresser on afternoon tour.
Driller on afternoon tour. Tool dresser on afternoon tour.

RECEIVED
MAR 18 2009
DEP. SOUTHWEST REGION
OIL & GAS



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

GEO COPY 003-00674

DEP USE ONLY	
Auth # 785717	APS # 688827
Site # 5126	Primary Facility #
eFACTS Client # 60451	Sub-fac #

Notice of Intention by Well Operator to Plug a Well

☒ Well Operator ☐ Coal Operator		DEP ID# 52451	Well API # (Permit / Reg) 37-003-00674	Date Drilled (If Known) 8/27/1938
PC Exploration, Inc.				
Address 502 Keystone Drive		Phone 724-772-3500	Well Farm Name Margaret Hamilton (108ac)	
City Warrendale	State PA	Zip Code 15086	Well # 1	Well Serial #
☐ Agent (contractor) acting on behalf of the operator named above.			County Allegheny	
Address		Phone	Municipality Plum Borough	
City	State	Zip Code	Attach well record if not previously submitted.	

Coal Operator, Owner, and Lessee

Complete this section if applicable. Prior to abandoning any well in an area underlain by a workable coal seam, the well operator or owner shall notify the coal operator, lessee, or owner of the intention to plug and abandon the well, and shall submit a plat showing the location and affix the date and time at which the work of plugging will commence.

Coal ☐ Operator ☐ Owner ☐ Lessee	Coal ☐ Operator ☐ Owner ☐ Lessee	Coal ☐ Operator ☐ Owner ☐ Lessee
Address "Non-Coal" area	Address	Address
City, State, Zip	City, State, Zip	City, State, Zip
Phone	Phone	Phone
Notified? ☐ Yes ☐ No	Notified? ☐ Yes ☐ No	Notified? ☐ Yes ☐ No
This Party hereby waives the rights to be notified of the date and time before plugging work will begin, and to be present at the plugging of this well.	This Party hereby waives the rights to be notified of the date and time before plugging work will begin, and to be present at the plugging of this well.	This Party hereby waives the rights to be notified of the date and time before plugging work will begin, and to be present at the plugging of this well.
Signature:	Signature:	Signature:

Scheduled Date and Time of Plugging: Plugging is scheduled to begin on (date) 3/24/2009 at (time) 7:00am.

Checklist and Additional Attached Information

- ☒ Location Plat
☐ Current Well Record
☒ Available Well Record
☐ Application for Approval of Alternate Method of Plugging
☐ Other, describe:

Signature of Applicant (Operator or Agent)

Signature

Date

Print or Type Signer's Name and Title

Gary A. Clark Vice President of Operations

NonCoal

GOB - Up. Frequent

DEP USE ONLY	
If this well has not been permitted or registered previously, DEP hereby assigns this permit / registration number to the well location described in this notice: API# 37-003-00674 Date: 4/14/09 Please refer to this number in all future correspondence.	Notice acknowledged by: DEP Rep: (Signature) Alan Eichler (Print Name) Date: 4/14/09 Geologist: SKB Date: 4/14/09
DEP will fill in the information below and send a copy of this approved notice to the applicant and these DEP staff or offices.	
DEP Oil and Gas Inspector Name MICHAEL ARCH Address 400 WATERFRONT DRIVE City, State, Zip PITTSBURGH PA 15222-4745 Phone 412-442-4010	DEP Mine Inspector MID # 7 Name RICHARD MURPHY Address 3122 PARK DRIVE City, State, Zip CLARKSBURG PA 15725 Phone 724-726-9516
Rec'd in DEP Reg. Ofc. Plugging must begin within 30 days of: RECEIVED MAR 18 2009 DEP. SOUTHWEST REGION OIL & GAS	

GA. DOW = 5/16/09



RECEIVED

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

003-00674

MAY 04 2009

Certificate of Well Plugging

DEP USE ONLY	
Site ID#	Primary Facility ID#
eFACTS Client #	Sub-facility ID#
Bonded Well?	Bond Agreement #
☐ Yes ☒ No	

Well Operator: PC Exploration, Inc		DEP ID# 52451	Well API # (Permit / Reg) 37-003-00674	Project Number	Type of Well Gas
Address 502 Keystone Drive		Well Form Name Margaret Hamilton (108ac)	Well # 1	Serial #	
City Warrendale	State PA	Zip Code 15086	County Allegheny	Municipality Plum Borough	
Phone 724-772-3500	Fax 724-772-3505	Complete the next section (coal) if applicable.			
Coal ☐ Operator ☐ Owner ☐ Lessee		Coal ☐ Operator ☐ Owner ☐ Lessee		Coal ☐ Operator ☐ Owner ☐ Lessee	
Address "Non-Coal" area		Address		Address	
City, State, Zip		City, State, Zip		City, State, Zip	

The undersigned representatives of the Well Operator certify that we participated in plugging this well, and that the work was started on (date) April 9, 2009, and that the well was plugged as follows

Filling Material and Plugs	Depth		Casing and Tubing		
	From	To	Size	Pulled	Left
well plugged from attainable bottom		3968'			
perforate 3" with 1 shot per 50' from 3910' to 2366' (28 holes)					
144 5 sks, 50/50 poz, 10% salt, 2% gel	3978'	2292'			
dressed plug at 2312', seen 2 bbls					
separate 3" at 2282'					
19 66 sks, 50/50 poz, 10% salt, 2% gel	2278'	2072'			
dress plug at 2074', seen 1/2 bbl					
separate 4 3/4" at 2022'					
260 sks, 50/50 poz, 10% salt, 2% gel	2022'	929'			
pipe separated at 4 3/4" permission from DEP to perforate					
4 3/4" from 486' to 632'					
38 29 sks, 50/50 poz, 10% salt, 2% gel	666'	453'			

Signature of Participants		
Signature - Well Operator 	Signature - Qualified Participant 	Signature - Qualified Participant
Print or Type Signer's Name and Title Gary A. Clark Vice President of Operations	Print or Type Signer's Name, Title & Co Frank R. Bracius RIG OPERATOR - WHIPSTOCK	Print or Type Signer's Name, Title, & Co SHAWN LONDON UNIVERSAL WELL SERVICES CEMENT SUPERVISOR

Signers certify that the work of plugging this well was completed on (date) April 20, 2009 and that the information above is true and accurate

DEP USE ONLY		
☒ Approved	☐ Denied	Plug Inspector
DEP Rep	Date 3-15-10	Site Restoration (WQS)
		Bond Rel #
		☐ Yes ☐ No
		Date

Upon completion of plugging, mail one copy of this certificate to each coal operator, owner, or lessee, if any, and one copy to the appropriate DEP Regional Oil and Gas Management Program office

Dept of Environmental Protection
NW Regional Office - Oil & Gas
230 Chestnut Street
Meadville, PA 16335-3481

Dept of Environmental Protection
SW Regional Office - Oil & Gas
400 Waterfront Drive
Pittsburgh, PA 15222-4745



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

Certificate of Well Plugging

003-00674

RECEIVED

MAY 04 2009

DEP, SOUTHWEST REGION
OIL & GAS

DEP USE ONLY	
Site ID#	Primary Facility ID#
eFACTS Client#	Sub-facility ID#
Bonded Well?	Bond Agreement #
☐ Yes ☐ No	

Well Operator PC Exploration, Inc	DEP ID# 52451	Well API # (Permit / Reg) 37-003-00674	Project Number	Type of Well Gas
Address 502 Keystone Drive		Well Farm Name Margaret Hamilton (108ac)	Well # 1	Serial #
City Warrendale	State PA	County Allegheny	Municipality Plum Borough	
Phone 724-772-3500	Fax 724-772-3505	Complete the next section (coal) if applicable.		

Coal ☐ Operator ☐ Owner ☐ Lessee	Coal ☐ Operator ☐ Owner ☐ Lessee	Coal ☐ Operator ☐ Owner ☐ Lessee
Address "Non-Coal" area	Address	Address
City, State, Zip	City, State, Zip	City, State, Zip

The undersigned representatives of the Well Operator certify that we participated in plugging this well, and that the work was started on (date) April 9, 2009, and that the well was plugged as follows

Filling Material and Plugs	Depth		Casing and Tubing		
	From	To	Size	Pulled	Left
dressed plug at 463', seen 3 bbls			10"		16 5'
separate 3 1/2" at 453'			8"		208'
attempt to pull surface casing, unsuccessful			6 25"		929'
79 65 sks, 50/50 poz, 10% salt, 2 % gel	453'	0'	4 3/4"	1618'	454'
			3 1/2"	1710'	2282'
			Depth to coal seams, if any		
			600'-606'		
			750'-54'		
			Describe Monument		
			Burned plate with permit number affixed		

MAR 19 2010

DEP, SOUTHWEST REGION
OIL & GAS

Signature of Participants		
Signature - Well Operator <i>[Signature]</i> Print or Type Signer's Name and Title Gary A Clark Vice President of Operations	Signature - Qualified Participant <i>[Signature]</i> Print or Type Signer's Name, Title, & Co Frank R. Broebus RIG OPERATOR - WHIPSTOCK	Signature - Qualified Participant <i>[Signature]</i> Print or Type Signer's Name, Title, & Co Shawn Landman UNIVERSAL WELL SERVICES CEMENT SUPERVISOR

Signers certify that the work of plugging this well was completed on (date) April 20, 2009 and that the information above is true and accurate

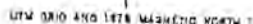
DEP USE ONLY		
☒ Approved	☐ Denied	Plug Inspector
DEP Rep <i>[Signature]</i>	Date 3-15-10	Site Restoration (WQS)
		Bond Rel 2
		☐ Yes ☐ No

Upon completion of plugging, mail one copy of this certificate to each coal operator, owner, or lessee, if any, and one copy to the appropriate DEP Regional Oil and Gas Management Program office

Dept of Environmental Protection
NW Regional Office - Oil & Gas
230 Chestnut Street
Meadville, PA 16335-3481

Dept of Environmental Protection
SW Regional Office - Oil & Gas
400 Waterfront Drive
Pittsburgh, PA 15222-4745

OG 3
00207



003-00707

003-00707

WELL REGISTRATION FORM

To be used for well(s) not permitted or issued drilling file numbers under Act 225, The Pennsylvania Gas Operations, Well-Drilling, Petroleum and Coal Mining Act. Supply all available information.

DEN USE ONLY

Code	
911ZM	3-20-86

Lines

19

Laura L. Langer
420 Blvd. of the Allies
Pittsburgh, PA 15219
(412) 553-6132

Telephone

Project # If previously assigned by Dept

County ALLEGHENY

FM. TD BRADFORD GROUP.
PROD. FM. VENTNIG & BRADFORD GROUPS.
FIELD RENTON FIELD.

ELEV. 1087'

Locality	Farm Name	Well #	Serial # Optional	Date Drilled	Type Well	T.D.	Casing Record Size (diam.) Length (ft.)	Type and amount of cement	Packers Size/Type/Setting/Depth	Producing Horizons
1	ESTHER McLAUGHLIN	938		1911	GAS	3785	10"-11' 3"-2196 8"-897 6 5/8"-1924		6 5/8" X 3 HW 2196	5th SPECCHLEY BRADFORD
2	A.C. WRIGHT	963		1899	GAS	2208	10"-21' 4 7/8"-1900 8 1/4"-180 2"-2152 6 1/4"-965		4 7/8" X 2 A 2123	5th SEW SE1
3	NOAH SHAFFER	990		1906	GAS	1855	10"-7' 4 7/8"-1500 8 1/4"-308 3"-1650 6"-658		4 7/8" X 3 HW 1560	5th CAR NE1/2
4	W.C. KROEGHER	993		1910	GAS	2208	10"-296 2"-1793 6 5/8"-1671 3"-61		6 5/8" X 3 W 1842	GORDON SEN SE1
	SUSANNA DAVIDSON	3292		1943	GAS	2113	10"-247' 3"-2113' 8 1/4"-1080' 6 5/8"-2046'		6 5/8" X 3 A 2057'	30' PSH NE2
	KATHERINE KRON	3296		1944	GAS	2811	7 1/4"-Cased 6 5/8"-2249 10"-132' 8 1/4"-1315'			BARARD GB NW1
	AGNES SHARP	3303		1944	GAS	4103	13"-105' 6 5/8"-2170' 10"-386' 8 1/4"-1199'			Bradford PGH NE2

File map or other description to enable the Department to find the well sits on the ground

Blanket bond ☐ Alternate fees in lieu of bond

☐ Driller's log (if available)

☐ Registration fee of \$15 per well or \$250 for blanket registration on well registrations submitted simultaneously for same project.

Used pursuant to this registration form shall be installed on the well in a legible, conspicuous and permanent manner within 60 days of issuance.

WELL NO. 938 LESSOR Mclaughlin Esther CASE NO. 40375 ACRES 108 MAP 64 SW 1-3 ELEVATION 1087 P.M. 55 L DIV. G. DIST. 10870000		COUNTY Allegheny		TOWNSHIP		RANGE		SECTION		ELEVATION		DIV.		G. DIST.	
FORMATION		TOP	BOTTOM	GAS AT	OIL AT	WATER AT	FORMATION	TOP	BOTTOM	GAS AT	OIL AT	WATER AT	CLASSIFICATION		
WATERWORKING COAL							108	1908	1916	1860	1860		CASING AND TUBING DATA		
HARLEYSBURG							108	1908	1916	1860	1860		CASING AND TUBING DATA		
REDKNEE							108	1908	1916	1860	1860		CASING AND TUBING DATA		
TITTS RUNCH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
MURPHY SAND							108	1908	1916	1860	1860		CASING AND TUBING DATA		
AMES LIMESTONE							108	1908	1916	1860	1860		CASING AND TUBING DATA		
BARKENTOWN COAL							108	1908	1916	1860	1860		CASING AND TUBING DATA		
L. INDIAN SAND							108	1908	1916	1860	1860		CASING AND TUBING DATA		
L. BUNKER SAND		401	436				108	1908	1916	1860	1860		CASING AND TUBING DATA		
MURPHY COAL		160	158				108	1908	1916	1860	1860		CASING AND TUBING DATA		
L. HVT.							108	1908	1916	1860	1860		CASING AND TUBING DATA		
M.							108	1908	1916	1860	1860		CASING AND TUBING DATA		
L.							108	1908	1916	1860	1860		CASING AND TUBING DATA		
VANPORT LIME							108	1908	1916	1860	1860		CASING AND TUBING DATA		
CLAYTON COAL							108	1908	1916	1860	1860		CASING AND TUBING DATA		
MOONVILLE COAL							108	1908	1916	1860	1860		CASING AND TUBING DATA		
SET BAR SAND							108	1908	1916	1860	1860		CASING AND TUBING DATA		
WENGER COAL							108	1908	1916	1860	1860		CASING AND TUBING DATA		
1ST BALT SAND							108	1908	1916	1860	1860		CASING AND TUBING DATA		
2ND							108	1908	1916	1860	1860		CASING AND TUBING DATA		
3RD							108	1908	1916	1860	1860		CASING AND TUBING DATA		
4TH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
5TH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
6TH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
7TH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
8TH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
9TH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
10TH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
11TH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
12TH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
13TH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
14TH							108	1908	1916	1860	1860		CASING AND TUBING DATA		
15TH							108	1908	1916	1860	1860				

[illegible]

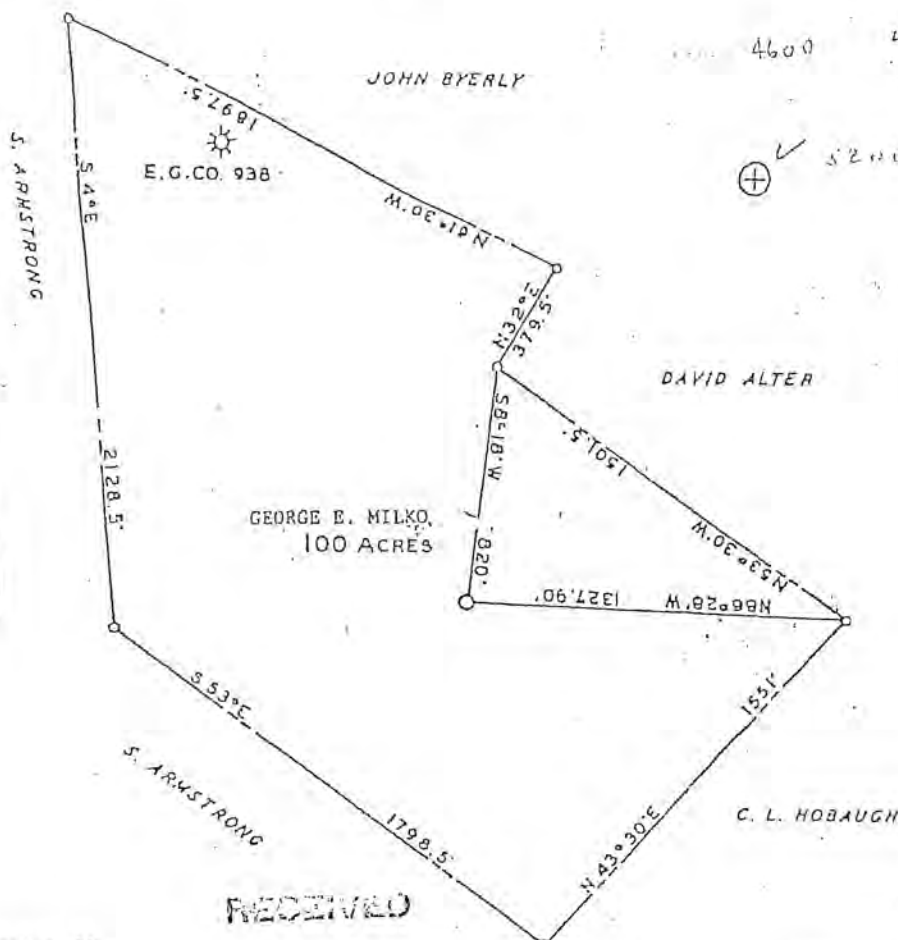
DAILY VOLUME FACTOR 17.95

DATE 9-20-42 TIME 3:30 PM

LATITUDE 40° 32' 30"

003-20903

LONGITUDE 79° 22' 30"



New Location ☒
 Drill Deeper ☐
 Abandonment ☐
 Re-drill ☐

DEC 1 1976
 PA. GEOLOGIC SURVEY
 Oil & Gas Division

Company FOX OIL AND GAS INC.
 Address 1725 WASHINGTON ROAD
PITTSBURGH PENNA 15241
 Farm GEORGE E. MILKO
 Tract Acres 100 Lease No PI2379
 Well Name 3 Co. Serial No.
 Angle of Deviation, if any NONE
 Elevation 1230 TOPO Quadrangle NFW. KEN. EAST
 County ALLEGHENY Township PLUM BORO
 Engineer William H. Patton
 Engineer's Registration No. 17573-E
 File No. FPT.S.W. 35 Drawing No.
 Date 5-29-76 Scale 1" = 500'

COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF MINES

OIL AND GAS DIVISION
 HARRISBURG 12-14-76

WELL LOCATION MAP

DEPT. FILE NO. ALL-20903

⊕ Denotes Values of Well on United
 States Topographic Map

Scale 1" = 7 1/2' ☒

WORKABLE COAL SEAMS TO BE PENETRATED
 NAME OF SEAM OWN. OF SEAM

Freeport series Allegheny Pittsburgh Coal Co.
West Penn Power Co. Green
 All other seams George E. Milko
12934 McKelvey Rd.
Pittsburgh, PA 15221



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
DIVISION OF OIL AND GAS
PITTSBURGH, PENNSYLVANIA 15222

Office Use Only

PERMIT NO. 003-20903

PROJECT NO. _____

TYPE OF WELL _____

Gas

Plum Township
Renton Field

WELL RECORD
LOCATION
4,650' S 40° 32' 30"
3,200' W 79° 42' 30"
NEW KENSINGTON EAST

WELL OPERATOR Fox O. & G. Inc.

Area Code 412-
TELEPHONE NO. 343 4322

ADDRESS 900 Washington Road Pittsburgh, Pa.

Zip 15228

FARM NAME George E. Milko

FARM NO. 3

SERIAL NO.

ACRES 100

TOWNSHIP Plum Borough

COUNTY Allegheny

DRILLING COMMENCED 12/28/76

DRILLING COMPLETED 1/7/77

ELEVATION 1230'

QUADRANGLE NEW KEN EAST☒

7 1/2'

☒ 15'

CASING AND TUBING RECORD

Pipe Size	Amount In Well	Material Behind Pipe Cement (Sks.)	Pipe Gel (Sks.)	Packer Type	Size	Depth	Date Run																
13 3/8	18.00	None	None	None	None	None	12/28/76																
9 5/8	822.50	W/3% CACL 2 250 SKS Neat	None	None	None	None	12/31/76																
7"	2122.00	W/3% CACL 2 50 SKS Neat	None	None	None	None	1/5/77																
<table border="1"> <tr> <td>D.</td><td>D.D.</td><td>J.P.L.</td><td>Class</td><td>O/G</td><td>Lease</td><td></td><td></td></tr> <tr> <td>3792</td><td>X</td><td>5006</td><td>D</td><td>X</td><td>X</td><td></td><td></td></tr> </table>								D.	D.D.	J.P.L.	Class	O/G	Lease			3792	X	5006	D	X	X		
D.	D.D.	J.P.L.	Class	O/G	Lease																		
3792	X	5006	D	X	X																		

Perforation Record

Stimulation Record

Date	Interval Perforated From	To	Date	Interval Treated	Amount Fluid	Amount Sand	Injection Rate

NATURAL OPEN FLOW 2,000,000

NATURAL ROCK PRESSURE 60 PSI

72 hrs.

AFTER TREATMENT OPEN FLOW None

AFTER TREATMENT ROCK PRESSURE None

3 days

REMARKS:

Did not run any 4 1/2" casing. Well was not hydro fractured
and no type of well logging was attempted, due to large flow.

RECEIVED

MAY 2 1977

PA. GEOLOGIC SURVEY

Oil & Gas Division

FORMATION ON REVERSE SIDE

003-20903

FORMATIONS

NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (Fresh or Salt Water)	SOURCE OF DATA
SUBSTRUCTURE	0	10				DRILLERS LOG
SHALE	10	15				
SAND	15	41				
COAL	41	43				
SHALE & SAND	43	60			1" Water	
RED SHALE	60	270			545'	
SHALE & SAND	270	395				
RED ROCK	395	415				
SAND & SHALE	415	700				
COAL	700	705				
SHALE AND SAND	705	2236				ELECTRIC LOG
RED ROCK	2236	2280				
SAND & SHALE	2280	2310			Gas Show	
SAND & SHALE	2310	2350			@ 3006'	
RED ROCK	2350	2380				
SAND	2380	2410				
RED ROCK	2410	2415				
SAND (HARD)	2415	2510				
SHALE	2510	2700				
SAND	2700	2810				
SAND & SHALE	2810	2900				
SAND sp.	2900	3020	3006'			
SAND & SHALE	3020	3310				
SAND	3310	3380				
SAND & SHALE	3380	3792				
T.P.	3792					



Date 4/20, 1977

APPROVED LA Jos

By Pos
Title

7-06-4-71



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
DIVISION OF OIL AND GAS
PITTSBURGH, PENNSYLVANIA 15222

Office Use Only

This permit number to
be voided:

PERMIT NO. ALL-21030-R
Note: To be released as ALL-20902
PROJECT NO. 069-21020

TYPE OF WELL Gas

WELL RECORD

OWN

Renton Field

WELL OPERATOR	Fox O & G, Inc.	TELEPHONE NO.	412-941-2450
ADDRESS	924 N. Washington Road, McMurray, PA	ZIP	15317
FARM NAME	George E. Milko	FARM NO.	3
		SERIAL NO.	
		ACRES	100
TOWNSHIP	Plum Borough	COUNTY	Allegheny
DRILLING COMMENCED	August 6, 1980	DRILLING COMPLETED	June 21, 1981
ELEVATION	1230'	QUADRANGLE	FREEPORT New Ken. East
			☒ 7 1/2' ☐ 15'

CASING AND TUBING RECORD

Pipe Size	Amount In Well	Cement	Material Behind Pipe (Sks.)	Gel (Sks.)	Packer Type	Size	Depth	Date Run
13 3/8"	18.00'	--	--	--	--	--	--	12-28-76
9 5/8"	822.50'	250 Neat w/3% Cal. Chl.	--	--	Guide Shoe	9 5/8"	824.50'	12-29-76
7"	2122.00'	50 Neat w/3% Cal. Chl.	--	--	Guide Shoe	7"	2124.00'	1-04-77
4 1/2"	3483.90'	250 Pozmix A w/ 1% Salt	--	10	Float Shoe	4 1/2"	3485.40'	6-21-81

Perforation Record

Stimulation Record

Date	Interval Perforated From	To	Date	Interval Treated	Amount Fluid	Amount Sand	Injection Rate
6-30-81	3345'	3375'	6-30-81	Speechley	12,000gal	20,000#	16.7

NATURAL OPEN FLOW 10,000 cu. Ft. NATURAL ROCK PRESSURE - hrs.
AFTER TREATMENT OPEN FLOW 400,000 cu. Ft. AFTER TREATMENT ROCK PRESSURE 800 PSI ,72 hrs.

REMARKS: Circulated with water before cementing 4 1/2" pipe.

In August 1980, we cleaned out hole, but did not regain the natural gas flow. In June 1981, the rig moved back on the well, cleaned out the hole, ran 4 1/2" pipe, cemented and hydrofracked.

RECEIVED

OCT 5 1981

PA GEOLOGICAL SURVEY
(Oil & Gas Geology Division)

FORMATION ON REVERSE SIDE

9-10-81 check note on permit number

003-20903

003-20903

FORMATIONS

NAME	TOP	BOTTOM	GAS AT	OIL AT	RATE AT SAND AT WATER	SOURCE OF DATA
SUBSTRUCTURE	0	10				DRILLERS LOG
SHALE	10	15				
SAND	15	41				
COAL	41	43				
SHALE & SAND	43	60			1" WATER	
RED SHALE	60	270			545'	
SHALE & SAND	270	395				
RED ROCK	395	415				
SAND & SHALE	415	700				
COAL	700	705				
SHALE & SAND	705	2236				ELECTRIC LOG
RED ROCK	2236	2280				
SAND & SHALE	2280	2310			GAS SHOW	
SAND & SHALE	2310	2350			@ 3006'	
RED ROCK	2350	2380				
SAND	2380	2410				
RED ROCK	2410	2415				
SAND (HARD)	2415	2510				
SHALE	2510	2700				
SAND	2700	2810				
SAND & SHALE	2810	2900				
SAND	2900	3020				
SAND & SHALE	3020	3310				
SAND	3310	3380				
SAND & SHALE	3380	3792				
T.D.	3792'	This addition made by Frank E. Mackey per telephone conversation with Diana McNea of Fox Oil & Gas on 9-10-81 <i>Frank E. Mackey</i>				

Date August 24, 19 81

APPROVED

By

Title

DER-166
1981 AUG 25 PM 2:50
DIVISION OF OIL
AND GAS REGULATION
1000 1000 1000

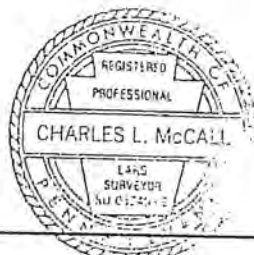
1981 AUG 25 PM 2:50

DER-166

LONGITUDE $79^{\circ} 42' 53''$



New Location ☐
 Drill Deeper ☐
 Abandonment ☐
 Re-Drill ☒



Scale 1"=100'

[illegible]

PA GEOLOGICAL SURVEY
(Oil & Gas Geology Division)

12913

NEW KENSINGTON EAST

003-21165

DER Office Use Only

Code

CP

Oil & Gas Inspector

Date Approved _____

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF OIL AND GAS REGULATION

155 MAR 21 AM 11:14

1923年5月

Type of Well: Gas []

Name of Well Operator T. W. Phillips Gas and
Oil Co.

Oil
205 N. Main St., Butler, PA 16001

march 10

19 86

Date _____

Plum Boro

Political Subdivision, Borough, City or Township

Allegheny

County

Alexander J. Serakowski, et ux. County

Farm fmly. Henry L. Waldsmith

Wall (Farm) No. 1 Serial No. _____

Serial No.

COMPLETE ABOVE SECTION IF APPLICABLE

FM TD - BRALLIER.

PROD FM - VENANGO + BRADFORD

FIELD - RENTON

ELEV - 1182'

We, the undersigned representatives of the Well Operator certify that we participated in the plugging of the above well, and that the work was started September 24, 19 85, and that the well was plugged as follows:

FILLING MATERIAL AND PLUGS	FROM	TO	Casing and Tubing		
			SIZE	PULLED	LEFT
Cavings and Sand Pumpings	4020'	3288'	6 1/2"	1045' in	1820
Cement	3288'	3120'	4-3/4"	2066'	94'
Aquagel	3120'	2450'	3"	3288'	732'
Cement	2450'	2160'			
Aquagel	2160'	2066'			
Cement	2066'	1800'			
Aquagel	1800'	1050'	Depth of Coal Seam, If Any		
Cement	1050'	773'	612' to 619' = 7'		
Ran 773' of 4-3/4" vent pipe & cement outside	773'	0'	670' to 673' = 3'		
			Description of Monument		
			773' of 4-3/4" vent pipe from 773' to surface A 4-3/4"		
			x2" sweded & 7' of 2" stand pipe with 2" tee & 2-2" st		
			ells on top as weather cap		

I certify that the work of plugging and filling said well was completed on the 22 day of January 19 86 and that the above information is true and accurate.

(Well Operator)

PERMIT/REGISTRATION NO. ALL-21165-D

PROJECT NO. _____

Gas Well (Qualified Participant)
Maintenance Technician

One copy of this certificate to be mailed to each coal operator, lessee, or owner, if any, and one to the Bureau of Oil and Gas Management, upon completion of plugging.

ONE

4-28-PC

Lead

RECEIVED

JUL 12 1988

PA GEOLOGICAL SURVEY
(Min. & Enr. Geology Division)

003-21165-10

003-21165-10

003-21165-10

003-21165-10

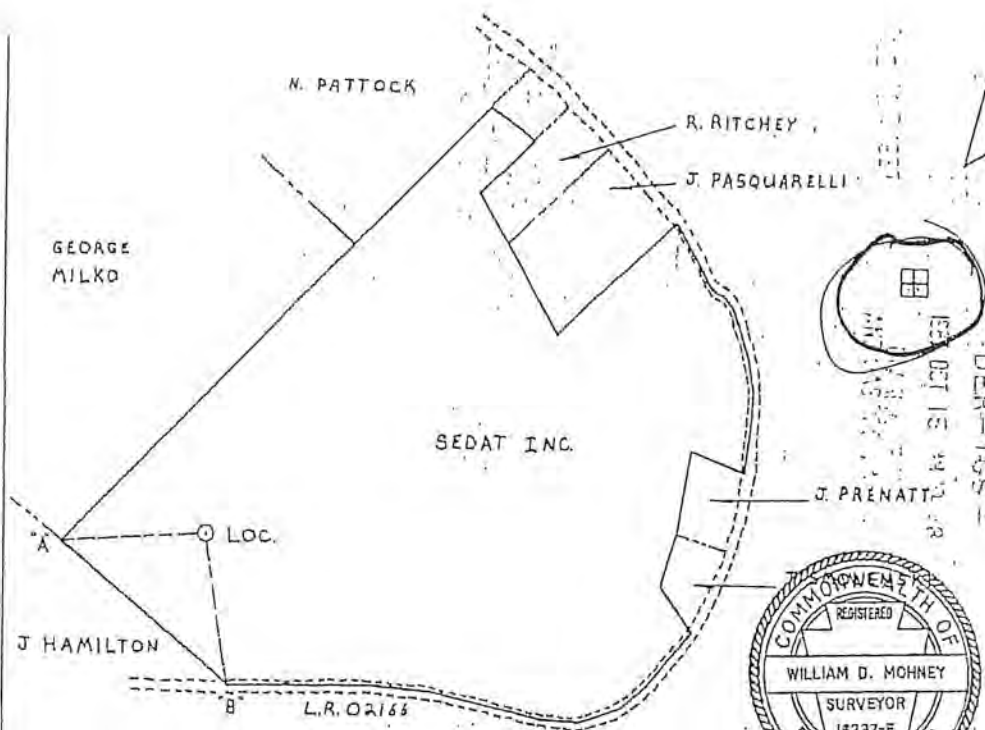
003-21165-10

003-21165-10

WELL	LOCATION	PLAT
------	----------	------

003-21210

Well is located on topo map 5950 feet south of LATITUDE 40° 32' 30"



Well is located on topo map 2,380 feet west of LONGITUDE 79 ° 42 ' 30

_____ LIMIT OF LEASE
----- PROPERTY LINE

SCALE: 1" = 500'

LOC TO A S 86° 52' 41" W. 524.02

LOC TO "B" S 9° 14' 09" E 531.90'

"A" TREE ON CORNER

"B" CENTER LINE OF ROAD CORNER

Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'.
Reference to buildings, springs, bodies of water and wetlands is not required for well plugging.

 Denotes location of well on 7 1/2" topo map. Permit # 37-GA3-22410-0d

Project # _____

Well Operator Penneco Oil Company Inc.	Revision Re-Issue Alteration Storage Recondition New Location Drill Deeper Abandonment Registration Plugging	☐ ☐ ☐ ☐ ☒ ☐ ☐ ☐ ☐	Surveyor/Engineer W.D. Mohr Drawing Number S-1 Date 11/1/86 Date
Address U.S. Route #22 Delmont, PA 15626	Surface landowner and water purveyor with water supply within 1,000'		Approximate course and distance to water supply
Surface Owner Sedat Inc. Surface Lessor (if any) N/A	Frank Choltko Ferdinand Palombo	S 45° E 850' S 55° W	RECEIVED DEC 3 1986
Firm Name Sedat			
Well No. #1	Serial No. PS-7		
Acres 69.5	Ground Elevation 1260'		
Topo Quadrangle New Kensington East	Section (7)		
County Allegheny	Political Subdivision Plum	Owner/Operator Villa Coal Company	Workable Coal Seam Upper Freeport
Angle of Deviation None	Anticipated TD 3,500'	Sedat Inc.	All others
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management		RENTON MINE 10-31-87	

5950' S 40° 32' 30"
2380' W 79° 42' 30"
(4)

ER-00-4; Rev. 8/84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF OIL AND GAS REGULATION
PITTSBURGH, PENNSYLVANIA 15206-2988

NEW KENSINGTON EAST

Office Use Only

003-21210

WELL RECORD

PERMIT NO. 37-003-21210-00

PROJECT NO.

FIBER-RENTON-DEV

TYPE OF WELL

Gas and Oil

WELL OPERATOR
Penneco Energy Corporation

TELEPHONE NO.
412-468-8232

ADDRESS
U. S. Route #22, Delmont, PA

ZIP
15626

FARM NAME

Sedat #1A

FARM NO.

SERIAL NO.

ACRES

TOWNSHIP

Plum Borough

COUNTY

Allegheny

DRILLING COMMENCED

3-5-88

DRILLING COMPLETED

3-13-88

ELEVATION

1,260'

QUADRANGLE

New Kensington East

☒ 7 1/2' ☐ 15'

CASING AND TUBING RECORD

PIPE SIZE	AMOUNT IN WELL	MATERIAL BEHIND PIPE		PACKER			DATE RUN
		CEMENT (SKS.)	GEL (SKS.)	TYPE	SIZE	DEPTH	
15"	39	Cuttings	None	N/A	N/A	39	3-5-88
9-5/8"	742	300	30	Float shoe	8-5/8"	752	3-10-88
7"	2,256	551	7	Float shoe	7"	2,266	3-11-88
4-1/2"	3,486	175	4	Float shoe	4-1/2"	3,496	3-13-88
1-1/2"	3,311	N/A	N/A	N/A	N/A	3,311	3-23-88

PERFORATION RECORD

STIMULATION RECORD

DATE	INTERVAL PERFORATED FROM	TO	DATE	INTERVAL TREATED	AMOUNT FLUID	AMOUNT SAND	INJECTION RATE
3-22-88	3312	3352	3-22-88	3312-3352	32,000	47,000#	33.38BPM
3-22-88	3237	3243	3-22-88	3237-3243	10,000	13,000#	30.08BPM
3-22-88	2406	2408	3-22-88	2406-2488	11,000	8,500#	16.83BPM
	2420	2421					
	2468	2488					

T.D.	D.D.	D.P.I.	Class	O	G	Lease
3522		3352	D		2	1

NATURAL OPEN FLOW

Not Taken

NATURAL ROCK PRESSURE

Not Taken

HRS.
DAYS

AFTER TREATMENT OPEN FLOW

312 MCF

AFTER TREATMENT ROCK PRESSURE

720#

72 HRS.
DAYS

REMARKS:

Good cement returned to surface after setting 9-5/8" casing and 7" casing. No water encountered in Renton Mine.

PROD FM → VENANGO

BRADFORD

FM TO - BRALLIER

DER-BOGH
PITTSBURGH REGION
1988 JUL 29 AM 10:34

RECEIVED
(FORMAT AND REVISIONS)

NOV 22 1988

PA GEOLOGICAL SURVEY
(Oil & Gas Geology Division)

NOV 24 1988
PITTSBURGH REGION
DER-BOGH
9:55 AM 10:34

10-20-88

003-21210

CO-1

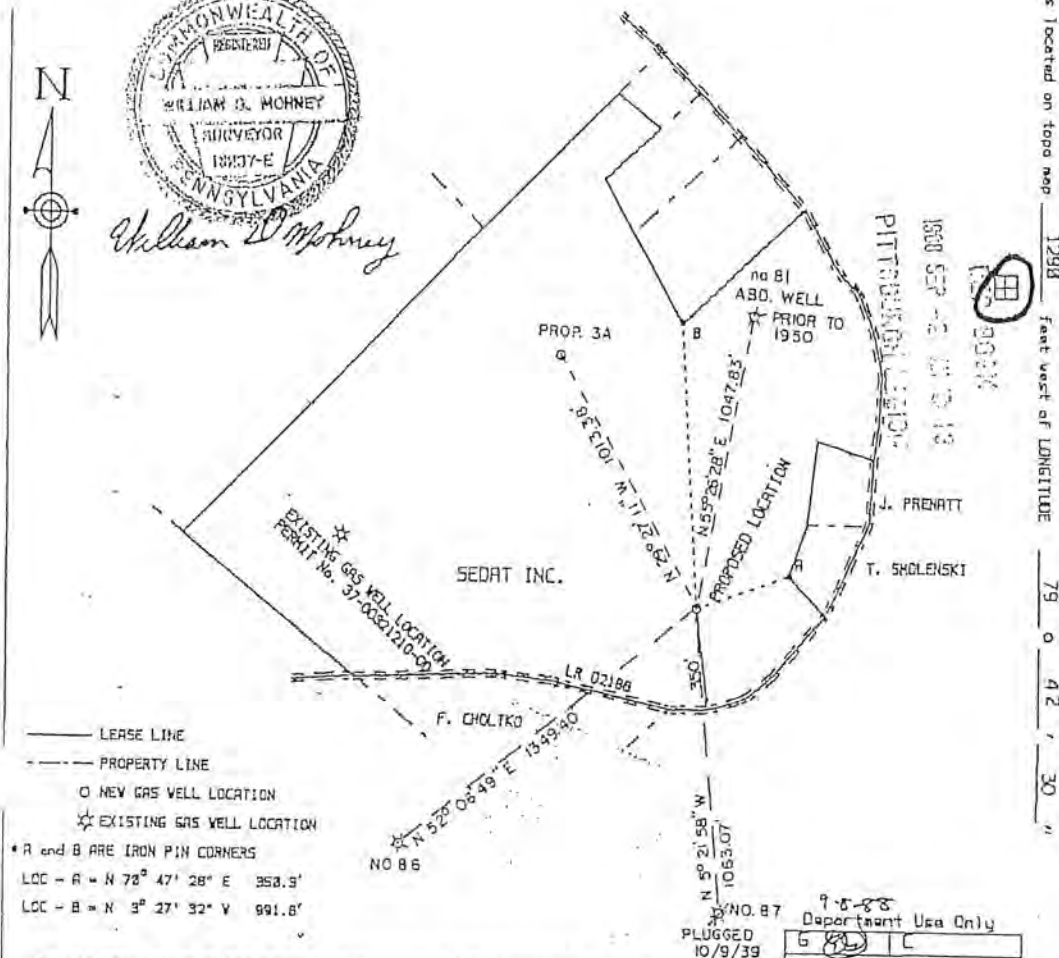
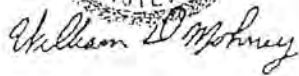
FORMATIONS						
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA
Sub	0	10				Driller's Log
Fill	10	70				
Sand	70	100				
Red Rock	100	125				
Sand	125	135				
Red rock	135	150				
Sand	150	160				
Red rock	160	175			155 ± stream	
Sand and Shale	175	245				
Red Rock	245	255				
Sand	255	285				
Coal	285	287				
Sandy shale	287	340				
Red rock	340	355				
Sandy Shale	355	375				
Red Rock	375	385				
Sandy Shale	385	395				
Red rock	395	410				
Shale	410	420				
Coal	420	424				
Sandy Shale	424	485				1" - 2,000 Ft.
Shale	485	502				
Sand and Shale	502	697				
Coal	697	700				
Sand	700	755				
Sand and Shale	755	815				
Shale	815	850				
Sand and Shale	850	910				
Sand	910	940				
Shale	940	985				
Sand	985	1015				
Shale	1015	1040				
Sand	1040	1100				
Sandy Shale	1100	1135				
Sand	1135	1175				
Red Rock	1175	1180				
Sandy Shale	1180	1200				
Sand	1200	1290				
Sand and Shale	1290	1310				
Shale	1310	1325				
Sand and Shale	1325	1430				Geophysical Log Data
Sand	1430	1660				
Red Rock	1660	1663				
Sand	1663	1710				
Shale	1710	1815				
Sand	1815	1895				
Shale	1895	1975				
Sand	1975	2160				
Sand and Shale	2160	2205				
Red rock	2205	2210				
Sand and Shale	2210	2230				
Red Rock	2230	2235				
Sandy Shale	2235	2245				
Red Rock	2245	2250				
Sand	2250	2500				
Sand and Shale	2500	2565				
Shale	2565	2645				
Sand and Shale	2645	2740				
Sand	2740	2985				
Shale	2985	3095				
Sand and shale	3095	3145				Fourth Fifth Speechley Stray Speechley
Shale	3145	3230				
Sandy Shale	3230	3285				
Shale	3285	3340				
Sandy Shale	3340	3385				
Shale	3385	3420				
Sandy Shale	3420	3475				
Shale	3475	3522				
T.D.	3522					

BRALLIER

July 28 1988
DATE
APPROVED BY
Vice-President
TITLE

003-21222

NOTE: The locations of the abandoned gas wells No. 80, 81, 86 and 87 have been located on the maps from the old Ranton Myna maps due to the absence of any evidence in the field.

Well 15 located on topo map 1298 feet west of LONGITUDE 79 ° 42 ' 30 '

10/9/39

Include description of the property and course and distance of the well(s) location to two or more permanent identifiable points or land markers, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' (identified on the most current 7 1/2 topographic map and wetlands within 100'). Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 is not required for well plugging

 Denotes location of well on 7 1/2" topo map Permit No. 51-003-21212-00 Project No. _____

PENNECOIL COMPANY INC.		Revision		☐	W. D. MOHNEY	
Well Permittee/Registrator		Alteration		☐	Surveyor/Engineer 16237-E	
200 U.S. ROUTE 22		Storage Recondition		☐	S-2A	
Address		New Location		☒	Drawing Number	
DELMONT PA 15826		Drill Deeper		☐	7-12-88, B. 29-BB	
		Abandonment		☐	Date	
SEDAT INC.		Registration		☐	1" = 500'	
Surface Owner		Plugging		☐	Scale	
N/A						
Surface Lessee (if any)		Surface landowner and water purveyor with water supply within 1,000'			Approximate course and distance to water supply	
SEDAT						
Firm Name		J. PREVATT		N 88° E 625'		
2A		PS - 8		N 81° E 935'		
Well No.		Tract		S 49° W 551'		
69.5		Serial No.				
		1162				
Acres		Ground Elevation				
NONE		3420'				
Angle of Deviation (Drilling)		Anticipated TD				
ALLEGHENY		PLUM BROD				
County		Municipality				
EV KENSINGTON EAST		G				
300 Quadrangle		Section				
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management		Owner/Operator/Lessee		Venueable Coal, Seams & More of Seam	SEP 26 1988	
		VILLA COAL COMPANY		UPPER FREEPORT	PA GEOLOGICAL SURVEY	
		SEDAT INC.		ALL OTHERS	FIELD NO. 16237-E	
		CONSOLIDATION COAL CO.		UPPER FREEPORT	PA GEOLOGICAL SURVEY	

6190' S 40° 32' E
1343' W 14' 00' S
(G)

RE

ER-OG-4: Rev. 5/84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF OIL AND GAS REGULATION
PITTSBURGH, PENNSYLVANIA 15208-2988

NEW KENSINGTON EAST

WELL RECORD

003-21222

Office Use Only

PERMIT NO. 37-003-21222-00

PROJECT NO.

TYPE OF WELL

Gas and Oil

RENTON FIELD

WELL OPERATOR DIX CO. INC. CORRECTION 01/04/89
Penneco Energy Corporation BY JUDITH WILKINSON-PEW 2/0

TELEPHONE NO.

412-468-8232

ADDRESS

200 Route 22, Delmont, PA

ZIP
15626

FARM NAME

Sadat #2A

FARM NO.

SERIAL NO.

PS-8

ACRES
70

TOWNSHIP

Plum Borough

COUNTY

Allegheny

DRILLING COMMENCED

1-12-89

DRILLING COMPLETED

1-19-89

ELEVATION

1162'

QUADRANGLE

New Kensington East

☒ 7 1/2' ☐ 15'

CASING AND TUBING RECORD

PIPE SIZE	AMOUNT IN WELL	MATERIAL BEHIND PIPE		PACKER			DATE RUN												
		CEMENT (SKS.)	GEL (SKS.)	TYPE	SIZE	DEPTH													
13-3/8"	16	Cuttings	None	N/A	N/A	16	1-12-89												
9-5/8"	653	225	5	Float Shoe	9-5/8"	663	1-13-89												
7"	1,985	280	11	Float Shoe	7"	1,995	1-17-89												
<table><tr><td>T.D.</td><td>D.D.</td><td>D.P.I.</td><td>Class</td><td>O.G.</td><td>Loss</td></tr><tr><td>4323</td><td></td><td>2375</td><td>A</td><td>1/1</td><td></td></tr></table>								T.D.	D.D.	D.P.I.	Class	O.G.	Loss	4323		2375	A	1/1	
T.D.	D.D.	D.P.I.	Class	O.G.	Loss														
4323		2375	A	1/1															

PERFORATION RECORD

STIMULATION RECORD

DATE	INTERVAL PERFORATED FROM TO	DATE	INTERVAL TREATED	AMOUNT FLUID	AMOUNT SAND	INJECTION RATE
NATURAL OPEN FLOW		NATURAL ROCK PRESSURE		72 HRS. DAYS		
294 MCF		50#				
AFTER TREATMENT OPEN FLOW		AFTER TREATMENT ROCK PRESSURE		HRS. DAYS		
N/A		N/A				

REMARKS:

Good cement returned to surface after setting 9-5/8" casing

and 7" casing. No water encountered in Renton Mine. Well

is to be produced naturally.

RECEIVED

PROD FM - Bradford

FMTR - BRALLIER

JUN 2 1989

PA GEOLOGICAL SURVEY

(Oil & Gas Geology Division)

(INFORMATION ON REVERSE SIDE)

11-21-89
4-25-89

003-21222

pg. 2

FORMATIONS						
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA
Clay and Shale	0	10				Driller's Log
Shale and Sand	10	16				
Sand and Shale	16	105				
Sand and Shale	105	460			Damp @ 60'	
Sand and Shale	460	495				
Sandy Shale	495	611				
Shale	611	621				
Shale	621	669				
Sand and Shale	669	865			1/2" @ 700'	
Shale	865	940				
Sand and Shale	940	1040				
Sand	1040	1219				
Sand and Shale	1219	1490				
Sand and Shale	1490	1950				
Sand	1950	2029				
Sand and Shale	2029	2210				
Red Rock	2210	2330				
Sand	2330	2445	2375'			
Sand and Shale	2445	2485				
Shale	2485	2600				
Sand and Shale	2600	3140				REMOVED GEOPHYSICAL LOG DATA
Shale and Sand	3140	3800				
Shale	3800	4323				
t.D.	4323					
Fourth					2334-2351	
Fifth					2391-2426	
Speechley Stray					3170-3188	
Speechley					3250-3286	
2nd Balltown					3561-3570	
2nd Bradford					3874-3884	

March 22, 1989
DATE
APPROVED BY
Vice-President
TITLE

WELL LOCATION PLAT

003-21223

Well is located on topo map 5210 feet south of LATITUDE 40 0 32 30 "

NOTE: The locations of the abandoned gas wells No. 80, 81, 86 and 87 have been located on the maps from the old Renton Mine maps due to the absence of any evidence in the field.

Well is located on topo map 1500 feet west of LONGITUDE 79 0 42 30 "



*A and B ARE PROPERTY CORNERS
 LOC - A = S 47° 22' 09" E 1128.9'
 LOC - B = N 75° 45' 07" E 452.4'

9-8-88
 Department Use Only

Include description of the property and courses and distances of the well(s) locations to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2 topographic map and wetlands within 100'. Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 is not required for well plugging

Denotes location of well on 7 1/2" topo map. Permit No. 37-003-21223-00 Project No.

PENNCO OIL COMPANY, INC.		Revision		W. D. MOHNEY	
Well Permittee/Registrant		Alteration		Surveyor/Engineer 16237-E	
220 U.S. ROUTE 22		Storage Recondition		5 - 3A	
Address		New Location		Drawing Number	
DELMONT, PA 15626		Drill Deeper		7-12-88, 8-29-88	
SEDAT INC.		Abandonment		Date	
Surface Owner		Regulation		1" = 500'	
N/A		Plugging		Scale	
Surface Lessor (if any)		Surface landowner and water purveyor with water supply within 1,000'		Approximate course and distance to water supply	
SEDAT		NONE		RECEIVED	
Form Name				SEP 26 1988	
3A				PA GEOLOGICAL SURVEY	
Well No. Tract				Office of Gas Geology Division	
69.5 PS - 46				VARIABLE Coal Seam	
Serial No.				Name of Seam	
1186				VILLA COAL COMPANY	
Ground Elevation				SEDAT INC.	
NONE 9350'				CONSOLIDATION COAL CO.	
Angle of Deviation (Drilling)				UPPER FREEPORT	
ALLEGHENY				ALL OTHERS	
County				UPPER FREEPORT?	
NEW KENSINGTON EAST					
Topo Quadrangle					
Municipality					
PLUM BORO					
Section					
G (7)					
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management					

003-21223

5310' S 40° 32' 30"
196X 8/17/42 50
(G)
B# 39241
39242

ER-00-4: Rev. 6/84
RE

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF OIL AND GAS REGULATION
PITTSBURGH, PENNSYLVANIA 15206-2988

NEW KENSINGTON EAST
2/22/89
Office Use Only
003-21223

WELL RECORD

PERMIT NO. 37-003-21223-00 PROJECT NO. TYPE OF WELL Gas and ~~Oil~~
WELL OPERATOR RENTON FIELD Penneco Energy Corporation TELEPHONE NO. 412-468-8232
ADDRESS 200 Route 22, Delmont, PA ZIP 15626
FARM NAME Sedat #3A FARM NO. SERIAL NO. PS-46 ACRES 70
TOWNSHIP Plum Borough COUNTY Allegheny
DRILLING COMMENCED 1-25-89 DRILLING COMPLETED 2-1-89
ELEVATION 1,106' QUADRANGLE NEW KENSINGTON EAST 7 1/2' 15'

CASING AND TUBING RECORD

PIPE SIZE	AMOUNT IN WELL	MATERIAL BEHIND PIPE		PACKER			DATE RUN
		CEMENT (SKS.)	GEL (SKS.)	TYPE	SIZE	DEPTH	
13-3/8"	16-1/2	Cuttings	None	N/A	N/A	16-1/2	1-25-89
9-5/8"	643	150	3	Float Shoe	9-5/8"	653	1-26-89
7"	1,948	265	8	Float Shoe	7"	1,958	1-28-89
4-1/2"	3,999	110	4	Float Shoe	4-1/2"	4,009	2-1-89
1-1/2"	3,270	N/A	N/A	N/A	N/A	3,270	2-10-89

PERFORATION RECORD			STIMULATION RECORD				
DATE	INTERVAL PERFORATED FROM	TO	DATE	INTERVAL TREATED	AMOUNT FLUID	AMOUNT SAND	INJECTION RATE
2-8-89	3890	3893	2-8-89	3557-3893	14,500	14,000#	17.0BPM
2-8-89	3874	3878	2-8-89	3342-3276	31,000	33,600#	30.0BPM
2-8-89	3557	3561	2-8-89	3102-3169	10,500	9,200#	28.0BPM
2-8-89	3242	3276					
2-8-89	3102	3104					
2-8-89	3166	3169					

T.D.	D.D.	D.P.I.	Class	O.G.	Lease
4320		3893	8	1	1

NATURAL OPEN FLOW 29 MCF	NATURAL ROCK PRESSURE Not Taken	HRS. DAYS
AFTER TREATMENT OPEN FLOW 287 MCF	AFTER TREATMENT ROCK PRESSURE 720#	89 72 HRS. DAYS

REMARKS:
Good cement returned to surface after setting 9-5/8" casing and 7" casing. No water encountered in Renton Mine.
PROP. FM - Bradford
FM TO - BRALLIER

RECEIVED (SIDE)
JUN 2 1989
PA. GEOLOGICAL SURVEY
(Oil & Gas Geology Division)

003-21223

19 2

FORMATIONS							
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA	
Fill	0	6				Driller's Log	
Shale	6	14					
Sand	14	16					
Sand and Shale	16	48					
Sand and Shale	48	475			Hole damp @ 48'		
Shale	475	669			2" @ 220 ft.		
Sand and Shale	669	760					
Shale	760	890					
Sand	890	960					
Shale	960	1105					
Sandy Shale	1105	1190					
Sand and Shale	1190	1550					
Sand and Shale	1550	1900			1" @ 1860 Ft.		
Sand	1900	1934					
Red Rock	1934	1938					
Sand	1938	2000					
Sand	2000	2032					
Sand and Shale	2032	2571	2360-2390				
Sand and Shale	2571	3030					
Shale and Sand	3030	3630	3240-50				
Shale	3630	4320	3560-70'				
T.D.	4320		3880-3900				
BRUNER							
GEOPHYSICAL LOG DATA							
Speechley Stray				3099-3172			
Speechley				3240-3280			
2nd Balltown				3556-3562			
2nd Bradford				3868-3892			
[REDACTED]							

March 17, 1989
DATE

APPROVED BY

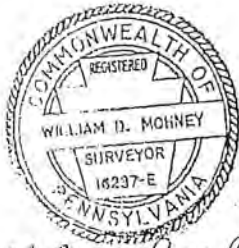
Vice-President

TITLE

WELL LOCATION PLAT

003-21225

Well is located on topo map 6700 feet south of LATITUDE 40 0 32 38 "



William D. Mohney



BEN DZIUBAN

PROPOSED LOCATION

DRENNEN ROAD

Well is located on topo map 11,150 feet west of LONGITUDE 79 0 40 00 "

— LEASE LINE
--- PROPERTY LINE

A and B ARE PROPERTY CORNERS

LOC - A = N 8° 02' 51" W 372.1'

LOC - B = S 85° 09' 35" E 898.4'

9-21-88
Department Use Only

6	99	1	C
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Include description of the property and courses and distances of the well(s) locations to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2 topographic map and wetlands within 100'. Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 is not required for well plugging

Denotes location of well on 7 1/2" topo map Permit No. 37-003-21225-05 Project No.

PENNECO OIL COMPANY, INC.		Revision	☐	WILLIAM D. MOHNEY
Well Permittee/Registrant		Alteration	☐	Surveyor/Engineer 16237-E
200 U.S. ROUTE 22		Storage Recondition	☐	DZ-1
Address		Nav Location	☒	Drilling Number
DELMONT, PA 15626		Drill Deeper	☐	B-12-88
BEN DZIUBAN		Abandonment	☐	Date
Surface Owner		Registration	☐	1" = 40'
NONE		Plugging	☐	Scale
Surface Lessor (if any)		Surface landowner and water purveyor with water supply within 1,000'		Approximate location and distance to water supply
DZIUBAN				OCT 19 1988
Form Name				PA GEOLOGICAL SURVEY
1	PD 73	BEN DZIUBAN		N 84° E 602' 1" Gas Geology Division
Well No.	Tract	Serial No.	SPR DZIUBAN	N 72° E 988'
60.5		1038	RICHARD OSKIN SR	N 57° E 988'
Acres	Ground Elevation		STEVE BOBIK	N 51° E 843'
NONE	3680'		RANDY BOBIK	N 37° E 813'
Angle of Deviation (Drilling)	Anticipated TD		JOHN DZIUBAN	N 12° E 613'
ALLEGHENY	PLUM BORO			
County	Municipality	Owner/Operator/Lessor		
EV KENSINGTON EAST 1408	B	VILLA COAL COMPANY		
Topo Quadrangle	Section	BEN DZIUBAN		
		WATER PLAYVEYOR :		
		Wollie Crooks		
		Consolidation Coal Co.		
		RENTON MINE		

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Oil and Gas Management

6700' S 40° 33' 30"
11150' W 74° 43' 00"
RE 37252 939253 (4) (X)

ER-OQ-4: Rev. 6/84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF OIL AND GAS REGULATION
PITTSBURGH, PENNSYLVANIA 15206-2988

NEW KENSINGTON EAST

WELL RECORD

Office Use Only
003-21225

PERMIT NO. 37-003-21225-00 PROJECT NO. TYPE OF WELL Gas

RENTON FIELD

WELL OPERATOR OIL CO. INC. *CONTRACT MADE BY PHILIP* TELEPHONE NO. 412-468-8232
Pennaco Energy Corporation *WITH ADDRESS NEW KEN. PENN.*
ADDRESS 200 Route 22, Delmont, PA ZIP 15626

FARM NAME Ben Dziuban #1 FARM NO. SERIAL NO. PD-73 ACRES 60

TOWNSHIP Plum Borough COUNTY Allegheny

DRILLING COMMENCED 11-30-88 DRILLING COMPLETED 12-6-88

ELEVATION 1038' QUADRANGLE New Kensington East ☒ 7 1/2' ☐ 16'

CASING AND TUBING RECORD

PIPE SIZE	AMOUNT IN WELL	MATERIAL BEHIND PIPE		PACKER			DATE RUN
		CEMENT (SKS.)	GEL (SKS.)	TYPE	SIZE	DEPTH	
13-3/8"	30	Cuttings	None	N/A	N/A	30	11-30-88
7"	1,910	380	20	Float Shoe	7"	1,920	12-3-88
4-1/2"	3,798	175	12	Float Shoe	4-1/2"	3,808	12-7-88
1-1/2"	3,408	N/A	N/A	N/A	N/A	3,408	12-8-88

PERFORATION RECORD

STIMULATION RECORD

DATE	INTERVAL PERFORATED FROM	TO	DATE	INTERVAL TREATED	AMOUNT FLUID	AMOUNT SAND	INJECTION RATE
12-11-88	3405	3410	12-11-88	3405-3410	8,500	7,200#	25BPM
12-11-88	3094	3124	12-11-88	3094-3124	31,000	33,600#	33BPM
12-11-88	3019	3023	12-11-88	3019-3023	9,000	7,200#	25BPM

I.D.	D.D.	D.P.I.	Class	O/G	Lease
4181		3410	D		

NATURAL OPEN FLOW 38 MCF	NATURAL ROCK PRESSURE Not Taken	HRS. DAYS
AFTER TREATMENT OPEN FLOW 280 MCF	AFTER TREATMENT ROCK PRESSURE 910	72 HRS. DAYS

REMARKS:

Good cement returned to surface after setting 7" casing.

PROD. FM - Bradford

FM TO - BRALLIER

RECEIVED
(FORMATION ON REVERSE SIDE)

JUN 2 1989

PA GEOLOGICAL SURVEY
(Oil & Gas Geology Division)

003-21225

192

FORMATIONS							
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA	
Clay	0	10				Driller's Log	
Shale	10	20					
Sand	20	23					
Sand and Shale	23	430					
Sand and Shale	430	600			Damp @ 90'		
Coal	600	602			1" @ 430'		
Sand and Shale	602	650					
Shale and Sand	650	1120					
Sand and Shale	1120	1549					
Sand and Shale	1549	1870			1" @ 1750'		
Sand and Shale	1870	1938					
Sand and Shale	1938	2064					
Sand, Shale & Red Rock	2064	2450					
Sand and Shale	2450	2930					
Sand and Shale	2930	3530					
Shale and Sand	3530	3810					
Shale	3810	4181					
T.D.	4181						
<i>Boiler</i>							
<u>GEOPHYSICAL LOG DATA</u>							
Fifth					2270-2290		
Speechley Stray					3018-3024		
Speechley					3092-3126		
2nd Balltown					3404-3412		
2nd Bradford					3710-3740		
1000 1000							

March 31, 1989
DATE
[Signature]
APPROVED BY
Vice-President
TITLE

WELL LOCATION PLAT

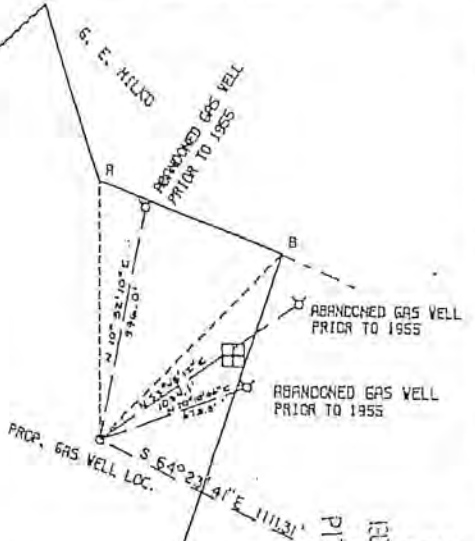
003-21224

Well is located on topo map 5820 feet south of LATITUDE 40 0 32 30 "

Well is located on topo map 4500 feet west of LONGITUDE 79 0 42 30 "



LOGANS FERRY SPORTSMEN'S CLUB



- LEASE LINE
- - - PROPERTY LINE
- ⊙ ABANDONED GAS WELL
- PROPOSED GAS WELL LOCATION

A and B ARE PROPERTY CORNERS
 LOC - A = N 88° 57' 55" W 1265.8'
 LOC - B = N 44° 36' 38" E 1111.4'



Department Use Only

b	c
---	---

Include description of the property and courses and distances of the well(s) locations to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' (identified on the most current 7 1/2 topographic map and wetlands within 100'). Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000' is not required for well plugging

⊞ Denotes location of well on 7 1/2" topo map Permit No. 37-003-21224-00 Project No.

PENNECO OIL COMPANY, INC.		Revision	☐	W. D. MOHNEY
Well Permittee/Registrant		Alteration	☐	Surveyor/Engineer 16237-E
200 U.S. ROUTE 22		Storage Recondition	☐	5 - 1
Address		New Location	☒	Drawing Number
DELMONT, PA 15626		Drill Deeper	☐	10-13-88 11-4-88
LOGANS FERRY SPORTSMEN'S CLUB		Abandonment	☐	Date
Surface Owner		Registration	☐	1" = 600'
N/A		Plugging	☐	Scale
Surface Lessor (if any)		Surface landowner and water purveyor with water supply within 1,000'		Approximate course and distance to water supply
SPORTSMEN'S CLUB				
Form Name				
1				
Well No.	Tract	Serial No.		
142.323		1064		
Acres		Ground Elevation		
NONE		3700		
Angle of Deviation (Drilling)		Anticipated JO		
ALLEGHENY		PLUM BORO		
County		Municipality		
EV KENSINGTON EAST		7		
Topo Quadrangle		Section		
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management		PA GEOLOGICAL SURVEY Owner: <u>Yella Coal Co and Consolidation Coal Co</u> Name of Seam: <u>ALL SEAMS</u>		

RECEIVED

RECEIVED

DEC 9 1988

DEC 9 1988

ETB 11/22/86

003-21226

P5 2

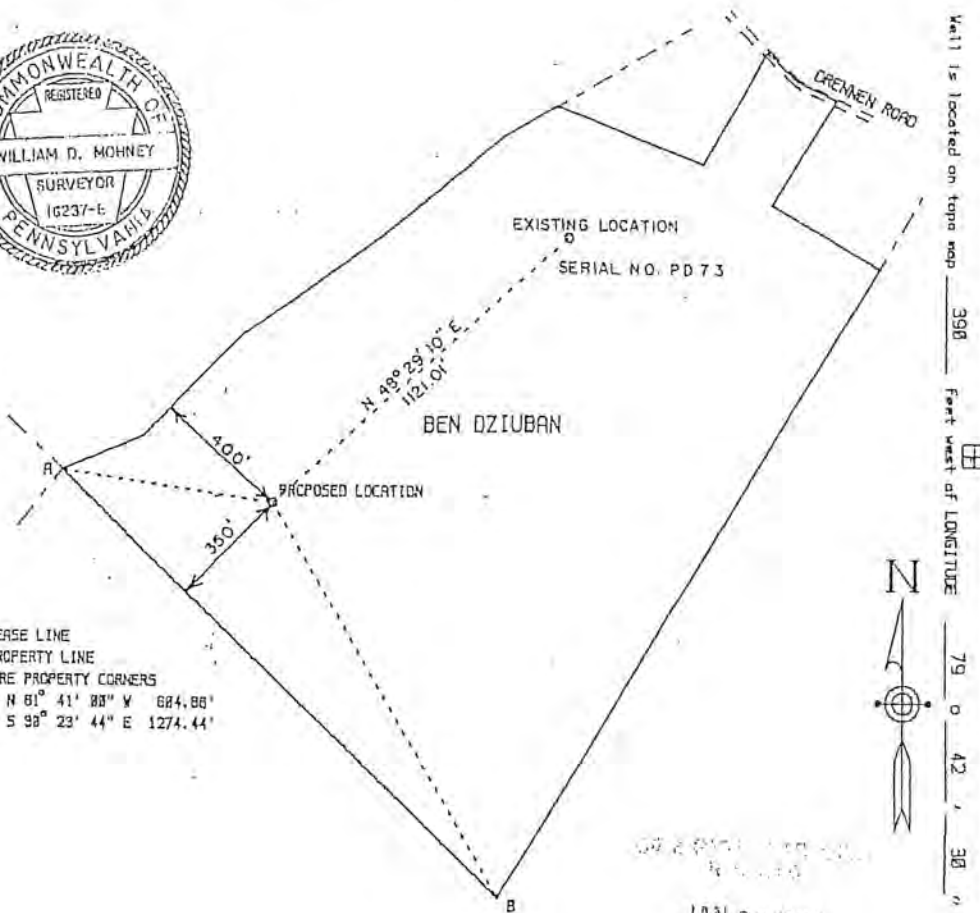
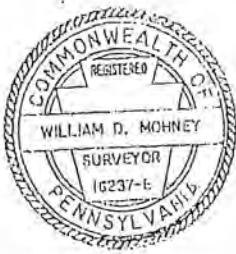
FORMATIONS							
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA	
Shale and Sand	0	28				Driller's Log	
Sand and Shale	28	180			1/2" @ 100'		
Shale and Sand	180	430					
Sand and Shale	430	540					
Mine	540	545					
Shale	545	580					
Sand and Shale	580	740					
Shale	740	780					
Sandy Shale	780	890					
Shale	890	915					
Sand	915	955					
Shale	955	1020					
Sand and Shale	1020	1340					
Sand and Shale	1340	1763					
Sand and Shale	1763	1825			1-1/2" @ 1825'		
Sand	1825	1943				2100'	
Shale, sand & Red Rock	1943	2216					
Red Rock, Shale & Sand	2216	2720					
Sand and Shale	2720	3356		2100'			
Sand and Shale	3356	3800					
Shale	3800	4230					
T.D.	4230						
GEOPHYSICAL LOG DATA							
Fourth					2278-2292		
Fifth					2344-2372		
Speechley Sray					3124-3132		
Speechley					3194-3238		
2nd Balltown					3515-3621		
2nd Bradford					3835-3837		

March 22, 1989
DATE
APPROVED BY
Vice-President
TITLE

WELL LOCATION PLAT

003-21228

Well is located on topo map 7500 feet south of LATITUDE 40 0 32' 30"



Well is located on topo map 390 feet west of LONGITUDE 79 0 42' 30"

LEASE LINE
PROPERTY LINE
A and B ARE PROPERTY CORNERS
LOC - A = N 81° 41' 00" W 684.86'
LOC - B = S 98° 23' 44" E 1274.44'

JAN 26 1989

1-31-89
Department Use Only
G C L

Include description of the property and courses and distances of the well(s) locations to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2 topographic map and wetlands within 100'. Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 is not required for well plugging

Denotes location of well on 7 1/2" topo map Permit No. 37-003-21228-00 Project No.

PENNCO OIL COMPANY, INC.		Revision	☐	V. D. MOHNEY
Well Permittee/Registrant		Alteration	☐	Surveyor/Engineer 16237-E
280 U.S. ROUTE 22		Storage Recodition	☐	DZ - 2
Address		New Location	☒	Drawing Number
DELMONT, PA 15626		Drill Deeper	☐	1-5-89
BEN DZIUBAN		Abandonment	☐	Date
Surface Owner		Registration	☐	1" = 400'
NONE		Plugging	☐	Scale
Surface Lessor (if any)		Approximate course and distance to water supply within 1,000'		
DZIUBAN		RECEIVED		
Farm Name		521 E 1000'		
2		FEB 24 1989		
Well No. Tract		PA GEOLOGICAL SURVEY		
60.5 1818		(Oil & Gas Geology Division)		
Area		Ground Elevation		
NONE		3600		
Angle of Deviation (Drilling)		Anticipated TO		
ALLEGHENY		PLUM BORO		
County		Municipality		
NEW KENSINGTON EAST 1408		Section		
Topo Quadrangle		Commonwealth of Pennsylvania		
		Department of Environmental Resources		
		Bureau of Oil and Gas Management		
		RENTON MINE		

7500' S 4034' 30"
390' W 79' 43' 30"
1E (a)

EN-OG-4: Rev. 8/84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF OIL AND GAS REGULATION
PITTSBURGH, PENNSYLVANIA 15208-8998

DER-BOGM

NEW KENSINGTON EAST

JUN -6 PM 48

Office Use Only

WELL RECORD PITTSBURGH REGION

PERMIT NO. 07-003-21228-00
PROJECT NO. 1142
TYPE OF WELL GAS
WELL OPERATOR
Penneco Energy Corporation
ADDRESS
200 Route 22, Delmont, PA
FARM NAME
Ben Dziuban #2
TOWNSHIP
Plum Borough
COUNTY
Allegheny
DRILLING COMMENCED
3-21-89
DRILLING COMPLETED
3-28-89
ELEVATION
2010'
QUADRANGLE
New Kensington East 7' 15'

CASING AND TUBING RECORD

PIPE SIZE	AMOUNT IN WELL	MATERIAL BEHIND PIPE		PACKER			DATE RUN
		CEMENT (SKS.)	GEL (SKS.)	TYPE	SIZE	DEPTH	
13-3/8"	25	Cuttings	None	N/A	N/A	25	3-21-89
9-5/8"	497	175	6	Float Shoe	9-5/8"	507	3-22-89
7"	1905	165	12	Float Shoe	7"	1,915	3-24-89
4-1/2"	3,886	190	5	Float Shoe	4-1/2"	3,896	3-28-89
T.D. D.D. D.P.I. Casing O.G. Loss							
4301 3750 0 1 1							

PERFORATION RECORD

STIMULATION RECORD

DATE	INTERVAL PERFORATED FROM	TO	DATE	INTERVAL TREATED	AMOUNT FLUID	AMOUNT SAND	INJECTION RATE
4-11-89	3728	3732	4-11-89	3720-3750	11,800	12,000#	30BPM
4-11-89	3740	3740	4-11-89	3417-3422	10,000	8,000#	25BPM
4-11-89	3748	3750	4-11-89	3107-3138	28,000	34,000#	37BPM
4-11-89	3417	3422	4-11-89	3030-3038	10,000	9,200#	25BPM
4-11-89	3107	3112					
4-11-89	3118	3118					
4-11-89	3124	3138					
4-11-89	3030	3031					
4-11-89	3034	3038					

NATURAL OPEN FLOW	43 MCF	NATURAL ROCK PRESSURE	Not Taken	HRS. DAYS
AFTER TREATMENT OPEN FLOW	280 MCF	AFTER TREATMENT ROCK PRESSURE	810	72 HRS. DAYS

REMARKS:

Good cement returned to surface after setting 7" casing.

FM TD - ELK GROUP

PROD FM - BRADFORD

RECEIVED

(FORMATION ON REVERSE SIDE)

JUL 3 1 1989

PA GEOLOGICAL SURVEY
(Oil & Gas Geology Division)

7-0-89

003-21228

P 2

FORMATIONS						
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA
Clay and Shale	0	25				Driller's Log
Sand and Shale	25	48			1/2" @ 48'	
Sand and Shale	48	75				
Sand	75	160				
Sand and Shale	160	342				
Shale	342	405				
Sand	405	465				
Gob	465	475				
Shale	475	520				
Shale	520	590			1/2" @ 540'	
Sand and Shale	590	805				1" @ 1750'
Shale	805	1005				
Sand	1005	1110				
Sand and Shale	1110	1250				
Shale and Sand	1250	1600				
Sand and Shale	1600	1720				
Sand	1720	1890				
Sand and Shale	1890	1915				
Sand and Shale	1915	2300				
Sand and Shale	2300	2764				
Shale and Sand	2764	3240	3/20'			
Sand and Shale	3240	3850				
Shale	3850	4201				
T.D.	4201					
GEOPHYSICAL LOG DATA						
Fifth					2244-2304	
Speechley Spray					3029-3038	
Speechley					3100-3140	
2nd Balltown					3416-3423	
2nd Bradford					3725-3751	

April 28

89

DATE _____, 19__

APPROVED BY

Vice-President

TITLE _____

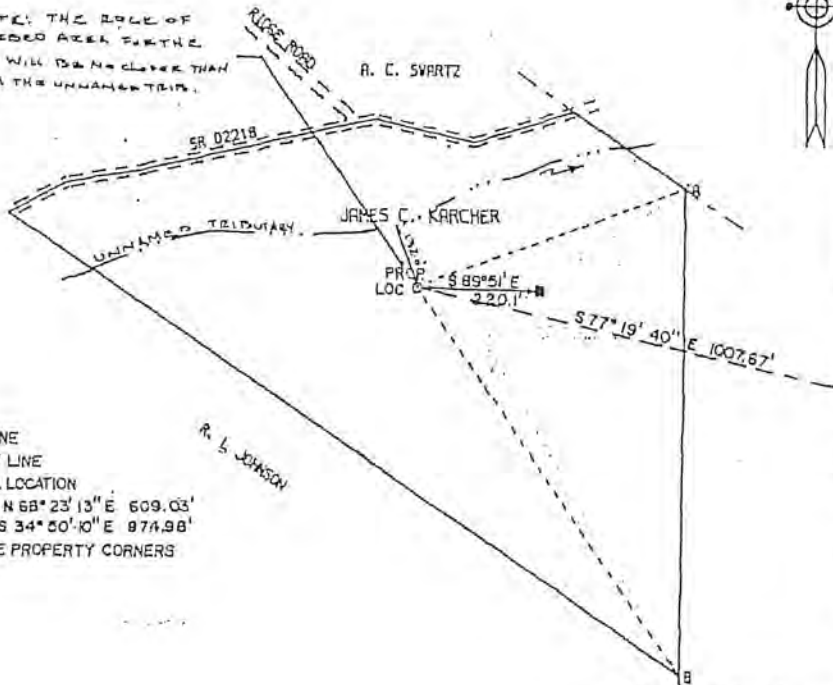
WELL LOCATION PLAT

Well is located on topo map - 3085 - feet south of LATITUDE 48 0 32' 30"

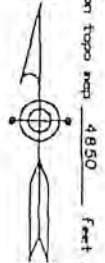
003-21232



NOTE: THE ROLE OF THE DISTRICTED AREA FURTHER LOCATION WILL BE NO CLOSER THAN 100' FROM THE UNNAMED TRIBUTARY.



DER-BOGM
89 MAR 29 AM 10:55
PITTSBURGH REGION



Well is located on topo map 4850 feet west of LONGITUDE 79 0 42' 30"

EXISTING GAS WELL 00707

- LEASE LINE
- - - PROPERTY LINE
- o GAS WELL LOCATION
- LOC-A = N 68° 23' 13" E 609.03'
- LOC-B = S 34° 50' 10" E 874.98'
- A and B ARE PROPERTY CORNERS

Department Use Only

G	C
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Include description of the property and courses and distances of the well(s) locations to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'. Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 is not required for well plugging

Denotes location of well on 7 1/2" topo map Permit No. 37-043-21232-00 Project No.

PENNCO OIL COMPANY, INC. 13825		Revision	☐	W. D. MOHNEY
Well Permittee/Registrant		Alteration	☐	Surveyor/Engineer 16237-E
200 U.S. ROUTE 22		Storage Recondition	☐	K - 1
Address		New Location	☒	Drawing Number
DELMONT, PA 15626		Drill Casper	☐	9-6-88 2-3-89 2-15-89
JAMES KARCHER		Abandonment	☐	Date
Surface Owner		Registration	☐	1" = 300'
N/A		Plugging	☐	Scale
Surface Lessor (if any)		Approximate course and distance to water supply		
KARCHER		within 1,000'		
Park Name		James C. Karcher S 42° 42' E 235.7'		
1		Richard S. Borowski N 61° 00' E 910'		
Well No. Tract		S. A. Borowski N 61° 30' E 980'		
20		Walter Hummel N 65° 30' E 690'		
Acres				
NONE				
Ground Elevation				
3500'				
Angle of Deviation (Drilling)				
ALLEGHENY				
County				
EV KENSINGTON EAST				
Topo Quadrangle				
Section				
Commonwealth of Pennsylvania				
Department of Environmental Resources				
Bureau of Oil and Gas Management				
		Owner/Operator/Lessor		
		Yorkshire Coal Seam		
		Name of Seam		
		U. MAY 31 1989		
		all seams except U.F.		
		PA GEOLOGICAL SURVEY		
		1011 G. Geology Division		
		FSD 3/31/89		

Name, Address, and Telephone Number of Well Service Companies			APR 27 1990
F. D. Hill Drilling Co.	Rte. 121 South, Kane PA 16735		814-837-6612
Dowell Schlumberger	P. O. Box 437, Blacklick, PA 15401	LOGICAL SURVEY	12-459-7900
Allegheny Nuclear Surveys, Inc.	Elderton, PA 15736	(Oil & Gas Geology Division)	412-354-3090

003-21232

PS 2

DRILLER'S LOG OF FORMATIONS						
Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Clay	0	5				Driller's Log
Shale	5	25				
Sand	25	34				
Sand and Shale	34	100				
Sand and Shale	100	300				
Sand and Shale	300	335			5" @ 330'	
Open Mine	335	340				
Sand and Shale	340	870			1" @ 475'	
Sand and Shale	870	1280				
Shale and Sand	1280	1703			5" @ 1600'	
Sand	1703	1920				
Red Rock and Sand	1920	1970				
Sand and Shale	1970	2360	1750'			
Shale and Sand	2360	2930				
Sand and shale	2930	3550	2980'			
Shale	3550	4139				
T.D.	4139					
Brillie						
GEOPHYSICAL LOG DATA						
Fifth					2099-2130	
Third Warren					2817-2834	
Speechley					2954-3001	
2nd Balltown					3272-3281	
Bradford					3628-3631	

BY:

Operator's Signature

Vice-President

Title

11-22-89

Date

FOR OFFICIAL USE ONLY

Reviewed By William H. Evans 1/25/90

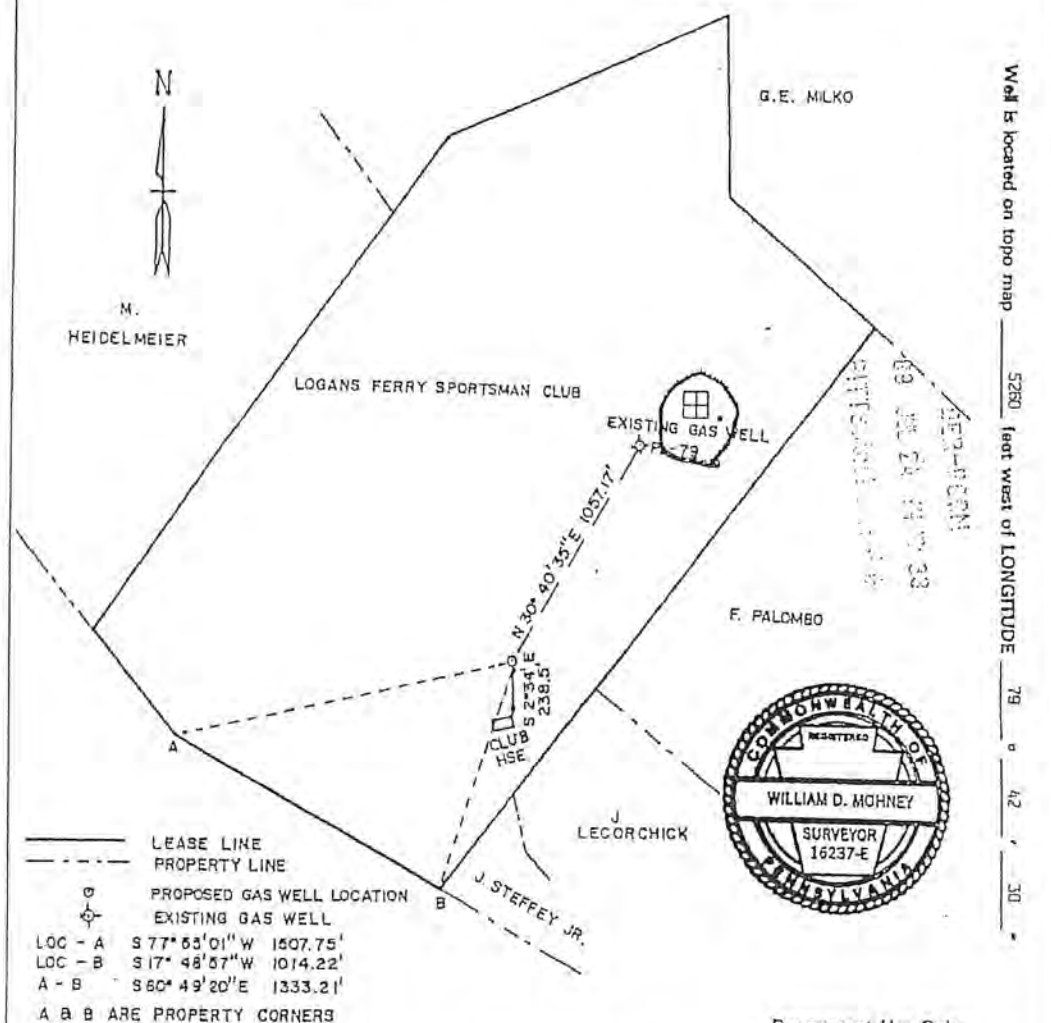
Date

Comments

003-21236

44078

Well is located on topo map 6800 feet south of LATITUDE 40 ° 32 ' 30 "



Department Use Only

G	C
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Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'.

Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 is not required for well plugging.

 Denotes location of well on 7 1/2" topo map Permit # 37-162-21236-uc Project # _____

Penneco Oil Company, Inc.		13825		Project No.	
Well Permitter/Regulant 200 U.S. Route 22		Revision Alteration Storage Recondition New Location Drill Deeper Abandonment Registration Plugging		☐ ☐ ☐ ☒ ☐ ☐ ☐ ☐	
Address Delmont, PA 15626				M.D. Mohney Surveyor/Engineer S - 5 Drawing Number 7-14-69 Date 1" = 600' Scale	
Logans Ferry Sportaman's Club					
Surface Owner N/A					
Surface Lessor (if any) Sportman's Club		Surface landowner and water purveyor with water supply within 1,000'		Approximate course and distance to water supply	
Form Name S		PL-83			
Well No.	Tract	Serial No.		Logan's Ferry Sportsman's Club S 21° E 250'	
142.323		1243		RECEIVED	
Acres None		Ground Elevation 3600'			
Angle of Deviation (Chiling)		Anticipated TD		SEP 25 1969	
Allegheny		Plum Boro			
County		Municipality		Workable Coal Seams GEOLOGICAL SURVEY Division of Geology Office of Gas Geology	
New Kensington East	1418	7		Consolidation Coal Co.	
Topo Quadrangle		Section		All Seams	
Commonwealth of Pennsylvania				F.B. 8/2/84 -	
Department of Environmental Resources					
Bureau of Oil and Gas Management					

RE

FIELD RENTON - DEV

NEW KENSINGTON EAST

21236
003-21236

ER-OG-4: Rev. 3/89

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Oil and Gas Management4800' S 40° 32' 30"
5260' W 79° 42' 30"

(G)

WELL RECORD AND COMPLETION REPORT

- In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
- In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-OG-75).

Well Operator Penneco Energy Corporation		Telephone Number 412-468-8232	
Address 200 Route 22, Delmont, PA		Zip 15626	
Permit Number 37-003-21236-00		Project Number	
Farm Name Logans Ferry Sportsman's Club #5	Farm Number	Serial Number PL-83	Acres 142
Township Blum Boro		County Allegheny	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air ☒ Mud ☐ Cable Tool ☐ Other ☐ (Specify)		Date Drilling Started 11-2-89	Date Drilling Completed 11-9-89
Elevation 1243'	Total Depth 4517'	7 1/2' Quadrangle New Kensington East	

FMTD - BRALLIER

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe	Packer/Hardware			Date Run
			Type and Amount	Type	Size	Depth	
15"	13"	34	Cuttings	N/A	N/A	34	11-2-89
12-1/2"	9-5/8"	734	Cement - 140 Sacks			741	11-3-89
8-3/4"	7"	2068	Cement - 275 Sacks	Float Shoe	7"	2,078	11-7-89
6-1/4"	4-1/2"	3712	Cement - 150 Sacks	Float Shoe	4-1/2"	3,718	11-10-89
	1-1/2"	3316	N/A				11-16-89
Cement return on surface casing? ☒ yes ☐ no							

COMPLETION REPORT
PROD FM - BRADFORD

Perforation Record			Stimulation Record																		
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate												
	From	To			Type	Amount	Type	Amount													
11-15	3,614	3,619	11-15	3614-3619	Water	8,500	Sand	13,000#	24 BPM												
11-15	3,300	3,336	11-15	3300-3336	Water	32,000	Sand	60,000#	29 BPM												
<table><tr><td>T.D.</td><td>D.D.</td><td>D.P.I.</td><td>Class</td><td>O.G.</td><td>Lease</td></tr><tr><td>4517</td><td></td><td>3619</td><td>D</td><td></td><td></td></tr></table>										T.D.	D.D.	D.P.I.	Class	O.G.	Lease	4517		3619	D		
T.D.	D.D.	D.P.I.	Class	O.G.	Lease																
4517		3619	D																		

Natural Open Flow 136 MCF	Natural Rock Pressure Not Treated	Hours N/A	Days
After Treatment Open Flow 350 MCF	After Treatment Rock Pressure 750#	Hours 60	Days

Name, Address, and Telephone Number of Well Service Companies	PA GEOLOGICAL SURVEY
F. D. Hill Drilling Co.	Rte. 321 South, Kane, PA 17830 814-837-6612
Dowell Schlumberger	P. O. Box 437, Blacklick, PA 15716 412-429-2700
Allegheny Nuclear Surveys, Inc.	Elderton, PA 15736 412-534-3090

003-21236

PS 2

DRILLER'S LOG OF FORMATIONS						
Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Fill	0	12				Driller's Log
Shale	12	34				
Sand	34	40				
Shale and Sand	40	100				
Sand and Shale	100	520			1" @ 420'	
Sand and Shale	520	760			1" @ 640'	
Shale and Sand	760	1030				
Red Rock, Sand, Shale	1030	1450				
Sand and Shale	1450	1900				
Sand and Shale	1900	2087			4" @ 1935'	
Sand and Shale	2087	2180				
Shale and Sand	2180	2270				
Red Rock and Shale	2270	2750				
Sand and Shale	2750	3430				
Sand and Shale	3430	4020				
Shale	4020	4517				
T.D.	4517					
Brallier						
GEOPHYSICAL LOG DATA						
Fourth					2384-2400	
Fifth					2444-2470	
Speechley					3296-3340	
2nd Balltown					3612-3622	

PENNCO ENERGY CORPORATION

BY: [Signature]
Operator's SignatureVice-President
TitleDecember 9, 1989
Date

FOR OFFICIAL USE ONLY

Reviewed By [Signature] 11/25/90
Date

Comments _____

WELL LOCATION PLAT

003-21237
44077

Well is located on topo map 4830 feet south of LATITUDE 40° 32' 30"



Department Use Only

G	C

Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'.

Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000' is not required for well plugging.

⊙ Denotes location of well on 7 1/2" topo map Permit # 27-003-21237-00 Project #

Pennaco Oil Company, Inc.		Revision	☐	W.D. Mohney
Well Permits/Registrant		Alteration	☐	Surveyor/Engineer 16237-E
200 U.S. Route 22		Storage Recondition	☐	S-2
Address		New Location	☒	Drawing Number
Delmont, PA 15626		Drill Deeper	☐	6-27-89
Logans Ferry Sportsmen's Club		Abandonment	☐	Date
Surface Owner		Registration	☐	1" = 600'
N/A		Plugging	☐	Scale
Surface Lessor (if any)		Surface landowner and water purveyor with water supply within 1,000'		Approximate course and distance to water supply
Sportsmen's Club				RECEIVED
Prime Name				SEP 25 1989
2		PL-80	None	PA GEOLOGICAL SURVEY
Well No.		Tract	Serial No.	(Oil & Gas Ecology Division)
142,323		1105		Workable Coal Seams
Acres		Ground Elevation		Owner/Operator/Lessor
None		3700'		Name of Seams
Angle of Deviation (Drilling)		Anticipated TD		Consolidation Coal Co.
Allentown		Plum Boro		All Seams
County		Municipality		
New Kensington East 1405		7		
Topo Quadrangle		Section		
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management				



Client Id
Sub-facility Id

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

003-21237

WELL RECORD AND COMPLETION REPORT

CF

Well Operator Penneco Oil Company, Inc		DEP ID# 7674	Well API # (Permit / Reg) 37-003-21237	Project Number	Acres 142
Address 200 Rt 22, PO Box 300		State PA	Zip Code 15626	Well # 2	Sanol # PL-80
City Delmont		County Allegheny	Municipality Plum Boro		
Phone 724-468-8232		Fax 724-468-8230	USGS 7.5 min quadrangle map New Kensington East		

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

WELL RECORD AND COMPLETION REPORT

Well Type	☒ Gas ☐ Oil ☐ Combination Oil & Gas ☐ Injection ☐ Storage ☐ Disposal
Drilling Method	☒ Rotary - Air ☐ Rotary - Mud ☐ Cable Tool
Date Drilling Started 10/25/89	Date Drilling Completed 11/2/89
Surface Elevation 1105 ft	Total Depth - Driller 4520 ft
	Total Depth - Logger 4522 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
15"	13"	N/A	thread	34	Cuttings	N/A	N/A	N/A	10/25/8
12 1/4"	9 5/8"	N/A	thread	573	Cement - 240 sacks	Float Shoe	9 5/8"	581	10/26/8
8 3/4"	7"	N/A	thread	1904	Cement - 245 sacks	Float Shoe	7"	1912	10/30/8
6 1/4"	4 1/2"	9 5#	thread	3237	71 sks Completion Blend Cement	Float Shoe	4 1/2"	3237	6/17/05

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated From	To	Date	Interval Treated	Fluid Type	Amount	Propping Agent Type	Amount	Average Injection
6/27/05	3173	3213	6/27/05	3173 - 3213	Water	23,016 gal	Sand	29,300#	38 BPM

Natural Open Flow	1300 MCF	Natural Rock Pressure	50#	72 Hours	Days
After Treatment Open Flow	531 MCFPD	After Treatment Rock Pressure	300 PSI	72 Hours	Days

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

Name Hill Drilling Address P O Box 309 City - State - Zip Bradford, PA 16701 Phone 814-368-3831	Name Dowell Schlumberger Address P O Box 437 City - State - Zip Blacklick, PA 15716 Phone 412-459-7900	Name BJ Services Company Address RR #1, Box 144A City - State - Zip Fairmount City, PA 16224 Phone 814-365-2003
--	---	--

DEC 12 2005

003-21237

LOG OF FORMATIONS

Well API# 37-003-21237

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine, ft)	Source of Data
Clay and Shale	0	10				Driller's Log
Sand	10	34				
Sand & Shale	34	48				
Sand & Shale	48	380			1/2" @ 100'	
Sand & Shale	380	550			1/2" @ 490'	
Coal	550	555			6" @ 550'	
Shale & Sand	555	581				
Sand & Shale	581	920			1/2" @ 710'	
Shale & Sand	920	1320				
Sand & Shale	1320	1667			2" @ 1805'	
Sand & Shale	1667	1925			2" @ 1850'	
Sand & Shale	1925	2390				
Shale & Sand	2390	2720	2387'			
Sand & Shale	2720	3350				
Sand & Shale	3350	3890				
Shale	3890	4520				
T D	4520					

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

Well Operator Signature		DEP USE ONLY	
Title	Date	Reviewed by	Date
Vice President	12/7/05	mt	1/23/08
		Comments	



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

Client Id

Sub-facility Id

003-21237

WELL RECORD AND COMPLETION REPORT

CF

Well Operator Penneco Oil Company, Inc.		DEF ID# 7674	Well API # (Permit / Reg) 37-003-21237	Project Number	Acres 142
Address 200 Rt. 22, PO Box 300			Well Farm Name Logans Ferry Sportsmen's Club	Well # 2	Serial # PL-80
City Delmont	State PA	Zip Code 15626	County Allegheny	Municipality Plum Boro	
Phone 724-468-8232	Fax 724-468-8230	USGS 7.5 min. quadrangle map New Kensington-East			
Check all that apply: ☐ Original Well Record ☐ Original Completion Report ☒ Amended Well Record ☒ Amended Completion Report					

WELL RECORD

Also complete Log or Formations on back (pages 2-4)

Well Type	☒ Gas ☐ Oil ☐ Combination Oil & Gas ☐ Injection ☐ Storage ☐ Disposal								
Drilling Method	☒ Rotary - Air ☐ Rotary - Mud ☐ Cable Tool								
Date Drilling Started 10/25/89	Date Drilling Completed 11/2/89	Surface Elevation 1105 ft.	Total Depth - Driller 4520 ft.	Total Depth - Logger 4522 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
15"	13"	N/A	thread	34	Cuttings	N/A	N/A	N/A	10/25/8
12 1/4"	9 5/8"	N/A	thread	573	Cement - 240 sacks	Float Shoe	9 5/8"	581	10/26/8
8 3/4"	7"	N/A	thread	1904	Cement - 245 sacks	Float Shoe	7"	1912	10/30/8
6 1/4"	4 1/2"	9.5#	thread	3237	71 sks Completion Blend Cement	Float Shoe	4 1/2"	3237	6/17/05

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated From	To	Date	Interval Treated	Fluid Type	Amount	Propping Agent Type	Amount	Average Injection
6/27/05	3173	3213	6/27/05	3173 - 3213	Water	23,016 gal	Sand	29,300#	38 BPM

Natural Open Flow	1300 MCF	Natural Rock Pressure	50#	72 Hours	Days
After Treatment Open Flow	531 MCFPD	After Treatment Rock Pressure	300 PSI	72 Hours	Days

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

Name Hill Drilling	Name Dowell Schlumberger	Name BJ Services Company
Address P.O. Box 309	Address P.O. Box 437	Address RR #1, Box 144A
City - State - Zip Bradford, PA 16701	City - State - Zip Blacklick, PA 15716	City - State - Zip Fairmount City, PA 16224
Phone 814-368-3831	Phone 412-459-7900	Phone 814-365-2003

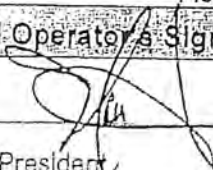
DEC 12 2005

LOG OF FORMATIONS

Well API#: 37-003-21237

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine: ft.)	Source of Data
Clay and Shale	0	10				Driller's Log
Sand	10	34				
Sand & Shale	34	48				
Sand & Shale	48	380			1/2" @ 100'	
Sand & Shale	380	550			1/2" @ 490'	
Coal	550	555			6" @ 550'	
Shale & Sand	555	581				
Sand & Shale	581	920			1/2" @ 710'	
Shale & Sand	920	1320				
Sand & Shale	1320	1667				
Sand & Shale	1667	1925			2" @ 1805'	
Sand & Shale	1925	2390			2" @ 1850'	
Shale & Sand	2390	2720	2387'			
Sand & Shale	2720	3350				
Sand & Shale	3350	3890				
Shale	3890	4520				
T.D.	4520					

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

Well Operator's Signature: 	DEP USE ONLY
Title: Vice President	Reviewed by: _____ Date: _____
Date: 12/7/05	Comments: _____

RE

FIELD-RENTON-DEV

NEW KENSINGTON EAST

ER-OG-4; Rev. 3/89

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Oil and Gas Management48° 0' 3' 40" 32' 30"
51° 0' 4' 79" 42' 30"

(Q)

WELL RECORD AND COMPLETION REPORT 89 DEC -4 AM 11:30

DER-BOGM

PITTSBURGH REGION

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-OG-75).

Well Operator Penneco Energy Corporation		Telephone Number 412-468-8232	
Address 200 Route 22, Delmont, PA		Zip 15626	
Permit Number 37-003-21237-00		Project Number	
Farm Name Logans Ferry Sportsman's Club #3	Farm Number	Serial Number PL-80	Acres 142
Township Plum Boro		County Allegheny	
Type of Well ☒ Oil ☐ Gas ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD

(Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air ☒ Mud ☐ Cable Tool ☐ Other ☐ (Specify)	Date Drilling Started 10-25-89	Date Drilling Completed 11-2-89
Elevation 1,105'	Total Depth 4,520'	TX# Quadrangle New Kensington East

FM TD BRALLIER

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe		Packer/Hardware			Date Run											
			Type and Amount	Type	Size	Depth													
15"	13"	34	Cuttings	N/A	N/A	N/A	10-25-89												
12-1/4"	9-5/8"	573	Cement - 240 sacks	Float Shoe	9-5/8"	581	10-26-89												
8-3/4"	7"	1,904	Cement - 245 sacks	Float Shoe	7"	1,912	10-30-89												
<table border="1"> <tr> <td>T.D.</td> <td>D.D.</td> <td>D.P.I.</td> <td>Class</td> <td>O'G</td> <td>Lease</td> </tr> <tr> <td>4520</td> <td></td> <td>2307</td> <td>D</td> <td></td> <td></td> </tr> </table>								T.D.	D.D.	D.P.I.	Class	O'G	Lease	4520		2307	D		
T.D.	D.D.	D.P.I.	Class	O'G	Lease														
4520		2307	D																

Cement return on surface casing? ☒ yes ☐ no

COMPLETION REPORT

PROP FM - Venango (Bayard?)
Fifth

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate
	From	To			Type	Amount	Type	Amount	

Natural Open Flow 1,300 MCF	Natural Rock Pressure 504	Hours 	Days
After Treatment Open Flow N/A	After Treatment Rock Pressure N/A	Hours 	Days

RECEIVED

APR 27 1990

Name, Address, and Telephone Number of Well Service Companies			
F. D. Hill Drilling Co.	Rte. 321 South, Kane, PA 16735	PA GEOLOGICAL SURVEY	412-837-6612
Dowell Schlumberger	P. O. Box 437, Blacklick, PA 15716	Oil & Gas Geology Division	412-459-7900
Allegheny Nuclear Surveys, Inc.	Elderton, PA 15736		412-354-3090

203-21237

DRILLER'S LOG OF FORMATIONS							
Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data	
Clay and Shale	0	10				Driller's Log	
Sand	10	34					
Sand and Shale	34	48					
Sand and Shale	48	380			1" @ 100'		
Shale and Sand	380	550			1" @ 490'		
Coal	550	555			6"		
Shale and Sand	555	581					
Sand and Shale	581	920			1" @ 710'		
Shale and Sand	920	1320					
Sand and Shale	1320	1667			2" @ 1805		
Sand and Shale	1667	1925			2" @ 1850		
Sand and Shale	1925	2390					
Shale and Sand	2390	2720	2387'				
Sand and Shale	2720	3350					
Sand and Shale	3350	3890					
Shale	3890	4520					
T.D.	4520						
Buller							
GEOPHYSICAL LOG DATA							
Fifth					2318-2349		
Third Warren					3035-3041		
Speechley Stray					3108-3110		
Speechley					3169-3215		

BY: [Signature] Vice-President 11-22-89
Operator's Signature Title Date

FOR OFFICIAL USE ONLY

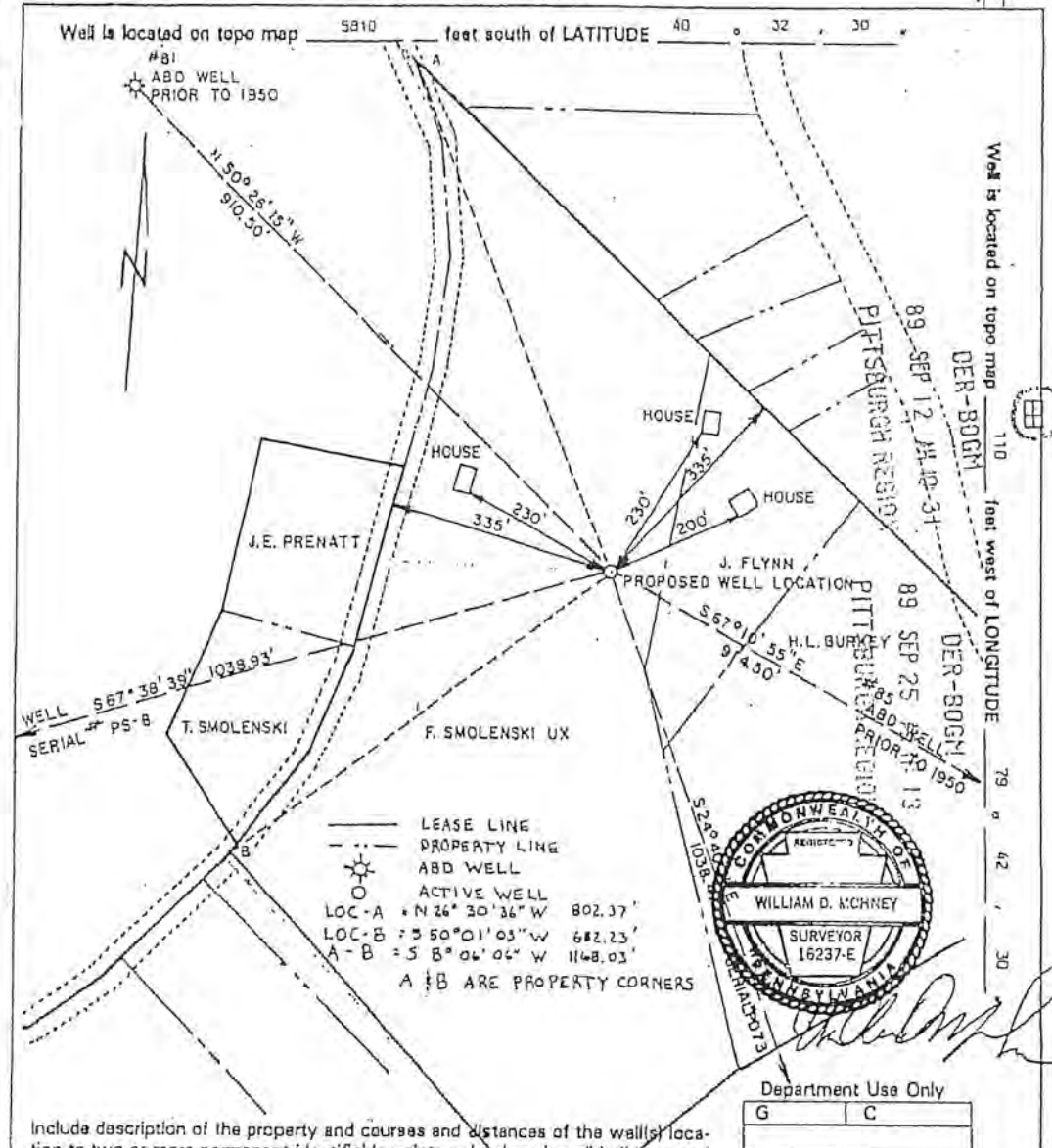
Reviewed By [Signature] 11/25/89 Date
Comments _____

003-21238

CG-2: Rev. 8/88

WELL LOCATION PLAT

44271



Include description of the property and courses and distances of the well location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'.

Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000' is not required for well plugging.

Denotes location of well on 7 1/2" topo map Permit #37-007-21238-2 Project #

Pennaco Oil Company, Inc. 138257		Revision		W.D. Mchney	
Well Permittee/Registrant		Alteration		Surveyor/Engineer	
200 U.S. Route 22		Storage Recondition		S-1	
Address		New Location		Drawing Number	
Delmont, PA 15626		Drill Deeper		8-15-89	
F. Smolenski		Abandonment		Date	
Surface Owner		Registration		1" = 200'	
N/A		Plugging		Scale	
Surface Lessor (if any)		Surface landowner and water purveyor with water supply within 1,000'		PA GEOLOGICAL SURVEY	
Smolenski		E. Taylor N4° W 940'		Approximate course and distance to water supply	
Farm Name		J. Prenatt S84° W 450'		C.J. Flynn N55°E 231'	
1		T. Smolenski S71° W 520'		D. Maloney N35°E 650'	
Well No. Tract		F. Choltko S45° W 810'		J. Smith N49°E 600'	
14.58		W. Barker N66° E 800'		W. Burkey S75°E 550'	
Acres		Walter Barker N66°E 800'		J. Hoey S71°E 700'	
None		D. Aruskiewicz 780'		R. Ozubian S62°E 910'	
Angle of Deviation (Drilling)		F. Smolenski N2°E 310'		F. Smolenski N3°E 255'	
Anticipated TD		Owner/Owner/Classes		Name of Seam	
Plum Eoro		Consolidation Coal Co.		Upper F&B	
County		F. Smolenski		All Others	
Municipality				FOR W/2/89	
New Kensington East 1488					
Topo Quadrangle					
Section					
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management					

RECEIVED

OCT 20 1989

PA GEOLOGICAL SURVEY

(PA A-22-00002-00002)

5810' 3 40° 32' 30"
110' 16 79° 42' 30"

(G)

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Oil and Gas Management

NEW KENSINGTON EAST

21238

003-21238

WELL RECORD AND COMPLETION REPORT

FIELD- RENTON - DEV

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-QG-75).

Well Operator Penneco Energy Corporation		Telephone Number 412-468-8232	
Address 200 Route 22, Delmont, PA		Zip 15626	
Permit Number 37-003-21238-00		Project Number	
Firm Name Smolenski #1	Firm Number	Serial Number PS-75	Acres 14
Township Plum Boro		County Allegheny	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air ☒ Mud ☐ Cable Tool ☐ Other ☐ (Specify)	Date Drilling Started 11-13-89	Date Drilling Completed 11-17-89
Elevation → 975'	Total Depth 4264'	7 1/2' Quadrangle New Kensington East

FRYD-BEALLIER

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe	Packer/Hardware			Date Run
			Type and Amount	Type	Size	Depth	
15"	13-3/8"	34	Cuttings	N/A	N/A	N/A	11-13-89
8-3/4"	7"	1,817	Cement - 400 sacks	Float Shoe	7"	1,824	11-15-89
6-1/4"	4-1/2"	3,797	Cement - 175 sacks	Float Shoe	4-1/2"	3,804	11-17-89
	1-1/2"	3,046	N/A	N/A	N/A	N/A	11-10-89

Cement return on surface casing? ☒ Yes

T.D.	D.D.	D.P.I.	Class	O.G.	Lease
4264		3666	D	FI	

COMPLETION REPORT

PENN- FM- BRADFORD

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate
	From	To	Type		Amount	Type	Amount		
11-28	3,660	3,666	11-28	3,660-3,666	Water	12,500	Sand	15,000#	26 BPM
11-28	3,348	3,351	11-28	3,348-3,351	Water	10,500	Sand	13,000#	25 BPM
11-28	3,036	3,072	11-28	3,036-3,072	Water	30,500	Sand	48,000#	30 BPM
11-28	2,957	2,964	11-28	2,957-2,964	Water	10,500	Sand	13,000#	25 BPM

Natural Open Flow 124 MCF	Natural Rock Pressure Not Taken	Hours N/A	Days
After Treatment Open Flow 400 MCF	After Treatment Rock Pressure 860#	Hours RECEIVED	Days

Name, Address, and Telephone Number of Well Service Companies

MAY 21 1990

D. Hill Drilling Co.	Rte. 321 South, Kane, PA 16735	814-837-6612
Dowell Schlumberger	P. O. Box 437, Blacklick, PA 15716	412-459-7900
Allegheny Nuclear Surveys, Inc.	Elderton, PA 15736	412-354-3090

003-21238

B2

DRILLER'S LOG OF FORMATIONS

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data	
Shale	0	10				Driller's Log	
Shale and Sand	10	34					
Sand and Shale	34	250					
Sand and Shale	250	425			1" @ 90'		
Coal	425	428					
Sand and shale	428	459					
Sand and Shale	459	950			1" @ 500'		
Sand and Shale	950	1,400					
Sand and Shale	1,400	1,850			1" @ 1650'		
Sand and Shale	1,850	1,950					
Sand and Shale	1,950	2,516	2217'				
Shale and Sand	2,516	3,170					
Sand and Shale	3,170	3,830					
Shale	3,830	4,264					
T.D.	4,264						
Bottle							
GEOPHYSICAL LOG DATA							
Hundred Foot				1171-1835			
Gordon				2018-2034			
Fourth				2120-2171			
Fifth				2177-2228			
Speechley Stray				2955-2965			
Speechley				3032-3072			

PENNERO ENERGY CORPORATION

BY:

Operator's Signature

Vice-President

Title

12-17-89

Date

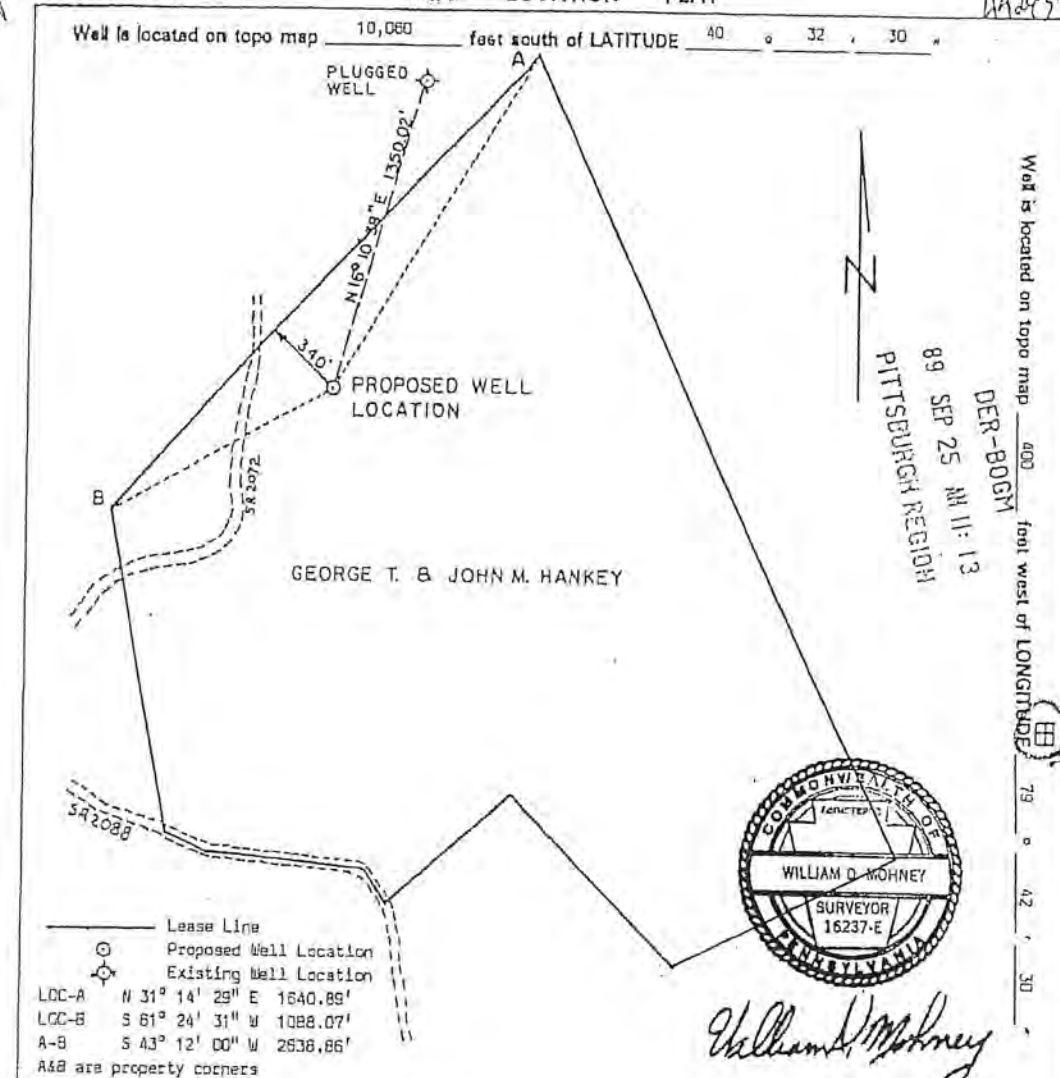
FOR OFFICIAL USE ONLY

Reviewed By William P. ... 3. 4. 70

Date

Comments

WELL LOCATION PLAT



Department Use Only

G	C
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Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'.
Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 is not required for well plugging.

☒ Denotes location of well on 7 1/2" topo map

Permit # 37-603-21240-00

Project #

Penneco Oil Company, Inc.		Revision	☐	W.D. Mohney
Well Permits/Registrant 200 U.S. Route 22		Alteration	☐	Surveyor/Engineer
Address Delmont, PA 15626		Storage Recondition	☐	H-1
George T. & John M. Hankey		New Location	☒	Drawing Number
Surface Owner N/A		Drill Deeper	☐	9-7-89
Surface Lessor (if any) Hankey		Abandonment	☐	Date
Farm Name 1		Registration	☐	1" = 600'
Well No. Tract Serial No. 162.95 1250		Plugging	☐	Scale
Acres None		Surface landowner and water purveyor with water supply within 1,000'		Approximate course and distance to water supply
Angle of Deviation (Drilling) Allegheny		G.T. & J.M. Hankey		RECEIVED
County New Kensington East				S 11° 30' W 350'
Topo Quadrangle 1408				OCT 20 1989
Municipality 7				PA GEOLOGICAL SURVEY
Section Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management		Owner/Operator/Leasee Consolidated Coal Co. G.T. & J.M. Hankey	Workable Coal Seams Name of Seam Upper Freeport All others	

FEB 1989

10060' S 40° 32' 30"
400' W 79° 42' 30"
(G) 4

NEW KENSINGTON EAST

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Oil and Gas Management

21240
003-21240
L

WELL RECORD AND COMPLETION REPORT

FIELD - RENTON - DEV

- In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
- In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-QG-75).

Well Operator Panneco Energy Corporation		Telephone Number 412-468-8232	
Address 200 Route 22, Delmont, PA		Zip 15626	
Permit Number 37-003-21240-00		Project Number	
Firm Name Hankey #1	Firm Number	Serial Number PH-84	Acres 162
Township Plum Borough		County Allegheny	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD

(Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air) ☒ Mud ☐ Cable Tool ☐		Date Drilling Started 12-5-89	Date Drilling Completed 12-15-89
Other ☐ (Specify)			
Elevation 1250'	Total Depth 4530'	7 1/2' Quadrangle New Kensington East	

FMTD - BRAULIER

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe	Packer/Hardware			Date Run
			Type and Amount	Type	Size	Depth	
15"	13-3/8"	26	Cuttings	N/A	N/A	N/A	12-5-89
12-1/4"	9-5/8"	730	Cement - 265 sacks	Float Shoe	9-5/8"	730	12-12-89
8-3/4"	7"	2,100	Cement - 295 sacks	Float Shoe	7"	2,108	12-13-89
6-1/4"	4-1/2"	4,142	Cement - 175 sacks	Float Shoe	4-1/2"	4,150	12-16-89
	1-1/2"	3,333	N/A	N/A	N/A	N/A	12-21-89

Cement return on surface casing? ☒ yes

Q.D.	D.D.	D.P.I.	Class	O'G	Leak
4530		3958	D		

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate
	From	To			Type	Amount	Type	Amount	
12-20	3,936	3,958	12-20	3936-3958	Water	16,500	Sand	21,000#	29BPM
12-20	3,939	3,951	12-20	3939-3951	Water	12,500	Sand	15,000#	28BPM
12-20	3,321	3,351	12-20	3321-3351	Water	30,500	Sand	48,000#	32BPM
12-20	3,243	3,251	12-20	3243-3251	Water	12,500	Sand	15,000#	29BPM

Natural Open Flow 158 MCF	Natural Rock Pressure Not Taken	Hours 90	Days 06
After Treatment Open Flow 300 MCF	After Treatment Rock Pressure 850#	Hours 24	Days 07

MAY 21 1990

Name, Address, and Telephone Number of Well Service Companies	PA GEOLOGICAL SURVEY
F. D. Hill Drilling Co.	Rte. 321 South, Kane, PA 16833
Dowell Schlumberger	P. O. Box 437, Blacklick, PA 15716
Allegheny Nuclear Surveys, Inc.	Elderton, PA 15736

003-21240

PS 2

DRILLER'S LOG OF FORMATIONS							
Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data	
Shale	0	20				Driller's Log	
Sand	20	25					
Sand	25	40					
Shale and Sand	40	340			2 1/2" @ 224		
Sand and Shale	340	680					
Gob	680	685					
Shale and Sand	685	755					
Sand and Shale	755	1187			1/2" @ 900'		
Sand and Shale	1187	1550					
Shale and Sand	1550	2000			2" @ 1955		
Sand and Shale	2000	2146					
Sand	2146	2210					
Red Rock and Shale	2210	2500	2500'				
Shale and Sand	2500	3100					
Shale	3100	3261					
Sand	3261	3291					
Shale	3291	3441					
Sand	3441	3471					
Shale	3471	3651					
Sand	3651	3581					
Shale	3581	3951					
Sand	3951	3981					
Shale	3981	4530					
TD	4530						
Brillier							
GEOPHYSICAL LOG DATA							
Hundred Foot					2058-2118		
Fourth					2452-2491		
Fifth					2493-2517		
Speechley Stray					3242-3252		
Speechley					3320-3352		
1st Balltown					3498-3502		
2nd Balltown					3630-3640		
2nd Bradford					3935-3959		

PENNCO ENERGY CORPORATION

BY:

Operator's Signature

Vice-President

Title

1-15-90

Date

FOR OFFICIAL USE ONLY

Reviewed By

3-6-90
Date

Comments

GEO COPY

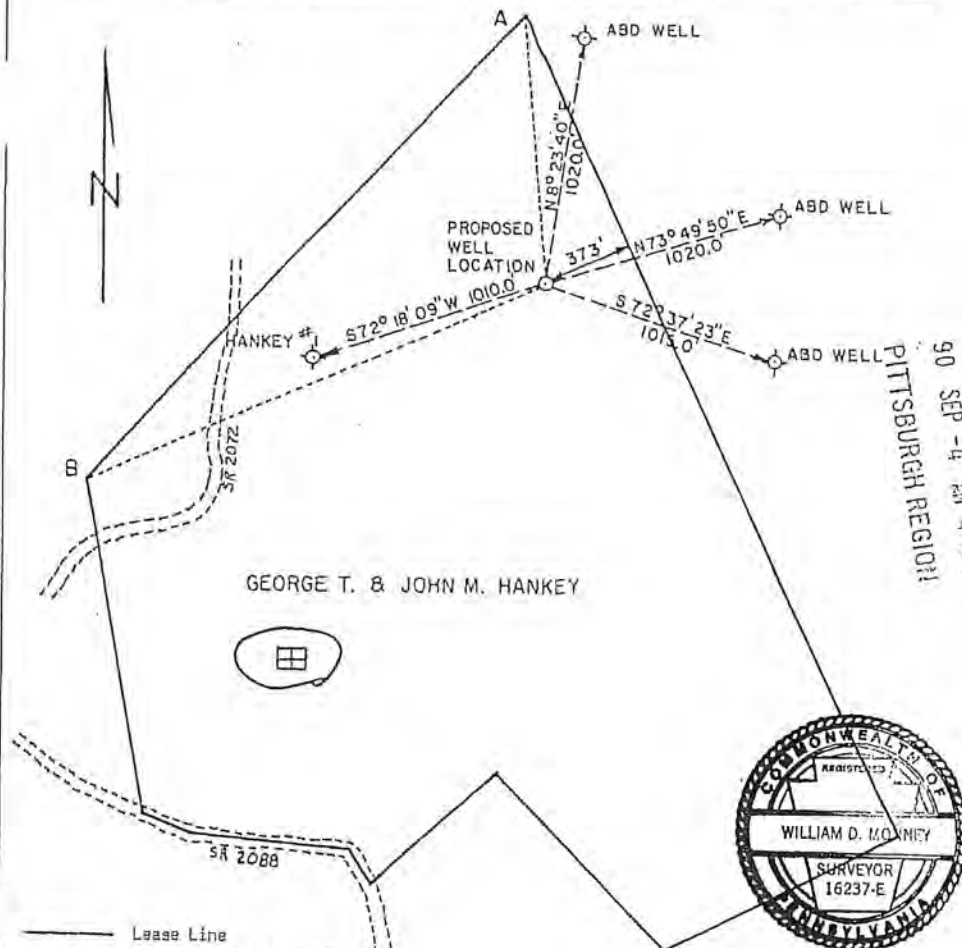
WELL LOCATION PLAT

C-45349

003-21253

Well is located on topo map 9710 feet south of LATITUDE 40 0 32 30

Well is located on topo map 11,010 feet west of LONGITUDE 79 0 40 00

DER-B06M
90 SEP -4 AM 4:00
PITTSBURGH REGION

Lease Line
 Proposed Well Location
 Existing Well Location
 LCC - A = N 5° 47' 31" W 1101.53'
 LCC - B = S 66° 39' 08" W 2088.61'
 A - B = S 43° 12' 00" W 2638.86'
 A & B are property corners

William D. Mohney

Department Use Only

G	C
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Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'.

Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 is not required for well plugging.

☐ Denotes location of well on 7 1/2" topo map Permit # 37-202-21253-0 Project # _____

Penneco Oil Company, Inc.		Revision ☐		W.D. Mohney	
Well Permittee/Registrant 200 U.S. Route 22		Alteration ☐		Surveyor/Engineer H-2	
Address Delmont, PA 15625		Storage Recondition ☐		Drawing Number 8-7-89	
George T. & John M. Hankey		New Location ☒		Date 1" = 600'	
Surface Owner N/A		Drill Deeper ☐		Scale	
Surface Lessor (if any) Hankey		Abandonment ☐		Approximate course and distance to water supply	
Farm Name 2 PH-85		Registration ☐		RECEIVED	
Well No. Tract Serial No. 162,95 1125		Plugging ☐		OCT 5 1990	
Acres None		Surface landowner and water purveyor with water supply within 1,000'		PA GEOLOGICAL SURVEY	
Angle of Deviation (Drilling) Allegheny County		None		(OH & Gas Geology Division)	
Municipality Plum Boro		None		WORKABLE COAL SEAMS	
County New Kensington East 1408		None		Owner/Operator/Lessor Consolidated Coal Co.	
Topo Quadrangle		None		Name of Seams Upper Freeport	
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management		None		G.T. & J.M. Hankey	
		None		All others	
		None		cum 9/19/90	

NEW KENSINGTON EAST
003-21253

RE D# 41126
ER-00-4: Rev. 3/89 41127

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Oil and Gas Management

9710' 3 40 32' 30"
11010' 1 37 40' 00"
(H)

WELL RECORD AND COMPLETION REPORT

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-QG-75).

RENTON - DEV

Well Operator Penneco Energy Corporation		Telephone Number 412-468-8232	
Address 200 U.S. Route 22, Delmont, PA			
Permit Number 37-003-21253-00		Project Number	
Farm Name Hankey #2	Farm Number	Serial Number PH-85	Acres 162.95
Township Plum Borough		County Allegheny Co.	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD (Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air ☒ Mud ☐ Cable Tool ☐ Other ☐ (Specify)	Date Drilling Started 3-5-91	Date Drilling Completed 3-12-91
Elevation 1125	Total Depth 4038	7 1/2' Quadrangle New Kensington East

BRADLEY

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount in Well	Material Behind Pipe Type and Amount	Packer/Hardware			Date Run												
				Type	Size	Depth													
15"	13-3/8"	34.30	Sanded in	N/A	N/A	N/A	3-5-91												
12-1/4"	9-5/8"	657	Cement - 240 Sacks	Float Shoe	9-5/8"	665	3-6-91												
8-3/4"	7"	2013	Cement - 280 Sacks	Float Shoe	7"	2014	3-8-91												
<table border="1"> <tr> <td>T.D.</td> <td>D.D.</td> <td>D.P.I.</td> <td>Class</td> <td>O.G.</td> <td>Lease</td> </tr> <tr> <td>4038</td> <td></td> <td>2385</td> <td>D</td> <td></td> <td></td> </tr> </table>								T.D.	D.D.	D.P.I.	Class	O.G.	Lease	4038		2385	D		
T.D.	D.D.	D.P.I.	Class	O.G.	Lease														
4038		2385	D																
Cement return on surface casing? ☒ yes ☐ no																			

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Overall Injection Rate
	From	To			Type	Amount	Type	Amount	

Natural Open Flow 490 M cfd	Natural Rock Pressure 70 psi	Hours 72	Days
After Treatment Open Flow	After Treatment Rock Pressure	Hours	Days

JUL 21 1992

Name, Address, and Telephone Number of Well Service Companies	
F.D. Hill Drilling Co., Rte 321 South, Kane, PA 16735	814-837-6612
Universal Well Services, P.O. Box 305, Punxsutawney, PA 15767	814-938-2051
Allegheny Nuclear Surveys, Inc., Elderton, PA 15736	412-354-2090

003-21253

DRILLER'S LOG OF FORMATIONS

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Shale	0	10				Drillers Log
Sand	10	40				
Red Bed	40	48				
Red BED & Shale	48	110				
Sand & Shale	110	350			Damp at 78'	
Shale & Sand	350	590			1/2" @ 110'	
Gob (Mine)	590	597				
Shale & Sand	597	691				
Sand & Shale	691	960			1/2" @ 750'	
Shale & Sand	960	1010				
Sand & Shale	1010	1380				
Sand & Shale	1380	1762				
Sand & Shale	1762	2046			2" @ 1830'	
Sand, Red Rock, & Shale	2046	2350			2" @ 1865'	
Sand & Shale	2350	2870	2385			
Sand & Shale	2870	3375				
Sand & Shale	3375	3875				
Sand & Shale	3875	4038				
T D	4038					

Operator's Signature

Title

Date

FOR OFFICIAL USE ONLY

Reviewed By

Date

Comments

GEO COPY

WELL LOCATION PLAT

C-4576 003-21254

Well is located on topo map 2100 feet south of LATITUDE 40° 32' 30"

Well is located on topo map 4300 feet west of LONGITUDE 79° 04' 30"



William D. Mohney

Lease Line
Property Line
Proposed Well Location
Loc - A = S 78° 19' 24" W 436.11'
Loc - B = S 7° 56' 51" W 462.83'
A - B = S 44° 27' 04" E 518.48'
A & B are property corners

FRANK, PETER & GEORGE STONIS

90 AUG 17 AM 7:35
PITTSBURGH REGION

HOUSE

PROPOSED WELL LOCATION

BARN

HOUSE

SR 2090

WEBSTER ROAD

Department Use Only

G C *OK*

Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'.

Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 is not required for well plugging.

Denotes location of well on 7 1/2" topo map Permit # *37-003-21254-01* Project #

Pernco Oil Company, Inc.		Revision	☐	W.D. Mohney
Well Permit/Registration		Alteration	☐	Surveyor/Engineer
200 U.S. Route 22		Storage Recondition	☐	S-1
Address		New Location	☒	Drawing Number
Delmont, PA 15626		Drill Deeper	☐	7-17-90
Frank, Peter and George Stonis		Abandonment	☐	Date
Surface Owner:		Registration	☐	1" = 300' OCT 5 1990
N/A		Plugging	☐	Scale
Surface Lessor (if any)		Surface landowner and water		P4 GEOLOGICAL SURVEY
Stonis		purveyor with water supply		Approximate course and distance to water supply
Firm Name		within 1,000' Richard Borowski		S 20° 00' E 600'
1		John Schech		S 82° 30' E 950'
Well No.	Tract	Walter Hummel		S 1° 00' E 750'
50.0	940	Stan Borowski		S 25° 00' E 550'
Acres	Ground Elevation	Charles Memphis		S 39° 00' E 600'
None	3550	Richard Ambrose		S 67° 10' E 800'
Angle of Deviation (Drilling)	Anticipated TD	Walter Casella		N 74° 30' E 910'
Allegheny Co.	Plum Boro	Ed Rockwell		S 75° 00' E 1000'
County	Municipality	Ed Rockwell		S 75° 00' E 900'
New Kensington East 1408	7	Owner/Operator/Leases		Workable Coal Seams
Topo Quadrangle	Section	Allegheny & Ohio Div. Coal Report		Name of Seam
Commonwealth of Pennsylvania		Frank Stonis et al		All others
Department of Environmental Resources				
Bureau of Oil and Gas Management				Sum 9/28/90

PITTSBURGH REGION •

FIELD RENTON-DEV

F M TD - BALLIER

PROD FM - BRAD

APR 3 1991

2nd GEOLOGICAL SURVEY
Oil & Gas Geology Division

MA 3-19-71

003-21254

DRILLER'S LOG OF FORMATIONS

PS 2

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Fill	0	15				Driller's Log
Shale and Sand	15	48				
Shale and Sand	48	105			1" @ 60'	
Sand and Shale	105	270			3" @ 215'	
Coal	270	273				
Sand and Shale	273	380			3 1/2" @ 320'	
Mine	380	385				
Sand and Shale	385	428				
Sand and Shale	428	970			1" @ 725'	
Shale and Sand	970	1280				
Sand and Shale	1280	1670			3" @ 1630'	
Sand and Shale	1670	1785			2" @ 1650'	
Sand and Shale	1785	1900				
Sand, Red Rock & Shale	1900	2470				
Shale and Sand	2470	3100				
Sand and Shale	3100	3750				
Sand and Shale	3750	4110				
T.D.	4110					

PENNCO ENERGY CORPORATION

BY:

Operator's Signature

Vice President

Title

11-20-90

Date

FOR OFFICIAL USE ONLY

Reviewed By

Date

Comments

Well is located on topo map 9500 feet south of LATITUDE 40° 32' 30"

Well is located on PIER N @ CM 1420 feet west of LONGITUDE 79° 0' 42" 30"

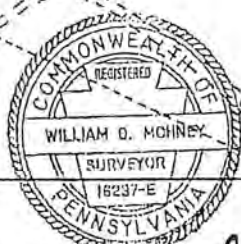
91 FEB -5 PM 3:06

PITTSBURGH REGION

A.R. MILLER

MICHAEL A. BALENO

PROPOSED WELL LOCATION



HANKEY 1 W

William D. Mohney

- Lease Line
 - - - Property Line
 ⊙ Proposed Well Location
 ⊕ Existing Well Location

Loc-A = S 10° 01' 06" W 1529.2'
 Loc-B = N 66° 57' 16" E 1915.6'
 A - B = N 41° 58' 00" E 3033.85'

Department Use Only

G	C
---	---

Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'.

Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 is not required for well plugging.

⊕ Denotes location of well on 7 1/2" topo map

Permit # 37-003-21266-00

Project #

Penneco Oil Company, Inc.		Revision	☒	W.D. Mohney
Well Permittee/Registrant		Alteration	☐	Surveyor/Engineer
200 U.S. Route 22		Storage Recondition	☐	PB-2
Address		New Location	☐	Drawing Number
Delmont, PA 15626		Drill Deeper	☐	Revised
		Abandonment	☐	1-2-91 02-05-91
		Registration	☐	Date
		Plugging	☐	1" = 500'
Michael A. Baleno		Scale		
Surface Owner		Approximate course and distance to water supply		
N/A		N 62° 51' E 850'		
Surface Lessor (if any)		Name of Seam		
Burton		Upper Freeport		
Farm Name		All Others		
L		Cum 2/7/91		
Well No.	Tract	Serial No.		
107.3		1120		
Acres	Ground Elevation			
None	4200			
Angle of Deviation (Drilling)	Anticipated TD			
Allegheny	Plum Horn			
County	Municipality			
New Kensington East	7			
Topo Quadrangle	Section			

Commonwealth of Pennsylvania
 Department of Environmental Resources
 Bureau of Oil and Gas Management

- Revision ☒
 Alteration ☐
 Storage Recondition ☐
 New Location ☐
 Drill Deeper ☐
 Abandonment ☐
 Registration ☐
 Plugging ☐

Surface landowner and water purveyor with water supply within 1,000'
 M.A. Baleno

RECEIVED
 FEB 29 1991
 BUREAU OF OIL AND GAS MANAGEMENT

W.D. Mohney

RENTON MINE

W.D. Mohney

Sealed

WORKABLE COAL SEAMS

Consolidated Coal Co.

M.A. Baleno

RE

75° 54' 32" 30"
142° W 79° 42' 30"NEW KENSINGTON EAST
003-21266

ER-QG-4: Rev. 3/89

(4)

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Oil and Gas Management

DE 41072

41073

WELL RECORD AND COMPLETION REPORT

- In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
- In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filled with the Completion Report (see ER-QG-75).

RENTON-DEL

Well Operator Pennaco Energy Corporation		Telephone Number 412-468-8232	
Address 200 Route 22, P. O. Box 300, Delmont, PA 15626-1634			
Permit Number 17-001-21266-00		Project Number	
Firm Name Burton #1	Firm Number	Serial Number PB-92	Acres 107
Township Plum Borough		County Allegheny	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD

(Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air Dr) ☒ Mud ☐ Cable Tool ☐ Other ☐ (Specify)	Date Drilling Started 2-22-91	Date Drilling Completed 3-1-91
Elevation 1,120'	Total Depth 4,025'	7 1/2' Quadrangle New Kensington East

BRANER

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe	Packer/Hardware			Date Run	
			Type and Amount	Type	Size	Depth		
15"	13-3/8"	35	Sanded In	N/A	N/A	N/A	2-21-91	
12-1/4"	9-5/8"	612	Cement - 150 Sacks	Float shoe	9-5/8"	612	2-25-91	
8-3/4"	7"	1,987	Cement - 275 Sacks	Float shoe	7"	1,995	2-27-91	
6-1/4"	4-1/2"	3,959	Cement - 170 Sacks	Float shoe	4-1/2"	3,967	3-3-91	
			T.D.	D.D.	D.P.I.	Class	O.G.	Loss
			4025		3870	D	1	1
Cement return on surface casing? ☒ Yes ☐ No								

Cement return on surface casing? ☐ yes ☒ no

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate
	From	To			Type	Amount	Type	Amount	
3-11	3,845	3,870	3-11	3845-3870 25	Water	12,500	Sand	15,000	31 BPM
3-11	3,406	3,443	3-11	3406-3443 37	Water	10,500	Sand	13,000	25 BPM
3-11	3,228	3,256	3-11	3228-3256 29	Water	33,000	Sand	68,000	34 BPM
3-11	3,146	3,150	3-11	3146-3150 4	Water	10,500	Sand	13,000	23 BPM
Natural Open Flow			Natural Rock Pressure			Hours		Days	
			Not Taken			RECEIVED			
After Treatment Open Flow			After Treatment Rock Pressure			Hours		Days	
250 MCF			650#			JUL 21 1992			

Name, Address, and Telephone Number of Well Service Companies

F. D. Hill Drilling Co.

Rte. 321 South, Kane, PA 16735-8337-6611

Universal Well Services

P. O. Box 305, Punxsutawney, PA 15767-0305-938-2051

Allegheny Nuclear Surveys, Inc.

Elderton, PA 15736

412-354-3095

003-21266

DRILLER'S LOG OF FORMATIONS

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Fill	0	3				Driller's Log
Shale	3	25				
Sand	25	35				
Sand and Red Bed	35	48				
Redbed, Sand & Shale	48	560			1" @ 98'	
Sand and Shale	560	585				
Open Mine	585	613				
Sand and Shale	613	700				
Sand and Shale	700	1150				
Sand and shale	1150	1510				
Shale and Sand	1510	1930			2" @ 1850'	
Sand and Shale	1930	2022				
Sand	2022	2095				
Redrock, Sand & Shale	2095	2220				
Sand and Shale	2220	2750				
Sand and Shale	2750	3280				
Shale and Sand	3280	4025				
TD	4025					

PENNECO ENERGY CORPORATION

BY:

Operator's Signature

Vice-President

Title

6-5-91

Date

FOR OFFICIAL USE ONLY

Reviewed By

Date

Comments

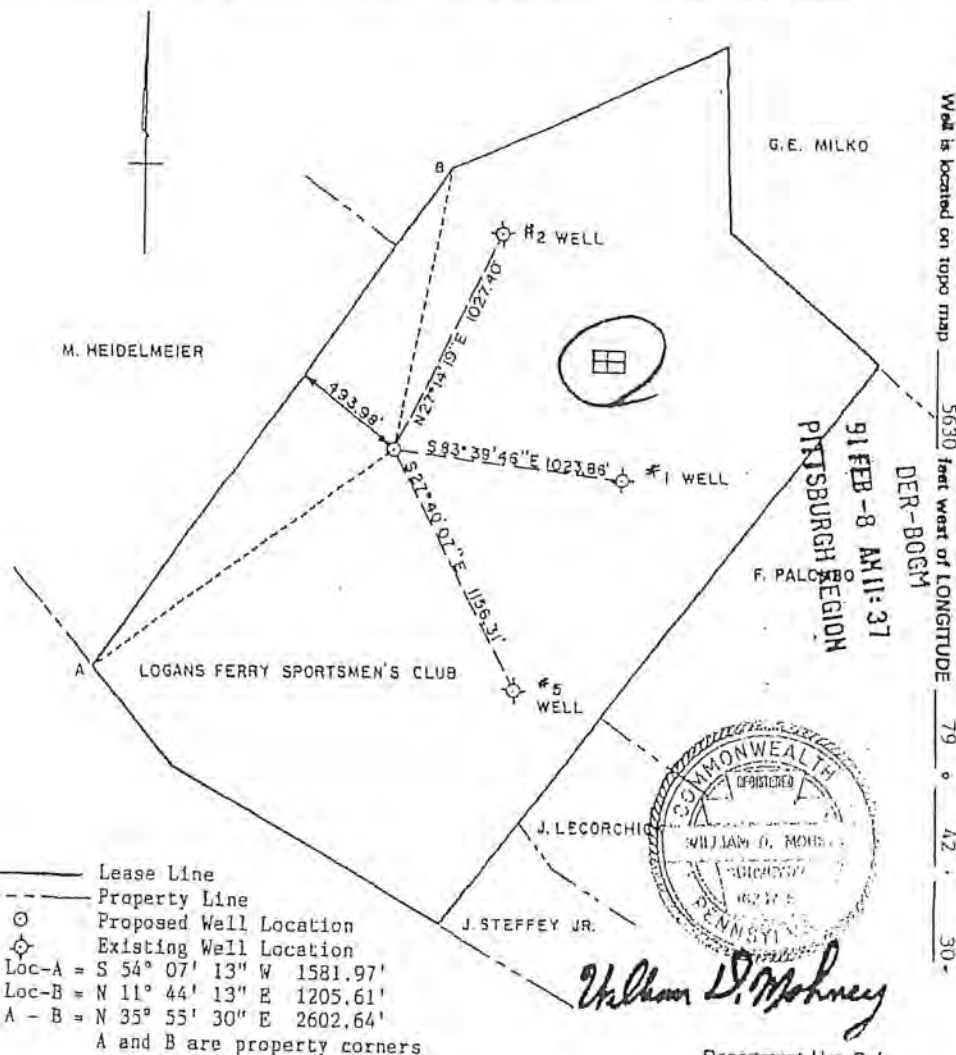
GEO COPY

WELL LOCATION PLAT

003-21267

C-10997

Well is located on topo map 5790 feet south of LATITUDE 40 ° 32 ' 30 "



Penneco Oil Company, Inc.		Revision		W.D. Mohney	
Well Permittee/Registrant		Alteration		Surveyor/Engineer	
200 U.S. Route 22		Storage Recondition		S-3	
Address		New Location		Drawing Number	
Delmont, PA 15626		Drill Deeper		1-29-91	
Logans Ferry Sportsman's Club		Abandonment		Date	
Surface Owner		Registration		1" = 600'	
N/A		Plugging		Scale	
Surface Lessor (if any)		Surface landowner and water purveyor with water supply within 1,000'		Approximate course and distance to water supply	
Sportsman's Club		None			
Farm Name					
3					
Well No.		Tract		Serial No.	
142,32		1220			
Acres		Ground Elevation			
None		4300			
Angle of Deviation (Drilling)		Anticipated TD			
Allegheny		Plum Boro			
County		Municipality			
New Kensington East		7			
Topo Quadrangle		Section			
Commonwealth of Pennsylvania		Department of Environmental Resources		Bureau of Oil and Gas Management	
		Owner/Operator/Lessor		Workable Coal Seams	
		Lesone Enterprise Inc		All Seams	
				Seam 2/21/91	
				Within Renton Mine	
				Villa Coal Co.	
				Seated	

RED# 41128
41729

NEW KENSINGTON EAST
003-21267

2

EN-OG-4: Rev. 3/89

5790.5 40° 32' 30"
5630 W 79° 42' 30"

(9)

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Oil and Gas Management

WELL RECORD AND COMPLETION REPORT

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-OG-75).

RENTAN-DEV

Well Operator Penneco Energy Corporation		Telephone Number 412-468-8232
Address 200 U.S. Route 22 - Delmont, PA 15626		
Permit Number 37-001-21267-00	Project Number	
Farm Name Sportsmen's Club #1	Farm Number	Serial Number
Township Plum Boro	County Allegheny	Area 1A2 37
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)		

WELL RECORD (Include Driller's Log on Reverse Side)

Drilling Method Rotary ☒ Mud ☐ Cable Tool ☐ Other (Specify)	Date Drilling Started 3/13/91	Date Drilling Completed 3/22/91
Elevation 1220	Total Depth 4428	7K' Quadrangle New Kensington East

BRALHER

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe		Packer/Hardware			Date Run												
			Type	Amount	Type	Size	Depth													
15"	13-3/8"	34.30'	Sanded in		N/A	N/A	N/A	3/13/91												
12-1/4"	9-5/8"	749.0'	Cement - 200 Sacks		Flange	9-5/8"	749.0'	3/19/91												
8-3/4"	7"	2201.30	Cement - 355 Sacks		Flange	7"	2214.0'	3/21/91												
<table border="1"> <tr> <td>T.D.</td> <td>D.D.</td> <td>D.P.I.</td> <td>Class</td> <td>O.G.</td> <td>Lease</td> </tr> <tr> <td>4428</td> <td></td> <td>2490</td> <td>D</td> <td></td> <td></td> </tr> </table>									T.D.	D.D.	D.P.I.	Class	O.G.	Lease	4428		2490	D		
T.D.	D.D.	D.P.I.	Class	O.G.	Lease															
4428		2490	D																	

Cement return on surface casing? ☒ yes ☐ no

COMPLETION REPORT

BRAP

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate
	From	To			Type	Amount	Type	Amount	

Natural Open Flow 875 MCF	Natural Rock Pressure 408	Hours	Days
After Treatment Open Flow N/A	After Treatment Rock Pressure N/A	Hours	Days

Name, Address, and Telephone Number of Well Service Companies			
F.D. Hill Drilling Co., Rt. 321 South Kane PA 16735		814-837-6612	
Universal Well Services P.O. Box 305 Punxsutawney, PA 15767		814-938-2051	
Allegheny Nuclear Surveys, Inc. Elderton, PA 15736		412-354-3090	

RECEIVED

JUL 27 1992

cell 2/10

003-21267

DRILLER'S LOG OF FORMATIONS

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Bony	0	20				Drillers Log
Shale	20	30				
Sand	30	48				
Sand & Shale	48	193				
Sand & Shale	193	220			Damp @ 50	
Red Rock & Shale	220	600			1" @ 220'	
Sand & Shale	600	690				
Mine	690	695				
Sand & Shale	695	780				
Sand & Shale	780	1125				
Sand & Shale	1125	1220				
Sand & Shale	1220	1600				
Sand & Shale	1600	2000				
Sand & Shale	2000	2225			2" @ 1950'	
Red Rock, Sand & Shale	2225	2340				
Shale & Sand	2340	2900	2470'			
Shale & Sand	2900	3400				
Sand & Shale	3400	3975				
Sand & Shale	3975	4428				
T.D.	4428					

Operator's Signature

Title

Date

FOR OFFICIAL USE ONLY

Reviewed By

Date

Comments

Well is located on topo map 1940 feet west of LONGITUDE 79 ° 42 , 30



(Sealed)

1940-1942-30 WELL RECORD AND COMPLETION REPORT

(G) .

In accordance with 26 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-QG-75).

PENTON FIELD.

DIR-BOSS
97.3
JUN-1 AM 11:5
P TROUBLE REGIO

CASING AND TUBING RECORD

Cement return on surface casing? ☒ Yes ☐ No

Time	Average Injection Rate
26.1	BPM
20.4	BPM
26.4	BPM
19.6	BPM

412-3703-3000

UNIT 10: THE GREAT WALL OF CHINA

003 21285

PS 2

DRILLER'S LOG OF FORMATIONS

Name	Top	Bottom	Gas At	Oil At	Water At (Feet or Below)	Source of Data
White Sand	0	4				Drillers Log
Shale & Sand	4	9				
Shale & Sand	9	30				
Sand & Sand	30	40			1/2" @ 40'	
Shale	40	130				
Red Bed	130	150				
Shale	150	200				
Red Rock	200	210				
Shale	210	260				
Red Rock	260	285				
Shale	285	300				
Red Rock	300	315				
Shale & Sand	315	525				
Sand & Shale	525	605				
Coal & Shale	605	612				
Sand & Shale	612	698				
Shale	698	775				
Sand & Shale	775	1330				
Shale	1330	1370				
Sand & Shale	1370	1630				
Shale & Sand	1630	1910			3" @ 1870	
Sand	1910	2060		1980		
Shale & Sand	2060	2120				
Red Rock	2120	2150				
Shale, Sand, Red Rock	2150	2400				
Shale	2400	2550				
Sand & Shale	2550	3160	show of			
Sand	3160	3165				
Sand & Shale	3165	3260				
Sand	3260	3265				
Shale & Sand	3265	3510				
Shale & Sand	3510	4060				

Operator's Signature

Title

Date

FOR OFFICIAL USE ONLY

Reviewed By

Date

Comments

PENNECO OIL COMPANY, INC.		REVISION ALTERATION STORAGE RECONDITION NEW LOCATION DRILL DEEPER ABANDONMENT REGISTRATION PLUGGING		☐ ☐ ☒ ☐ ☐ ☐ ☐	W.D. MOHNEY & ASSOC. Surveyor/Engineer 1/1 Drawing Number 7-17-01 Date 1 INCH = 300 FEET Scale	
Well Permittee/Registrant 200 U.S. ROUTE 22 Address DELMONT, PA 15826 THOMAS G. & BARBARA HOWARD KENNETH & SUSAN HOWARD Surface Owner N/A Surface Lessor (if any) HOWARD		SURFACE LANDOWNER AND WATER PURVEYOR WITH WATER SUPPLY WITHIN 100'		APPROXIMATE COURSE AND DISTANCE TO WATER SUPPLY		
Farm Name 1		PH-96	E.L. PATTOCK	N 88°55'E	800'	
Well No. 31.23	Tract	Serial No. 1075.00	D.A. PLANCE	S 80°00'E	1000'	
			GEORGE SZITAS	N 48°10'E	1000'	
			VIRGINIA D. MITCHELL	N 21°40'E	850'	
			ROBERT MATT	N 35°30'E	750'	
Acres NONE		Ground Elevation 4260	RECEIVED			
Angle of Deviation (Drilling) ALLEGHENY		Anticipated TD PLUM BOROUGH				
County EW KENSINGTON (EAST)	Municipality 7	Section	Owner/Operator/Lessee TESONE ENTERPRISES, INC. THOMAS G. & BARBARA HOWARD KENNETH & SUSAN L. HOWARD	Workable Coal Seams None	Name of Lessee SEP 10 1991	
Geo Quadrangle			Freeport	ALL OTHERS GEOLOGICAL SURVEYS		
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF OIL AND GAS MANAGEMENT			Cum 8/29/91	With Revision Sealed		

NEW HENSINGTON EAST

10179005-21287

4200' S 40° 32' 30"
2190 W 79° 42' 30"
(G)

42179

- RENTON FIELD

Well Operator Penneco Oil Company, Inc.		Telephone Number 412-468-8232	
Address 200 Rt 22, P.O. Box 300 Delmont, PA		15626 Zip	
Permit Number 37-003-21287-00		Project Number	
Firm Name Howard	Form Number 1	Serial Number PH - 96	Accession 331.23
Township Plum Borough		County Allegheny County	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

DER-BOGM
JUN - 1 AM 11:50
PITTSBURGH REG

Drilling Method	Rotary (A) ☒ Mud ☐ Cable Tool ☐	Date Drilling Started	Date Drilling Completed
Other ☐ (Specify)		09-24-91	10-01-91
Elevation	Total Depth	7 1/2' Quadrangle	
1075	4121	New Kensington East	

-97-

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe	Packer/Hardware			Date Run
			Type and Amount	Type	Size	Depth	
15"	13 3/8"	34'	Sanded In	N/A	N/A	N/A	9-24-91
2 1/4"	9 5/8"	574'	Cement - 200 sacks	Float Shoe	9 5/8"	574	9-25-91
8 3/4"	7"	1993'	Cement - 305 sacks	Float Shoe	7"	2009	9-27-91
6 1/4"			NO PIPE INSTALLED				

Cement return on surface casing? ☒ yes ☐ no

DER-30241	93 JUN -2	AM 6:44	Injection Ra
PFTB SURF REGION			unt

Perforation Record			Stimulation Record							
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate	
	From	To			Type	Amount	Type	Amount		
				No Zones were Fractured						
	D.	D.D.		E.P.I.	Class	O	G	Lease		
	4/21			2300	D G		1	1		
	BR			V			V			
Natural Open Flow 349 MCF			Natural Rock Pressure 48 psig						Hours 72	Days
After Treatment Open Flow			After Treatment Rock Pressure						RECEIVED	Days

Time, Address, and Telephone Number of Well Service Companies

JUN 28 1993

JUN 26 1993

PA GEORGE KE BUREAU

F.D. Hill Drilling Company - Rt 321 South - Kane, PA 16735 Tel 814-837-5612

Nowco Well Service - 3000 Old Airport Road - Wooster, OH 44691 216-364-1800

Allegheny Nuclear Surveys, Inc. - Elderton, PA 15736 412-354-3090

003-21287

DRILLER'S LOG OF FORMATIONS

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Clay	0	10				Drillers Log
Red Bed & Shale	10	28				
Sand	28	34				
Shale & Sand	34	79			Damp @60'	
Sand & Shale	79	150				
Red Rock	150	165				
Sand & Shale	165	185				
Red Rock	185	205				
Sand & Shale	205	295				
Shale	295	315				
Sand & Shale	315	515			1" @ 430'	
Mine (Gdb)	515	525				
Sand & Shale	525	685				
Shale	685	745				
Sand & Shale	745	760				
Shale	760	880				
Sand & Shale	880	940			1/2" @ 880'	
Shale	940	1000				
Sand & Shale	1000	1045				
Sand	1045	1100				
Sand & Shale	1100	1290				
Shale & Sand	1290	1700				
Shale	1700	1780				
Sand & Shale	1780	1810			2" @ 1790'	
Sand	1810	1840				
Sand & Shale	1840	1885			1" @ 1885	
Sand	1885	1935				
Sand & Shale	1935	1940				
Shale	1940	1950				
Sand & Shale	1950	2015				
Shale	2015	2060				
Red Rock & Sand	2060	2200				
Sand & Shale	2200	2313	2300			
Shale & Sand	2313	2500				
Sand & Shale	2500	3100				
Sand & Shale	3100	3600				
Shale	3600	3900				
Sand & Shale	3900	3920				
Shale	3920	4121				

Operator's Signature

Title

Date

FOR OFFICIAL USE ONLY

Reviewed By

Date

Comments

WELL LOCATION PLAT

C.47278

GEO COPY

Well is located on topo map 8490' Feet south of LATITUDE 40 - 32 - 30

003-21300

Well is located on topo map 1145' feet west of LONGITUDE 78 - 42 - 30



INCLUDE DESCRIPTION OF THE PROPERTY AND COURSES AND DISTANCES OF THE WELL(S) LOCATION TO TWO OR MORE PERMANENT IDENTIFIABLE POINTS OR LAND MARKS, ALL BUILDINGS AND WATER SUPPLIES WITHIN 200', ALL SPRINGS, BODIES OF WATER AND STREAMS WITHIN 100' IDENTIFIED ON THE MOST CURRENT 7 1/2" TOPOGRAPHIC MAP AND WETLANDS WITHIN 100'. REFERENCE TO BUILDINGS, SPRINGS, BODIES OF WATER, WETLANDS AND WATER SUPPLIES WITHIN 1000' IS NOT REQUIRED FOR WELL PLUGGING.



DENOTES LOCATION OF WELL ON 7 1/2" TOPO MAP

PERMIT NO. 37-003-21300-01

PROJECT NO.

PENNCO OIL COMPANY, INC. 13825		REVISION ALTERATION STORAGE RECONDITION NEW LOCATION DRILL DEEPER ABANDONMENT REGISTRATION PLUGGING	W.D. MOHNEY & ASSOC. Surveyor/Engineer B-3 Drawing Number 1-11-92 Date 1 INCH = 600' Scale
Well Permittee/Registrant P.O. BOX 300, 200 U.S. ROUTE 22			
Address DELMONT, PA 15826			
MICHAEL A. AND LINDA S. BALENO			
Surface Owner N/A		SURFACE LANDOWNER AND WATER PROVIDER WITH WATER SUPPLY WITHIN 1000'	APPROXIMATE COURSE AND DISTANCE TO WATER SUPPLY
Surface Lessor (if any) BURTON			
Farm Name 3			
Well No. 107.30 Tract PB-94 Serial No. 1120'			
Acres NONE Ground Elevation 4000'		MICHAEL A. & LINDA S. BALENO	
Angle of Deviation (Drilling) ALLEGHENY		LaDorria H. Fuge	
Municipality NEW KENSINGTON, EAST 7		S 67°10' E 710'	
Topo Quadrangle		N 63° 21' 57" W 854'	
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF OIL AND GAS MANAGEMENT		RECEIVED 11/13/92 ALL OTHERS: SURVEY 3/6/92	

NEW KENSINGTON EAST

003-21300

8490' 540° 32' 30"

145' 4379° 42' 30" WELL RECORD AND COMPLETION REPORT

(4)

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.

2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-QG-7B).

RENTON FIELD

Well Operator Penneco Oil Company, Inc.		Telephone Number 412-468-8232	
Address 200 Route 22, P.O. Box 300 Delmont, PA		Zip 15626	
Permit Number 37-003-21300-00		Project Number	
Firm Name Burton #3	Firm Number	Serial Number PB-94	Acres 107.3
Township Plum Borough		County Allegheny County	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method Notary (A) ☒ Mud ☐ Cable Tool ☐ Other ☐ (Specify)	Date Drilling Started 03-09-92	Date Drilling Completed 03-16-92
Elevation 1197	Total Depth 4018	7 1/2' Quadrangle New Kensington East

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe		Packer/Hardware			Date Run														
			Type and Amount	Type	Size	Depth																
15"	13 3/8"	34'	Sanded in	N/A	N/A	N/A	03-09-92															
2 1/4"	9 5/8"	648'	Cement - 215 sacks	Float Shoe	9 5/8"	648	03-10-92															
8 3/4"	7"	2035	Cement - 350 sacks	Float Shoe	7"	2043	03-12-92															
6 1/4"	4 1/2"	3952	Cement - 165 sacks	Float Shoe	4 1/2"	3960	03-16-92															
<table><tr><td>TD</td><td>DD</td><td>DPI</td><td>Class</td><td>0</td><td>G</td><td>Lease</td></tr><tr><td>4018</td><td></td><td>3862</td><td>D G</td><td>1</td><td>1</td><td></td></tr></table>								TD	DD	DPI	Class	0	G	Lease	4018		3862	D G	1	1		
TD	DD	DPI	Class	0	G	Lease																
4018		3862	D G	1	1																	
Cement return on surface casing? ☒ yes ☐ no																						

COMPLETION REPORT

Perforation Record			Stimulation Record						Average Perforation Rate
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		
	From	To			Type	Amount	Type	Amount	
03-25-92	3844	3850	3-25	3844-3850					
03-25-92	3860	3862	3-25	3860-3862	Water	12,000gal	Sand	15,000#	31.3 BPM
03-25-92	3535	3539	3-25	3535-3539	Water	10,000gal	Sand	13,000#	23.0 BPM
03-25-92	3225	3232	3-25	3225-3232	Water				
03-25-92	3238	3252	3-25	3238-3252	Water	32,000gal	Sand	68,000#	34.4 BPM

Natural Open Flow 69 MCFPD	Natural Rock Pressure 775 PSIG	Days
After Treatment Open Flow 380 MCFPD	After Treatment Rock Pressure 775 PSIG	Days

Name, Address, and Telephone Number of Well Service Companies

P.D. Hill Drilling Co., Rt. 321 South, Kane, PA 16735	814-877-6612
Universal Well Services, P.O. Box 305, Punxsutawney, PA 15767	814-938-2051
Allegheny Nuclear Surveys, Inc., Elderton, PA 15736	412-354-3090

DRILLER'S LOG OF FORMATIONS

003-21300

A 2

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Shale	0	10				Drillers Log
Sand	10	14				
Red Bed & Shale	14	30				
Sand	30	34				
Shale & Sand	34	48				
Sand & Shale	48	580			1" @ 100'	
Mine	580	588				
Shale	588	655				
Sand & Shale	655	1579				
Shale & Sand	1579	1830				
Murrysville	1830	1942			1" @ 1840	
100' Sand	1942	2015			3" @ 1900	
Sand & Shale	2015	2051				
Sand, Shale & Red Rock	2051	2165				
Red Rock, Sand & Shale	2165	2605				
Sand & Shale	2605	3013				
Shale	3013	3045				
Sand & Shale	3045	3170				
Shale & Sand	3170	3570				
Sand & Shale	3570	4018				

Operator's Signature

Vice President
Title

Date

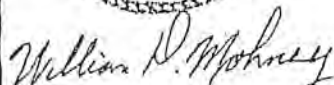
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Reviewed By

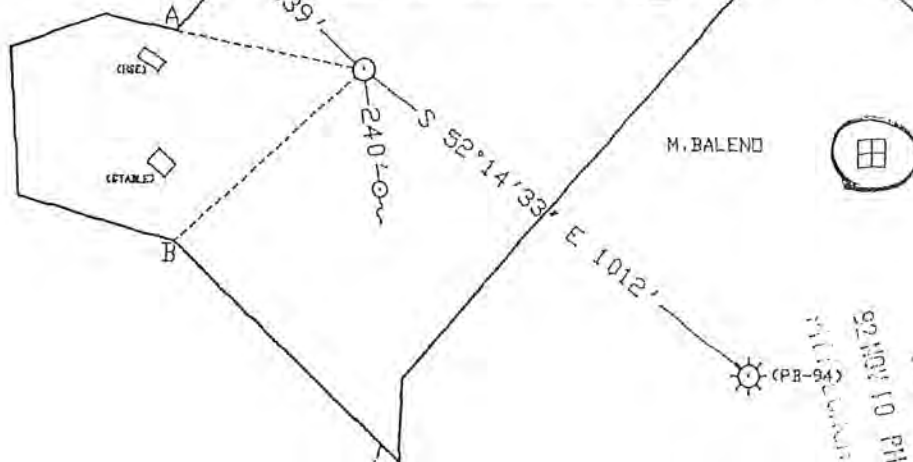
Date

Comments

GEOCOPY



LaDonna H. Fuge



Well is located on topo map 2100' feet west of LONGITUDE 79° 42' 30"

M. BALEND

92 NOV 10 PM 1:29
(PB-94)

LEASE LINE
PROPERTY LINE
PROPOSED WELL LOCATION
EXISTING WELL

WATER SUPPLY (SPRING)
LOC-A = N 78°41'23" W 394.77'
LOC-B = S 48°10'06" W 528.93'
CORNERS A-B = S 00°56'20" W 430.29'

DEPARTMENT USE ONLY

G	C
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INCLUDE DESCRIPTION OF THE PROPERTY AND COURSES AND DISTANCES OF THE WELL(S) LOCATION TO TWO OR MORE PERMANENT IDENTIFIABLE POINTS OR LAND MARKS, ALL BUILDINGS AND WATER SUPPLIES WITHIN 200', ALL SPRINGS, BODIES OF WATER AND STREAMS WITHIN 100' IDENTIFIED ON THE MOST CURRENT 7 1/2" TOPOGRAPHIC MAP AND WETLANDS WITHIN 100'. REFERENCE TO BUILDINGS, SPRINGS, BODIES OF WATER, WETLANDS AND WATER SUPPLIES WITHIN 1,000' IS NOT REQUIRED FOR WELL PLUGGING.

 DENOTES LOCATION OF WELL ON 7 1/2" TPOD MAP PERMIT NO. 37-003-21317-00

PROJECT NO. _____

PENNECO OIL COMPANY, INC.	13825	REVISION ALTERATION STORAGE RECONDITION NEW LOCATION DRILL DEEPER ABANDONMENT REGISTRATION PLUGGING	W.D. MOHNEY & ASSOC. Surveyor/Engineer PM-1 Boring Number: 10-28-92 Date 1 INCH = 300 FEET Scale
Vell Permittee/Registrant BOX 800, 200 U.S. ROUTE 22			
Address DELMONT, PA 15626			
LaDonna H. Fuge	RECEIVED		
Surface Owner N/A	DEC 18 1992	SURFACE LANDOWNER AND WATER PURVEYOR WITH WATER SUPPLY WITHIN 1000'	APPROXIMATE COURSE AND DISTANCE TO WATER SUPPLY
Surface Lessor (if any) MILLER		L. H. FUGE	S 08°48'11" E 240'
Farm Name 1		LINDA & RICHARD KAZIMER	S 86°00' W 750'
Vell No. 28.12	Tract	K. J. FRYNCKO	S 74°00' W 1000'
Acres NONE		J. E. WILLIAMS	S 48°00' W 1000'
		R. G. DEPEW	S 60°00' W 900'
Angle of Deviation (Drilling)	Anticipated TD	Workable Coal Seams	
ALLEGHENY	PLUM BORO	Diner/Operator/Lessee	Name of Seam
County NEW KENSINGTON, EAST	Municipality 7	TESONE LAND COMPANY	FREEPORT SEAMS
Topo Quadrangle	Section	LODONNA H. FUGE	ALL OTHERS
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF OIL AND GAS MANAGEMENT		GOB (upper) Freeport	11-24-92 CRV

NEW KENSINGTON EAST

003-21317

[Signature]

79°20'34.0" 32°30'00"

125°26'39" 42°30'00"

WELL RECORD AND COMPLETION REPORT

(4)

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-QG-75).

RENTON FIELD

Well Operator Penneco Oil Company, Inc.		Telephone Number 412-468-8232	
Address 200 Rt 22, P.O. Box 300 Delmont, PA 15626			
Permit Number 37-003-21317-00		Project Number	
Farm Name Miller #1	Farm Number	Serial Number PM-95	Area 28.12
Township Plum Borough		County Allegheny Co.	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air ☒ Mud ☐ Cable Tool ☐ Other (Specify)	Date Drilling Started 12-31-92	Date Drilling Complete 2-16-93
Elevation 1100'	Total Depth 4062'	7K' Quadrangle New Kensington East

PITTSBURGH
REGION
93 MAY 24 AM 10:29
DER-B08:11

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe	Packer/Hardware			Date Run
			Type and Amount	Type	Size	Depth	
"	16"	8.5'	Sanded in	N/A	N/A	N/A	12/31/92
"	13"	34'	Sanded in	N/A	N/A	N/A	2/9/93
12 1/4"	9 5/8"	600'	Cement - 275 sacks	Float Shoe	9 5/8"	608'	2/10/93
8 3/4"	7"	2020'	Cement - 330 sacks	Float Shoe	7"	2028'	2/11/93
6 1/4"	4 1/2"	4002'	Cement - 160 sacks	Float Shoe	4 1/2"	4010'	3/2/93

Cement return on surface casing? ☒ Yes ☐ No

T.D.	D.D.	D.P.I.	Class	O	G	Lease
4062	-	3818	D G	-	1	1

BR COMPLETION REPORT B

B

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate
	From	To	Type		Amount	Type	Amount		
5-18-93	3815	3818	5-18	3815-3818					
5-18-93	3822	3827	5-18	3822-3827	Water	14,000gal	Sand	21,000#	
5-18-93	3833	3835	5-18	3833-3835					
5-18-93	3202	3205	5-18	3202-3205					
5-18-93	3210	3228	5-18	3210-3228	Water	27,000gal	Sand	74,000#	
5-18-93	3116	3119	5-18	3116-3119	Water	11,000 gal	Sand	3,000#	19.5 BPM
Natural Open Flow			Natural Rock Pressure		Hours Days				
After Treatment Open Flow 240 MCFPD			After Treatment Rock Pressure 550 psi		Hours Days				

Name, Address, and Telephone Number of Well Service Companies

JUN 1 1993

F.D. Hill Drilling Company - Rt 321 South - Kane, PA 16735 PA GEOLOGICAL SURVEY 814-838-6612
 Nowco Well Service - 3000 Old Airport Road - Wooster, OH 44691 OH 614-592-1111
 Allegheny Nuclear Surveys, Inc. - Elderton, PA 15736 412-354-3090

DRILLER'S LOG OF FORMATIONS

003-21317

154

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Clay	0	7				Drillers Log
Shale	7	8				
Clay & Shale	8	20			Damp @ 70	
Red Bed & Shale	20	30				
Sand & Shale	30	150				
Shale & Sand	150	319			1" @ 220'	
Sand & Shale	319	562				
Open Mine	562	567				
Sand & Shale	567	611				
Shale & Sand	611	775				
Sand & Shale	775	866				
Shale & Sand	866	910				
Sand & Shale	910	922				
Shale & Sand	922	1196			1/2" @ 1020'	
Sand & Shale Red Rock	1196	1650				
Shale & Sand	1650	1800			1" @ 1830	
Murrysville Sand	1800	1930				
100' Sand	1930	2010				
Sand & Shale	2010	2041				
Shale, Sand, Red Rock	2041	2280				
Shale, Sand	2280	2780				
Sand & Shale	2780	3405				
Shale & Sand	3405	3690				
Sand & Shale	3690	4062				

Operator's Signature

Vice-President
Title

Date

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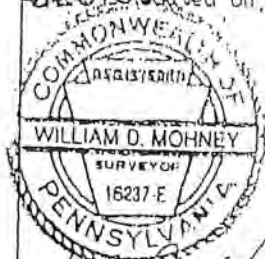
Date

Comments

003-21334

GEO CORP.

Based on topo map 9800' feet south of LATITUDE 40 • 32 • 30 ,



8/2/93

CHARLES D. BONSALE &
SANDRA A. BONSALEOLD LEECHBURG ROAD
SANDS ROAD

N

Well is located on topo map 3500' feet west of LONGITUDE 79 • 42 • 30 ,

DER-000M

93 SEP 15 PM 2:44

DER-000M

93 AUG 20 PM 2:10

PITTSBURGH REGION
PITTSBURGH REGION

- LEASE LINE
— PROPERTY LINE
— ROADS
⊙ PROPOSED WELL LOCATION

LOC-A = S 26°19'42" W 993.67'

LOC-B = S 88°58'10" E 473.76'

PROPERTY CORNERS A-B = N 46°0'50" E 1270.50'

DEPARTMENT USE ONLY

G930-93C-14
CPT

INCLUDE DESCRIPTION OF THE PROPERTY AND COURSES AND DISTANCES OF THE WELL(S) LOCATION TO TWO OR MORE PERMANENT IDENTIFIABLE POINTS OR LAND MARKS, ALL BUILDINGS AND WATER SUPPLIES WITHIN 200', ALL SPRINGS, BODIES OF WATER AND STREAMS WITHIN 100' IDENTIFIED ON THE MOST CURRENT 7 1/2" TOPOGRAPHIC MAP AND WETLANDS WITHIN 100'. REFERENCE TO BUILDINGS, SPRINGS, BODIES OF WATER, WETLANDS AND WATER SUPPLIES WITHIN 1000' IS NOT REQUIRED FOR WELL PLUGGING.



DENOTES LOCATION OF WELL ON 7 1/2" TOPO MAP PERMIT NO. 37-003-21334-00 PROJECT NO.

PENNECO OIL COMPANY, INC. 13825		REVISION ALTERATION STORAGE RECONITION NEW LOCATION DRILL DEEPER ABANDONMENT REGISTRATION PLUGGING	☐ ☐ ☐ ☐ ☐ ☐ ☐	W.D. MOHNEY & ASSOC.
Well Permittee/Registrant P.O. BOX 300, 200 U.S. ROUTE 22				Surveyor/Engineer PB-1
Address DELMONT, PA 15626 - 0300				Drawing Number 7-12-93
CHARLES D. BONSALE & SANDRA A. BONSALE				Date 1 INCH = 400 FEET
Surface Owner N/A		SURFACE LANDOWNER AND WATER PURVEYOR WITH WATER SUPPLY WITHIN 1000'	APPROXIMATE COURSE AND DISTANCE TO WATER SUPPLY	
Surface Lessor (if any) BONSALE				
Form Name 1		RUDOLPH D. DYKE	N 24°00' E 1000' ± N 55°30' E 950'	
Well No. 43.78	Tract PB-108	Serial No. 1100'	DEC 7 1993	
Acres NONE	Ground Elevation 3800'	Anticipated TD PLUM	PA GEOLOGICAL SURVEY	
County ALLEGHENY	Municipality 7	Workable Coal Name of Seam		
County NEW KENSINGTON, EAST	Section	JESONE LAND COMPANY NATIONAL STEEL CORP.		
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF OIL AND GAS MANAGEMENT		80% of UPPER FREEPORT 40% of UPPER FREEPORT		
		CHARLES D. BONSALE & SANDRA A. BONSALE		
		ALL OTHERS		

GOB (top) Freeport

NEW KENSINGTON EAST

003-21334

9800' S 40° 32' 30"
3500' W 79° 45' 30"

WELL RECORD AND COMPLETION REPORT

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-QG-76).

RENTON FIELD

Well Operator Pennaco Oil Company, Inc.		Telephone Number 412-468-8232	
Address 200 Route 22, P. O. Box 300, Delmont, PA		15626-0300	
Permit Number 37-003-21334		Project Number	
Farm Name Bonsall #1	Farm Number	Serial Number PB-198	Acres 43.78
Township Butte Borough		County Allegheny County	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD

(Include Driller's Log on Reverse Side)

Drilling Method Rotary (A) ☒ Mud ☐ Cable Tool ☐	Date Drilling Started 11/09/93	Date Drilling Completed 11/16/93
Other ☐ (Specify)		
Elevation 1100	Total Depth 3938	7X Quadrangle New Kensington East

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe	Packer/Hardware			Date Run
			Type and Amount	Type	Size	Depth	
15"	13 3/8"	34'	Sanded in		N/A	N/A	11/09/93
12 1/4"	9 5/8"	567'	Cement - 228 sacks	Float Shoe	9 5/8"	567'	11/10/93
8 3/4"	7"	1962'	Cement - 320 sacks	Float Shoe	7"	1970'	11/11/93
6 1/4"			No Pipe was installed				

Cement return on surface casing? ☒ yes ☐ no

COMPLETION REPORT

[illegible]

Natural Open Flow 138.583 <i>2400F</i>	Natural Rock Pressure 475 psi	Hours 72	Days 3
After Treatment Open Flow	After Treatment Rock Pressure	Hours	Days

SEP 9 1994

Name, Address, and Telephone Number of Well Service Companies	
F.D. Hill Drilling Company - Rt 321 South - Kane, PA 16735	814-837-6612
Nowaco Well Service - 3000 Old Airport Road - Wooster, OH 44691	216-264-8885
Allegheny Nuclear Surveys, Inc. - Elderton, PA 15736	412-354-3090

03-21334

ps 2

DRILLER'S LOG OF FORMATIONS						
Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Fill	0	5				Drillers Log
Clay, Red Bed	5	30				
Shale	30	34				
Sand	34	36				
Red Rock, Shale, Sand	36	513			Damp @ 47'	
Open Mine	513	527			1/2" @ 90	
Sand and Shale	537	565				
Shale and Sand	565	1115				
Sand and Shale	1115	1530				
Shale and Sand	1530	1990			1" @ 1772	
Shale and Sand	1990	2280			2" @ 1795	
Sand and Shale	2280	2750		2" @ 1887		
Shale and Sand	2750	3250				
Sand and Shale	3250	3660	138 MCF @ 3190			
Sand and Shale	3660	3938				

Operator's Signature

Vice President
Title

Date

6-9-94

FOR OFFICIAL USE ONLY

Reviewed By

Date

Comments

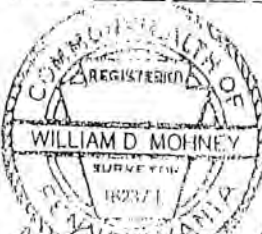
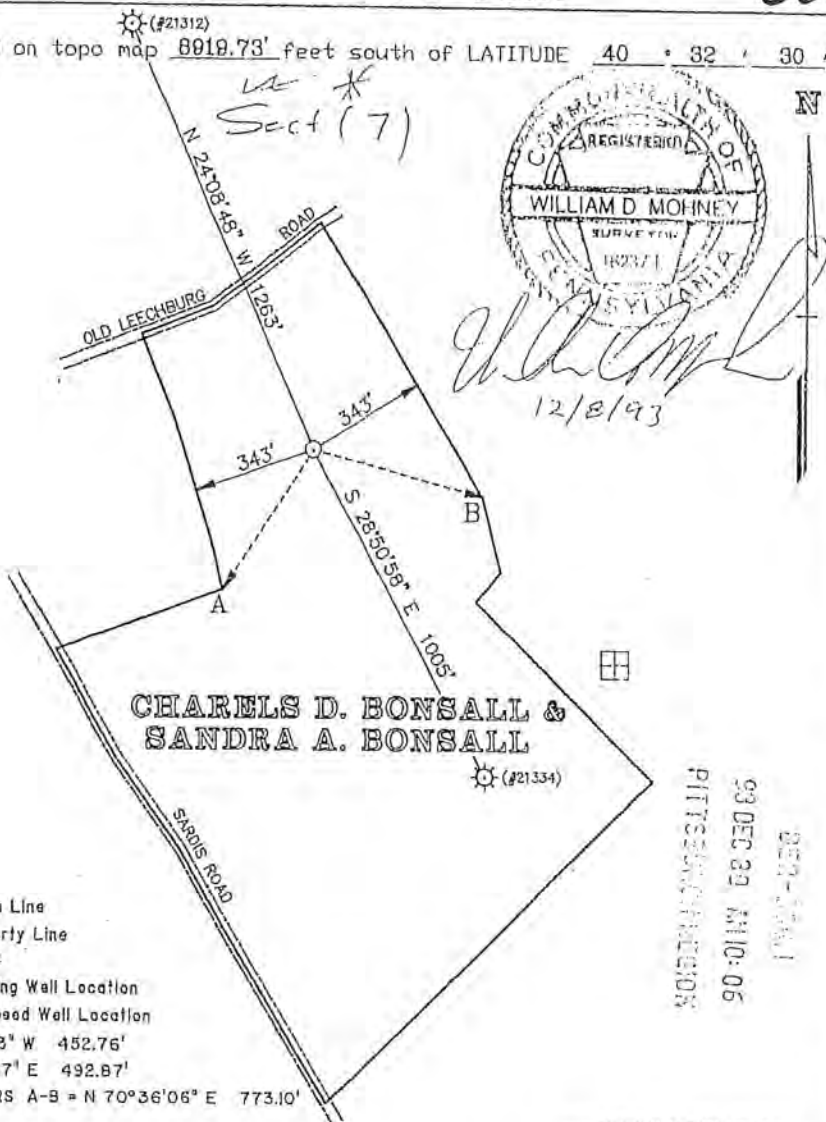
WAF 8-5-94

FR - PG - 20 Rev. 1/76
GEO COPY

WELL LOCATION PLAN

003-21341

Well is located on topo map 8918.73' feet south of LATITUDE 40 • 32 • 30 •



12/8/93

DEC 22 11:00:06
PITTSBURGH, PA

DEPARTMENT USE ONLY

G 25 C 024
1/27/94

INCLUDE DESCRIPTION OF THE PROPERTY AND COURSES AND DISTANCES OF THE WELL(S) LOCATION TO TWO OR MORE PERMANENT IDENTIFIABLE POINTS OR LAND MARKS, ALL BUILDINGS AND WATER SUPPLIES WITHIN 200', ALL SPRINGS, BODIES OF WATER AND STREAMS WITHIN 100' IDENTIFIED ON THE MOST CURRENT 7 1/2' TOPOGRAPHIC MAP AND WETLANDS WITHIN 100'. REFERENCE TO BUILDINGS, SPRINGS, BODIES OF WATER, WETLANDS AND WATER SUPPLIES WITHIN 1,000' IS NOT REQUIRED FOR WELL PLUGGING.

DEMONSTRATES LOCATION OF WELL ON 7 1/2' TOPO MAP PERMIT NO. 37-003-21341-01 PROJECT NO.

PENNECO OIL COMPANY, INC. 13825 Well Permittee/Registrant P.O. BOX 300, 200 U.S. ROUTE 22 Address DELMONT, PA 15626 CHARLES D. BONSALL & SANDRA A. BONSALL Surface Owner N/A Surface Lessor (if any) BONSALL Farm Name 2 PB-199 Well No. 43.78 Tract Serial No. 1166' Acres NONE Ground Elevation 3800' Angle of Deviation (Drilling) ALLEGHENY County NEW KENSINGTON, EAST Topo Quadrangle Section COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF OIL AND GAS MANAGEMENT		REVISION ALTERATION STORAGE RECONDITION LOCATION DEEPER ABANDONMENT REGISTRATION PLUGGING SURFACE LANDOWNER AND WATER PURVEYOR WITH WATER SUPPLY WITHIN 1,000' Harold Henson Thomas Brown Ronald DesLauriers Alexander J. Serakowski WORKABLE COAL SEAMS Owner/Operator/Lessee Name of Seams TESONE LAND COMPANY, INC. NATIONAL STEEL CORP. CHARLES D. BONSALL & SANDRA A. BONSALL GAB V. PUGH	W.D. MOHNEY & ASSOC. Surveyor/Engineer PB-2 Drawing Number 12-04-93 Date 1 INCH = 400 FEET Scale APPROXIMATE COURSE AND DISTANCE TO WATER SUPPLY N 13°00' E 1000' N 08°00' E 900' N 00°30' E 750' N 01° E 500' 60% of UPPER FREEPORT 40% of UPPER FREEPORT ALL OTHERS
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* Set (7)

003-21341

WELL RECORD AND COMPLETION REPORT

Penton Field

In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.

2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-OG-75).

Well Operator PENNECO OIL COMPANY, INC.		Telephone Number (412) 468-8232	
Address 200 Route 22, P.O. Box 300, Delmont, PA		Zip 15626-0300	
Permit Number 37-003-21341-00		Project Number	
Farm Name Bonsall #2	Farm Number	Serial Number PB-199	Acres 43.78
Township Plum Borough		County Allegheny County	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air) ☒ Mud ☐ Cable Tool ☐ Other ☐ (Specify)	Date Drilling Started 03-04-94	Date Drilling Completed 03-11-94
Elevation 1155	Total Depth 3994	7 1/2' Quadrangle New Kensington East

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe	Packer/Hardware			Date Run
			Type and Amount	Type	Size	Depth	
15"	13 3/8"	34'	Sanded in	N/A	N/A	N/A	03-04-94
12 1/4"	9 5/8"	604'	Cement-250 sacks, Class A Reg 3% CaCl ₂ + 1/4 # flake/sack	Float Shoe	9 5/8"	611'	03-07-94
8 3/4"	7"	2025'	Cement-315 sacks, Class A Reg 3% CaCl ₂ + 1/4 # flake/sack	Float Shoe	7"	2033'	03-10-94
6 1/2"			No pipe was installed				

Cement return on surface casing? ☒ Yes ☐ No

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate
	From	To			Type	Amount	Type	Amount	
				WELL WAS NOT TREATED					
				WELL WAS NOT TREATED					

Natural Open Flow 159,940 cfpd	Natural Rock Pressure 362 #	Hours 5	Days 6
After Treatment Open Flow	After Treatment Rock Pressure	Hours	Days

RECEIVED

NOV 22 1995

Name, Address, and Telephone Number of Well Service Companies

F. D. Hill Drilling Company-Route 321 South - Kane, PA 16735	PA GEOLOGICAL SURVEY Oil & Gas Geology Division 814-837-6612
Newsco Well Service - 3000 Old Airport Road - Wooster, OH 44691	216-264-0885
Milliburton Logging Service - P. O. Box 427 - Indiana, PA 15701	412-479-9046

DRILLER'S LOG OF FORMATIONS

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Oil shale	0'	0'				Driller's Log
Shale	10'	20'				
Red Bed	20'	25'			Damp @ 60'	
Shale	25'	30'				
Sand	30'	34'				
Sand, Shale, Red Bed	34'	290'				
Sand & Shale	290'	585'				
Clay	585'	592'				
Sand & Shale	592'	613'				
Sand & Shale	613'	900'				
Shale & Sand	900'	1260'			2" Brine @ 1875'	
Shale & Sand	1260'	1550'				
Sand & Shale	1550'	1935'				
Sand & Shale	1935'	1950'				
100' Sand	1950'	2020'		1965'		
Shale	2020'	2045'				
Sand & Shale	2045'	2525'	160 MCF @ 2385'			
Shale & Sand	2525'	2990'				
Sand & Shale	2990'	3400'				
Sand & Shale	3400'	3872'				
Shale & Sand	3872'	3994'				

003-21341

PS 2

Operator's Signature

Vice President
Title

Date

FOR OFFICIAL USE ONLY

Reviewed By

Date

Comments

GEO COPY

WELL LOCATION PLAT

603-21344

Well is located on topo map 8910 feet south of LATITUDE 40° 32' 30"

Well is located on topo map 2330 feet west of LONGITUDE 79° 42' 30"

COMMONWEALTH OF PENNSYLVANIA
REGISTERED
WILLIAM D. MOHNEY
SURVEYOR
16237-E

A. SERAKOWSKI

J. WILLIAMS

K. FRYNCKO

RUDOLPH D. DYKE & ANNIE R. DYKE

C. BONBALL

OLD HOUSE

M. BALEND

TO WELL (21266)

LOC-A = N 67° 58' 09" E 606.66'
LOC-B = S 09° 54' 26" W 1247.02'
PROPERTY CORNERS A-B = S 26° 21' 42" W 1689.18'

Department Use Only

G	135	C	201
3/5/94			

Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'.
Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000' is not required for well plugging.

Denotes location of well on 7 1/2" topo map

Permit # 37-013-21344-1

Project #

PENNECO OIL COMPANY, INC. 13825		Revision	☐	W. D. MOHNEY & ASSOC.
200 ROUTE 22, P. O. BOX 300		Alteration	☐	Surveyor/Engineer
Address		Storage Recondition	☐	PD-1
DELMONT, PA 15626-0300		New Location	☐	Drawing Number
RUDOLPH D. DYKE & ANNIE R. DYKE		Drill Deeper	☐	02-09-94
Surface Owner		Abandonment	☐	Date
N/A		Registration	☐	1" = 300'
Surface Lessor (if any)		Plugging	☐	Scale
DYKE		Surface landowner and water purveyor with water supply within 1,000'		
Farm Name		L. H. FUGE		
PD-228		K. J. FRYNCKO		
Well No.		J. E. WILLIAMS		
37.09		R. KAZIMER		
Tract		R. D. & A. R. DYKE		
Serial No.		N 32° E 1,000'		
1160		N 36° 30' W 950'		
Acres		N 43° W 600'		
None		N 21° W 1,000'		
Ground Elevation		S 84° W 600'		
3800'				
Angle of Deviation (Grading)				
ALLEGHENY				
Anticipated TD				
PLUM BOROUGH				
County				
NEW KENSINGTON EAST				
Municipality				
7				
Topo Quadrangle				
Section				
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management				

Plat
Sect (7)

WELL RECORD AND COMPLETION REPORT

Renton Field

003-21344

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-00-76).

Well Operator PENNECO OIL COMPANY, INC.		Telephone Number 412-468-8232	
Address 200 Rt. 22, P.O. Box 300, Delmont, PA 15626			
Permit Number 37-003-21344		Project Number	
Farm Name Dyke #1	Farm Number	Serial Number PD-228	Acres 37.09
Township Plum Borough		County Allegheny County	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air ☒ Mud ☐ Cable Tool ☐ Other ☐ (Specify)	Date Drilling Started 05-11-94	Date Drilling Completed 05-18-94
Elevation 1060	Total Depth 3960	7 1/2' Quadrangle New Kensington East

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe	Packer/Hardware			Date Run
			Type and Amount	Type	Size	Depth	
15"	13 3/8"	34'	Sanded in	N/A	N/A	N/A	05-11-94
12 1/2"	9 5/8"	542'	Cement-220 sacks-Class A Reg. 3/4" Cas 12 + 1/4" Cel for lake/sack	Float Shoe	9 5/8"	550'	05-12-94
8 3/4"	7"	1938'	Cement-290 sacks-Class A Reg. 3/4" Cas 12 + 1/4" Cel for lake/sack	Float Shoe	7"	1938'	05-17-94
6 1/2"			No Pipe Was Installed				

Cement return on surface casing? ☒ yes ☐ no

COMPLETION REPORT

Perforation Record			Stimulation Record					
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent	
	From	To			Type	Amount	Type	Amount

Natural Open Flow 265 MCF/D	Natural Rock Pressure 530 PSI	Hours 72	Days
After Treatment Open Flow	After Treatment Rock Pressure	Hours	Days

RECEIVED

NOV 22 1995

Name, Address, and Telephone Number of Well Service Company	PA GEOLOGICAL SURVEY Oil & Gas Geology Division
F.D. Hill Drilling Company - Route 321 South - Kane, PA. 16735	814-837-6612
Nowco Well Service - 3000 Old Airport Road - Wooster, OH 44691	216-254-8885
Allegheny Nuclear Surveys, Inc. - Elderton, PA. 15736	412-354-3090

DRILLER'S LOG OF FORMATIONS

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
lay	0	15				Drillers Log
shale & Red Bed	15	30				
sand	30	34				
red Bed, Sand, Shale	34	110			Damp @ 60'	
sand & Shale	110	500				
scb	500	510				
Sand & Shale	510	550				
shale & Sand	550	690				
sand & Shale	690	1081				
shale & Sand	1081	1425				
sand & Shale	1425	1770			3" Brine @ 1760	
sand & Shale	1770	1962				
sand & Shale	1962	2000		1895 100 AT		
red Rock, Shale, Sand	2000	2180				
Sand, Shale	2180	2580				
Shale & Sand	2580	3120				
Sand & Shale	3120	3560	3184			
Sand & Shale	3560	3960				

003-21344

P5 2

Operator's Signature

PRESIDENT
Title

5/18/95
Date

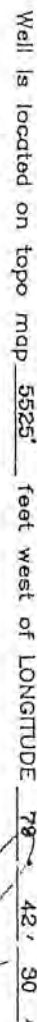
FOR OFFICIAL USE ONLY

Reviewed By *MA 1023-25*

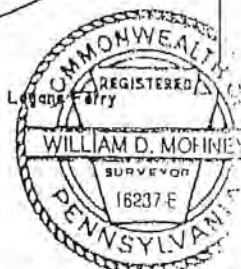
Date

Comments

Well is located on topo map 3880' feet south of LATITUDE 40 • 32 ' 30 ,



LOC-A = N 66°45'24" W 1348.65'
LOC-B = S 08°59'40" W 1048.77'
PROPERTY CORNERS A-B = S 34°30'00" E 1899.15'



DEPARTMENT USE ONLY

G	DS	C	DL+
9/27/94			

INCLUDE DESCRIPTION OF THE PROPERTY AND COURSES AND DISTANCES OF THE WELL(S) LOCATION TO TWO OR MORE PERMANENT IDENTIFIABLE POINTS OR LAND MARKS, ALL BUILDINGS AND WATER SUPPLIES WITHIN 200', ALL SPRINGS, BODIES OF WATER AND STREAMS WITHIN 100' IDENTIFIED ON THE MOST CURRENT 7 1/2" TOPOGRAPHIC MAP AND WETLANDS WITHIN 100'.
REFERENCE TO BUILDINGS, SPRINGS, BODIES, OF WATER, WETLANDS AND WATER SUPPLIES WITHIN 1000' IS NOT REQUIRED FOR WELL PLUGGING

 DENOTES LOCATION OF WELL ON 7 1/2" TOPO MAP PERMIT NO. 37-013-21357-00 ²¹³⁵⁷

PENNECO OIL COMPANY, INC.		REVISION ALTERATION STORAGE RECONDITION NEW LOCATION DRILL DEEPER ABANDONMENT REGISTRATION PLUGGING	☐ ☐ ☒ ☐ ☐	W.D. MOHNEY & ASSOC. Surveyor / Engineer PC-1 Drawing Number 08/10/94 Date INCH = 400 FEET Scale
Well Permitter / Registrant P.O. BOX 300, 200 U.S. ROUTE 22				
Addressee DELMONT, PA 15628				
JOSEPH CARUSO & DEBORAH CARUSO				
Surface Owner N/A		SURFACE LANDOWNER AND WATER PURVEYOR WITH WATER SUPPLY WITHIN 1,000'		APPROXIMATE COURSE AND DISTANCE TO WATER SUPPLY
Surface Lessor (If any) CARUSO				
Farm Name 1 PC-238				
Well No. Tract 66.75	Serial No. 1042'	No Water Supplies Within 1000'		
Acreage NONE	Ground Elevation 3800			
Angle of Deviation (Drilling) ALLEGHENY	Anticipated TD PLUM BOROUGH			
County NEW KENSINGTON, EAST	Municipality 7	Owner / Operator / Lessee	Workable Coal Seams	Other Seams
Type Quadrangle	Section	Youghiogheny & Ohio Coal Co. J. & D. Caruso	Upper Freeport	All Others
		DATE 8-10-94		
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF OIL AND GAS MANAGEMENT		Sub Upper Freeport		

3003-21357

WELL RECORD AND COMPLETION REPORT

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-QG-75).

RENTON FIELD

Well Operator Penneco Oil Company, Inc.		Telephone Number 412-468-8232	
Address 200 RT 22, PO Box 300, Delmont, PA 15626			
Permit Number 37-003-21357-00		Project Number	
Farm Name Caruso	Farm Number 1	Serial Number PC-236	Acres 55.75
Township Plum Borough		County Allegheny County	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air ☒ Mud ☐ Cable Tool ☐ Other ☐ (Specify)	Date Drilling Started 10-21-94	Date Drilling Completed 10-27-94
Elevation 1042	Total Depth 3295'	7 1/2' Quadrangle New Kensington East

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe Type and Amount	Packer/Hardware			Date Run
				Type	Size	Depth	
15"	13 3/8"	35'	Sanded In	N/A	N/A	N/A	10-21-94
12 1/4"	9 5/8"	529'	Cement-185 Sacks-Class A Reg 3% CaCl ₂ +1/4# Celloflake/Sack	Float Shoe	9-5/8"	537'	10-24-94
8 3/4"	7"	1918'	Cement-300 Sacks, Class A Reg 3% CaCl ₂ +1/4# Celloflake/sack				
6 1/4"			NO PIPE WAS INSTALLED				

Cement return on surface casing? ☒ yes ☐ no

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate
	From	To			Type	Amount	Type	Amount	

WELL WAS NOT TREATED

Natural Open Flow 103 MCFPD	Natural Rock Pressure 25 PSIG	Hours 72	Days
After Treatment Open Flow Not Treated	After Treatment Rock Pressure Not Treated	Hours	Days

Name, Address, and Telephone Number of Well Service Companies

F.D. Hill Drilling Company	Route 321 South-Kane, PA 16735	814-837-6512
Nowco Well Service	3000 Old Airport Road, Wooster, OH 44691	216-264-8885
Allegheny Nuclear Surverys, Inc.	Elderton, PA 15736	412-354-3090

003-21357

DRILLER'S LOG OF FORMATIONS

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Fill	0'	8'				Drillers Log
Shale	8'	20'				
Red Bed & Shale	20'	30'				
Sand	30'	35'				
Sand & Shale	35'	48'				
Sand	48'	70'				
Sand & Shale	70'	135'				
Red Bed, Sand, Shale	135'	215'			1 1/2" Fresh @ 130'	
Sand & Shale	215'	390'				
Shale & Sand	390'	484'				
Gob (Mine)	484'	490'			3" Fresh in mine	
Sand & Shale	490'	538'				
Shale & Sand	538'	783'			2" Brine @ 1735'	
Sand & Shale	783'	1250'				
Sand & Shale	1250'	1600'			2" Brine @ 1780'	
Sand & Shale	1600'	1947'				
Shale & Sand	1947'	2009'				
Shale, Sand, Red Rock	2009'	2471'	2249			
Red Rock, Sand, Shale	2471'	2550'				
Shale & Sand	2550'	3100'				
Sand	3100'	3144'				
Shale & Sand	3144'	3295'				

PS 2

Operator's Signature

Title

Date

FOR OFFICIAL USE ONLY

Reviewed By

Date

Comments

GEO COPY

003-21438

5500-PM-OG0002 Rev 3/97



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil and Gas Management Program
WELL LOCATION PLAT

DEP USE ONE	DEP Application Tracking # 37-003-21438-00	Project #
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Well is located on topo map 4745 feet south of latitude 40° 32' 30"

☐ Denotes location of well on topo map.

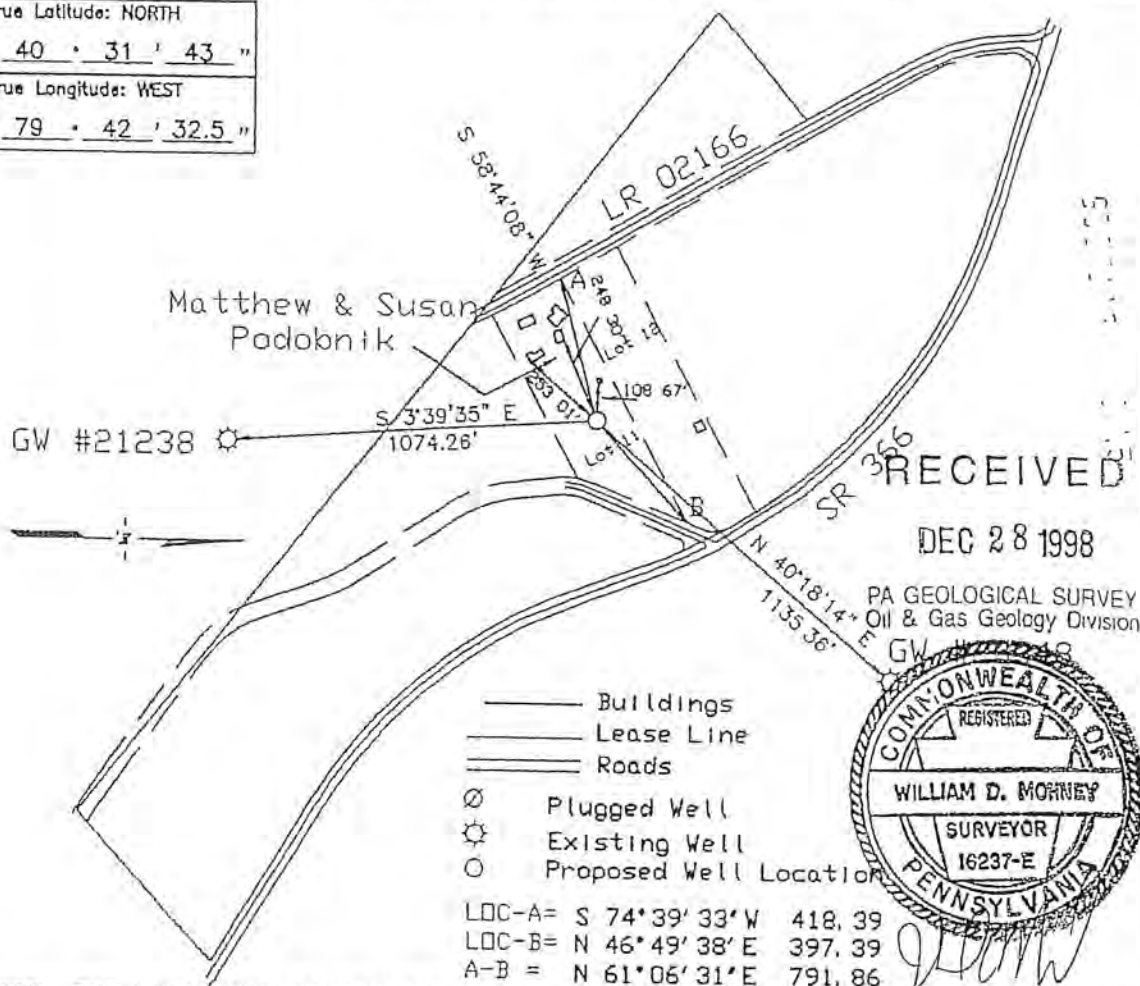
True Latitude: NORTH

40° 31' 43"

True Longitude: WEST

79° 42' 32.5"

NOTE: CONSOLIDATION COAL COMPANY OWNS THE OIL AND GAS UNDER ALL THE TRACTS LOCATED WITHIN THE LEASED AREA



Well is located on topo map ☐

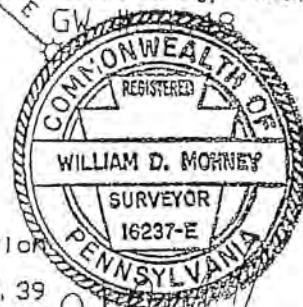
190

feet west of longitude

79° 42' 30"

DEC 28 1998

PA GEOLOGICAL SURVEY
Oil & Gas Geology Division



NOTE: THE LOCATIONS OF THE ABANDONED GAS WELL No. 81 HAVE BEEN LOCATED ON THE MAPS FROM THE OLD RENTON MINE MAPS DUE TO THE ABSENCE OF ANY EVIDENCE IN THE FIELD.

Surveyor of Engineers
W.D. MOHNEY AND ASSOCIATES

Dwg # PCL-8

Date 12-14-98

Scale 1" = 500' Tract Acreage 57

Applicant / Well Operator Name PENNECO OIL COMPANY		DEP ID# 7674	Well (Farm) Name CONSOLIDATION COAL COMPANY		Well # 8	Serial # PC-393
Address P O BOX 300, 200 US RTE 22, DELMONT, PA 15826		County - Code ALLEGHENY 02		Municipality PLUM BOROUGH		
Surface Owner MATHEW & SUSAN PODOBNIK		USGS 7 1/2 Quadrangle Map Name NEW KENSINGTON EAST		Map Section 7		
Surface Lessor N/A		Angle & Course of Deviation (Drilling) NONE		Surface Elevation 940 ft	Anticipated Total Depth 3800 ft	
Surface Owner of Water Surrounding Well SEE ATTACHED LIST		Approximate Course and Distance to Water Supply		Name of Coal Seam Owned, Leased, or Operated		
60% (Barton Mine)		TESONE LAND CO. INC		60% UF		
10% (Frederick)		NATIONAL STEEL CORP		40% UF		
		CONSOLIDATION COAL CO.		ALL OTHERS		

Water Supplies Within 1000'

003-21438

Gerald Greiner 1520 Menk Road New Kensington, PA 15068	N 30° E	1000'
Lenora Greiner 1510 Menk Road New Kensington, PA 15068	N 30° E	1000'
Louis Trzeciak 203 Menk Road New Kensington, PA 15068	N 60° E	900'
Edward Taylor R.D.#2, Old Leechburg Road New Kensington, PA 15068	S 70° W	300'
Frank Smolenski R.D.#2, Box 325A New Kensington, PA 15068	S 05° W	800'
Raymond Smolenski R D.#2, Old Leechburg Road New Kensington, PA 15068	S 02° W	900'
James R. Flynn 504 Clarendon Road Pittsburgh, PA 15238	S 10° E	1000'
David Maloney 1927 Drennen Road New Kensington, PA 15068	S 40° E	600'
James Smith 1931 Drennen Road New Kensington, PA 15068	S 30° E	850'

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DEC 28 1998

PA GEOLOGICAL SURVEY
Oil & Gas Geology Division



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil & Gas Management Program

003-21438

DEP USE ONLY	
Auth #	APS #
Site #	Facility #
FLX Client #	Sub fac #

WELL RECORD AND COMPLETION REPORT

Well Operator Penneco Oil Company, Inc	DEP ID# 7674	Well API # (Permit / Reg) 37-003-21438-00	Project Number	Acres 57
Address 200 Rt 22, P O Box 300	Well Farm Name Consolidation Coal Company	Well # 8	Serial # PC-393	
City Delmont	State PA	Zip Code 15626-0300	County Allegheny	Municipality Plum Boro
Phone 724-468-8232	Fax 724-468-8230	USGS 7.5 min quadrangle map New Kensington East		

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 01-04-99	Date Drilling Completed 01-12-99	Surface Elevation 940 Ft.	Total Depth - Driller 3773' Ft	Total Depth - Logger 3766 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
15"	13 3/8"	N/A	Thread	35'	Sanded in with drill cuttings	N/A	N/A	N/A	01-04-99
12 1/4"	9 5/8"	26#	Thread	434'	Cement - 160 Sacks Class A Reg	Float Shoe	9 5/8"	442'	01-05-99
9 3/4"	7"	17#	Thread	1801'	Cement - 300 Sacks Class A Reg	Float Shoe	7"	1809'	01-07-99
1/4"					No Pipe Was Installed				

COMPLETION REPORT

Perforation Record			Stimulation Record				
Date	Interval Perforated From	To	Date	Interval Treated	Fluid Type	Propping Agent Type	Average Injection Rate
				Well was not treated			

AUG 17 2000

Natural Open Flow 198 MCFPD	Natural Rock Pressure 505#	PA GEOLOGICAL SURVEY Subsurface Geology Section
After Treatment Open Flow Well was not treated	After Treatment Rock Pressure Well was not treated	

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

Name Hill Drilling Company	Name Superior Well Services	Name
Address Route 321 South	Address P.O. Box 458	Address
City - State - Zip Kane, Pa 16735	City - State - Zip Blacklick, Pa 15716	City - State - Zip
Phone 14-837-6612	Phone 724-248-1001	Phone

LOG OF FORMATIONS

Well API# 37-003-21438-00

Formation Name	Top	Bottom	Gas at	Oil at	Water at (Fresh or Brine)	Source of Data
Shale	0	10				Drillers Log
Sand	10'	15'				
Shale	15'	32'				
Sand	32'	34'				
Sand, Red Bed & Shale	34'	109'				
Sand & Shale	109'	373'			Damp & 55'	
Open Mine	373'	385'			1" Fresh	
Sand & Shale	385'	435'			& 230'	
Sand & Shale	435'	780'				
Shale & Sand	780'	1200'				
Sand & Shale	1200'	1620'				
Shale	1620'	1750'				
100' Sand	1750'	1800'			2" Brine	
Shale	1800'	1817'			& 1620'	
Sand & Shale	1817'	1980'				
Shale & Sand	1980'	2450'	2264'			
Sand & Shale	2450'	2950'				
Shale & Sand	2950'	3550'	3010'			
Sand & Shale	3550'	3773'				

(PC users: Please delete empty rows above as necessary to make all of page 2 fit on one page, if possible. You will need to "unprotect" the form first.)

Well Operator's Signature.

Title
President

Date

8/5/99

DEP USE ONLY

Reviewed by

Date

Comments



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil and Gas Management Program
WELL LOCATION PLAT

DEP Application Tracking # 537645
Permit # 37-003-21644-00
Project #

G. *RB*
C. *CB*

Well is located on topo map 5366.42 feet south of latitude 40 . 32 . 30 "

☐ Denotes location of well on topo map.

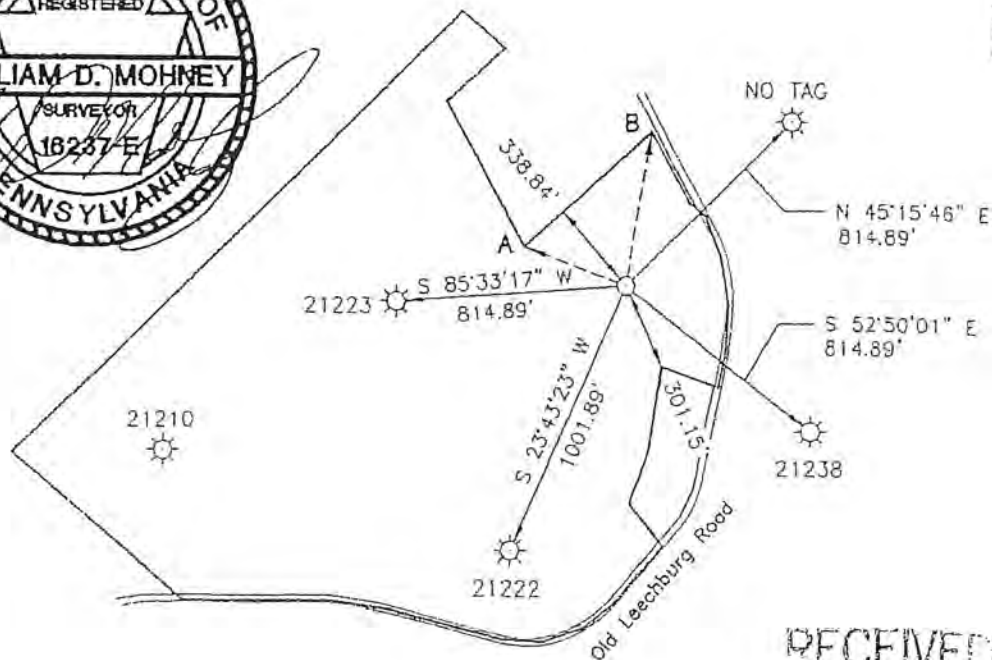
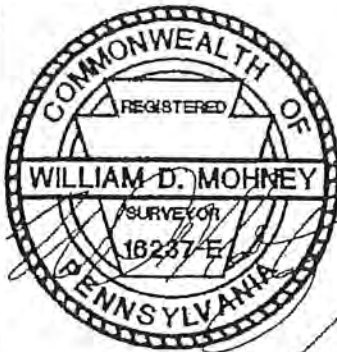
True Latitude: NORTH
40 . 31 . 36.9 "

True Longitude: WEST
79 . 42 . 39.7 "

Loc-A N 70°03'58" W 384.91'
Loc-B N 09°11'04" E 537.82'
A-B N 48°15'12" E 600.00'

Proposed Well Location
 Existing Well
 Plugged Well

Lease Line
 Property Line
 Roads
 Streams/Water



Well is located on topo map

749.80 feet west of longitude 79 . 42 . 30 "

RECEIVED

APR 02 2004

DEP
Southwest Regional Office

Surveyor of
Engineer: W.D. Mohney
& Associates

Dwg. #
sedatplum

Date:
December 15, 2003

Scale:
1" = 600'

Treat
Acres: 69.54 Acres

Applicant / Well Operator Name Pennaco Oil Company, Inc.	DEP ID# 7674	Well (Form) Name SEDAT	Well # 4 A	Serial # PS-748
Address P.O. Box 300, 200 US Route 22, Delmont PA 15626		County - Code Allegheny - 65	Municipality Plum Borough	
Surface Owner Sedat Inc.		USGS 7 1/2 Quadrangle Map Name New Kensington East, PA		
Surface Lessor n/a		Angle & Course of Deviation (Drilling) None	Surface Elevation 1068 ft	Anticipated Total Depth 3800' ft
Surface Owners or Water Purveyor n/a		Approximate Course and Distance to Water Supply		
See Attached Sheet		Noncoal Area	N/A	
		GOB Upper Leechburg Area		

003-21644

SURFACE OWNER OR WATER PURVEYOR
WITH A WATER SUPPLY WITHIN 1000'
OF THE SEDAT #4A GAS WELL LOCATION

<u>SURFACE OWNER OR</u> <u>WATER PURVEYOR</u>	<u>APPROXIMATE COURSE &</u> <u>DISTANCE TO WATER SUPPLY</u>
1. JOHN & MARTHA SLACK	N 5° E 1,000'
2. MARY C. SCHWARTZ	N 10° E 900'
3. MATTHEW W. PODOBNIK	N 25° E 700'
4. EDWARD TAYLOR	N 45° E 500'
5. BEVERLY SISKOS	N 70° E 600'
6. RALPH & ETHELYN ANKROM	S 85° E 900'
7. HERMAN & IRENE VANHORN	N 80° E 800'
8. JANET & RUSSELL MITCHELL	S 70° E 800'
9. EARL & JEAN WILKERSON	S 40° E 400'
10. FRANK T. & MARCIA SMOLENSKI	S 30° E 700'
11. THEODORE & VIRGINIA SMOLENSKI	S 20° E 600'

RECEIVED

APR 02 2004

DEP
Southwest Regional Office

Client Id
SYLVANIA

Sub-facility Id

003-21644

WELL RECORD AND COMPLETION REPORT

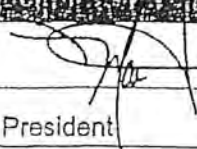
PENDING APPROVAL

LOG OF FORMATIONS

Well API#: 37-003-21644

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Clay	0	6				Drillers Log
Shale - R bed	6	30				
Sand	30	34				
Sand & Shale	34	50				
Sand & Shale	50	100			Damp @ 100	
Shale & Sand	100	330				
Shale & Sand	330	440			1" @ 440	
Shale	440	510			3" @ 510	
Mine	510	520				
Shale & Sand	520	577				
Shale	577	760				
Sand & Shale	760	940				
Shale	940	1030				
Sand	1030	1150				
Sand & Shale	1150	1775				
Murrysville	1775	1870			2" @ 1789'	
Shale	1870	1900				
100'	1900	1922				
Sand 100'	1922	1935				
Sand & Shale	1935	2240				
Sand	2240	2245				
Shale & Sand	2245	2300				
5 th Sand	2300	2330				
Shale	2330	2700	Show @ 2335			
Shale	2700	3000				
Sand & Shale	3000	3925				

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

		DEP USE ONLY	
Title: Vice President		Date: 8/19/04	
Comments:			



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

Client Id

Sub-facility Id

WELL RECORD AND COMPLETION REPORT

003-21644

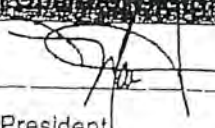
Well Operator Penneco Oil Company, Inc.		DEP ID# 7674	Well API # (Permit / Reg) 37-003-21644-00		Project Number	Acres 69.54
Address 200 Rt. 22, PO Box 300		AUG 20 2004		Well Farm Name Sedat	Well # 4A	Serial # PS-748
City Delmont	State PA	Zip Code 15626	County Allegheny		Municipality Plum Borough	
Phone 724-468-8232	Fax 724-468-8230	USGS 7.5 min. quadrangle map New Kensington East				
Check all that apply: ☒ Original Well Record ☒ Original Completion Report ☐ Amended Well Record ☐ Amended Completion Report						
Well Type ☒ Gas ☐ Oil ☐ Combination Oil & Gas ☐ Injection ☐ Storage ☐ Disposal						
Drilling Method ☒ Rotary - Air ☐ Rotary - Mud ☐ Cable Tool						
Date Drilling Started 06/21/04		Date Drilling Completed 06/24/04		Surface Elevation 1068 ft.	Total Depth - Driller 3925 ft.	Total Depth - Logger 3925 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
17"	16"	N/A	N/A	31	sanded in with cuttings	N/A N/A 31 6/21/04
15"	13 3/8"	48#	thread	302	105 sks Class A Regular	Float Shoe 13 3/8" 302 6/21/04
12"	9 5/8"	29.3#	thread	564	100 sks Class A Regular	Float Shoe 9 5/8" 564 6/22/04
8 3/4"	7"	19.41#	thread	1906	130 sks Class A Regular	Float Shoe 7" 1906 6/24/04
6 1/4"	4 1/2"	9.5#	thread	3886	80 sks Completion Blend Cement	Float Shoe 4 1/2" 3886 6/24/04
Perforation Record						
Date	Interval Perforated From	To	Date	Interval Treated	Fluid Type Amount	Propping Agent Type Amount Average Injection Rate
7/19/04	3054	3767	7/19/04	3054-3767	Water 11,634 gal	Sand 10,000# 28.4
7/19/04	3445	3452	7/19/04	3445-3452	Water 15,918 gal	Sand 11,000# 28.4
7/19/04	3132	3163	7/19/04	3132-3163	Water 36,456 gal	Sand 50,200# 26.7
7/19/04	3054	3064	7/19/04	3054-3064	Water 15,246 gal	Sand 15,200# 27.7
JAN 29 2008						
Natural Open Flow		Not Taken		Natural Rock Pressure	Not Taken	
After Treatment Open Flow		581 MCFPD		After Treatment Rock Pressure	500 PSI	
					72 Hours	
Well Service Companies -- Provide the name, address, and phone number of all well service companies involved.						
Name Hill Drilling		Name BJ Services Company		Name		
Address P.O. Box 309		Address Route 2, Box 506		Address		
City - State - Zip Bradford, PA 16701		City - State - Zip Clarksburg, WV 26301		City - State - Zip		
Phone 814-368-3831		Phone 304-624-9802		Phone		

LOG OF FORMATIONS

Well API#: 37-003-21644

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Clay	0	6				Drillers Log
Shale - R bed	6	30				
Sand	30	34				
Sand & Shale	34	50				
Sand & Shale	50	100				
Shale & Sand	100	330			Damp @ 100	
Shale & Sand	330	440			1" @ 440	
Shale	440	510			3" @ 510	
Mine	510	520				
Shale & Sand	520	577				
Shale	577	760				
Sand & Shale	760	940				
Shale	940	1030				
Sand	1030	1150				
Sand & Shale	1150	1775				
Murrysville	1775	1870				
Shale	1870	1900			2" @ 1789'	
100'	1900	1922				
Sand 100'	1922	1935				
Sand & Shale	1935	2240				
Sand	2240	2245				
Shale & Sand	2245	2300				
5 th Sand	2300	2330				
Shale	2330	2700	Show @ 2335			
Shale	2700	3000				
Sand & Shale	3000	3925				

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

Title:  Vice President		Date: 8/19/04	DEP USE ONLY	
Reviewed by: 		Date: 1/24/08	Comments:	

003-21644

PENNECO OIL COMPANY, INC.
Pre-drill Survey

Name John R + Martha J. Slack
Address 2008 Old Leechburg Road
City, State, Zip New Kensington, PA 15068-8324
Day Phone # 724-337-3069 Evening Phone # 724-337-3069

Primary Water Supply

Well ☒ (Drilled ☒ or Dug ☐)

Spring ☐

Public ☒

Other

Municipal Water Authority of New Kensington

Well Information

Depth 65 ft. Age 50 yrs. Casing Size & Depth ? Don't Know.

Location from house (Example: 20' NW) 18' SE

Spring Information

Flow _____ Developed ☐ Undeveloped ☐

Secondary Water Supply

See below

Treatment System

Yes ☐ No ☐ If yes, what type(s)? _____

Any other water supply information?

Yes ☐ No ☒

If yes, what type(s)? (Pond or lake for livestock, etc.) _____

Any water abnormality worth noting? Tank in cellar not used - leaked. Intended to use it but illness prevented repair of tank.

Yes ☐ No ☒ If yes, please describe.

Even in driest weather well never ran dry. Soft water

Thank you for your help in determining the quality and quantity of your water supply.

Martha J. Slack
Signature of Property Owner

2/10/04
Date

PENNECO OIL COMPANY, INC.
Pre-drill Survey

003-21644

Name VIRGINIA SMOLEWSKI
Address 1835 Old Leechburg Rd
City, State, Zip NEW KENSINGTON PA 15068
Day Phone # 724 339-0007 Evening Phone # 724 339-0007

Primary Water Supply

Well ☒ (Drilled ☒ or Dug ☐
Spring ☐
Public ☐
Other _____

Well Information

Depth 240' Age 30 Casing Size & Depth 8" ?

Location from house (Example: 20' NW) 30' NW

Spring Information

Flow _____ Developed ☐ Undeveloped ☐

Secondary Water Supply

Treatment System

Yes ☐ No ☒ If yes, what type(s)? _____

Any other water supply information?

Yes ☐ No ☒

If yes, what type(s)? (Pond or lake for livestock, etc.) _____

Any water abnormality worth noting?

Yes ☐ No ☒ If yes, please describe. _____

Thank you for your help in determining the quality and quantity of your water supply.

Virginia M Smolewski
Signature of Property Owner

2/10/04
Date

PENNECO OIL COMPANY, INC.
Pre-drill Survey

003-21644

Name Frank Smolenski
Address 1900 Old Leechburg Rd
City, State, Zip New Kensington Pa 15068
Day Phone # 412 824-0021 Evening Phone # 724 335-8863

Primary Water Supply

Well ☐ (Drilled ☐ or Dug ☐
Spring ☒
Public ☐
Other _____

Well Information

Depth _____ Age _____ Casing Size & Depth _____

Location from house (Example: 20' NW) 275' NE

Spring Information

Flow 6-8 Gal per min. Developed ☒ Undeveloped ☐

Secondary Water Supply

Treatment System

Yes ☐ No ☒ If yes, what type(s)? _____

Any other water supply information?

Yes ☒ No ☐

If yes, what type(s)? (Pond or lake for livestock, etc.) Hand dug well + spring

Any water abnormality worth noting?

Yes ☐ No ☒ If yes, please describe.

Thank you for your help in determining the quality and quantity of your water supply.

Frank Smolenski
Signature of Property Owner

2/10/04
Date

003-21644

PENNECO OIL COMPANY, INC.
Pre-drill Survey

Name Mary C. Schwartz
Address 4198 Brittany Drive
City, State, Zip Ellicott City MD 21043-6014
Day Phone # (410) 465-5963 Evening Phone # _____

Primary Water Supply

Well ☐ * (Drilled ☐ * or ~~Other~~)
Spring ☐
Public ☒
Other _____

for property at:
2000 Old Leechburg Rd
New Kensington PA

15068-8324

→ There is a well head on the property, but it has not been used for approx. 20 years

Well Information

Depth ? Age 1950? Casing Size & Depth ?

Location from house (Example: 20' NW) 10 feet off long kitchen window-access in basement,

Spring Information

Flow ? Developed ☐ Undeveloped ☒

Per conversation with Mr. Smail I mention several springs that come out on the Greensburg Rd (Rt 366) from the back of my property. They are used by the general public.

Secondary Water Supply

None

Treatment System

Yes ☐ No ☒ If yes, what type(s)? _____

Any other water supply information?

Yes ☐ No ☒

If yes, what type(s)? (Pond or lake for livestock, etc.) _____

Any water abnormality worth noting?

Yes ☐ No ☒ If yes, please describe. _____

Thank you for your help in determining the quality and quantity of your water supply.

Mary C. Schwartz
Signature of Property Owner

2/13/04
Date

003-21644

5500-PM-OG001 Rev. 4/97



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

PERMIT APPLICATION FOR DRILLING OR ALTERING A WELL
Page 2 — Record of Notification / Written Consent

Farm Name - Well # Sedal #4A	
Applicant Name Panneco Oil Company	DEP ID# 7674
DEP USE ONLY	Application Tracking #

List the following: surface landowner; all landowners or water purveyors whose water supplies are within 1,000 feet of this proposed well location; gas storage operator if within 2,000 feet; all coal owners and lessees of all underlying workable coal seams; operators of underground coal mines at the proposed location; and coal operators with a deep mine within 1,000 feet. Mark the boxes, "X", which show the parties' interests. Use additional forms if you need more space. You are required to notify each of these parties.

Name	Address	Surface Landowner	Coal Owner	Coal Lessee	Coal Mine Operator	Gas Storage Operator	Within 1,000 feet			Notification			
							Surf Owner with water	Water Purveyor	Coal Mine Operator	Certified Mail Dates		Address Ack'd	Written Consent
Name: Sedal, Inc.	Address: P.O. Box 300 Delmont, PA 15626-0300	X								Sent	Return Rec'd		X
Name: John & Martin Slack City Water	Address: 2008 Old Leechburg Rd. New Kensington, PA 15068						X			02/06/04	02/04/04		
Name: Mary C. Schwartz - Please Note Survey	Address: 4198 Brittany Drive Ellicott City, MD 21043						X			02/06/04	02/09/04		
Name: Matthew W. Podobnik 724-335-9042	Address: 1932 Old Leechburg Rd. New Kensington, PA 15068						X			02/06/04		X	
Name: Edward Taylor U.L.	Address: 323 Old Leechburg Rd. New Kensington, PA 15068						X			02/06/04	02/10/04		
Name: Beverly Siskos 724-468-3410	Address: 275 Rock Springs Rd. Delmont, PA 15626						X			02/06/04	02/10/04		
Name: Ralph & Ethelyn Ankrom 412-276-0221 or 412-278-0685	Address: 38 Terrace Rd. Carnegie, PA 15106-1053						X			02/06/04	02/07/04		

Optional: Signature below indicates the party's approval of the well location, and waives the 15-day objection period.				Signature below indicates written consent.	
Water Purveyor or Landowner with water supply within 1,000 ft.	Date	Coal Operator, Owner, or Lessee	Date	Owner of water well or building within 200 feet	Date
Water Purveyor or Landowner with water supply within 1,000 ft.	Date	Coal Operator, Owner, or Lessee	Date	Address (of above)	
Water Purveyor or Landowner with water supply within 1,000 ft.	Date	Coal Operator, Owner, or Lessee	Date	200 Route 22, P.O. Box 300	
Water Purveyor or Landowner with water supply within 1,000 ft.	Date	Coal Operator, Owner, or Lessee	Date	Delmont, PA 15626-0300	
Surface Landowner at proposed location	Date	Coal Operator within 1,000 feet of proposed location	Date	Owner of water well or building within 200 feet	Date
Surface Landowner at proposed location	Date	Gas Storage Operator within 2,000 feet	Date	Address (of above)	

003-21644



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

PERMIT APPLICATION FOR DRILLING OR ALTERING A WELL
Page 2 — Record of Notification / Written Consent

Farm Name - Well #	
Sadrat #4A	
Applicant Name	
Pennaco Oil Company	
DEP USE ONLY	Application Tracking #
	7674

List the following: surface landowner; all landowners or water purveyors whose water supplies are within 1,000 feet of this proposed well location; gas storage operator if within 2,000 feet; all coal owners and lessees of all underlying workable coal seams; operators of underground coal mines at the proposed location; and coal operators with a deep mine within 1,000 feet. Mark the boxes, "X", which show the parties' interests. Use additional forms if you need more space. You are required to notify each of these parties.

Name	Address	Surface Landowner	Coal Owner	Coal Lessee	Coal Mine Operator	Gas Storage Operator	Within 1,000 feet			Notification			
							Surf Owner with water	Water Purveyor	Coal Mine Operator	Note the means and attach proof.			
										Certified Mail Sent	Return Receipt	Address Ack'd	Written Consent
Name: Herman & Irene Vanhorn U.L.	Address: 1920 Drennen Rd. New Kensington, PA 15068						X			02/06/04	02/09/04		
Name: Earl & Jean Wilkerson 724-339-2560 ?	Address: 1000 Wright Rd. New Kensington, PA 15068						X			02/06/04	02/09/04		
Name: Frank & Marla Smolenski Survey	Address: 1900 Old Leechburg Rd. New Kensington, PA 15068						X			02/06/04	02/09/04		
Name: Theodore & Virginia Smolenski Survey	Address: 1835 Old Leechburg Rd. New Kensington, PA 15068						X			02/06/04	02/07/04		
Name: Janet & Russell Mitchell U.L.	Address: 504 Clarendon Street Pittsburgh, PA 15238						X			02/06/04	02/07/04		
Name:	Address:												
Name:	Address:												

Optional: Signature below indicates the party's approval of the well location, and waives the 15-day objection period.				Signature below indicates written consent.	
Water Purveyor or Landowner with water supply within 1,000 ft.	Date	Coal Operator, Owner, or Lessee	Date	Owner of water well or building within 300 feet	Date
Water Purveyor or Landowner with water supply within 1,000 ft.	Date	Coal Operator, Owner, or Lessee	Date	Address (of above)	
Water Purveyor or Landowner with water supply within 1,000 ft.	Date	Coal Operator, Owner, or Lessee	Date		
Water Purveyor or Landowner with water supply within 1,000 ft.	Date	Coal Operator, Owner, or Lessee	Date	Owner of water well or building within 200 feet	Date
Surface Landowner at proposed location	Date	Coal Operator within 1,000 feet of proposed location	Date	Address (of above)	
Surface Landowner at proposed location	Date	Gas Storage Operator within 2,000 feet	Date		



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil and Gas Management Program
WELL LOCATION PLAT

003-21712

DEP Application Tracking #	NC-585600	G:	
USE Permit #	37-003-21712-00	C:	
ONLY Project #			ra1

Denotes location of well on topo map.

True Latitude: NORTH

40 ° 31 ' 17.31 "

True Longitude: WEST

79 ° 43 ' 20.38 "

Well is located on topo map 7356 feet south of latitude 40 ° 32 ' 30 "

LOC - A S 26°-52' E - 596.16'

LOC - B S 73°-00' E - 1498.49'

A - B = N 85°-24' E - 1167.32'

A = CL ROAD & PROPERTY LINE

B = PROPERTY CORNER

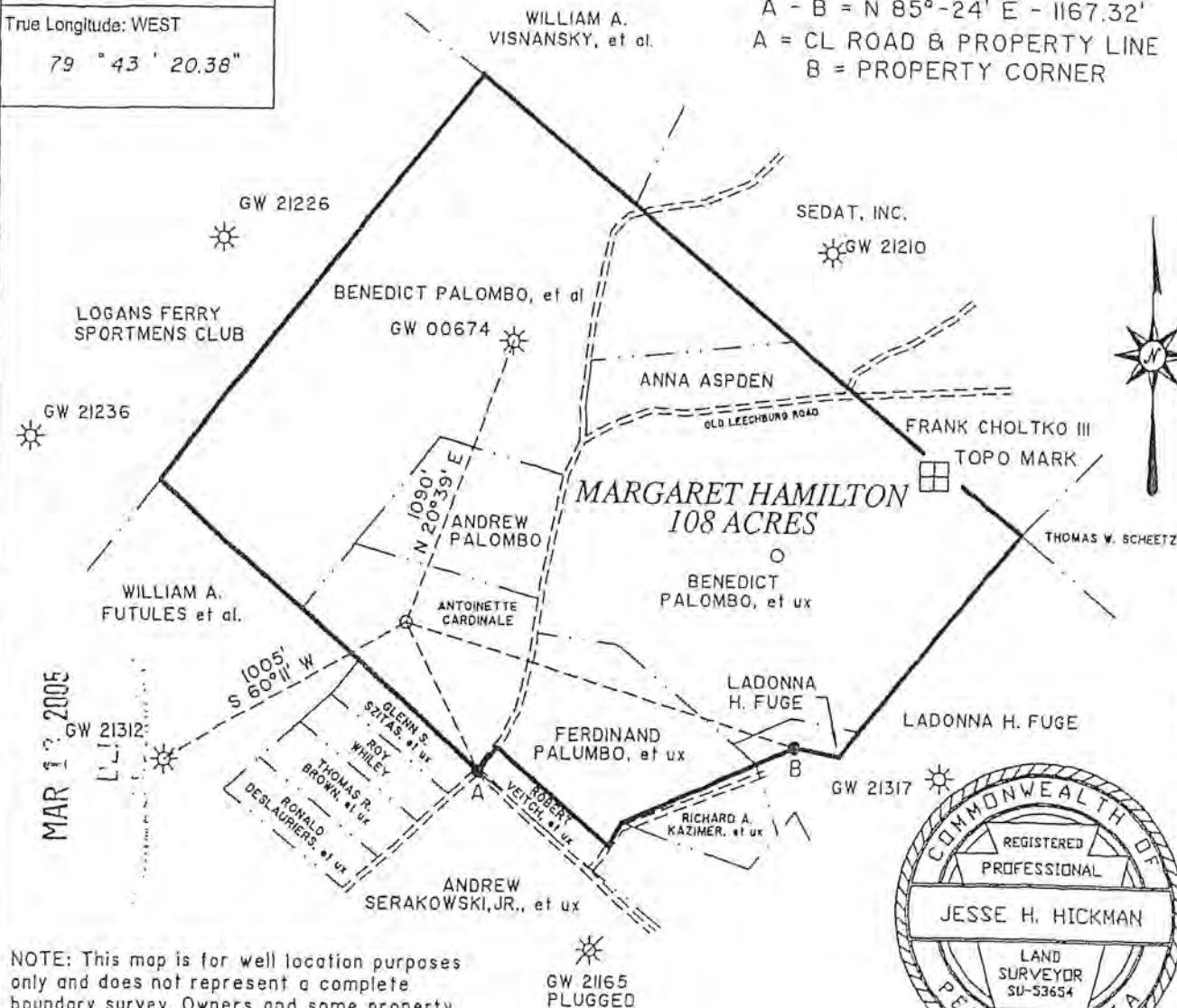
Well is located on topo map

3890

feet west of longitude

79 °

42 ' 30 "



NOTE: This map is for well location purposes only and does not represent a complete boundary survey. Owners and some property lines are shown as per tax assessment records.

Surveyor or Engineer Jesse H. Hickman SU - 53654

Phone # 412-549-0733 Dwg. #

BK 4 PG 43

Date 2-10-05

Scale 1" = 600 FEET

Tract N/A
Acreage 108

Lal. & Long Metadata Method ITPMP Accuracy 0.20" ft. Datum NAD 1927

Applicant / Well Operator Name P C EXPLORATION INC.

Address 502 KEYSTONE DRIVE WARRENDALE, PA. 15088

Surface Landowner ANTOINETTE CARDINALE

Surface Lessor N/A

Surface Owner or Water Purveyor with a Water Supply within 1,000 ft.

Approximate Course and Distance to Water Supply

Elevation Metadata Method TOPO Accuracy +/- 20' ft. Datum NAD 27

Survey Date 1-10-05

Well(Farm) Name MARGARET HAMILTON

Well # 2

Serial # N/A

County - Code ALLEGHENY-02

Municipality 133 PLUM BOROUGH

USGS 7 1/2 Quadrangle 1408 NEW KENSINGTON EAST

Map Section 7

Angle & Course of Deviation (Chiling) 0

Surface Elevation 1148

Anticipated Total Depth 5000

Owner, Lessee, or Operator of Workable Coal Seam

Name of Coal Seam

Owned, Leased, or Operated

E ATTACHED SHEET

NON COAL AREA

N/A

GCB (Villa Coal Co. Horton Mine / Upper Freeport)



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

JAN 27 2006

003-21712

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

WELL RECORD AND COMPLETION REPORT

Well Operator PC Exploration, Inc.		DEP ID# 52451	Well API # (Permit / Reg) 37-003-21712	Project Number	Acres 108
Address 502 Keystone Drive			Well Form Name Margaret Hamilton	Well # 2	Serial #
City Warrendale	State PA	Zip Code 15086	County Allegheny	Municipality Plum Borough	
Phone 724-772-3500	Fax 724-772-3505	USGS 7.5 min. quadrangle map New Kensington East			
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 12/30/05	Date Drilling Completed 1/6/06	Surface Elevation 1148 ft.	Total Depth - Driller 3741 ft.	Total Depth - Logger 3742 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	Date Run
15 1/2"	13 3/4"	37 #	Thrd.	36	Sanded In		12/30/05
12 1/4"	9 1/2"	26 #	Thrd.	622	260 Sacks cement standard	G shoe/Bsk 9 1/2" 622/578	1/3/06
8 3/4"	7"	20 #	Thrd.	1995	460 Sacks cement standard	F shoe/Bsk 7" 1995/88	1/5/06
6 1/4"	4 1/2"	10.5#	Thrd.	3672	165 Sacks cement standard	F shoe 4 1/2" 3672	1/7/06

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated From	To	Date	Interval Treated	Fluid Type	Amount	Propping Agent Type	Amount	Average Injection
1/17/06	3519	3524	1/17/06	Sheffield	Water	11340	Sand	23000	36.6
1/17/06	3203	3243	1/17/06	Speechley	Water	20748	Sand	42000	40.6
1/17/06	3066	3132	1/17/06	Upper Speechley/ Stray	Water	8862	Sand	18000	35.3
Natural Open Flow 37,520 cu ft			Natural Rock Pressure 24 Hours - 3Day -						
After Treatment Open Flow 184,320 cu ft			After Treatment Rock Pressure 24 Hours-C390/490 3Day-C415/T515						

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

Name Titan Wireline Service Address P.O. Box 286 City - State - Zip Elderton, PA 15736 Phone 724-354-2629	Name LK Drilling Corp., Inc. Address 655 Philadelphia St City - State - Zip Indiana, PA 15701 Phone 724-465-9130	Name Allegheny Wireline Address PO Box 129 City - State - Zip Elderton, PA 15736 Phone 724-354-3090	Name BJ Services Address P.O. Box 144A City - State - Zip Fairmont City, PA 16224 Phone 814-365-2003
--	---	--	---

003-21712

LOG OF FORMATIONS						Well API#: 37-003-21712
Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Fill	0	3				Drillers Log
Brown Sand	3	12				
Red Shale	12	21				
Gray Shale	21	580				
Open	580	585				
Gray Sand	585	657			Damp @ 655'	
Gray Sand/Shale	657	3741			80-100gpm @ 1849' Brine	Drillers TD
5 th Sand	2285	2340				Wireline Log
5 th Stray	2347	2384	2350			
Bayard	2387	2408				
Upper Speechley	3058	3080				
Speechley Stray	3122	3134				
Speechley	3200	3246				
Sheffield	3514	3530				
Shale	3530	3742				Log TD
Please delete empty rows if necessary to make all of page 2 fit on one page.						
Well Operator's Signature:			DEP USE ONLY			
Title: <u>James</u> Date: <u>1/26/06</u> Assistant Vice President of Operations 1/26/06			Reviewed by: _____ Date: _____ Comments: _____			

003-21868

5500-PM-06002-DXF Rev. 11/2003



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil and Gas Management Program
WELL LOCATION PLAT

DEP Application Tracking #	NC-664689
USE ONLY	Project # 37-003-21868-00
Project #	RAL

Denotes location of well on topo map.
True Latitude: NORTH 40° 31' 20.33"
True Longitude: WEST 79° 43' 02.44"

Well is located on topo map 7050 feet south of latitude 40° 32' 30"

LOC - A S 54°-06' W - 1350.42'
LOC - B S 05°-42' E - 701.70'
A - B = N 85°-24' E - 1167.32'
A = CL ROAD & PROPERTY LINE
B = PROPERTY CORNER

Well is located on topo map

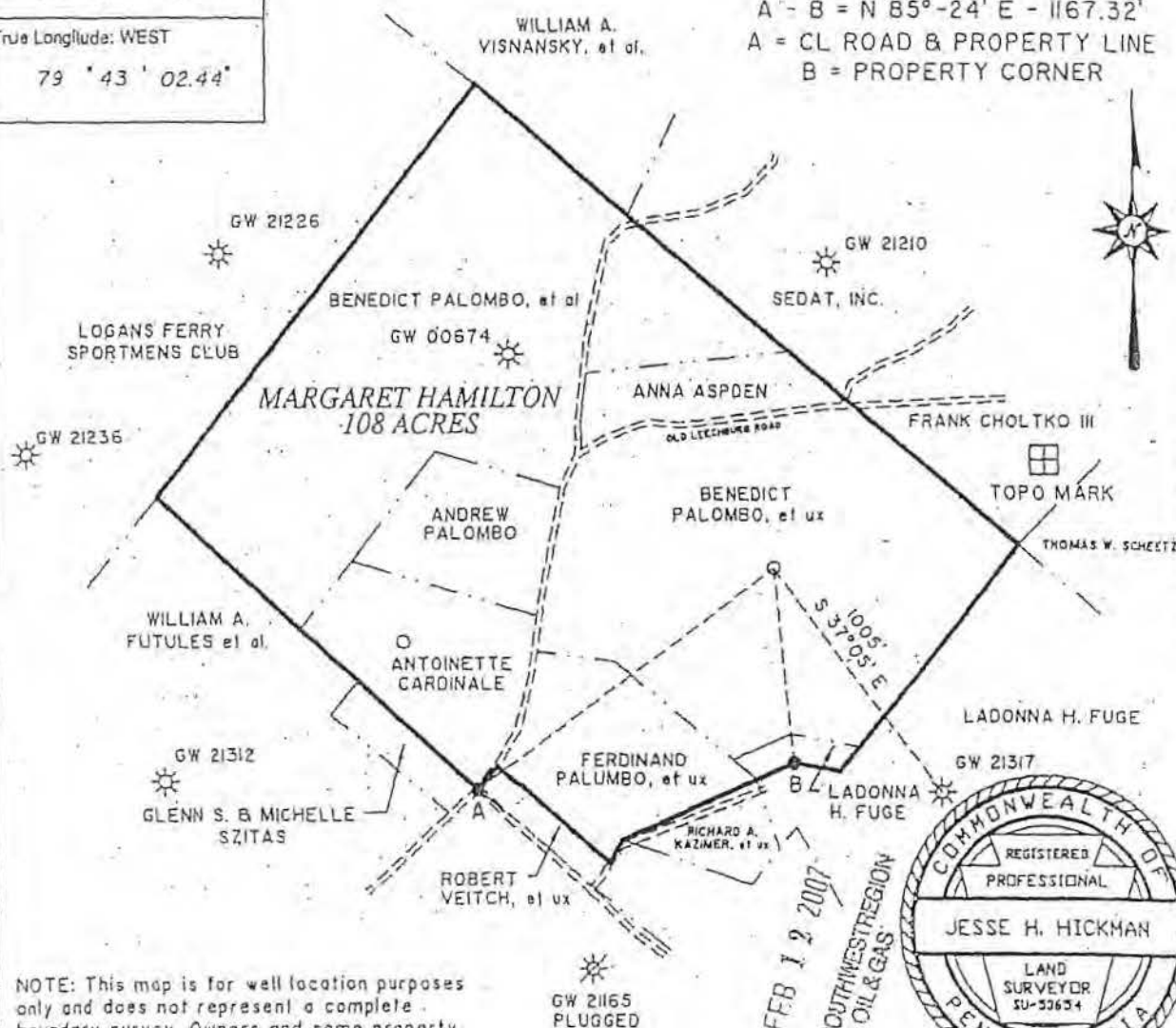
2505

feet west of longitude

79°

42'

30"



NOTE: This map is for well location purposes only and does not represent a complete boundary survey. Owners and some property lines are shown as per tax assessment records.

Surveyor: Jesse H. Hickman
Engineer: SU - 53654

Phone: 412-549-0733

Dwg. # BK 4 PG 43

Date: 2-10-05

MHAMILTON-A.DWG

Scale: 1" = 600 FEET

Tract: N/A

Acres: 108

Loc. & Log Method Method ITPMP Accuracy 0.20" A. Datum NAD 1927				Elevation Method Method TOPO Accuracy +/- 20' A. Datum NAD 27				Survey Date 1-10-05	
Applicant/Well Operator Name P C EXPLORATION INC.				Well(Farm) Name MARGARET HAMILTON		H# 3		Serial N/A	
Address 502 KEYSTONE DRIVE WARRENDALE, PA. 15086				County - Code ALLEGHENY-02		Municipality 133 PLUM BOROUGH			
Surface Landowner BENEDICT PALUMBO, et ux.				USGS 71/2 Quadrangle Map Name 1408 NEW KENSINGTON EAST				Map Section 7	
Surface Lessor N/A				Angle & Course of Deviation (Drilling) 0		Surface Elevation 1090		Anticipated Total Depth 5000	
Surface Owner or Water purveyor with a Water Supply within 1,000 ft.		Approximate Course and Distance to Water Supply		Owner, Lessee, or Operator of Workable Coal Seam		Name of Coal Seam Owned, Leased, or Operated			
58 ANNA ASPDEN		N 54-02 W 845'		NON COAL AREA		N/A			
77 RICHARD KAZIMER		S 22-43 W 998'							

GOB (Villa Coal Company) / Benton Mine / Upper Freeport Seam



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

003-21868

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

WELL RECORD AND COMPLETION REPORT

Well Operator PC Exploration, Inc.	DEP ID # 52451	Well API # (Perm / Rag) 37-003-21868	Project Number	Acres 108
Address 502 Keystone Drive		Well Form Name Margaret Hamilton	Well # 3	Serial #
City Warrendale	State PA	Zip Code 15086	County Allegheny	Municipality Plum
Phone 724-772-3500	Fax 724-772-3505	USGS 7.5 min. quadrangle map New Kensington East		

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 12/3/07	Date Drilling Completed 12/10/07	Surface Elevation 1090 ft.	Total Depth - Driller 3676 ft.	Total Depth - Logger 3679 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	Date Run
15 1/2"	13 1/4"	37 #	Thrd.	77	Sanded In		12/3/07
12 1/4"	9 1/4"	26 #	Thrd.	573	230 Sacks cement standard	G shoe/Bsk 9 1/4" 573/88	12/4/07
8 1/2"	7"	20 #	Thrd.	2051	365 Sacks cement standard	F shoe/Bsk 7" 2051/80	12/6/07
6 1/4"	4 1/2"	10.5#	Thrd.	3626	115 Sacks cement standard	F shoe 4 1/2" 3626	12/10/07

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated From	To	Date	Interval Treated	Fluid Type	Amount	Propping Agent Type	Amount	Average Injection
12/14/07	3474	3482	12/14/07	Sheffield	Water	9652	Sand	17500	32.3
12/14/07	3350	3354	12/14/07	Balltown	Water	5926	Sand	12000	30.8
12/14/07	3160	3197	12/14/07	Speechley	Water	16527	Sand	34000	37.2

Natural Open Flow	10,000 cu ft	Natural Rock Pressure	24 Hours -	30day -
After Treatment Open Flow	118,000 cu ft	After Treatment Rock Pressure	24 Hours-560C/440T	30day- 566C/678T

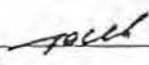
Well Service Companies -- Provide the name, address, and phone number of all well service companies involved.

Name	Name	Name	Name
Titan Wireline Service	Phillips Drilling Company	Weatherford	BJ Services
Address P.O. Box 286	Address 799 Old Rt 119N	Address PO Box 129	Address P.O. Box 144A
City - State - Zip Elderton, PA 15736	City - State - Zip Indiana, PA 15701	City - State - Zip Elderton, PA 15736	City - State - Zip Fairmont City, PA 16224
Phone 724-354-2629	Phone 724-465-9130	Phone 724-354-3090	Phone 814-365-2C03

003-21868

LOG OF FORMATIONS						Well API#: 37-003-21868
Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Brown Clay	0	5				Drillers Log
Brown Sandy Shale	5	15				
Gray Shale	15	30				
Red Rock	30	55				
Gray Sandy Shale	55	60				
Red Rock/Gray Shale	60	105			3gpm @ 95' Fresh	
Gray Sandy Shale	105	170				
Red Rock	170	195				
Gray Sandstone	195	310				
Coal	310	313				
Gray Shale	313	350				
White Sandstone	350	425				
Gray Sandy Shale	425	495				
Subsidence(mine)	495	537				
Gray Sand/Shale	537	1500				
Coal/Red Rock	1500	1515				
Gray Sandy Shale	1515	1630			5gpm @ 1570'	
Gray Sandstone	1630	1980			20gpm @ 1735'	
Gray Sand/Shale	1980	3676				Drillers TD
5 th Sand	2247	2264				Wireline Log
5 th Stray	2302	2337	2314			
Bayard	2346	2364				
Upper Speechley	3024	3028				
Speechley	3158	3198				
Balltown	3352	3355				
Sheffield	3473	3484				
Shale	3484	3674				Log TD

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

Well Operator's Signature:		DEP USE ONLY	
		Reviewed by:	Date:
Title: Vice President of Operations Date: 1/3/08		Comments:	



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

003-21868

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

WELL RECORD AND COMPLETION REPORT

Well Operator PC Exploration, Inc.		DEP ID# 52451	37-003-21868		Acres 108
Address 502 Keystone Drive		Well Farm Name Margaret Hamilton		Well # 3	Serial #
City Warrendale	State PA	Zip Code 15086	County Allegheny	Municipality Plum	
Phone 724-772-3500	Fax 724-772-3505	USGS 7.5 min. quadrangle map New Kensington East			

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 12/3/07	Date Drilling Completed 12/10/07	Surface Elevation 1090 ft.	Total Depth - Driller 3676 ft.	Total Depth - Logger 3679 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		Date Run
15 1/2"	13 1/4"	37 #	Thrd.	77	Sanded In			12/3/07
12 1/4"	9 5/8"	26 #	Thrd.	573	230 Sacks cement standard	G shoe/Bsk	9 5/8" 573/88	12/4/07
8 3/4"	7"	20 #	Thrd.	2051	365 Sacks cement standard	F shoe/Bsk	7" 2051/80	12/6/07
6 1/4"	4 1/2"	10.5#	Thrd.	3626	115 Sacks cement standard	F shoe	4 1/2" 3626	12/10/07

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated From	To	Date	Interval Treated	Fluid Type	Amount	Propping Agent Type	Amount	Average Injection
12/14/07	3474	3482	12/14/07	Sheffield	Water	9652	Sand	17500	32.3
12/14/07	3350	3354	12/14/07	Balltown	Water	5926	Sand	12000	30.8
12/14/07	3160	3197	12/14/07	Speechley	Water	16527	Sand	34000	37.2

Natural Open Flow	10,000 cu ft	24 Hours -	3Day -
After Treatment Open Flow	118,000 cu ft	24 Hours-560C/440T	3Day- 566C/678T

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

Name Tilton Wireline Service	Name Phillips Drilling Company	Name Weatherford	Name BJ Services
Address P.O. Box 286	Address 799 Old Rt 119N	Address PO Box 129	Address P.O. Box 144A
City - State - Zip Elderton, PA 15736	City - State - Zip Indiana, PA 15701	City - State - Zip Elderton, PA 15736	City - State - Zip Fairmont City, PA 16224
Phone 724-354-2629	Phone 724-465-9130	Phone 724-354-3690	Phone 814-365-2003

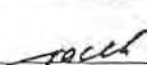
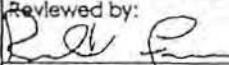
~~603-21686~~

LOG OF FORMATIONS

Well API#: 37-003-21866

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Brown Clay	0	5				Drillers Log
Brown Sandy Shale	5	15				
Gray Shale	15	30				
Red Rock	30	55				
Gray Sandy Shale	55	60				
Red Rock/Gray Shale	60	105			3gpm @ 95' Fresh	
Gray Sandy Shale	105	170				
Red Rock	170	195				
Gray Sandstone	195	310				
Coal	310	313				
Gray Shale	313	350				
White Sandstone	350	425				
Gray Sandy Shale	425	495				
Subsidence(mine)	495	537				
Gray Sand/Shale	537	1500				
Coal/Red Rock	1500	1515				
Gray Sandy Shale	1515	1630			5gpm @ 1570'	
Gray Sandstone	1630	1980			20gpm @ 1735'	
Gray Sand/Shale	1980	3676				Drillers TD
5 th Sand	2247	2264				Wireline Log
5 th Stray	2302	2337	2314			
Bayard	2346	2364				
Upper Speechley	3024	3028				
Speechley	3158	3198				
Balltown	3352	3355				
Sheffield	3473	3484				
Shale	3484	3674				Log TD

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

Well Operator's Signature		DEP USE ONLY	
 Title: Vice President of Operations		Reviewed by:  Date: 3-17-18	
Date: 1/3/08		Comments:	



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil and Gas Management Program
WELL LOCATION PLAT

GEO COPY

003-21843

DEP Application Tracking #	C-730386	G	RS
USE ONLY	57-003-21963-00	C	7/2/08
Project #			RAL

☐ Denotes location of well on topo map

True Latitude NORTH

40° 31' 11.54"

True Longitude WEST

79° 43' 11.32"

Well is located on topo map 7940 feet south of latitude 40° 32' 30"



Well is located on topo map

3190

feet west of longitude

79°

42'

30"

GW 21226

LOGANS FERRY
SPORTSMEN'S CLUBGW 00674
TO BE PLUGGED

BENEDICT PALOMBO, et al

GW 21210

SEDAT, INC.

ANNA ASPDEN

SR 2076

FRANK CHOLTKO III

THOMAS W.
SCHEETZ

TOPO MARK

WILLIAM A.
FUTULES et al.ANDREW
PALOMBOANTOINETTE
CARDINALE

GW 21712

GW 21868

BENEDICT
PALOMBO, et ux

LADONNA H FUGE

GW 21317

GLENN S &
MICHELLE
SZITASROBERT
VEITCH, et uxRICHARD A.
KAZIMER, et uxGW 21165
PLUGGED

LOC - A N 79°-50' W - 425.52'

LOC - B N 77°-13' E - 763.59'

A - B = N 85°-24' E - 1167.32'

A = CL ROAD & PROPERTY LINE

B = PROPERTY CORNER

JUN 12 2008

DEP, SOUTHWEST REGION
OIL & GAS

NOTE: This map is for well location purposes only and does not represent a complete boundary survey. Owners and some property lines are shown as per tax assessment records.

Surveyor of Jesse H Hickman Phone # 412-549-0733 Dwg # BK 18 PG 4
Engineer SU - 53654

MHAMILTON-D.DWG

Date 5-19-08

Scale 1" = 600 FEET Tract N/A
Acreage 108

Lat & Long Metadata Method ITPMP Accuracy 0.20" Datum NAD 1927		Elevation Metadata Method TOPO Accuracy +/- 20' Datum NAD 27		Survey Date 5-6-08	
Applicant / Well Operator Name P C EXPLORATION INC.		Well (Farm) Name MARGARET HAMILTON		Well # 4	
Address 502 KEYSTONE DRIVE WARRENDALE, PA. 15088		County - Code ALLEGHENY-02		Municipality 133 PLUM BOROUGH	
Surface Landowner FERDINAND PALOMBO, et ux.		USGS 7 1/2 Quadrangle Map Name NEW KENSINGTON EAST 14036		Top Section 7	
Surface Lessor N/A		Angle & Course of Deviation (Drilling) 0		Surface Elevation 1162	
Surface Owner or Water Purveyor with a Water Supply within 1,000 ft		Approximate Course and Distance to Water Supply S 72-21 E 288'		Name of Coal Seam Owned, Leased, or Operated	
W-77 RICHARD KAZIMER		NO WORKABLE COAL SEAMS			



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

003-21963

WELL RECORD AND COMPLETION REPORT

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

Well Operator PC Exploration, Inc.	DEP ID# 52451	Well API # (Permit / Reg) 37-003-21963	Project Number	Acres 108
Address 502 Keystone Drive	Well Farm Name Margaret Hamilton	Well # 4	Serial #	
City Warrendale	State PA	Zip Code 15086	County Allegheny	Municipality Plum
Phone 724-772-3500	Fax 724-772-3505	USGS 7.5 min. quadrangle map New Kensington		

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 11/13/08	Date Drilling Completed 11/21/08	Surface Elevation 1162 ft.	Total Depth - Driller 4005 ft.	Total Depth - Logger 4016 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	Date Run
20"				14	Sanded In	14	11/13/08
15 1/2"	13 3/4"	37 #	Thrd.	169	135 Sacks cement standard	F shoe/Bsk	169/160 11/14/08
12 1/4"	9 5/8"	26 #	Thrd.	673	245 Sacks cement standard	G shoe 9 5/8"	673/160 11/18/08
8 3/4"	7"	20 #	Thrd.	2150	435 Sacks cement standard	F shoe/Bsk 7"	2150/160 11/20/08
6 1/2"	4 1/2"	10.5#	Thrd.	3987	145 Sacks cement standard	F shoe 4 1/2"	3987 11/24/08

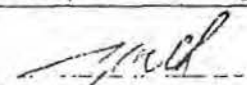
COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated From	To	Date	Interval Treated	Fluid Type	Amount	Propping Agent Type	Amount	Average Injection
12/6/08	3870	3882	12/6/08	2 nd Bradford	Water	16025	Sand	28000	38.9
12/6/08	3556	3563	12/6/08	Balltown	Water	17809	Sand	28000	38.8
12/6/08	3242	3282	12/6/08	Speechley	Water	23950		40000	39.0
RECEIVED DEC 22 2008 DEP, SOUTHWEST REGION OIL & GAS									
Natural Open Flow 5,000 cu ft			Natural Rock Pressure 24 Hours - 0 3Day - 0						
After Treatment Open Flow 213,120 cu ft			After Treatment Rock Pressure 24 Hours- C385/T90 3Day- C387/T197						

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

Name Titan Wireline Service	Name Phillips Drilling Company	Name Weatherford	Name Universal Well Service
Address P.O. Box 286	Address 799 Old RI 119 N	Address PO Box 129	Address Rte. 436, Box 305
City - State - Zip Elderton, PA 15736	City - State - Zip Indiana, PA 15701	City - State - Zip Elderton, PA 15736	City - State - Zip Punxsutawney, PA 15767
Phone 724-354-2629	Phone 724-465-9130	Phone 724-354-3090	Phone 814-938-2051

603-21963

LOG OF FORMATIONS						Well API#: 37-003-21963
Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Clay/Shale	0	3				Drillers Log
Brown Shale	3	13				
Gray Sandstone	13	100				
Red Rock/Limestone	100	370			5gpm @ 200' FW	
Gray White Sandstone	370	604				
Coal	604	608				
Shale	608	650				
Sandstone	650	700				
Coal	700	708				
Sandstone	708	770				
Shale/Limestone	770	950				
Gray White Sandstone	950	1040				
Coal	1040	1043			5gpm @ 1040'	
Black Shale	1043	1125			10gpm @ 1120'	
White Sandstone	1125	1225				
Gray Sandstone	1225	1830				
Shale	1830	1880			50gpm @ 1880'	
Limestone	1880	2000				
Red Rock/Limestone	2000	2330				
Sandstone/Shale	2330	2445				
Shale	2445	2500				
Sandstone	2500	4005				Drillers TD
5 th Sand	2326	2344				Wireline Log
5 th Stray	2382	2411				
Bayard	2421	2448				
Speechley	3240	3282				
Balltown	3555	3566				
1 st Bradford	3776	3781				
2 nd Bradford	3868	3886				
Shale	3886	4016				Log TD
Please delete empty rows if necessary to make all of page 2 fit on one page.						
Well Operator's Signature:			DEP USE ONLY			
 Title: Vice President of Operations			Reviewed by:		Date:	
Date: 12/12/08			Comments:			



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

003-21963

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

WELL RECORD AND COMPLETION REPORT

Well Operator PC Exploration, Inc.		DEP ID# 52451	Well API # (Permit / Reg) 37-003-21963	Project Number	Acres 108
Address 502 Keystone Drive		Well Form Name Margaret Hamilton		Well # 4	Serial #
City Warrendale	State PA	Zip Code 15086	County Allegheny	Municipality Plum	
Phone 724-772-3500	Fax 724-772-3505	USGS 7.5 min. quadrangle map New Kensington			

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 11/13/08	Date Drilling Completed 11/21/08	Surface Elevation 1162 ft.	Total Depth - Driller 4005 ft.	Total Depth - Logger 4016 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	Date Run
	20"			14	Sanded In		11/13/08
15 1/2"	13 3/4"	37 #	Thrd.	169	135 Sacks cement standard	F shoe/Bsk	11/14/08
12 1/4"	9 3/4"	26 #	Thrd.	673	245 Sacks cement standard	G shoe	11/18/08
8 3/4"	7"	20 #	Thrd.	2150	435 Sacks cement standard	F shoe/Bsk	11/20/08
6 1/4"	4 1/2"	10.5#	Thrd.	3987	145 Sacks cement standard	F shoe	11/24/08

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated From	To	Date	Interval Treated	Fluid Type	Amount	Propping Agent Type	Amount	Average Injection
12/6/08	3870	3882	12/6/08	2 nd Bradford	Water	16025	Sand	28000	38.9
12/6/08	3556	3563	12/6/08	Balltown	Water	17809	Sand	28000	38.8
12/6/08	3242	3282	12/6/08	Speechley	Water	23400	Sand	40000	39.0

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DEC 22 2008
MAR 02 2010
DEP, SOUTHWEST REGION
OIL & GAS
DEP, SOUTHWEST REGION
OIL & GAS

Natural Open Flow	5,000 cu ft	Natural Rock Pressure	24 Hours - 0	3Day - 0
After Treatment Open Flow	213,120 cu ft	After Treatment Rock Pressure	24 Hours - C385/T190	3Day - C387/T197

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

Name Titan Wireline Service	Name Phillips Drilling Company	Name Weatherford	Name Universal Well Service
Address P.O. Box 286	Address 799 Old Rt 119 N	Address PO Box 129	Address Rte. 436, Box 305
City - State - Zip Elderton, PA 15736	City - State - Zip Indiana, PA 15701	City - State - Zip Elderton, PA 15736	City - State - Zip Punxsutawney, PA 15767
Phone 724-354-2629	Phone 724-465-9130	Phone 724-354-3090	Phone 814-938-2051

003-21963

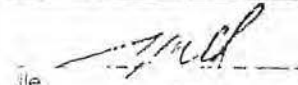
LOG OF FORMATIONS

Well API#: 37-003-21963

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Gray/Shale	0	3				Drillers Log
Brown Shale	3	13				
Gray Sandstone	13	100				
Red Rock/Limestone	100	370			5gpm @ 200' FW	
Gray White Sandstone	370	604				
Coal	604	608				
Shale	608	650				
Sandstone	650	700				
Coal	700	708				
Sandstone	708	770				
Shale/Limestone	770	950				
Gray White Sandstone	950	1040				
Coal	1040	1043			5gpm @ 1040'	
Black Shale	1043	1125			10gpm @ 1120'	
White Sandstone	1125	1225				
Gray Sandstone	1225	1830				
Shale	1830	1880			50gpm @ 1880'	
Limestone	1880	2000				
Red Rock/Limestone	2000	2330				
Sandstone/Shale	2330	2445				
Shale	2445	2500				
Sandstone	2500	4005				Drillers TD
5 th Sand	2326	2344				Wireline Log
5 th Stray	2382	2411				
Bayard	2421	2448				
Speechley	3240	3282				
Balltown	3555	3566				
1 st Bradford	3776	3781				
2 nd Bradford	3868	3886				
Shale	3886	4016				Log TD

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

Well Operator's Signature:


 Vice President of Operations

 Date:
 12/12/08

DEP USE ONLY

Reviewed by:

Comments:

Date:

1-19-10



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil and Gas Management Program
WELL LOCATION PLAT

003-21944 7-8-08

DEP Application Tracking #	NC-730995	G	EAB
USE ONLY	Project # 37-003-21964-00	C	RAL

Denotes location of well on topo map

True Latitude NORTH

40° 31' 30.61"

True Longitude WEST

79° 43' 15.33"

Well is located on topo map 5010 feet south of latitude 40° 32' 30"



Well is located on topo map

3500

feet west of longitude

79°

42'

30"

JUN 16 2008

DEP, SOUTHWEST REGION
OIL & GAS

NOTE: This map is for well location purposes only and does not represent a complete boundary survey. Owners and some property lines are shown as per tax assessment records.

Surveyor: Jesse H. Hickman Phone # 412-549-0733 Cwp # BK 18 PG 4
Engineer: SU - 53654

MHAMILTON-C.DWG

Date 5-19-08

Scale 1" = 600 FEET Tract: N/A Acreage 108

LOC - A S 04°-16' W - 1555.97'
LOC - B S 30°-16' E - 2034.24'
A - B = N 85°-24' E - 1167.32'
A = CL ROAD & PROPERTY LINE
B = PROPERTY CORNER

Lat & Long Metadata Method ITPMP Accuracy 0.20" Datum NAD 1927	Elevation Metadata Method TOPO Accuracy +/- 20' Datum NAD 27	Survey Date 5-6-08
Applicant/Well Operator Name P C EXPLORATION INC.	Well(Farm) Name MARGARET HAMILTON	Well # 5
Address 602 KEYSTONE DRIVE WARRENDALE, PA. 15086	County Code ALLEGHENY-02	Municipality 133 PLUM BOROUGH
Surface Landowner BENEDICT PALOMBO, et al	USGS 71/2 Quadrangle Map Name 1408 NEW KENSINGTON EAST	Map Section 7
Surface Lessor N/A	Angle & Course of Deviation (Degrees) 0	Surface Elevation 180
Surface Owner or Water Provider with a Water Supply within 1,000 ft	Approximate Course and Distance to Water Supply S 25-45 E 625'	Unrecorded Tract Depth 5000
W-58 ANNA ASPDEN	Owner, Lessee, or Operator of Workable Coal Seams NO WORKABLE COAL SEAMS	Name of Coal Seam Owned, Leased, or Operated
GUB UPPER FREEPORT RANTON MINE		



RECEIVED
JUL 27 2009
DEP, SOUTHWEST REGION
OIL & GAS

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

WELL RECORD AND COMPLETION REPORT

003-21964

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

Well Operator Phillips Exploration, Inc.		DEP ID# 52451	Well API # (Permit / Reg) 37-003-21964	Project Number	Acres 108
Address 502 Keystone Drive		Well Farm Name Margaret Hamilton		Well # 5	Serial #
City Warrendale	State PA	Zip Code 15086	County Allegheny	Municipality Plum	
Phone 724-772-3500	Fax 724-772-3505	USGS 7.5 min quadrangle map New Kensington East			

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 6-23-2009	Date Drilling Completed 7-1-2009	Surface Elevation 1180 ft.	Total Depth - Driller 4050 ft.	Total Depth - Logger 4052 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	Date Run
15 1/2"	13 3/4"	37 #	Thrd.	22	Sanded In		6-23-2009
12 1/4"	9 3/4"	26 #	Thrd.	648	275 Sacks cement standard	G shoe/Bsk 9 3/4" 648/547	6-24-2009
8 3/4"	7"	20 #	Thrd.	2194.7	510 Sacks cement standard	G shoe/Bsk 7" 2195/84	6-29-2009
6 1/4"	4 1/2"	10.5#	Thrd.	4000.15	170 Sacks cement standard	F shoe 4 1/2" 4000	7-1-2009

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated From	To	Date	Interval Treated	Fluid Type	Amount	Propping Agent Type	Amount	Average Injection
7-7-2009	3872	3884	7-10-2009	2 nd Bradford	Water	9,802	Sand	12,000	30.0
7-10-2009	3554	3562	7-10-2009	Balltown	Water	15,158	Sand	24,000	36.9
7-10-2009	3237	3279	7-10-2009	Speechley	Water	26,452	Sand	42,000	36.5
7-10-2009	3164	3168	7-10-2009	Upper Speechley	Water	13,418	Sand	20,000	34.4
					Water		Sand		
					Water		Sand		
Natural Open Flow 65,160 cu ft			Natural Rock Pressure 24 Hours - 0 3Day - 0						
After Treatment Open Flow 103,000 cu ft			After Treatment Rock Pressure 24 Hours - 530c/641 3Day - 520c/651						

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

Name	Name	Name	Name
Phillips Drilling Company	Superior Well Services	Weatherford	
Address 799 Old RT 119 N	Address PO Box 360469	Address PO Box 129	
City - State - Zip Indiana, PA 15701	City - State - Zip Pittsburgh, PA 15251	City - State - Zip Elderton, PA 15736	
Phone 724-465-9130	Phone 724-248-1001	Phone 724-354-3090	

003-21964

LOG OF FORMATIONS						Well API#: 37-003-21964
Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Clay	0	10				Drillers log
Sand shale	10	180				
Sandstone	180	215				
Shale	215	226				
Coal	226	230				
Shale, sand	230	575			10 GPM @ 325' FW	
Sandstone	575	705			30 GPM @ 540' FW	
Coal	705	709				
Shale	709	765				
Coal	765	771				
Shale, sand	771	1970			5 GPM @ 835' BW	
Sand	1970	2095			5 GPM @ 975' BW	
Shale	2095	4050			100+GPM@1900' BW	Drillers TD
5 th sand	2332	2344				
5 th stray	2390	2400	2390			Wireline log
Bayard	2404	2412				
Warren	2985	3000				
Upper speechley	3160	3170	3165			
Speechley	3234	3280	3278			
Balltown	3550	3564	3558			
2 nd Bradford	3872	3884				
Shale	3884	4052				Wireline TD
RECEIVED JUL 27 2009 DEP, SOUTHWEST REGION OIL & GAS						
Please delete empty rows if necessary to make all of page 2 fit on one page.						
Well Operator's Signature:			DEP USE ONLY			
<i>[Signature]</i> 7/20/09 Title: Vice President of Operations Date: 7/16/09			Reviewed by: _____ Date: _____ Comments: _____			



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JUL 27 2009

DEP, SOUTHWEST REGION
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DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS MANAGEMENT PROGRAM

003-21964

WELL RECORD AND COMPLETION REPORT

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

Well Operator Phillips Exploration, Inc.	DEP ID# 52451	Well API # (Perm / Reg) 37-003-21964	Project Number	Acres 108
Address 502 Keystone Drive	Well Form Name Margaret Hamilton	Well # 5	Serial #	
City Warrendale	State PA	Zip Code 15086	County Allegheny	Municipality Plum
Phone 724-772-3500	Fax 724-772-3505	USGS 7.5 min quadrangle map New Kensington East		

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 6-23-2009	Date Drilling Completed 7-1-2009	Surface Elevation 1180 ft.	Total Depth - Driller 4050 ft.	Total Depth - Logger 4052 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	Date Run
15 1/2"	13 3/4"	37 #	Thrd.	22	Sanded In		6-23-2009
12 1/4"	9 3/4"	26 #	Thrd.	648	275 Sacks cement standard	G shoe/Bsk 9 3/4" 648/547	6-24-2009
8 3/4"	7"	20 #	Thrd.	2194.7	510 Sacks cement standard	G shoe/Bsk 7" 2195/84	6-29-2009
6 1/4"	4 1/2"	10.5#	Thrd.	4000.15	170 Sacks cement standard	F shoe 4 1/2" 4000	7-1-2009

COMPLETION REPORT

Perforation Record				Stimulation Record					
Date	Interval Perforated From	To		Date	Interval Treated	Fluid Type	Amount	Propping Agent Type	Average Injection
7-7-2009	3672	3884		7-10-2009	2 nd Bradford	Water	9,802	Sand 12,000	30.0
7-10-2009	3554	3562		7-10-2009	Balltown	Water	15,158	Sand 24,000	36.9
7-10-2009	3237	3279		7-10-2009	Speechley	Water	26,452	Sand 42,000	36.5
7-10-2009	3164	3168		7-10-2009	Upper Speechley	Water	13,418	Sand 20,000	34.4
						Water		Sand	
						Water		Sand	

MAR 30 2010

DEP, SOUTHWEST REGION
OIL & GAS

Natural Open Flow	65,160 cu ft	Natural Rock Pressure	24 Hours - 0	3Day - 0
After Treatment Open Flow	103,000 cu ft	After Treatment Rock Pressure	24 Hours - 530c/641	3Day - 520c/651

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

Name	Name	Name	Name
Address	Phillips Drilling Company	Superior Well Services	Weatherford
City - State - Zip	799 Old RT 119 N Indiana, PA 15701	Address PO Box 360469 Pittsburgh, PA 15251	Address PO Box 129 Elderton, PA 15736
Phone	724-465-9130	Phone 724-248-1001	Phone 724-354-3090

003-21964

LOG OF FORMATIONS

Well API#: 37-003-21964

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Clay	0	10				Drillers log
Sand shale	10	180				
Sandstone	180	215				
Shale	215	226				
Coal	226	230				
Shale, sand	230	575			10 GPM @ 325' FW	
Sandstone	575	705			30 GPM @ 540' FW	
Coal	705	709				
Shale	709	765				
Coal	765	771				
Shale, sand	771	1970			5 GPM @ 835' BW	
Sand	1970	2095			5 GPM @ 975' BW	Drillers TD
Shale	2095	4050			100+GPM@1900'BW	
5 th sand	2332	2344				Wireline log
5 th stray	2390	2400	2390			
Bayard	2404	2412				
Warren	2985	3000				
Upper speechley	3160	3170	3165			
Speechley	3234	3280	3278			Wireline TD
Balltown	3550	3564	3558			
2 nd Bradford	3872	3884				
Shale	3884	4052				

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JUL 27 2009

DEP, SOUTHWEST REGION
OIL & GAS

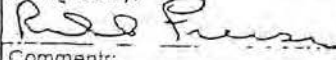
Please delete empty rows if necessary to make all of page 2 fit on one page.

Well Operator's Signature:

 7/20/09
Title:
Vice President of OperationsDate:
7/18/09

DEP USE ONLY

Reviewed by:



Date:

3-2-10

Comments:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS MANAGEMENT PROGRAM
WELL LOCATION PLAT



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Auth. No. C-876833	TF 5-12-11
Permit No. CO3-22187	
Project No. RD	

Denotes location of well on topo map.		
True Latitude:	NORTH	
40° 30'	51.6"	
True Longitude:	WEST	
79° 42'	23.0"	

Well is located on topo map 9,983 feet south of latitude 40° 32' 30"

Top & Bottom Hole Locations (NAD 27 - For Applicant's Use)		
	Lat.	Lon.
Top	40°30'51.35"	79°42'23.84"
Bottom	40°31'13.41"	79°42'43.14"

Bottom Hole Location NAD 83		
	Lat.	Lon.
Bottom	40°31'13.66"	79°42'42.30"

UNIT

Reeger 1028.29' = 38.3%

Baleno 1656.71' = 61.7%

Total 2685.00' = 100%

Loc - A N 08°38'09" W 1376.08'
Loc - B S 40°57'04" E 2496.37'
A - B S 29°35'04" E 3732.53'

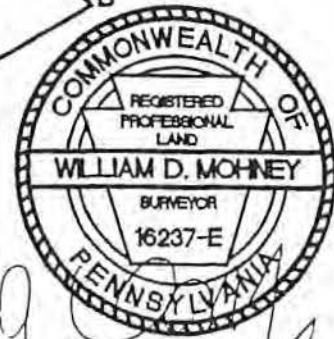
Legend

- Lease Tract Boundary
- - - Surface Tract
- == Roads
- - - Streams/Water
- Bottom Hole
- Water Well or Spring
- Proposed Well Location
- ☼ Existing Well
- ☼ Plugged Well

S.R. 2088

APR 21 2011

DEP, SOUTHWEST REGION
OIL & GAS



Surveyor or Engineer: W.D. Mohney & Associates (724) 543-1023	Phone #: (724) 543-1023	Day #: bonsall	Date: April 15, 2011	Scale: 1" = 1000'	Tract Acreage: 268 ±
Lat & Long Metadata	Elevation Metadata	Survey Data			
Method GPS-Code Based Accuracy 10 ± Datum NAD 83	Method U.S.G.S. Plotted Accuracy 30 ± Datum NGVD29	Various Dates			
Applicant / Well Operator Name Penneco Oil Company	Well (Farm) Name Hankey Unit	Well # 6H	Serial # PH-1670		
Address 6608 US Route 22, Delmont, PA. 15626	County Allegheny	Municipality Plum Borough	Well Type New Oil Well		
Surface Landowner / Lessor Thomas L. Reeger	USGS 7 "Quadrangle Map Name New Kensington East - 1408	Map Section 8	Surface Elevation 1180 ±		
Target Formation(s) Speechley	Angle & Course of Deviation (Drilling) N 32°26'53" W -2,685'	Anticipated Total Depth ft. TVD 3,270		TMD 5,100	
Surface Owner or Water Purveyor Thomas L. Reeger	Approximate Course and Distance to Water Supply S 58° W - 950'	Owner, Lessee, or Operator of Workable Coal Seam Consolidation Coal Company		Name of Coal Seam Upper Freeport	
		Owner, Lessee, or Operator Thomas L. Reeger		All Others	

Gob - upper Freeport Coal Seam

Well is located on topo map 11,107 feet west of longitude 79° 40' 00"



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DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

Well Record

DEP USE ONLY	
Site ID	Primary Fac ID
Client Id	Subfacility Id

WELL INFORMATION

Well Operator Panneco Oil Company		DEP ID# 7674	Well API # (Permit / Reg) 37-003-22187-00		Project Number	Acres 268
Address 6608 Route 22			Well Farm Name Hankey Unit		Well # 6H	Serial # PH-1670
City Dalmont	State PA	Zip Code 15626	County Allegheny		Municipality Plum Borough	
Phone (724) 468-8232	Fax (724) 468-8230	Email penneco@penneco.com		USGS 7.5 min. quadrangle map New Kensington East, PA		

Check the appropriate Submission:

☒ Original Well Record☐ Amended Well Record

Well Type	☒ Gas	☐ Oil	☐ Combination Oil & Gas	☐ Injection	☐ Storage	☐ Disposal
Well Orientation	☐ Vertical ☒ Deviated from Vertical (Side view and Deviated Survey must be attached)					
Drilling Method	☒ Rotary - Air ☐ Rotary - Mud ☐ Cable Tool					
Date Drilling Started 06/13/11	Date Drilling Completed 08/02/11	Surface Elevation 1180 ft.	Total Depth - Driller 4805 ft.	Total Depth - Logger 4805 ft.	Depth of Deepest Fresh Groundwater N/A	

CEMENT

Cement returned on surface casing?	☒ Yes ☐ No	If No, provide top of cement and method used to determine:
Cement returned on coal protective casing?	☒ Yes ☐ No	If No, provide top of cement and method used to determine: ☐ N/A
Cement returned on intermediate casing?	☒ Yes ☐ No	If No, provide top of cement and method used to determine: ☐ N/A

Casing String	Type of Cement	Amount of Cement	Gas Block (or equivalent) Used
Surface	CLA A, 3%cc 1/4# flake	50 sks	
Conductor	CLA A, 3%cc 1/4# flake	110 sks	☐ Yes ☒ No ☐ N/A
Coal Protective	CLA A, 3%cc 1/4# flake	565 sks	☐ Yes ☒ No ☐ N/A
Intermediate	CLA A, 3%cc 1/4# flake	900 sks	☐ Yes ☒ No ☐ N/A
Production	UFL	1131 sks	☐ Yes ☒ No ☐ N/A
			☐ Yes ☐ No ☐ N/A
			☐ Yes ☐ No ☐ N/A
			☐ Yes ☐ No ☐ N/A

CASING AND TUBING

Hole Size	Pipe Size	Wt.	Thread / Weld	Casing / Tubing Type	Amount in Well (ft.)	Packer / Hardware / Centralizers			Date Run
						Type	Size	Depth	
28"	26"	77.26 #	N/A	Structural SRL	33	N/A	N/A	N/A	06/13/11
22"	20"	81.30 #	N/A	R-3 MC-50	210	guide shoe	20"	210	06/15/11
17 1/2"	13 3/8"	54.50 #	N/A	R-3 MC-50	714	guide shoe	13 3/8"	714	06/17/11
12 3/8"	9 5/8"	40.00 #	N/A	R-3 MC-50	2490	guide shoe	9 5/8"	2490	06/23/11
6 1/2"	4 1/2"	11.60 #	thread	R-3 N-80	4754	float shoe	4 1/2"	4754	08/02/11

any casing is welded, provide the name of the welder:

Also complete the Log of Formations on back (page 2)

DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL & GAS

003-22187

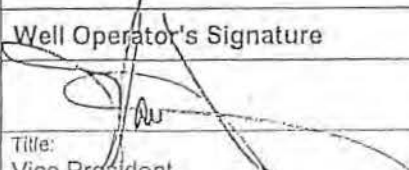
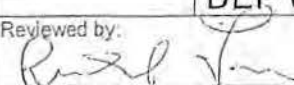
LOG OF FORMATIONS

Well API#: 37-003-22187-00

(If you will need more space than this page, please photocopy the blank form before filling it in.)

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Let Down	0	33				Driller's Log (Vertical Borehole)
Sand	33	85				
Sand / Shale	85	115				
Red Rock	115	125				
Shale	125	190				
Red Rock	190	205				
Red Rock	205	300				
Sand	300	382				
Sandy Shale	382	450				
Sandy Shale / Sand	450	642				
Coal	642	647				
Sand	647	712				
Sandy Shale	712	1044				
Sand	1044	1134				
Sandy Shale	1134	1270				
Sand Stone	1270	1300				
Sand / Shale	1300	1370				
Sand / Shale	1370	1430				
Sand	1430	1494				
Sand	1494	1550				
Sandy Shale	1550	2184			1" brine @ 1874	
Red Rock	2184	2214			1" brine @ 1914	
Sand	2214	2274				
Red Rock	2274	2610				
Sand	2610	2700				
Sand / Shale	2700	2805				
Sand / Shale	2805	2820				
Shale	2820	2950				
Sand / Shale	2950	3240				
Shale	3240	3300				
Cement	2546	2608				Driller's Log (Horizontal Borehole)
Sand & Shale	2608	2705				
Shale	2705	2831				
Sand & Shale	2831	3210				
Sand	3210	3270				
Shale	3270	3420				
Sand	3420	3520				
Shale	3520	3870				
Sand	3870	4805				

I do hereby certify to the best of my knowledge, information and belief that the well identified on this Well Record has been properly cased and cemented in accordance with the requirements of 25 Pa. Code Chapter 78 and any conditions contained in the permit for this well. In addition, I do hereby certify that any casing which is attached to a blow-out preventer with a pressure rating greater than 3,000 psi has passed a pressure test in accordance with 25 Pa. Code §78.84(f). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Well Operator's Signature		DER USE ONLY	
		Reviewed by:	Date:
Title: Vice President			2-14-12
Date: 8/31/11		Comments:	

003-22187



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

Completion Report

DEP USE ONLY	
Site ID	Primary Fac ID
Client	Subfacility Id

Well Information

If you are submitting this Completion Report attached to the Well Record, you only need to enter the well API # in this section.

Well Operator Penneco Oil Company		DEP ID# 7674	Well API # (Permit / Reg) 37-003-22187-00		Project Number	Acres 268
Address 6608 Route 22			Well Farm Name Hankey Unit		Well # 6H	Serial # PH-1670
City Delmont	State PA	Zip Code 15626	County Allegheny		Municipality Plum Borough	
Phone (724) 468-8232	Fax (724) 468-8230	Email penneco@penneco.com		USGS 7.5 min. quadrangle map New Kensington East, PA		

Check the appropriate submission: ☒ Original Completion Report ☐ Amended Completion Report

STIMULATION BASE FLUID

List Water Management Plan Approved Water Source(s) that were used	Water Management Plan ID No.	Volume (Gallons)
1. Not Applicable		
2.		
3.		
4.		
5.		
6.		
Recycled Water Used		
Other Base Fluid(s)/Components Used		
1.		
2.		
Total Base Fluid(s)/Components Used		

PERFORATION RECORD

Stage No.	Perforation Date	Stage Perforated From	Stage Perforated To	Perf. Orientation (Vertical, Horizontal, Radial)	Formation
1	08/16/11	4670	4730	Radial	Speechley
2	08/18/11	4570	4630	Radial	Speechley
3	08/18/11	4470	4530	Radial	Speechley
4	08/18/11	4370	4430	Radial	Speechley
5	08/18/11	4270	4330	Radial	Speechley
6	08/18/11	4170	4230	Radial	Speechley
7	08/18/11	4070	4130	Radial	Speechley
8	08/18/11	3970	4030	Radial	Speechley
9	08/18/11	3870	3930	Radial	Speechley
10	08/18/11	3430	3520	Radial	Speechley
11	08/18/11	3216	3266	Radial	Speechley Stray

SEP 13 2011
DEP, SOUTHWEST REGION
DL 8346

003-22187

Well AP# 37-005-22107-88

STIMULATION FLUID ADDITIVES

a: Trade secret or confidential proprietary information should be clearly identified as such and should be submitted on a separate sheet attached to this report.

Descriptive Additive Type	Chemical Component(s) listed on Material Safety Data Sheet of the Additive	CAS No. of Chemical Component	Chemical Component % By Volume in Additive	Chemical Component % By Volume used in Each Stage										
				Stage No. 1	Stage No. 2	Stage No. 3	Stage No. 4	Stage No. 5	Stage No. 6	Stage No. 7	Stage No. 8	Stage No. 9	Stage No. 10	Stage No. 11
ALPHA 3385	Solvent Naptha (Petroleum), petroleum aromatic	64742-94-5	65 - 100%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.10%	0.08%
ALPHA 3385	Poly(oxy- 1,2- ethanediyl), a(nonylphenyl)-w- hydroxy- phosphate	51811-79-1	30 - 60%	0.04%	0.04%	0.04%	0.04%	0.04%	0.05%	0.05%	0.05%	0.05%	0.06%	0.05%
ALPHA 3385	Naphthalene	91-20-3	3 - 7%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%
CLA CHEK LP	Ethylene Glycol	107-21-1	30 - 60%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Flomax 50	Isopropanol	67-63-0	1 - 15%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Flomax 50	Citrus Terpenes	94266-47-4	1 - 15%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Hydrochloric Acid	Hydrochloric Acid	7647-01-0	31 - 33%	0.25%	0.25%	0.25%	0.25%	0.25%	0.26%	0.26%	0.26%	0.26%	0.18%	0.26%
IRON STA II C	Ethylene Glycol	107-21-1	10 - 30%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
NE-90	Methanol	67-56-1	30 - 60%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
NE-90	Isopropanol	67-63-0	5.0 - 10.0%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
NE-90	Heavy Aromatic Naptha	64742-94-5	1.0 - 5.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NE-90	Polyethylene Glycol	25322-68-3	1.0 - 5.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NE-90	EO-C7-9-iso, C8-rich alcohols	78330-19-5	1.0 - 5.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NE-90	EO-C9-11-iso, C10-rich alcohols	78330-20-8	1.0 - 5.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NE-90	2-Ethylhexanol	104-76-7	5.0 - 10.0%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
NE-90	Napthalene	91-20-3	0.1 - 1.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sand	Crystalline Silica in the form of Quartz	14808-60-7	67 - 99.9%	6.48%	7.66%	7.10%	7.12%	7.12%	7.15%	7.17%	7.18%	7.37%	7.70%	7.31%
IPER SURF	Methanol	67-56-1	30 - 60%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
igel 5F	Guar Gum	N/A	>95%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.10%	0.10%

Please insert additional copies of this page if additional rows/stages are needed.

STIMULATION INFORMATION (WELL)

Open Flow Production: Still Testing	24 Hr. Open Flow Production: Still Testing	24 Hr. Shut-In Pressure: 660 PSI	Flow Back Date: 08/18/11
--	---	-------------------------------------	-----------------------------

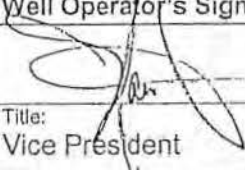
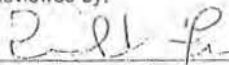
STIMULATION INFORMATION (STAGE)

Complete a separate record for each stimulation stage. (Please insert additional copies of this page for additional stages).

Stage No.: 1	Stimulation Date: 08/18/11	Pump Rate: 41.0 BPM
Pressure (psi): 3500	Shut-In Surface Pressure: 2300	5 Minute Shut-In Surface Pressure: Not Measured
Propping Agent Type: White Sand	Propping Agent Amount: 27,500 #	Propping Agent Size: 20/40
Stage No.: 2	Stimulation Date: 08/18/11	Pump Rate: 44.0 BPM
Pressure (psi): 3390	Shut-In Surface Pressure: 2440	5 Minute Shut-In Surface Pressure: Not Measured
Propping Agent Type: White Sand	Propping Agent Amount: 32,500 #	Propping Agent Size: 20/40
Stage No.: 3	Stimulation Date: 08/18/11	Pump Rate: 40.0 BPM
Pressure (psi): 3350	Shut-In Surface Pressure: 2070	5 Minute Shut-In Surface Pressure: Not Measured
Propping Agent Type: White Sand	Propping Agent Amount: 30,000 #	Propping Agent Size: 20/40
Stage No.: 4	Stimulation Date: 08/18/11	Pump Rate: 40.0 BPM
Pressure (psi): 3600	Shut-In Surface Pressure: 2260	5 Minute Shut-In Surface Pressure: Not Measured
Propping Agent Type: White Sand	Propping Agent Amount: 30,000 #	Propping Agent Size: 20/40
Stage No.: 5	Stimulation Date: 08/18/11	Pump Rate: 40.0 BPM
Pressure (psi): 3600	Shut-In Surface Pressure: 2300	5 Minute Shut-In Surface Pressure: Not Measured
Propping Agent Type: White Sand	Propping Agent Amount: 30,000 #	Propping Agent Size: 20/40
Stage No.: 6	Stimulation Date: 08/18/11	Pump Rate: 40.0 BPM
Pressure (psi): 3600	Shut-In Surface Pressure: 2250	5 Minute Shut-In Surface Pressure: Not Measured
Propping Agent Type: White Sand	Propping Agent Amount: 30,000	Propping Agent Size: 20/40
Stage No.: 7	Stimulation Date: 08/18/11	Pump Rate: 40.0 BPM
Pressure (psi): 3500	Shut-In Surface Pressure: 2430	5 Minute Shut-In Surface Pressure: Not Measured
Propping Agent Type: White Sand	Propping Agent Amount: 30,000 #	Propping Agent Size: 20/40
Stage No.: 8	Stimulation Date: 08/18/11	Pump Rate: 41.0 BPM
Pressure (psi): 3300	Shut-In Surface Pressure: 2280	5 Minute Shut-In Surface Pressure: Not Measured
Propping Agent Type: White Sand	Propping Agent Amount: 30,000 #	Propping Agent Size: 20/40
Stage No.: 9	Stimulation Date: 08/18/11	Pump Rate: 40.0 BPM
Pressure (psi): 3500	Shut-In Surface Pressure: 2270	5 Minute Shut-In Surface Pressure: Not Measured
Propping Agent Type: White Sand	Propping Agent Amount: 30,000 #	Propping Agent Size: 20/40
Stage No.: 10	Stimulation Date: 08/18/11	Pump Rate: 48.0 BPM
Pressure (psi): 3200	Shut-In Surface Pressure: 2300	5 Minute Shut-In Surface Pressure: Not Measured
Propping Agent Type: White Sand	Propping Agent Amount: 45,000 #	Propping Agent Size: 20/40
Stage No.: 11	Stimulation Date: 08/18/11	Pump Rate: 40.0 BPM
Pressure (psi): 80	Shut-In Surface Pressure: 1920	5 Minute Shut-In Surface Pressure: Not Measured
Propping Agent Type: White Sand	Propping Agent Amount: 30,000 #	Propping Agent Size: 20/40

WELL SERVICE COMPANIES (Provide the name, address, and telephone number of all well service companies involved.)

003-22127

Name U.S. Energy	Name Universal Well Services	Name Geosearch Logging Inc.
Address P.O. Box 237	Address 114 Universal Drive	Address 101 Bradford Rd # 212
City - State - Zip Rural Valley, PA 16249	City - State - Zip Punxsutawney, PA 15767	City - State - Zip Wexford, PA 15090-6909
Phone (724)783-7624	Phone (814) 938-2051	Phone (412) 719-2158
<i>I do hereby certify to the best of my knowledge, information and belief that the information contained on this Completion Report is true and correct. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.</i>		
Well Operator's Signature	DEP USE ONLY	
 Title: Vice President	Reviewed by:	Date:
	 Comments:	2-11-11
Date:		
8/31/11		

003-22187

Hankey Unit #6H Plugback Procedure

In order to establish local depth control for the Speechley sand, Hankey Unit #6H was drilled vertically to a depth of 3390' and plugged back to accommodate DEP regulations as well as requirements for directional kick-off equipment. This pilot wellbore was drilled according to the sequence of a typical vertical well with 26" casing to 33', 20" casing to 210', 13 3/8" casing to 714', and 9 5/8" casing to 2490'. 7 7/8" air-rotary drilling was utilized to complete the pilot boring from 2490' to 3390'. Once logged, the pilot wellbore was plugged back to a depth of 2608' using 305 sks of Class A cement. The wet cement was pumped through drill steel lowered to the bottom of the pilot well bore, and then pulled back to the desired plugback depth of 2546' and washed off. The cement was allowed to harden for 43 hours. During this time, a cement bond log (CBL) was run to verify that cement had adequately filled the annulus for the 9 5/8" casing and tagged the top of the cement plug at 2546'. Following the CBL, Phoenix Technology Services and U.S. Energy ran in with directional drilling equipment to kick out of the vertical wellbore. Using the tag method before drill string, the top of the cement plug was confirmed at 2546'. Given a minimum requirement of 30' of hard cement to ensure proper functionality of the directional tools, a plan was established to kick off no higher than 2576'.

FILED 1 - 2017

DEPT. SOUTHWEST REGION
OIL & GAS

SEP 6 - 2011

DEPT. SOUTHWEST REGION
OIL & GAS

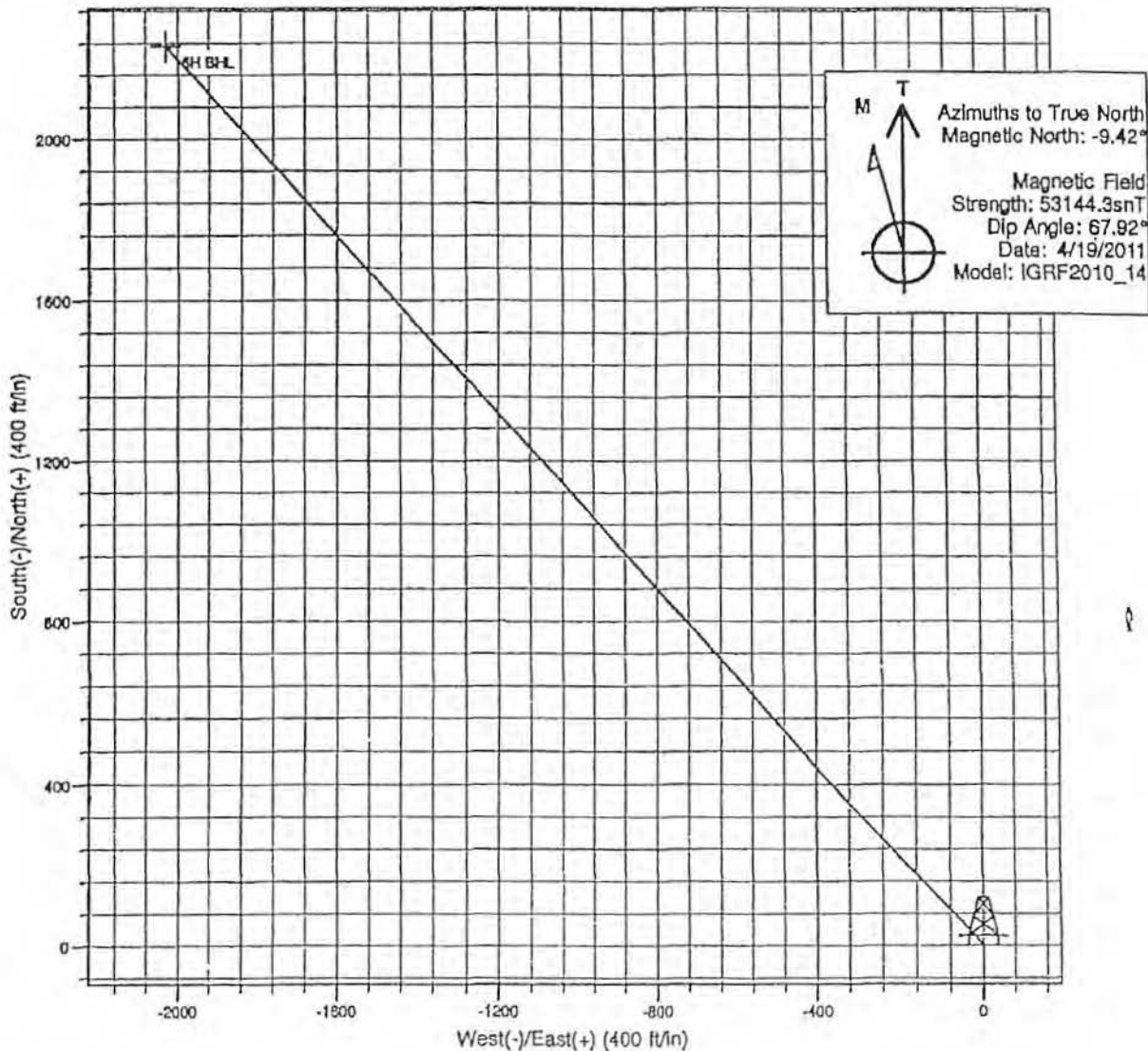
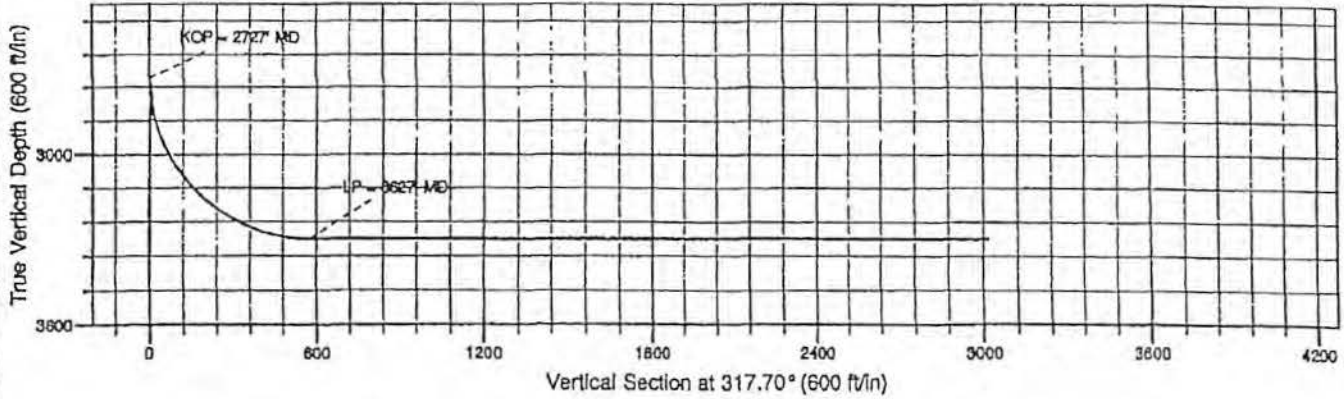
003-22187



PHOENIX
TECHNOLOGY SERVICES USA INC.

Penneco Oil Company

Project: Allegheny County, PA
Site: Plum Borough #6H
Well: Hankey Unit 6H
Wellbore: Main Wellbore
Design: Plan 1



MAY 05 2011

DEP, SOUTHWEST REGION
OIL & GAS

003- 222 00

8 COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS MANAGEMENT PROGRAM
WELL LOCATION PLAT



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP	With ID	NC-90104	TF
USE	Permit #:	003-22200	12-1
ONLY	Project #:		RD

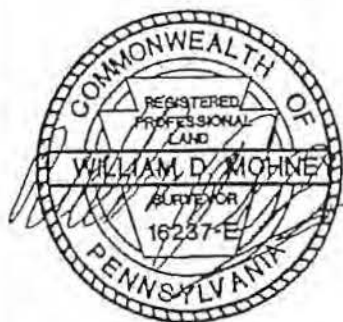
 Denotes location of well on tape map.

True Latitude: NORTH

40° 31' 31.75"

True Longitude: WEST

79	42	43.98
----	----	-------



UNIT BREAKDOWN

Sedot Inc. 1331.84' = 76.4%

Kenneth Howard et al 411.01' = 23.6%

Total Horizontal 1742.85' = 100%

LOC - A S 8742'00" W 1762.08'

Loc - B N 32°48'56" W 1200.45' ↗

A - B N 45°47'53" E 1548.50'

Legend

- | | |
|--|------------------------|
| | Lease Tract Boundary |
| | Surface Tract |
| | Roads |
| | Streams/Water |
| | Bottom Hole Location |
| | Proposed Well Location |
| | Existing Well |
| | Plugged Well |
| | Water Well +/- |

Kenneth Howard et al owns the oil & gas under parcels: 1233-N-326, 1234-A-160 & 1234-B-254.

Surveyor or
Engineer: W.D. Mohney & Associates (724) 543-1023 sardis rd lidar October 19, 2011 1" = 800' Tract
Acres: 101 ±

Lat & Long Metadata				Elevation Metadata				Survey Date			
Method	GPS-Code	Based Accuracy	10 ± ft.	Datum	NAD 83	Method	U.S.G.S. Plotted Accuracy	30 ± ft.	Datum	NGVD29	Survey Date

Applicant / Well Operator Name	DEP ID	Well (Farm) Name	Well	Serial
Penneco Oil Company	7674	SEDAT	5H	PS-1753

Address	County	Municipality	Well Type
6608 US Route 22, Delmont, PA. 15626	Allegheny	Plum Borough	New Oil Well

Surface Landowner / Lessor	USGS 7 1/2 Quadrangle Map Name	Map Section	Surface Elevation
Sedot Inc.	New Kensington East, PA. - 1408	7	1248 ft

Target Formation(s)	Angle & Course of Deviation (Drilling)	Anticipated Total Depth (ft)
Speechley ✓	NONE	TWD 3340' TWD 4845'

Surface Owner or Water Purveyor with a Water Supply within 1000	Approximate Course and Distance to Water Supply	Owner, Lessee, or Operator of Workable Coal Seam	Name of Coal Seam Owner, Lessee, or Operator
---	---	--	--

With a Water Supply Within 1000 Feet to a Water Supply	Workable Coal Seam	Owner, Leased, or Operated
Frank J. & Marcia M. Smolenski N 77° E - 950' S 73° E - 350'	NON-COAL AREA	

Frank Chalikoff III S 25° W - 750'
Daniel Cooper N 80° E - 600' GOR - Renton Mine, Upper Freeport Coal Seam

003-22200



PHOENIX

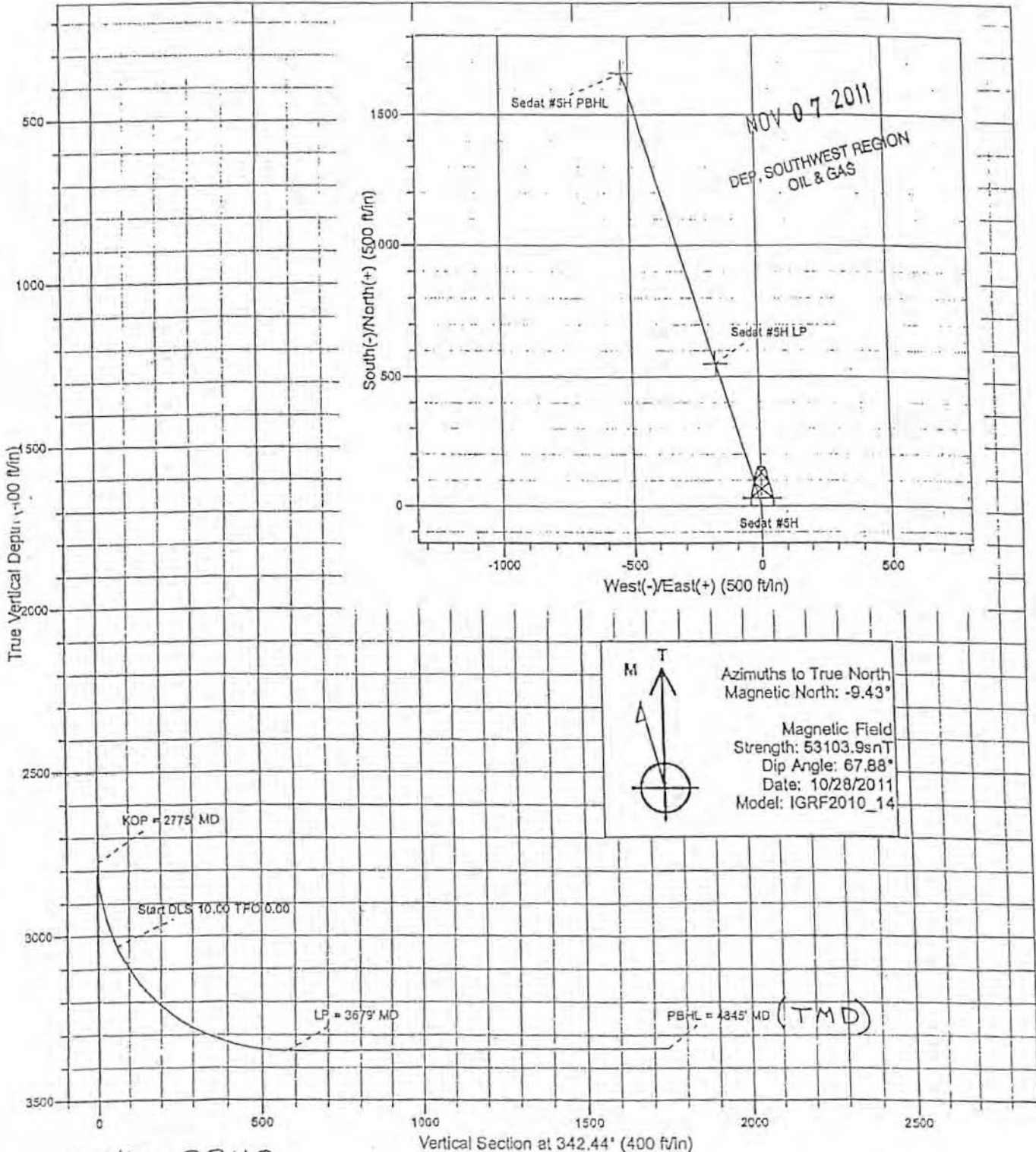
TECHNOLOGY SERVICES USA INC.

OCT 31 2011

Penneco Oil Company

DEP, SOUTHWEST REGION
OIL & GAS

Project: Allegheny County, PA
Site: Plum Borough #5H
Well: Sedat #5H
Wellbore: Main Wellbore
Design: Plan 1



TVD = 3340

Bottom of Pilot Hole = 3450

003-222 00

Penneco Oil Company

Allegeny County, PA
Plum Borough #5H
Sedat #5H

Main Wellbore

Plan: Plan 1

Standard Planning Report

28 October, 2011

OCT 31 2011

DEP, SOUTHWEST REGION
OIL & GAS

003-222 00

Phoenix Technology Services Planning Report

Database: NER DB
Company: Penneco Oil Company
Project: Allegeny County, PA
Site: Plum Borough #5H
Well: Sedat #5H
Wellbore: Main Wellbore
Design: Plan 1

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Site Plum Borough #5H
WELL @ 1256.80ft (Original Well Elev)
WELL @ 1256.80ft (Original Well Elev)
True
Minimum Curvature

Project	Allegeny County, PA		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Pennsylvania Southern Zone		

Site	Plum Borough #5H		
Site Position:	Northings:	440,348.19 ft	Latitude: 40° 31' 31.750 N
From: Lat/Long	Easting:	1,423,066.00 ft	Longitude: 79° 42' 43.980 W
Position Uncertainty:	0.00 ft	Spot Radius: 13.200 in	Grid Convergence: -1.27 °

Well	Sedat #5H		
Well Position	+N-S	0.00 ft	Northings: 440,348.19 ft
	+E-W	0.00 ft	Easting: 1,423,066.00 ft
Position Uncertainty	0.00 ft	Wellhead Elevation:	Ground Level: 1,248.00 ft

Wellbore	Main Wellbore		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010_14	10/28/2011	-9.43
			Dip Angle 67.88
			Field Strength 53,104

Design	Plan 1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD)	+N-S	+E-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction 342.44

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Dogleg Rate (1/1000)	Build Rate (1/1000)	Turn Rate (1/1000)	True BFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,775.80	0.00	0.00	2,775.80	0.00	0.00	0.00	0.00	0.00	0.00	
3,040.13	26.43	342.44	3,030.85	57.10	-18.07	10.00	10.00	0.00	342.44	
3,879.81	90.39	342.44	3,348.80	550.05	-174.07	10.00	10.00	0.00	0.00	Sedat #5H LP
4,845.76	90.39	342.44	3,340.80	1,681.64	-525.83	0.00	0.00	0.00	0.00	Sedat #5H PBHL

OCT 31 2011

DEP, SOUTHWEST REGION
OIL & GAS

003-22200

OCT 8 1 2011

Phoenix Technology Services

Planning Report

DEP, SOUTHWEST REGION
OIL & GAS

Database: NER DB
 Company: Pennco Oil Company
 Project: Allegheny County, PA
 Site: Plum Borough #5H
 Well: Sedat #5H
 Wellbore: Main Wellbore
 Design: Plan 1

Local Co-ordinate Reference: Site Plum Borough #5H
 TVD Reference: WELL @ 1256.80ft (Original Well Elev)
 MD Reference: WELL @ 1256.80ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Doping Rate (°/100m)	Build Rate (°/100m)	Turn Rate (°/100m)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,775.80	0.00	0.00	2,775.80	0.00	0.00	0.00	0.00	0.00	0.00
KOP = 2775' MD									
2,800.00	2.42	342.44	2,799.99	0.43	-0.15	0.51	10.00	10.00	0.00
2,900.00	12.42	342.44	2,899.03	12.78	-4.05	13.41	10.00	10.00	0.00
3,000.00	22.42	342.44	2,994.32	41.29	-13.07	43.31	10.00	10.00	0.00
3,040.13	26.43	342.44	3,030.85	57.10	-18.07	59.89	10.00	10.00	0.00
3,041.79	26.60	342.44	3,032.34	57.81	-18.30	60.84	10.00	10.00	0.00
Start DLS 10.00 TFO 0.00									
3,100.00	32.42	342.44	3,082.88	85.13	-26.94	89.29	10.00	10.00	0.00
3,200.00	42.42	342.44	3,182.30	142.99	-45.25	149.98	10.00	10.00	0.00
3,300.00	52.42	342.44	3,229.88	213.10	-67.44	223.51	10.00	10.00	0.00
3,400.00	62.41	342.44	3,283.87	293.33	-92.83	307.87	10.00	10.00	0.00
3,500.00	72.41	342.44	3,322.03	381.25	-120.85	399.88	10.00	10.00	0.00
3,600.00	82.41	342.44	3,343.79	474.18	-150.06	497.35	10.00	10.00	0.00
3,679.72	90.39	342.44	3,348.79	550.04	-174.07	576.92	10.00	10.00	0.00
LP = 3679' MD									
3,679.81	90.39	342.44	3,348.80	550.05	-174.07	576.94	10.00	10.00	0.00
3,700.00	90.39	342.44	3,348.86	569.30	-180.16	597.12	0.00	0.00	0.00
3,800.00	90.39	342.44	3,347.98	684.84	-210.33	697.12	0.00	0.00	0.00
3,900.00	90.39	342.44	3,347.29	759.97	-240.50	797.12	0.00	0.00	0.00
4,000.00	90.39	342.44	3,346.80	855.31	-270.67	897.12	0.00	0.00	0.00
4,100.00	90.39	342.44	3,345.92	950.85	-300.84	997.12	0.00	0.00	0.00
4,200.00	90.39	342.44	3,345.23	1,045.99	-331.01	1,097.11	0.00	0.00	0.00
4,300.00	90.39	342.44	3,344.54	1,141.32	-361.18	1,197.11	0.00	0.00	0.00
4,400.00	90.39	342.44	3,343.86	1,236.66	-391.35	1,297.11	0.00	0.00	0.00

003-22200

Phoenix Technology Services
Planning Report

Database: NER DB
Company: Pennco Oil Company
Project: Allegany County, PA
Site: Plum Borough #5H
Well: Sedat #5H
Wellbore: Main Wellbore
Design: Plan 1

Local Co-ordinate Reference: Site Plum Borough #5H
TVD Reference: WELL @ 1256.80ft (Original Well Elev)
MD Reference: WELL @ 1256.80ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey									
Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	N-S (m)	E-W (m)	Vertical Section (m)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,500.00	90.39	342.44	3,343.17	1,332.00	-421.52	1,397.11	0.00	0.00	0.00
4,800.00	90.39	342.44	3,342.49	1,427.34	-451.69	1,497.10	0.00	0.00	0.00
4,700.00	90.39	342.44	3,341.80	1,522.88	-481.86	1,597.10	0.00	0.00	0.00
4,800.00	90.39	342.44	3,341.11	1,618.01	-512.03	1,697.10	0.00	0.00	0.00
4,845.76	90.39	342.44	3,340.80	1,661.64	-525.83	1,742.86	0.00	0.00	0.00
PBHL = 4845' MD									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir (°)	TVD (m)	N-S (m)	E-W (m)	Northing (m)	Easting (m)	Latitude	Longitude
Sedat #5H PBHL - plan hits target center - Point	0.00	0.00	3,340.80	1,661.64	-525.83	442,021.11	1,422,577.22	40° 31' 48.170 N	79° 42' 50.790 W
Sedat #5H LP - plan hits target center - Point	0.00	0.00	3,348.80	550.05	-174.07	440,901.98	1,422,904.20	40° 31' 37.185 N	79° 42' 46.234 W

Plan Annotations				
Measured Depth (m)	Vertical Depth (m)	N-S (m)	E-W (m)	Comment
2,775.80	2,775.80	0.00	0.00	KOP = 2775' MD
3,041.79	3,032.34	57.81	-18.30	Start DLS 10.00 TFO 0.00
3,679.79	3,348.80	550.03	-174.06	LP = 3679' MD
4,845.77	3,340.80	1,661.64	-525.83	PBHL = 4845' MD

OCT 8 1 2011

DEP, SOUTHWEST REGION
OIL & GAS



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil & Gas Management Program

DEP USE ONLY
Application Tracking #

Proposed Alternate Method or Material for
Casing, Plugging, Venting or Equipping a Well

Well Operator Penneco Oil Company	DEP ID# 7674	Well Permit or Registration Number 003-22200-00
Address 6608 Route 22		Well Form Name Sedat
City Delmont	State PA	Well # #5H
Phone 724-468-8232	Zip Code 15626-2408	Serial # PS-1753
	Fax 724-468-8230	County Allegheny
		Municipality Plum Borough

A proposed alternate method is subject to provisions in Section 211 of the Oil and Gas Act, Section 13 of the Coal and Gas Resource Coordination Act, and 25 PA Code §78.75 Alternate Methods. Attach proof of notification of coal operator(s).

Describe in reasonable detail using a written description and / or diagram:

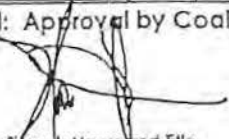
1. the proposed alternate method or materials, and
2. the manner in which the alternative will satisfy the goals of the laws and regulations.

The purpose of this submission is to account for the proximity of the referenced well to the documented boundary of an abandoned deep mine and to offer an alternative casing scenario should the coal isolation segment of the well realize a mine void.

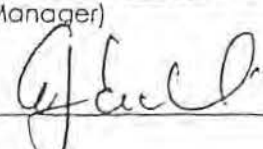
In the event that the construction of the above referenced well were interrupted by a mine void encounter rather than the anticipated stump or solid coal, the drilling contractor will continue drilling another 50 feet below the mine floor (ream if necessary), install the requisite isolation string of casing (basket set above mine ceiling), and cement using the balance and grout method.

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Optional: Approval by Coal Owner or Operator Signature  Date 10/28/11 Print or Type Signer's Name and Title D. Marc Jacobs	Signature of Applicant / Well Operator Signature _____ Date _____ Print or Type Signer's Name and Title D. Marc Jacobs, Jr., Senior Vice President
---	---

If optional approval is signed by coal owner or operator, the 15-day objection period may be waived.

DEP USE ONLY		
Approved by: (DEP Manager) 	Conditions: ☐ YES, See Attached ☒ NO	Date 12/9/11



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OFFICE OF OIL AND GAS MANAGEMENT

Well Record

003-22200 CF

DEP USE ONLY	
Site ID	Client ID
Client ID	Sub Facility ID

WELL INFORMATION							
Well Operator Penneco Oil Company		DEP ID# 7674	Well API# 37-003-22200-00		Well Farm Name Sedat	Well # 5H	
Address 6608 Route 22			LAT 40°31' 31.7500" LONG - 79°42' 43.9800"		NAD 83	Project Number	Serial # PS-1753
City Delmont	State PA	Zip 15626-2408	Municipality Plum		County Allegheny		
Phone (724)468-8232	Fax (724)468-8230	Email penneco@penneco.com		USGS 7.5 min. quadrangle map New Kensington East		Section 7	
Check the appropriate Submission: ☒ Original Well Record ☐ Amended Well Record							
Well Type	☐ Gas ☒ Oil ☐ Combination Oil & Gas ☐ CBM ☐ Injection ☐ Disposal ☐ Storage						
Well Orientation	☐ Vertical ☒ Deviated from Vertical (Top & Side views & Deviation Survey must be attached)						
Drill Method(s)	☒ Rotary - Air 3450' ☒ Rotary - Mud 4850' ☐ Cable Tool ☐ Other						
Drilling Started	01/12/12	Surface Elev.	1248 ft.	GW Depth	700 ft.	Wellbore Conditioning: 25' Grout (No Conditioning) 20' 8 min / 15 BBL / 1-5 BPM / Gal 13 3/8" 5 min / 15 BBL / 1-5 BPM / Gal 9 5/8" 4 min / 10 BBL / 1-5 BPM / Gal 4 1/2" 4 min / 20 BBL / 4 BPM / SAPP 4 1/2" 3 min / 10 BBL / 4 BPM / Gal	
Drilling Complete	03/17/12	True Vertical Depth	3343 ft.	Depth of DFGW	700 ft.		
Date Well Completed	03/17/12	Total Measured Depth	4850 ft.	DFGW decided by	1		

CEMENT							
Cement returned on surface casing?		☒ Yes ☐ No		If No, provide depth to top of cement and method used to determine:			
Cement returned on coal protective casing?		☒ Yes ☐ No		If No, provide depth to top of cement and method used to determine: ☐ NA			
Cement returned on intermediate casing?		☒ Yes ☐ No		If No, provide depth to top of cement and method used to determine: ☐ NA			
Casing String	Type/Class of Cement (Lead/Tail)	Slurry Temp F*	Amount of Cement (sks) (Lead/Tail/Total)	WOC hrs	WT PPG	Yld #/3 bbl	Gas Migration Controls Used
Conductor	CLA A, 3%cc 1/4# flake	40 °	25 / 0 / 25	8	15.6	1.18	Gas Block for Intermediate string cement
Surface	CLA A, 3%cc 1/4# flake	40 °	450 / 0 / 450	8	15.6	1.18	
Coal Protective	CLA A, 3%cc 1/4# flake	34 °	650 / 0 / 650	8	15.6	1.18	
Intermediate	Gas Block	40 °	835 / 0 / 835	8	15.7	1.30	
Production	50% TYPE 1, 50% FLYASH, 0.75% CFL-2, 10% SALT, 0.2% FCP	71 °	1264 / 0 / 1264	8	14.2	1.30	
If additional strings attach form(s)			Total	3224			

CASING AND TUBING									
Hole Size	Pipe Size	Wt. #/ft.	Grade Casing / Tubing Type	Thread / Weld - New/ Used	Amount In Well (ft.)	Hardware - Baskets / Packer / Centralizers (Total/String)			Date Run
						Type	Size	Depth	
28"	26"	77.26	PE	T - N	35	N/A	N/A	N/A	01/13/12
22"	20"	94.00	J-55	T - N	423	guide shoe	20"	423	01/17/12
17 1/2"	13 3/8"	54.50	MC-50	T - N	786	guide shoe	13 3/8"	786	01/19/12
12 3/8"	9 5/8"	40.00	MC-50	T - N	2510	guide shoe	9 5/8"	2510	01/26/12
8 1/2"	4 1/2"	11.60	WT-80	T - N	4817	float shoe	4 1/2"	4817	03/17/12

PLUG-BACK/WELLBORE ALTERATION						
Fill Material & Plugs		Depth		Date	Casing & Tubing	
		From	To		Size	Pulled
Cement Kick Plug / 320 sks - CLA A, 3%cc 1/4# flake		3450	2525	01/30/12	N/A	N/A
				JUN 11 2012		

DEP SOUTHWEST REGION
OIL & GAS

MAY 09 2012

003-22200

LOG OF FORMATIONS

Well API#: 37-003-22200-00

(If you will need more space than this page, please photocopy the blank form before filling it in.)

Formation Name or Lithology	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine, ft.)	Source of Data
Fill	0	5				Driller's Log
Shale	5	35				
Sand	35	55				
Red Rock	55	400				
Gray Shale / Sand	400	520				
Coal	520	525				
Sand / Shale	525	712			F 700	
Sand / Shale	712	802				
Shale	802	1042				
Sandy Shale	1042	1322				
Shale	1322	1452				
Sandy Shale	1452	1882				
Sand	1882	1912				
Shale	1912	2002			B 1972	
Sand	2002	2300			B 2042	
Red Rock	2300	2420				
Sandy Shale	2420	3450				

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If no show of oil, gas or water, explain why:

WELL SERVICE COMPANIES (Provide the name, address, and telephone number of all well service companies involved.)

Casing Source	Cementing Company	Hardware Supplier	Logging Company
Name McJunkin Redman Corporation	Name Universal Well Services, Inc.	Name Ken Miller Supply, Inc.	Name Weatherford International
Address 480 Geesey Road	Address 324 Meter St.	Address 5484 Route 286 Hwy. E.	Address 124 Windy Ridge Lane
City - State - Zip Indiana PA 15701	City - State - Zip Punxsutawney PA 15767	City - State - Zip Indiana PA 15701	City - State - Zip Elderton PA 15736
Phone (724)349-8823	Phone (814)938-5327	Phone (724)465-8875	Phone (724)354-3090

I do hereby certify to the best of my knowledge, information and belief that the well identified on this Well Record has been properly cased and cemented in accordance with the requirements of 25 Pa. Code Chapter 78 and any conditions contained in the permit for this well. In addition, I do hereby certify that any casing which is attached to a blow-out preventer with a pressure rating greater than 3,000 psi has passed a pressure test in accordance with 25 Pa. Code §78.84(f). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Driller		Well Operator's Signature		DEP USE ONLY	
Name U. S. Energy	Rig 4 / 8	 Printed Name / Title: Marc Jacobs / Vice President		Reviewed by:	
Address P.O. Box 237				 Comments:	
City - State - Zip Rural Valley PA 16249					
Phone (724)783-7624		Date: 5/8/12			

003-22200

LOG OF FORMATIONS

Well API#: 37-003-22200-00

(If you will need more space than this page, please photocopy the blank form before filling it in.)

Formation Name or Lithology	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Fill	0	5				Driller's Log
Shale	5	35				
Sand	35	55				
Red Rock	55	400				
Gray Shale / Sand	400	520				
Coal	520	525				
Sand / Shale	525	712			F 700	
Sand / Shale	712	802				
Shale	802	1042				
Sandy Shale	1042	1322				
Shale	1322	1452				
Sandy Shale	1452	1882				
Sand	1882	1912				
Shale	1912	2002			B 1972	
Sand	2002	2300			B 2042	
Red Rock	2300	2420				
Sandy Shale	2420	3450				

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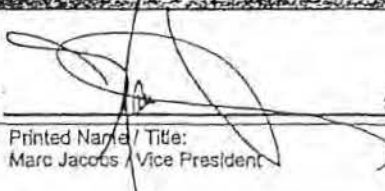
DEP, SOUTHWEST REGION
OIL & GAS

If no show of oil, gas or water, explain why:

WELL SERVICE COMPANIES: Provide the name, address and telephone number of all well service companies involved.

Casing Source	Cementing Company	Hardware Supplier	Logging Company
Name McJunkin Redman Corporation	Name Universal Well Services, Inc.	Name Ken Miller Supply, Inc.	Name Weatherford International
Address 480 Geesay Road	Address 324 Meter St.	Address 5484 Route 286 Hwy. E.	Address 124 Windy Ridge Lane
City - State - Zip Indiana PA 15701	City - State - Zip Punxsutawney PA 15767	City - State - Zip Indiana PA 15701	City - State - Zip Elderton PA 15736
Phone (724)349-6823	Phone (814)938-5327	Phone (724)465-8875	Phone (724)354-3090

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Driller		Well Operator's Signature		DEP USE ONLY	
Name U. S. Energy	Rig 4 / 8	 Printed Name / Title: Marc Jacobs / Vice President		Reviewed by:	
Address P.O. Box 237				Date: 5/8/12	
City - State - Zip Rural Valley PA 16249				Comments:	
Phone (724)783-7624					



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DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

Completion Report

003-22200 CF

DEP USE ONLY	
Site ID	Primary Facility ID
Client ID	Sub Facility ID

Graph +
Standard Survey Report

Well Information							
Well Operator Penneco Oil Company		DEP ID# 7674	Well API # 37-003-22200-00		Well Farm Name Sedal	Well # 5H	
Address 8608 Route 22		LAT - 40° 31' 31.7500"		NAD 83	Project Number		Serial # PS-1753
City Delmont		State PA	Zip Code 15626	Municipality Plum		County Allegheny	
Phone (724)468-8232	Fax (724)468-8230	Email penneco@penneco.com		USGS 7.5 min. quadrangle map New Kensington East		Section 7	
Check the appropriate submission: ☒ Original Completion Report ☐ Amended Completion Report							
STIMULATION BASE FLUID							
List Water Management Plan Source(s)			Water Management Plan ID		Volume (Gallons)		
1. Not Applicable							
2.							
3.							
4.							
5.							
6.							
			DEP Biologist Review/Date	Total Gallons of Water Used	Water	Recycled	
Other Base Fluid(s) Used					Quantity and /UOM		
1.					/		
2.					/		
Total Quantity all Fluid(s)					/		
STIMULATION/PRODUCTION INFORMATION (WELL)							
Radioactive tracers used? ☐ Specify Tracer		24 Hr. Open-Flow (MCF/Day) / Data Still Testing / --		24 Hr. Shut-in Pressure / Date Still Testing / --		Completion Date: 04/25/12	
Well Products: ☒ Gas Btu 1050 (Expected)		☒ Oil API G 39 (Expected)		☐ Condensate API G		☐ Other	
						☐ GOR Still Testing	
WELL SERVICE COMPANIES							
Perforation Company		Frac Company		Plug Drill Out/Flow Back Company			
Name Titan Wireline Services		Name Universal Well Services, Inc.		Name Multi Production Systems Inc.			
Address 717 Pennsylvania 210		Address 324 Meter St.		Address 314 Mill Run Drive			
City - State - Zip Shelock PA 15774		City - State - Zip Punxsutawney PA 15767		City - State - Zip Indiana PA 15701			
Phone (724)354-2629		Phone (814)938-5327		Phone (724)465-6663			
I do hereby certify to the best of my knowledge, information and belief that the information contained on this Completion Report is true and correct. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.							
Well Operator's Signature				DEP USE ONLY			
				Reviewed by:			
5/8/12				Date: 6-6-12			
Printed Name / Title: Marc Jacobs / Vice President				Comments:			

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DEP SOUTHWEST REGION
OIL & GAS

Page 1 of 5

DEP SOUTHWEST REGION
OIL & GAS

003-22200

Well API# 37-003-22200-00

STIMULATION FLUID ADDITIVES

Note: Information designated as Trade Secret or Confidential proprietary information must be clearly identified as such and should be submitted on the "Confidential Stimulation Fluid Additives" form.

Trade Name	Supplier	Purpose	Ingredients	CAS # of Chemical Component	Max. Component % Mass in Additive	Chemical Component % Mass used in Total Base Fluid (Pg 1)	Comment
ALPHA 338S	Clearwater International LLC	Corrosion Inhibitor	Solvent Naphtha (Petroleum), petroleum aromatic	64742-84-5	65 - 100%	0.074%	
ALPHA 338S	Clearwater International LLC	Corrosion Inhibitor	Poly(oxy-1,2-ethanedyl), s(nonylphenyl)-w-hydroxy-phosphate	51811-79-1	30 - 80%	0.043%	
ALPHA 338S	Clearwater International LLC	Corrosion Inhibitor	Naphthalene	91-20-3	3 - 7%	0.005%	
CLA CHEK LP	Clearwater International LLC	Clay Control	Ethylene Glycol	107-21-1	30 - 80%	0.024%	
EC8118A	Nalco Company	Biocide	Dibromooctanediol	3252-43-5	1.0 - 5.0%	0.001%	
EC8118A	Nalco Company	Biocide	2,2-Dibromo-3-nitroisopropionamide	10222-01-2	10.0 - 30.0%	0.004%	
EC8118A	Nalco Company	Biocide	Polyethylene Glycol	25322-68-3	30.0 - 90.0%	0.009%	
Flomax 50	CESI Chemical	Flow Control	Isopropanol	67-63-0	1 - 15%	0.008%	
Flomax 50	CESI Chemical	Flow Control	Citrus Terpenes	94268-47-4	1 - 15%	0.000%	
Hydrochloric Acid	Niacet Corporation	Formation Breaker	Hydrochloric Acid	7647-01-0	21 - 33%	0.325%	
IRON STA II C	Clearwater International LLC	Iron Control Agent	Ethylene Glycol	107-21-1	10 - 30%	0.011%	
LEB 10X	Clearwater International LLC	Gel Breaker	Ethylene Glycol	107-21-1	30 - 80%	0.001%	
NE-90	Universal Well Services, Inc.	Flow Control	Methanol	67-56-1	30 - 80%	0.037%	
NE-90	Universal Well Services, Inc.	Flow Control	Isopropanol	67-63-0	5.0 - 10.0%	0.006%	
NE-90	Universal Well Services, Inc.	Flow Control	Heavy Aromatic Naphtha	64742-84-5	1.0 - 5.0%	0.002%	
NE-90	Universal Well Services, Inc.	Flow Control	Polyethylene Glycol	25322-68-3	1.0 - 5.0%	0.002%	
NE-90	Universal Well Services, Inc.	Flow Control	EO-C7-9-iso, C8-rich alcohols	78330-19-5	1.0 - 5.0%	0.002%	
NE-90	Universal Well Services, Inc.	Flow Control	EO-C9-11-iso, C10-rich alcohols	78330-20-8	1.0 - 5.0%	0.002%	
NE-90	Universal Well Services, Inc.	Flow Control	2-Ethylhexanol	104-76-7	5.0 - 10.0%	0.006%	
NE-90	Universal Well Services, Inc.	Flow Control	Napthalene	91-20-3	0.1 - 1.0%	0.000%	
Sand	Unimin Corporation	Proppant	Crystalline Silica in the form of Quartz	14808-60-7	87 - 99.5%	5.796%	
SUPER SURF	Clearwater International LLC	Surface Tension Reducer	Methanol	67-56-1	30 - 80%	0.021%	
Unigel 3F	Clearwater International LLC	Gelling Agent	Gum Gum	N/A	>85%	0.077%	

Please insert additional copies of this page if additional rows are needed.

OIL & GAS

003-22200

Well API# 37 -003-22200-00

STIMULATION INFORMATION / STAGE

Complete a separate record for each stimulation stage. (Please insert additional lines for additional stages or additional pages as applicable).

Stg #	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Proppant Type	Proppant Mesh Size(s)
1	04/23/12	40.0	3,727	4,200	1,800	White Sand	20/40
2	04/23/12	40.0	4,225	4,870	2,000	White Sand	20/40
3	04/23/12	40.0	3,790	3,400	2,000	White Sand	20/40
4	04/23/12	40.0	4,080	5,100	1,800	White Sand	20/40
5	04/23/12	40.0	4,526	4,300	1,900	White Sand	20/40
6	04/24/12	40.0	3,704	4,200	2,100	White Sand	20/40
7	04/24/12	40.0	3,505	4,300	2,100	White Sand	20/40
8	04/24/12	40.0	3,514	4,300	2,200	White Sand	20/40
9	04/24/12	40.0	3,600	4,610	2,100	White Sand	20/40
10	04/24/12	40.0	4,045	5,160	2,050	White Sand	20/40
11	04/24/12	42.0	4,080	4,320	2,050	White Sand	20/40
12	04/25/12	25.0	3,145	5,130	2,100	White Sand	20/40
13	04/25/12	25.0	3,002	5,080	2,000	White Sand	20/40
14	04/25/12	25.0	2,725	4,090	2,100	White Sand	20/40
15	04/25/12	25.0	2,618	3,020	2,000	White Sand	20/40
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OIL & GAS

603-22200

Note: Additives designated on the "Stimulation Fluid Additives" as Trade Secret or Confidential proprietary information must be clearly identified as such and should be submitted on this or similarly identified sheet as confidential to this report.

[illegible]

The Department will prevent disclosure of the designated confidential information to the extent permitted under the Right-to-know Law (65 P.S. §67.101-67.3103.
Use additional pages as needed.

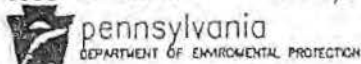
Name/Title	
Address	
City - State - Zip	
Phone	Signature

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OIL & GAS

5500-PM-OG0002

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

OIL AND GAS MANAGEMENT PROGRAM

WELL LOCATION PLAT

DEP	Auto-ID #	7F
USE	Permit #	1-10-12
ONLY	Project #	RP

Denotes location of well on topo map.

True Latitude: NORTH
40° 30' 48.09"

True Longitude: WEST
79° 42' 54.05"

NOTE:

Parcels 1098-H-100 & 1098-H-028 are subject to the Rudolph D. Dyke lease. Parcels 1235-K-276 and 1098-O-277 are subject to the James E. Burton Lease.

Well is located on topo map 10,312 feet south of latitude 40° 32' 30"

Bottom Hole NAD 83

LAT: 40° 31' 07.72"
LON: 79° 42' 52.58"

Well is located on topo map 1,857 feet west of longitude 79° 42' 30"

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Loc - A N 57°02'10" W 1917.15'
Loc - B S 24°42'09" E 727.59'
A - B S 48°17'53" E 2561.65'

Legend

- Lease Tract Boundary
- - - Surface Tract
- == Roads
- Streams/Water
- Bottom Hole Location
- Proposed Well Location
- ⊙ Existing Well
- ⊙ Plugged Well
- Water Well +-

UNIT BREAKDOWN

Rudolph D. Dyke (A.L.V.) - 38.4 sq.ft. = 0.02%
James E. Burton (Balena) - 176002.4 sq.ft. = 88.47%
Alvin R. & Diane E. Miller (Fuge) - 22667.1 sq.ft. = 11.51%
Unit Area - 198927.9 sq.ft. = 100%



Surveyor or Engineer: W.D. Mohney & Associates (724) 543-1023 sedat area Date: November 16, 2011 Scale: 1" = 1000' Tract Area: 171 ±

Lot & Long Methodology	Method GPS-Code Based Accuracy 10 ± ft. Datum NAD 83	Elevation Methodology	Method PA. LIDAR Accuracy 20 ± ft. Datum NGVD29	Survey Data	Various Dates
Applicant / Well Operator Name	Penneco Oil Company	Well (Form) Name	Burton Unit	Well #	4H
Address	6608 US Route 22, Delmont, PA. 15626	County	Allegheny	Municipality	Plum Borough
Surface Landowner / Lessor	Michael A. & Linda S. Baleno	USGS 7 1/2" Quadrangle Map Name	New Kensington East, PA. - 1408	Map Section	7
Target Formation(s)	Speechley	Angle & Course of Deviation (Drilling)	N 04°33'14" E - 1989.26'	Anticipated Total Depth ft.	TMD 3280-3370 TMD 5023'
Surface Owner or Water Purveyor	Approximate Course and	Owner, Lessee, or Operator of	Workable Coal Seam	Name of Coal Seam	Upper Freeport Seam
with a Water Supply within 1000' Distance to Water Supply	NONE	Consolidation Coal Company	Michael A. & Linda S. Baleno	Owner, Leased, or Operated	All Others

Gob-Upper Freeport Seam

003-22208



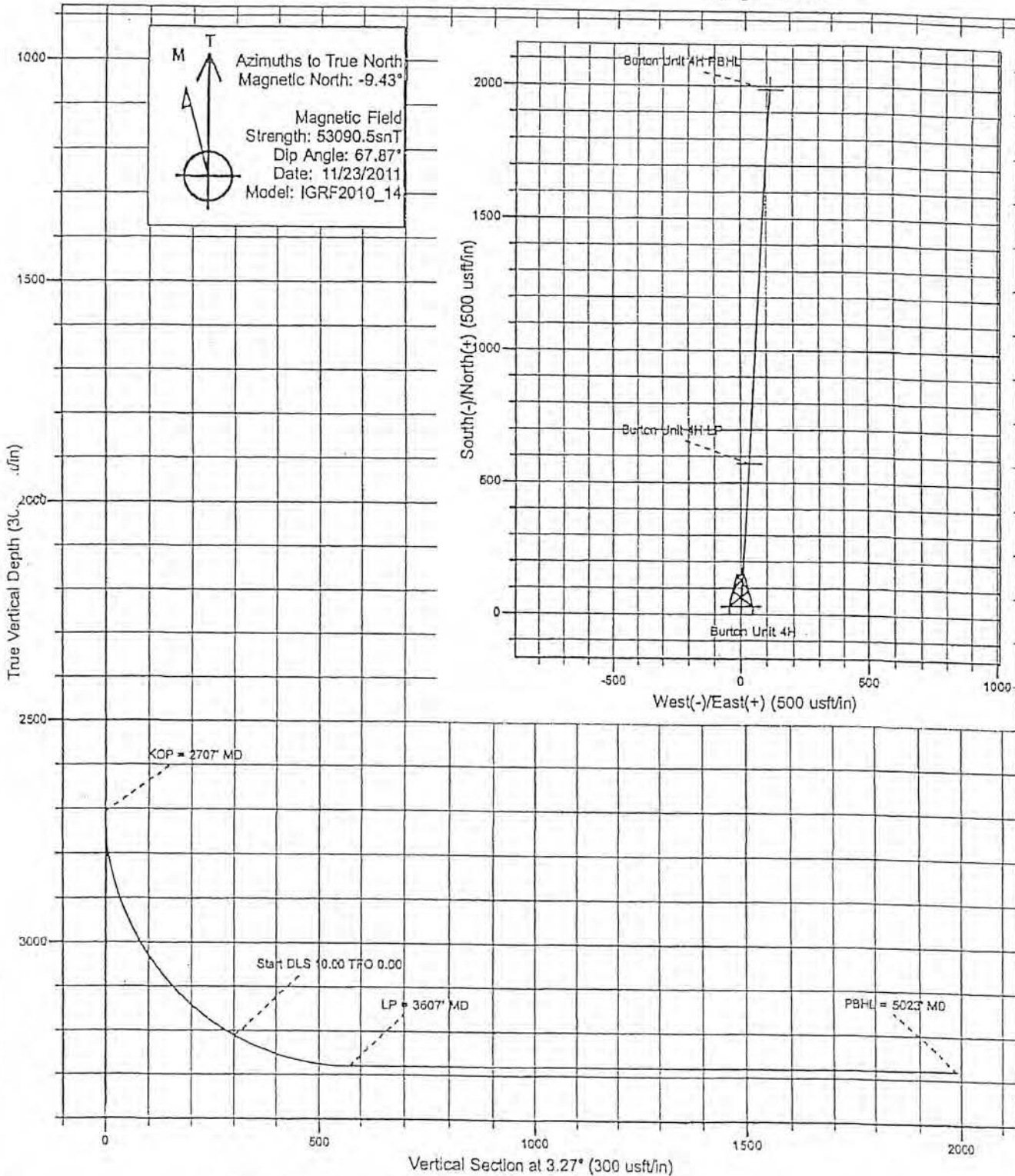
PHOENIX
TECHNOLOGY SERVICES USA INC.

DEC 08 2011

Penneco Oil Company

DEP, SOUTHWEST REGION
OIL & GAS

Project: Allegheny County, PA
Site: Plum Borough 4H
Well: Burton Unit 4H
Wellbore: Main Wellbore
Design: Plan 1



TVD=3280'

003-22203-

Penneco Oil Company

Allegheny County, PA
Plum Borough 4H
Burton Unit 4H

Main Wellbore

Plan: Plan 1

Standard Planning Report

23 November, 2011

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OIL & GAS

Phoenix Technology Services
Planning Report

003-22205

Database: NER DB v5000
Company: Penneco Oil Company
Project: Allegheny County, PA
Site: Plum Borough 4H
Well: Burton Unit 4H
Wellbore: Main Wellbore
Design: Plan 1

Local Co-ordinate Reference: Site Plum Borough 4H
TVD Reference: WELL @ 1168.0usft (Original Well Elev)
MD Reference: WELL @ 1168.0usft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Project	Allegheny County, PA		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Pennsylvania Southern Zone		

Site	Plum Borough 4H		
Site Position:		Northing:	435,947.49 usft
From:	Lat/Long	Easting:	1,422,187.44 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"
		Grid Convergence:	-1.27"

Well	Burton Unit 4H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	Ground Level:

Wellbore	Main Wellbore		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010_14	11/23/2011	-9.43
			Dip Angle
			67.87
			Field Strength
			53.090

Design	Plan 1		
Audit Notes:			
Version:	Phase:	PROTOTYPE	Tie On Depth:
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,707.0	0.00	0.00	2,707.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,323.6	61.66	3.27	3,211.3	300.5	17.2	10.00	10.00	0.00	3.27	
3,607.1	90.00	3.27	3,290.0	572.1	32.7	10.00	10.00	0.00	0.00	Burton Unit 4H LP
5,023.8	90.00	3.27	3,280.0	1,986.5	113.5	0.00	0.00	0.00	0.00	Burton Unit 4H PBHL

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DEP, SOUTHWEST REGION
OIL & GAS

Phoenix Technology Services
Planning Report

003-22205

Database: NER DB v5000
Company: Penneco Oil Company
Project: Allegheny County, PA
Site: Plum Borough 4H
Well: Burton Unit 4H
Wellbore: Main Wellbore
Design: Plan 1

Local Co-ordinate Reference: Site Plum Borough 4H
TVD Reference: WELL @ 1168.0usft (Original Well Elev)
MD Reference: WELL @ 1168.0usft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,707.0	0.00	0.00	2,707.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP = 2707' MD									
2,800.0	9.30	3.27	2,799.6	7.5	0.4	7.5	10.00	10.00	0.00
2,900.0	19.30	3.27	2,896.4	32.1	1.8	32.2	10.00	10.00	0.00
3,000.0	29.30	3.27	2,987.4	73.2	4.2	73.3	10.00	10.00	0.00
3,100.0	39.30	3.27	3,069.9	129.4	7.4	129.6	10.00	10.00	0.00
3,200.0	49.30	3.27	3,141.4	199.0	11.4	199.3	10.00	10.00	0.00
3,300.0	59.30	3.27	3,199.7	280.0	16.0	280.4	10.00	10.00	0.00
3,323.6	61.86	3.27	3,211.3	300.5	17.2	301.0	10.00	10.00	0.00
Start DLS 10.00 TFO 0.00									
3,400.0	69.30	3.27	3,243.0	369.8	21.1	370.4	10.00	10.00	0.00
3,500.0	79.29	3.27	3,270.0	465.3	25.6	466.6	10.00	10.00	0.00
3,600.0	89.29	3.27	3,279.9	565.0	32.3	566.0	10.00	10.00	0.00
3,607.1	90.00	3.27	3,280.0	572.1	32.7	573.0	10.00	10.00	0.00
LP = 3607' MD									
3,700.0	90.00	3.27	3,280.0	664.9	38.0	665.9	0.00	0.00	0.00
3,800.0	90.00	3.27	3,280.0	764.7	43.7	765.9	0.00	0.00	0.00
3,900.0	90.00	3.27	3,280.0	864.5	49.4	865.9	0.00	0.00	0.00
4,000.0	90.00	3.27	3,280.0	964.4	55.1	965.9	0.00	0.00	0.00
4,100.0	90.00	3.27	3,280.0	1,064.2	60.8	1,065.9	0.00	0.00	0.00
4,200.0	90.00	3.27	3,280.0	1,164.0	66.5	1,165.9	0.00	0.00	0.00
4,300.0	90.00	3.27	3,280.0	1,263.9	72.2	1,265.9	0.00	0.00	0.00
4,400.0	90.00	3.27	3,280.0	1,363.7	77.9	1,365.9	0.00	0.00	0.00
4,500.0	90.00	3.27	3,280.0	1,463.6	83.8	1,465.9	0.00	0.00	0.00
4,600.0	90.00	3.27	3,280.0	1,563.4	89.3	1,565.9	0.00	0.00	0.00

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Phoenix Technology Services
Planning Report

003-22205

Database: NER DB v5000
Company: Penneco Oil Company
Project: Allegany County, PA
Site: Plum Borough 4H
Well: Burton Unit 4H
Wellbore: Main Wellbore
Design: Plan 1

Local Co-ordinate Reference: Site Plum Borough 4H
TVD Reference: WELL @ 1168.0usft (Original Well Elev)
MD Reference: WELL @ 1168.0usft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,700.0	90.00	3.27	3,280.0	1,663.2	95.1	1,665.9	0.00	0.00	0.00
4,800.0	90.00	3.27	3,280.0	1,763.1	100.8	1,765.9	0.00	0.00	0.00
4,900.0	90.00	3.27	3,280.0	1,862.9	106.5	1,865.9	0.00	0.00	0.00
5,000.0	90.00	3.27	3,280.0	1,962.7	112.2	1,965.9	0.00	0.00	0.00
5,023.8	90.00	3.27	3,280.0	1,986.5	113.5	1,989.7	0.00	0.00	0.00

PBHL = 5023' MD

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Eastng (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Burton Unit 4H LP	0.00	0.00	3,280.0	572.1	32.7	436,518.72	1,422,232.86	40° 30' 53.743 N	79° 42' 53.827 W
- plan hits target center									
- Point									
Burton Unit 4H PBHL	0.00	0.00	3,280.0	1,986.5	113.5	437,930.95	1,422,345.13	40° 31' 7.720 N	79° 42' 52.580 W
- plan hits target center									
- Point									

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,707.0	2,707.0	0.0	0.0	KOP = 2707' MD
3,323.6	3,211.3	300.5	17.2	Start OLS 10.00 TFO 0.00
3,607.1	3,280.0	572.1	32.7	LP = 3607' MD
5,023.8	3,280.0	1,986.5	113.5	PBHL = 5023' MD

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DER, SOUTHWEST REGION
OIL & GAS



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil & Gas Management Program

003-22205

DEP USE ONLY
Application Tracking #

Proposed Alternate Method or Material for
Casing, Plugging, Venting or Equipping a Well

Well Operator Penneco Oil Company	DEP ID# 7674	Well Permit or Registration Number 003-22205-00,01
Address 6608 Route 22		Well Farm Name Burton Unit
City Delmont	State PA	Well # #4H
Phone 724-468-8232	Zip Code 15626-2408	Serial # PB-1752
	Fax 724-468-8230	County Allegheny
		Municipality Plum Borough

A proposed alternate method is subject to provisions in Section 211 of the Oil and Gas Act, Section 13 of the Coal and Gas Resource Coordination Act, and 25 PA Code §78.75 Alternate Methods. Attach proof of notification of coal operator(s).

Describe in reasonable detail using a written description and / or diagram:

1. the proposed alternate method or materials, and
2. the manner in which the alternative will satisfy the goals of the laws and regulations.

The purpose of this submission is to account for the proximity of the referenced well to the documented boundary of an abandoned deep mine and to offer an alternative casing scenario should the coal isolation segment of the well realize a mine void.

In the event that the construction of the above referenced well were interrupted by a mine void encounter rather than the anticipated stump or solid coal, the drilling contractor will continue drilling another 50 feet below the mine floor (ream if necessary), install the requisite isolation string of casing (basket set above mine ceiling), and cement using the balance and grout method.

Optional: Approval by Coal Owner or Operator	Signature of Applicant / Well Operator
Signature	Signature
Date	Date 12/1/11
Print or Type Signer's Name and Title	Print or Type Signer's Name and Title D. Marc Jacobs, Sr. - Senior Vice President

If optional approval is signed by coal owner or operator, the 15-day objection period may be waived.

DEP USE ONLY	
Approved by: (DEP Manager) <i>Matthew Holme</i>	Conditions: ☒ YES, See Attached ☐ NO
	Date 1/11/12

for Alan Eichele

003-22205

CF

8000-FM-OOGM0004a 2/2012

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTIONGraph T Standard
Survey ReportCOMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

Well Record

DEP USE ONLY	
Site ID	Client Id
Client Id	Sub Facility Id

WELL INFORMATION

Well Operator Penneco Oil Company	DEP ID# 7674	Well API # 37-003-22205-00-01	Well Farm Name Burton Unit	Well # 4H
Address 6608 Route 22		LAT 40°30' 48.0900" LONG - 79°42' 54.0500"	Project Number	Serial # PB-1752
City Delmont	State PA	Zip 15626-2408	Municipality Plum	County Allegheny
Phone (724)468-8232	Fax (724)468-8230	Email penneco@penneco.com	USGS 7.5 min. quadrangle map New Kensington East	Section 7

Check the appropriate Submission: ☒ Original Well Record ☐ Amended Well Record

Well Type	☐ Gas ☒ Oil ☐ Combination Oil & Gas ☐ CBM ☐ Injection ☐ Disposal ☐ Storage	Wellbore Conditioning:
Well Orientation	☐ Vertical ☒ Deviated from Vertical (Top & Side views & Deviation Survey must be attached)	String Time / Volume / Rate / Material
Drill Method(s)	☒ Rotary - Air 3370' ☒ Rotary - Mud 5006' ☐ Cable Tool ☐ Other	26" Grout (No Conditioning)
Drilling Started	02/12/12 Surface Elev. 1168 ft. GW Depth 870 ft.	20" 5 min / 15 BBL / 3.5 BPM / Gel-Bar
Drilling Complete	06/23/12 True Vertical Depth 3275 ft. Depth of DFGW 870 ft.	13 3/8" Grout (No Conditioning)
Date Well Completed	06/24/12 Total Measured Depth 5006 ft. DFGW/decided by 1	9 5/8" 15 min / 70 BBL / 3.5 BPM / Gel
		4 1/2" 5 min / 20 BBL / 3.5 BPM / SAPP
		4 1/2" 5 min / 20 BBL / 3.5 BPM / Gel

CEMENT

Cement returned on surface casing?	☒ Yes ☐ No	If No, provide depth to top of cement and method used to determine:	
Cement returned on coal protective casing?	☐ Yes ☒ No	If No, provide depth to top of cement and method used to determine:	
Cement returned on intermediate casing?	☒ Yes ☐ No	If No, provide depth to top of cement and method used to determine:	
Casing String	Type/Class of Cement (Lead/Tail)	Slurry Temp F°	Amount of Cement (sks) (Lead/Tail/Total)
Conductor	CLA A, 3%cc 1/2 flake	37 °	40 / 0 / 40
Surface	CLA A, 3%cc 1/2 flake	37 °	310 / 0 / 310
Coal Protective	CLA A, 3%cc 1/2 flake	37 °	45 / 430 / 475
Intermediate	Gas Block	40 °	680 / 0 / 680
Production	UFL	76 °	1328 / 0 / 1328
If additional strings attach form(s)		Total 2833	
		WOC hrs	WT PPG
		Yld #3 / sk	Gas Migration Controls Used
			What controls were used if any (additional details. Specify type and depth applicable):
			Gas Block for intermediate string cement

CASING AND TUBING

Hole Size	Pipe Size	Wt. #/ft.	Grade Casing / Tubing Type	Thread / Weld - New/ Used	Amount In Well (ft.)	Hardware - Baskets / Packer / Centralizers (Total/String)	Type	Size	Depth	Date Run
28"	26"	77.26	PE	- - N	39	N/A	N/A	N/A	N/A	02/13/12
22"	20"	94.00	J-55	T - N	214	guide shoe	20"	214	02/14/12	
17 1/2"	13 3/8"	54.50	MC-50	T - N	640	guide shoe	13 3/8"	640	02/16/12	
12 3/8"	9 5/8"	40.00	MC-40	T - N	2044	guide shoe	9 5/8"	2044	02/21/12	
8 1/2"	4 1/2"	11.60	WT-80	T - N	4982	float shoe	4 1/2"	4982	06/24/12	

If any casing is welded, provide the name(s) of the welder(s):

PLUG-BACK/WELLBORE ALTERATION

Fill Material & Plugs	Depth		Date	Casing & Tubing		
	From	To		Size	Pulled	Left
Kick Plug - 438 sks - Kick Plug Cement	2074	3370	02/24/12	N/A	N/A	N/A

DEP SOUTHWEST REGION
OIL & GASDEP SOUTHWEST REGION
OIL & GAS

003-22203

8000-FM-OOGM0004a 2/2012

LOG OF FORMATIONS

Well API#: 37-003-22205-00-01

(If you will need more space than this page, please photocopy the blank form before filling it in.)

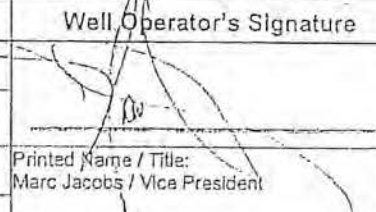
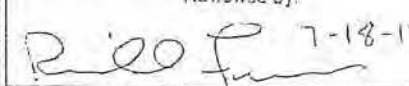
Formation Name or Lithology	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Let Down	0	5				Driller's Log
Shale	5	35				
Sand	35	46				
Shale	46	90				
Red Rock	90	120			F 90	
Sand / Shale	120	250				
Shale	250	300				
Coal	300	304				
Sand / Shale	304	400				
Shale	400	450				
Sand / Shale	450	520				
Coal	520	525				
Sand / Shale	525	600				
Open Mine	600	610				
Sand / Shale	610	774				
Coal	774	778				
Sand / Shale	778	930			F 870	
Sand	930	1050				
Sand / Shale	1050	1200			B 1150	
Sand	1200	1450				
Sand / Shale	1450	1600				
Sand	1600	1830				
Shale	1830	1900				
Sand / Shale	1900	2065			B 1890	JUL 11 2012 DEP SOUTHWEST REGION OIL & GAS
Sand / Shale	2065	2350			B 1920	
Red Rock	2350	2450				
Shale	2450	2500				
Sand	2500	2600				
Sand / Shale	2600	2750				
Sand	2750	2900				
Sand / Shale	2900	3370	3171	3171		

If no show of oil, gas or water, explain why:

WELL SERVICE COMPANIES (Provide the name, address, and telephone number of all well service companies involved.)

Casing Source	Cementing Company	Hardware Supplier	Logging Company
Name McJunkin Redman Corporation	Name Universal Well Services, Inc.	Name Ken Miller Supply, Inc.	Name Weatherford International
Address 480 Geesey Road	Address 324 Meter St.	Address 5484 Route 286 Hwy. E.	Address 124 Windy Ridge Lane
City - State - Zip Indiana PA 15701	City - State - Zip Punxsutawney PA 15767	City - State - Zip Indiana PA 15701	City - State - Zip Elderton PA 15736
Phone (724)349-6823	Phone (814)938-5327	Phone (724)465-8875	Phone (724)354-3090

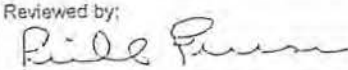
I do hereby certify to the best of my knowledge, information and belief that the well identified on this Well Record has been properly cased and cemented in accordance with the requirements of 25 Pa. Code Chapter 78 and any conditions contained in the permit for this well. In addition, I do hereby certify that any casing which is attached to a blow-out preventer with a pressure rating greater than 3,000 psi has passed a pressure test in accordance with 25 Pa. Code §78.84(f). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Driller(s)				Well Operator's Signature		DEP USE ONLY	
Name U.S. Energy	Rig 4	Name Les Wilson Inc.	Rig 25	 Printed Name / Title: Marc Jacobs / Vice President		Reviewed by:	
Address P.O. Box 237		Address P.O. Box 331				 7-18-12 Comments:	
City - State - Zip Central Valley PA 18249		City - State - Zip Carmi IL 62821					
Phone (724)783-7624		Phone (618)382-4867					

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Completion Report

DEP USE ONLY	
Site ID	Primary Facility ID
Client ID	Sub Facility ID

Well Information									
Well Operator Penneco Oil Company		DEP ID# 7674		Well API # 37-003-22205-00-01			Well Farm Name Burton Unit		Well # 4H
Address 6608 Route 22				LAT - 40° 30' 48.0900" LONG - 79° 42' 54.0500"		NAD 83	Project Number		Serial # PB-1752
City Delmont		State PA	Zip Code 15626	Municipality Plum			County Allegheny		
Phone (724)468-8232		Fax (724)468-8230		Email penneco@penneco.com			USGS 7.5 min. quadrangle map New Kensington East		Section 7
Check the appropriate submission: ☒ Original Completion Report ☐ Amended Completion Report									
STIMULATION BASE FLUID									
List Water Management Plan Source(s)				Water Management Plan ID			Volume (Gallons)		
1. Not Applicable									
2.									
3.									
4.									
5.									
6.									
				DEP Biologist Review/Date		Total Gallons of Water Used		Water	Recycled
Other Base Fluid(s) Used								Quantity and /UOM	
1.								/	
2.								/	
Total Quantity all Fluid(s)								/	
STIMULATION/PRODUCTION INFORMATION (WELL)									
Radioactive tracers used? ☐		24 Hr. Open-Flow (MCF/Day) / Date Still Testing / --			24 Hr. Shut-in Pressure/ Date Still Testing / --			Completion Date: 07/24/12	
Specify Tracer		☒ Gas Stu 1050 (Expected)		☒ Oil API G 39 (Expected)		☐ Condensate API G		☐ Other	
Well Products:		☐ GOR Still Testing							
WELL SERVICE COMPANIES									
Perforation Company			Frac Company			Plug Drill Out/Flow Back Company			
Name Titan Wireline Services			Name Universal Well Services, Inc.			Name Multi Production Systems Inc.			
Address 717 Pennsylvania 210			Address 324 Meter St.			Address 314 Mill Run Drive			
City - State - Zip Shelock PA 15774			City - State - Zip Punxsulawney PA 15767			City - State - Zip Indiana PA 15701			
Phone (724)354-2629			Phone (814)938-5327			Phone (724)465-6663			
I do hereby certify to the best of my knowledge, information and belief that the information contained on this Completion Report is true and correct. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.									
Well Operator's Signature					DEP USE ONLY				
					Reviewed by: 				
Printed Name / Title: Marc Jacobs / Vice President					Date: 8/8/12				
					Comments:				
					Date: 8-28-12				

Page 1 of 15 GAS

AUG 13 2012

NO. 763,00027, RI. 620M
20-1-1955

Well API# 37-003-22205-00-01

[illegible]

003-22205

Well API# 37-003-22205-00-01

STIMULATION FLUID ADDITIVES

Note: Information designated as Trade Secret or Confidential proprietary information must be clearly identified as such and should be submitted on the "Confidential Stimulation Fluid Additives" form.

Trade Name	Supplier	Purpose	Ingredients	CAS # of Chemical Component	Max. Component % Mass in Additive	Chemical Component % Mass used in Total Base Fluid (Pg 1)	Comment
ALPHA 3335	Clearwater International LLC	Corrosion Inhibitor	Solvent Naptha (Petroleum), petroleum aromatic	84742-94-5	65 - 100%	0.069%	
ALPHA 3335	Clearwater International LLC	Corrosion Inhibitor	Poly(oxy- 1,2- ethanediyl), a(nonylphenyl)- w- hydroxy- phosphate	51811-79-1	30 - 60%	0.040%	
ALPHA 3335	Clearwater International LLC	Corrosion Inhibitor	Naphthalene	91-20-3	3 - 7%	0.004%	
CLA CHEK LP	Clearwater International LLC	Clay Control	Ethylene Glycol	107-21-1	30 - 60%	0.023%	
EC8116A	Nalco Company	Biocide	Dibromosetonitrile	3252-43-5	1.0 - 5.0%	0.000%	
EC8116A	Nalco Company	Biocide	2,2-Dibromo-3-nitropropionamide	10222-01-2	10.0 - 30.0%	0.003%	
EC8116A	Nalco Company	Biocide	Polyethylene Glycol	25322-68-3	30.0 - 60.0%	0.007%	
Flomax 50	CESI Chemical	Flow Control	Isopropanol	67-63-0	1 - 15%	0.009%	
Flomax 50	CESI Chemical	Flow Control	Citrus Terpenes	94256-47-4	1 - 15%	0.000%	
Hydrochloric Acid	Niacet Corporation	Formation Breaker	Hydrochloric Acid	7647-01-0	31 - 33%	0.445%	
IRON STA II C	Clearwater International LLC	Iron Control Agent	Ethylene Glycol	107-21-1	10 - 30%	0.010%	
LEB 10X	Clearwater International LLC	Gel Breaker	Ethylene Glycol	107-21-1	30 - 60%	0.001%	
NE-90	Universal Well Services, Inc.	Flow Control	Methanol	67-56-1	30 - 60%	0.023%	
NE-90	Universal Well Services, Inc.	Flow Control	Isopropanol	67-63-0	5.0 - 10.0%	0.004%	
NE-90	Universal Well Services, Inc.	Flow Control	Heavy Aromatic Naptha	64742-94-5	1.0 - 5.0%	0.002%	
NE-90	Universal Well Services, Inc.	Flow Control	Polyethylene Glycol	25322-68-3	1.0 - 5.0%	0.002%	
NE-90	Universal Well Services, Inc.	Flow Control	EO-C7-9-iso, C8-rich alcohols	78330-19-5	1.0 - 5.0%	0.002%	
NE-90	Universal Well Services, Inc.	Flow Control	EO-C9-11-iso, C10-rich alcohols	78330-20-8	1.0 - 5.0%	0.002%	
NE-90	Universal Well Services, Inc.	Flow Control	2-Ethylhexanol	104-78-7	5.0 - 10.0%	0.004%	
NE-90	Universal Well Services, Inc.	Flow Control	Naphthalene	91-20-3	0.1 - 1.0%	0.000%	
Sand	Unimin Corporation	Proppant	Crystalline Silica in the form of Quartz	14808-80-7	87 - 99.9%	6.274%	
SUPER SURF	Clearwater International LLC	Surface Tension Reducer	Methanol	67-56-1	30 - 60%	0.023%	
Unigel 5F	Clearwater International LLC	Gelling Agent	Guar Gum	N/A	>95%	0.084%	

Please insert additional copies of this page if additional rows are needed.

SEP 10 2013
DEP. SOUTHWEST ENERGY

003-22205

Well API# 37 -003-22205-00-01

STIMULATION INFORMATION / STAGE

Complete a separate record for each stimulation stage. (Please Insert additional lines for additional stages or additional pages as applicable).

Slg #	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Proppant Type	Proppant Mesh Size(s)
1	07/24/12	38.0	4,230	3,013	1,800	White Sand	20/40
2	07/24/12	40.0	4,137	3,760	1,900	White Sand	20/40
3	07/24/12	40.0	3,882	5,012	1,850	White Sand	20/40
4	07/24/12	40.0	3,926	5,060	2,000	White Sand	20/40
5	07/24/12	31.0	4,375	4,620	2,000	White Sand	20/40
6	07/24/12	23.0	4,600	5,060	1,950	White Sand	20/40
7	07/24/12	19.0	4,724	4,750	1,900	White Sand	20/40
8	07/25/12	40.0	3,660	5,310	1,950	White Sand	20/40
9	07/25/12	40.0	4,130	5,600	2,000	White Sand	20/40
10	07/25/12	40.0	3,552	5,610	1,950	White Sand	20/40
11	07/25/12	40.0	3,926	5,620	2,100	White Sand	20/40
12	07/25/12	40.0	3,691	6,000	2,100	White Sand	20/40
13	07/25/12	40.0	3,530	5,610	2,000	White Sand	20/40
14	07/25/12	40.0	4,370	5,620	2,000	White Sand	20/40
15	07/25/12	40.0	3,904	5,600	2,100	White Sand	20/40
16	07/25/12	40.0	3,505	5,460	1,900	White Sand	20/40
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AUG 13 2012

DLP SOUTHWEST REGION
08/13/12

5500-PM-OG0002

Rev. 9/2008

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF ENVIRONMENTAL PROTECTION OIL AND GAS MANAGEMENT PROGRAM WELL LOCATION PLAT

003-22215

DEP	Auth	NC-908188	TF
USE	Permit	003-22215	1-18-12
ONLY	Project		

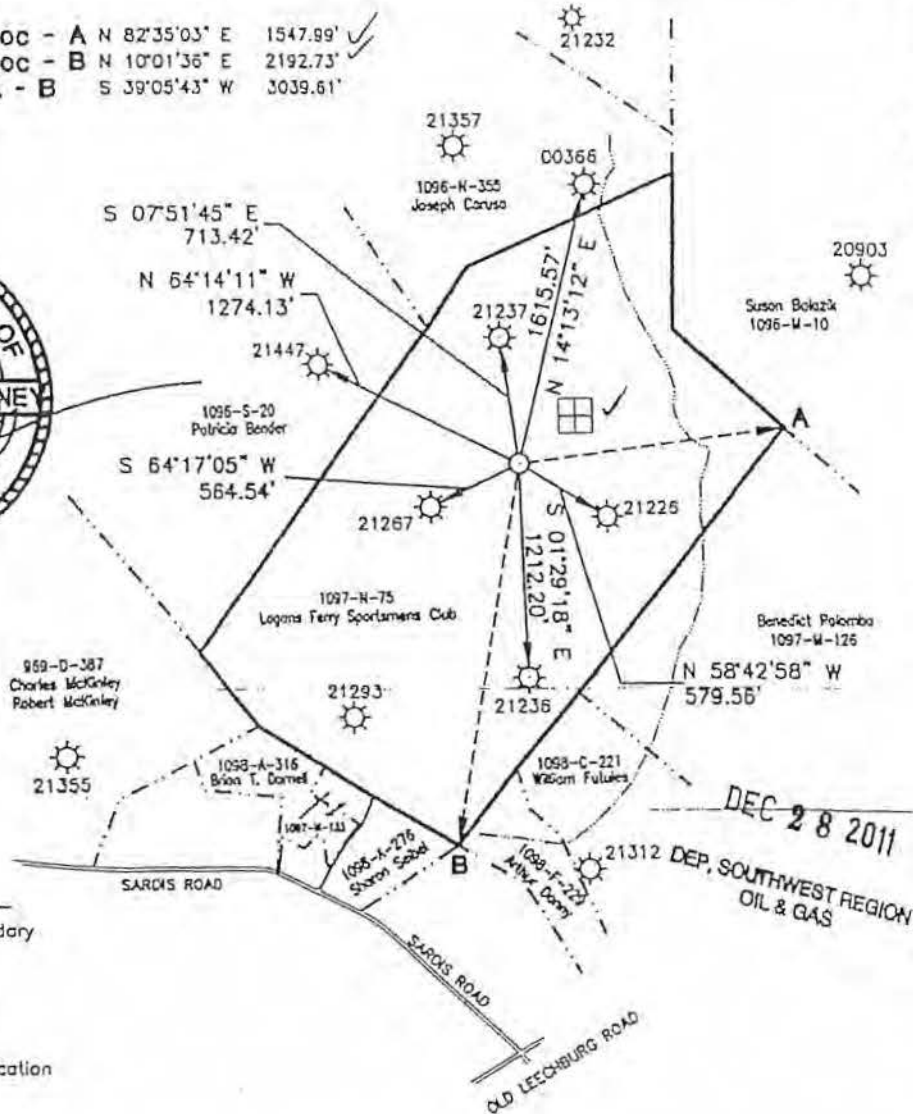


Denotes location of well on topo map.

True Latitude: NORTH
40° 31' 34.52"
True Longitude: WEST
79° 43' 36.08"

Well is located on topo map 5,614 feet south of latitude 40° 32' 30"

Loc - A N 82°35'03" E 1547.99' ✓
Loc - B N 10°01'36" E 2192.73'
A - B S 39°05'43" W 3039.61'



Legend

- Lease Tract Boundary
- - - Surface Tract
- == Roads
- Streams/Water
- Proposed Well Location
- ☼ Existing Well
- ⊗ Plugged Well

Surveyor or Engineer: W.D. Mohney & Associates (724) 543-1023		Phone #:	Day #	Date: December 16, 2011	Scale: 1" = 1000'	Tract Acreage: 145 ±
Lat & Long Method: GPS-Code Based Accuracy 10 ± ft. Datum NAD 83		Elevation Method: PASDA LIDAR Accuracy 30 ± ft. Datum NGVD29		Survey Date: Various Dates		
Applicant / Well Operator Name: Penneca Oil Company ✓		Well (Form) Name: Logans Ferry Sportsman's Club ✓		Well #:		Serial: PL-1801
Address: 6608 US Route 22, Delmont, PA. 15626 ✓		County: Allegheny ✓		Municipality: Plum Borough ✓		Well Type: New Gas Well
Surface Landowner / Lessor: Logans Ferry Sportsman's Club ✓		USGS 7 1/2" Quadrangle Map Name: New Kensington East, PA. - 1408		Map Section: 7 ✓		Surface Elevation: 1085 ft.
Target Formation(s): Speechley		Angle & Course of Deviation (Drilling): None		Anticipated Total Depth ft.: TWO 3800'		TWO 3800'
Surface Owner or Water Purveyor Approximate Course and Distance to Water Supply: NONE						
Owner Leases to Operator of Coal Seam: Non-Coal Area						
Name of Coal Seam: G&B - Upper Freeport Coal						



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil & Gas Management Program

003-22215

DEP USE ONLY
Application Tracking #
NC-908168

Proposed Alternate Method or Material for
Casing, Plugging, Venting or Equipping a Well

Well Operator Penneco Oil Company	DEP ID# 7674	Well Permit or Registration Number 003-22215-00
Address 6608 Route 22		Well Form Name Logans Ferry Sportsman's Club
City Delmont	State PA	Well # #6
Phone 724-468-8232	Zip Code 15626-2408	Serial # PL-1801
Fax 724-468-8230		County Allegheny
		Municipality Plum Borough

A proposed alternate method is subject to provisions in Section 211 of the Oil and Gas Act, Section 13 of the Coal and Gas Resource Coordination Act, and 25 PA Code §78.75 Alternate Methods. Attach proof of notification of coal operator(s).

Describe in reasonable detail using a written description and / or diagram:

1. the proposed alternate method or materials, and
2. the manner in which the alternative will satisfy the goals of the laws and regulations.

The purpose of this submission is to account for the proximity of the referenced well to the documented boundary of an abandoned deep mine and to offer an alternative casing scenario should the coal isolation segment of the well realize a mine void.

In the event that the construction of the above referenced well were interrupted by a mine void encounter rather than the anticipated stump or solid coal, the drilling contractor will continue drilling another 50 feet below the mine floor (ream if necessary), install the requisite isolation string of casing (basket set above mine ceiling), and cement using the balance and grout method.

DEC 28 2011

DEP, SOUTHWEST REGION
OIL & GAS

Optional: Approval by Coal Owner or Operator	Signature of Applicant / Well Operator
Signature _____ Date _____	Signature Date 12/27/11
Print or Type Signer's Name and Title _____	Print or Type Signer's Name and Title D. Marc Jacobs, Jr. Senior Vice President

If optional approval is signed by coal owner or operator, the 15-day objection period may be waived.

DEP USE ONLY	
Approved by: (DEP Manager) 	Conditions: ☒ YES, See Attached ☐ NO
	Date 1/23/12

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003-22215

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3000-FM-OOGM0004a 2/2012



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

Well Record

DEP USE ONLY	
Site ID	Client ID
Client ID	Sub Facility ID

WELL INFORMATION							
Well Operator Penneco Oil Company		DEP ID# 7674		Well API # 37-003-22215-00		Well Farm Name Logans Ferry Sportsmans Club	
Address 6608 Route 22		LAT 40°31' 34.5200"		NAD 83		Well # 6	
City Delmont		State PA		Zip 15626-2408		Project Number Serial # PL-1801	
Phone (724)468-8232		Fax (724)468-8230		Email penneco@penneco.com		County Allegheny	
USGS 7.5 min. quadrangle map New Kensington East		Section 7					
Check the appropriate Submission: ☒ Original Well Record ☐ Amended Well Record							
Well Type ☒ Gas ☐ Oil ☐ Combination Oil & Gas ☐ CBM ☐ Injection ☐ Disposal ☐ Storage		Wellbore Conditioning:					
Well Orientation ☒ Vertical ☐ Deviated from Vertical (Top & Side views & Deviation Survey must be attached)		String Time / Volume / Rate / Material					
Drill Method(s) ☒ Rotary - Air 3410' ☐ Rotary - Mud ☐ Cable Tool ☐ Other		GROUT (No Conditioning)					
Drilling Started 04/01/12		Surface Elev. 1085 ft.		GW Depth 545 ft.		9 5/8" 10 min / 4.5 BBL / 3-5 BPM / Gel and Bariteal	
Drilling Complete 04/10/12		True Vertical Depth 3410 ft.		Depth of DFGW 545 ft.		7" 5 min / 35 BBL / 3-5 BPM / Gel and Bariteal	
Date Well Completed 04/10/12		Total Measured Depth 3410 ft.		DFGW decided by		4 1/2" 4 min / 35 BBL / 4 BPM / Gel	

CEMENT							
Cement returned on surface casing? ☒ Yes ☐ No		If No, provide depth to top of cement and method used to determine:					
Cement returned on coal protective casing? ☒ Yes ☐ No		If No, provide depth to top of cement and method used to determine: ☐ NA					
Cement returned on intermediate casing? ☒ Yes ☐ No		If No, provide depth to top of cement and method used to determine: ☐ NA					
Casing String	Type/Class of Cement (Lead/Tail)	Slurry Temp F°	Amount of Cement (sks) (Lead/Tail/Total)	WOC hrs	WT PPG	Yd sk	Gas Migration Controls Used
Conductor	CLA A, 3%cc Y# flake	50 °	10 / 0 / 10	8	15.6	1.18	Gas Block for coal protective string cement
Surface	CLA A, 3%cc Y# flake	50 °	385 / 0 / 385	8	15.6	1.18	
Coal Protective	Gas Block	50 °	375 / 0 / 375	8	15.7	1.3	
Intermediate		*	/ /				
Production	Unipro 171	50 °	51 / 0 / 51	8	13.6	1.71	
If additional strings attach form(s)			Total 821				

CASING AND TUBING								
Hole Size	Pipe Size	Wt. #/ft.	Grade Casing / Tubing Type	Thread / Weld - New/ Used	Amount In Well (ft.)	Hardware - Baskets / Packer / Centralizers (Total/String)	Size	Date Run
17 1/2"	13 3/8"	37.00	L/S R-3	T - N	74	guide shoe	13 3/8"	04/01/12
12 3/8"	9 5/8"	26.00	250W R-3	T - N	640	guide shoe	9 5/8"	04/02/12
8 7/8"	7"	19.00	250W R-3	T - N	2002	guide shoe	7"	04/05/12
6 1/4"	4 1/2"	10.50	65 Grade	T - N	3317	float shoe	4 1/2"	04/10/12

If any casing is welded, provide the name(s) of the welder(s):

FILL MATERIAL & PLUGS		Depth		Date	Casing & Tubing		
		From	To		Size	Pulled	Left
MAY 22 2012							
DEP, SOUTHWEST REGION OIL & GAS							

003-22215

LOG OF FORMATIONS

Well API#: 37-003-22215-00

(If you will need more space than this page, please photocopy the blank form before filling it in.)

Formation Name or Lithology	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Fill	0	5				Driller's Log
Red Rock	5	70				
Sand	70	120				
Sandy Shale	120	180				
Red Rock	180	330				
Sandy Shale	330	420				
Coal	420	423			F 545	
Sand	423	535				
Coal	535	545				
Shale	545	600				
Sand / Shale	600	664				
Shale	664	715				
Coal	715	720				
Sand	720	870				
Sand / Shale	870	1170				
Sandy Shale	1170	1620			B 1200	
Sand / Shale	1620	2010			B 1810	
Sand	2010	2400				
Sandy Shale	2400	2700				
Sand / Sandy Shale	2700	3300				
Shale	3300	3410				

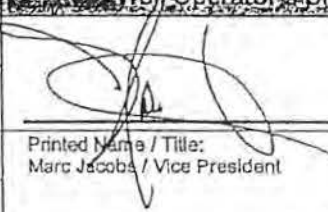
MAY 22 2012
DEPT. OF ENVIRONMENT
OIL & GAS

If no show of oil, gas or water, explain why:

WELL SERVICE COMPANIES (Provide the name, address, and telephone number of all well service companies involved.)

Casing Source	Cementing Company	Hardware Supplier	Logging Company
Name McJunkin Redman Corporation	Name Universal Well Services, Inc.	Name Ken Miller Supply, Inc.	Name Weatherford International
Address 480 Geesey Road	Address 324 Meter St.	Address 5484 Route 286 Hwy. E.	Address 124 Windy Ridge Lane
City - State - Zip Indiana PA 15701	City - State - Zip Punxsutawney PA 15767	City - State - Zip Indiana PA 15701	City - State - Zip Elderton PA 15736
Phone (724)349-6823	Phone (814)938-5327	Phone (724)465-8875	Phone (724)354-3080

I do hereby certify to the best of my knowledge, information and belief that the well identified on this Well Record has been properly cased and cemented in accordance with the requirements of 25 Pa. Code Chapter 78 and any conditions contained in the permit for this well. In addition, I do hereby certify that any casing which is attached to a blow-out preventer with a pressure rating greater than 3,000 psi has passed a pressure test in accordance with 25 Pa. Code §78.84(f). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Driller		Well Operator's Signature		DEPT. USE ONLY	
Name U. S. Energy	Plg 4	 Printed Name / Title: Marc Jacobs / Vice President		Reviewed by:	
Address P.O. Box 237				Comments:	
City - State - Zip Rural Valley PA 16249					
Phone (724)783-7624		Date: 5/18/12			



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

Completion Report

DEP USE ONLY	
Site ID	Primary Facility ID
Client ID	Sub Facility ID

Well Information					
Well Operator Penneco Oil Company		DEP ID# 7674	Well API # 37-003-22215-00		Well Farm Name Logans Ferry Sportsmans Club
Address 6608 Route 22			LAT - 40° 31' 34.5200"	NAD 83	Well # 6
City Dalmont		State PA	Zip Code 15626	Project Number	Serial # PL-1801
Municipality Plum		County Allegheny			
Phone (724)468-8232	Fax (724)468-8230	Email penneco@penneco.com		USGS 7.5 min. quadrangle map New Kensington East	Section 7
Check the appropriate submission: ☒ Original Completion Report ☐ Amended Completion Report					

STIMULATION BASE FLUID			
List Water Management Plan Source(s)	Water Management Plan ID	Volume (Gallons)	
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
DEP Biologist Review/Date		Total Gallons of Water Used	Water Recycled
Other Base Fluid(s) Used		Quantity and UOM	
1.		/	
2.		/	
Total Quantity all Fluid(s)		/	

STIMULATION/PRODUCTION INFORMATION (WELL)			
Radioactive tracers used? ☐ Specify Tracer	24 Hr. Open-Flow (MCF/Day) / Date 119 MCFD / 05/02/12	24 Hr. Shut-In Pressure / Date 440 PSI / 05/02/12	Completion Date: 05/02/12
Well Products: ☒ Gas Btu 1050 (Expected)	☐ Oil API G	☐ Condensate API G	☐ Other
☐ GOR Still Testing			

WELL SERVICE COMPANIES		
Perforation Company	Frac. Company	Prod. Drill Out/Flow Back Company
Name Titan Wireline Services	Name Universal Well Services, Inc.	Name Multi Production Systems Inc.
Address 717 Pennsylvania 210	Address 324 Meter St.	Address 314 Mill Run Drive
City - State - Zip Shelock PA 15774	City - State - Zip Punxsutawney PA 15767	City - State - Zip Indiana PA 15701
Phone (724)354-2629	Phone (814)938-5327	Phone (724)465-6683

I do hereby certify to the best of my knowledge, information and belief that the information contained on this Completion Report is true and correct. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Well Operator's Signature	DEP USE ONLY
 Printed Name / Title: Marc Jacobs / Vice President	Reviewed by: _____ Date: _____ Comments: _____

5/18/12

MAY 22 2012

DEP, SOUTHWEST REGION
OIL & GAS

PERFORATION RECORD

MAY 22 2012
DEP, SOUTHWEST REGION
OIL & GAS

Well API# 37 -003-22215-00

003-22215

STIMULATION INFORMATION / STAGE

Complete a separate record for each stimulation stage. (Please insert additional lines for additional stages or additional pages as applicable).

Stg #	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Proppant Type	Proppant Mesh Size(s)
1	05/02/12	35.0	3,485	3,675	1,900	White Sand	20/40
2	05/02/12	26.0	2,475	3,730	1,850	White Sand	20/40
3							
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MAY 22 2012

DEP, SOUTHWEST REGION
OIL & GAS

✓

Well Record

DEP USE ONLY	
Site ID	Client id
Client id	Sub Facility id

WELL INFORMATION									
Well Operator Penneco Oil Company			DEP ID# 7674		Well API # 37-003-22215-00		Well Farm Name Logans Ferry Sportsmans Club		Well # 6
Address 6608 Route 22				LAT 40°31' 34.5200" LONG - 79°43' 36.0800"		NAD 83		Project Number	Serial # PL-1801
City Delmont		State PA	Zip 15626-2408	Municipality Plum		County Allegheny			
Phone (724)468-8232		Fax (724)468-8230		Email penneco@penneco.com			USGS 7.5 min. quadrangle map New Kensington East		Section 7
Check the appropriate Submission: ☒ Original Well Record ☐ Amended Well Record									
Well Type		☒ Gas ☐ Oil ☐ Combination Oil & Gas ☐ CBM ☐ Injection ☐ Disposal ☐ Storage							
Well Orientation		☒ Vertical ☐ Deviated from Vertical (Top & Side views & Deviation Survey must be attached)							
Drill Method(s)		☒ Rotary - Air 3410' ☐ Rotary - Mud ☐ Cable Tool ☐ Other							
Drilling Started		04/01/12		Surface Elev.		1085 ft.		GW Depth 545 ft.	
Drilling Complete		04/10/12		True Vertical Depth		3410 ft.		Depth of DFGW 545 ft.	
Date Well Completed		04/10/12		Total Measured Depth		3410 ft.		DFGW decided by 1	
								Wellbore Conditioning:	
								String Time / Volume / Rate / Material	
								13 3/8" Grout (No Conditioning)	
								5 5/8" 10 min / 4.5 BBL / 3-5 BPM / Gel and Barocel	
								7" 5 min / 25 BBL / 3-5 BPM / Gel and Barocel	
								4 1/2" 4 min / 35 BBL / 4 BPM / Gel	

CEMENT

Cement returned on surface casing? ☒ Yes ☐ No			If No, provide depth to top of cement and method used to determine:				
Cement returned on coal protective casing? ☒ Yes ☐ No			If No, provide depth to top of cement and method used to determine: ☐ NA				
Cement returned on intermediate casing? ☒ Yes ☐ No			If No, provide depth to top of cement and method used to determine: ☐ NA				
Casing String	Type/Class of Cement (Lead/Tail)	Slurry Temp F*	Amount of Cement (sks) (Lead/Tail/Total)	WOC hrs	WT PPG	Yd / sk	Gas Migration Controls Used
Conductor	CLAA, 3%cc ½ sks	50 °	10 / 0 / 10	8	15.8	1.18	If any cement was used in any (additional) annulus, specify type and depth. Gas Block for coal protective string cement
Surface	CLAA, 3%cc ½ sks	50 °	385 / 0 / 385	8	15.8	1.18	
Coal Protective	Gas Block	50 °	375 / 0 / 375	8	15.7	1.3	
Intermediate		"	/ /				
Production	Unipro 171	50 °	51 / 0 / 51	8	13.8	1.71	
If additional strings attach form(s)			Total 821				

CASING AND TUBING

Hole Size	Pipe Size	Wt. #/ft.	Grade Casing / Tubing Type	Thread / Weld - New/ Used	Amount In Well (ft.)	Hardware - Baskets / Packer / Centralizers (Total/String)			Date Run
						Type	Size	Depth	
17 1/2"	13 3/8"	37.00	L/S R-3	T - N	74	guide shoe	13 3/8"	74	04/01/12
12 3/8"	9 5/8"	26.00	.250W R-3	T - N	640	guide shoe	9 5/8"	640	04/02/12
8 7/8"	7"	19.00	.250W R-3	T - N	2002	guide shoe	7"	2002	04/05/12
6 1/4"	4 1/2"	10.50	65 Grade	T - N	3317	float shoe	4 1/2"	3317	04/10/12
				-					

If any casing is welded, provide the name(s) of the welder(s):

PLUG-BACKWELLBORE ALTERATION

Fill Material & Plugs	Depth		Date	Casing & Tubing		
	From	To		Size	Pulled	Left
MAY 28 2012						
DER SOUTHWEST REGION OIL & GAS				JUN 27 2012		
				SOUTHWEST REGION		

003-22215

LOG OF FORMATIONS

Well API#: 37-003-22215-00

(If you will need more space than this page, please photocopy the blank form before filling it in.)

Formation Name or Lithology	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Fill	0	5				Driller's Log
Red Rock	5	70				
Sand	70	120				
Sandy Shale	120	180				
Red Rock	180	330				
Sandy Shale	330	420				
Coal	420	423			F 545	
Sand	423	535				
Coal	535	545				
Shale	545	600				
Sand / Shale	600	664				
Shale	664	715				
Coal	715	720				
Sand	720	870				
Sand / Shale	870	1170				
Sandy Shale	1170	1620			B 1200	
Sand / Shale	1620	2010			B 1810	
Sand	2010	2400				
Sandy Shale	2400	2700				
Sand / Sandy Shale	2700	3300				
Shale	3300	3410				

JUN 11 2012
DEP. SOUTHWEST REGION
OIL & GAS

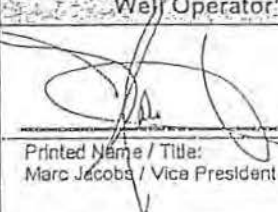
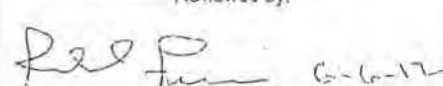
MAY 22 2012
DEP. SOUTHWEST REGION
OIL & GAS

If no show of oil, gas or water, explain why:

WELL SERVICE COMPANIES (Provide the name, address, and telephone number of all well service companies involved.)

Casing Source	Cementing Company	Hardware Supplier	Logging Company
Name McJunkin Redman Corporation	Name Universal Well Services, Inc.	Name Ken Miller Supply, Inc.	Name Weatherford International
Address 480 Geesey Road	Address 324 Meter St.	Address 5484 Route 286 Hwy. E.	Address 124 Windy Ridge Lane
City - State - Zip Indiana PA 15701	City - State - Zip Punxsutawney PA 15767	City - State - Zip Indiana PA 15701	City - State - Zip Elderton PA 15736
Phone (724)349-8823	Phone (814)938-5327	Phone (724)465-8875	Phone (724)354-3090

I do hereby certify to the best of my knowledge, information and belief that the well identified on this Well Record has been properly cased and cemented in accordance with the requirements of 25 Pa. Code Chapter 78 and any conditions contained in the permit for this well. In addition, I do hereby certify that any casing which is attached to a blow-out preventer with a pressure rating greater than 3,000 psi has passed a pressure test in accordance with 25 Pa. Code §78.84(f). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Driller		Well Operator's Signature		DEP-USE ONLY	
Name U. S. Energy	Rtg 4	 Printed Name / Title: Marc Jacobs / Vice President		Reviewed by:	
Address P.O. Box 237				 Comments:	
City - State - Zip Central Valley PA 16249					
Phone (724)783-7624		Date: 5/18/12			



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

GEO COPY

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

Completion Report

003-22215

CF

DEP USE ONLY	
Site ID	Primary Facility ID
Client ID	Sub Facility ID

Well Information							
Well Operator Pennaco Oil Company		DEP ID# 7874	Well API # 37-003-22215-00		Well Farm Name Logans Ferry Sportmans Club	Well # 6	
Address 8608 Route 22			LAT - 40° 31' 34.5200"	NAD 83	Project Number		Serial # PL-1801
City Delmont			State PA	Zip Code 15626	Municipality Plum		County Allegheny
Phone (724)468-8232		Fax (724)468-8230	Email pennaco@pennaco.com		USGS 7.5 min. quadrangle map New Kensington East		Section 7
Check the appropriate submission: ☒ Original Completion Report ☐ Amended Completion Report							

STIMULATION BASE FLUID			
List Water Management Plan Source(s)		Water Management Plan ID	Volume (Gallons)
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
DEP Biologist Review/Date		Total Gallons of Water Used	Water Recycled
Other Base Fluid(s) Used		Quantity and UOM	
1.		/	
2.		/	
Total Quantity all Fluid(s)		/	

STIMULATION/PRODUCTION INFORMATION (WELL)			
Radioactive tracers used? ☐	24 Hr. Open-Flow (MCF/Day) / Date 119 MCFD / 05/02/12	24 Hr. Shut-in Pressure / Date 440 PSI / 05/02/12	Completion Date: 05/02/12
Specify Tracer	☒ Gas Btu 1050 (Expected)	☐ Oil API G	☐ Condensate API G
Well Products:	☐ Other	☐ GOR Still Testing	

WELL SERVICE COMPANIES		
Perforation Company	Frac Company	Plug-Drill Out/Flow Back Company
Name Titan Wireline Services	Name Universal Well Services, Inc.	Name Multi Production Systems Inc.
Address 717 Pennsylvania 210	Address 324 Meter St.	Address 314 Mill Run Drive
City - State - Zip Shelock PA 15774	City - State - Zip Punxsutawney PA 15767	City - State - Zip Indiana PA 15701
Phone (724)354-2629	Phone (814)938-5327	Phone (724)465-6663

I do hereby certify to the best of my knowledge, information and belief that the information contained on this Completion Report is true and correct. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Well Operator's Signature		DEP USE ONLY	
 Printed Name / Title: Marc Jacobs / Vice President		Reviewed by: Date: 6-6-12	Comments:
Date: 5/18/12			

JUN 11 2012

MAY 22 2012

003-22215

Well API# 37-003-22215-00

STIMULATION FLUID ADDITIVES

Note: Information designated as Trade Secret or Confidential proprietary information must be clearly identified as such and should be submitted on the "Confidential Stimulation Fluid Additives" form.

Trade Name	Supplier	Purpose	Ingredients	CAS # of Chemical Component	Max. Component % Mass in Additive	Chemical Component % Mass Used in Total Base Fluid (Pg 1)	Comments
ALPHA 3385	Clearwater International LLC	Corrosion Inhibitor	Solvent Naphtha (Petroleum), petroleum aromatic	64742-94-5	65 - 100%	0.048%	
ALPHA 3385	Clearwater International LLC	Corrosion Inhibitor	Poly(oxy-1,2-ethanedithyl), a(nonylphenyl)-w-hydroxy phosphate	51811-79-1	30 - 60%	0.028%	
ALPHA 3385	Clearwater International LLC	Corrosion Inhibitor	Naphthalene	91-20-3	3 - 7%	0.003%	
CLA CHEK LP	Clearwater International LLC	Clay Control	Ethylene Glycol	107-21-1	30 - 60%	0.026%	
Flomax 50	CESI Chemical	Flow Control	Isopropanol	67-63-0	1 - 15%	0.008%	
Flomax 50	CESI Chemical	Flow Control	Citrus Terpenes	94268-47-4	1 - 15%	0.000%	
Hydrochloric Acid	Niacet Corporation	Formation Breaker	Hydrochloric Acid	7647-01-0	31 - 33%	0.186%	
IRON STA II C	Clearwater International LLC	Iron Control Agent	Ethylene Glycol	107-21-1	10 - 30%	0.010%	
NE-90	Universal Well Services, Inc	Flow Control	Methanol	67-56-1	30 - 60%	0.068%	
NE-90	Universal Well Services, Inc	Flow Control	Isopropanol	67-63-0	5.0 - 10.0%	0.011%	
NE-90	Universal Well Services, Inc	Flow Control	Heavy Aromatic Naphtha	64742-94-5	1.0 - 5.0%	0.005%	
NE-90	Universal Well Services, Inc	Flow Control	Polyethylene Glycol	25322-89-3	1.0 - 5.0%	0.005%	
NE-90	Universal Well Services, Inc	Flow Control	EO-C7-9-iso, C8-rich alcohols	78330-19-5	1.0 - 5.0%	0.005%	
NE-90	Universal Well Services, Inc	Flow Control	EO-C8-11-iso, C10-rich alcohols	78330-20-8	1.0 - 5.0%	0.005%	
NE-90	Universal Well Services, Inc	Flow Control	2-Ethylhexanol	104-76-7	5.0 - 10.0%	0.011%	
NE-90	Universal Well Services, Inc	Flow Control	Napthalene	91-20-3	0.1 - 1.0%	0.001%	
Sand	Unimin Corporation	Proppant	Crystalline Silica in the form of Quartz	14808-80-7	87 - 99.3%	8.168%	
ST-20	CESI Chemical	Friction Reducer	Hydrotreated Light Distillate	64742-47-8	10 - 30%	0.023%	
SUPER SURF	Clearwater International LLC	Surface Tension Reducer	Methanol	67-56-1	30 - 80%	0.029%	
				JUN 11 2012		MAY 22 2012	
				DER. SOUTHWEST REGION OIL & GAS		DER. SOUTHWEST REGION OIL & GAS	

Please insert additional copies of this page if additional rows are needed.

003-22215

Well API# 37 -003-22215-00

STIMULATION INFORMATION / STAGE

Complete a separate record for each stimulation stage. (Please Insert additional lines for additional stages or additional pages as applicable).

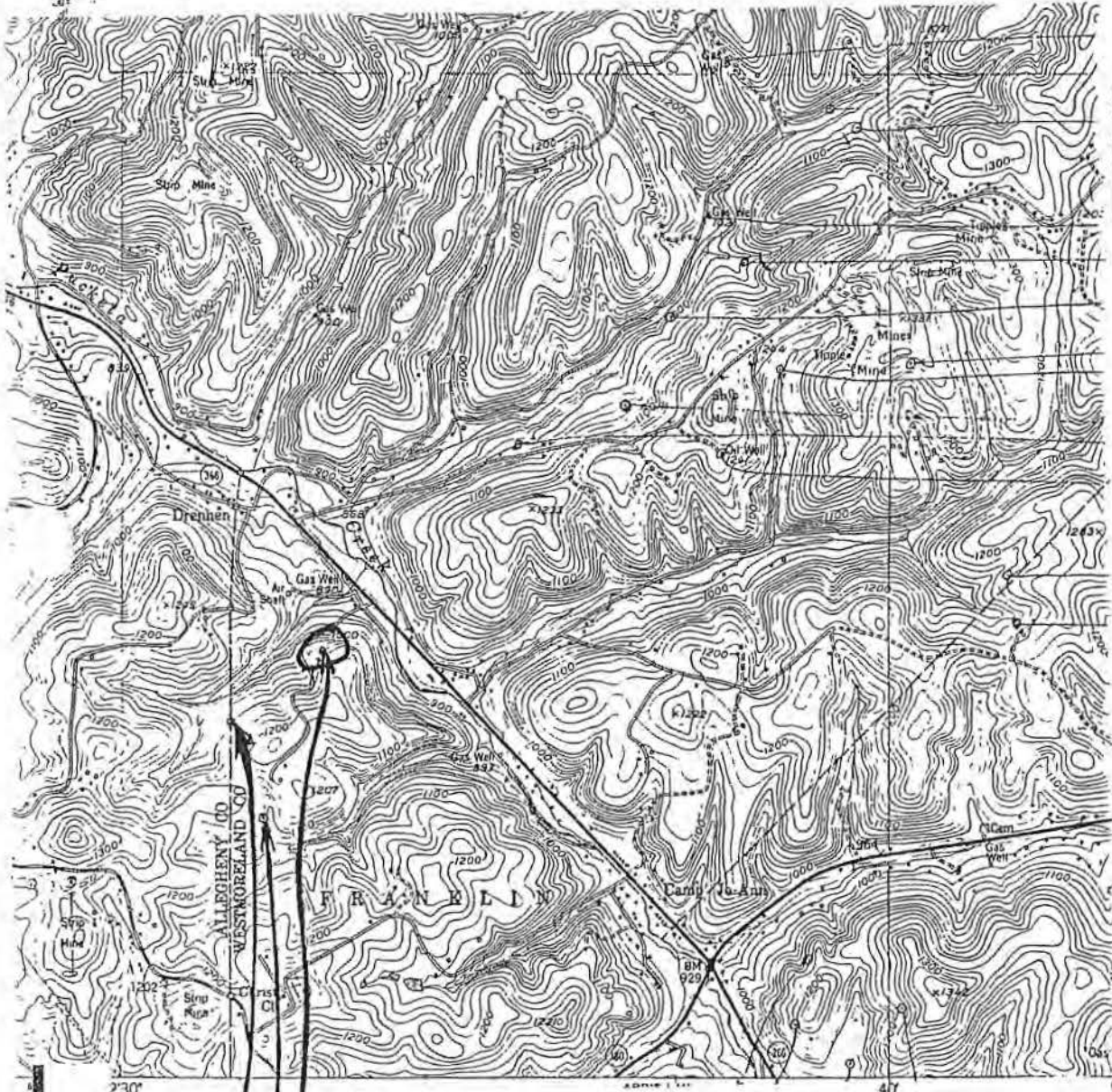
Stg #	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Proppant Type	Proppant Mesh Size(s)
1	05/02/12	35.0	3,485	3,675	1,900	White Sand	20/40
2	05/02/12	26.0	2,475	3,730	1,850	White Sand	20/40
3							
4							
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JUN 11 2012
 DEP. SOUTHWEST REGION
 OIL & GAS

MAY 22 2012

DEP. SOUTHWEST REGION
 OIL & GAS

8700' S
8500' W



129-00136

Frank Beighley #2-134 A
Frank Beighley #1-134 A
Lysie Hall #2-95 A

FRANKLIN TWP.

NEW KENSINGTON EAST
7.5' QUAD.

129-00136

ICY STANDARDS
NGTON, D C 20242
S AVAILABLE ON REQUEST

QUADRANGLE LOCATI

WELL REGISTRATION FORM

Page 2

To be used for well(s) not permitted or issued drilling file numbers under Act 225, The Pennsylvania Gas Operations, Well-Drilling, Petroleum and Coal Mining Act. Supply all available information.

T. W. Phillips Gas & Oil Co.

Operator Name
83 N. 1st St.
Address
Butler, Pa 16001
412-287-2751
Telephone #

Agent _____ Signature _____
Address _____
Telephone # _____

Project # _____
If previously assigned by Dept
County WESTMORELAND
129

Code	10-8-85
DATE	10-8-85

8700' S 40° 32' 30"
8500' W 79° 40' 00"
(N)
New Kensington East
7 1/2 miles

API/ Registration #	Municipality	Farm Name	Well #	Serial # Optional	Date Drilled	Type Well	T.D.	Casing Record Size (diam.) Length (ft)	Type and amount of cement	Packers Size/Type/Setting/Length	Producing Horizons
129-00134	Upper Burrell Twp.	W.J. Bescom 63 A	1		1928	Gas	3825'	10"-21' & 8 1/2"-195' 6 1/2" Pulled & 4-3/4"-975' 3" 3825'		3" Anchor 3145'	3725'-3745'
11 00135	Upper Burrell Twp.	J.J. Becker 86 A	1		1920	Gas	2491'	10"-40' & 6 1/2" Pulled 4-7/8" 2141' 3" 2184'		3" Wall 2184'	2182'-2213'
11 00136	Franklin Township	Lizzie Hall 95 A	2		1918	Gas	3824'	8 1/2"-237' & 6 1/2"-940' 4-3/4" 1964' 3" 3824'		3" Anchor 2310'	3050'-3062' 3125'-3168' 3724'-3740'
11 00137	Upper Burrell Twp.	J. P. Hamilton 81A	1		1922	Gas	3820'	8 1/2"-200' & 6 1/2" Pulled 4-3/4" 1975' 3" 3820'		3" Anchor 2125'	3035'-3045' 3110'-3155' 3708'-3730'
11 00138	Upper Burrell Twp.	J.P. Hamilton 81 A	2		1923	Gas	3770'	8 1/2"-150' & 6 1/2" Pulled 4-3/4" 1885' 3" 3770'		3" Anchor 1930'	3040'-3088' 3230'-3235' 3630'-3640' 3650'-3665'
11 00139	Upper Burrell Twp.	A.T. Miller 90 A	1		1915	Gas	3753'	6 1/2" 775' 4-3/4" 1766' 3" 3753'		3" Anchor 2145'	2200'-2240' 3660'-3674'
11 00140	Upper Burrell Twp.	J. McCrady, Sr 84 A	1		1917	Gas	3976'	6 1/2" Pulled 4-3/4" 2105' 3" 3976'		3" Anchor 2345'	2435'-2485' 3190'-3205' 3875'-3890'

Attachments Needed:

- ☒ 7 1/2 minute topographic map or other description to enable the Department to find the well site on the ground
☒ Proof of bond or blanket bond ☐ Alternate fees in lieu of bond

☒ Driller's log (if available)☒ Registration fee of \$15 per well or \$250 for blanket registration on well registrations submitted simultaneously for same project.

The registration number issued pursuant to this registration form shall be installed on the well in a legible, conspicuous and permanent manner within 60 days of issuance.

129-00136
WES-00736

DRILLERS' RECORD 129-00136

Well No. 2 Mr. Lizzie Hall Farm of 95 acres in Burrill Twp. Hastings County,
 Monmouth North by Eliza L. Brooks Mrs. East by Baxter Walker
 South by Frankie Beighley West by John Hamilton
 well is located about 350 feet from the South line and about 300 feet from the West line of the farm
 for the J. H. Phillips Land Co. Company and completed in the month of October 1918
 with 237 feet of 8 1/2 inch casing set in on packer
 Cased with 946 feet of 4 3/4 inch casing set in on packer
 Coal veins 47.5 - 48.2 - 7 ft. Location card filed in Franklin Twp
 Well is located in " " "
 Limestone 750 - 760 - 10 ft.

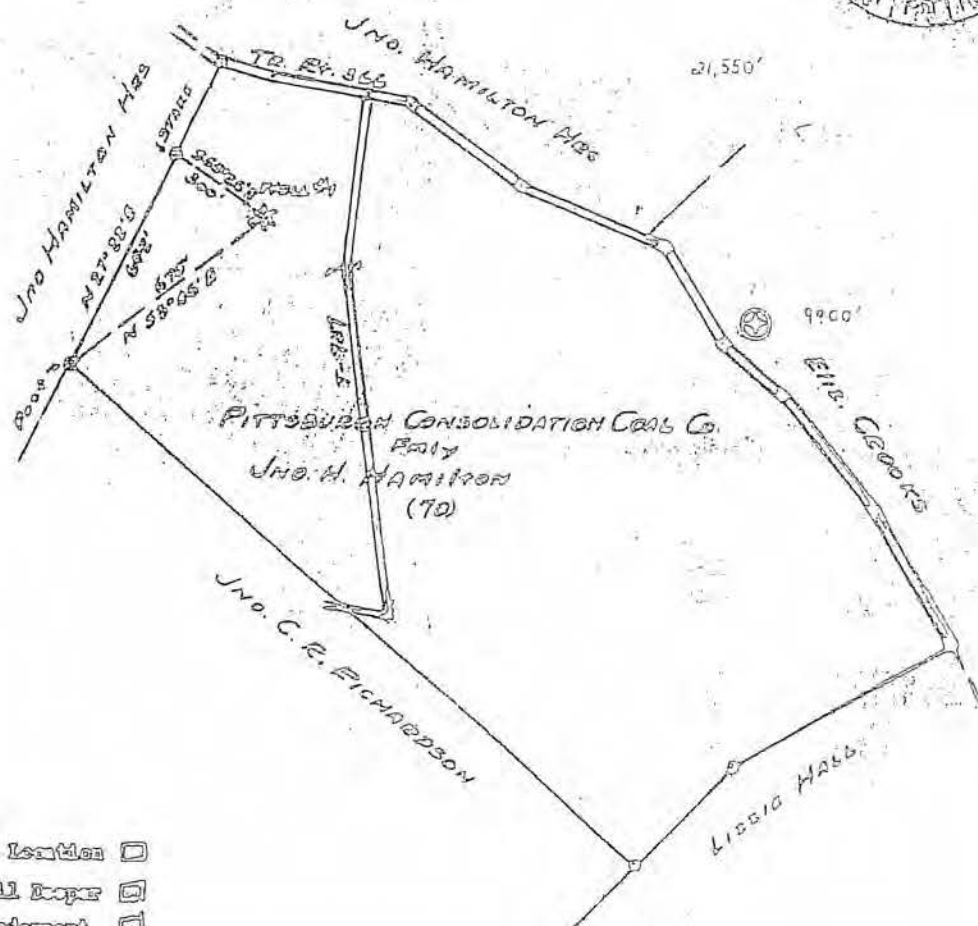
Kind of formation Sand or Slate, etc.	Top	Bottom	Thick-ness	Dist. from top of H.P.	If Sand give name	Description	If it contains gas, oil or water, state quantity and where in the sand found.
Sand	800	860	60		60 ft.		
"	877	935	58		40 ft.		
"	1025	1140	115		70 ft.		
"	1725	1830	105		Gas	White	Water at 1740.
"	1850	1964	114		150 ft.	"	Gas at 1899
"	1985	2010	25		30 ft.	"	
"	2100	2130	30		Boulder		
"	2150	2175	25		Thin		
"	2210	2220	10		Fourth		
"	2252	2340	88		Fifth		
"	3050	3062	12		Speechley		Gas at 3050 High
"	3125	3168	43		Speechley		Gas at 3131, 3141 and 3145
"	3427	3444	17		Sheffield Chocolate		
"	3724	3740	16		Bradford	"	Gas at 3724 to 3728 blew drillings up 50

Remarks Shot with 60gts Oct 18, 1918. 180⁵⁰

The above record was copied by me until it had been O. K'd or approved on the 20 day of Nov 1918
 by Supt. R. B. B.

129-20294

129-20294



- New Location ☐
 Drill Log ☐
 Amendment ☐
 Re-drill ☐

Company P. L. PHILLIPS GAS & OIL COMPANY

Address 205 N. Main St., Butler, Pa.

From Jno. Consolidation Coal Co. Jno. H. Hamilton

Tract 1 Acres 70 Loc. No. 1

Well (Face) No. 1 Co. Serial No.

Angle of Deviation, if any

Elevation 940' Quadrangle Verona

County Westmoreland Township Franklin

Engineer Myra B. Bays

Engineer's Registration No. 703151

File No. Drawing No.

Date Recd. 15, 1961 Scale 1"=400'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF MINES

Oil and Gas Division
HARRISBURG

129-20294
WELL LOCATION MAP
Dept. File No. WES-201-2

⊕ Denotes location of well on United
States Topographic Map.

Scale 1" = 400'

WORKABLE COAL SEAMS TO BE MINED

Name of Seam

All North

Bedford

Bedford

129-20294

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF MINES AND MINERAL INDUSTRIES
OIL AND GAS DIVISION

68°00'54"00"32'30"
98°00'W 79°40'00"

(8) ✓

NEW KENSINGTON EAST
QUADRANGLE: 22° 10' E 79° 40' W 2240' S 40' 35' LOCATION
PERMIT NO. 189-20294
MAP REFERENCE: NEW KENSINGTON EAST (H) KIND OF WELL: Oil
(Oil, Gas, Other)

WELL RECORD

COMPANY:	Size of Casing and Tubing	Used in Drilling	Left in Well	Packers: Type, Size and Depth
T. W. Phillips Gas and Oil Company	8-3/4"	222'	222'	4-3/4" x 2" Anchor
ADDRESS: 205 E. Main Street, Butler, Pa.				
Fgh. Consolidation Coal Co.	4-9/16"	1840'	1840'	at 3665'
FARM: Formerly John H. Hamilton ACRE: 70				
WELL (FARM) NO. 2 CO. SERIAL NO.	3"	2035'	2035'	
ELEVATION: 940' LEASE:	2"	3642'	3642'	
TOWNSHIP: Farmville COUNTY: Westmoreland				
DRILLING COMMENCED: 1-8-1962				
COMPLETED: 1-19-1962				
PRODUCTION: 11,000 cu. ft.				PERFORATIONS AT:
ROCK PRESSURE: 2264 psig 24 hrs.				3642' - 3600'
WELL TREATMENT: (Shooting, Acidizing, Fracturing Etc.) Hydrofractured				
Cementing Data (Steel Pipe, Depth, No. Bags, Etc.)				
22" 3600' - 3516', 10 Bags Cement, 1-23-1962				
Open Flow				
RESULTS AFTER TREATMENT: 175,000 Cu. Ft.				
ROCK PRESSURE AFTER TREATMENT: 2705 - 24 Hrs.				
REMARKS:				

Drilled 1917

FORMATION	DEPTH	LOGGING	GAS AT	OIL AT	WATER AT (Fresh or Salt Water)	REMARKS
Sand	865	935				
"	1640	1720				
"	1740	1840				
"	1890	1910				
"	1965	1995				
"	2080	2111				
"	2145	2193	2172			
"	2925	2980				
"	3518	3616	3620			
Total Depth		3642'				



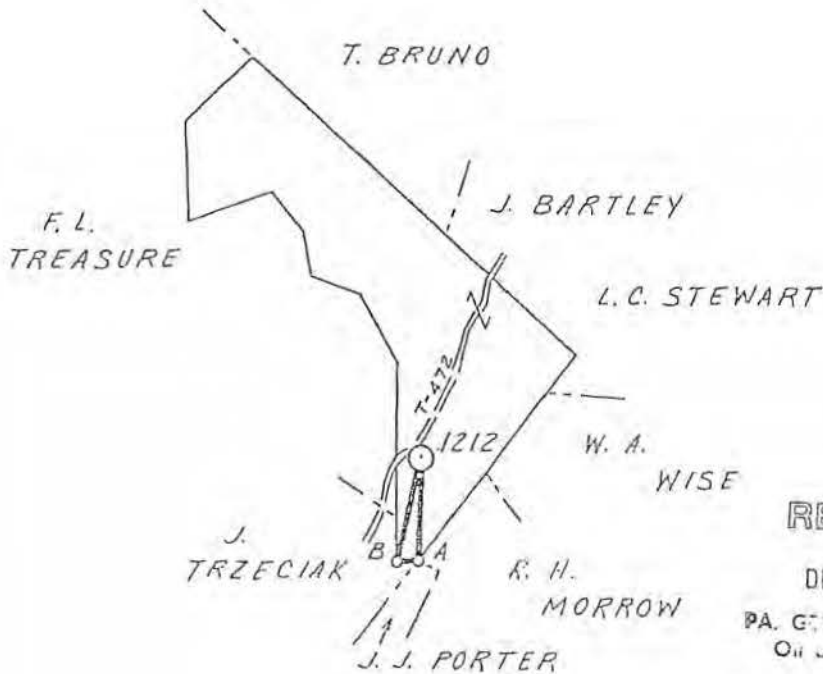
A - W. OAK COR.
 A-WELL = N 00° 49' E 924.48'
 WELL-B = S 12° 47' W 956.79'
 B - COR STONE
 B-A = N 87° 29' E 198.61'

⊕ TOPO.
 REF.

3,650' SOUTH OF LATITUDE 40° 32' 30"

8650 WEST OF LONGITUDE 79° 40'

129-21590



RECEIVED

DEC 10 1979

PA. GEOL. & MIN. SURV.
 Oil & Gas Div.

3,600

☐ NEW LOCATION ☐ REVISED LOCATION ☐ DRILL DEEPER ☐ ABANDONMENT ☒ RE-DRILL ☐ REPAIRS	DIVISION NORTHERN		SURVEYED BY KUNCHEFF		MAP NK 10 EH 6		
	LOC. MADE (Date) 11 / 28 / 78		BOOK 1858	PAGE 20-21	EL. BOOK 1858	PAGE 19	
	APPROVED E. O. Campbell					DATE 11 / 20 / 79	

THE PEOPLES NATURAL GAS COMPANY TWO GATEWAY CENTER, PITTSBURGH, PENNSYLVANIA 15222			COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BX-C 12-6-79 DIVISION OF OIL AND GAS PITTSBURGH WELL LOCATION MAP 129-21590 DEPT. FILE NO WES-21590-R		
FARM WM. F. & R. N. CROOKS					
TRACT 1	ACRES 120	LEASE NO. 8649			
WELL (FARM) NO. 1	CO. SERIAL NO. 1212				
ELEVATION 901'	QUADRANGLE NEW KENSINGTON E.				
COUNTY WESTMORELAND					
WORKABLE COAL SEAMS, IF ANY ☐ SOLID ☐ COB NAME OF SEAM ALL SEAMS OWNER OF SEAM CONSOLIDATION COAL CO.					
DATE 11-21-79					

DR. BY ASK / PCK	DATE 12 / 5 / 79
----------------------------	----------------------------

129-21590

FORMATIONS						
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA
Coal	320					Drillers Log
Sand	725	780				
Sand	820	990				
Sand	1530	1640				
Sand	1640	1770	1701			
Sand	2060	2161				
Sand	2871	2900				
Sand	2956	2982				
Sand	3265	3280				
Sand	3561	3579	3563			
Total depth		3609				

DEW-TGS
129-21590

February 27, 19 81

DATE

E. O. Campbell
APPROVED BY E. O. Campbell

Manager, Production & Storage
TITLE

WELL LOCATION PLAT

129-22777

Well is located on topo map 4425 feet south of LATITUDE 40° 31' 30"

N/F WILLIAM CROOKS

Well is located on topo map 2130 feet west of LONGITUDE 79° 40' 00"

DER-TGS
1985 NOV 27 AM 11:08
DIVISION OF OIL
AND GAS IN PENN.

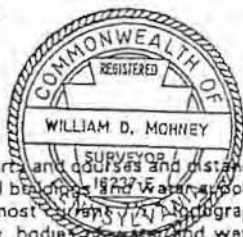
N/F WILLIAM BRACOM

HAROLD
MORROW

N/F ROBERT McVAY

N/F MARGARET
MORROWN/F WILLIAM
CROOKSLOC TO A S 83° 11' 56" W 486.04'
LOC TO B S 08° 54' 31" W 1091.20'A = IRON PIN ON CORNER
B = IRON PIN ON CORNER--- PROPERTY LINE
--- LIMIT OF LEASE

SCALE 1" = 500



William D. Mohney

Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most recent 7 1/2" topographic map and wetlands within 100'. Reference to buildings, springs, bodies of water and wetlands is not required for well plugging.

☒ Denotes location of well on 7 1/2" topo map Permit # 37-129-22777-00 Project #

Well Operator Penneco Oil Company, Inc.	Revision Re-Issue Alteration Storage Recondition New Location Drill Deeper Abandonment Registration Plugging	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Surveyor/Engineer William D. Mohney Drawing Number 48 Date 10/30/85 Date												
Address U.S. Route 22 Delmont, PA 15626	Surface landowner and water purveyor with water supply within 1,000'														
Surface Owner Harold V. Morrow	Approximate course and distance to water supply														
Surface Lessor (if any) PA GEOLOGICAL SURVEY (Oil & Gas Ecology Division)	William Venter N 37° W 950' William Wise S 82° E 475'														
Form Name Morrow	Well No #1	Serial No PM-37													
Acres 71.83	Ground Elevation 1185														
Topo Quadrangle New Kensington East	Section 8														
County Westmoreland	Political Subdivision Upper Merion														
Angle of Deviation None	Anticipated TD 4,000														
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management		<table border="1"> <thead> <tr> <th>Owner/Operator</th> <th>Workable Coal Seams</th> </tr> </thead> <tbody> <tr> <td>Consolidation Coal Co.</td> <td>Upper Freeport</td> </tr> <tr> <td>Villa Coal Company</td> <td>Upper Freeport</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>		Owner/Operator	Workable Coal Seams	Consolidation Coal Co.	Upper Freeport	Villa Coal Company	Upper Freeport						
Owner/Operator	Workable Coal Seams														
Consolidation Coal Co.	Upper Freeport														
Villa Coal Company	Upper Freeport														

TRENTON MINE

12-10-85 (20)

CHE
4-25-86
LE 1

28-22777

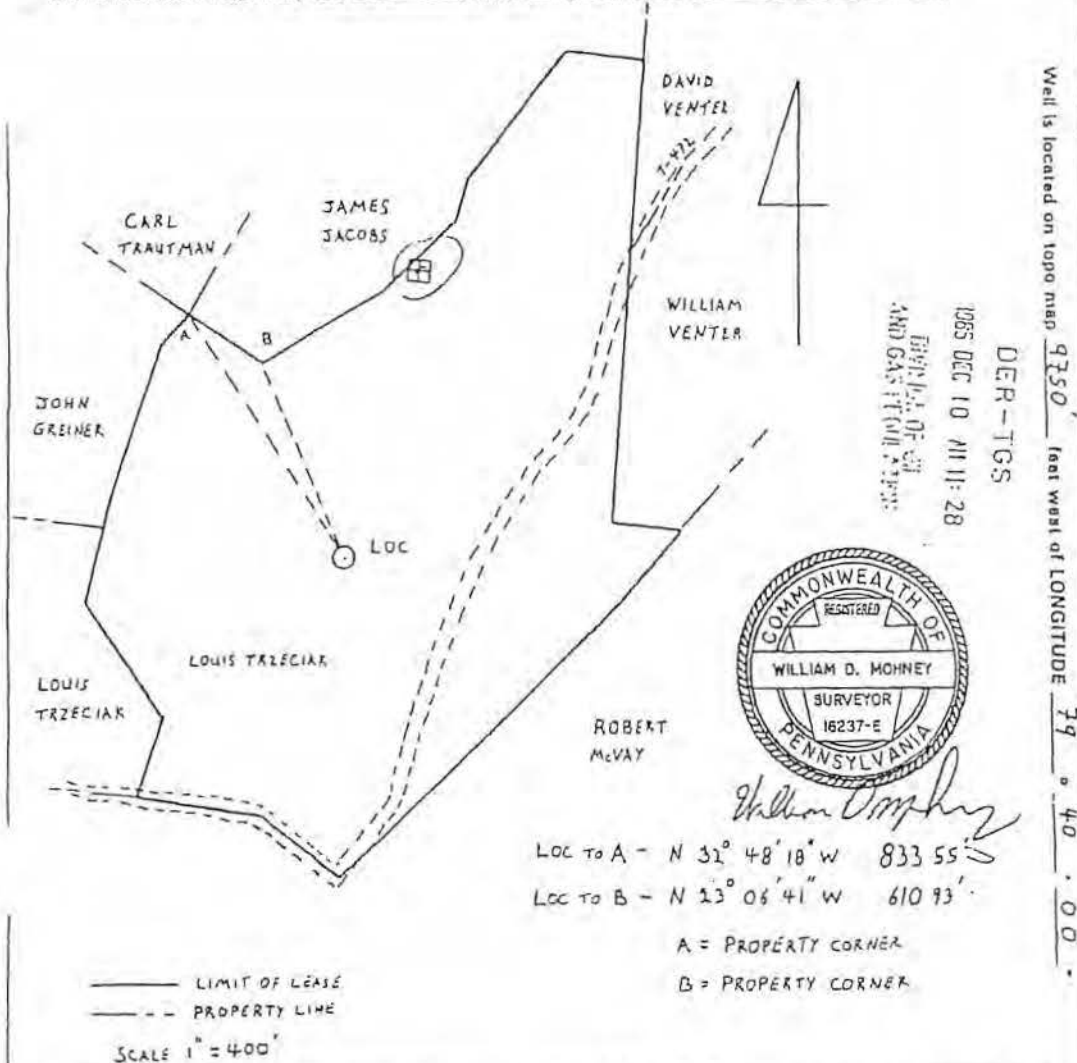
500-885

FORMATIONS						
NAME	TOP	BOTTOM	GAS AT	DIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA
Clay	0	10				Driller's Log
Clay	10	15				
Shale	15	25				
Red Rock	25	35				
Shale	35	55				
Red rock	55	60				
Shale	60	80				
Sandy Shale	80	95			65' - Fresh	
Red Rock	95	115				
Shale	115	175				
Sand	175	220				
Shale	220	230				
Red Rock	230	235				
Shale	235	245				
Red Rock	245	250				
Shale	250	260				
Red Rock	260	275				
Shale	275	290				
Red Rock	290	295				
Coal And Shale	295	299				
Sandy Shale	299	305			300' - Fresh	GEOPHYSICAL LOT DATA
Sand	305	355				
Sandy Shale	355	390				
Sand	390	465				
Shale	465	480			470' - Fresh	
Sandy Shale	480	502				
Shale	502	545				
Sand	545	582				
Coal	582	589				
Shale	589	630				
Sandy Shale	630	870				
Coal	870	875				
Shale	875	930				
Sandy Shale	930	965				
Shale	965	1000				
Sandy Shale	1000	1070				
Shale	1070	1110				
Sandy Shale	1110	1130				
Sand	1130	1190				
Red Rock	1190	1200				
Sand	1200	1255				
Sandy Shale	1255	1295				
Black Shale	1295	1305				
Shale	1305	1325				
Sand	1325	1410				
Shale	1410	1495				
Red Rock	1495	1500				
Sandy Shale	1500	1570				
Shale	1570	1735				
Sandy Shale	1735	1760				
Shale	1760	1825				
Sandy Shale	1825	1850				
Sand	1850	1910				
Sandy Shale	1910	2070				
Shale	2070	2120				
Red Rock	2120	2360				
Sandy Shale	2360	2540				
Sand	2540	2730				
Sandy Shale	2730	2800				
Sand	2800	2880				
Sandy Shale	2880	2975				
Shale	2975	3005				
Sandy Shale	3005	3040				
Shale	3040	3185				
Sandy Shale	3185	3210				
Sand	3210	3225				
Shale	3225	3290				
Sandy Shale	3290	3380				
T.D.	3380					

March 26, 1986
DATE
[Signature]
APPROVED BY
Vice President
TITLE

129-22783

Well is located on topo map 4525 feet south of LATITUDE 40° 32' 30"



Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'. Reference to buildings, springs, bodies of water and wetlands is not required for well plugging

Denotes location of well on 7 1/2" topo map Permit # 37-129-22783-00 Project #

Well Operator Pennaco Oil Company, Inc.	Revision Re-Issue Alteration Storage Recondition New Location Drill Deeper Abandonment Registration Plugging	Surveyor/Engineer William D. Mohney Drawing Number 41 Date 10/22/85 Date
Address U.S. Route 22 Delmar, PA 15626	Surface landowner and water purveyor with water supply within 1,000'	Approximate course and distance to water supply S 43° W 800'
Surface Owner Louis Trzeciak, Jr. & Cynthia Louise Trzeciak	Michael T. Vichuk	RECEIVED
Surface Lessor (if any) None		JAN 8 1996
Farm Name Trzeciak		
Well No. #1	Serial No. P1-111	
Acres 443	Ground Elevation 1000'	
Topo Quadrangle New Kensington East	Section H 8	
County Stairland	Political Subdivision Upper Merion	Owner/Operator Consolidation Coal Co.
Age of Drilling None	Anticipated TD 4,000	Workable Coal Seam Name of Seam Upper Freeport
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management		Upper Freeport

721283

ER-004; Rev. 10/82

4525' S 40° 32' 30" W
79° 40' 00" E

(8)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF OIL AND GAS REGULATION
PITTSBURGH, PENNSYLVANIA 15222

NEW KENSINGTON CO

129-22783

34827
34878
34879

WELL RECORD

PERMIT NO. 37-129-22783-00

PROJECT NO. PINE RUN-DEV

TYPE OF WELL Gas

WELL OPERATOR Penneco Energy Corporation

TELEPHONE NO. 412-488-8232

ADDRESS U. S. Route #22, Delmont, PA 15626

ZIP

FARM NAME Louis Trzeciak, Jr.

FARM NO.

SERIAL NO. PT-36

ACRES 49.3

TOWNSHIP Upper Burrell

COUNTY Westmoreland

DRILLING COMMENCED 6-2-86

DRILLING COMPLETED 6-9-86

ELEVATION 1000'

QUADRANGLE New Kensington East ☒ 7 1/2' ☐ 15'

CASING AND TUBING RECORD

PIPE SIZE	AMOUNT IN WELL	MATERIAL BEHIND PIPE		PACKER			DATE RUN														
		CEMENT (SKS.)	GEL (SKS.)	TYPE	SIZE	DEPTH															
11-3/4"	38	Cuttings	None	N/A	N/A	N/A	6/2/86														
8-5/8"	1,718	350	10	Float Shoe	8-5/8"	1,728	6/7/86														
4-1/2"	3,142	265	5	Float Shoe	4-1/2"	3,152	6/9/86														
1-1/2"	3,060	N/A	N/A	N/A	N/A	3,060	6/18/86														
		<table><tr><td>TD</td><td>DD</td><td>D.P.I.</td><td>Class</td><td>O</td><td>G</td><td>Lease</td></tr><tr><td>3184</td><td></td><td>3116</td><td>D</td><td></td><td>2</td><td>1</td></tr></table>						TD	DD	D.P.I.	Class	O	G	Lease	3184		3116	D		2	1
TD	DD	D.P.I.	Class	O	G	Lease															
3184		3116	D		2	1															

PERFORATION RECORD

STIMULATION RECORD

DATE	INTERVAL PERFORATED FROM TO		DATE	INTERVAL TREATED	AMOUNT FLUID	AMOUNT SAND	INJECTION RATE
6-18-86	3,082	3,116	6-2-86	3082-3116	40,000	75,000#	33.0BPM
6-18-86	2,270	2,276	6-2-86	2270-2276	17,200	18,700#	17.8BPM

NATURAL OPEN FLOW 100 MCF

NATURAL ROCK PRESSURE Not Taken

HRS. DAYS

AFTER TREATMENT OPEN FLOW 237 MCF

AFTER TREATMENT ROCK PRESSURE 700#

72

HRS. DAYS

REMARKS: Good cement returned to surface after setting 8-5/8" casing.

U. S. Energy
Bradford

CHE
9-24-86
led

(FORMATION ON REVERSE SIDE)

RECEIVED

NOV 5 1986

PA GEOLOGICAL SURVEY
(Oil & Gas Geology Division)

129-22783

FORMATIONS						
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA
Clay	0	10				Driller's Log
Clay	10	15				
Shale	15	80			30' - Fresh	
Red rock	80	110				
Sand and Shale	110	120				
Red Rock	120	145				
Shale	145	200				
Sand and Shale	200	230			200' - Fresh	
Shale	230	280				
Sand and Shale	280	365				
Shale	365	450				
Coal	450	455				
Shale	455	545				
Sand and Shale	545	580				
Shale	580	625				
Sand and Shale	625	675				
Black Shale and Sand	675	700				
Sand and Shale	700	795				
White Sand	795	815				
Black Shale and Sand	815	845				
Sand and Shale	845	860				
White Sand	860	880				
Sand and Shale	880	995				
Sand	995	1310				
Shale	1310	1360				
Sand and Shale	1360	1420			1,360 - Salt	
Red Rock Shale	1420	1450				
Sand and Shale	1450	1580				
Shale	1580	1620				
Sand and Shale	1620	1640				
Shale	1640	1780			1,750 - Salt	
Sand	1780	1820				
Sand and Shale	1820	1895				
Shale	1895	1985				
Red Rock	1985	2010				
Shale	2010	2020				
Red Rock	2020	2069				
Shale	2069	2080				
Sand and Shale	2080	2100				
Red Rock and Shale	2100	2175				
Sand, Shale and Red Rock	2175	2240				
White Sand and Shale	2240	2270				
Sand, Shale and Red Rock	2270	2290				
Sand and Shale	2290	2300				
Shale	2300	2375				
Sand and Shale	2375	2975				
Shale	2975	3020	3,020	3,020		
Sand and Shale	3,020	3120				
Shale	3120	3184				
T.D.	3184					
BRAD						
			GEOPHYSICAL LOG DATA			
Fifth Speedley					2238-2276 3080-3120	

DATE Dec 11, 1982

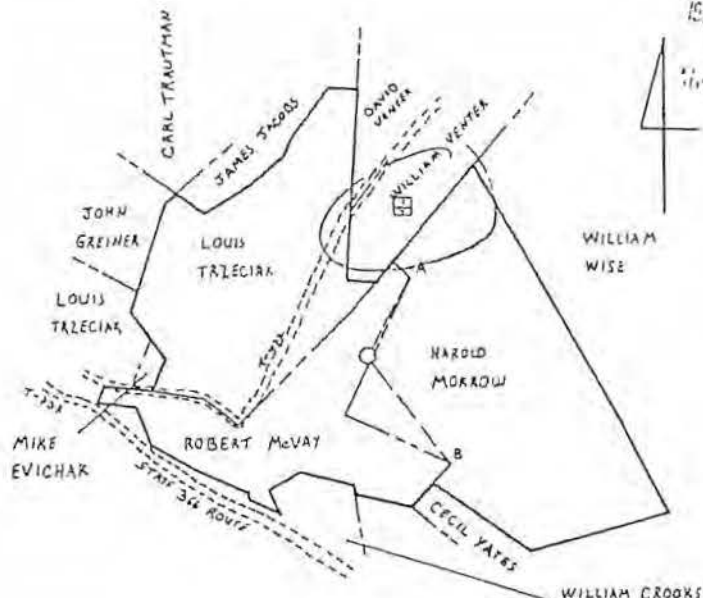
APPROVED BY W. A. [Signature]

TITLE

WELL LOCATION PLAT

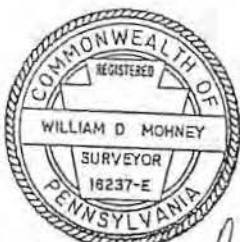
Well is located on topo map 4725 feet south of LATITUDE 40° 32' 30"

129-22836

Well is located on topo map 8280 feet west of LONGITUDE 79° 00' 00"

——— LIMIT OF LEASE
 - - - - - PROPERTY LINE

SCALE 1" = 1000'



LOC TO A N 29° 12' 38" E 64.71'

LOC TO B S 37° 37' 25" E 95.05'

A - IRON PIN ON PROPERTY CORNER

B - IRON PIN ON PROPERTY CORNER

Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'. Reference to buildings, springs, bodies of water and wetlands is not required for well plugging.

☒ Denotes location of well on 7 1/2" topo map

Permit # 25730
129-22836-22820

Project # _____

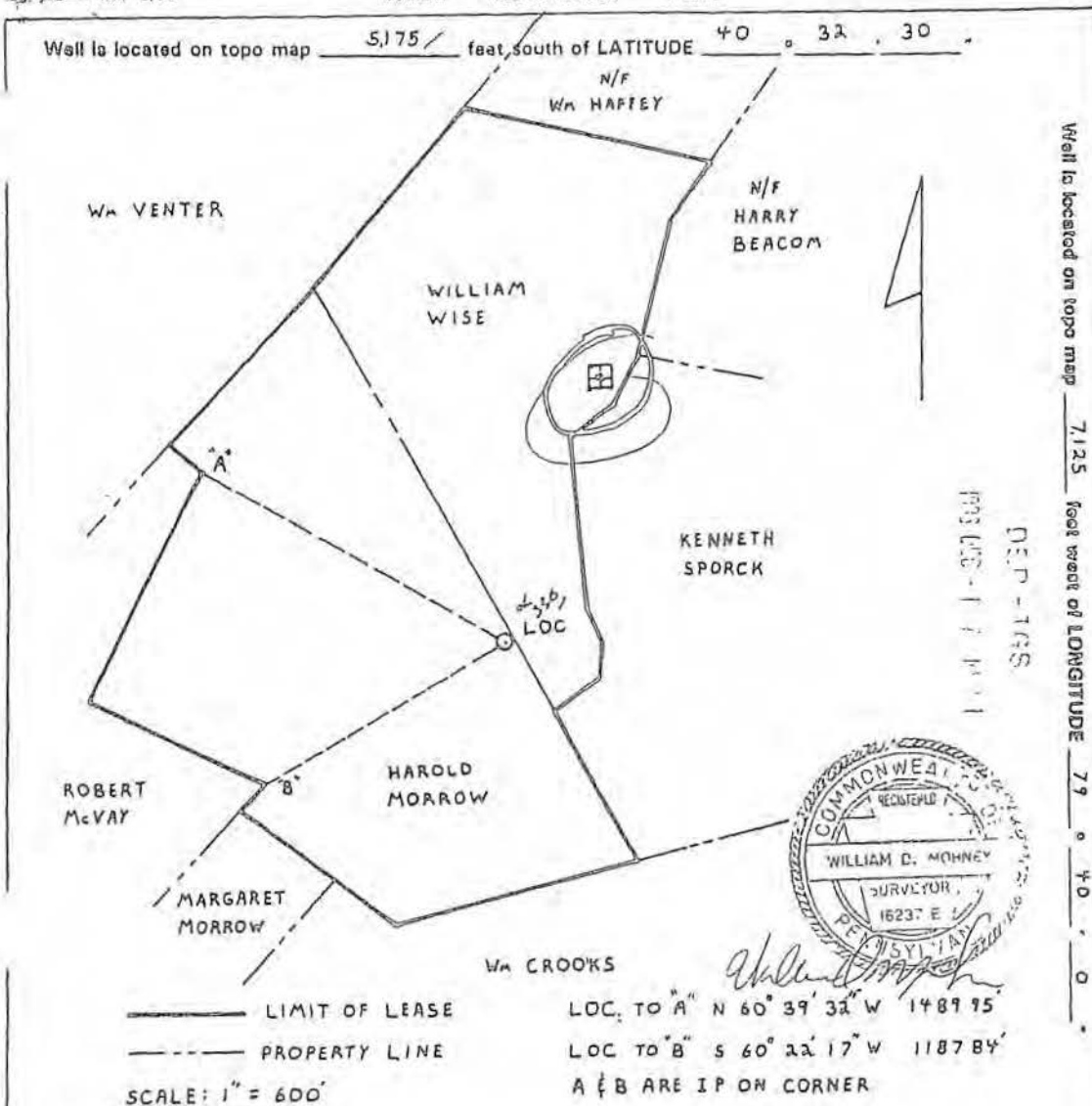
Well Operator <u>Princeton Oil Company, Inc.</u>	Revision ☐ Re Issue ☐ Alteration ☐ Storage Recondition ☒ New Location ☐ Drill Deeper ☐ Abandonment ☐ Registration ☐ Plugging	Surveyor/Engineer <u>William D. Moliney</u> Drawing Number Date <u>11/1/85</u> Date
Address <u>65 Route 22</u>	Surface landowner and water purveyor with water supply within 1000' <u>N/A</u>	Approximate course and distance to water supply <u>N/A</u>
Delmont, PA 15626		RECEIVED
Surface Owner <u>Robert D & Joyce S. McVay</u>		<u>JUN 30 1985</u>
Surface Lessor (if any) <u>None</u>		
Farm Name <u>McVay</u>		
Well No. <u>#1</u>	Serial No. <u>PM-6</u>	
Acres <u>40.3</u>	Ground Elevation <u>1040</u>	
Topo Quadrangle <u>New Amintion east</u>	Section <u>8</u>	
County <u>Westmoreland</u>	Political Jurisdiction <u>Upper Burrell Twp</u>	Owner/Operator <u>Wills Coal Co</u>
Angle of Deviation <u>None</u>	Anticipated TD <u>4,000</u>	Workable Coal <u>Upper Freeport</u>
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management		<u>3-17-86</u> RECEIVED <u>MIWE</u>

129-22836.

FORMATIONS						
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA
Sub	0	10				Driller's Log
Shale	10	85				
Red Rock	85	135				
Shale	135	225			225' Fresh	
Sand	225	280				
Sand and Shale	280	335				
Shale	335	390				
Coal	390	393				
Shale	393	415				
Sand and Shale	415	440				
Shale	440	535				
Sand	535	595				
Shale	595	680				
Coal	680	683				
Shale	683	730				
Sand and Shale	730	765				
Shale	765	975				
Sand	975	1040				
Shale	1040	1105				
Sandy Shale	1105	1195				
Sand	1195	1230				
Shale	1230	1265				
Sand	1265	1290				
Shale	1290	1385				
Sandy Shale	1385	1490				
Shale	1490	1695				
Sand and Shale	1695	1775				
Sand	1775	1840				
Red Rock	1840	1850				
Sand	1850	1980	1855'			
Red Rock	1980	2050				
Shale	2050	2100				
Red Rock	2100	2175				
Shale	2175	2310				
Sand	2310	2520				
Shale	2520	2685				
Sandy Shale	2685	2850				
Sand	2850	3015				
Shale	3015	3185				
Sand	3185	3277				
T.D.	3277					
GEOPHYSICAL LOG DATA						
Speechley			3,080	3,118		
Speechley Stray			3,004	3,024		
Fifth			2,260	2,276		

Mark 17, 1987
DATE
APPROVED BY
TITLE

WELL LOCATION PLAT



Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'. Reference to buildings, springs, bodies of water and wetlands is not required for well plugging.

Denotes location of well on 7 1/2" topo map Permit # 31-129-22913-00 Project # _____

Well Operator Penneco Oil Company, Inc.	Revision Re-Issue ☐ Alteration ☐ Storage Recondition ☒ New Location ☐ Drill Deeper ☐ Abandonment ☐ Registration ☐ Plugging ☐	Survivor/Engineer W.D. Mohnhey
Address U.S. Route #22		Drawing Number PM - 2
Delmont, PA 15626		Date 11/18/86
Surface Owner Harold V. Morrow		Date
Surface Lessor (if any) N/A	Surface landowner and water purveyor with water supply within 1,000'	Approximate course and distance to water supply
Firm Name Morrow	Kenneth Sporck	N 75° E 800'
Well No #2	Ronald Brennan	S 70° E 700'
Acres 71.83	Ground Elevation 1160	
Quadrangle New Kensington East	Section 8	
County Westmoreland	Political Subdivision Upper Burrell	
Angle of Deviation None	Anticipated TD 3,500'	
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management		
Owner/Operator Villa Coal Co.	Workable Coal Seams Name of Seam Upper Burrell	
RENTON	12-3-86	

CHE
10-25-88

FORMATIONS

NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA	
Sub	0	10				Driller's Log	
Shale	10	40					
Sand	40	85					
Shale	85	165					
Red Rock	165	180					
Shale	180	245					
Sand	245	290					
Sand and Shale	290	330					
Shale	330	375					
Coal	375	378					
Shale	378	565					
Sand	565	640					
Coal	640	643					
Shale	643	820					
Sand	820	835					
Shale	835	885					
Sand	885	925					
Shale	925	1000					
Sand	1000	1080					
Sand and Shale	1080	1105					
Shale	1105	1150					
Sand	1150	1310					
Sand and Shale	1310	1350					
Sand	1350	1440					
Sand and Shale	1440	1580					
Sand	1580	1640					
Shale	1640	1760					
Sand and Shale	1760	1810					
Sand	1810	1880					
Shale	1880	2085					
Red Rock	2085	2100					
Shale	2100	2170					
Red Rock	2170	2240					
Shale	2240	2415					
Sand	2415	2620					
Sandy Shale	2620	2785					
Shale	2785	2940					
Sandy Shale	2940	3100					
Sand	3100	3260					
Shale	3260	3400					
TD	3400						
BRUNSON							
GEOPHYSICAL LOG DATA							
Speechley	-	3120 - 3148					
Speechley Stray	-	3040 - 3044					
Fifth	-	2270 - 2312					
Fourth	-	2206 - 2230					

DATE March 17, 1987
John V. Vincent

42383

129-23073

Well is located on topo map 5700 feet south of LATITUDE 40 ° 32 ' 30 "



NOTE: Well location is located at a minimum of 330 feet from the lease line and a minimum of 1000 feet from any existing gas wells.

Well is located on topo map 8060 feet west of LONGITUDE 79 ° 40 ' 00 "

Limit of Lease

Property Line

Scale = 1" = 1000'

Loc. to "A" S 75° 02' 45" W 123.19'

Loc. to "B" S 75° 04' 40" E 1523.62'

"A" and "B" are iron pins on property corners.

Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'. Reference to buildings, springs, bodies of water and wetlands is not required for well plugging.

Denotes location of well on 7 1/2" topo map Permit # 37-129-23073-00 Project #

Well Operator Penneco Oil Company, Inc.	Revision ☐ Re-issuance ☐ Alteration ☐ Storage Recondition ☐ New Location ☐ Drill Deeper ☐ Abandonment ☐ Registration ☐ Plugging	Surveyor/Engineer W.D. Mohney & Associates Drawing Number 10/23/87 DEC 81307 Date 12/2/87
Address U.S. Route 22 Dalmont, PA 15626	Surface landowner and water purveyor with water supply within 1,000'	Approximate distance to nearest survey point 1000.0'
Surface Owner Harold Morrow	Cecil H. Yates William F. Crooks William F. Crooks Harold Morrow Fred C. Vanderhevel George Wilson	S 0° 32' 00" W 575' S 8° 30' 00" W 701.5' S 26° 34' 30" E 945.0' S 68° 08' 00" E 415.0' S 69° 00' 30" W 948.5' S 57° 30' 00" W 1000.0'
Surface Lessor (if any) None	Owner/Operator Harold Morrow Villa Coal Co.	Workable Coal Seams All Other Seams Upper Freeport
Farm Name Morrow	Anticipated TD 4,000	12-4-87
Well No 3	Serial No PM 40	
Acres 71.83	Ground Elevation 1020	
Quadrangle Kensington East	Section 7	
City Jonestown	Political Subdivision Upper Burrell Twp.	
Angle of Deviation None		
Commonwealth of Pennsylvania Department of Environmental Resources Bureau of Oil and Gas Management		

5700' S 40° 32' 30"
8060' W 79° 40' 00"

(8)

NEW KENSINGTON EAST

ER-OG-4: Rev. 6/84

H 38215
38216
38217

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF OIL AND GAS REGULATION
PITTSBURGH, PENNSYLVANIA 15206-2988

129-23073



129-23073

WELL RECORD

PERMIT NO.	07-129-23073-00	PROJECT NO.	PINE RUN-DEV	TYPE OF WELL	Gas and Oil
WELL OPERATOR Penneco Energy Corporation			TELEPHONE NO. 412-468-8232		
ADDRESS U. S. Route #22 Delmont, PA			ZIP 15626		
FARM NAME Harrow #3	FARM NO. 3	SERIAL NO. PH-40	ACRES 72		
TOWNSHIP Upper Burrell		COUNTY Westmoreland			
DRILLING COMMENCED 2-19-88		DRILLING COMPLETED 2-23-88			
ELEVATION 1020'		QUADRANGLE New Kensington East ☒ 7 1/2' ☐ 15'			

CASING AND TUBING RECORD

PIPE SIZE	AMOUNT IN WELL	MATERIAL BEHIND PIPE		PACKER			DATE RUN
		CEMENT (SKS.)	GEL (SKS.)	TYPE	SIZE	DEPTH	
16"	22	Cuttings	None	N/A	N/A	22	2-19-88
11-3/4"	110	Cuttings	None	N/A	N/A	110	2-19-88
8-5/8"	1,835	350	12	Float Shoe	8-5/8"	1,845	2-19-88
4-1/2"	3,205	325	5	Float Shoe	4-1/2"	3,215	2-23-88
1-1/2"	3,078	N/A	N/A	N/A	N/A	3,078	3-8-88

PERFORATION RECORD

DATE	INTERVAL PERFORATED FROM	TO
3-8-88	3072	3107
	2998	3003
3-8-88	3006	3008
	2234	2236
3-8-88	2246	2258
	2266	2268

STIMULATION RECORD

DATE	INTERVAL TREATED	AMOUNT FLUID	AMOUNT SAND	INJECTION RATE
3-8-88	3072-3107	30,000	47,500	32.4BPM
3-8-88	2998-3008	8,000	13,000	29.5BPM
3-8-88	2234-2268	16,000	27,000	32.5BPM

T.D.	D.D.	D.P.I.	Check	O.G.	Lease
3255		3167	D	2	1

NATURAL OPEN FLOW	Not Taken	NATURAL ROCK PRESSURE	Not Taken	HRS. DAYS
AFTER TREATMENT OPEN FLOW	375 MCF	AFTER TREATMENT ROCK PRESSURE	620#	72 HRS. DAYS

REMARKS:

Good cement returned to surface after setting 8-5/8" casing.

VENANGO

BRADFOOD

CSE

11-13-88

FORMATIONS

129-23073

FORMATIONS						129-2
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA
Sub	0	10				Driller's Log
Fill	10	32				
Shale	32	60				
Red rock	60	105				
Sand	105	125				
Shale	125	260				
Sand	260	340				
Shale	340	390				
Sand	390	465				
Coal	465	468				
Shale	468	515				
Sandy Shale	515	565				
Shale	565	655				
Sandy shale	655	745				
Shale	745	840				
Sandy shale	840	885				
Shale	885	970				
Sand	970	1030				
Sand and Shale	1030	1190				
Sand	1190	1280				
Sand and Shale	1280	1375				
Sand	1375	1455				
Shale	1455	1480				
Sandy Shale	1480	1505				
Shale	1505	1575				
Sandy Shale	1575	1645				
Shale	1645	1755			1755	
d	1755	1785			1 1/2 - 2" Fresh	
rock	1785	1790				
nd and Shale	1790	1980				
Red Rock	1980	2005				
Sand and Shale	2005	2035				
Red Rock	2035	2060				
Sand and Shale	2060	2290				
Shale	2290	2410				
Sand and Shale	2410	2860				
Sand	2860	2910				
Shale	2910	3060				
Sand	3060	3095	3000			
Sandy Shale	3095	3180				
Sand	3180	3255				
BRADFORD						
GEOPHYSICAL LOG DATA						
Fireth					2228 - 2280	
Speechley Stray					2996 - 3010	
Speechley					3070 - 3108	

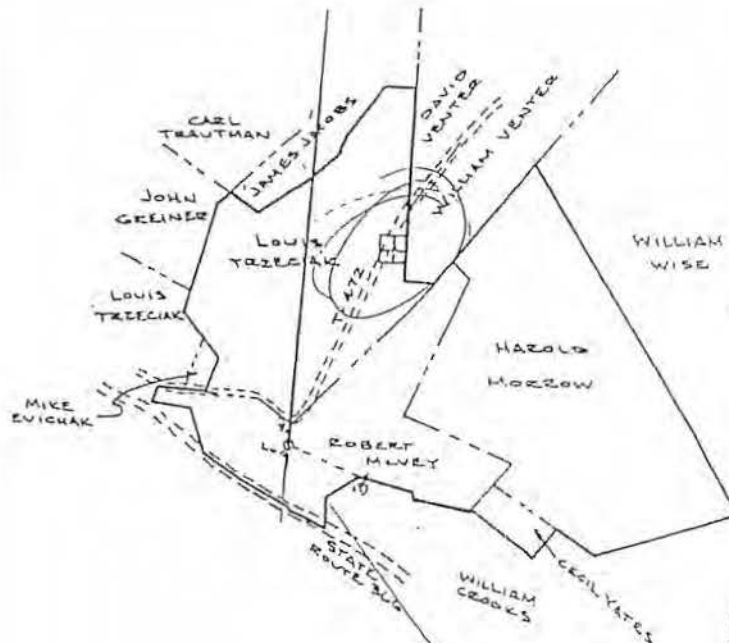
DATE July 26 19 88
APPROVED BY 
TITLE Vice-President

WELL LOCATION PLAT

42505

129-23085

Well is located on topo map 5,590 feet south of LATITUDE 40° 32' 30"

OIL & GAS MANAGEMENT
RECEIVED

DEC 11 1987

OIL & GAS MANAGEMENT
RECEIVED

DEC 29 1987

Well is located on topo map 9,710 feet west of LONGITUDE 79° 40' 00"

NOTE: Well location is located at a minimum of 330 feet from the lease line and a minimum of 1000 feet from any existing gas wells.



— LIMIT OF LEASE
— PROPERTY LINE

SCALE = 1" = 1000'

Loc. To A N 7° 30' 34" W 156.14'

Loc. To B S 69° 35' 16" E 535.38'

A and B are Voth iron pins

Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'. Reference to buildings, springs, bodies of water and wetlands is not required for well plugging.

☒ Denotes location of well on 7 1/2" topo map Permit # 57-129-23085-00 Project #

Well Operator Penneco Oil Company, Inc.	Revision ☐ Re-Issue ☐ Alteration ☒ Storage Recondition ☒ New Location ☒ Drill Deeper ☐ Abandonment ☐ Registration ☐ Plugging	Surveyor/Engineer W.D. Mohnsey & Associates Drawing Number Date 10/22/87 Date
Address U.S. Route 22 Delmont, PA 15626	Surface landowner and water purveyor with water supply within 1,000'	Approximate course and distance to water supply
Surface Owner Robert D. & Joyce S. McVey	See Attached Sheet	
Surface Lessor (if any) None		
Farm Name McVey		
Well No. #2	Serial No. PM-41	
Acres 49.2	Ground Elevation 858	
Quadrangle 1908 Kensington East	Section (8)	
County Westmoreland	Political Subdivision Upper Burrell Twp.	Owner/Operator Robert D. McVey
Angle of Deviation None	Anticipated TD 4,000'	Workable Coal Seams Name of Seam All seams except U.F. Villa Coal Co. Upper Freeport
Commonwealth of Pennsylvania Department of Environmental Resources		Routon Mine 1-4-88

5590' S 41° 32' 30"
9710' W 29° 40' 00"

(8)

CR-DG-4, Rev. 6/84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF OIL AND GAS REGULATION
PITTSBURGH, PENNSYLVANIA 15205-2988

NEW KENSINGTON EAST

129-23085

Office Use Only

129-23085

WELL RECORD

PERMIT NO. 37-129-23085-00 <i>PINE RUN FIELD</i>	PROJECT NO. 	TYPE OF WELL <i>DEV</i> Gas
WELL OPERATOR Penneco Energy Corporation		TELEPHONE NO. 412-468-8232
ADDRESS 200 Route 22, Delmont, PA		ZIP 15626
FARM NAME Robert D. McVey #2	FARM NO.	SERIAL NO. PM-41
TOWNSHIP Upper Burrell	COUNTY Westmoreland	
DRILLING COMMENCED 11-5-88	DRILLING COMPLETED 11-10-88	
ELEVATION 858'	QUADRANGLE New Kensington East ☒ 7 1/2" ☐ 15"	

CASING AND TUBING RECORD

PIPE SIZE	AMOUNT IN WELL	MATERIAL BEHIND PIPE		PACKER			DATE RUN														
		CEMENT (SKS.)	GEL (SKS.)	TYPE	SIZE	DEPTH															
9-5/8"	32	Cuttings	None	N/A	N/A	N/A	11- 5-88														
7"	1,755	240	12	Float Shoe	7"	1,765	11- 8-88														
4-1/2"	3,652	165	12	Float Shoe	4-1/2"	3,662	11-10-88														
1-1/2"	3,531	N/A	N/A	N/A	N/A	3,531	11-19-88														
<table><tr><td>T.D.</td><td>D.D.</td><td>D.P.I.</td><td>Class</td><td>Q</td><td>G</td><td>Leads</td></tr><tr><td>3805</td><td></td><td>3546</td><td>D</td><td>-</td><td>1</td><td>1</td></tr></table>								T.D.	D.D.	D.P.I.	Class	Q	G	Leads	3805		3546	D	-	1	1
T.D.	D.D.	D.P.I.	Class	Q	G	Leads															
3805		3546	D	-	1	1															

PERFORATION RECORD

STIMULATION RECORD

PERFORATION RECORD

DATE	INTERVAL PERFORATED FROM	TO	DATE	INTERVAL TREATED	AMOUNT FLUID	AMOUNT SAND	INJECTION RATE
11-17-88	2826	2836	11-17-88	2826-2836	13,000	12,000#	308BPM
11-17-88	2902	2932	11-17-88	2902-2932	33,500	38,000#	348BPM
11-17-88	3214	3220	11-17-88	3214-3220	9,000	7,200#	258BPM
11-17-88	3522 3534 3546	3526 3536 3546	11-17-88	3522-3546	10,500	12,000#	308BPM

NATURAL OPEN FLOW 66 MCF	NATURAL ROCK PRESSURE Not Taken	HRS. DAYS
AFTER TREATMENT OPEN FLOW 350 MCF	AFTER TREATMENT ROCK PRESSURE 640#	72 HRS. DAYS

REMARKS:

Good cement returned to surface after setting 7" casing.

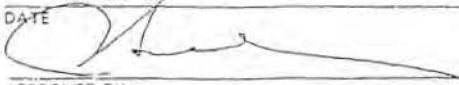
BRADFORD

(FORMATION ON REVERSE SIDE)

CHE
5-23-89
LED

129-23085

193-578		FORMATIONS					
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA	
Sand	0	5				Driller's Log	
Shale	5	15					
Sand and Shale	15	32					
Sand and Shale	32	120			1/2" @ 100'		
Sand and Shale	120	285					
Coal	285	290					
Shale	290	505			1/2" @ 505'		
Coal	505	509					
Shale	509	560					
Sand and Shale	560	1060					
Sand and Shale	1060	1430					
Sand and Shale	1430	1793			1/2" @ 1630'		
Red Rock, Sand & Shale	1793	2090					
Sand and Shale	2090	2550					
Sand and Shale	2550	3130	2800'				
Sand and Shale	3130	3680					
Shale	3680	3805					
BRADFORD							
GEOPHYSICAL LOG DATA							
Fifth					2053-2090		
Bayard					2146-2150		
Speechley Stray					2826-2836		
Speechley					2900-2934		
2nd Balltown					3214-3222		
2nd Bradford					3522-3546		

March 31, 1989
DATE

APPROVED BY
Vice-President
TITLE

129-2334 E



G	C <i>DLT</i>
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 - Denotes location of well on 7 1/2" topo map

Permit # 37-129-27748-0

Project #

[illegible]

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-OG-75).

DEV.

Well Operator Penneco Energy Corporation		Telephone Number 412-468-8232	
Address 200 U.S. Route 22, P. O. Box 300, Delmont, PA 15626			
Permit Number 37-129-23348		Project Number	
Farm Name Greiner	Farm Number 1	Serial Number PG-33	Acres 24.23
Township Upper Burrell		County Westmoreland County	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

Drilling Method Rotary (Air) ☒ Mud ☐ Cable Tool ☐		Date Drilling Started	Date Drilling Completed
Other ☐ (Specify)		7/26/91	8/6/91
Elevation	Total Depth	7 1/2" Quadrangle	
920	4214 B	New Kensington East	

Hole Size	Pipe Size	Amount in Well	Material Behind Pipe	Packer/Hardware			Date Run
			Type and Amount	Type	Size	Depth	
15"	13-3/8"	23'	Sanded In	N/A	N/A	N/A	7-29-91
2-1/4"	9-5/8"	393'	Cement - 114 sacks	Float Shoe	9-5/8"	393'	7-30-91
8-3/4"	7"	1827	Cement - 290 sacks	Float Shoe	7"	1840	8-1-91
6-1/4"	4-1/2"	3830	Cement - 165 sacks	Float Shoe	4-1/2"	3838	8-6-91

Cement return on surface casing? ☒ yes ☐ no

Perforation Record			Stimulation Record						
	Interval Perforated			Interval Treated	Fluid		Propping Agent		Average Fracture Rate
Date	From	To	Date		Type	Amount	Type	Amount	
8-12	3595	3600	8-12	3595 - 3600	Water	12,000 gal	Sand	21,000 lbs	25 BPM
8-12	3281	3286	8-12	3281 - 3286	Water	12,000 gal	Sand	20,000 lbs	23.8 BPM
8-12	2966	3000	8-12	2966 - 3000	Water	34,000 gal	Sand	68,000 lbs	53 BPM
8-12	2889	2908	8-12	2889 - 2908	Water	12,000 gal	Sand	20,000 lbs	23.8 BPM
	T.D.	D.P.L.		D.P.L.	Class:	C/G	Lens:		
	4214	3600		D		/	/		

Natural Open Flow 125 MCFPD	Natural Rock Pressure	Hours	Days
		N/A	0
After Treatment Open Flow 411 MCFPD	After Treatment Rock Pressure 940 psig	Hours 72	Days 3

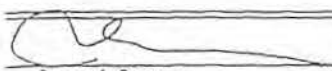
BRADFORD

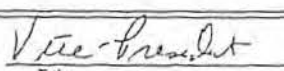
0423 1.0.1992

Name, Address, and Telephone Number of Well Service Companies		
D. Hill Drilling Company - Rt 321 South - Kane, PA 16735	814-837-6612	
Nowco Well Service - 3000 Old Airport Road - Wooster, OH 44691	216-264-8885	
Allegheny Nuclear Surveys, Inc. - Elderton, PA 15736	412-354-3090	

129-23748

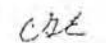
DRILLER'S LOG OF FORMATIONS						
Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Clay	0	5				Drillers Log
Red Bed	5	15				
Shale	15	30				
Sand	30	34				
Sand & Shale	34	345			1/2" @ 65'	
Mine	345	355				
Sand & Shale	355	890			1" @ 890'	
Sand & Shale	890	1,290				
Shale & Sand	1,290	1,670			1" @ 1,665'	
Sand & Shale	1,670	1,860			1" @ 1,790'	
Sand, Red Rock & Shale	1,860	2,475				
Shale & Sand	2,475	3,100	2,875'			
Sand & Shale	3,100	3,650				
Sand & Shale	3,650	4,214				


Operator's Signature


Title

10/31/91
Date

FOR OFFICIAL USE ONLY


Reviewed By

3/12/92
Date

Comments

GEO COPY

Well is located on topo map 3085' feet south of LATITUDE 40° 32' 30"

29-23430

H. A. BIONDI, AGENT

CARL L. TROUTMAN



William D. Mohney

Well is located on topo map 10200' feet west of LONGITUDE 79° 40' 00"

91 SEP -3 AM 11:26
PITTSBURGH REGION

PROPOSED
GAS WELL

GAS WELL

GERALD GREINER

LEASE LINE
PROPERTY LINE
PROPOSED WELL LOCATION
EXISTING GAS WELL

LDC-A = S 2°13'08"W 750'
LDC-B = N 48°17'05"E 550'

P. CORN. A-B = N 21°30'34"E 1198.92'

DEPARTMENT USE ONLY

G IC

INCLUDE DESCRIPTION OF THE PROPERTY AND COURSES AND DISTANCES OF THE WELL(S) LOCATION TO TWO OR MORE PERMANENT IDENTIFIABLE POINTS OR LAND MARKS, ALL BUILDINGS AND WATER SUPPLIES WITHIN 200', ALL SPRINGS, BODIES OF WATER AND STREAMS WITHIN 100' IDENTIFIED ON THE MOST CURRENT 7 1/2" TOPOGRAPHIC MAP AND WETLANDS WITHIN 100'. REFERENCE TO BUILDINGS, SPRINGS, BODIES OF WATER, WETLANDS AND WATER SUPPLIES WITHIN 1000' IS NOT REQUIRED FOR WELL PLUGGING



DENOTES LOCATION OF WELL ON 7 1/2" TOPO MAP

PERMIT NO. 37-29-23430-0

PROJECT NO.

PENNCO OIL COMPANY, INC		REVISION ALTERATION STORAGE RECONDITION NEW LOCATION DRILL DEEPER ABANDONMENT REGISTRATION PLUGGING	W.D. MOHNEY & ASSOC Surveyor/Engineer W-1 Drawing Number 0-30-91 Date 1 = 500' Scale
Well Permittee/Registrant 200 U.S. ROUTE 22			
Address DELMONT PA. 15626			
CARL L. TROUTMAN			
Surface Owner N/A		SURFACE LANDOWNER AND WATER PURVEYOR WITH WATER SUPPLY WITHIN 1000'	APPROXIMATE COURSE AND DISTANCE TO WATER SUPPLY
Surface Lessor (if any) TROUTMAN			
Farm Name 2			
NONE			
Well No. 82	Tract Serial No 1080.00	NONE	NONE
Acres NONE	Ground Elevation 4000		
Angle of Deviation (Drilling) WESTMORELAND CO	Anticipated TD UPPER BUREL TWP		
County NEW KENSINGTON, EAST	Municipality 8		
Topo Quadrangle	Section	Workable Coal (Specify) TESOME-LAND CO. INC CARL TROUTMAN	UPPER FREEPORT ALL OTHERS
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF OIL AND GAS MANAGEMENT		cum 9/4/91	Within Renton Mine (Sealed)

125-23430

477 - 782- DRILLER'S LOG OF FORMATIONS						
Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Fill	0	10				Drillers Log
Red Clay	10	15				
Shale & Clay	15	30				
Sand	30	34				
Sand & Shale	34	188				
Pitt Red Bed	188	198				
Shale & Sand	198	220				
Sand & Shale	220	510				
Mine	510	515				
Shale	515	540				
Sand & Shale	540	950				
Shale	950	1000				
Sand & Shale	1000	1080				
Sand	1080	1125				
Sand & Shale	1125	1325				
Shale & Sand	1325	1700				
Sand & Shale	1700	2600			1" @ 1830	
Shale	2600	2800			1/2" @ 1950	
Sand & Shale	2800	3060				
Sand	3060	3070	Show of gas @ 3065			
Sand & Shale	3070	3700				
Shale	3700	4028				

	Vice President	12-23-91
Operator's Signature	Title	Date

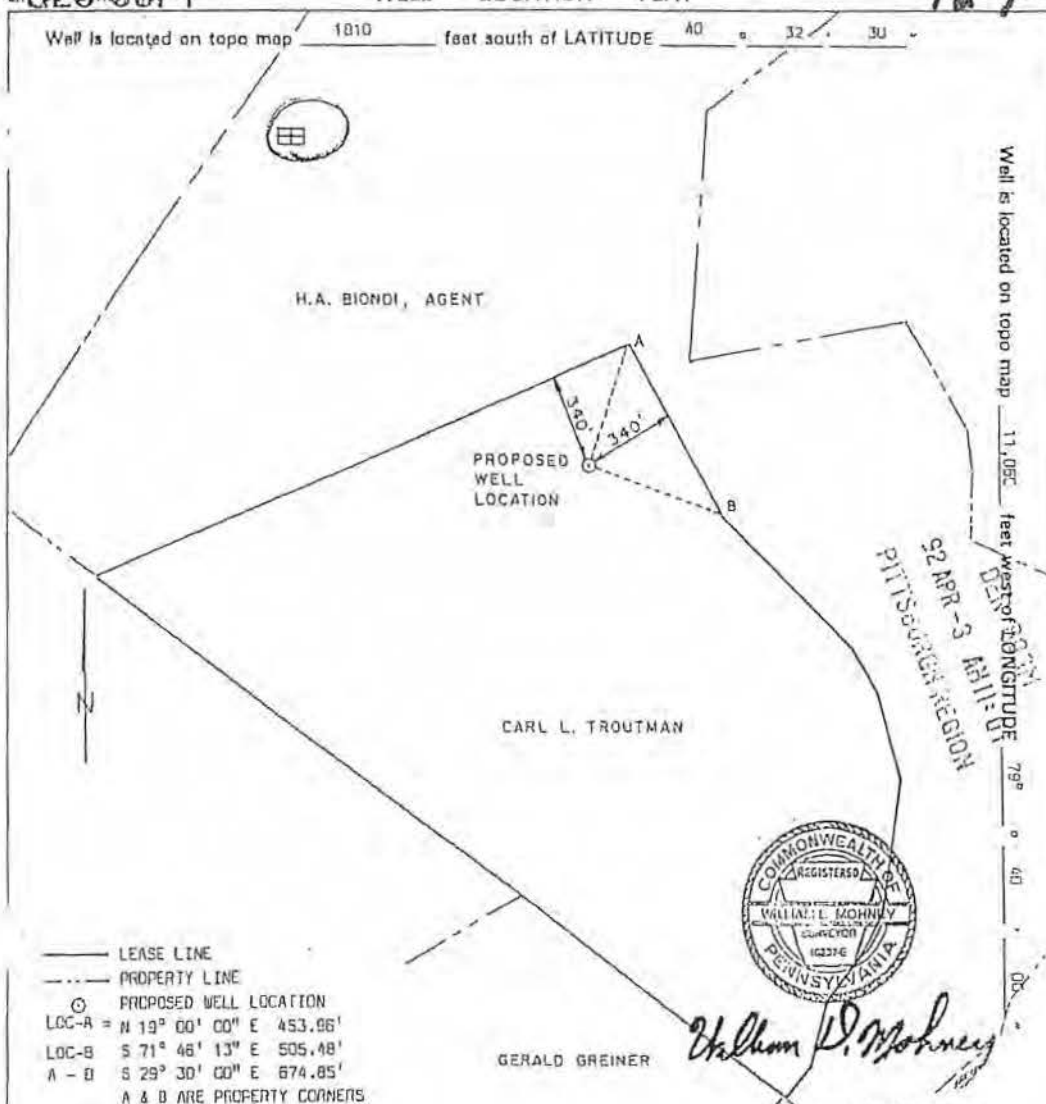
FOR OFFICIAL USE ONLY

	4/27/92	Comments
Reviewed By	Date	

GEO COPY

WELL LOCATION PLAT

129-23501



Include description of the property and courses and distances of the well(s) location to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2" topographic map and wetlands within 100'.

Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 is not required for well plugging.

[] Denotes location of well on 7 1/2" topo map

Permit # 37-129-23501-06

Project #

Pennaco Oil Company, Inc. 13825		Revision	☐	W.D. Mohney
Well Permittee/Registrant		Alteration	☐	Surveyor/Engineer
200 U.S. Route 22		Storage Recondition	☐	T-1
Address		New Location	☒	Drawing Number
Delmont, PA 15626		Drill Deeper	☐	12-4-90
Carl L. Troutman		Abandonment	☐	Date
Surface Owner		Registration	☐	1" = 500'
N/A		Plugging	☐	Scale
Surface Lessor (if any)		Surface landowner and water purveyor with water supply within 1,000'		Approximate course and distance to water supply
Troutman		Carl Troutman		S 25° 30' W 850'
Farm Name				
1 PT-121				
Well No.	Tract	Serial No.		
B2		1265		
Area		Ground Elevation		
None		435(1)		
Angle of Deviation (Grading)		Anticipated TD		
Westmoreland Co.	Upper Burrell Twp.			
County	Municipality			
New Kensington East	8			
Topo Quadrangle	Section			
Commonwealth of Pennsylvania		Department of Environmental Resources		
Bureau of Oil and Gas Management		Bureau of Oil and Gas Management		

NEW KENSINGTON EST.
129-23501

RG 43123

43176

WELL RECORD AND COMPLETION REPORT

$1810^{\circ} 3' 40'' = 32^{\circ} 30'$
 $11060^{\circ} 6' 79'' = 40^{\circ} 00''$ (8) ✓
 (H)

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-OG-76).

PINE RUN FIELD

Well Operator Pennaco Oil Company, Inc.		Telephone Number 412-468-8232	
Address 200 Rt 22, P.O. Box 300 Delmont, PA		Zip 15626	
Permit Number 37-129-23501		Project Number	
Farm Name Troutman #1	Farm Number	Serial Number PT - 121	Acres 82
Township Upper Burrell Township		County Westmoreland County	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method Rotary ☒ Air ☐ Mud ☐ Cable Tool ☐		Date Drilling Started 5-14-92	Date Drilling Completed 5-21-92
Other ☐ (Specify)			
Elevation 1265	Total Depth 4307	7 1/2' Quadrangle	New Kensington East

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount in Wall	Material Behind Pipe		Packer/ hardware			Date Run	
			Type	Amount	Type	Size	Depth		
15"	13 3/8"	35'	Sanded in		N/A	N/A	N/A	5-14-92	
12 1/4"			Reduced to 8 3/4" at 750						
8 3/4"	7"	1212	Cement - 460 sacks		Float 31w	7"	1219	5-19-92	
			T.D.	D.O.	D.P.I.	Class	O	G	Lease
			4307	—	3310	D	G	-	1

Cement return on surface casing? ☒ yes ☐ no **B** **B**

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated		Data	Interval Treated	Fluid		Propping Agent		Average Injection Rate
	From	To			Type	Amount	Type	Amount	
				Well was not treated					

Natural Open Flow	Natural Rock Pressure	Hours	Days
1,107 MCF	940 psig	72	
After Treatment Open Flow	After Treatment Rock Pressure	Hours	Days

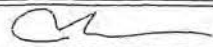
Name, Address, and Telephone Number of Well Service Companies

JUN 11 1993

F. D. Hall Drilling Company - Rt. 321 South - Kore, PA 16735	814-837-6612	PA GEOLOGICAL SURVEY
Halliburton Services, Inc. - P.O. Box 427 - Indiana, PA 15701	412-479-9046	Coal & Gas Geology Division
Allegheny Nuclear Surveyors, Inc. Elderton, PA 15736	412-354-3090	

129-23501

DRILLER'S LOG OF FORMATIONS						
Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Bony	0	35				Drillers Log
Sand	35	90				
Red Bed	90	100				
Sand & Shale	100	300			1/2'@100'	
Sand & Shale	300	870				
Shale	870	970				
Sand & Shale	970	1020				
Shale & Sand	1020	1400				
Sand & Shale	1400	1775				
Sand & Shale	1775	1920				
Murrysville	1920	2030			5" @ 1980	
Sand & Shale	2030	2065				
100' Sand	2065	2205		2160		
Sand & Shale	2205	2216				
Shale & Sand	2216	2235				
Red Rock	2235	2275				
Sand & Shale	2275	2675				
Shale & Sand	2675	3130				
Sand & Shale	3130	3630	3310			
Sand & Shale	3630	3735				
Sand	3735	3745				
Sand & Shale	3745	4100				
Shale & Shells	4100	4307				



Operator's Signature

Vice President
Title11/20/92
Date

FOR OFFICIAL USE ONLY

WA 5-25-93

Reviewed By

Date

Comments

Well is located on topo map 2150' feet south of LATITUDE 40° 32' 30"

H. A. BIONDI, AGENT

B

(PT-121)

(PT-123)

CARL L. TROUTMAN



LEASE LINE

PROPERTY LINE

PROPOSED WELL LOCATION

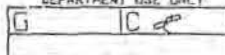
EXISTING WELL

LOC-A = N 82°05'22" W 684.95'

LOC-B = N 53°52'42" E 1472.20'

PROPERTY CORNERS A-B = N 67°30'00" E 2021.50'

DEPARTMENT USE ONLY



INCLUDE DESCRIPTION OF THE PROPERTY AND COURSES AND DISTANCES OF THE WELL(S) LOCATION TO TWO OR MORE PERMANENT IDENTIFIABLE POINTS OR LAND MARKS, ALL BUILDINGS AND WATER SUPPLIES WITHIN 200', ALL SPRINGS, BODIES OF WATER AND STREAMS WITHIN 100' IDENTIFIED ON THE MOST CURRENT 7 1/2' TOPOGRAPHIC MAP AND WETLANDS WITHIN 100'. REFERENCE TO BUILDINGS, SPRINGS, BODIES OF WATER, WETLANDS AND WATER SUPPLIES WITHIN 1000' IS NOT REQUIRED FOR WELL PLUGGING.

DENOTES LOCATION OF WELL ON 7 1/2' TOPO MAP PERMIT NO. 37-129 23506-4

PROJECT NO. _____

PENNECO OIL COMPANY, INC. <u>13825</u>		☐ REVISION ☐ ALTERATION ☐ STORAGE RECONDITION ☐ NEW LOCATION ☐ DRILL DEEPER ☐ ABANDONMENT ☐ REGISTRATION ☐ PLUGGING	W.D. MOHNEY & ASSOC.
Well Permittee/Registrant P.O. BOX 300, 200 U.S. ROUTE 22			Surveyor/Engineer T-1
Address DELMONT PA. 15626			Drawing Number 4-8-92
CARL L. TROUTMAN			Date = 500' Scale
Surface Owner N/A		SURFACE LANDOWNER AND WATER PURVEYOR WITH WATER SUPPLY WITHIN 1000'	APPROXIMATE COURSE AND DISTANCE TO WATER SUPPLY RECEIVED
Surface Lessor (if any) TROUTMAN		CARL TROUTMAN	S 34°48' E 343'
Farm Name 3	PT-123		JUN 21 1992
Well No. 82	Tract Serial No. 1136'		<i>129-23506-4</i>
Acres NONE	Ground Elevation 4200'		<i>129-23506-4</i>
Angle of Deviation (drilling) WESTMORELAND CO.	Anticipated TD UPPER BUREL TWP		
County NEW KENSINGTON, EAST	Municipality	Owner/Operator/Lessor TESONE-LAND CO. INC.	Workable Coal Seams Name of Seam UPPER FREEPORT
Topo Quadrangle	Section	CARL TROUTMAN	ALL OTHERS
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF OIL AND GAS MANAGEMENT		GOS RENTON MINE	
		Comm 5/11/92	

2158, 3 40° 32' 30" ✓
520 W 29° 42' 30" ✓
(6) • (7)

1. In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-QG-76).

PINE RUN FIELD

Well Operator Penneco Oil Company, Inc.		Telephone Number 412-468-8232	
Address 200 Rt 22 P.O. Box 300 Delmont, PA		Zip 15626	
Permit Number 37-129-23506-00		Project Number	
Farm Name Troutman #3	Farm Number	Serial Number PT-123	Acres 82
Township Upper Burrell Township		County Westmoreland County	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method Rotary (A/R) Mud ☐ Cable Tool ☐		Date Drilling Started 8-3-92	Date Drilling Completed 8-7-92
Other ☐ (Specify)			
Elevation 1135	Total Depth 4092	7 1/2" Quadrangle New Kensington East	

CASING AND TUBING RECORD							
Hole Size	Pipe Size	Amount In Well	Material Behind Pipe Type and Amount	Packer/Hardwars			Date Run
				Type	Size	Depth	
5"	13 3/8"	34'	Sanded in	N/A	N/A	N/A	8-3-92
2 1/4"	9 5/8"	620	Cement - 250 sacks	Float Shoe	9 5/8"	628	8-4-92
8 3/4"	7"	2038	Cement - 325 sacks	Float Shoe	7"	2046	8-6-92
6 1/4"	4 1/2"	3981	Cement - 160 sacks	Float Shoe	4 1/2"	3989	8-10-92

Cement return on surface casing? ☒ yes ☐ no

PITTSBURGH
93 MAY 2
DER

COMPLETION REPORT

Perforation Record			Stimulation Record							
Interval Perforated			Interval Treated		Fluid		Propping Agent		Average Section Rate	
Date	From	To	Date	Treated	Type	Amount	Type	Amount	per Day	
8-24	3521	3527	8-24	3521-3527					26 BPH	
8-24	3847	3849	8-24	3847-3849	Water	10,700 gal	Sand	13,000 lb	27.7 BPH	
8-24	3211	3224	8-24	3211-3224	Water	36,200 gal	Sand	73,000 lb		
	T.D.	D.D.	D.P.I.	Class	O	G	Lease			
	4092	—	3527	D G	-	/	/			
Natural Open Flow			B		Natural Rock Pressure		B		Hours Days	
			60MCF							
After Treatment Open Flow			A		After Treatment Rock Pressure		B		Hours Days	
			411 MCF				650 psia		RECEIVED	

Name, Address, and Telephone Number of Well Service Companies

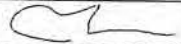
~~JUN 1 1933~~

F.D. Hill Drilling Company - Rt 321 South - Kane, PA 16735	814-837-6612	PA GEOLOGICAL SURVEY 101 N. Goshen Avenue
Nowaco Well Service - 3000 Old Airport Road - Wooster, OH 44691	216-264-8885	
Allegheny Nuclear Surveys, Inc. - Elderton, PA 15736	412-354-3090	

129-23506

PS 2 ✓

DRILLER'S LOG OF FORMATIONS						
Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Shale	0	5				Drillers Log
Red Clay	5	10				
Shale	10	20				
Red Bed	20	25				
Sand & Shale	25	45			Damp @45'	
Red Bed & Shale	45	140				
Shale	140	200				
Sand & Shale	200	319			1"@210'	
Shale	319	359				
Sand & Shale	359	554				
Mine	554	562				
Sand & Shale	562	1030				
Shale	1030	1175				
Sand & Shale	1175	1450				
Shale & Sand	1450	1820				
Sand	1820	1910			1"@1840	
Shale & Sand	1910	2058			3"@1870	
Sand & Shale	2058	2200				
Red Rock, Shale & Sand	2200	2385				
Sand & Shale	2385	3545				
Sand & Shale	3545	4092				


Vice-President
12/15/92
 Operator's Signature Title Date

FOR OFFICIAL USE ONLY

MA 5.25.93
 Reviewed By Date Comments

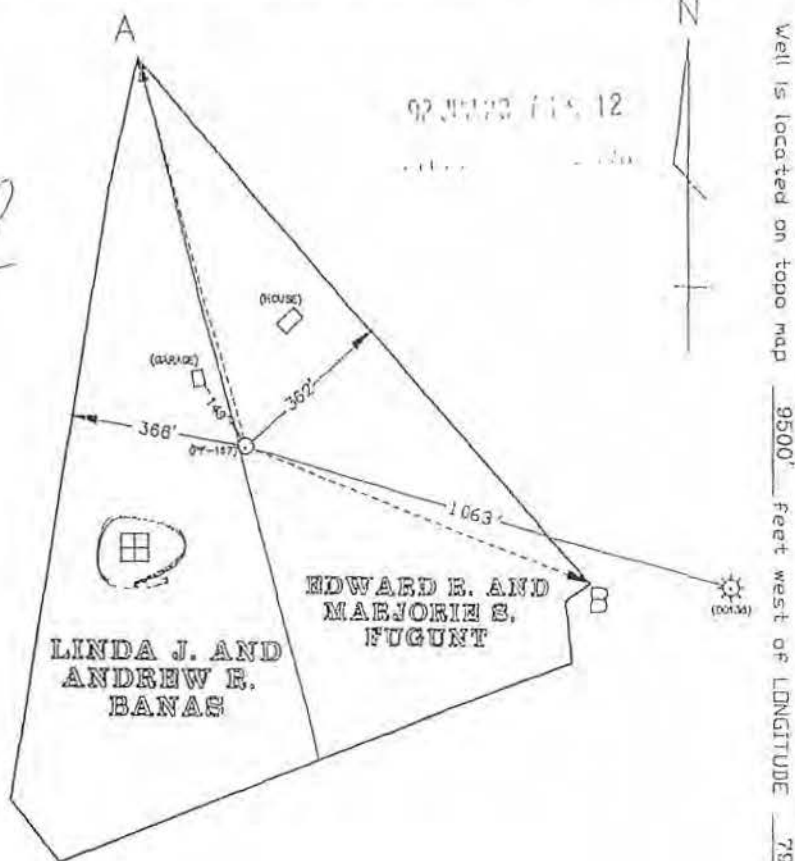
WELL LOCATION PLAN

Well(s) located on topo map 8500' feet south of LATITUDE 40° 32' 30"

129-23574



William D. Mohney
6/19/92



Well is located on topo map 9500' feet west of LONGITUDE 79° 40' 00"

— LEASE LINE
- - - PROPERTY LINE
○ PROPOSED WELL LOCATION
⊙ EXISTING WELL
LOC-A = N 16°00'05" W 625.73'
LOC-B = S 69°47'07" E 783.14'
PROPERTY CORNERS A-B = S 42°07'27" E 1435.02'

DEPARTMENT USE ONLY

G	C
---	---

INCLUDE DESCRIPTION OF THE PROPERTY AND COURSES AND DISTANCES OF THE WELL(S) LOCATION TO TWO OR MORE PERMANENT IDENTIFIABLE POINTS OR LAND MARKS, ALL BUILDINGS AND WATER SUPPLIES WITHIN 200', ALL SPRINGS, BODIES OF WATER AND STREAMS WITHIN 100' IDENTIFIED ON THE MOST CURRENT 7 1/2" TOPOGRAPHIC MAP AND WETLANDS WITHIN 100'. REFERENCE TO BUILDINGS, SPRINGS, BODIES OF WATER, WETLANDS AND WATER SUPPLIES WITHIN 1000' IS NOT REQUIRED FOR WELL PLUGGING



DENOTES LOCATION OF WELL ON 7 1/2" TOPO MAP PERMIT NO. 37-69-23574-00 PROJECT NO.

13830		REVISION ALTERATION STORAGE RECONDITION NEW LOCATION DRILL DEEPER ABANDONMENT REGISTRATION PLUGGING		WD MOHNEY & ASSOC Surveyor/Engineer PF-1 Drawing Number 6-04-92 Date 1 INCH = 300 FEET Scale	
PENNECO OIL COMPANY, INC.		LINDA AND ANDREW BANAS		N 24°00' W 225'	
Well Permittee/Registrant P.O. BOX 300, 200 U.S. ROUTE 22		EDWARD AND MARJORIE S FUGUNT		N 08°30' E 262'	
Address DELMONT, PA 15628		STEVE AND CATHERINE VENUS		S 62°00' E 950'	
EDWARD R. AND MARJORIE S FUGUNT		ALBERT AND BETTY SCHALLER		S 53°00' E 800'	
LINDA J. AND ANDREW R. BANAS		FRED AND MARY SNYDER		S 70°00' E 1000'	
Surface Owner N/A		SURFACE LANDOWNER AND WATER PURVEYOR WITH WATER SUPPLY WITHIN 1000'		APPROXIMATE COURSE AND DISTANCE TO WATER SUPPLY	
Surface Lessor (if any) FUGUNT					
Farm Name 1		PF-167			
Well No. 22.00		Tract 1040'			
Acres NONE		Ground Elevation 4000'			
Angle of Deviation (Drilling) WESTMORELAND		Anticipated TD MURRYSVILLE			
County NEW KENSINGTON, EAST		Municipality B			
Topo Quadrangle		Section			
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF OIL AND GAS MANAGEMENT		WORKABLE COAL SEAMS Owner/Operator/Lessee L & A. BANAS TESONE LAND COMPANY, INC. LINDA J. AND ANDREW R. BANAS E & M. FUGUNT TESONE LAND COMPANY, INC. EDWARD R. AND MARJORIE S FUGUNT		Name of Seams PROPERTY FREEPORT SEAMS ALL OTHERS PROPERTY FREEPORT SEAMS ALL OTHERS	

Gob 6.24.92 681

RE 43675 New sh.
43676 Blad
43677

WELL RECORD AND COMPLETION REPORT

8500' 3 40" 82' 30"
9500' 3 40" 82' 30"
(H) (8)

in accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.

2. In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see EN-OG-75).

PINE RUN FIELD

Well Operator Penneco Oil Company, Inc.		Telephone Number 412-468-8232	
Address 200 Rt 22 P.O. Box 300 Delmont, PA 15626-0300		Zip	
Permit Number 37-129-23514-00		Project Number	
Farm Name Fugant #1	Farm Number	Serial Number PF - 167	Acres 22.00
Township Municipality of Murrysville		County Westmoreland County	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method ☒ Rotary (Air) ☐ Mud ☐ Cable Tool ☐ Other ☐ (Specify)	Date Drilling Started 7-7-92	Date Drilling Completed 7-16-92
Elevation 1040	Total Depth 3925	7 1/2' Quadrangle New Kensington East

CASING AND TUBING RECORD

CASING AND TUBING RECORD								
Hole Size	Pipe Size	Amount In Well	Material Behind Pipe	Packer/Hardware			Date Run	
			Type and Amount	Type	Size	Depth		
	13 3/8"	34'	Sanded in	N/A	N/A	N/A	7-9-92	
1 1/4"	9 5/8"	488	Cement - 133 sacks	Float Shoe	9 5/8"	495	7-10-92	
8 3/4"	7"	1940	Cement - 305 sacks	Float Shoe	7"	1948	7-14-92	
6 1/4"	4 1/2"	3866	Cement - 150 sacks	Float Shoe	4 1/2"	3874	7-16-92	
		T.D.	D.D.	D.P.L.	Class	O	G	Lease
		3925	—	3720	D	G	—	1
Cement return on surface casing: ☒ yes ☐ no								

Cement return on surface casing ☒ Yes ☐ No

B

B

B

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Prepping Agent		Section Rate
	From	To			Type	Amount	Type	Amount	
8-3-92	3717	3720	8-3	3717-3720					
8-3-92	3730	3732	8-3	3730-3732	Water	11,000	Sand	33,300	23 BPM
8-3-92	3408	3412	8-3	3408-3412					
8-3-92	3108	3126	8-3	3108-3126	Water	27,000 gal	Sand	67,000	53.7 BPM
8-3-92	3026	3030	8-3	3026 - 3030	Water	10,000 gal	Sand	12,800	36.6 BPM

Natural Open Flow	Natural Rock Pressure
After Treatment Open Flow 250 MFP	After Treatment Rock Pressure 800 psi

1. Address, and Telephone Number of Well Service Companies

MAY 24 1993

F.D. Hill Drilling Company - Rt 321 South - Kane, PA 16735

814-837-6612

PA GEOLOGICAL SURVEY

NOVSCO Well Service - 3000 Old Airport Road - Wooster, OH 44691

216-264-0005

Oil & Gas Division, Erie

Allegheny Nuclear Surveys, Inc. - Eldersburg, PA 15716

412-354-1000

129-23514

DRILLER'S LOG OF FORMATIONS

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
ile	0	5				Drillers Log
Sand	5	50			Damp @ 50'	
Shale	50	90				
Sand	90	100				
Red Rock	100	110				
Sand & Shale	110	175				
Sand	175	275			1/2" @ 45'	
Sand & Shale	275	440				
Mine	440	450				
Shale & Sand	450	497				
Sand and Shale	497	700				
Shale	700	870				
Sand & Shale	870	1170				
Shale & Sand	1170	1585			1/2" @ 1210	
Sand & Shale	1585	1966			3" @ 1760	
Red Rock, Sand & Shale	1966	2450				
Sand & Shale	2450	3000				
Sand & Shale	3000	3570				
Shale & Sand	3570	3925				


 Director's Signature

 Vice-President
 Title

 5-3-93
 Date

FOR OFFICIAL USE ONLY

 MA 5-20-93
 Reviewed By

Date

Comments

NEW KENSINGTON EAST
129-23525

WELL RECORD AND COMPLETION REPORT

1160' S 40° 32' 30"
320' W 79° 42' 30" (7) ✓

- In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
- In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of top-hole water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-OG-75).

PINE RUN FIELD

Well Operator Penneco Oil Company, Inc.		Telephone Number 412-468-8232	
Address 200 Rt 22 P.O. Box 300 Delmont, PA 15626		Zip	
Permit Number 37-129-23525-00		Project Number	
Farm Name Blondt #3	Farm Number	Serial Number PU-49	Acres 162
Township Upper Burrell Township		County Westmoreland	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air ☒ Mud ☐ Cable Tool ☐ Other ☐ (Specify)	Date Drilling Started 8-11-92	Date Drilling Completed 8-15-92
Elevation 1030	Total Depth 3960	7K' Quadrangle New Kensington East

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe		Packer/Hardware			Date Run														
			Type and Amount	Type	Size	Depth																
15"	13 3/8"	34'	Sanded in	N/A	N/A	N/A	8-11-92															
8 3/4"	7"	1966'	Cement - 565 sacks	Float Shoe	7"	1974'	8-13-92															
6 1/4"	4 1/2"	3598'	Cement - 125 sacks	Float Shoe	4 1/2"	3605'	8-17-92															
<table border="1"> <tr> <td>T.D.</td> <td>D.D.</td> <td>D.P.I.</td> <td>Class</td> <td>O</td> <td>G</td> <td>Lease</td> </tr> <tr> <td>3960</td> <td>—</td> <td>3433</td> <td>D G</td> <td>-</td> <td>1</td> <td>1</td> </tr> </table>								T.D.	D.D.	D.P.I.	Class	O	G	Lease	3960	—	3433	D G	-	1	1	
T.D.	D.D.	D.P.I.	Class	O	G	Lease																
3960	—	3433	D G	-	1	1																
Cement return ☒ surface casing? ☒ yes ☐ no																						

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate
	From	To			Type	Amount	Type	Amount	
8-27	3427	3433	8-27	3427-3433	Water	9,000 gal	Sand	20,000	26.4 BPM
8-27	3116	3141	8-27	3116-3141	Water	23,000 gal	Sand	68,000	29.4 BPM
Natural Open Flow			Natural Rock Pressure			Hours Days			
After Treatment Open Flow 411 MCFPD			After Treatment Rock Pressure 960 psig			Hours Days			

Name, Address, and Telephone Number of Well Service Companies

JUN 11 1993

F.D. Hill Drilling Company - Rt 321 South - Kane, PA 16735	814-837-6612	LOGGICAL SURVEY
Halliburton Services, Inc. - P.O. Box 427 Indiana, PA 15701	412-479-0745	Gas Well Log Drilling
Allegheny Nuclear Surveys, Inc. Elderton, PA 15736	412-354-3090	

DRILLER'S LOG OF FORMATIONS						
Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Clay	0	10				Drillers Log
Red Bed & Shale	10	30				
Sand	30	48				
Shale & Sand	48	475			Damp@60'	
Coal	475	480				
Shale	480	499				
Sand & Shale	499	605				
Shale	605	655				
Coal	655	658				
Shale	658	670				
Sand & Shale	670	690				
Shale & Sand	690	1170				
Sand & Shale	1170	1710				
Shale	1710	1740				
Sand & Shale	1740	2100			7" @ 1760	
Red Rock, Sand, Shale	2100	2690				
Shale & Sand	2690	3230				
Sand & Shale	3230	3960				

129-23525

P12

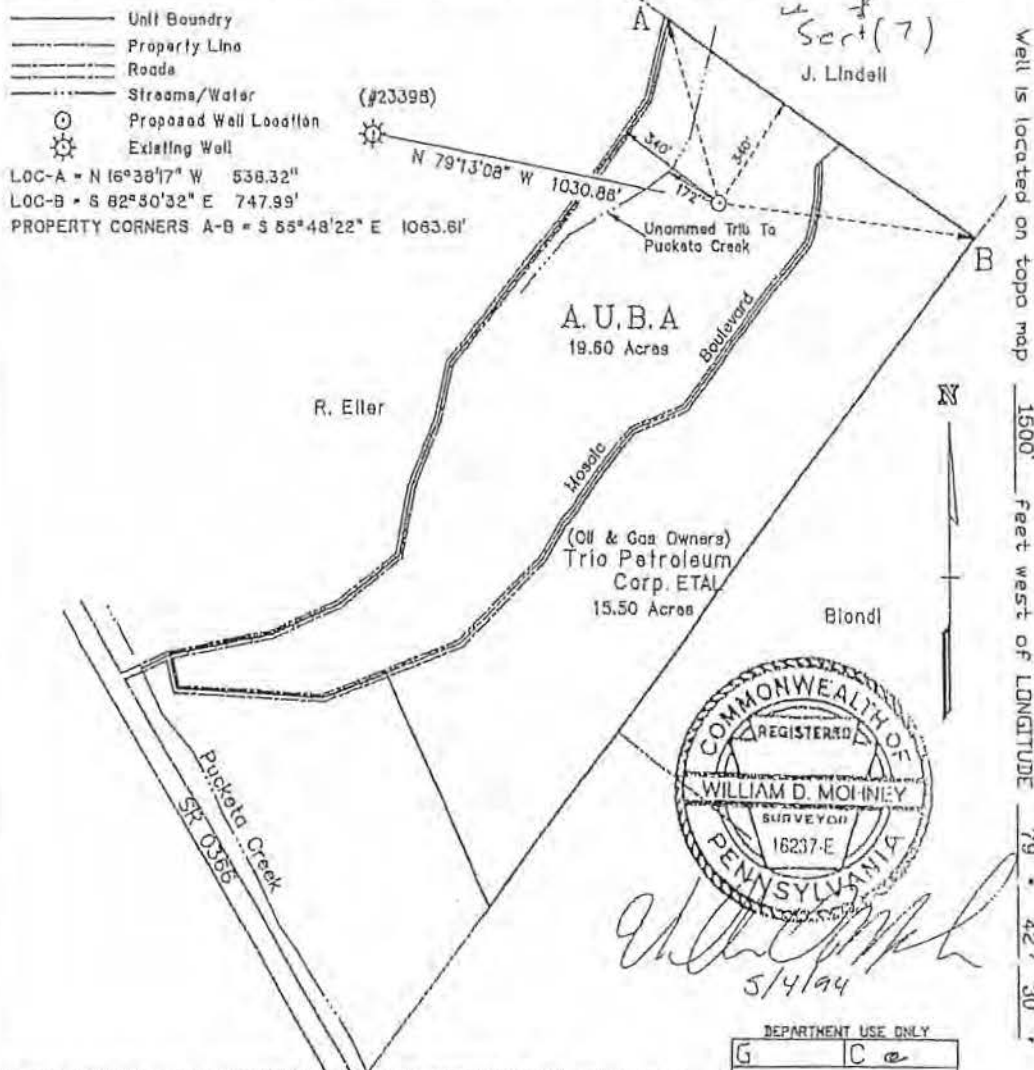
	Vice-President	12/15/92
Operator's Signature	Title	Date

FOR OFFICIAL USE ONLY

MA 5-25-93	Comments
Reviewed By	Date

Well is located on topo map 335' feet south of LATITUDE 40° 32' 30".

129-23728



INCLUDE DESCRIPTION OF THE PROPERTY AND COURSES AND DISTANCES OF THE WELL(S) LOCATION TO TWO OR MORE PERMANENT IDENTIFIABLE POINTS OR LAND MARKS, ALL BUILDINGS AND WATER SUPPLIES WITHIN 200', ALL SPRINGS, BODIES OF WATER AND STREAMS WITHIN 100' IDENTIFIED ON THE MOST CURRENT 7 1/2" TOPOGRAPHIC MAP AND WETLANDS WITHIN 100'.
REFERENCE TO BUILDINGS, SPRINGS, BODIES OF WATER, WETLANDS AND WATER SUPPLIES WITHIN 1000' IS NOT REQUIRED FOR WELL PLUGGING.



DENOTES LOCATION OF WELL ON 7 1/2' TOPO MAP PERMIT NO. 37-127-23723-00 PROJECT NO.

PENNECO OIL COMPANY, INC.	13825
Well Permittee/Registrant P.O. BOX 300, 200 U.S. ROUTE 22	
Address DELMONT, PA 15626	
ALLEGHENY UNION BAPTIST ASSOCIATION	
Surface Owner N/A	
Surface Lessee if any? A.U.B.A. UNIT	
Farm Name 1	PA 200
Well No. 35.10	Serial No. 930'
Acres NONE	Ground Elevation 3800'
Angle of Deviation (Drilling) WESTMORELAND	Anticipated TD UPPER BURRELL
County NEW KENSINGTON, EAST 140°	Municipality
Town Quadrangle	Section
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES BUREAU OF OIL AND GAS MANAGEMENT	

Pine Run Field WELL RECORD AND COMPLETION REPORT

129-23728

- In accordance with 25 Pa. Code 78.122(a), a Well Record must be submitted to the Department within 30 calendar days of cessation of drilling or altering a well.
- In accordance with 25 Pa. Code 78.122(b), a Completion Report must be submitted within 30 calendar days after completion of the well. In addition, the information on land application of topsoil water and disposal of residual waste (including contaminated drill cuttings) in a pit is to be filed with the Completion Report (see ER-QG-75).

Well Operator Pennaco Oil Company, Inc.		Telephone Number 412-468-8232	
Address 200 Rt 22, P.O. Box 300 Delmont, PA 15626-0300			
Permits Number 37-129-23728-00		Project Number	
Farm Name A. U. B. A. Unit	Farm Number #1	Serial Number PA-209	Acres 35.10
Township Upper Burrell Township		County Westmoreland County	
Type of Well ☒ Gas ☐ Oil ☐ Injection ☐ Storage ☐ Disposal ☐ Other (Specify)			

WELL RECORD
(Include Driller's Log on Reverse Side)

Drilling Method Rotary (Air ☒ Mud ☐ Cable Tool ☐ Other ☐ (Specify)	Date Drilling Started 08-11-94	Date Drilling Completed 08-17-94
Elevation 930	Total Depth 3509	7 1/2' Quadrangle New Kensington East

CASING AND TUBING RECORD

Hole Size	Pipe Size	Amount In Well	Material Behind Pipe	Packer/Hardware			Date Run
			Type and Amount	Type	Size	Depth	
18"	16"	8'	Sanded in	N/A	N/A	N/A	08-11-94
15"	13 3/8"	34'	Sanded in	N/A	N/A	N/A	08-11-94
12 1/4"	9 5/8"	412'	Cement - 145 sacks Class A Reg 3% CaCl ₂ + 1/2# seal/sack	Float Shoe	9 5/8"	420'	08-12-94
8 3/4"	7"	1810'	Cement - 300 sacks Class A Reg. 3% CaCl ₂ + 1/2# seal/sack	Float Shoe	7"	1818'	08-16-94
6 1/4"	4 1/2"	3411'	Cement - 120 sacks, Class A Reg 4% CaCl ₂ 0.5% FLA-1 3/8#D-Air	Float Shoe	4 1/2"	3419'	08-18-94
Cement return on surface casing? ☒ yes ☐ no							

COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated		Date	Interval Treated	Fluid		Propping Agent		Average Injection Rate
	From	To	Type		Amount	Type	Amount		
9-7-94	3291	3294	9-7	3291-3294	water	7523 gal	sand	13,500#	21.06 BPM
9-7-94	2988	3008	9-7	2988-3008	water	20,730 gal	Sand	69,000#	27.55 BPM

Natural Open Flow Not equipped to measure	Natural Rock Pressure Not Taken	Hours	Days
After Treatment Open Flow 211 MCFPD	After Treatment Rock Pressure 850 PSI	Hours	Days

JUL 20 1995

Name, Address, and Telephone Number of Well Service Companies

F. D. Hill Drilling Company - Route 321 South - Kane, PA 16735	PA GEOLOGICAL SURVEY Oil & Gas Geology Division 814-837-6612
Halliburton Energy Services, Inc. P.O. Box 427 Indiana, PA 15701	412-479-9046
Allegheny Nuclear Surveys, Inc. - Elderton, PA 15736	412-354-3090

DRILLER'S LOG OF FORMATIONS

Name	Top	Bottom	Gas At	Oil At	Water At (Fresh or Brine)	Source of Data
Fill	0'	8'				Driller's Log
Sand & Shale	8'	32'				
Sand	32'	34'				
Sand, Shale, Red Bed	34'	290'			Damp @ 60'	
Shale & Sand	290'	358'			2" fresh @ 260'	
Coal	358'	359'				
Gob	359'	365'			3" fresh @ 360'	
Sand & Shale	365'	840'				
Shale & Sand	840'	1250'			1" fresh @ 460'	
Sand & Shale	1250'	1695'			2" brine @ 1610'	
Shale & Sand	1695'	1725'				
100' Sand	1725'	1785'				
Sand & Shale	1785'	1830'				
Shale & Sand	1830'	2030'				
Sand, Shale, Red Rock	2030'	2150'				
Sand & Shale	2150'	2530'				
Shale & Sand	2530'	3040'				
& Shale	3040'	3509'				

125-
23728°
09 2

Operator's Signature

President
Title

Date

5/16/95

FOR OFFICIAL USE ONLY

Reviewed By

Date

Comments

W. J. L. 6-28-95

PIN_Long	COUNTY	MUNICIPALITY
1233-P-00036	Allegheny	Plum
1234-G-00148	Allegheny	Plum
1234-G-00155	Allegheny	Plum
1234-G-00219	Allegheny	Plum
1234-G-00230	Allegheny	Plum
1234-L-00142	Allegheny	Plum
1234-L-00184	Allegheny	Plum
1234-M-00208	Allegheny	Plum
1234-M-00208	Allegheny	Plum
1234-M-00211	Allegheny	Plum
1234-M-00237	Allegheny	Plum
1234-M-00263	Allegheny	Plum
62-80-00-0-001	Westmoreland	Upper Burrell
1233-P-00003	Allegheny	Plum
1234-A-00160	Allegheny	Plum
1234-F-00085	Allegheny	Plum
1096-M-00010	Allegheny	Plum
1097-M-00126	Allegheny	Plum
1098-D-00277	Allegheny	Plum
1233-N-00269	Allegheny	Plum
1233-N-00285	Allegheny	Plum
1233-N-00303	Allegheny	Plum
1233-N-00326	Allegheny	Plum
1233-N-00362	Allegheny	Plum
1233-N-00375	Allegheny	Plum
1233-N-00384	Allegheny	Plum
1233-P-00069	Allegheny	Plum
1233-P-00109	Allegheny	Plum
1233-P-00129	Allegheny	Plum
1234-B-00160	Allegheny	Plum
1234-B-00198	Allegheny	Plum
1234-B-00217	Allegheny	Plum

1234-B-00227	Allegheny	Plum
1234-B-00293	Allegheny	Plum
1234-B-00322	Allegheny	Plum
1234-F-00242	Allegheny	Plum
1234-G-00071	Allegheny	Plum
1234-G-00098	Allegheny	Plum
1234-H-00270	Allegheny	Plum
1234-J-00010	Allegheny	Plum
1234-L-00073	Allegheny	Plum
1234-L-00165	Allegheny	Plum
1234-M-00133	Allegheny	Plum
1234-M-00192	Allegheny	Plum
1234-M-00221	Allegheny	Plum
1234-M-00251	Allegheny	Plum
1234-M-00274	Allegheny	Plum
62-07-00-0-014	Westmoreland	Upper Burrell
62-08-00-0-010	Westmoreland	Upper Burrell
1097-M-00142	Allegheny	Plum
62-08-00-0-006	Westmoreland	Upper Burrell
62-08-00-0-008	Westmoreland	Upper Burrell
1096-H-00355	Allegheny	Plum
1096-M-00016	Allegheny	Plum
1097-S-00348	Allegheny	Plum
1098-D-00128	Allegheny	Plum
1233-J-00342	Allegheny	Plum
1233-N-00346	Allegheny	Plum
1233-P-00044	Allegheny	Plum
1234-C-00347	Allegheny	Plum
1234-C-00377	Allegheny	Plum
1234-F-00206	Allegheny	Plum
1234-G-00077	Allegheny	Plum
1234-G-00126	Allegheny	Plum
1234-K-00134	Allegheny	Plum
1234-K-00154	Allegheny	Plum
1234-L-00106	Allegheny	Plum
1234-M-00379	Allegheny	Plum
62-07-00-0-015	Westmoreland	Upper Burrell

62-08-00-0-007	Westmoreland	Upper Burrell
62-08-00-0-009	Westmoreland	Upper Burrell
62-08-00-0-086	Westmoreland	Upper Burrell
1234-G-00086	Allegheny	Plum
1234-M-00154	Allegheny	Plum
1234-G-00026	Allegheny	Plum
1233-N-00241	Allegheny	Plum
1233-P-00086	Allegheny	Plum
1233-P-00198	Allegheny	Plum
1233-P-00215	Allegheny	Plum
1233-P-00227	Allegheny	Plum
1233-P-00245	Allegheny	Plum
1233-P-00258	Allegheny	Plum
1233-P-00262	Allegheny	Plum
1234-B-00254	Allegheny	Plum
1234-B-00258	Allegheny	Plum
1234-F-00159	Allegheny	Plum
1234-G-00164	Allegheny	Plum
1234-G-00204	Allegheny	Plum
1234-J-00087	Allegheny	Plum
1234-K-00185	Allegheny	Plum
1234-K-00222	Allegheny	Plum
62-07-00-0-015	Westmoreland	Upper Burrell
62-07-00-0-030	Westmoreland	Upper Burrell
62-08-00-0-086	Westmoreland	Upper Burrell
1233-N-00354	Allegheny	Plum

SEDAT #4A WATER SUPPLY SURVEY

OWNER	Well_Detail	DateVerify
ROSENBERG NANCY	Certified Mail Delivered, no reply assum	2/7/2019
SPROUSE SHIRLEY ANN & EDDIE LION (H)	Certified Mail Delivered, no reply assum	2/7/2019
SMITH JAMES & SHIRLEY (W)	Certified Mail Delivered, no reply assum	2/7/2019
KOZUCH ROMAINE E	Certified Mail Delivered, no reply assum	2/7/2019
KOZUCH ROMAINE E	Certified Mail Delivered, no reply assum	2/7/2019
DZIUBAN ROBERT J & MARY LEE	Certified Mail Delivered, no reply assum	2/7/2019
OSWALT LARA BETH ROBINSON	Certified Mail Delivered, no reply assum	2/7/2019
BOBICK RANDALL D & TERRI LYNN (W)	Certified Mail Delivered, no reply assum	2/7/2019
BOBICK STEPHEN C	Certified Mail Delivered, no reply assum	2/7/2019
BOBICK STEPHEN C	Certified Mail Delivered, no reply assum	2/7/2019
TWIDWELL ROBERT L	Certified Mail Delivered, no reply assum	2/7/2019
BABINSACK VICTOR K & KATHLEEN E (W)	Certified Mail Delivered, no reply assum	2/7/2019
CALLENDER JESSALIN M	Public	2/7/2019
PATTOCK JAMES D & SUZANNE (W)	Public	2/7/2019
PATTOCK KIRT E & LISA M (W)	Public	2/7/2019
BUCHHOLZ BENJAMIN F	Public	2/7/2019
VISNANSKY A WILLIAM BALAZIK SUSAN M MILKO JEAN A	Public	2/7/2019
PALOMBO BENEDICT PALOMBO FERDINAND PALOMBO ANDREW	Public	2/7/2019
JOYCE PETER R	Public	2/7/2019
ROSALYN CHRISTOPHERSON	Public	2/7/2019
MATT ROBERT W & BARBARA L (W)	Public	2/7/2019
NATHAN KOSOWSKI	Public	2/7/2019
OTLANO PHILLIP JR & ALLENE C (W)	Public	2/7/2019
WILLIAMS MARVIN H	Public	2/7/2019
STRANO ANDREW R & LINDA E (W)	Public	2/7/2019
DAUGHERTY JENNIE E & LOUIS R DAUGHERTY	Public	2/7/2019
PARK LOTTIE E PHILLIPS ARTHUR D PHILLIPS ANNA	Public	2/7/2019
SWEENY MARK M & JUDITH ANN BLACK SWEENY (W)	Public	2/7/2019
JOHN L PATER	Public	2/7/2019
PODOBNIK MATTHEW W	Public	2/7/2019
SCHWARTZ MARY C	Public	2/7/2019
LARIS GEORGE	Public	2/7/2019

LARIS GEORGE	Public	2/7/2019
LABELLA JOHN R & MARGARET J (W)	Public	2/7/2019
HUSKA PAUL JR	Public	2/7/2019
GIACCO LEWIS R	Public	2/7/2019
ANKROM RALPH & ETHELYN (W)	Public	2/7/2019
PODOBNIK MATTHEW W	Public	2/7/2019
HIPPLE JOSHUA	Public	2/7/2019
SCHEETZ THOMAS W	Public	2/7/2019
FAVERO SHAWN L & MELISSA A (W)	Public	2/7/2019
HOEY JAMES J & DONNA J (W)	Public	2/7/2019
DEMAO RAYMOND LEONARD BARTLETT KELLY MARIE	Public	2/7/2019
FAVERO DAVID L & KATHLEEN L (W)	Public	2/7/2019
THE RICHARD F OSKIN FAMILY TRUST (RICHARD F OSKIN (TRUSTEE)	Public	2/7/2019
PASTUCHA JOANN G	Public	3/29/2019
LUCIANA JONATHAN R	Public	2/7/2019
HOUSEHOLDER DWIGHT E II+KENNA	Public	2/7/2019
MCVEY JEFFREY	Public	3/21/2019
ASPDEN ANNA	Spring	2/7/2019
CRAFT CLINT W.	Spring	2/27/2019
RESNIK MATTHEW R	Spring	2/7/2019
CHAMBERS CLARENCE	Vacant Land - None	2/7/2019
HARRIS MABLE	Vacant Land - None	2/7/2019
PALOMBO BENEDICT & KATHY ANN (W)	Vacant Land - None	2/7/2019
MILLER ALVIN R III & DIANE ELIZABETH (W)	Vacant Land - None	2/7/2019
MILLER ANNA LOUISE COSTA KATHLEEN	Vacant Land - None	2/7/2019
MILLER ANNA LOUISE & KATHLEEN COSTA	Vacant Land - None	2/7/2019
MACRO KLINT L & JENNIFER S (W)	Vacant Land - None	2/7/2019
FRERE LUCILLE CHRISTINA FRERE RAYMOND ARMOUL LOGAN FRERE	Vacant Land - None	2/7/2019
HALL LUKE	Vacant Land - None	2/7/2019
SEDAT INC	Vacant Land - None	2/7/2019
TTMAR INC	Vacant Land - None	2/7/2019
VAGLIA JOSEPH & MICHELLE (W)	Vacant Land - None	2/7/2019
SMOLENSKI THEODORE & VIRGINIA	Vacant Land - None	2/7/2019
SMOLENSKI THEODORE & VIRGINIA	Vacant Land - None	2/7/2019
ZEBRAK JOSHUA F	Vacant Land - None	2/7/2019
HAMILTON JOHN	Vacant Land - None	2/7/2019
LOMBARDO LOUIS ANTHONY & SANDY	Vacant Land - None	2/7/2019

TRZECIAK LOUIS JR CYNTHIA LOU	Vacant Land - None	2/7/2019
SANTUCCI JOSEPH & PAMELA	Vacant Land - None	2/7/2019
TRZECIAK LOUIS CYNTHIA LOUISE	Vacant Land - None	2/7/2019
VANHORN HERMAN E & IRENE B	Vacant per USPS	2/7/2019
DZIUBAN BENEDICT J	Vacant per USPS	2/7/2019
MITCHELL JANET ANN & RUSSELL WILLIAM MITCHELL	Well	2/7/2019
TEORSKY ROBERT M	Well	2/7/2019
MACRO KLINT L & JENNIFER S (W)	Well	2/7/2019
HASSON LEONARD J & NINA E (W)	Well	2/7/2019
MARTIN RICHARD A & MARY JANE (W)	Well	2/7/2019
DAUGHERTY LOUIS R & PAMELA E (W)	Well	2/7/2019
DAUGHERTY LOUIS R	Well	2/7/2019
DAUGHERTY DAVID R	Well	2/7/2019
DAUGHERTY DAVID R	Well	2/7/2019
PLANCE DAVID A & STEPHANIE (W)	Well	2/7/2019
PLANCE DAVID A & STEPHANIE (W)	Well	2/7/2019
COOPER DANIEL S	Well	2/7/2019
CARUSO DEBORAH	Well	2/7/2019
ANUSKIEWICZ DONALD J & FLORENCE M (W)	Well	2/7/2019
CHOLTKO FRANK III	Well	2/7/2019
SMOLENSKI FRANK T & MARCIA MARIE (W)	Well	2/7/2019
SMOLENSKI THEODORE & VIRGINIA	Well	2/7/2019
LOMBARDO LOUIS ANTHONY & SANDY	Well	2/7/2019
MILLER SHANE	Well	3/5/2019
TRZECIAK LOUIS CYNTHIA LOUISE	Well	2/7/2019
Combined with other parcel.		2/7/2019

[illegible]

Y
N
Y
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N

[illegible]

SEDAT 4A WATER SUPPLY INVENTORY	
OWNER	Phone
BUCHHOLZ BENJAMIN F	412-779-9610
DZIUBAN ROBERT J & MARY LEE	
KOZUCH ROMAINE E	
KOZUCH ROMAINE E	
MITCHELL JANET ANN & RUSSELL WILLIAM MITCHELL	
OSWALT LARA BETH ROBINSON	
PATTOCK JAMES D & SUZANNE (W)	
PATTOCK KIRT E & LISA M (W)	
ROSENBERG NANCY	
SMITH JAMES & SHIRLEY (W)	724-212-3890 724-335-0231 724-339-6926
SPROUSE SHIRLEY ANN & EDDIE LION (H)	
BABINSACK VICTOR K & KATHLEEN E (W)	
BOBICK RANDALL D & TERRI LYNN (W)	
BOBICK STEPHEN C	
BOBICK STEPHEN C	
CALLENDER JESSALIN M	
PASTUCHA JOANN G	
TWIDWELL ROBERT L	
CHAMBERS CLARENCE	724-335-7490 724-335-4512 won't give information over the phone 724-337-6945 724-337-6945 724-472-3421 - message 2-14-19, 2-18-19 412-828-2183 - bad no good number
FRERE LUCILLE CHRISTINA FRERE RAYMOND ARMOUL LOGAN FRERE	
HALL LUKE	
HAMILTON JOHN	
HARRIS MABLE	
LOMBARDO LOUIS ANTHONY & SANDY	
MACRO KLINT L & JENNIFER S (W)	
MILLER ALVIN R III & DIANE ELIZABETH (W)	
MILLER ANNA LOUISE & KATHLEEN COSTA	
MILLER ANNA LOUISE COSTA KATHLEEN	Vacant Land Per Tax Assessment
PALOMBO BENEDICT & KATHY ANN (W)	
SANTUCCI JOSEPH & PAMELA	
SEDAT INC	
SMOLENSKI THEODORE & VIRGINIA	
SMOLENSKI THEODORE & VIRGINIA	
TRZECIAK LOUIS CYNTHIA LOUISE	
TRZECIAK LOUIS JR CYNTHIA LOU	
TTMAR INC	
VAGLIA JOSEPH & MICHELLE (W)	724-422-9484 - message 2-14-19 Verified by M. Resnik that it is only a car port
ZEBRAK JOSHUA F	

ANKROM RALPH & ETHELYN (W)	
DAUGHERTY JENNIE E & LOUIS R DAUGHERTY	
DEMAO RAYMOND LEONARD BARTLETT KELLY MARIE	724-351-2232 2-7-19 confirmed Public Water
FAVERO DAVID L & KATHLEEN L (W)	412-418-1443 verified Public by Kathleen 2-18-19
FAVERO SHAWN L & MELISSA A (W)	412-418-1443 verified Public by Kathleen 2-18-19
GIACCO LEWIS R	
HIPPLE JOSHUA	
HOEY JAMES J & DONNA J (W)	Verified by Shawn Favero that the water line from the city is hooked in.
HOUSEHOLDER DWIGHT E II+KENNA	
HUSKA PAUL JR	
JOHN L PATER	
JOYCE PETER R	
LABELLA JOHN R & MARGARET J (W)	
LARIS GEORGE	
LARIS GEORGE	
LUCIANA JONATHAN R	724-831-7061 verified Public 2-18-19
MATT ROBERT W & BARBARA L (W)	
MCVEY JEFFREY	724-339-0699
NATHAN KOSOWSKI	
OTLANO PHILLIP JR & ALLENE C (W)	
PALOMBO BENEDICT PALOMBO FERDINAND PALOMBO ANDREW	
PARK LOTTIE E PHILLIPS ARTHUR D PHILLIPS ANNA	
PODOBNIK MATTHEW W	
PODOBNIK MATTHEW W	
ROSALYN CHRISTOPHERSON	
SCHEETZ THOMAS W	
SCHWARTZ MARY C	
STRANO ANDREW R & LINDA E (W)	
SWEENY MARK M & JUDITH ANN BLACK SWEENY (W)	724-337-8776 Judith Sweeny verified Public Water, well is unhooked.
THE RICHARD F OSKIN FAMILY TRUST (RICHARD F OSKIN (TRUSTEE)	724-337-4087 Public water per Richard
VISNANSKY A WILLIAM BALAZIK SUSAN M MILKO JEAN A	
WILLIAMS MARVIN H	
ASPDEN ANNA	
CRAFT CLINT W.	
RESNIK MATTHEW R	412-266-4176 - Verified by phone 2-14-19
DZIUBAN BENEDICT J	no good number
VANHORN HERMAN E & IRENE B	
ANUSKIEWICZ DONALD J & FLORENCE M (W)	
CARUSO DEBORAH	
CHOLTKO FRANK III	
COOPER DANIEL S	

DAUGHERTY DAVID R	
DAUGHERTY DAVID R	
DAUGHERTY LOUIS R	
DAUGHERTY LOUIS R & PAMELA E (W)	
HASSON LEONARD J & NINA E (W)	
LOMBARDO LOUIS ANTHONY & SANDY	
MACRO KLINT L & JENNIFER S (W)	
MARTIN RICHARD A & MARY JANE (W)	
MILLER SHANE	412-848-6309 via mailout
PLANCE DAVID A & STEPHANIE (W)	
PLANCE DAVID A & STEPHANIE (W)	
SMOLENSKI FRANK T & MARCIA MARIE (W)	
SMOLENSKI THEODORE & VIRGINIA	
TEORSKY ROBERT M	
TRZECIAK LOUIS CYNTHIA LOUISE	
Combined with other parcel.	

Well_Detai	DateVerify	Change Y/N
Mailed before and never replied.	2/7/2019	N
Mailed before and never replied.	2/7/2019	N
Mailed before and never replied.	2/7/2019	N
Mailed before and never replied.	2/7/2019	N
Mailed before and never replied.	2/7/2019	N
Mailed before and never replied.	2/7/2019	Y
Mailed before and never replied.	2/7/2019	N
Mailed before and never replied.	2/7/2019	N
Mailed before and never replied.	2/7/2019	N
Mailed before and never replied.	2/7/2019	N
Mailed before and never replied.	2/7/2019	N
NEW	2/7/2019	N
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NEW	2/7/2019	N
NEW	2/7/2019	N
NEW	2/7/2019	N
NEW	2/7/2019	Y
NEW	2/7/2019	N
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None	2/7/2019	N
None	2/7/2019	N
None	2/7/2019	N
None	2/7/2019	N
None	2/7/2019	Y

Public	2/7/2019	N
Public	2/7/2019	N
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Public	2/7/2019	N
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Public	2/7/2019	N
Public	2/7/2019	N
Public	2/7/2019	N
Public	2/7/2019	N
Spring	2/7/2019	N
Spring	2/27/2019	Y
Spring	2/7/2019	Y
Vacant per USPS	2/7/2019	N
Vacant per USPS	2/7/2019	N
Well	2/7/2019	N
Well	2/7/2019	Y
Well	2/7/2019	N
Well	2/7/2019	N

[illegible]

SEDAT 4A WATER SUPPLY PROOF OF NOTIFICATION

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9830 56](#) (Sequence Number 1 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: VICTOR K BABINSACK
1985 DRENNEN RD
NEW KENSINGTON PA 15068-1804

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9830 94](#) (Sequence Number 4 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: RUSSELL W MITCHELL
504 CLARENDON ST
PITTSBURGH PA 15238-3612

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9831 17](#) (Sequence Number 5 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: LARA BETH OSWALT
1942 DRENNEN RD
NEW KENSINGTON PA 15068-1805

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9831 24](#) (Sequence Number 6 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: JAMES D PATTOCK
2029 OLD LEECHBURG RD
NEW KENSINGTON PA 15068-8325

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9831 31](#) (Sequence Number 7 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: KIRT E PATTOCK
2029 OLD LEECHBURG RD
NEW KENSINGTON PA 15068-8325

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9831 48](#) (Sequence Number 8 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: RANDALL D BOBICK
1965 DRENNEN RD
NEW KENSINGTON PA 15068-1804

SEDAT 4A WATER SUPPLY PROOF OF NOTIFICATION

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9831 55](#) (Sequence Number 9 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: STEPHEN C BOBICK
1965 1/2 DRENNEN RD
NEW KENSINGTON PA 15068-1850

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9831 62](#) (Sequence Number 10 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: STEPHEN C BOBICK
1965 1/2 DRENNEN RD
NEW KENSINGTON PA 15068-1850

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9831 79](#) (Sequence Number 11 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: BENJAMIN F BUCHHOLZ
1924 OLD LEECHBURG RD
NEW KENSINGTON PA 15068-8318

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9831 93](#) (Sequence Number 12 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: JESSALIN M CALLENDER
1920 GREENSBURG RD
NEW KENSINGTON PA 15068-1800

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9832 16](#) (Sequence Number 14 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: ROBERT J DZIUBAN
1950 DRENNEN RD
NEW KENSINGTON PA 15068-1805

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9832 23](#) (Sequence Number 15 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: ROMAINE E KOZUCH
229 5TH AVE
NEW KENSINGTON PA 15068-6618

SEDAT 4A WATER SUPPLY PROOF OF NOTIFICATION

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9832 47](#) (Sequence Number 16 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: ROMAIN E KOZUCH
229 5TH AVE
NEW KENSINGTON PA 15068-6618

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9832 54](#) (Sequence Number 17 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: JOANN G PATUCHA
1981 DRENNEN RD
NEW KENSINGTON PA 15068-1804

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9832 61](#) (Sequence Number 18 of 18)

Scheduled Delivery Date: 02/28/2019

Shipped to: NANCY ROSENBERG
2032 OLD LEECHBURG RD
NEW KENSINGTON PA 15068-8324

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9921 33](#) (Sequence Number 1 of 4)

Scheduled Delivery Date: 02/28/2019

Shipped to: ROBERT L TWIDWELL
1977 DRENNEN RD
NEW KENSINGTON PA 15068-1804

Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9921 57](#) (Sequence Number 2 of 4)

Scheduled Delivery Date: 02/28/2019

Shipped to: JAMES SMITH
1933 DRENNEN RD
NEW KENSINGTON PA 15068-1804

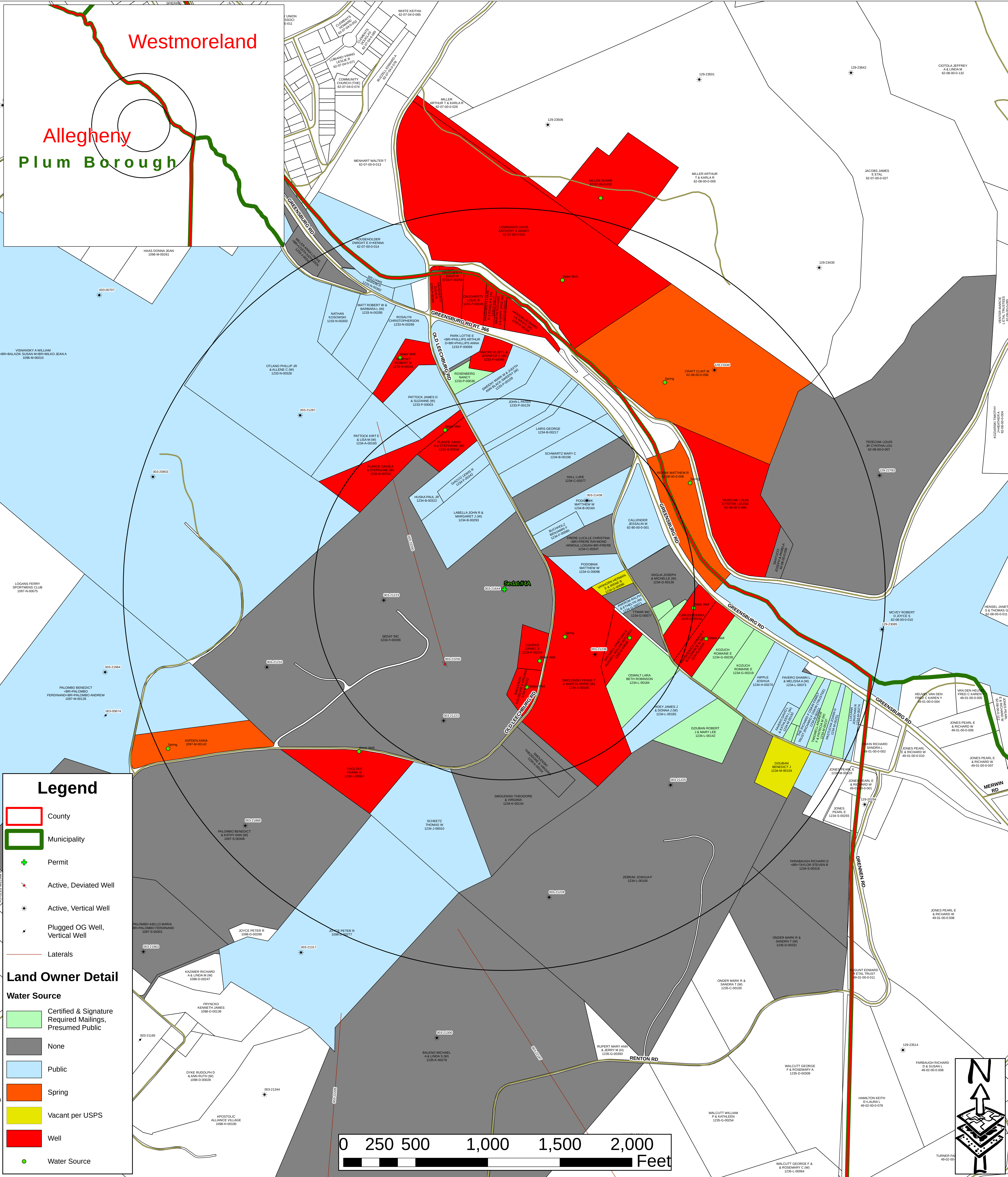
Priority Mail® 1-Day

Flat Rate Envelope

[9405 5036 9930 0431 9921 88](#) (Sequence Number 3 of 4)

Scheduled Delivery Date: 02/28/2019

Shipped to: EDDIE L SPROUSE
1927 DRENNEN RD
NEW KENSINGTON PA 15068-1804



BY: MEC

DATE: 4/29/2019

Scale: 1" = 200'

FILE: Sedat #4A Water Purveyor Map 2-7-19

JOB NO: 677415

SHEET: 1 of 2

WATER SUPPLY SURVEY FOR PENNECO ENVIRONMENTAL SOLUTIONS, LLC Plum Borough, Allegheny County Commonwealth of Pennsylvania

FOX & FOX, INC.
58 Timber Bridge Rd.
Clarion, PA 16214
Phone: 814-745-2861
Fax: 814-745-2248
email: ronaldfox@foxandfoxinc.us
web: www.foxandfoxinc.us

REVISIONS:

4/10/2019 - Updated Water Purveyor Data

4/12/2019 - Updated Water Purveyor Data

4/29/2019 - Updated Water Purveyor Data

ATTACHMENT "C"
Corrective Action Plan and Well Data

Attachment C
Corrective Action Plan and Well Data
Sedat #4A Injection Well

If any upward fluid migration should occur through the well bore of any known or unknown well or any improperly plugged well due to the injection of permitted fluids, injection will be stopped until the situation can be remedied. Should any problem develop with the casing of the injection well, injection will be stopped until repairs can be completed to the casing. Injection will be stopped in the event of any mechanical integrity failure or some other major failure and the Pennsylvania DEP and the EPA will be notified of the problem.

In addition to the proposed injection well there are five (5) wells in the ¼ mile AOR that penetrate the injection and are shown in the table below. Well records for the wells and a map showing their location are in Attachment B. Well permit # 003-21222 will be converted into an observation well.

Tabulation of Wells Penetrating the Injection Zone

Well Permit #	Well Type	Construction	Date Drilled	Location *	Total Depth	Completion
003-21238	Gas	Rotary/Air	11/13/89	South West	4,264'	Cased
003-22200**	Gas /Oil	Rotary/Air & Mud	1/12/12	South West	3,343' True VD	Cased
003-21222	Gas	Rotary/Air	1/12/89	South	4,323'	Cased
003-21223	Class IID	Rotary/Air	1/25/89	South West	1,940'	Cased
003-21438	Gas	Rotary/Air	1/4/99	North West	3,773'	Plugged

Well records and completion reports are included in Attachment B of the application.

*Location given in reference to proposed injection well Permit #003-21644

**Horizontal Well, lateral drilled to NW, for more information see well record in Attachment B and AOR map.

ATTACHMENT "E"
Name and Depth of USWD's



UIC Permit Application

SEDAT #4A

Plum Borough

Allegheny County

Pennsylvania

Binder 2

Attachment E

USDWs for Sedat #4A Injection Well

The Sedat #4A AOR is located in the Pittsburgh Low Plateau Section of the Appalachian Plateau physiographic province (refer to map at the end of this attachment). Underlying rock types are shale, siltstone, sandstone, limestone and coal. Aquifers in the AOR are mainly sandstones of the Conemaugh Group and the Allegheny Group. The Pottsville Group and the Mauch Chunk Formation, identified as USDWs in some areas of Pennsylvania lie at too great a depth to serve as aquifers in the AOR or are absent due to non deposition or erosion as is the case for the Mauch Chunk. See the table on the following pages listing USDWs in Pennsylvania. The thickness of the section from the Conemaugh Group through the Allegheny Group runs in the range of 800 feet depending on surface elevation. A review of the well records shows water production as deep as 1,700 feet. However reports of water production by the driller on their driller's logs are highly unreliable, the quantity and quality of the water is not measured by instrument. The quantity is estimated by site and the water quality which is often measured by taste, is a commingled sample from all formations open to the bore hole at the time of sampling. Additionally, Pennsylvania Geological Survey Water Resource Reports #35 and #37 state water quality is extremely poor beyond 500 feet in depth because of moderate to high mineralization of the waters (high dissolved solids and brine).

Description of USDWs in AOR

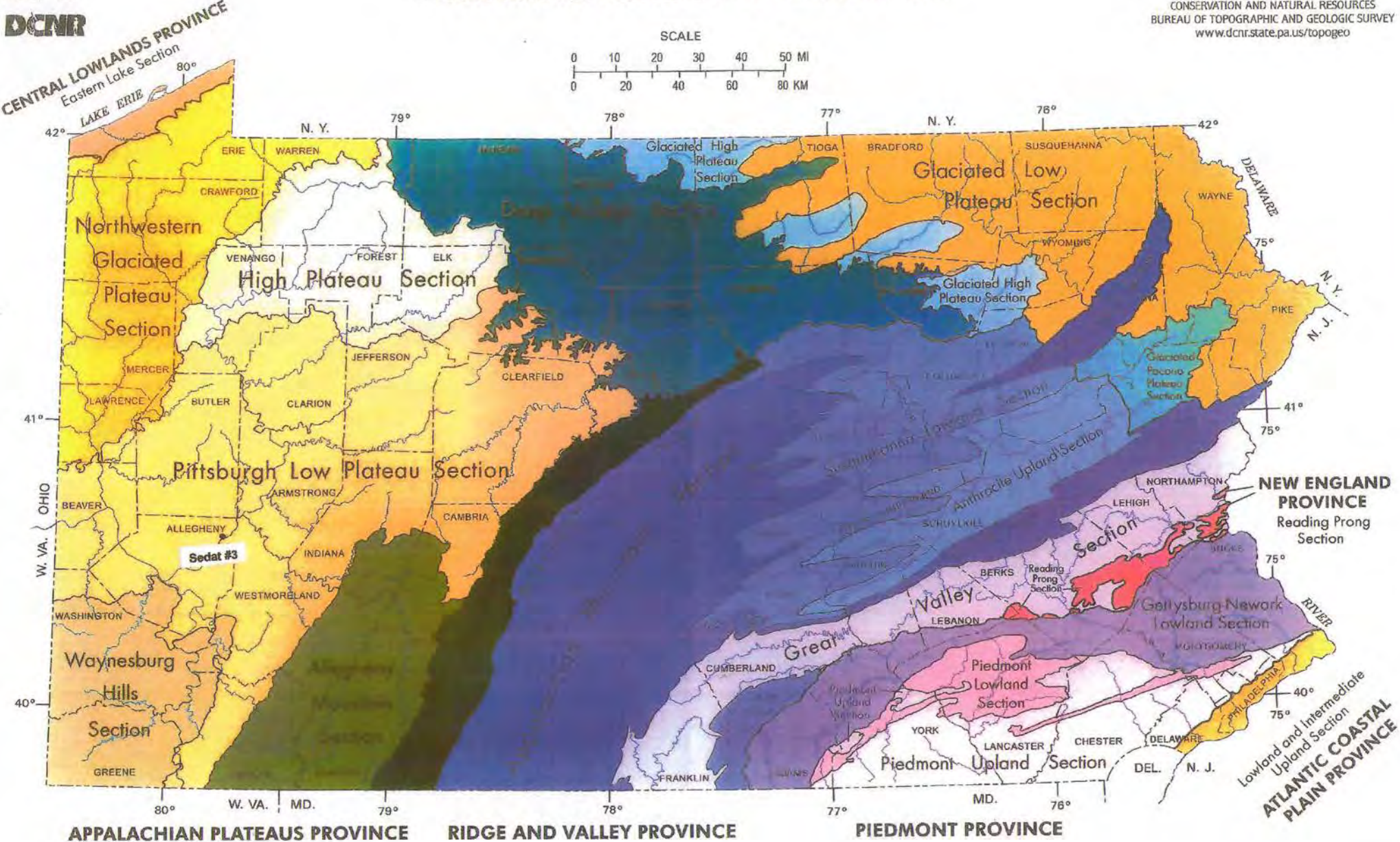
Rock members of the Conemaugh Group predominate at the surface in the AOR: see the section of the geologic map of Pennsylvania at the end of the attachment. The Casselman and Glenshaw Formations make up the Conemaugh Group, and consist of shale, red shale, sandstone and coals.

The Allegheny Group consists of shale, sandstone, thin beds of limestone and coals. The Freeport Formation, Kittanning Formation, Vanport Limestone, and Clarion Formation make up the Allegheny Group.

The established lowermost USDW for the Sedat 3A well (PAS2D701BALL), as detailed in its EPA Statement of Basis, is approximately 450'. Taking the elevation difference between Sedat 3A and Sedat 4A into account (-38'), the lowermost USDW at Sedat 4A is calculated at approximately 412'.

PHYSIOGRAPHIC PROVINCES OF PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

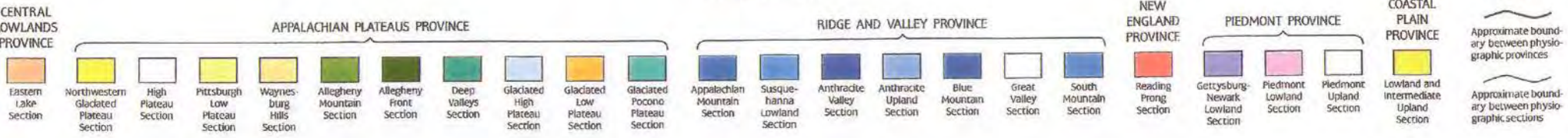


Figure 89. The principal aquifers in the Appalachian Plateaus Province in Segment 11 are sandstones in the geologic units shown in yellow and limestone shown in blue. Where fractured, rocks of the Greenbrier, the Catskill, and the Brallier Formations locally yield water. The gray areas represent missing rocks.

System	Pennsylvania	Maryland	West Virginia	Virginia
Permian	Dunkard Group		Dunkard Group	
Pennsylvanian	Monongahela Group	Monongahela Formation	Monongahela Group	
	Conemaugh Group	Conemaugh Formation	Conemaugh Group	
	Allegheny Group	Allegheny Formation	Allegheny Formation	
	Pottsville Group	Pottsville Formation		
			Pottsville Group	Horizon Formation
Mississippian				Wise Formation
				Norton Formation
				Lee Formation
	Mauch Chunk Formation	Mauch Chunk Formation	Mauch Chunk Group	Bluestone Formation
				Hinton Formation
				Bluestfield Formation
				Greenbrier Limestone
Devonian				Maecrady Shale
				Price Formation
	Pocono Formation	Pocono Formation	Pocono Group	
	Huntley Mountain Formation			
	Catskill Formation ¹	Hampshire Formation	Hampshire Formation	Chattanooga Shale
		Chemung Formation	Chemung Formation	
	Timmons Fork Formation	Brallier Formation ¹	Brallier Formation ¹	
	Harel Formation	Harel Shale	Harel Shale	

¹Locally water-yielding

Modified from:

Patchen, D.G., and others, 1985a, Correlation of stratigraphic units of North America (COSUNA) Project, southern Appalachian region: American Association of Petroleum Geologists, 1 sheet.

_____, 1985b, Correlation of stratigraphic units of North America (COSUNA) Project, northern Appalachian region: American Association of Petroleum Geologists, 1 sheet.

ATTACHMENT “G”
Geological Data on the Injection and Confining Zones

Attachment G
Geological Data on Injection and Confining Zones
SEDAT #4A Injection Well

Geological Data for Sedat #4A Injection Well

The Sedat #4A injection well will be a repurposed depleted natural gas well located in the Renton Gas Field in Plum Borough, Allegheny County, Pennsylvania. The injection well will target the Murrysville Sand as the injection zone which is water saturated and located very near the axis of the Duquesne-Fairmount syncline, see the copy of a section of Pittsburgh Region Structure Contour Map (Map 1) included with this attachment. Also included is a Geologic Map of the western part of Allegheny County, PA (Map 2). The immediate area around the well has been striped mined for coal (Pittsburgh Seam) and mined by underground methods for coal (Upper Freeport Seam); see the Area of Review map in Attachment B.

There are 14 wells within the 1/2 mile Area of Review (ARO) that penetrate the Murrysville sand, the state permit numbers for the wells are:

Permit #	Permit #	Permit #	Permit #
003-21287	003-21210	003-22200	003-21223
003-21222	003-21644	003-21238	003-21438
003-21228	129-23348	129-23085	
003-21225	003-20903	003-21868	

All the wells were cased and cemented through the Murrysville. Well 003-00674 was plugged. The well records can be found in Attachment B. The Sedat #3A well (003-21223) has been issued an EPA UIC permit (PAS2D701BALL) and has been repurposed for injection. The Sedat #1A (003-21210) will be converted to an observation well for the Sedat #3A injection well. The Sedat #2A well (003-21222) will be converted to an observation well for the Sedat #4A injection well.

The Murrysville Sand is approximately 94' thick, and lies at a depth of 1,706' to 1,800' in the Sedat #4A AOR. The well had an original TD of 3,886' and will be plugged back to 1,850' to just below the injection zone. See Attachment M Construction Details for well schematic and cement data. Fluid will be injected into a 60' section of the Murrysville Sand through a 2 $\frac{7}{8}$ " injection string set on a packer at approximately 1,650' in 4 $\frac{1}{2}$ " casing cemented to surface and into perforations in the 7" casing from 1,740' to 1,800'. The confining zones are the Riddlesburg Shale (Sunbury Equivalent) which overlays the Murrysville with the Riceville-Oswayo Shale lying underneath as the lower confining zone.

The upper confining zone lying directly on top of the Murrysville is the Riddlesburg Shale. The Riddlesburg is a dark gray to greenish and grayish black laminated shale and siltstone with occasional sandstone and limestone beds. The Riddlesburg is

between 80 to 90 feet thick in the Sedat #4A AOR; see the Riddlesburg Isopach map, Map 3 at the end of Attachment G.

The Murrysville is a greenish-yellow to gray sandstone with occasional conglomeratic lenses, with high porosity and permeability. Because of the Murrysville's thickness, high porosity and permeability the formation serves as a gas storage reservoir to the south of the Sedat lease. All most all the wells in the AOR including the Sedat #4A were drilled and cased through the Murrysville without running a porosity logs, see the well records in Attachment B. There are two wells for which porosity logs are available that show the average density porosity through the Murrysville Sand to average around 24%, which agrees with published reports of porosity values in the Murrysville. Refer to the log sections and location map at the end of this attachment for wells permit # 129-24721, and well permit #129-25581. Both wells where saturated with brine and did not produce gas.

Penneco conducted several tests to determine the reservoir characteristics of the Murrysville on this lease with the results included at the end of Attachment H. The test provided a breakdown pressure, the pressure needed to initiate a fracture, as 3,115 psi, ISP is estimated as 1,114 psi, with a fracture gradient of 1.23 psi. The reservoir pressure is 232 psi, with an estimated closure pressure of 553 psi. See the supplement to the HFrac report labeled Item 5 for more detail on the methodology used to determine the fracture gradient.

Formation permeability for the Murrysville was reported by Melissa Sager (Petrologic Study of the Murrysville sandstone in SW PA, 2007) as generally high throughout the formation, with a range of 0.005 to 1,000 millidarcies and an average of around 100 millidarcies. The permeability of the Murrysville in the Sedat #4A is estimated to be 1.8 mD and was determined from a series of tests performed on the Sedat #3A well to determine the reservoir characteristics of the Murrysville sand on Penneco leases. The tests were conducted by HFrac Consulting Services, LLC (see the supplement to the HFrac report labeled Item 7 at the end of this attachment for additional detail). This value falls within the lower range of Sager's study.

The Riceville-Oswayo Shale lying directly beneath the Murrysville serves as the lower confining zone. The Riceville-Oswayo is about 30 feet thick in the AOR; see Map 4, Isopach map of the Oswayo Shale. The Riceville-Oswayo formation consists of dark gray to medium gray shale and siltstones.

Structurally the AOR has a series of northeast-southwest trending anticlines and synclines with the Sedat #4A well lying along the axis of the Duquesne-Fairmount syncline refer to Map 1. While there are some deep seated basement faults associated with the Rome Trough, review of Map 1, Map 2 and an additional structure map contoured on the top of the Murrysville Sand and additional cross sections across the AOR supports the idea that there are no apparent faults at shallower depths in the AOR. The Murrysville structure map along with additional cross sections across the AOR are

from McDaniel's Subsurface Stratigraphy and Depositional Controls on Late Devonian-Early Mississippian Sediments in SW PA.

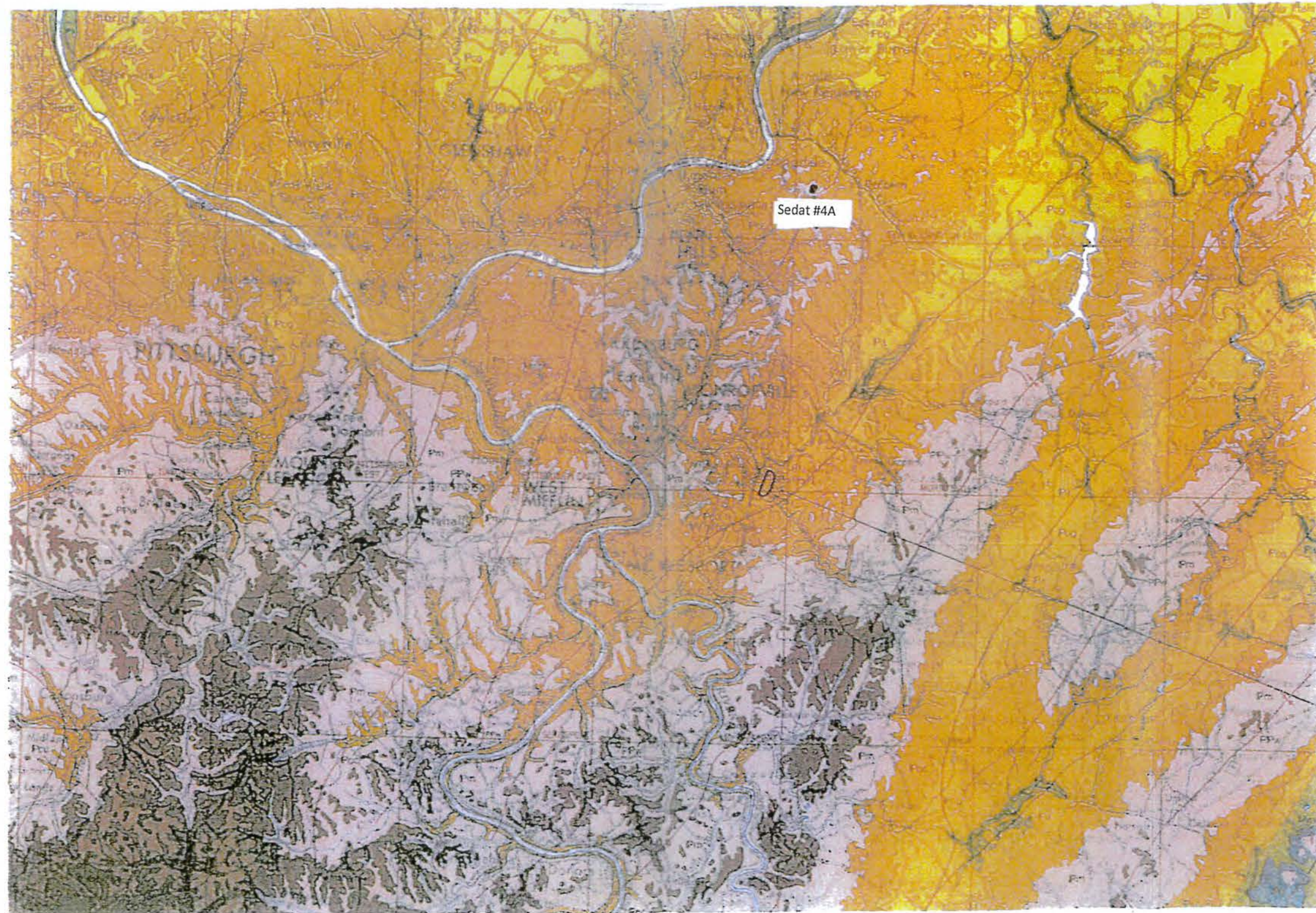
Review of Pennsylvania Geologic Publication, Atlas No. 36, Geology of the Freeport Quad (the Sedat #4A is in the SW corner of the quad) states on page 23 "displacement faults where not seen in any outcrop. Inquiry among mine operators indicate practically the same thing". Penneco Environmental Solutions, LLC had a related company that at one time mined in the AOR and a search of its records supports the statement found in Atlas No. 36.

The U.S.G.S rates the probability of seismic activity in SW Pennsylvania with sufficient intensity to cause damage as low. A series of four earthquake maps from the U.S.G.S earthquake hazards program website are found at the end of this attachment.

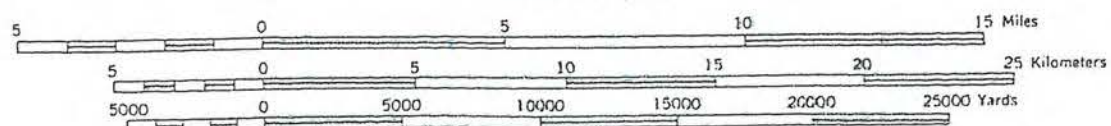
Earthquake Map 1 shows the historical locations of earthquakes in Pennsylvania and nearby areas. Earthquake Map 2 shows the entire US color code to show the chance of a seismic event occurring from lowest to highest. Map 1 shows no seismic events are shown to have occurred in SW PA, and Map 2 shows the AOR lies in an area with the second lowest hazard level.

Earthquake Maps 3 and 4 are from U.S.G.S. open file report 2016 One Year Seismic Hazard Forecast for the Central and Eastern United States from Induced and Natural Earthquakes OFR-2016-1035. Map 3 shows there is a small chance (one percent) that ground shaking greater than IV on the Modified Mercalli Scale will occur. Map 4 indicates the change of damage in the NE from natural or induced seismic activity to be 1% to 2%.

Penneco also contends that the maximum injection pressure is sufficiently below the pressure needed to initiate a fracture or reactive any unknown faults. The injection rate is also not of a sufficient volume to open or extend any fractures or reactive any unknown faults in the area, see the HFRAC report in Attachment I.



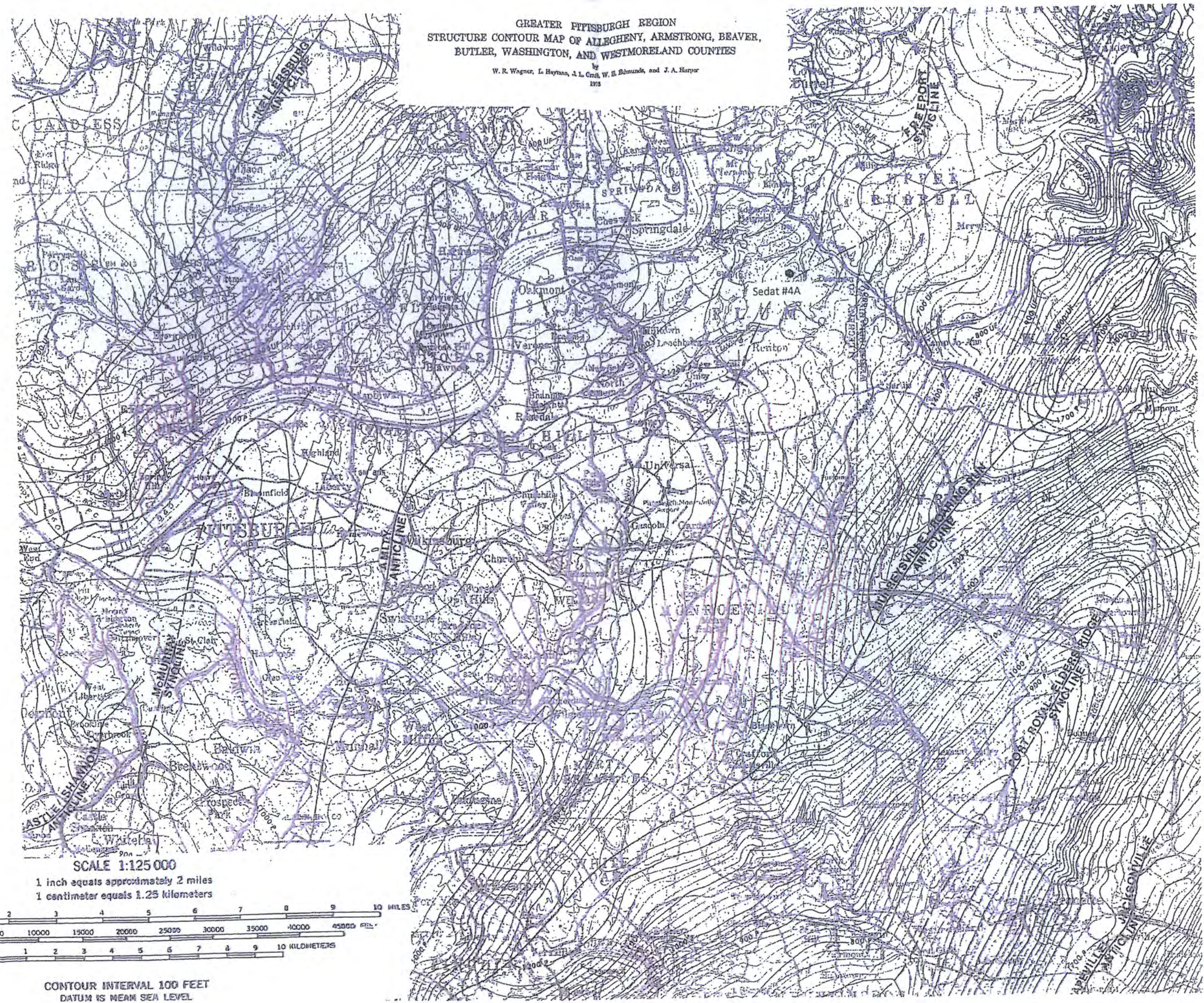
SCALE 1:250,000



ONE INCH EQUALS APPROXIMATELY FOUR MILES

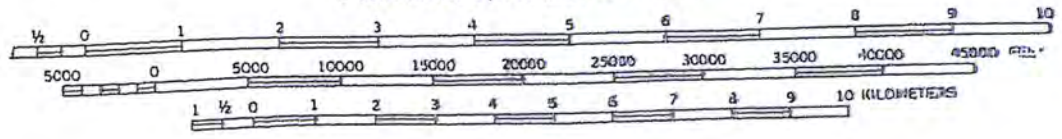
GREATER PITTSBURGH REGION
STRUCTURE CONTOUR MAP OF ALLEGHENY, ARMSTRONG, BEAVER,
BUTLER, WASHINGTON, AND WESTMORELAND COUNTIES

by
W. R. Wagner, L. Hayman, J. L. Criss, W. E. Edmunds, and J. A. Harper
1973



SCALE 1:125 000

1 inch equals approximately 2 miles
1 centimeter equals 1.25 kilometers



CONTOUR INTERVAL 100 FEET
DATUM IS MEAN SEA LEVEL



SUPERIOR
Blacklick, Pa
Mentor, Pa
Wooster, Ohio
Charleston, W Va

GR / NEU
CDL / DIL
TEMPERATURE

MARE

CPNY PENNECO OIL COMPA
Y, INC.

WELL SEDAT # 4A

FIELD NEW KENSTINGTON EAST

CO. ALLEGHENY ST PA.

COMPANY PENNECO OIL COMPANY, INC.

WELL SEDAT # 4A PS-7448

FIELD NEW KENSTINGTON EAST

COUNTY ALLEGHENY

LOCATION

P/N - 37-003-21644-00
749' WEST 79-42-39.70
5366' SOUTH 40-31-36.90

STATE PA.

OTHER SERVICES:
TIF FILE
2.0" SCALE
ANALYSIS

SEC. TWP. PLUM RGE.

PERMANENT DATUM CL = 7.0" ELEV. 1068'

LOG MEASURED FROM TOP OF 7.0" ABOVE PERMANENT DATUM

DATE 07-07-2004

ELEV. K.B. 1079'
D.F. 1078'
G.L. 1068'

DEPTH-DRILLER 3925'

DEPTH-LOGGER 3925'

BIT. LOG INTER. 3925'

TOP LOG INTER. GR / SURFACE

CASING-DRILLER 7.0" @ 1907'

CASING-LOGGER 7.0" @ 1907'

BIT SIZE 6.25"

FLUID TYPE AIR

DENS. : VISC. N/A

PH : FLUID LOSS N/A

SOURCE OF SAMPLE

RT # MEAS. TEMP.

RT # MEAS. TEMP.

RT # MEAS. TEMP.

SOURCE: RT# / RT#

RT # BHT

TIME SINCE CIRC.

MAX. REC. TEMP.

EQUIP.: LOCATION

RECORDED BY

WITNESSED BY

MR. HUMMEL

MR. HILL

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENT AND WE CANNOT AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES, OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR GENERAL TERMS AND CONDITIONS SET OUT IN OUR CURRENT PRICE SCHEDULE.

REMARKS:

MDEN - 2.68 CDL # 2473
FDEN - 1.0 DIL # 5272

CREW : BREAKIRON, STUMPF
TEMPERATURE LOGGED UPHOLE
THANK YOU FOR CHOOSING SUPERIOR WELL SERVICES

STOP DEPTH: 28.2 FEET
DIRECTION: UP 1:240

MAIN
SECTION

FILE DATE: 07-07-2004
TIME: 04:47

DifTemp
-10.0 Delta 10.0

CALIPER

5.0 inch 15.0

GAMMA RAY

0.0 API 200.0

MinR

0.00 OHMM 100.00

ILD

0.00 OHMM 100.00

CORR

-0.25 0.25

Temperature

70.0 F 75.0

DENSITY

30.00 PORO. -10.00

CBD

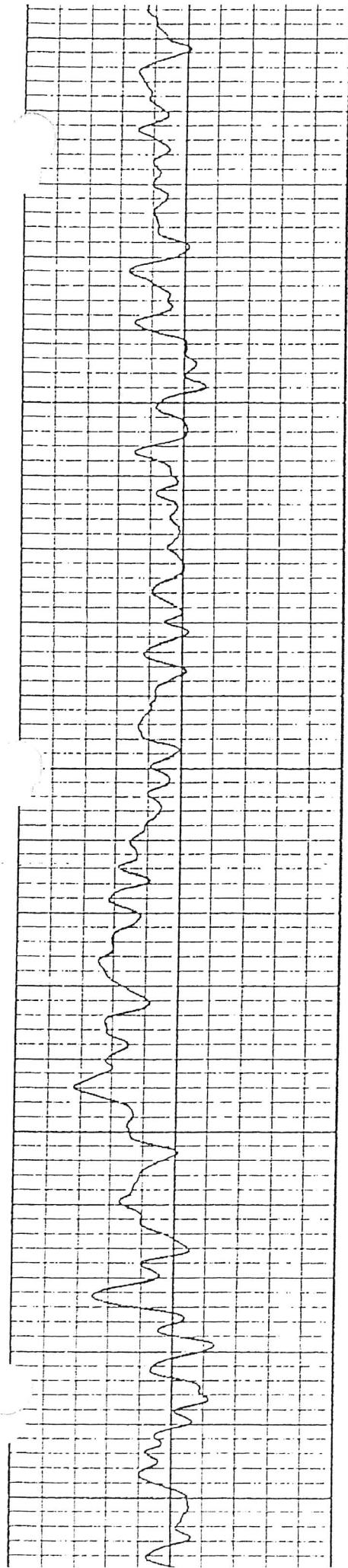
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NEUTRON

30.0 PORO. -10.0

200

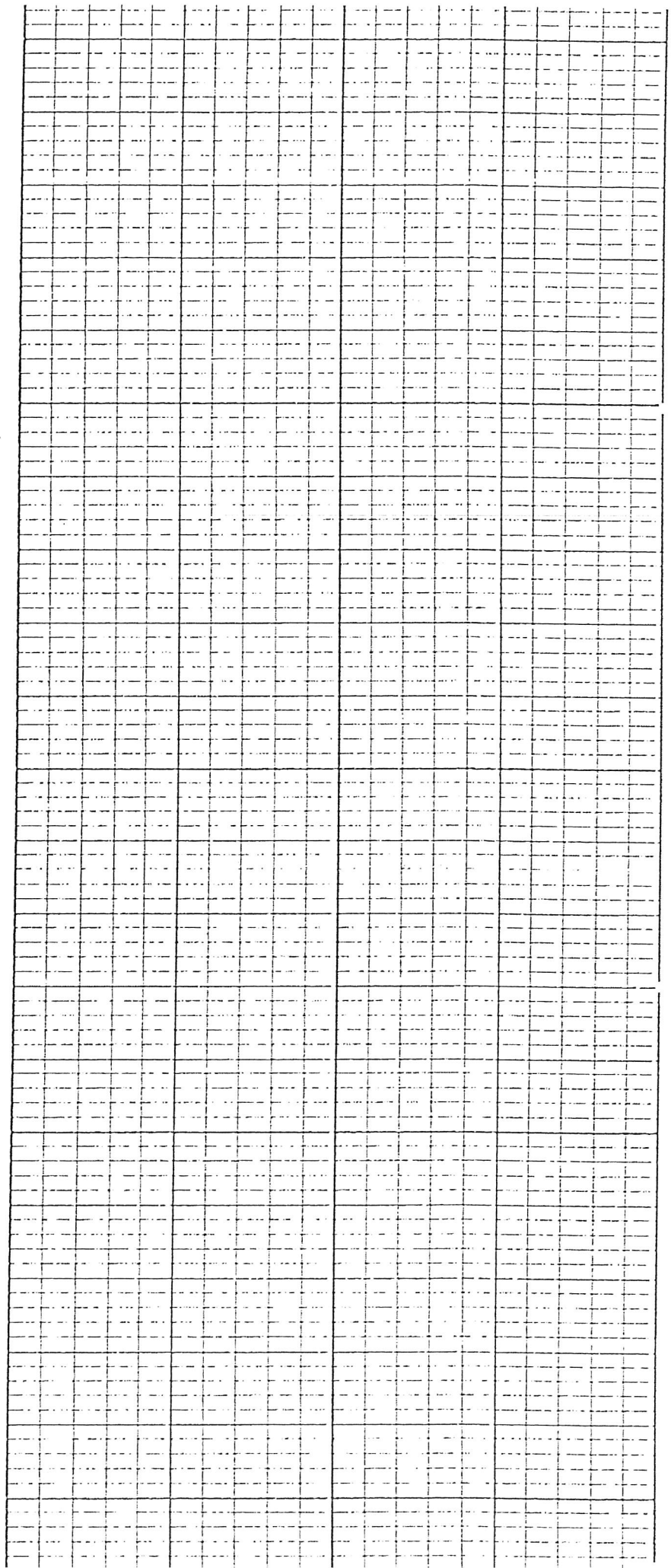
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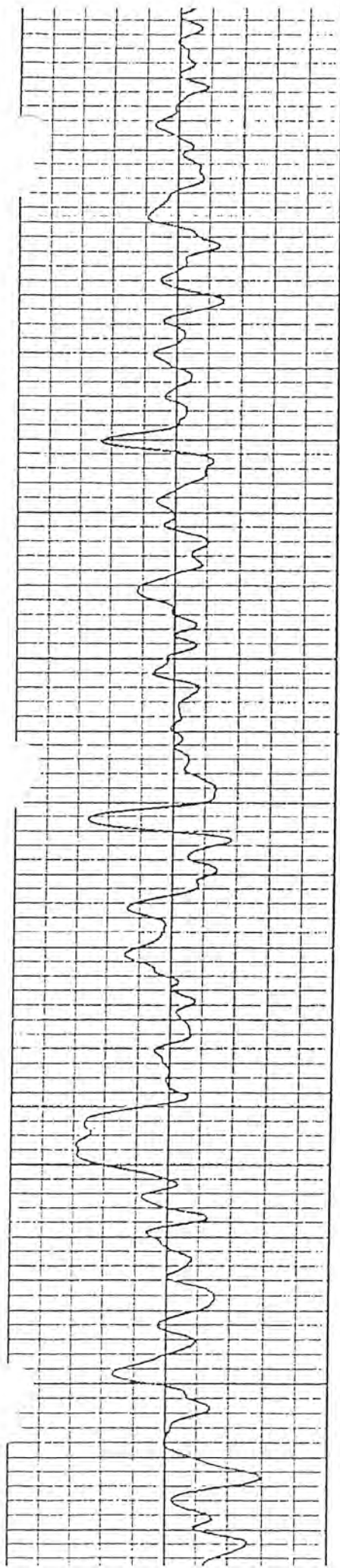


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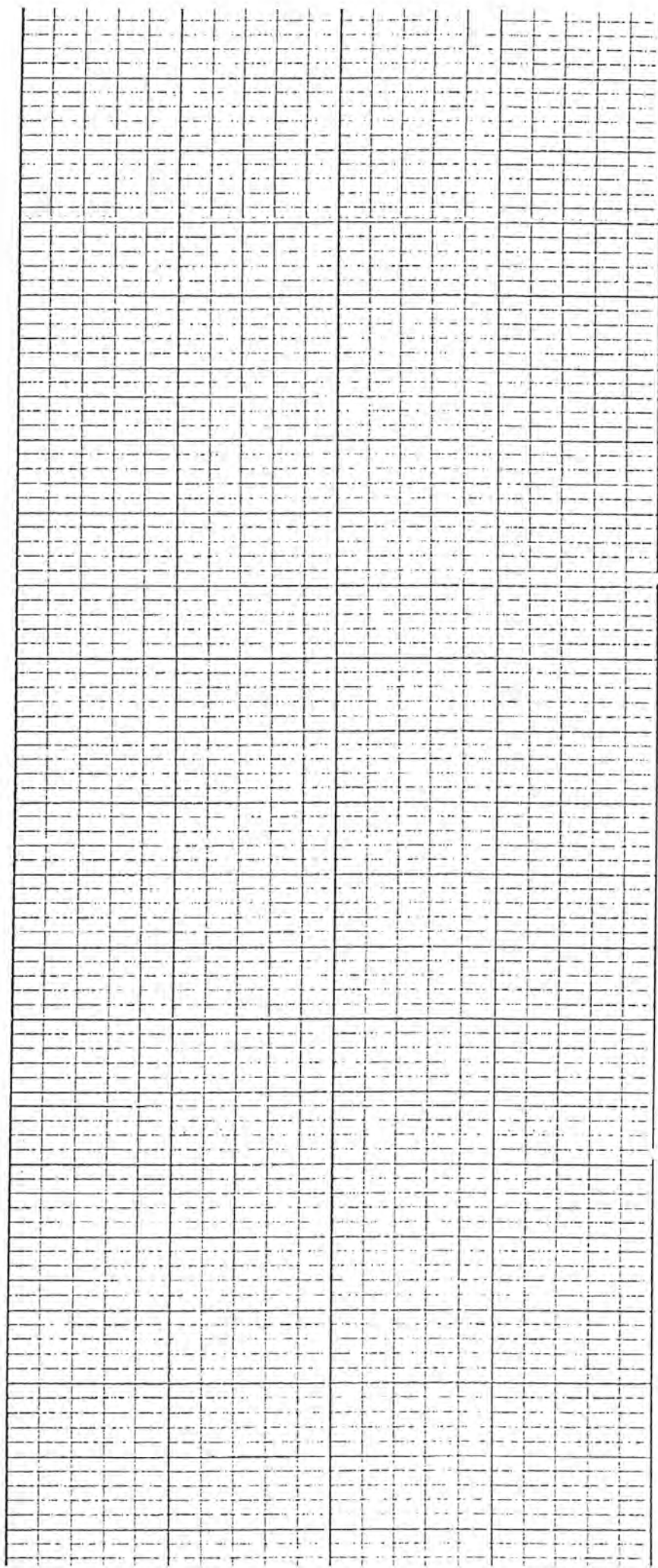
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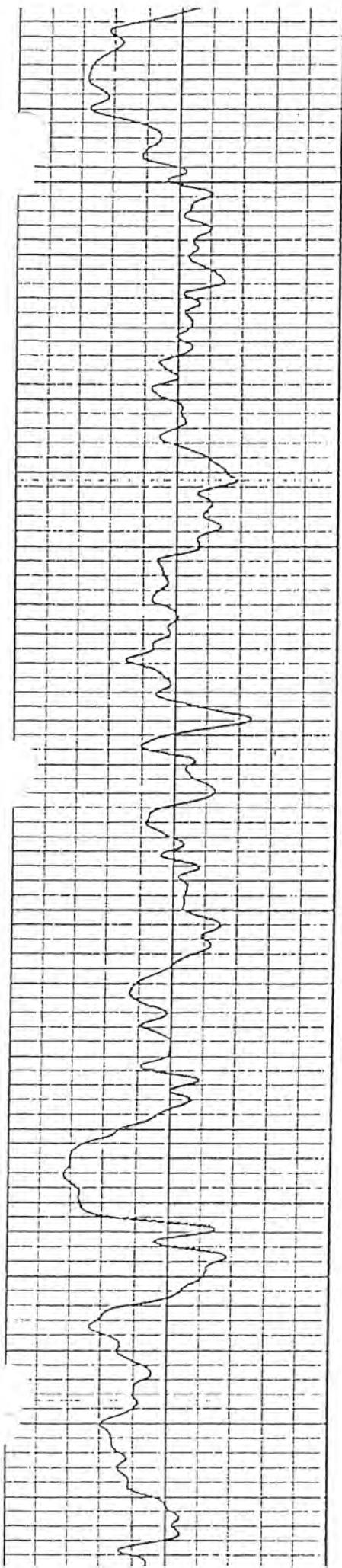




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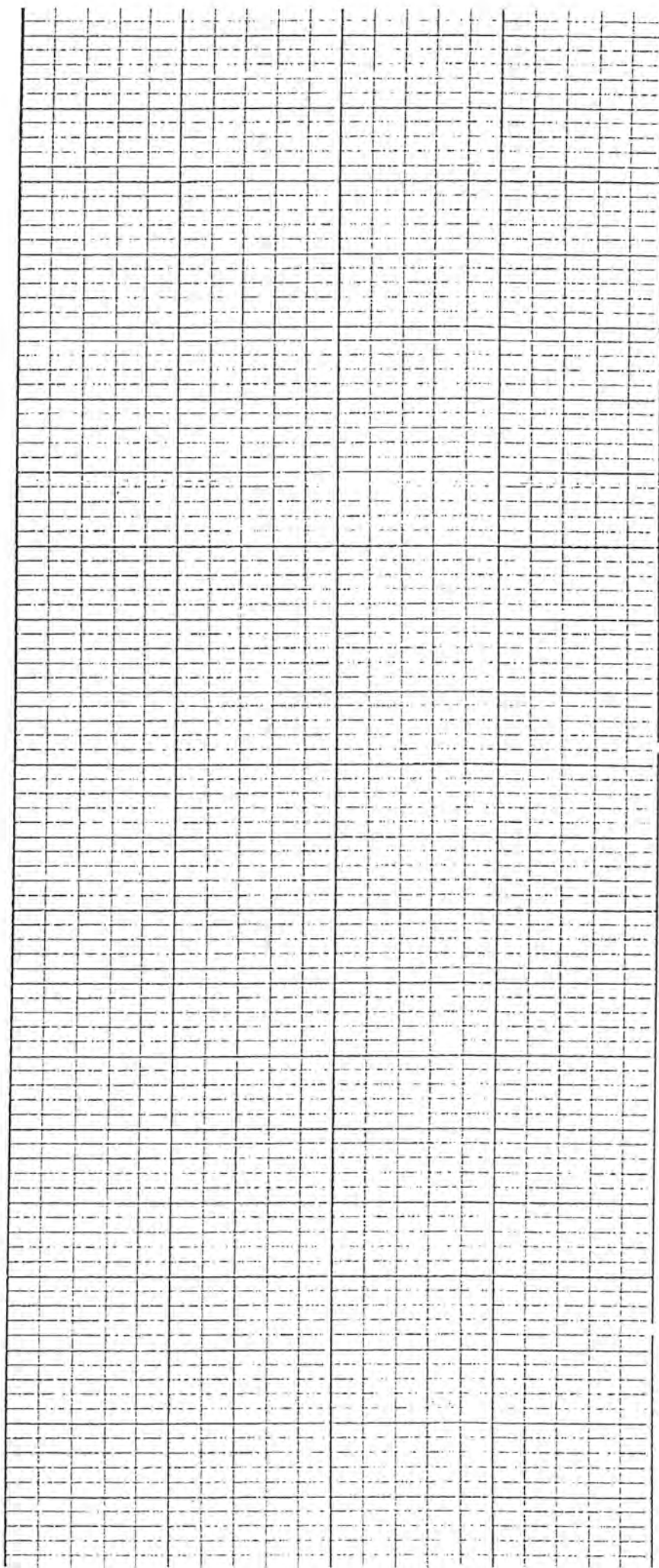
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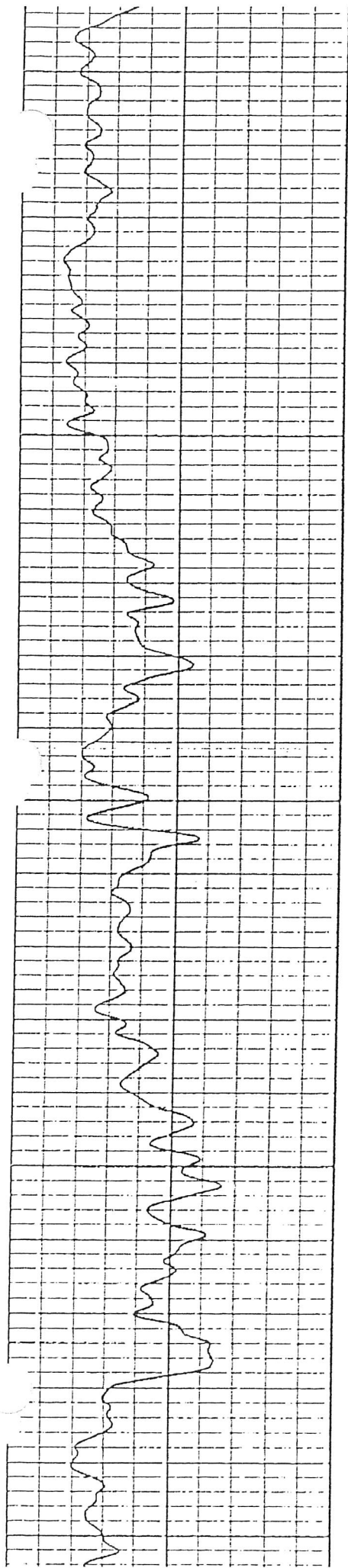




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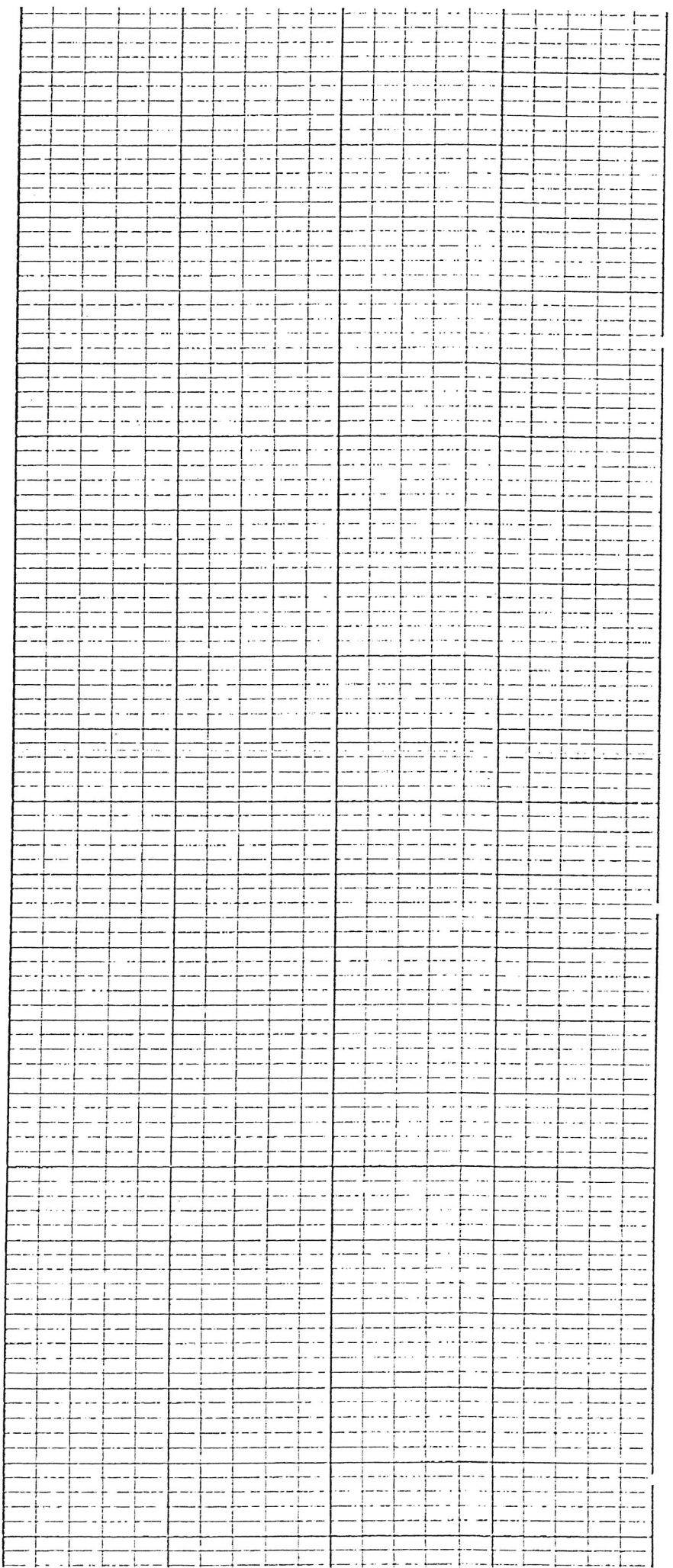
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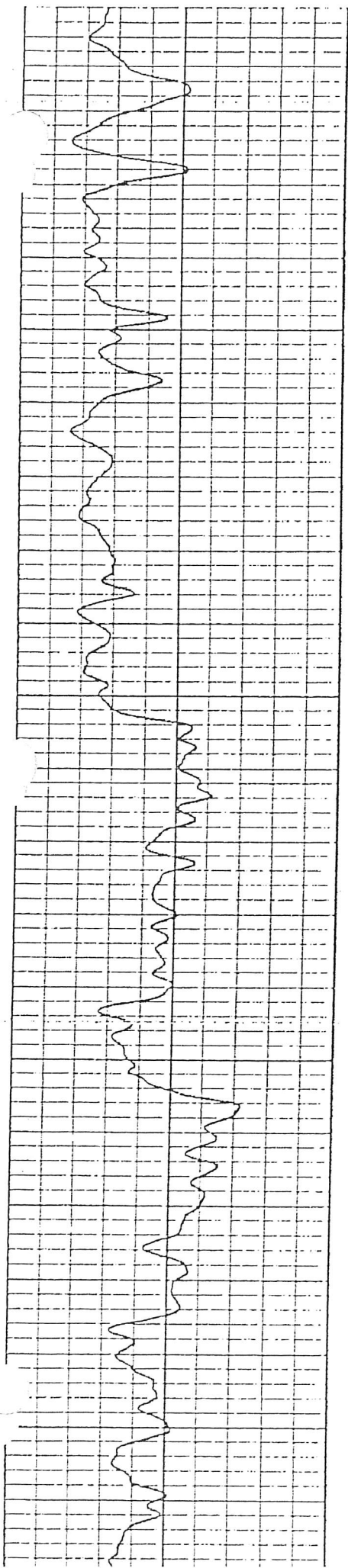




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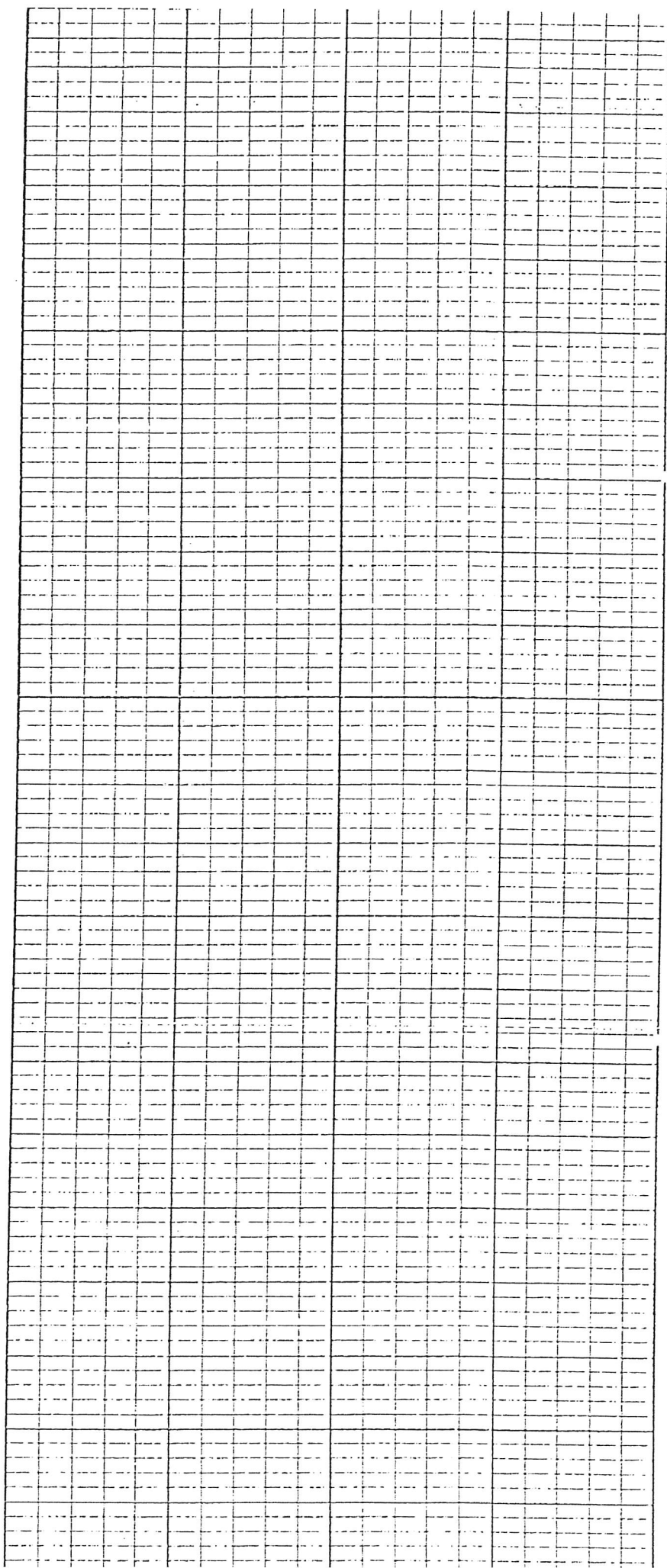
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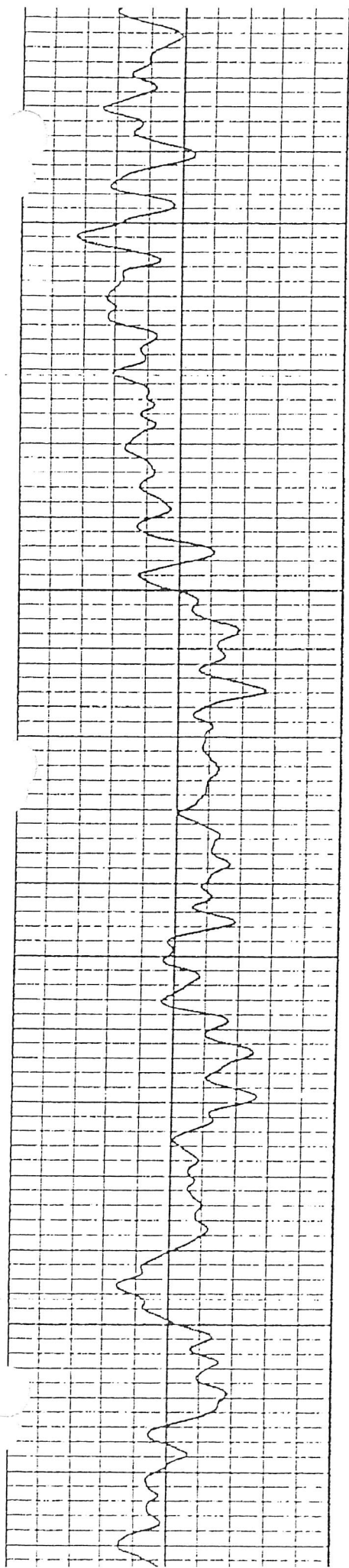




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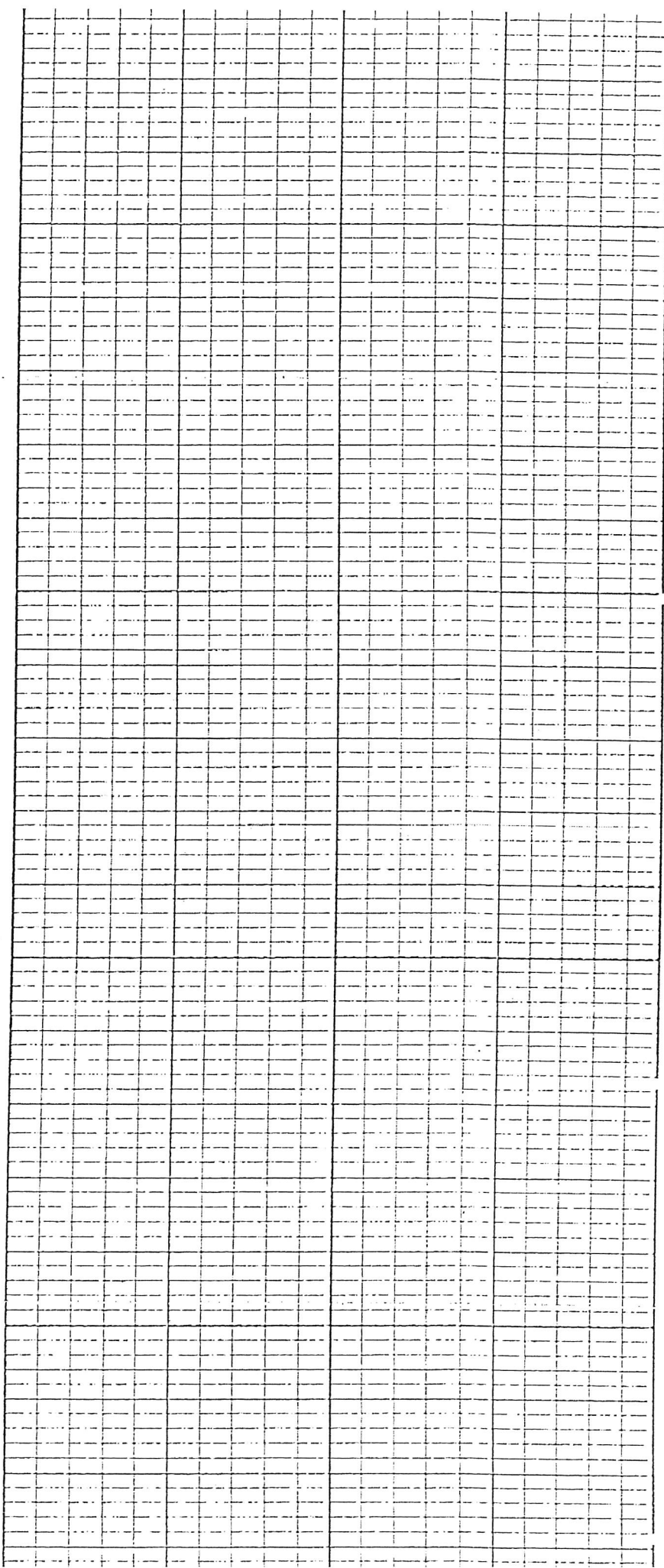
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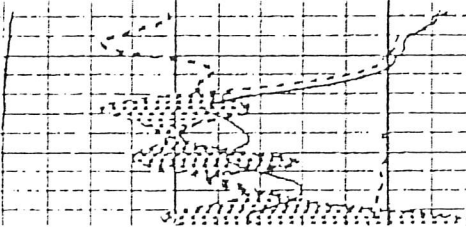


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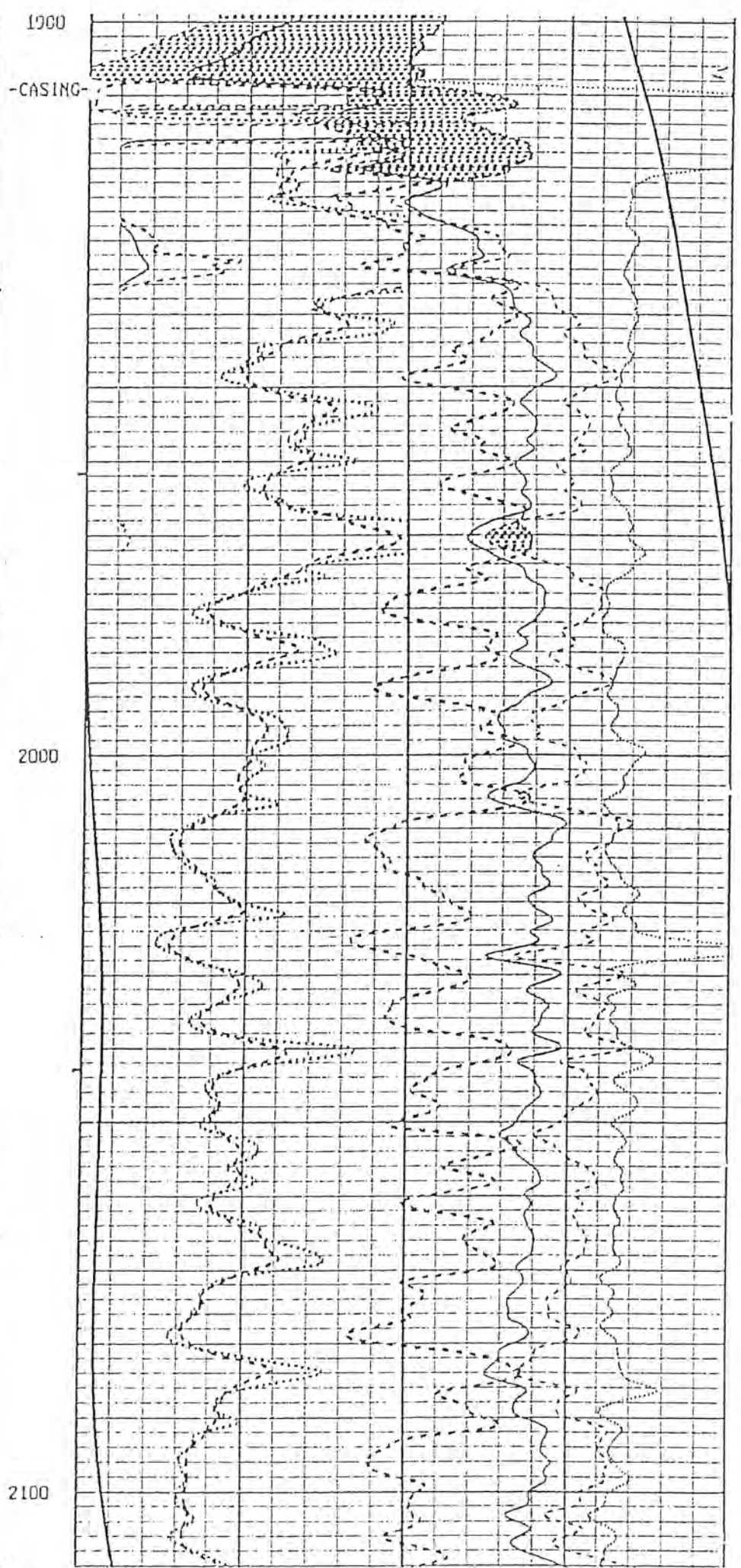
Murrysville 1706-1800

1700

1000



Hundred Foot 1884-1978





SUPERIOR
Blacklick, Pa
Mentor, Pa
Wooster, Ohio
Charleston, W Va

GR / NEU
CDL / DIL
TEMPERATURE

MARE

CPNY PENNECO OIL COMPA
Y, INC.

WELL SEDAT # 4A

FIELD NEW KENSTINGTON EAST

CO. ALLEGHENY ST PA.

COMPANY PENNECO OIL COMPANY, INC.

WELL SEDAT # 4A PS-7448

FIELD NEW KENSTINGTON EAST

COUNTY ALLEGHENY

LOCATION

P/N - 37-003-21644-00
749' WEST 79-42-39.70
5366' SOUTH 40-31-36.90

STATE PA.

OTHER SERVICES:

TIF FILE
2.0" SCALE
ANALYSIS

SEC. TWP. PLUM RGE.

PERMANENT DATUM CL = 7.0" ELEV. 1068'

LOG MEASURED FROM TOP OF 7.0" ABOVE PERMANENT DATUM

DATE 07-07-2004

ELEV. K.B. 1079'
D.F. 1078'
G.L. 1068'

RUN NO. ONE

DEPTH-DRILLER

DEPTH-LOGGER

BIT. LOG INTER.

TOP LOG INTER. GR / SURFACE

CASING-DRILLER 7.0" @ 1907'

CASING-LOGGER 7.0" @ 1907'

BIT SIZE 6.25"

FLUID TYPE AIR

DENS. : VISC. N/A

PH : FLUID LOSS N/A

SOURCE OF SAMPLE

RT # MEAS. TEMP.

RT # MEAS. TEMP.

RT # MEAS. TEMP.

SOURCE: RT# / RT#

RT # BHT

TIME SINCE CIRC.

MAX. REC. TEMP.

EQUIP.: LOCATION

RECORDED BY

WITNESSED BY

KOCHONIK

0041/BLACKLICK

PA

MR. HUMMEL

MR. HILL

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENT AND WE CANNOT AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES, OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR GENERAL TERMS AND CONDITIONS SET OUT IN OUR CURRENT PRICE SCHEDULE.

REMARKS:

MDEN - 2.68 CDL # 2473
FDEN - 1.0 DIL # 5272

CREW : BREAKIRON, STUMPF
TEMPERATURE LOGGED UPHOLE
THANK YOU FOR CHOOSING SUPERIOR WELL SERVICES

STOP DEPTH: 28.2 FEET
DIRECTION: UP 1:240

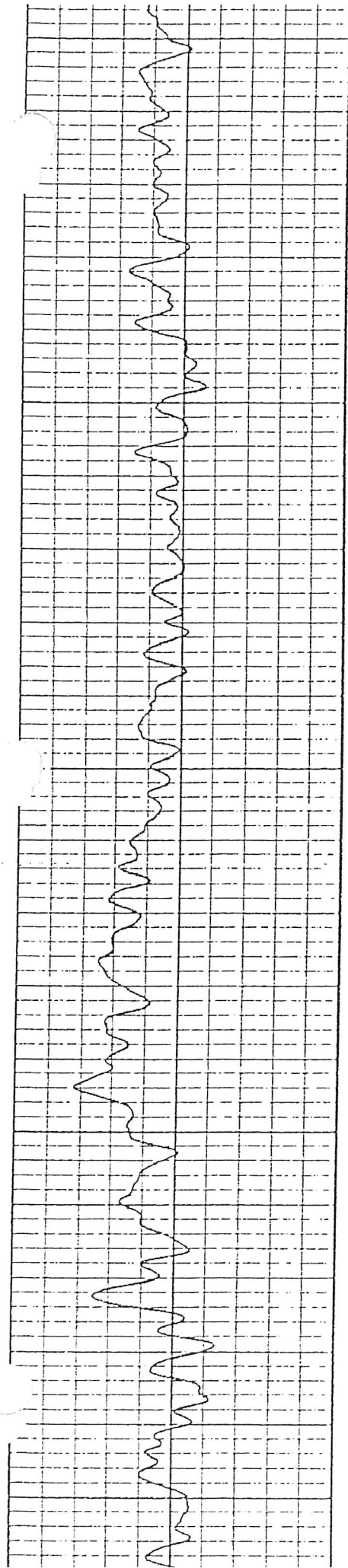
MAIN
SECTION

FILE DATE: 07-07-2004
TIME: 04:47

DifTemp			MInR			CORR		
-10.0	Delta	10.0	0.00	OHMM	100.00	0.00	OHMM	100.00
CALIPER			ILD			CORR		
5.0	inch	15.0	0.00	OHMM	100.00	-0.25		0.25
GAMMA RAY			Temperature			DENSITY		
0.0	API	200.0	70.0		F	75.0		
			PORO.			CBU		
			30.00			-10.00		
			g/cc			NEUTRON		
			2.00			3.00		
			PORO.			NEUTRON		
			30.0			-10.0		

200

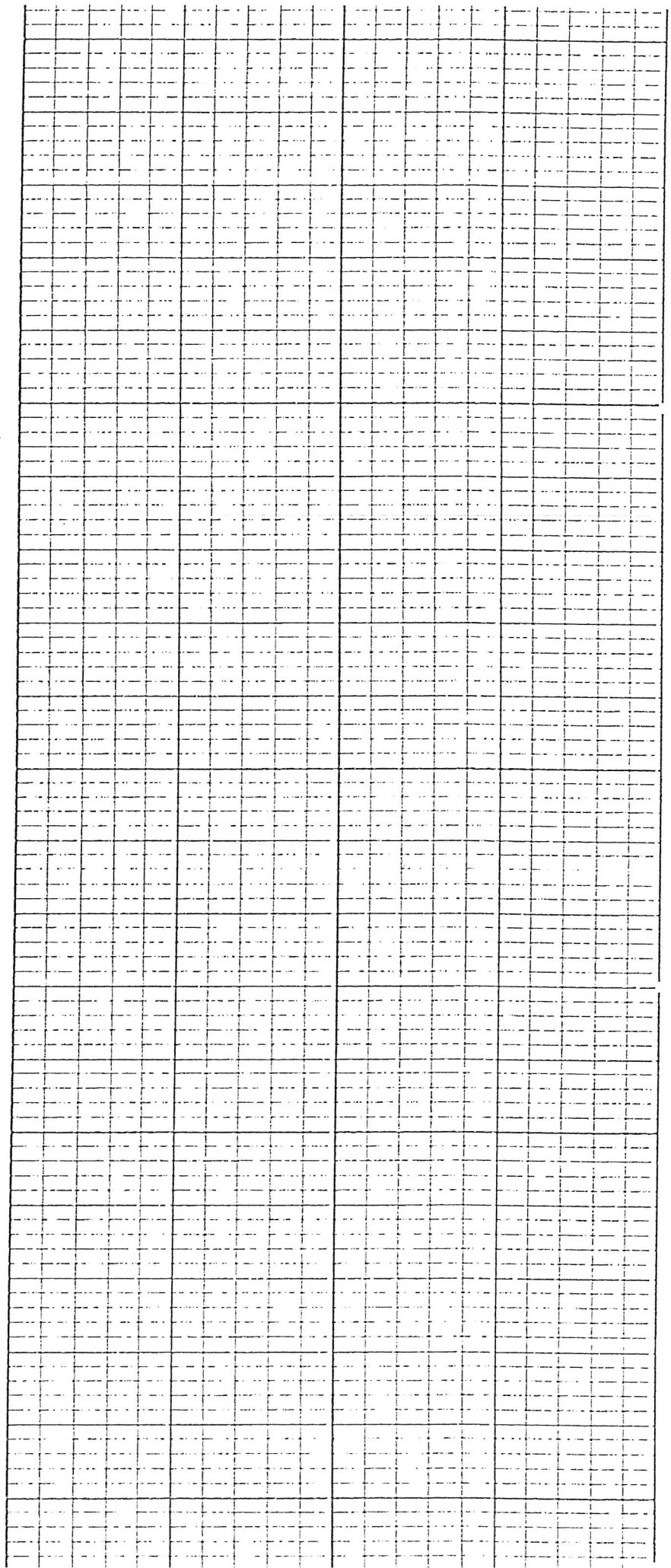
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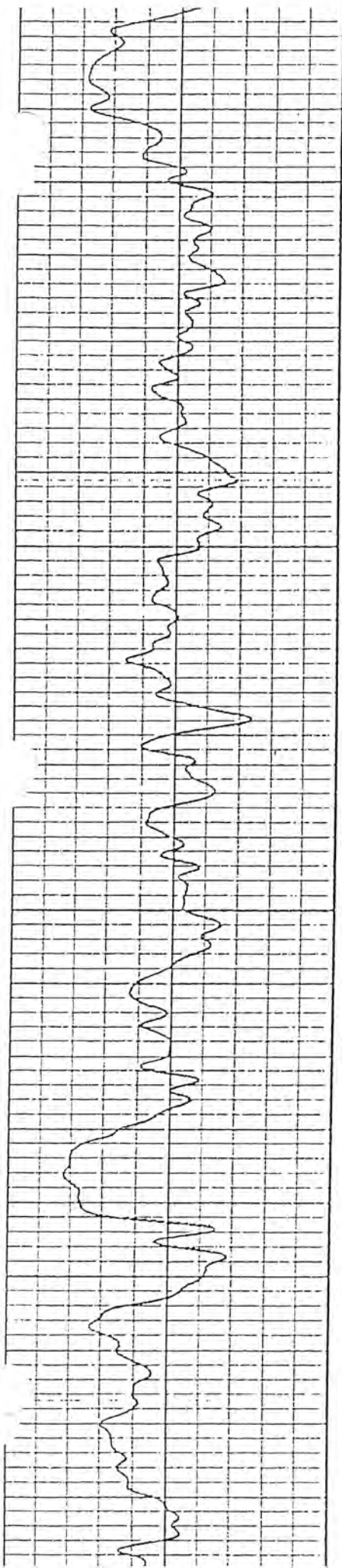


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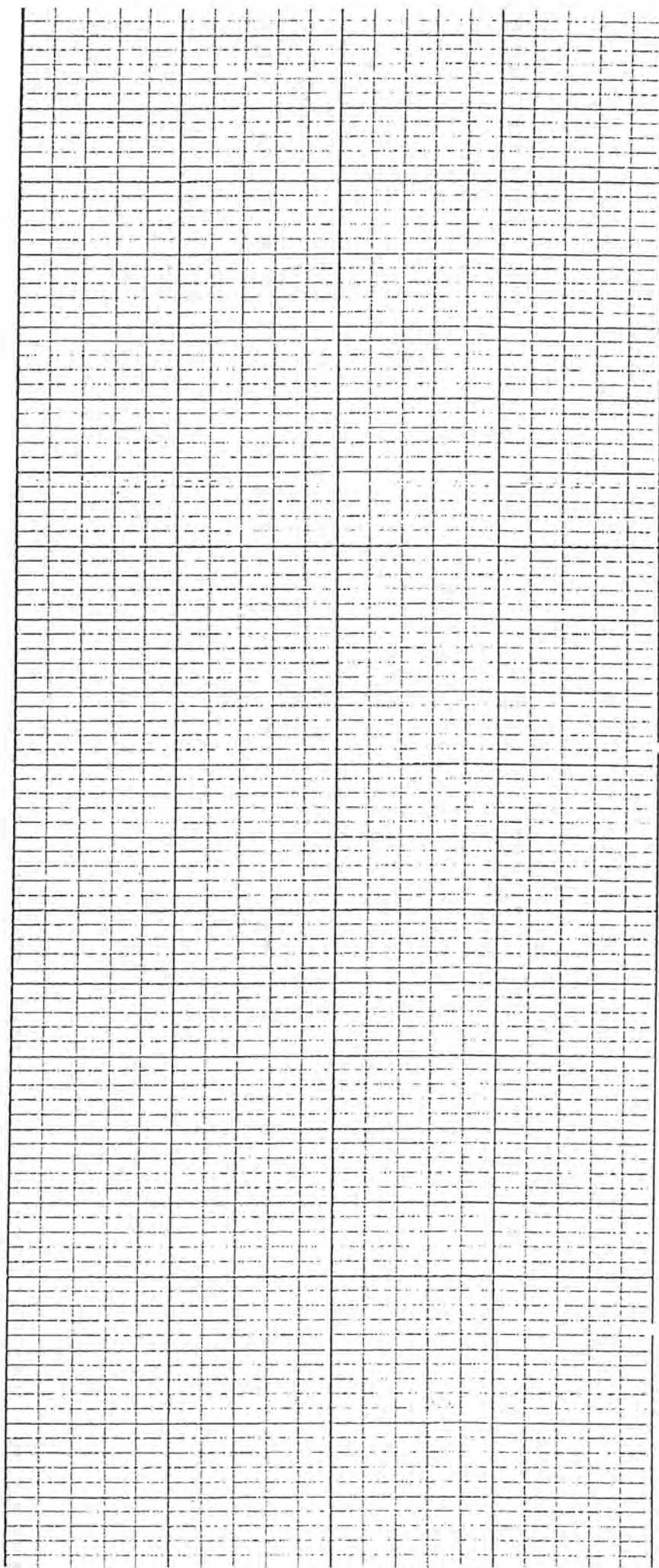
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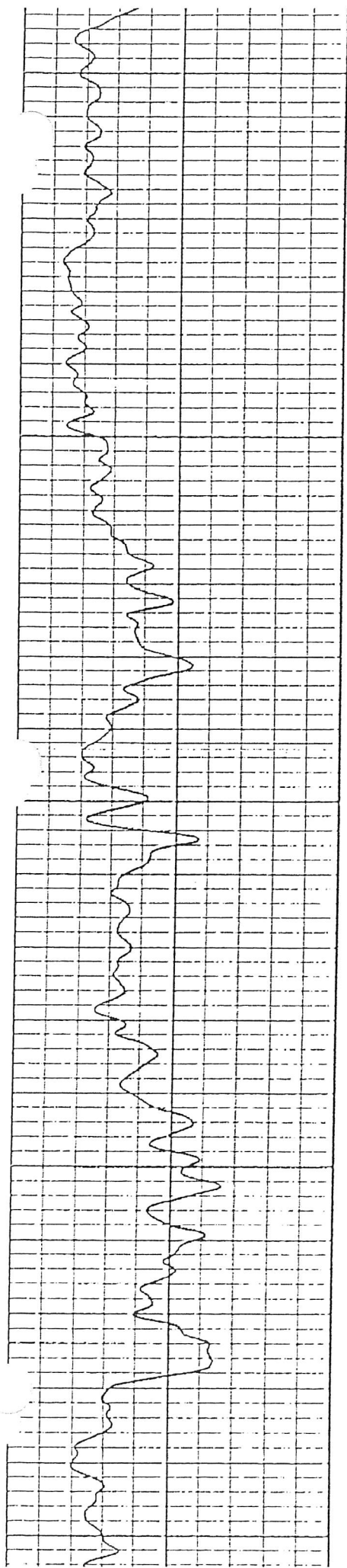




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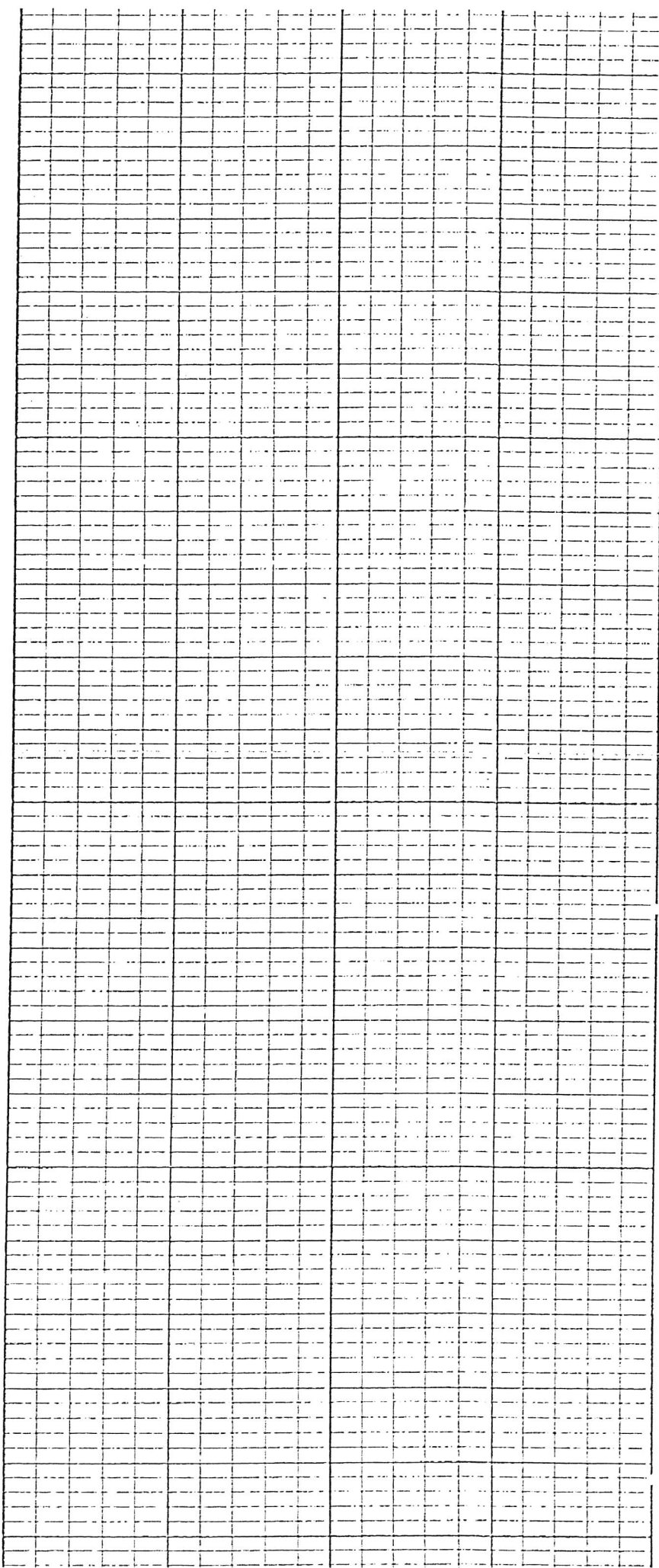
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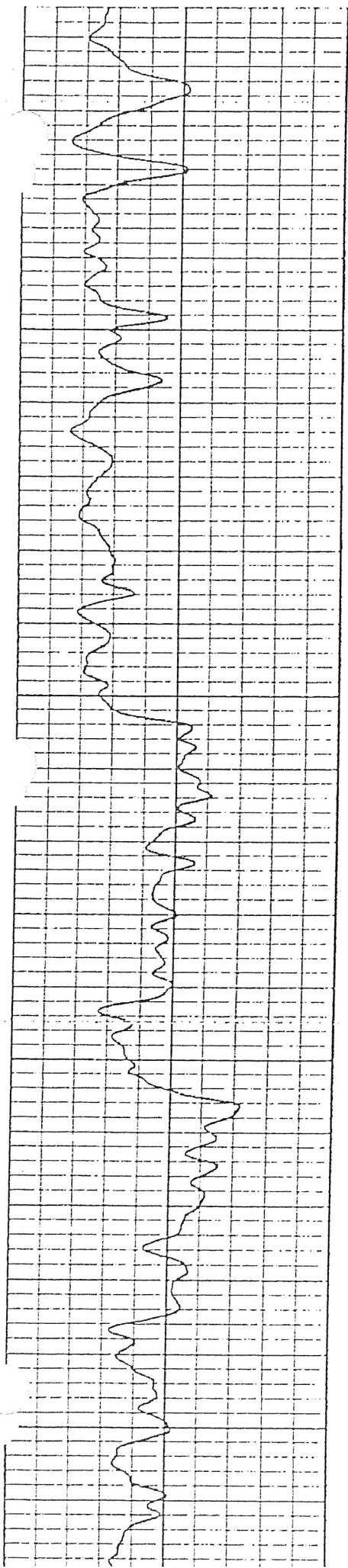




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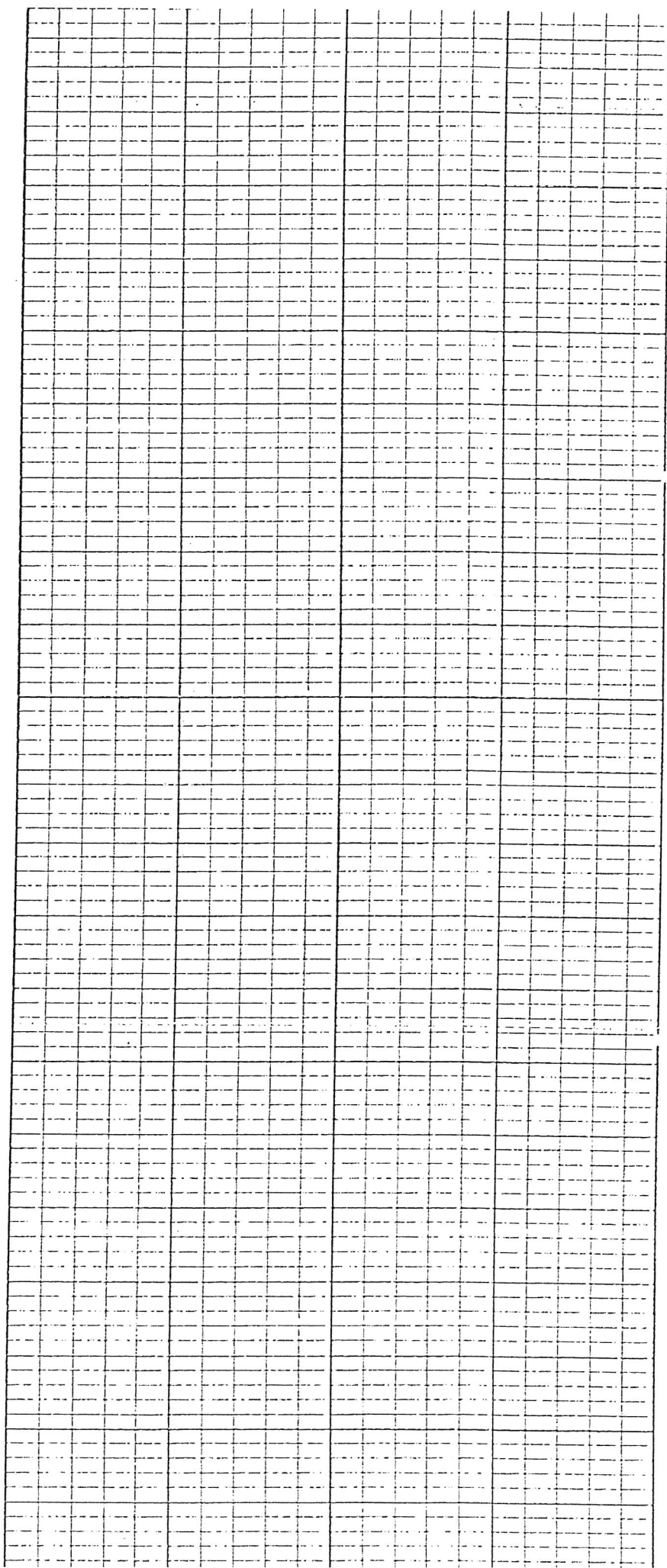
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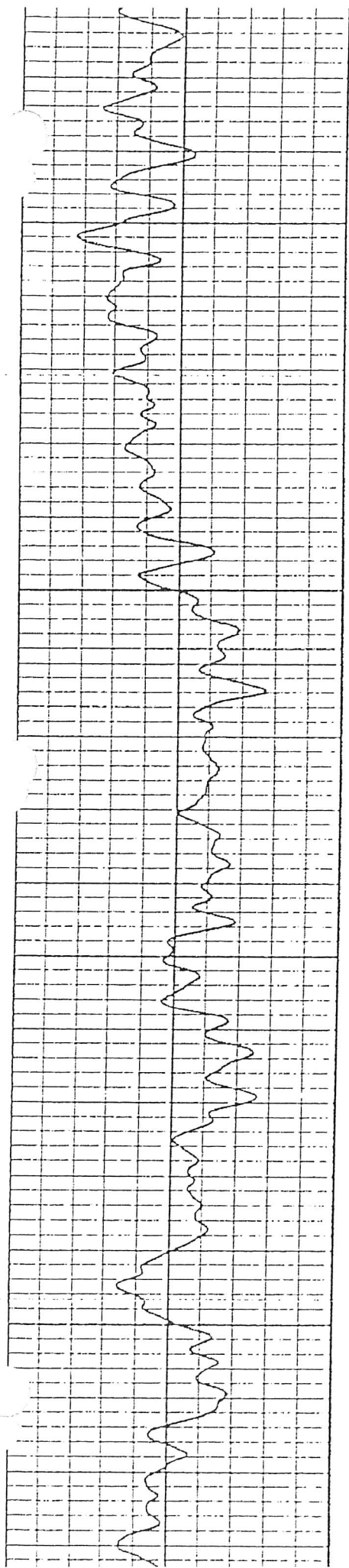




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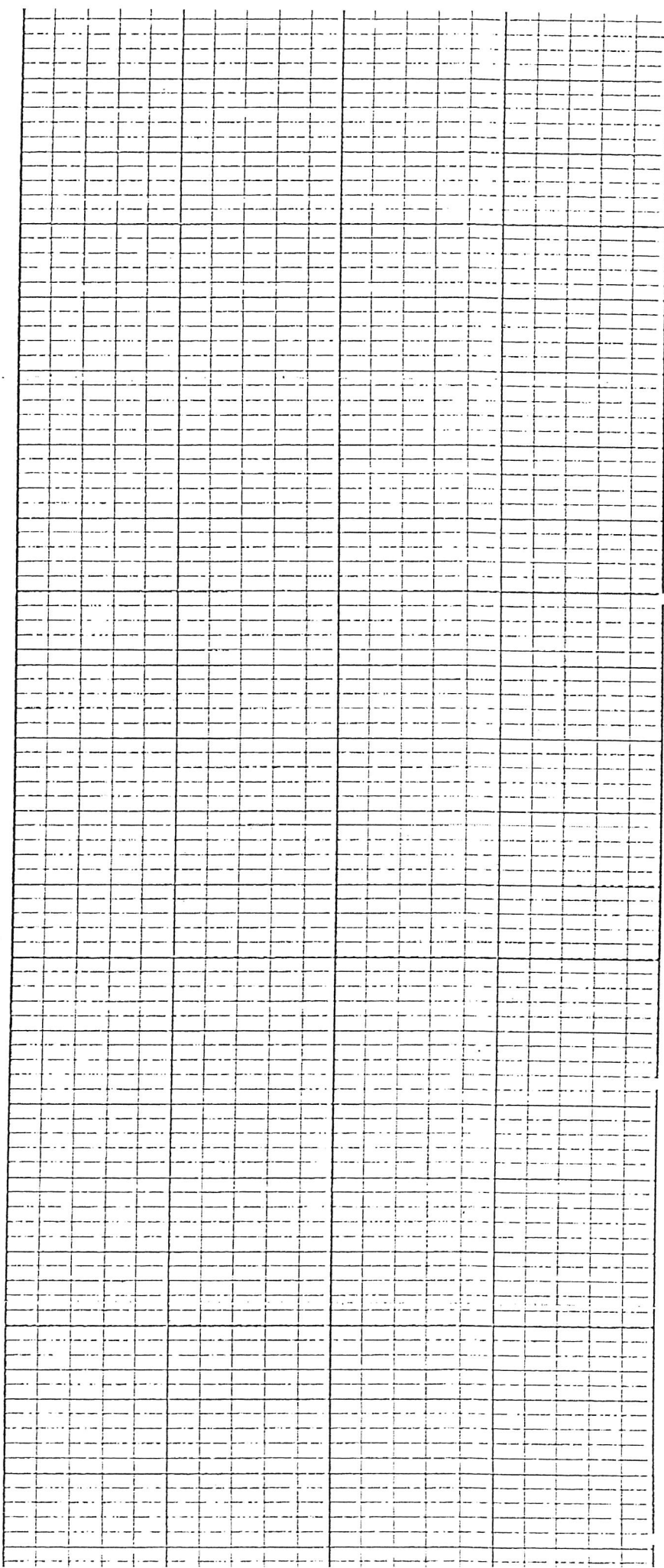
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1500

1000

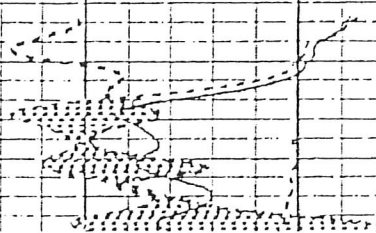


Sedet #4A

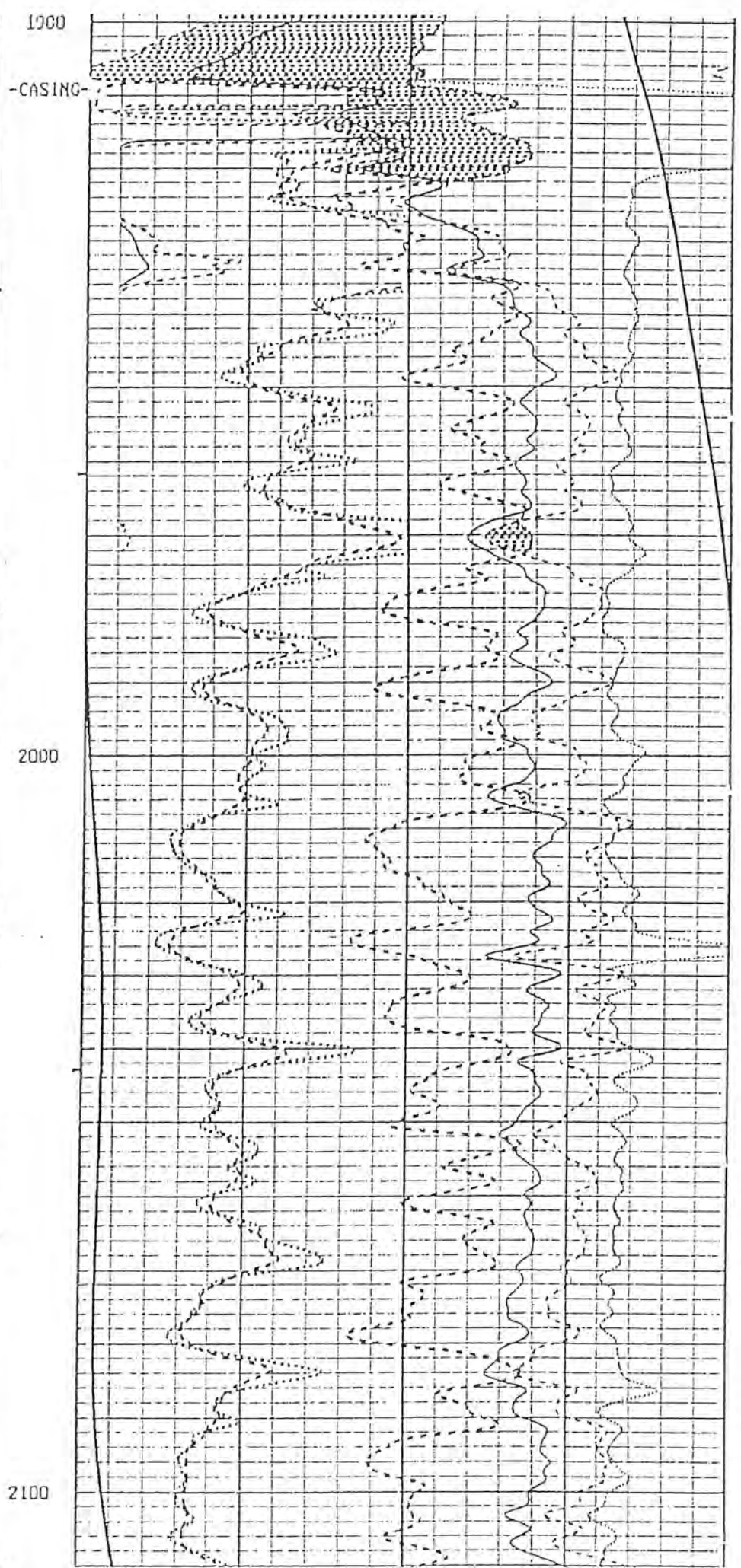
Murrysville 1706-1800

1700

1000



Hundred Foot 1884-1978





SUPERIOR
110-A Lick, Pa
Mifflin, Pa
Westmore, Ohio
Charleston, W. Va

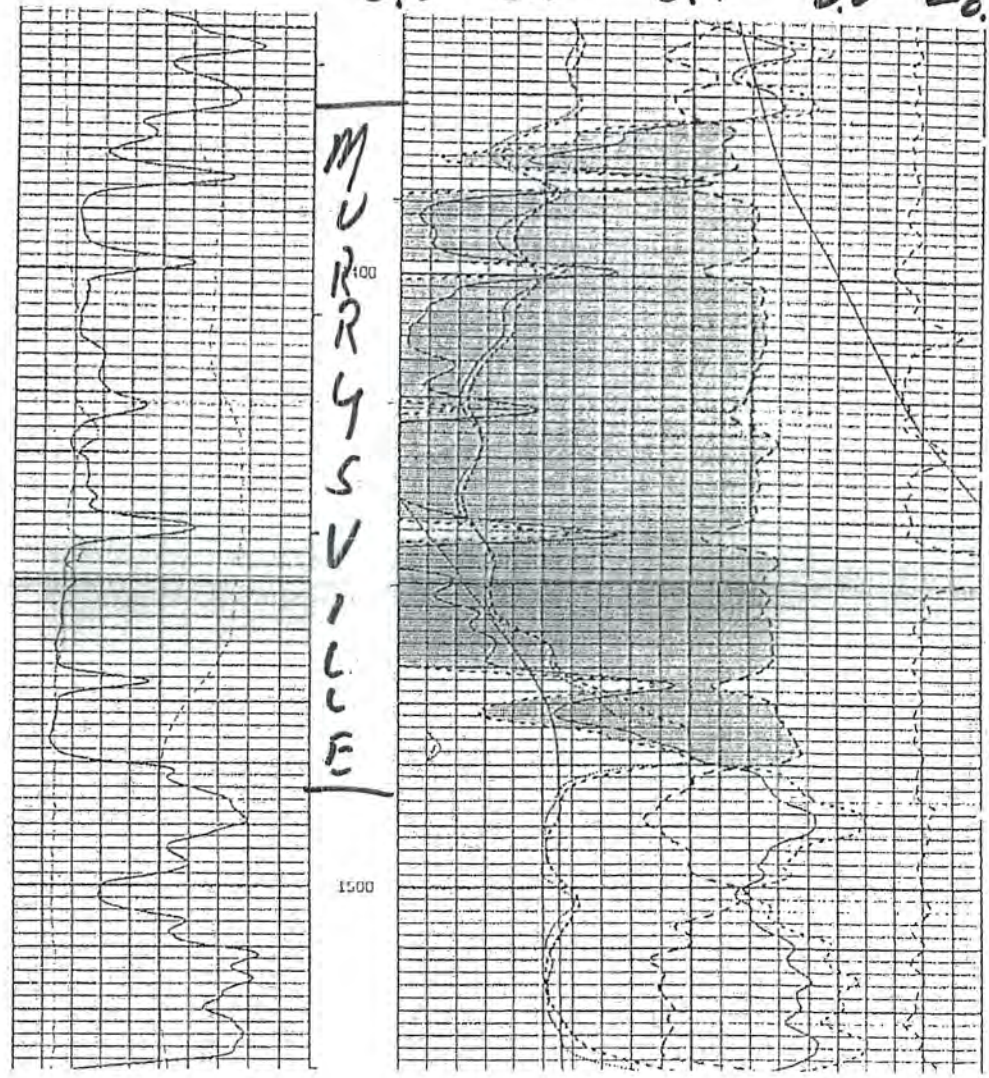
GAMMA RAY
NEUTRON
DENSITY
DUAL INDUC

COMPANY	PENNECO OIL COMPANY
WELL	PARADISE HONES #1 (PPH-504)
FIELD	MARYSVILLE OILCRANGL
COUNTY	WESTMORELAND
LOCATION	PERMIT 37-125-24721 0' WEST LONG: 79° 32' 58.2" 0' SOUTH LAT: 40° 29' 24.5"
SEC.	TWP. WASHINGTON

COMPANY	PENNECO OIL COMPANY
WELL	PARADISE HONES #1 (PPH-504)
FIELD	MARYSVILLE OILCRANGL
COUNTY	WESTMORELAND
LOCATION	PERMIT 37-125-24721 0' WEST LONG: 79° 32' 58.2" 0' SOUTH LAT: 40° 29' 24.5"
SEC.	TWP. WASHINGTON
DATE	106-14-02
RUN NO.	ONE
DEPTH-DRILLER	3550 FT.
DEPTH-LOGGER	3537 FT.
RTH. LOG INTER.	10 FT.
CASING-DRILLER	1280 FT.
CASING-LOGGER	1280 FT.
BIT SIZE	6.25 IN.
FLUID TYPE	AIR/GAS
DENS. & VISC.	N/A
PTH. & FLUID LOSS	N/A
SOURCE OF SAMPLE	N/A
RTH. P. MEAS. TEMP.	N/A
RTH. P. MEAS. TEMP.	N/A
RTH. P. MEAS. TEMP.	N/A
SOURCE: RTH/RMC	N/A
RTH. P. BHT	N/A
TIME SINCE CIRC.	N/A
MAX. REC. TEMP.	N/A
EQUIP.: LOCATION	DOSS/BLACK
RECORDED BY	JERRY MOORE
WITNESSED BY	MR. JACOBS

Dows. T_i ϕ

0.3 0.2 0.1 0.0 -0.1



131

Schlumberger
DOMINION EXPLORATION & PRODUCTION, INC.
JACOB SNYDER UNIT #3 (WPA06512)
HEMPFIELD TWP
WESTMORELAND
PENNsylvania

COUNTY: WESTMORELAND
Field: HEMPFIELD TWP.
Location: LATITUDE: 40-15-34.2700
Well: JACOB SNYDER UNIT #3 (WP)
Company: DOMINION EXPLORATION & P

LOCATION	
LATITUDE: 40-15-34.2700	Elev.: K.B. 1080 R
LONGITUDE: 79-40-1.3900	D.F.
1171 S & 100 W OF NE CORNER	
Permanent Datum:	GROUND LEVEL
Log Measured From: KB	Elev.: 1090 ft
Drilling Measured From: KB	8.0 ft above Perm. Datum
API Serial No. 37-129-25591-00	MAP SECTION: B
	TOWNSHIP: HEMPFIELD
	CLAD: RTWIN

LOGGING DATA	
Run Number	31 AUG 2005
Depth Driller	2190 ft
Schlumberger Depth	2135 ft
Bottom Log Interval	2127 ft
Top Log Interval	0 ft
Casing Driller Size @ Depth	8.625 in
Casing Schlumberger	364 ft
Bit Size	8.675 in
Type Fluid In Hole	AIR / GAS / PRODUCED FLUIDS
Density	0 lbm/gal
Fluid Loss	
Source Of Sample	
FM @ Measured Temperature	
FMF @ Measured Temperature	
FMF @ Measured Temperature	
Source FMF	
FM @ MFT	
Maximum Recorded Temperature	
Circulation Stopped	
Logger On Bottom	
Unit Number	31 AUG 2005
Recorded By	BRAD ORO
Witnessed By	TIM LYON, MIKE KOFNACKI

	Run 1	Run 2	Run 3	Run 4
LOGGING DATA				
Run Number				
Depth Driller				
Schlumberger Depth				
Bottom Log Interval				
Top Log Interval				
Casing Driller Size @ Depth				
Casing Schlumberger				
Bit Size				
Type Fluid In Hole				
Density				
Fluid Loss				
Source Of Sample				
FM @ Measured Temperature				
FMF @ Measured Temperature				
FMF @ Measured Temperature				
Source FMF				
FM @ MFT				
Maximum Recorded Temperature				
Circulation Stopped				
Logger On Bottom				
Unit Number				
Recorded By				
Witnessed By				

DISCLAIMER

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Jacob Snyder Unit #3

129-25501

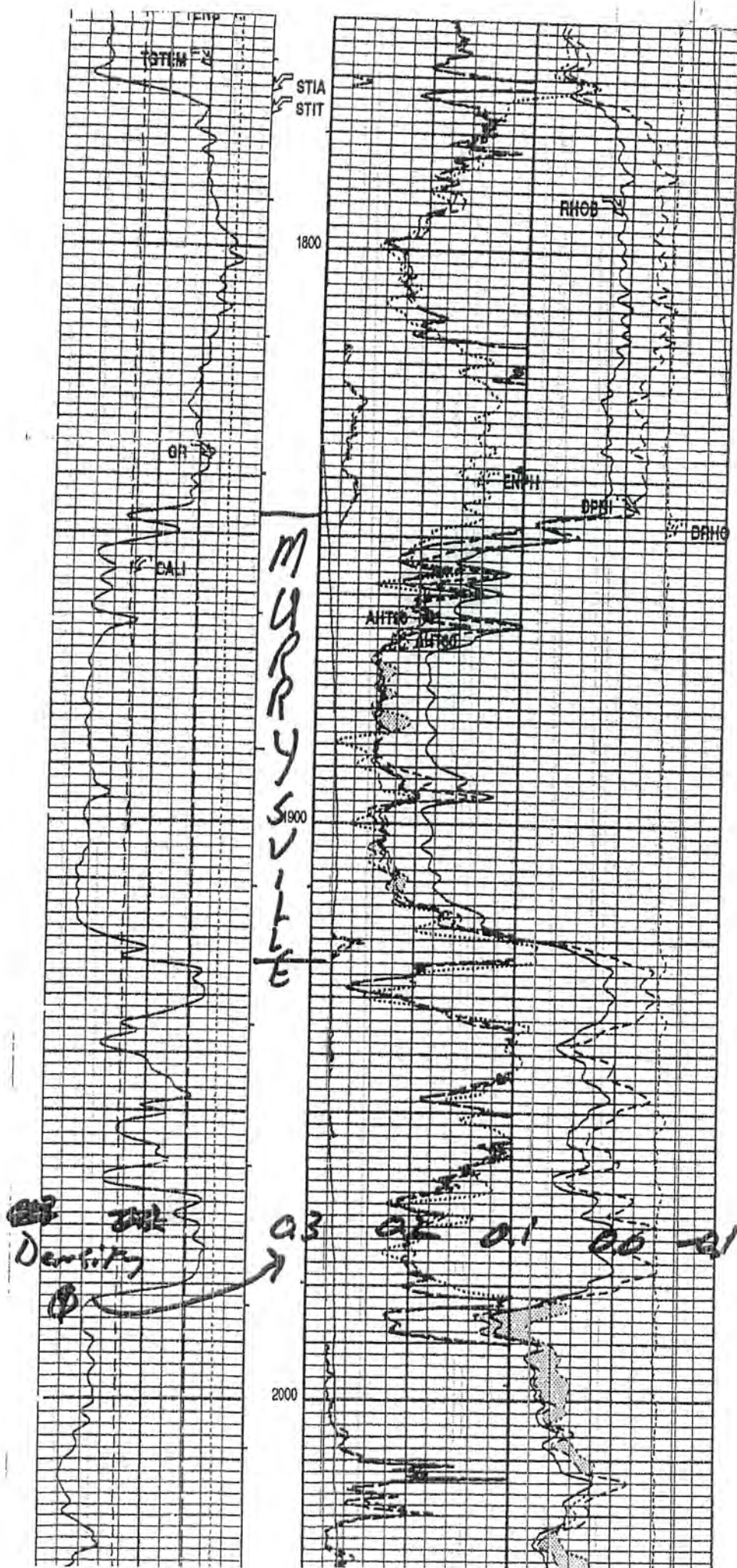


Figure 52 -- Permeability vs Depth

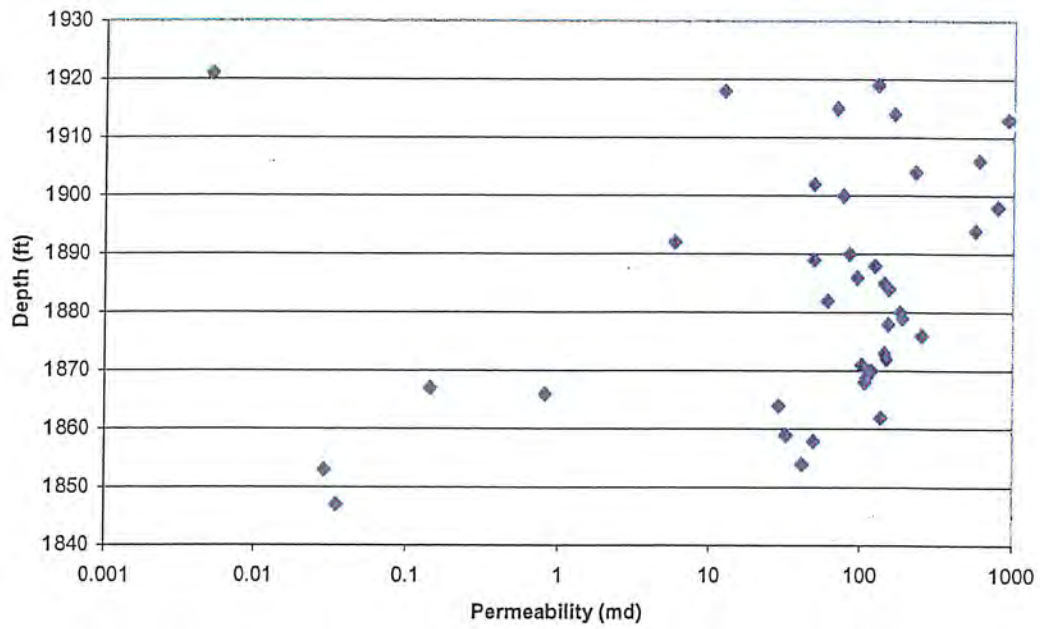
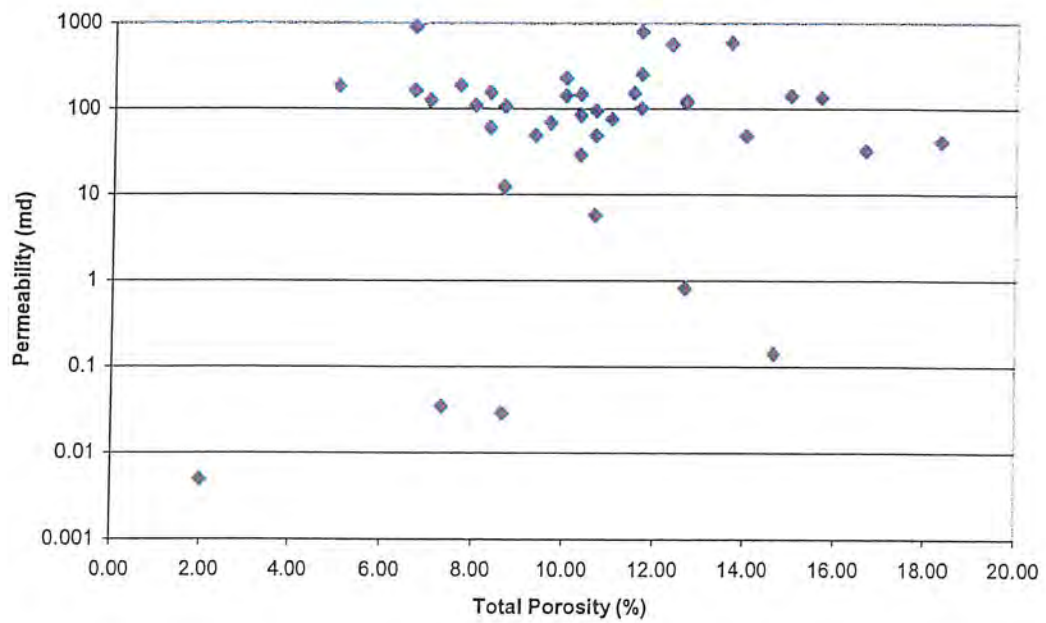
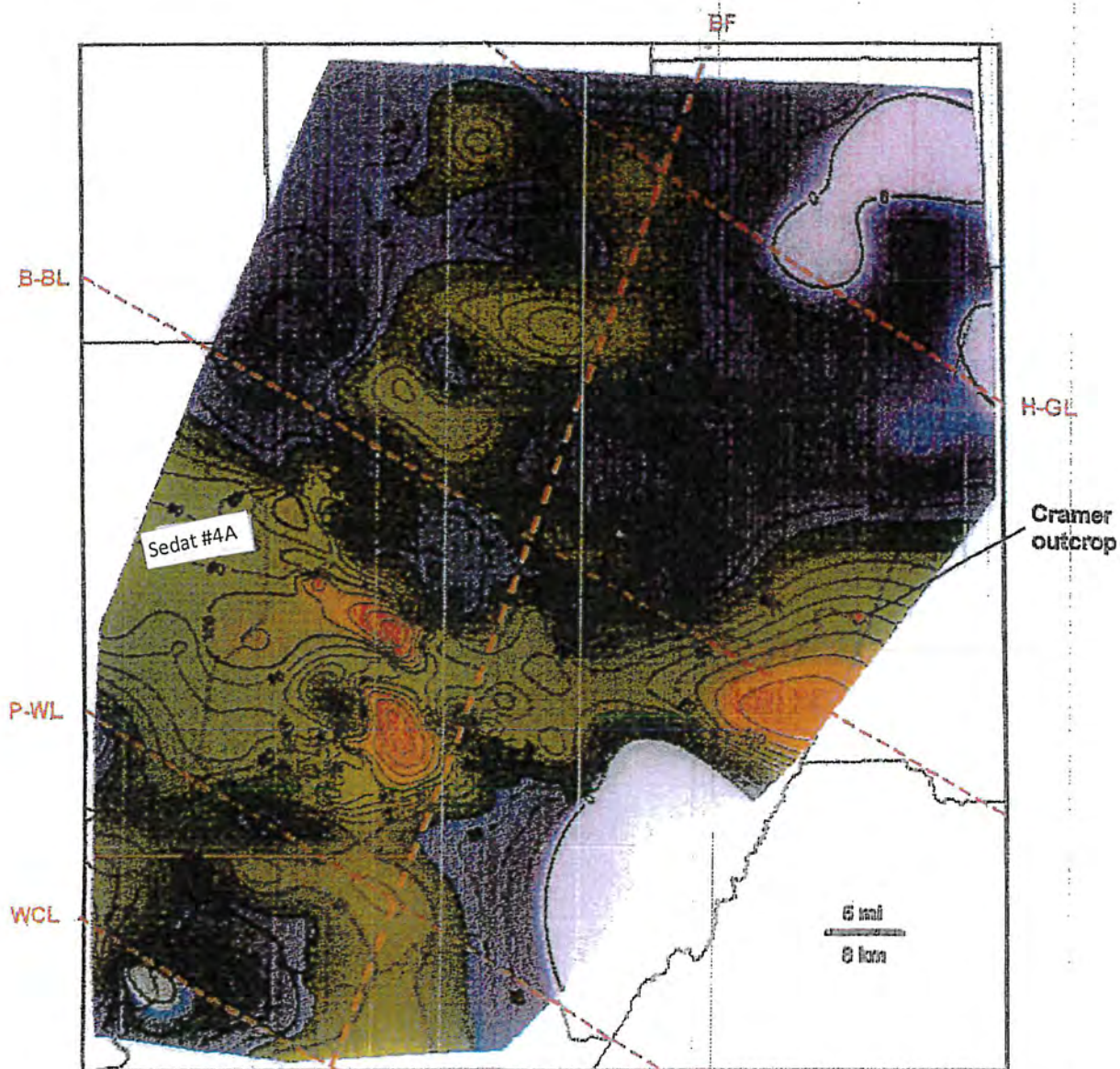


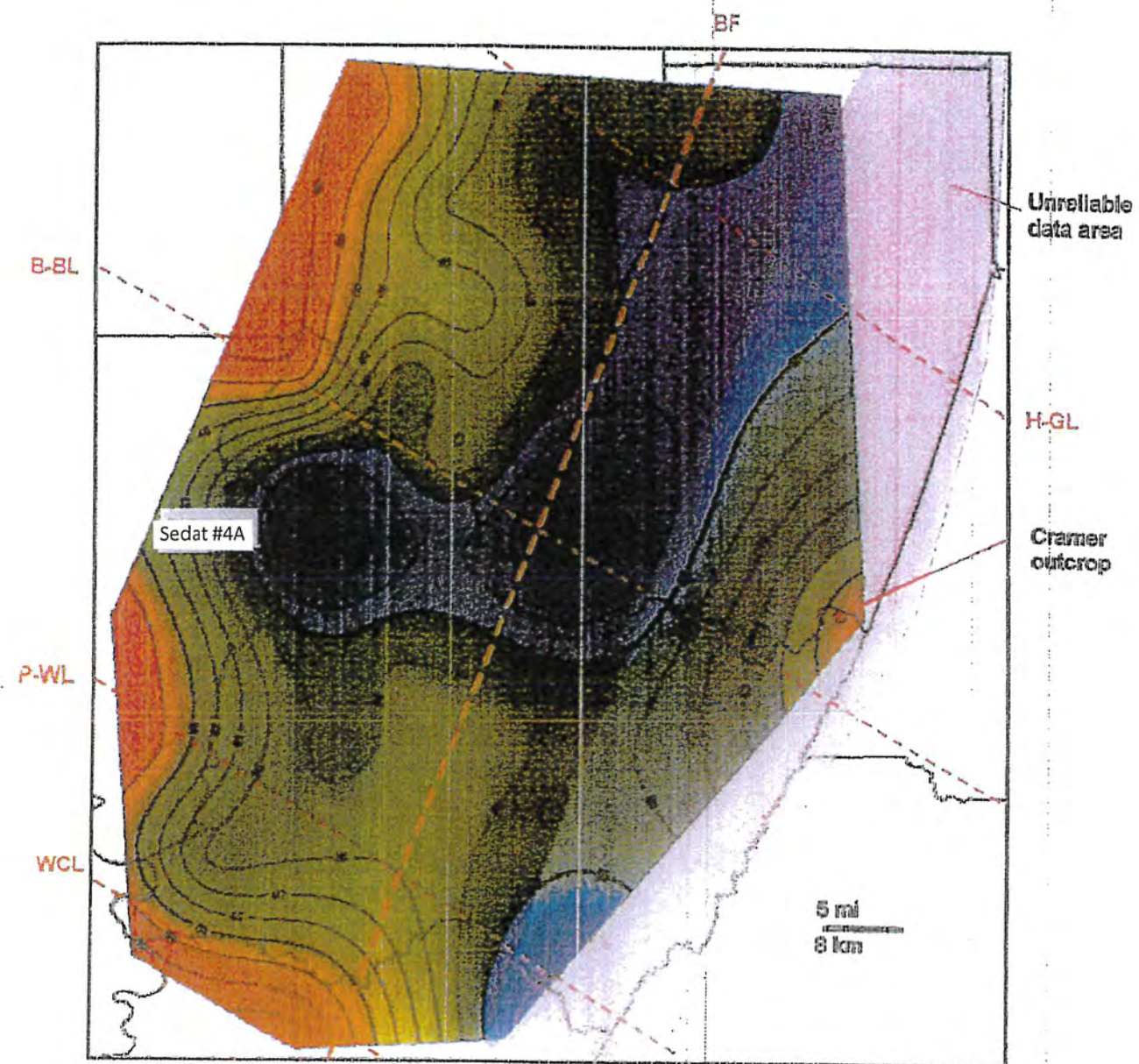
Figure 53 -- Total Porosity vs Permeability



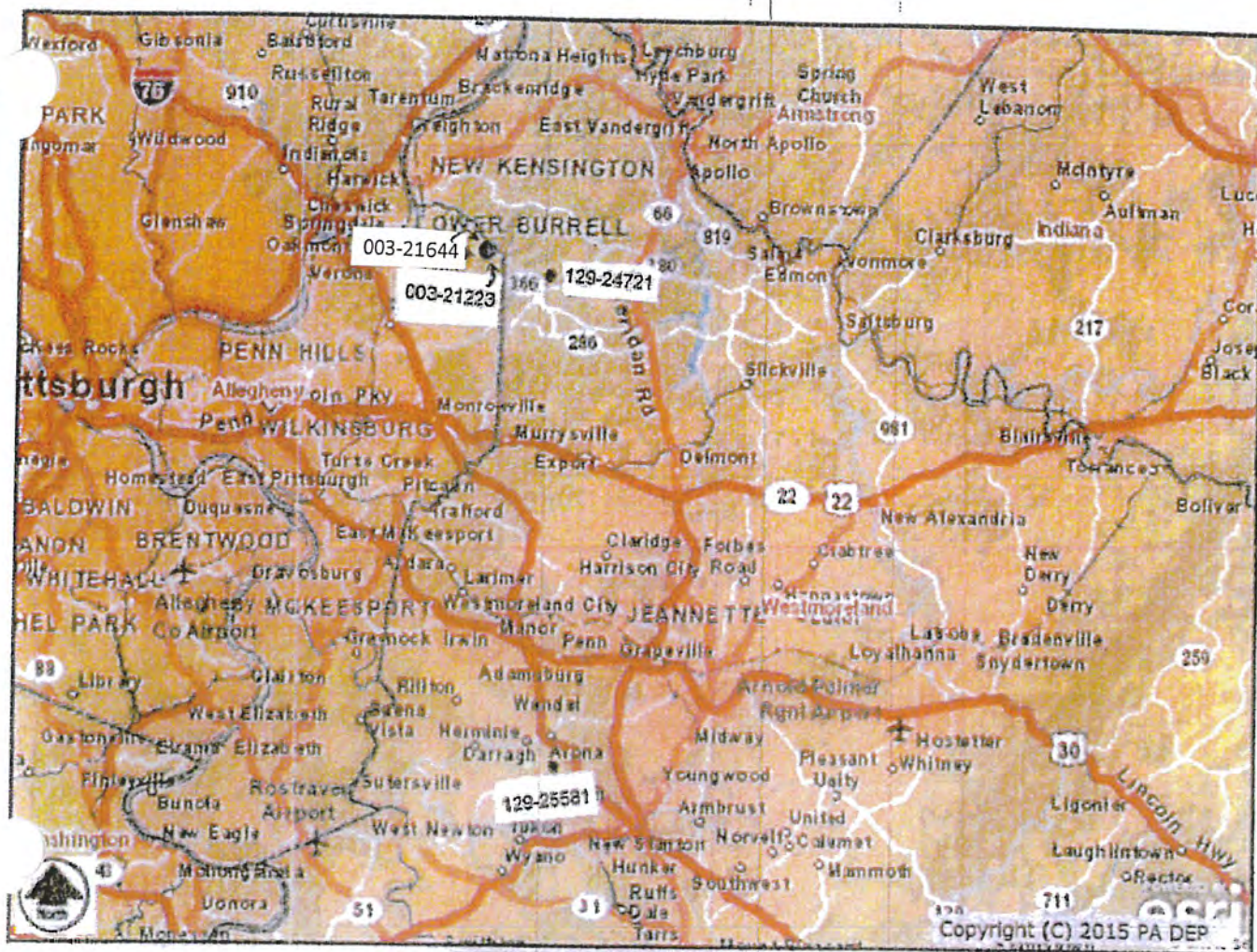


Map 3. Riddlesburg Shale Isopach Map

McDaniel, Bret, 2006. Subsurface Stratigraphy and Depositional Controls on Late Devonian-Early Mississippian Sediments in SW PA



Map 4. Riceville-Oswayo Shale Isopach Map
 McDaniel, Bret, 2006. Subsurface Stratigraphy and Depositional Controls
 on Late Devonian-Early Mississippian Sediments in SW PA.

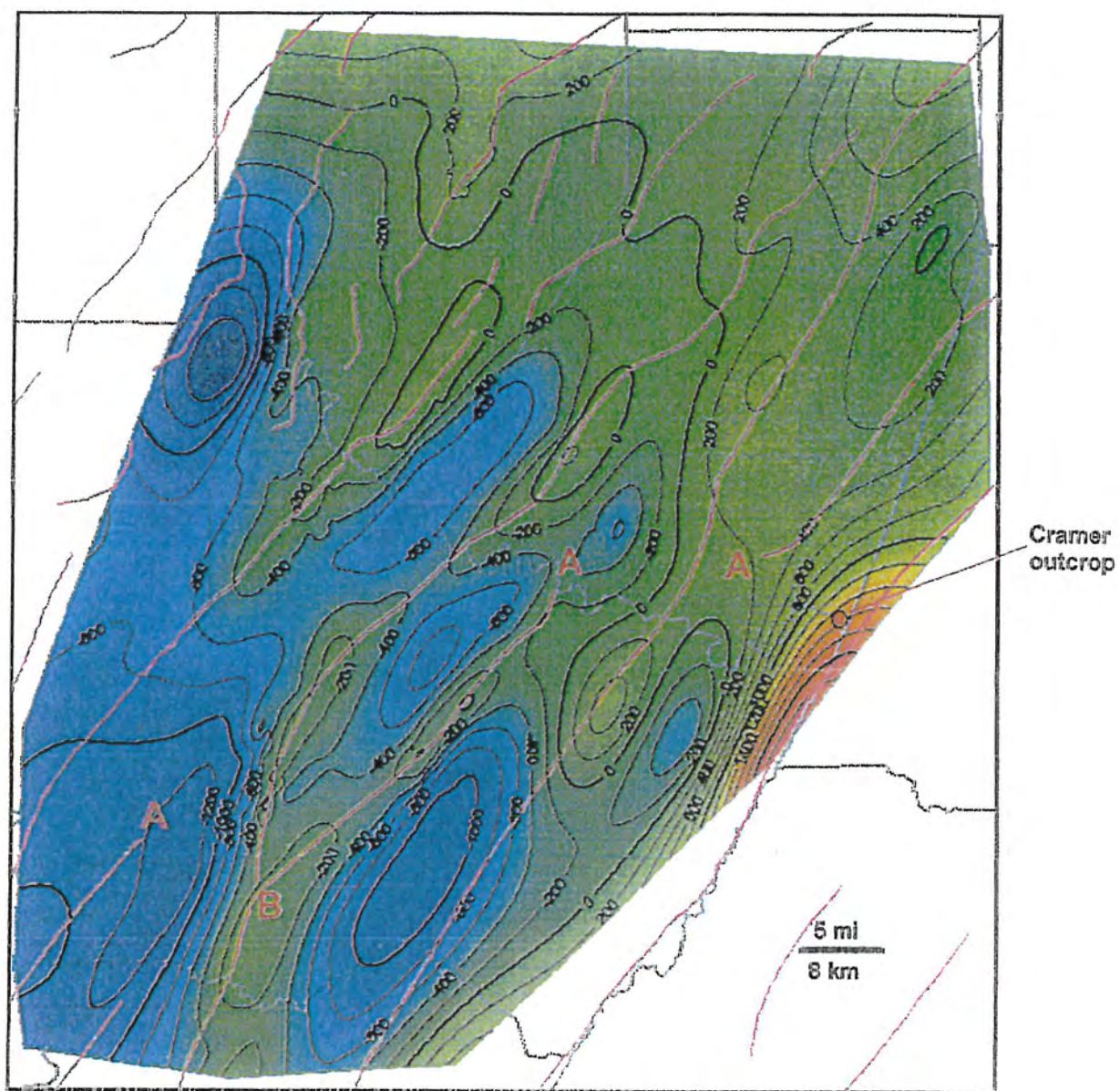


Legend

Unconventional Wells

Conventional Wells

County Boundaries



Map 5. Structure Map on Top of Murrysville Sand
McDaniel, Bret, 2006, Subsurface Stratigraphic and Depositional Controls
on Late Devonian-Early Mississippian Sediments in SW PA

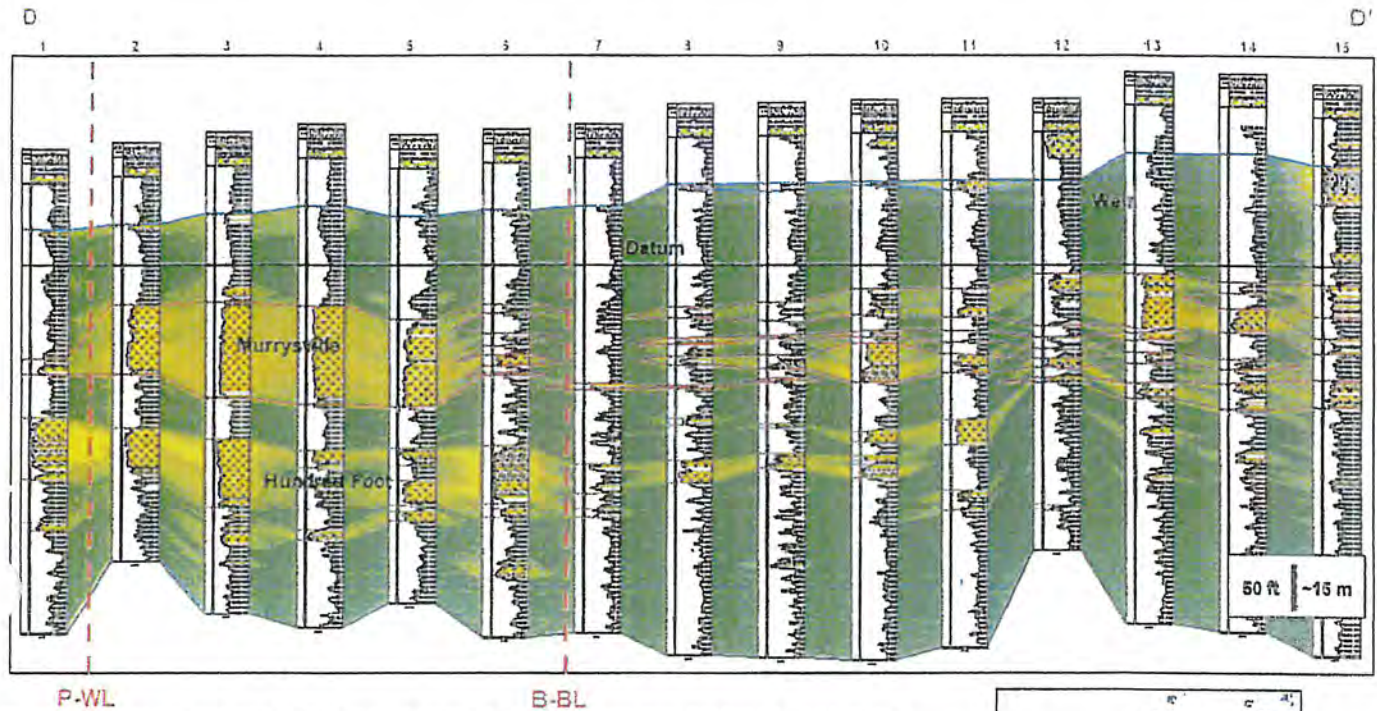
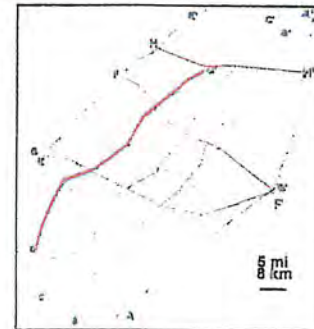


Figure 34. Cross section along D-D'. The most dramatic thinning occurs along this line as the Murrysville crosses the Blairsville-Broadtop Lineament (B-BL). Also evident is that there are two thick sequences of Murrysville, one thick and blocky in the southwest and another that lies to the northeast. It is unclear how this northeastern Murrysville relates to the blocky section to the south. One hypothesis may be that the north Murrysville may be nearshore deposits deposited north and south of the main channel the or perhaps these sandstones are abandoned delta lobes. The Weir is thin since it is far to the west of its depositional trend. The Hundred Foot becomes thick to the south, and it is here where the barrier bar sequence is best developed. See Figure 19 for the location of each numbered well.



Cross Section D-D'

McDaniel, Bret, 2006, Subsurface Stratigraphic and Depositional Controls on Late Devonian-Early Mississippian Sediments in SW PA

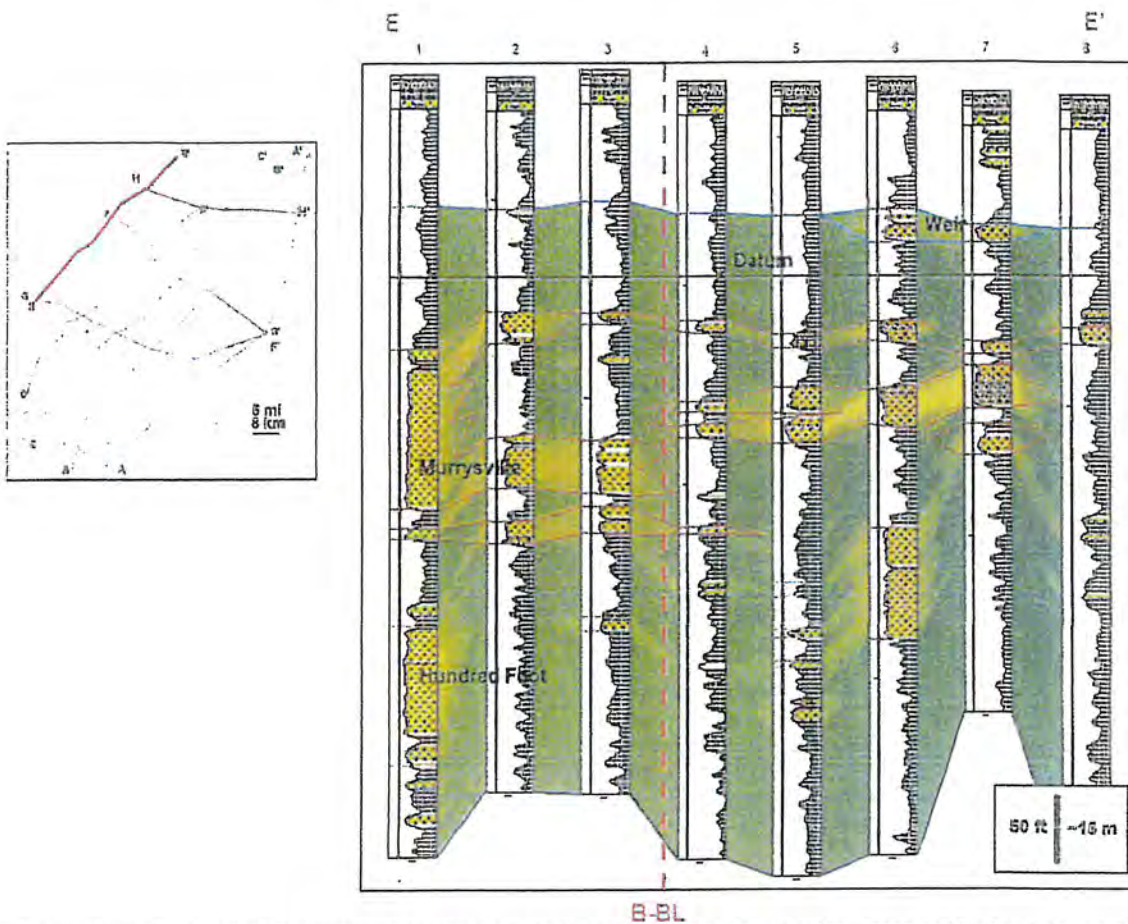


Figure 35. Cross-section along E-E'. This is the most erratic section in terms of correlative sand units. The data becomes difficult to interpret within this section, but there is still some evidence that the Blairsville-Broadtop Lineament (B-BL) may have had some influence on deposition of the Murrysville. The Weir sandstone is nearly gone this far west, with only a few intermittent sandstones. See Figure 19 for the location of each numbered well.

Cross Section E-E''

McDaniel, Bret, 2006, Subsurface Stratigraphic and Depositional Controls on Late Devonian-Early Mississippian Sediments in SW PA

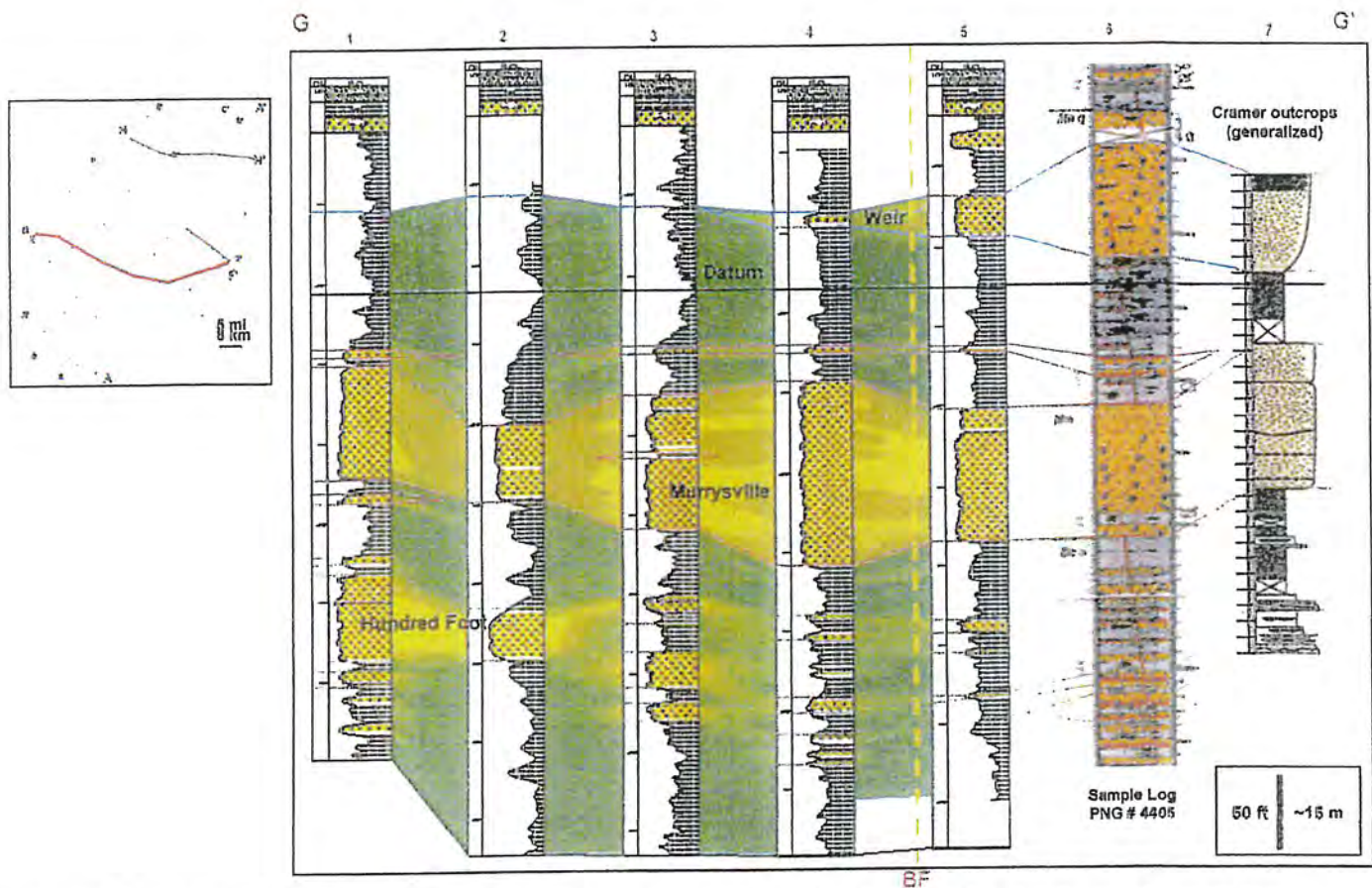


Figure 37. Cross section along G-G' section. This section attempts to tie the well log section to the outcrop data along the major Murrysville trend. Three things are evident from the section. (1)The Weir dramatically thins to the west across the proposed basement fault. (2)The Murrysville displays a thickened section to the west of the basement fault. (3)The Hundred Foot thins eastward as it reaches the basement fault. See Figure 19 for the location of each numbered well.

Cross Section G-G'

McDaniel, Bret, 2006, Subsurface Stratigraphic and Depositional Controls on Late Devonian-Early Mississippian Sediments in SW PA



Natural Gas

Seismicity in Pennsylvania and the Pennsylvania State Seismic Network

Dr. Andrew Nyblade, Dept. of Geosciences, Penn State, discusses the research on seismic activity as part of a DCNR and DEP monitoring program

Time Log:

00:00 Introduction

03:41 Earthquake primer and review of seismicity in PA

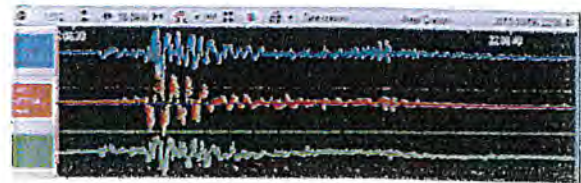
14:29 Review of building the PA Seismic network

20:56 Seismicity in PA 2013-2014

35:01 More on building PASEIS

42:54 Lawrence County Earthquakes

47:30 Q & A



www.dcnr.state.pa.us

[Seismicity in Pennsylvania and the Pennsylvania State Seismic Network powerpoint](#)

PDF, 5.5 MB

[Recorded Webinar - Seismicity in Pennsylvania and the Pennsylvania State Seismic Network](#)

Seismicity in Pennsylvania and the Pennsylvania State Seismic Network (PASEIS)

Andy Nyblade

Department of Geosciences, Penn State University

May 19, 2016



PennState



pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

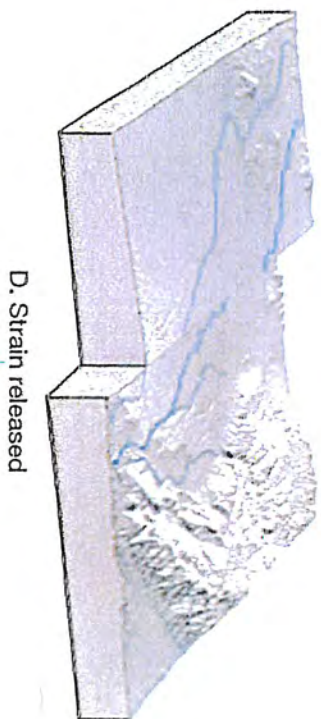
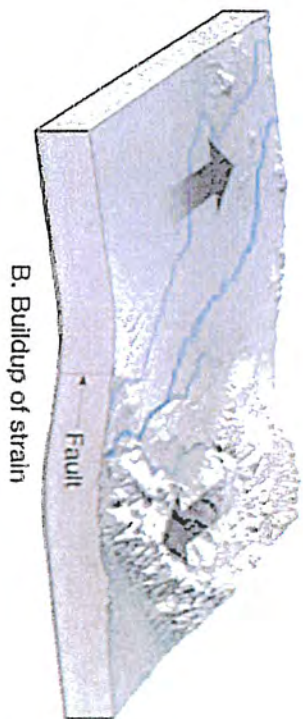
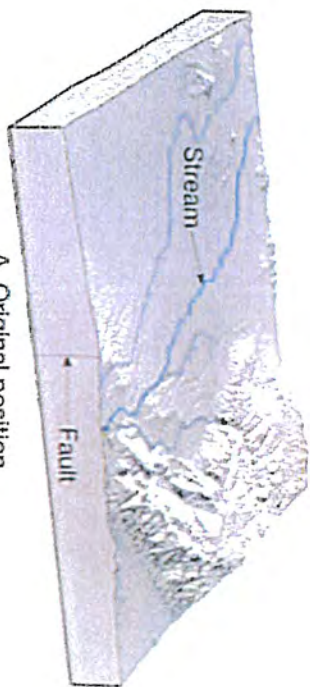


pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

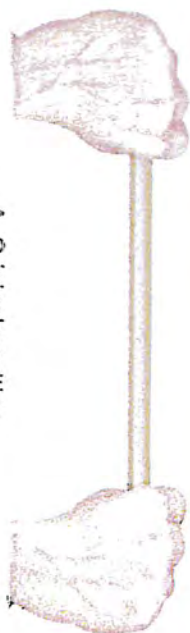
Introduction

- Earthquake primer
- Review of seismicity in PA
- Review of seismic networks in PA
- Building the Pennsylvania State Network (PASEIS)
- Seismicity in Pennsylvania 2013-2014
- More on building PASEIS
- April 25, 2016 Lawrence County earthquakes

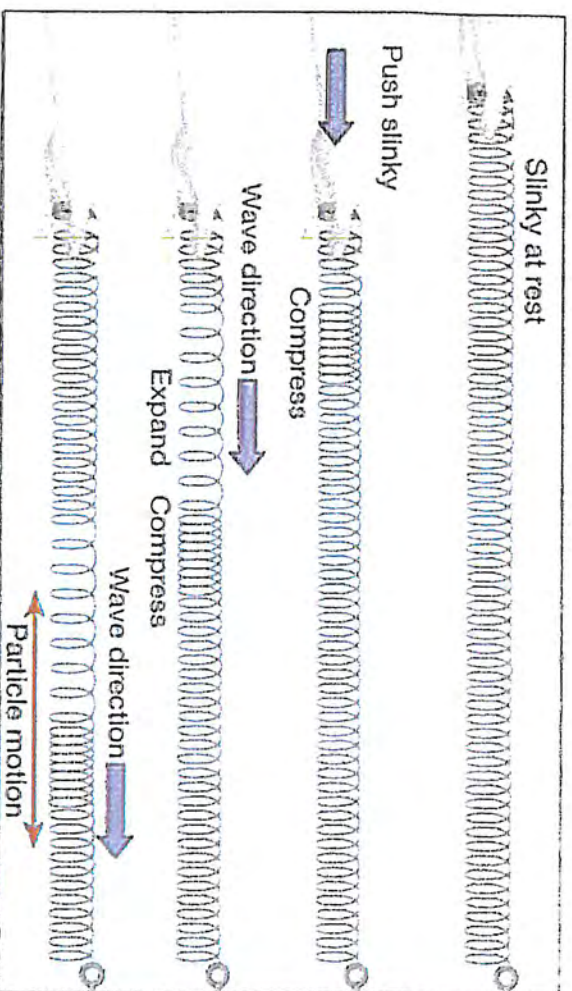
Deformation of rocks



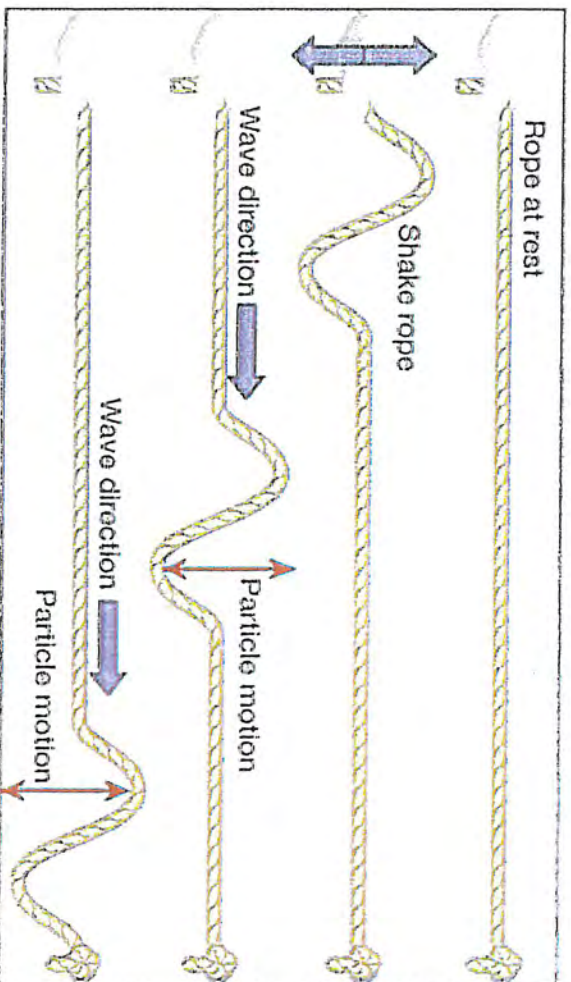
Deformation of a limber stick



Body Waves:

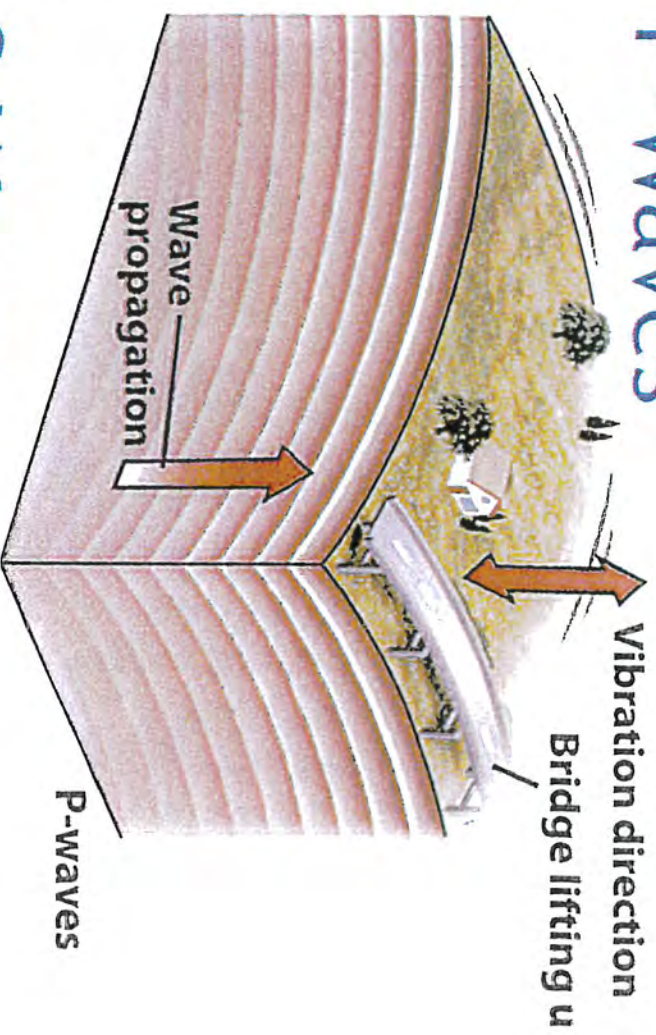


A. P waves generated using a slinky

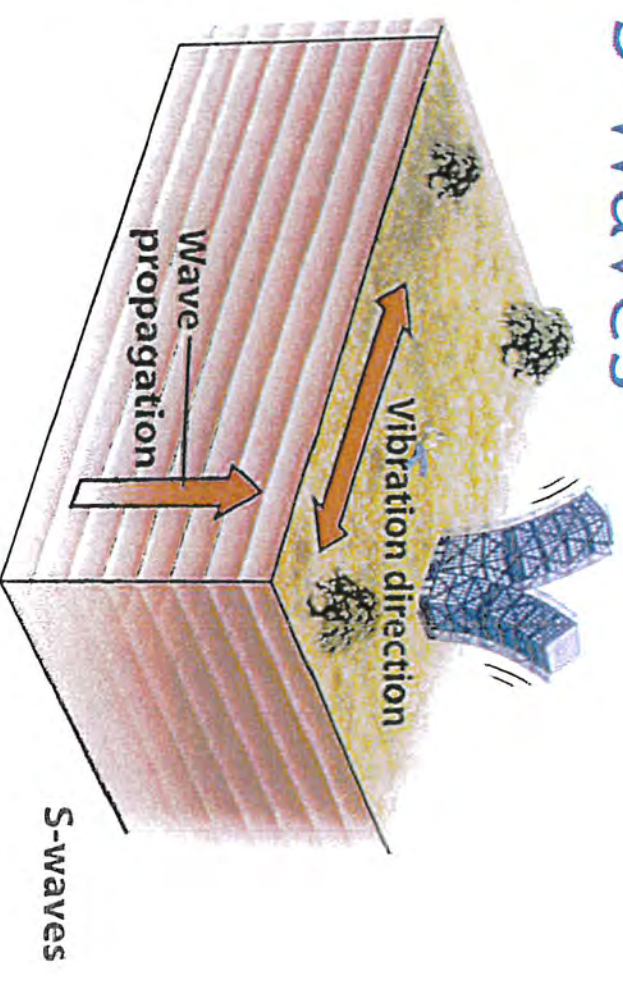


C. S waves generated using a rope

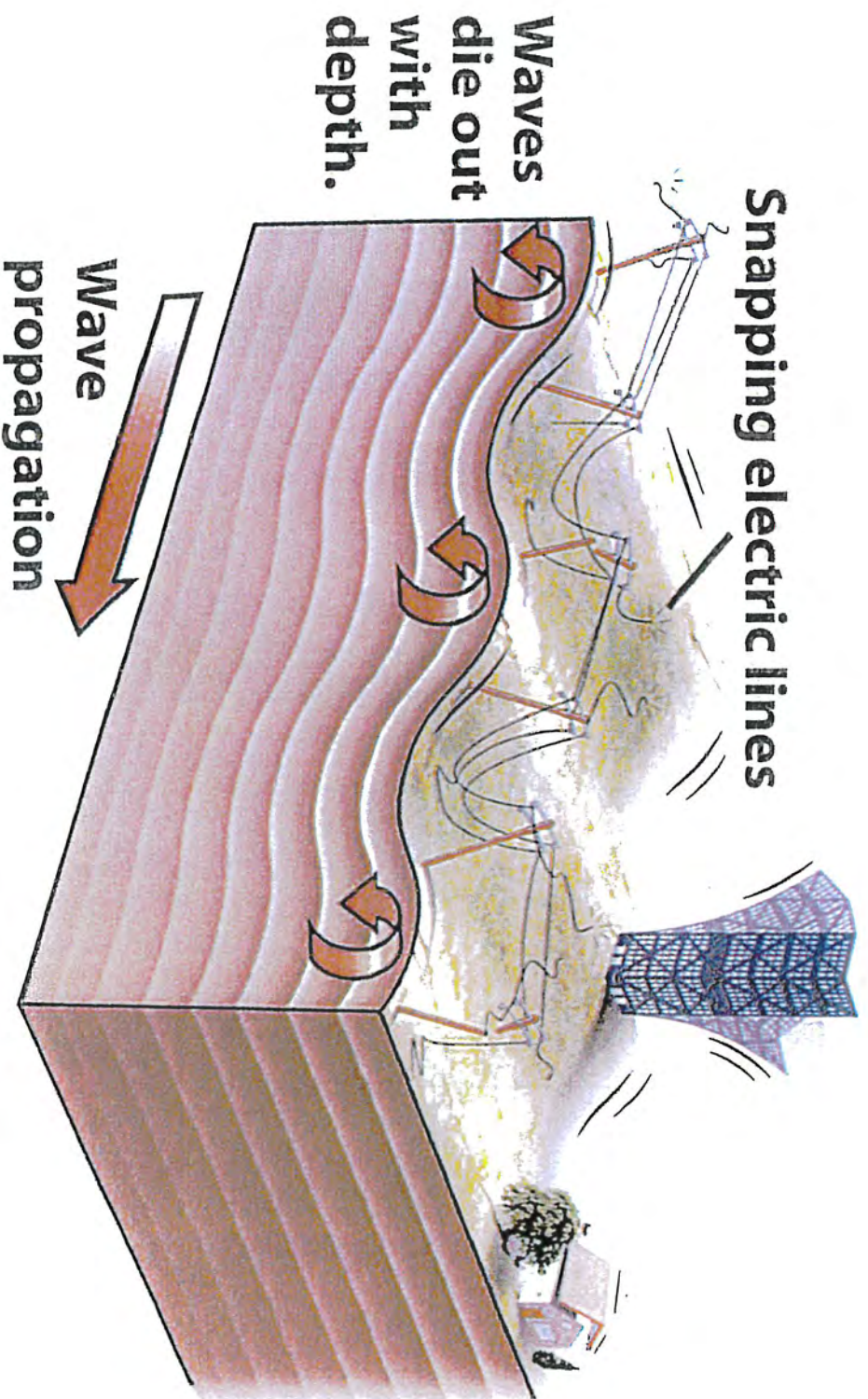
P-Waves



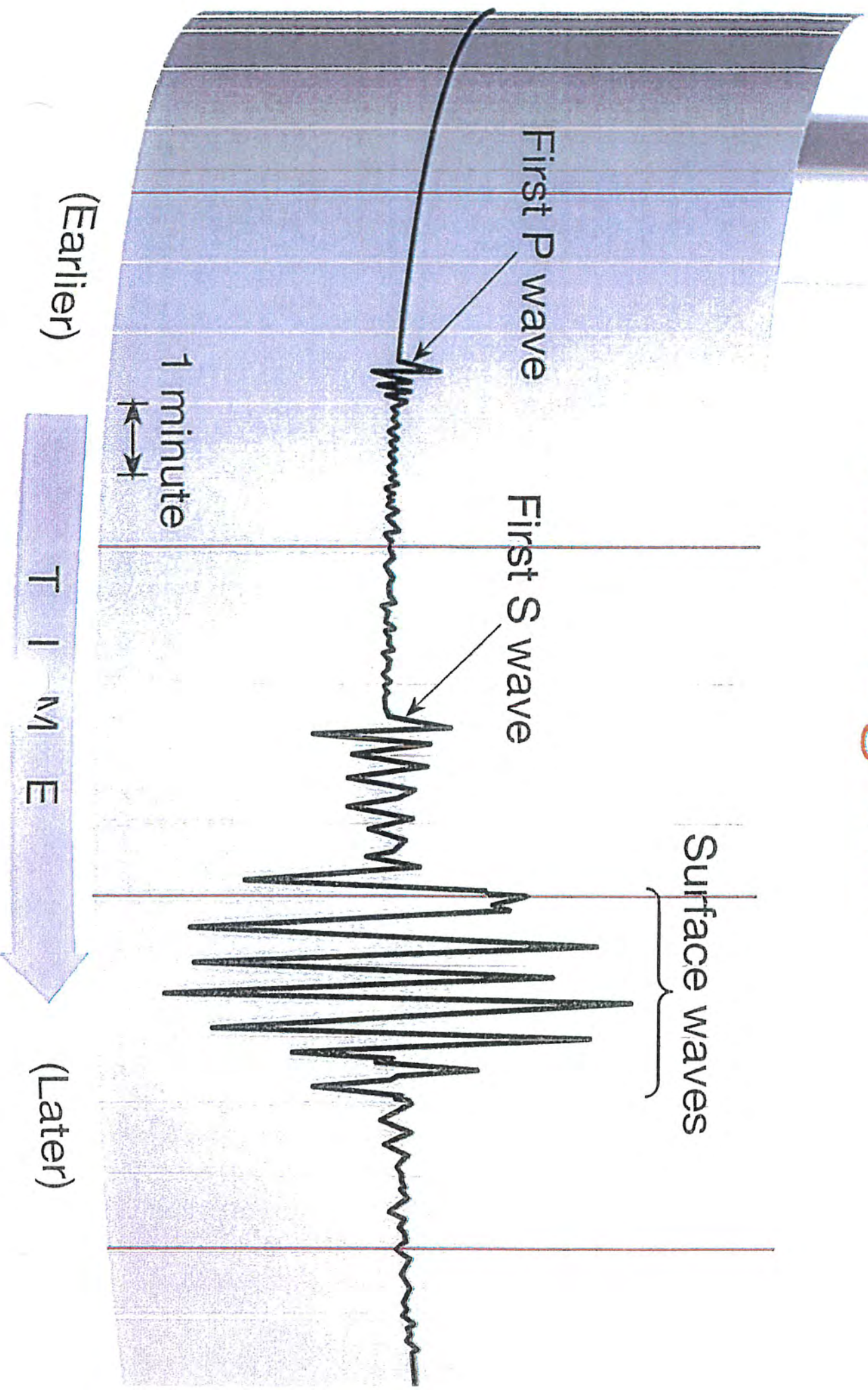
S-Waves



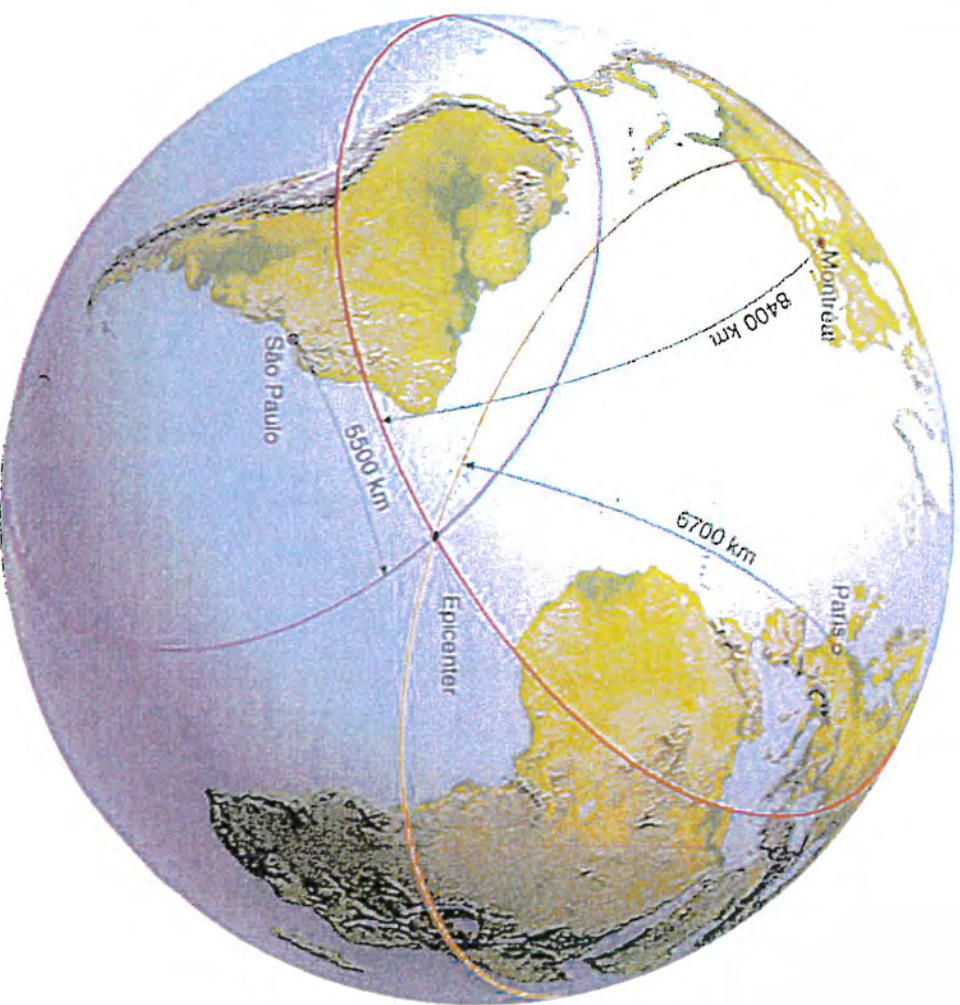
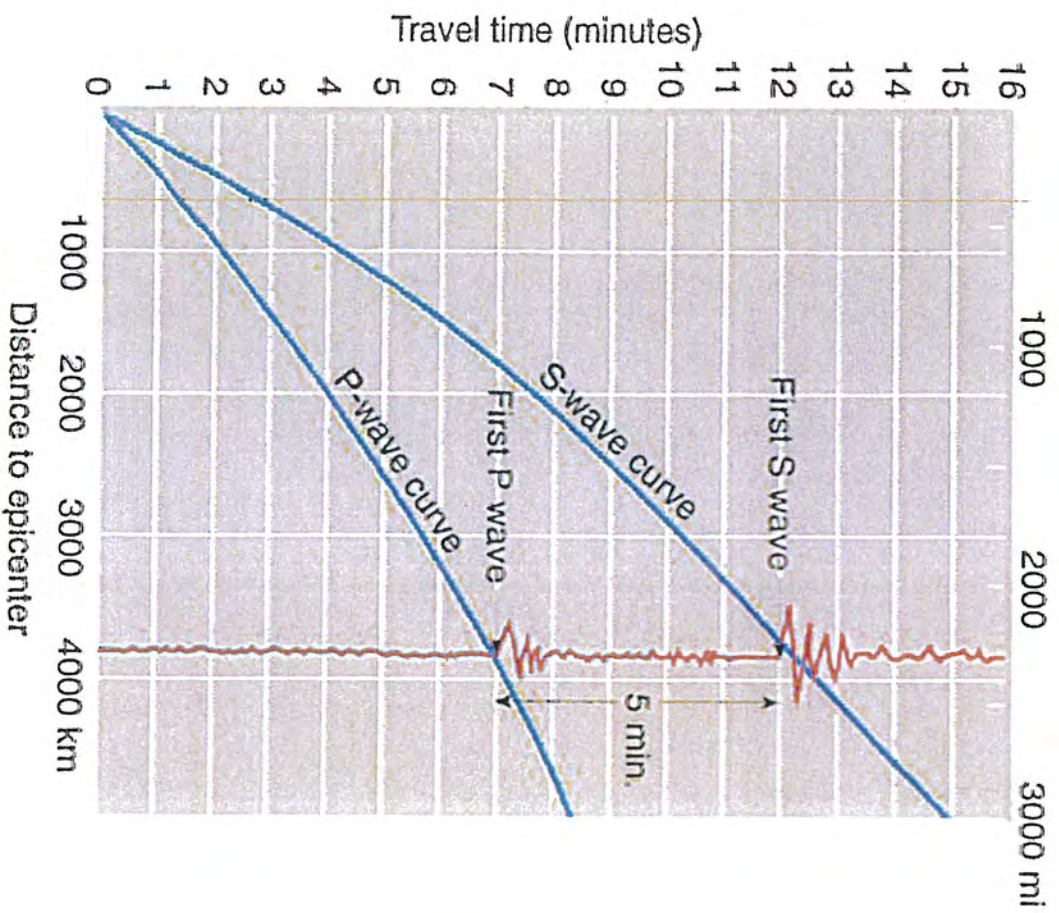
Surface Waves:



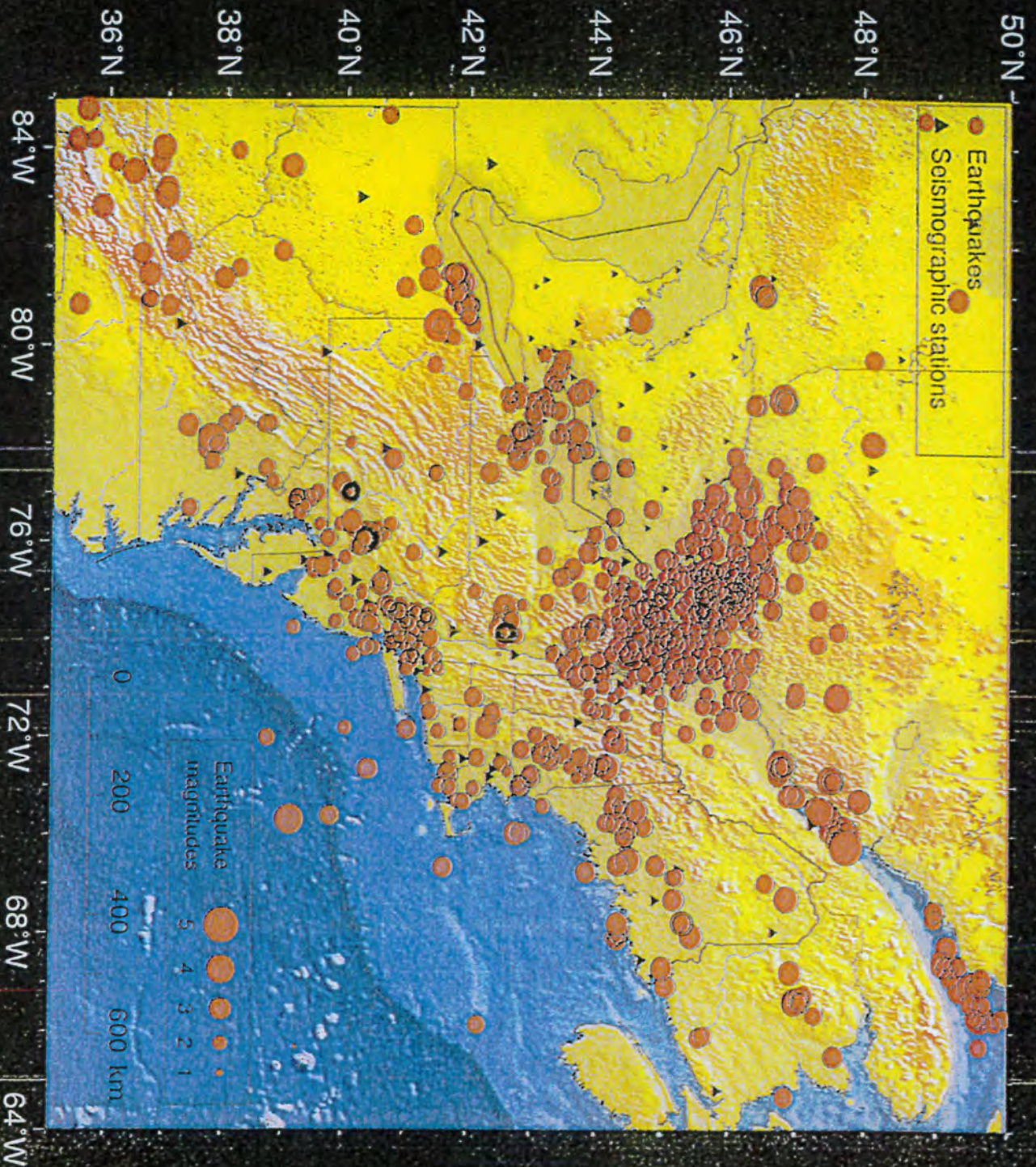
Seismogram



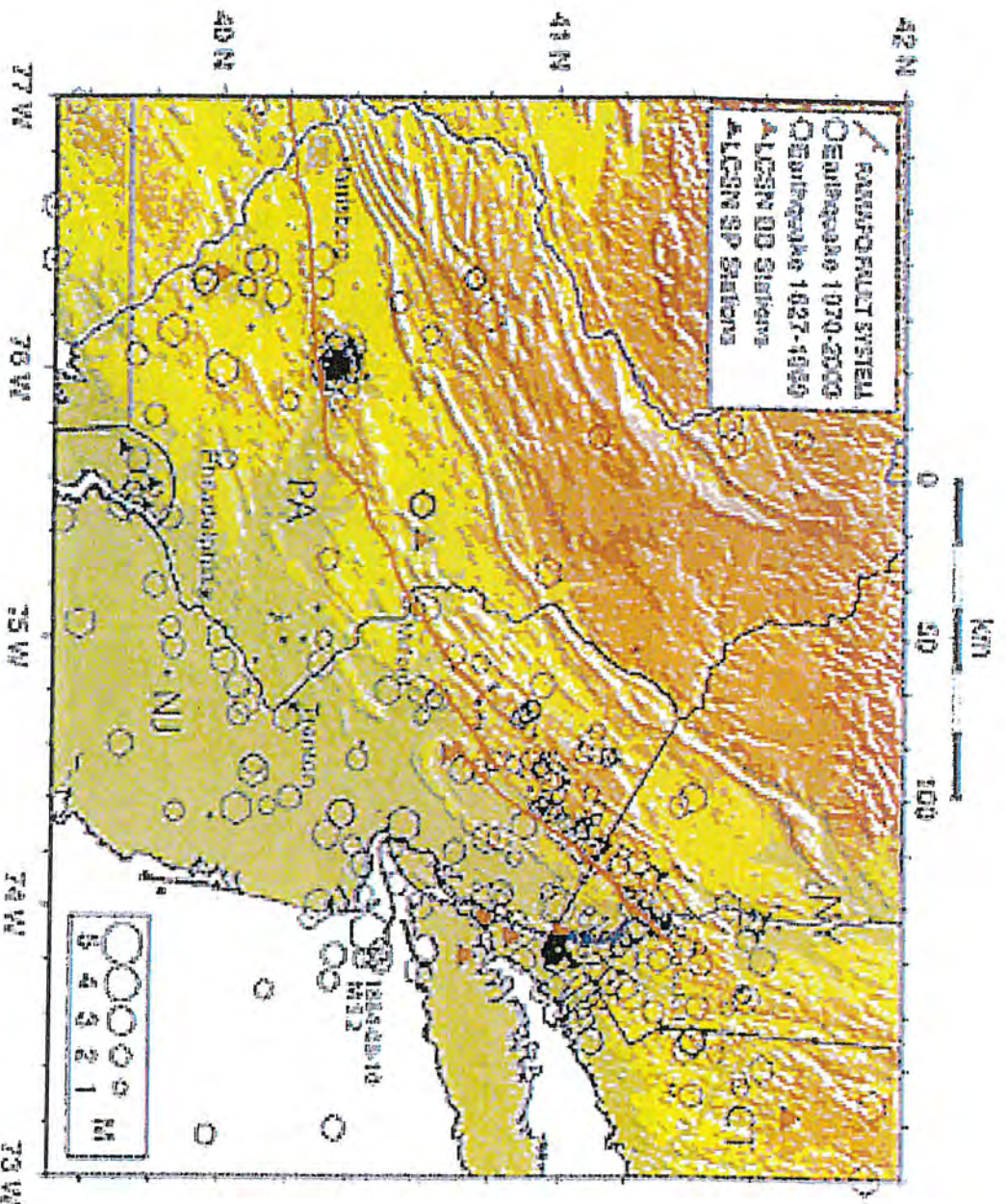
Earthquake Location



Earthquakes in NE United States and Canada 1990 - 2010



Earthquake locations by the Lamont Cooperative Seismographic Network, US Geological Survey and the Geological Survey of Canada.
 June 2010, Won-Young Kim, Lamont-Doherty Earth Obs. of Columbia University, <www.ideo.columbia.edu/LCSN>



LANCASTER SEISMIC ZONE

MAG
2 3 4
● ● ● EPICENTERS FROM:
● ● ● STOVER ET AL., 1981
● ● ● DEWEY & GORDON, 1984
● ● ● ARMSTRUSTER & SEEGER

[www.earthinstitute.columbia.edu/
news/2004/story04-30-04b.html](http://www.earthinstitute.columbia.edu/news/2004/story04-30-04b.html)

Armbruster and Seeber
(1987)

IRIS Earthquake Browser

Mag	Depth km	Day	Time UTC	Lat	Lon	Dist km
4.8	5	1998-09-25	19:52:51	41.44	-80.34	0
2.3	5	2008-07-21	01:41:30	41.47	-80.37	3
2.2	5	2014-02-09	22:34:05	41.48	-80.37	4
2.2	5	2010-12-10	21:26:32	41.51	-80.33	7
3.2	18	1985-04-14	11:39:49	41.33	-80.34	13
2.2	5	2005-04-20	21:36:09	41.62	-80.41	20
2	5	2005-02-10	04:39:15	41.68	-80.32	26
2.1	5	2007-01-03	09:08:31	41.73	-80.17	34
2.5	5	2011-09-30	00:52:38	41.14	-80.68	44
4	5	2011-12-31	20:05:01	41.12	-80.68	46

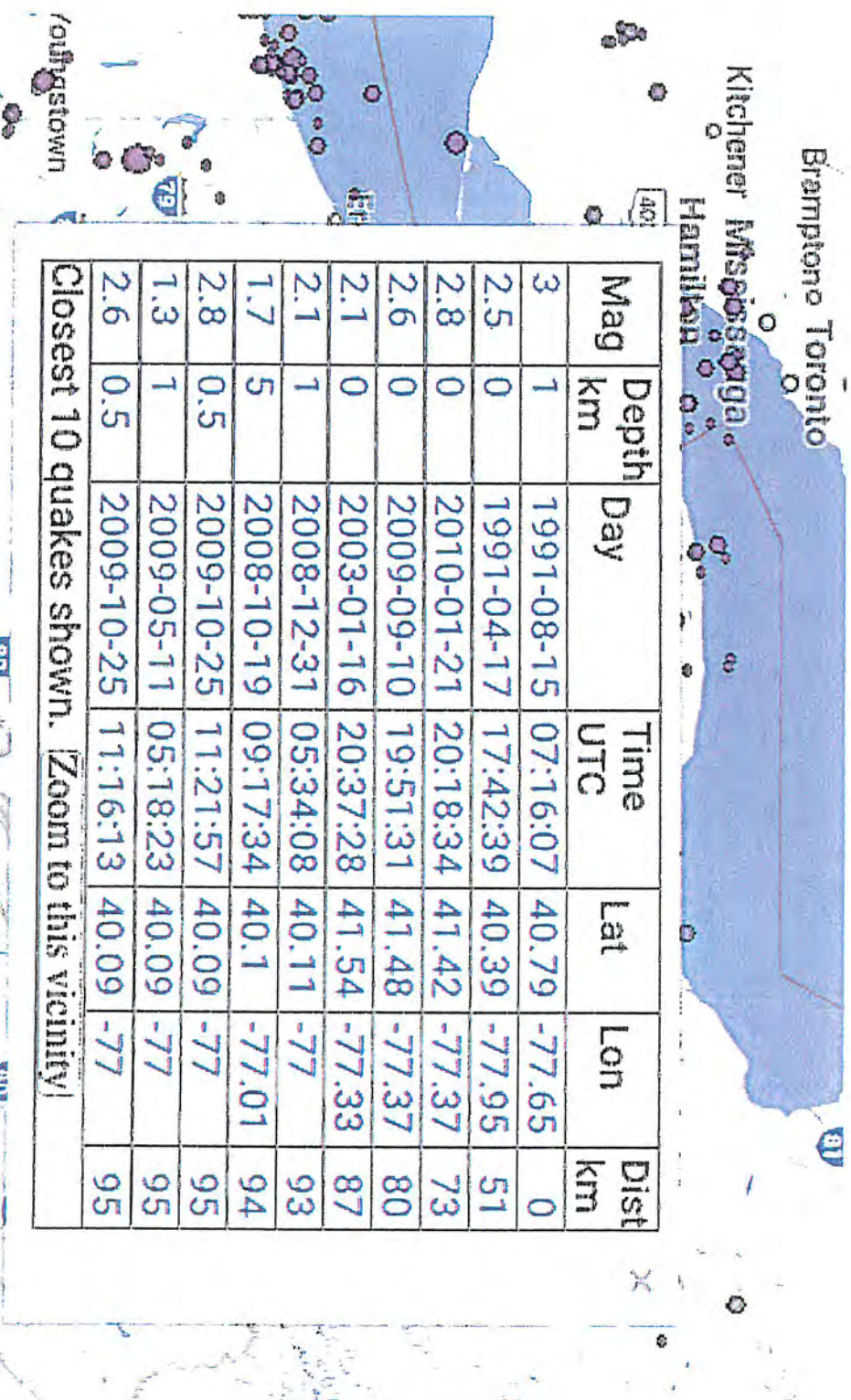
Closest 10 quakes shown. [Zoom to this vicinity]



IRIS=Incorporated
Research Institutions
for Seismology
(www.iris.edu)

Sept. 25, 1998
Pymatuning, PA
earthquake
(Mag. 5.2)

IRIS Earthquake Browser



Mag	Depth km	Day	Time UTC	Lat	Lon	Dist km
3	1	1991-08-15	07:16:07	40.79	-77.65	0
2.5	0	1991-04-17	17:42:39	40.39	-77.95	51
2.8	0	2010-01-21	20:18:34	41.42	-77.37	73
2.6	0	2009-09-10	19:51:31	41.48	-77.37	80
2.1	0	2003-01-16	20:37:28	41.54	-77.33	87
2.1	1	2008-12-31	05:34:08	40.11	-77	93
1.7	5	2008-10-19	09:17:34	40.1	-77.01	94
2.8	0.5	2009-10-25	11:21:57	40.09	-77	95
1.3	1	2009-05-11	05:18:23	40.09	-77	95
2.6	0.5	2009-10-25	11:16:13	40.09	-77	95

Closest 10 quakes shown. [Zoom to this vicinity](#)

Aug. 15, 1991
Centre Hall
earthquake
(Mag. 3)

IRIS Earthquake Browser

Dillsburg swarm

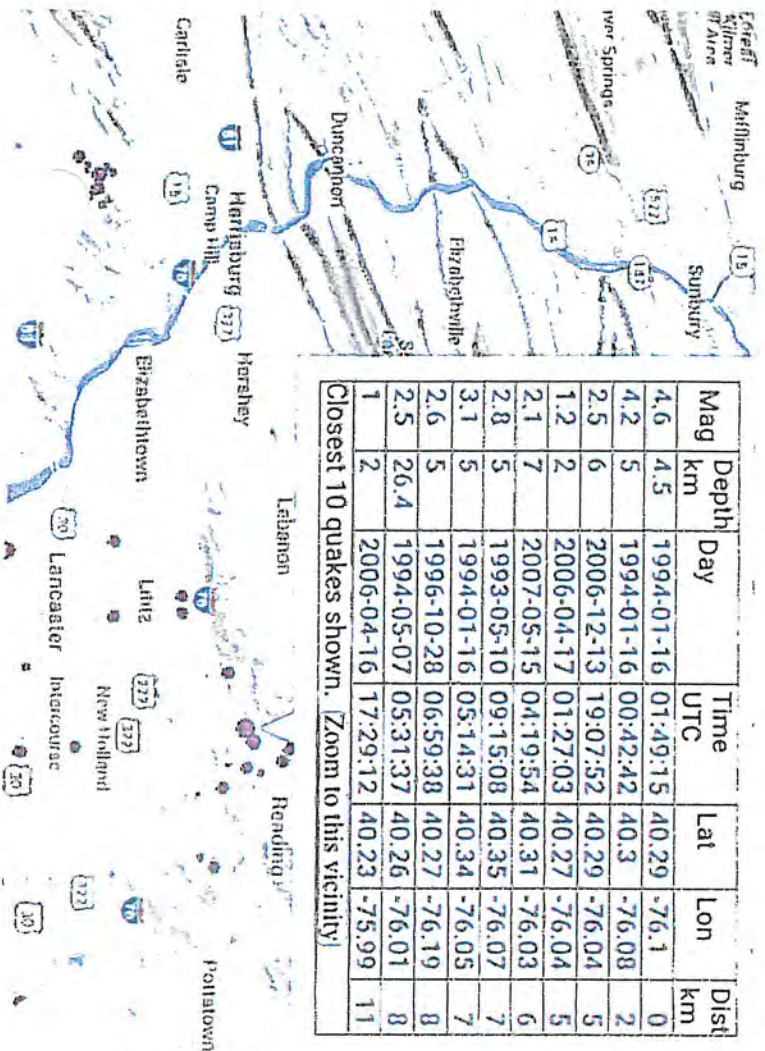
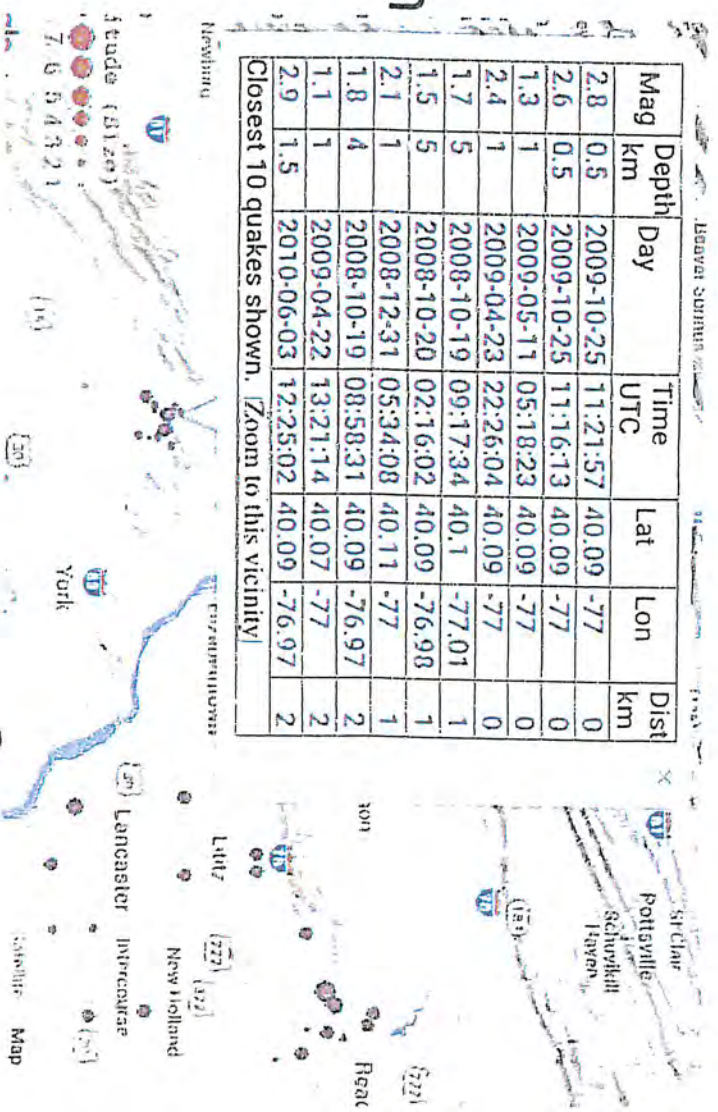
Mag	Depth km	Day	Time UTC	Lat	Lon	Dist km
2.8	0.5	2009-10-25	11:21:57	40.09	-77	0
2.6	0.5	2009-10-25	11:16:13	40.09	-77	0
1.3	1	2009-05-11	05:18:23	40.09	-77	0
2.4	1	2009-04-23	22:26:04	40.09	-77	0
1.7	5	2008-10-19	09:17:34	40.1	-77.01	1
1.5	5	2008-10-20	02:16:02	40.09	-76.98	1
2.1	1	2008-12-31	05:34:08	40.11	-77	1
1.8	4	2008-10-19	08:58:31	40.09	-76.97	2
1.1	1	2009-04-22	13:21:14	40.07	-77	2
2.9	1.5	2010-06-03	12:25:02	40.09	-76.97	2

Closest 10 quakes shown. [Zoom to this vicinity]

Mag	Depth km	Day	Time UTC	Lat	Lon	Dist km
4.6	4.5	1994-01-16	01:49:15	40.29	-76.1	0
4.2	5	1994-01-16	00:42:42	40.3	-76.08	2
2.5	6	2006-12-13	19:07:52	40.29	-76.04	5
1.2	2	2006-04-17	01:27:03	40.27	-76.04	5
2.1	7	2007-05-15	04:19:54	40.31	-76.03	6
2.8	5	1993-05-10	09:15:08	40.35	-76.07	7
3.1	5	1994-01-16	05:14:31	40.34	-76.05	7
2.6	5	1996-10-28	06:59:38	40.27	-76.19	8
2.5	26.4	1994-05-07	05:31:37	40.26	-76.01	8
1	2	2006-04-16	17:29:12	40.23	-75.99	11

Closest 10 quakes shown. [Zoom to this vicinity]

1994 Wyomissing Hills earthquakes (Mag. 4.0 foreshock and 4.6 mainshock)

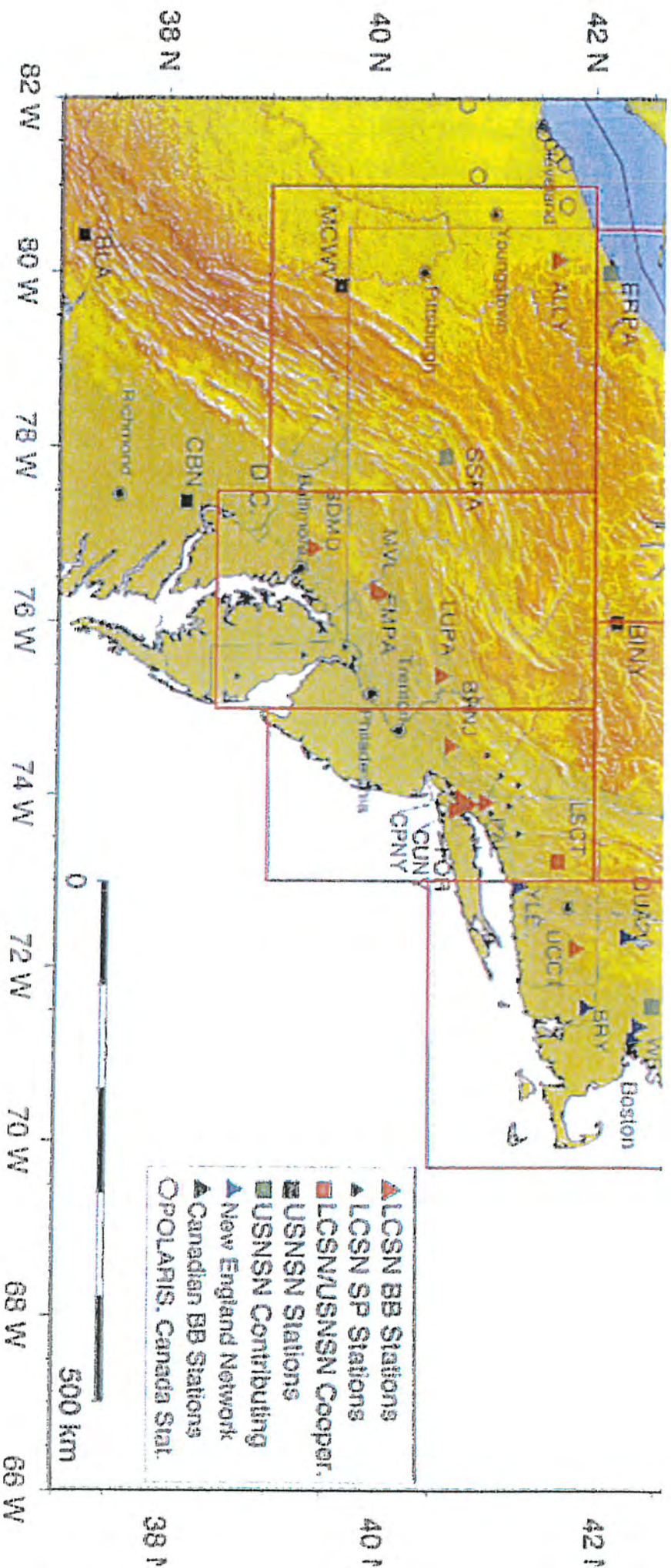


Permanent Seismic Stations in PA through 2015

3 Networks:

- USGS National Network (2 stations)
- Lamont Doherty Earth Observatory Cooperative Seismic Network (LCSN) (supported as a regional network by the USGS) (6 stations)
- Initial 10 PASEIS stations

USGS and LCSN Stations

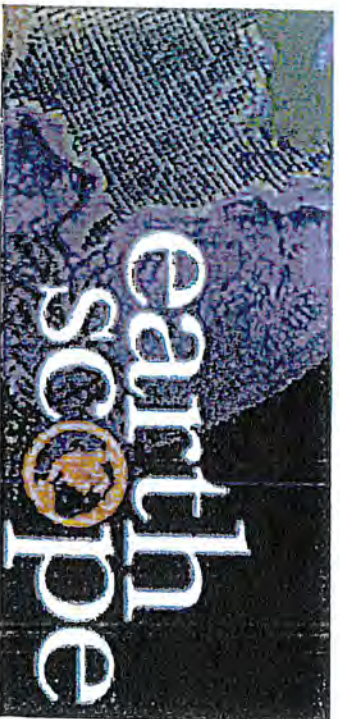


Initial 10 PASEIS stations



History of building a PA state seismic network

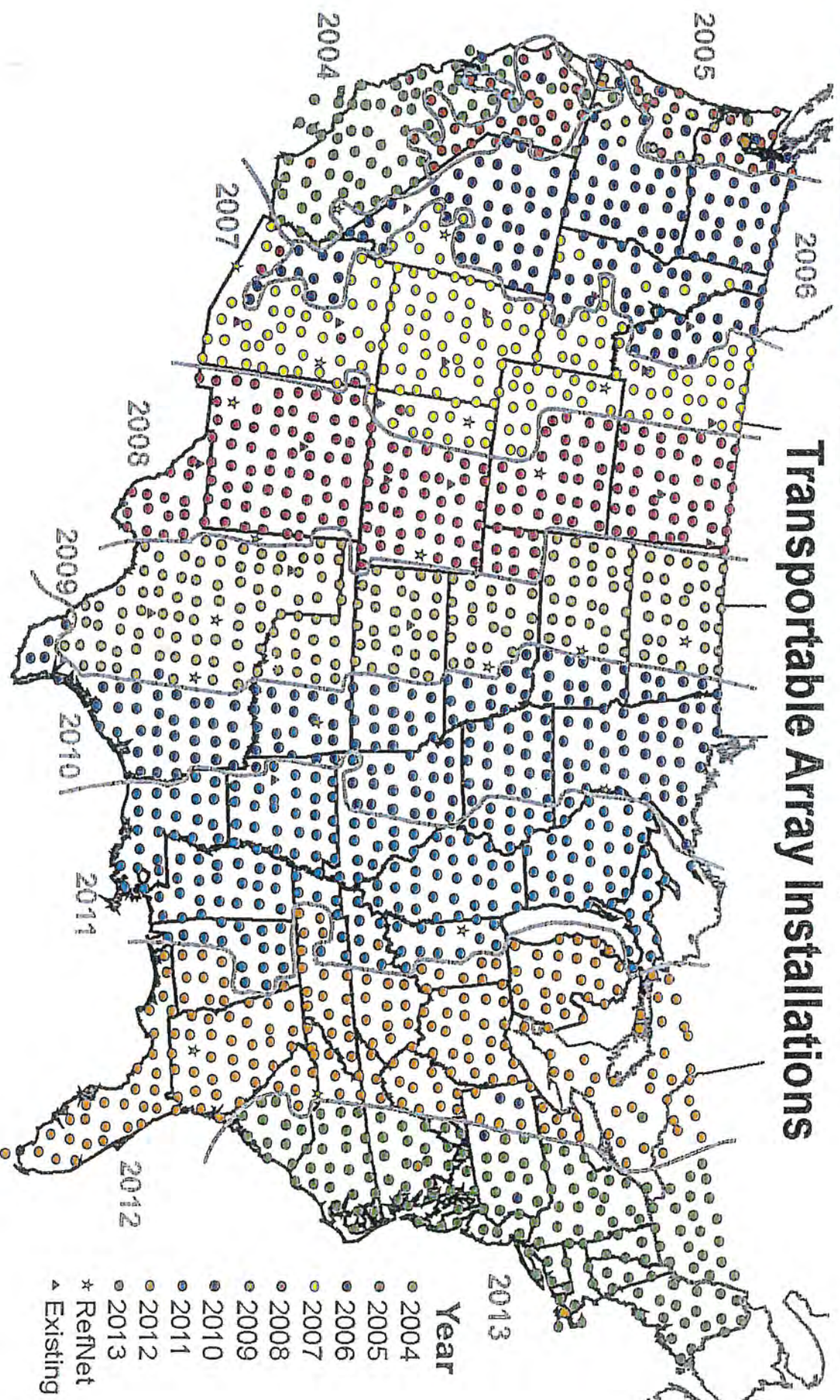
- 2006-2010 Establishment of the first 6 permanent PASEIS stations – DCNR
- 2009 Carbon sequestration technical assessment - DCNR
 - 25 portable seismic stations
- 2010 Purchase of 4 USArray stations from IRIS – DCNR
- 2013 Earthquake monitoring during USArray - DCNR
 - *Support for temporary network to densify the USArray network, develop seismicity catalog*
- 2015 Expand the 10-station permanent network to 30 stations and provide seismic event information – DCNR and DEP



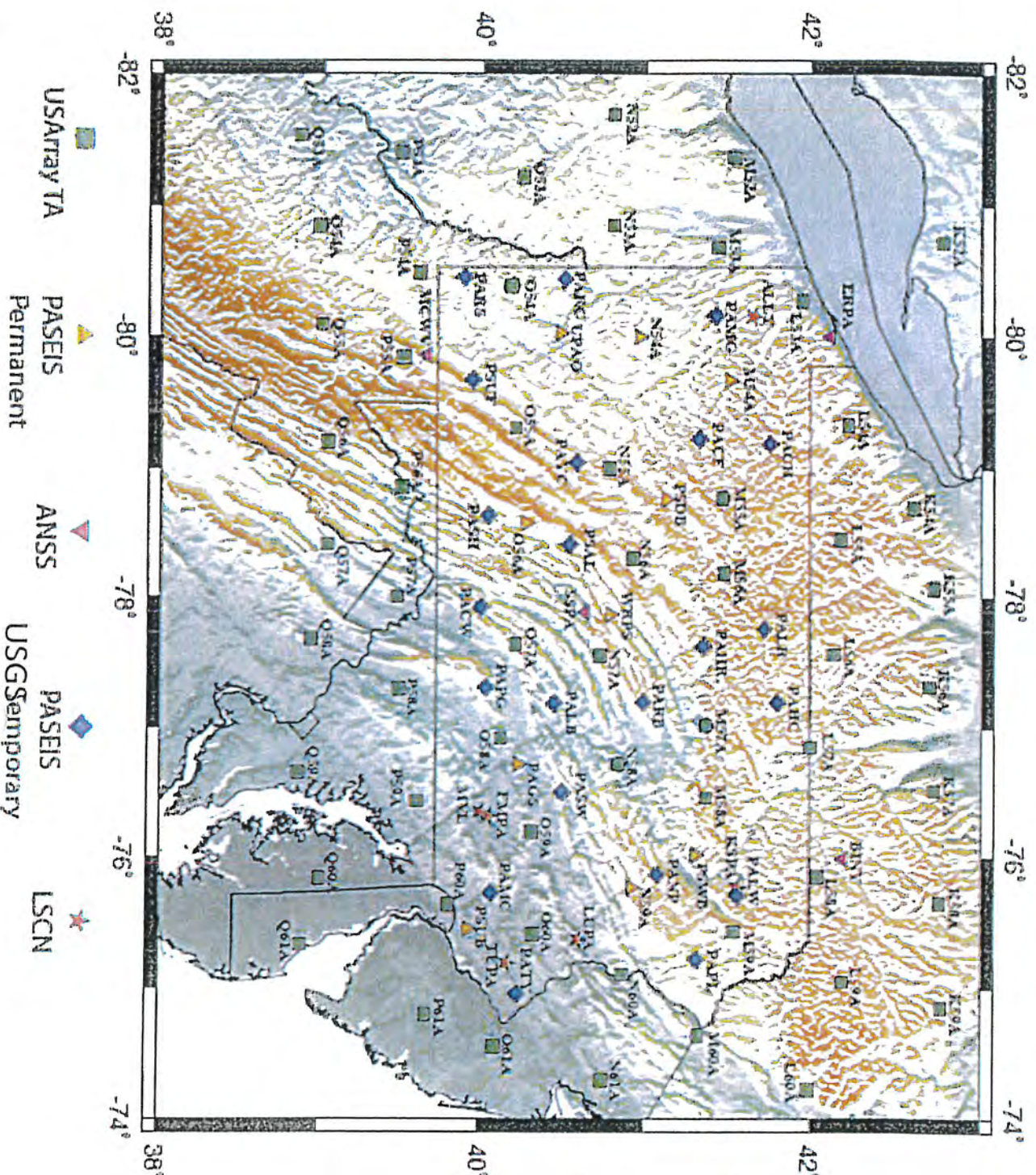
USArray



Transportable Array Installations



Stations 2/2013 to 12/2014



- Over 100 3-component high quality (broadband) stations
- Recording continuously
- Sample rates of between 40 and 100 samples per second



PA seismicity 2/2013 to 12/2014 (from Kyle Homman's MS thesis)

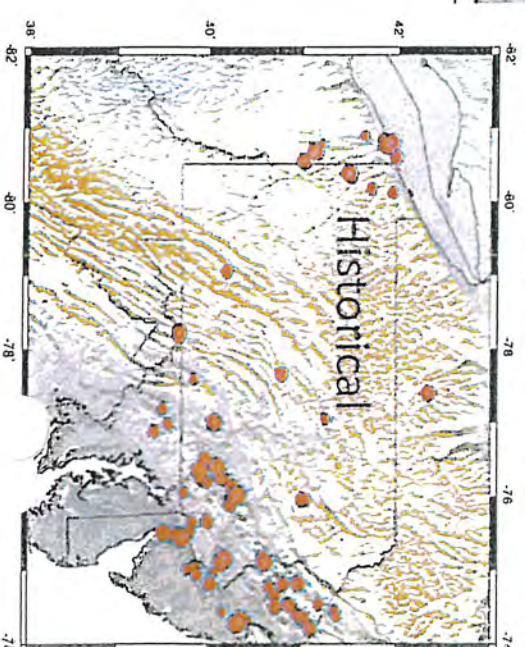
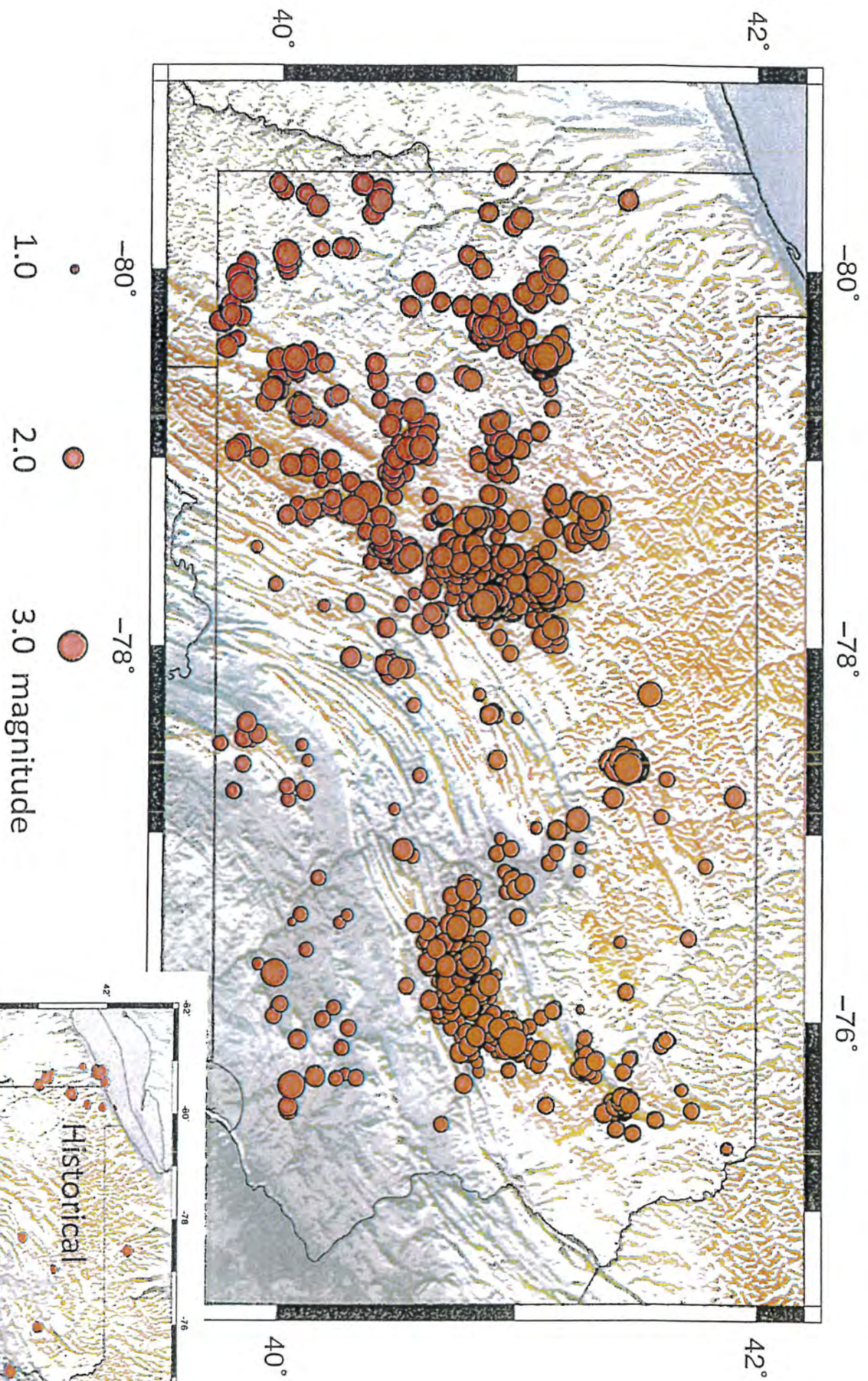
- Average number of stations used for each event: 10
- Minimum number of stations used was 4
- 1568 events with 1355 located in Pennsylvania

Picking and Locating Events

- Used Antelope Software package
- Manually picked arrival times
- Filtered with a 1-5 Hz bandpass filter
- Preliminary locations from Antelope using IASP91 velocity model
- Relocated using HYPOLLIPSE and a velocity model for Pennsylvania
- Magnitudes determined using Richter's method for local magnitude

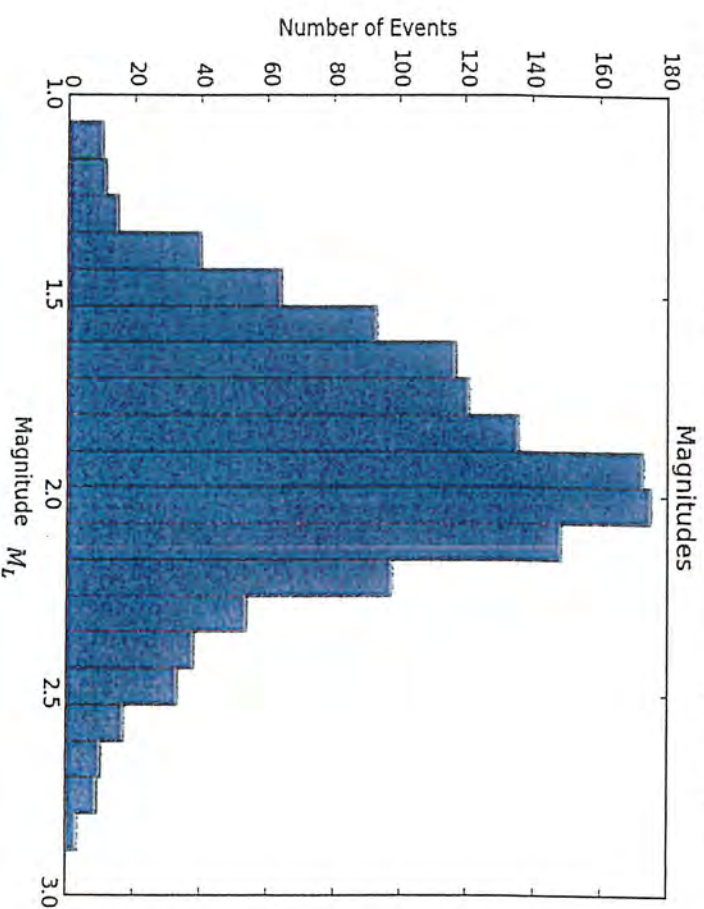
Layer	P-wave Velocity (km/s)	Depth of Interface (km)	Vp/Vs Ratio
1	6.0	0.0	1.74
2	6.3	10.0	1.74
3	6.6	20.0	1.74
4	6.9	30.0	1.74
5	8.1	37.0	1.74

Adapted from Katz (1955)



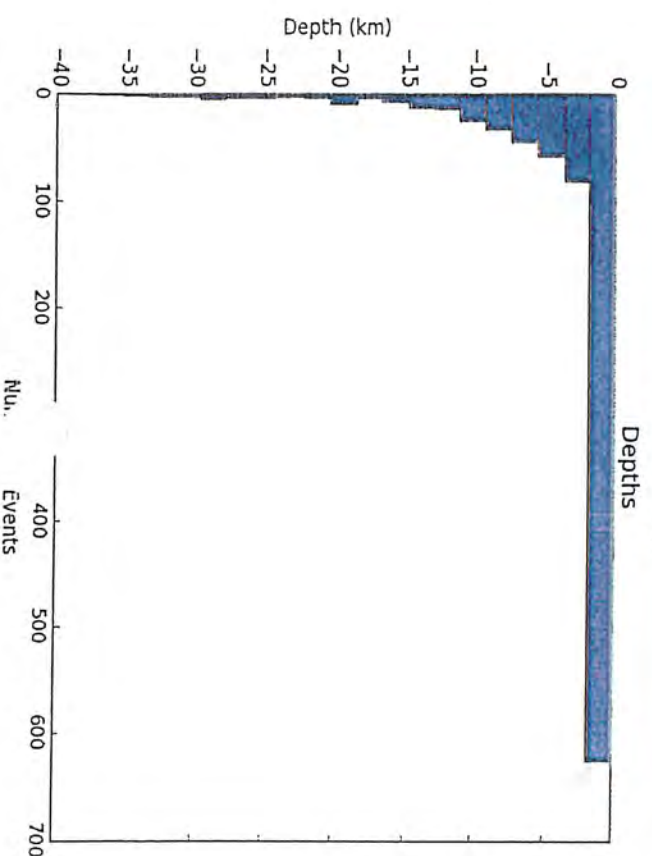
Magnitudes and Depths

- Local magnitudes range from 1.07 to 2.89



Catalog is complete to magnitude 2

- Depths mostly < 1 km

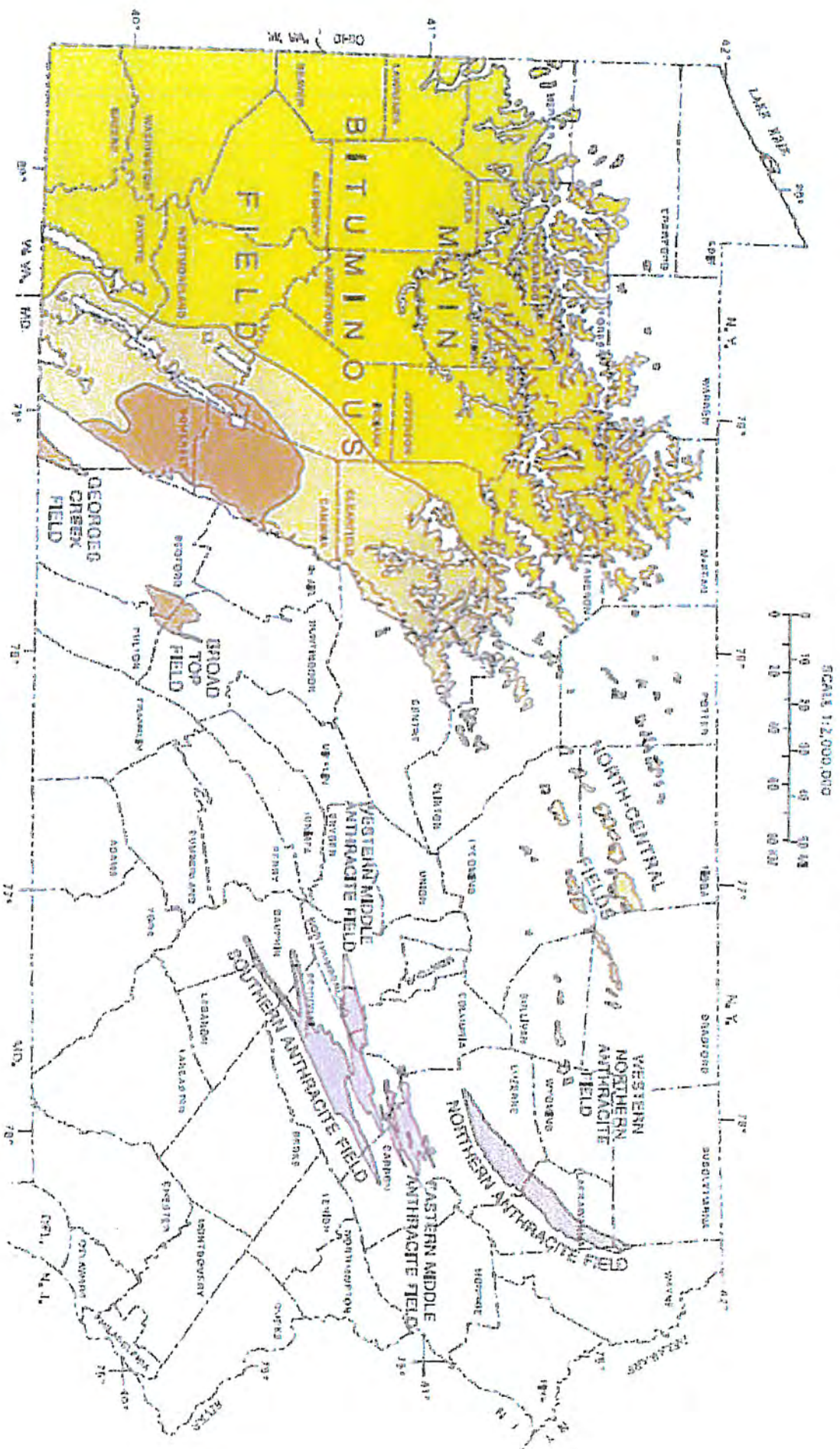


What are the sources of the seismic events?

Several possibilities

- tectonic earthquakes
- mine blasts (quarries, coal mines, other mines)
- induced seismicity from wastewater disposal wells
- induced seismicity from hydraulic fracking

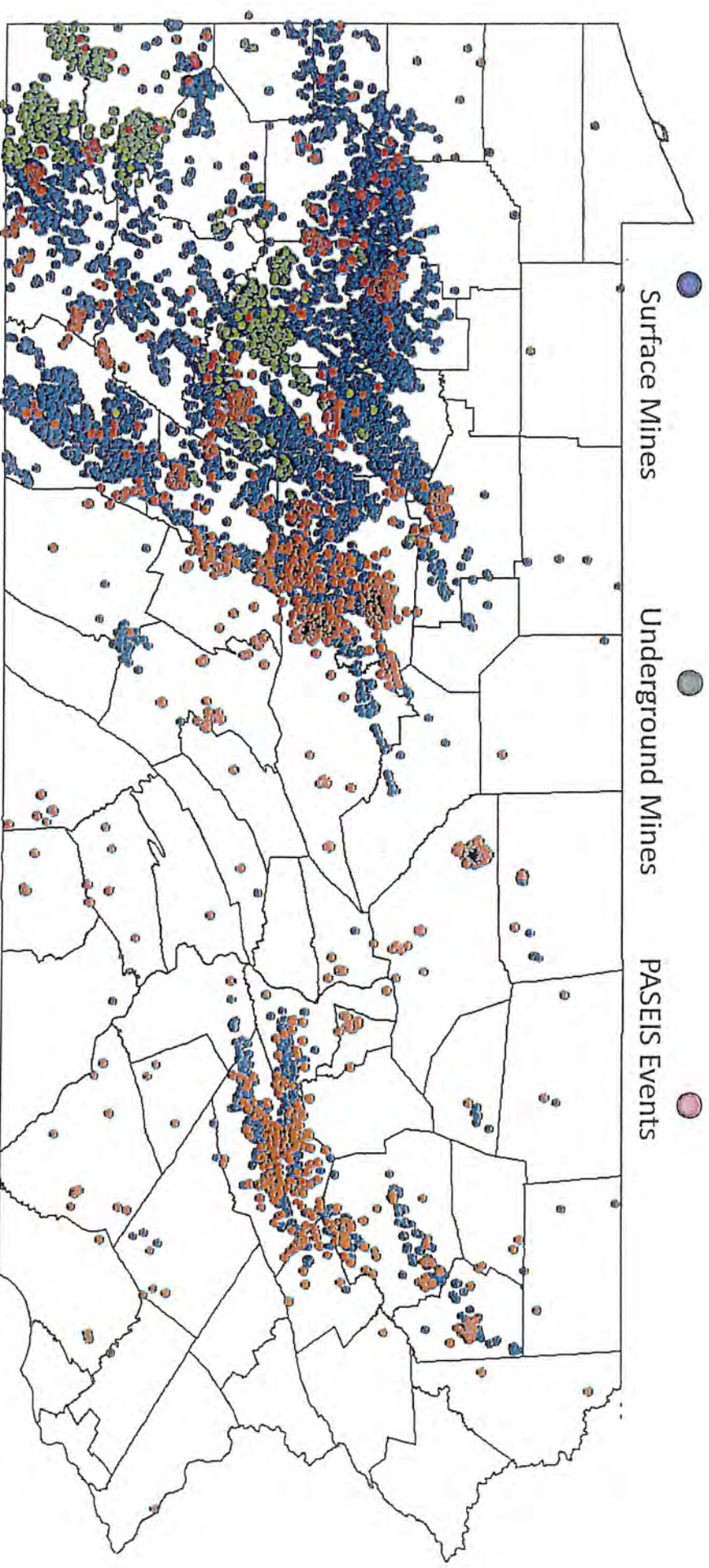
DISTRIBUTION OF PENNSYLVANIA COALS



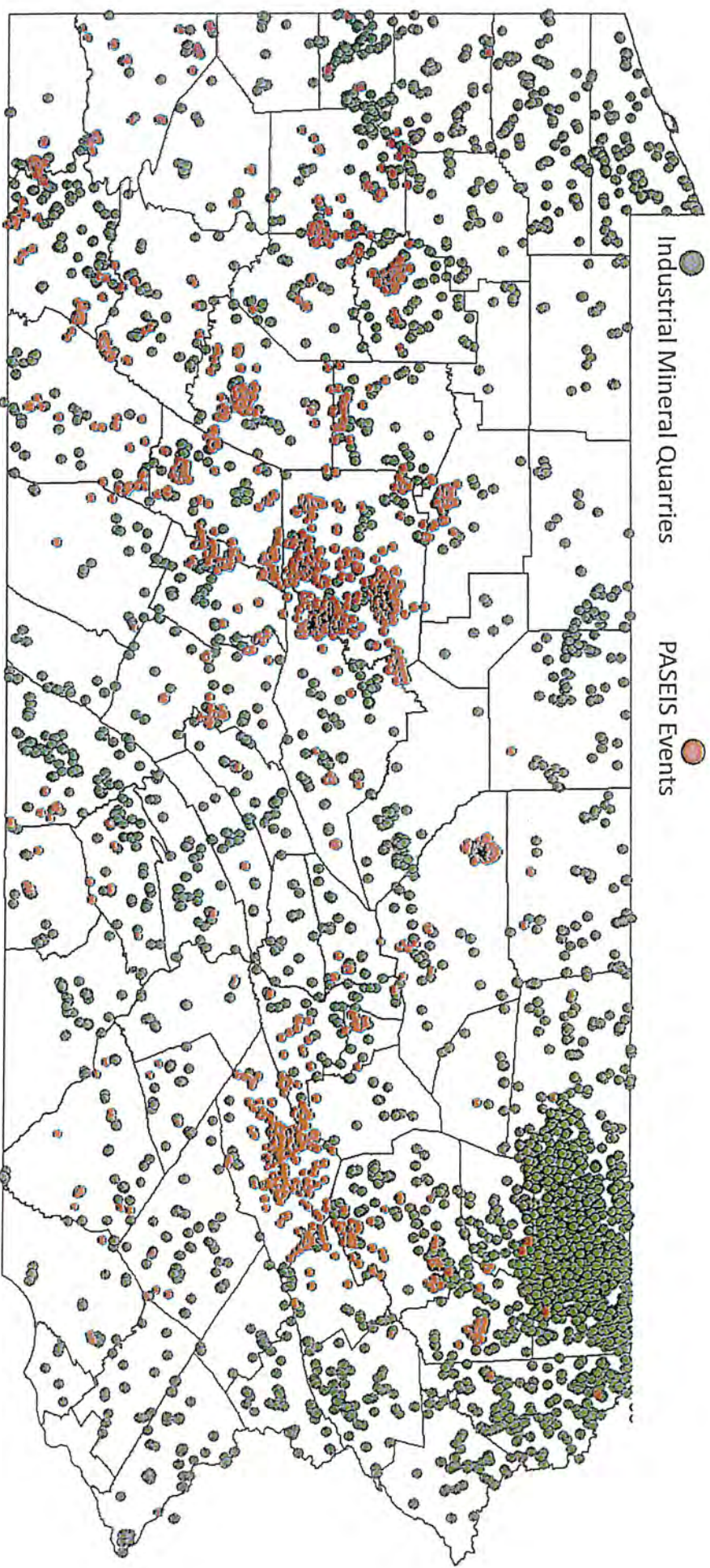
USGS Event Classification for Blasts

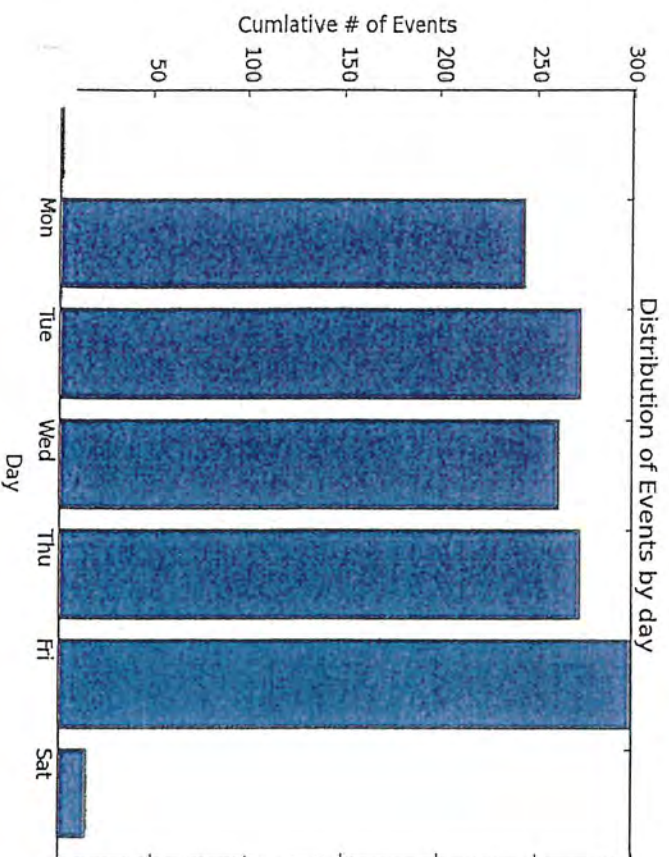
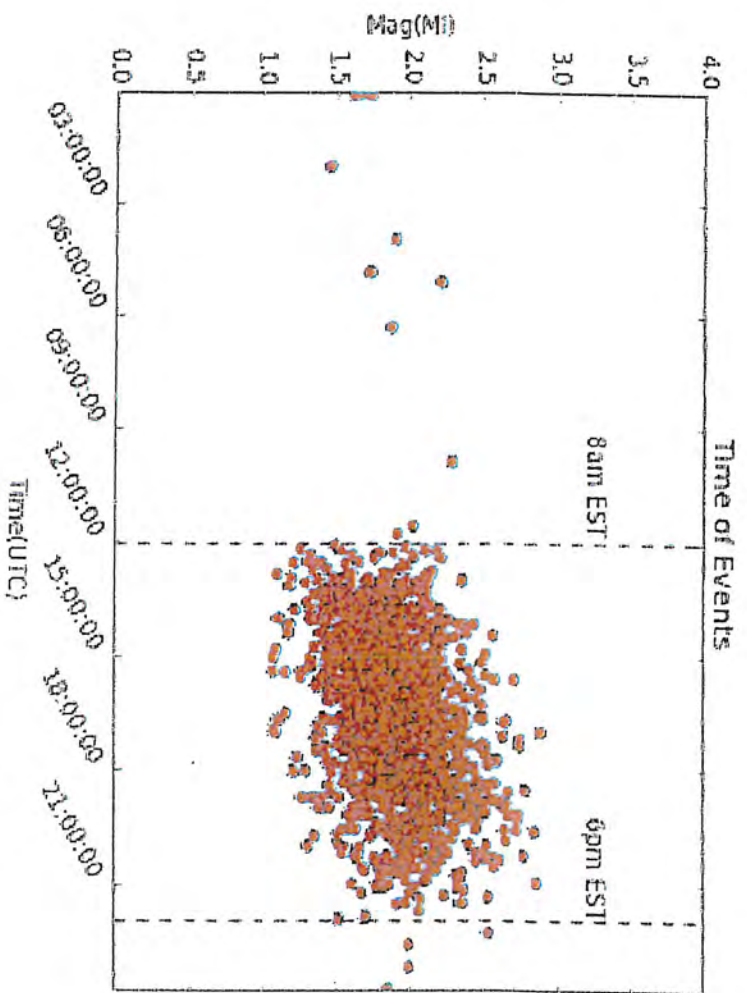
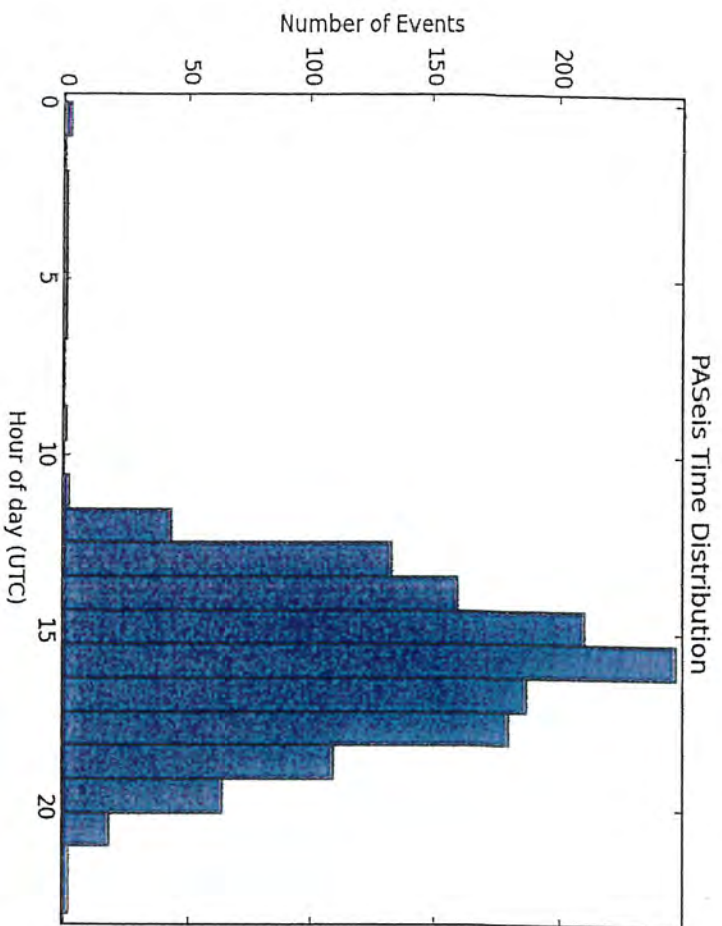
- Time of event (during working hours)
- Location of events relative to mines and quarries (within 5 km)
- Emergent phase arrivals
- Lack of clear S-wave arrivals
- Excessive low-frequency signal
- Presence of a short period surface wave

Spatial correlation with coal mines

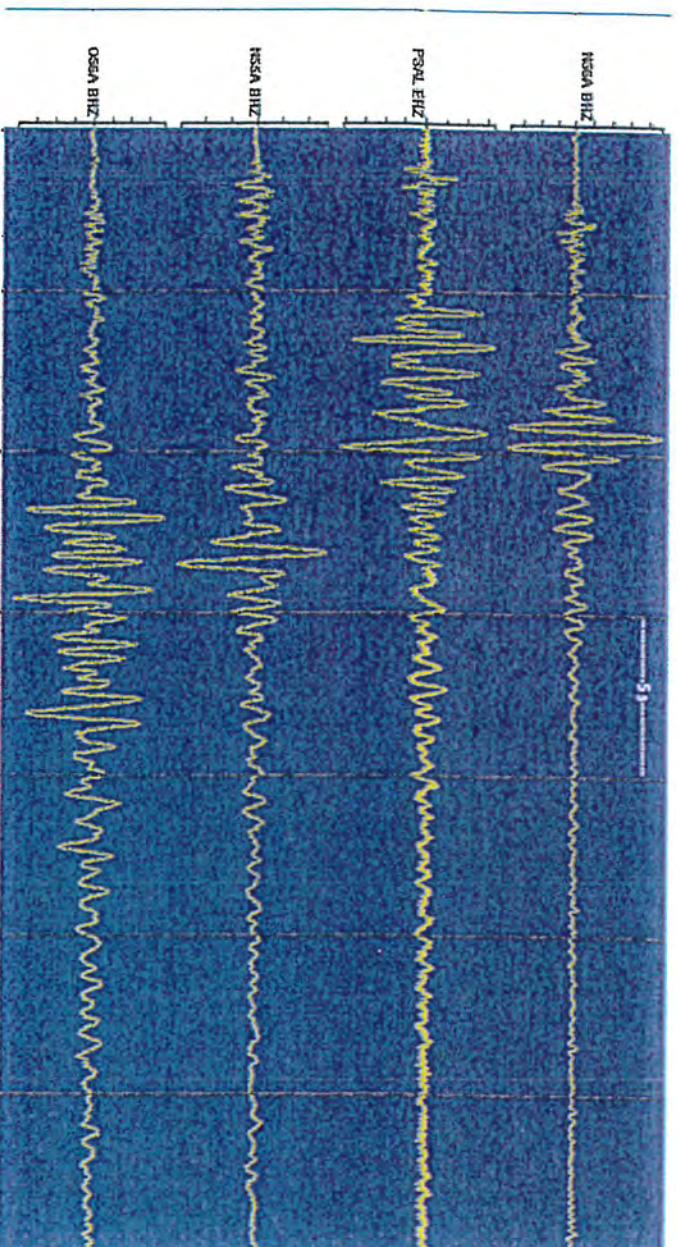


Spatial correlation with other mines





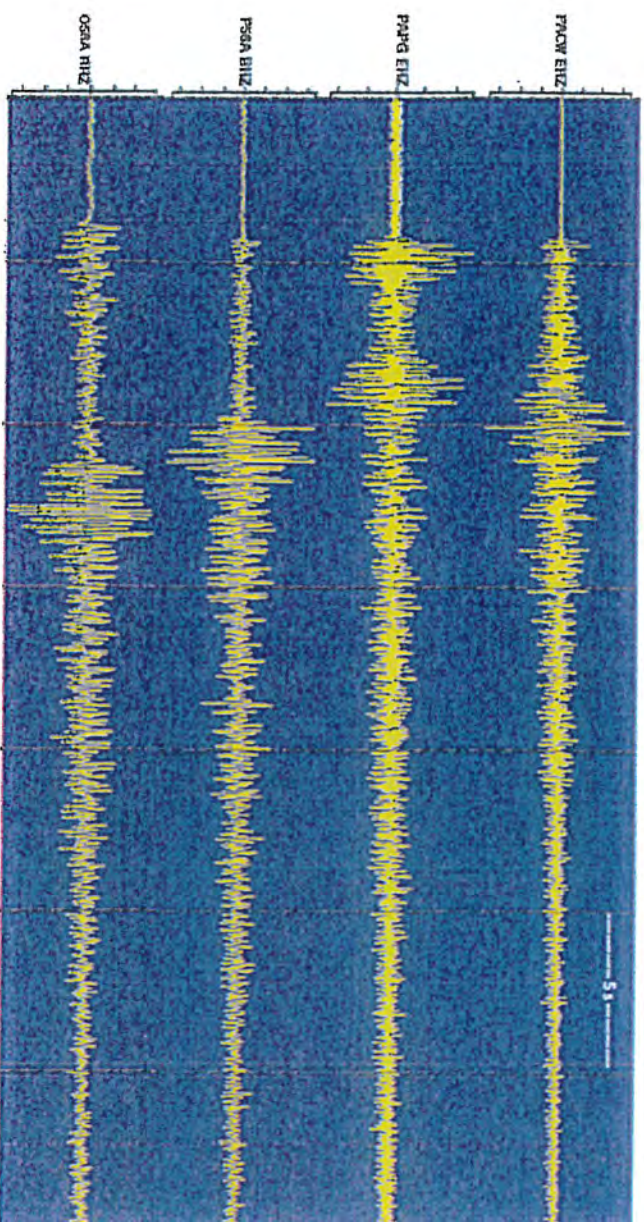
Timing of Events



Blasting event

Waveform characteristics

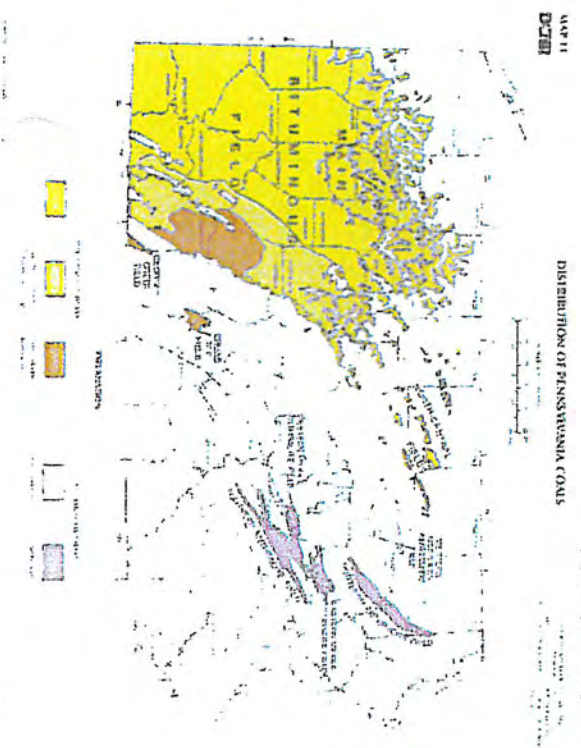
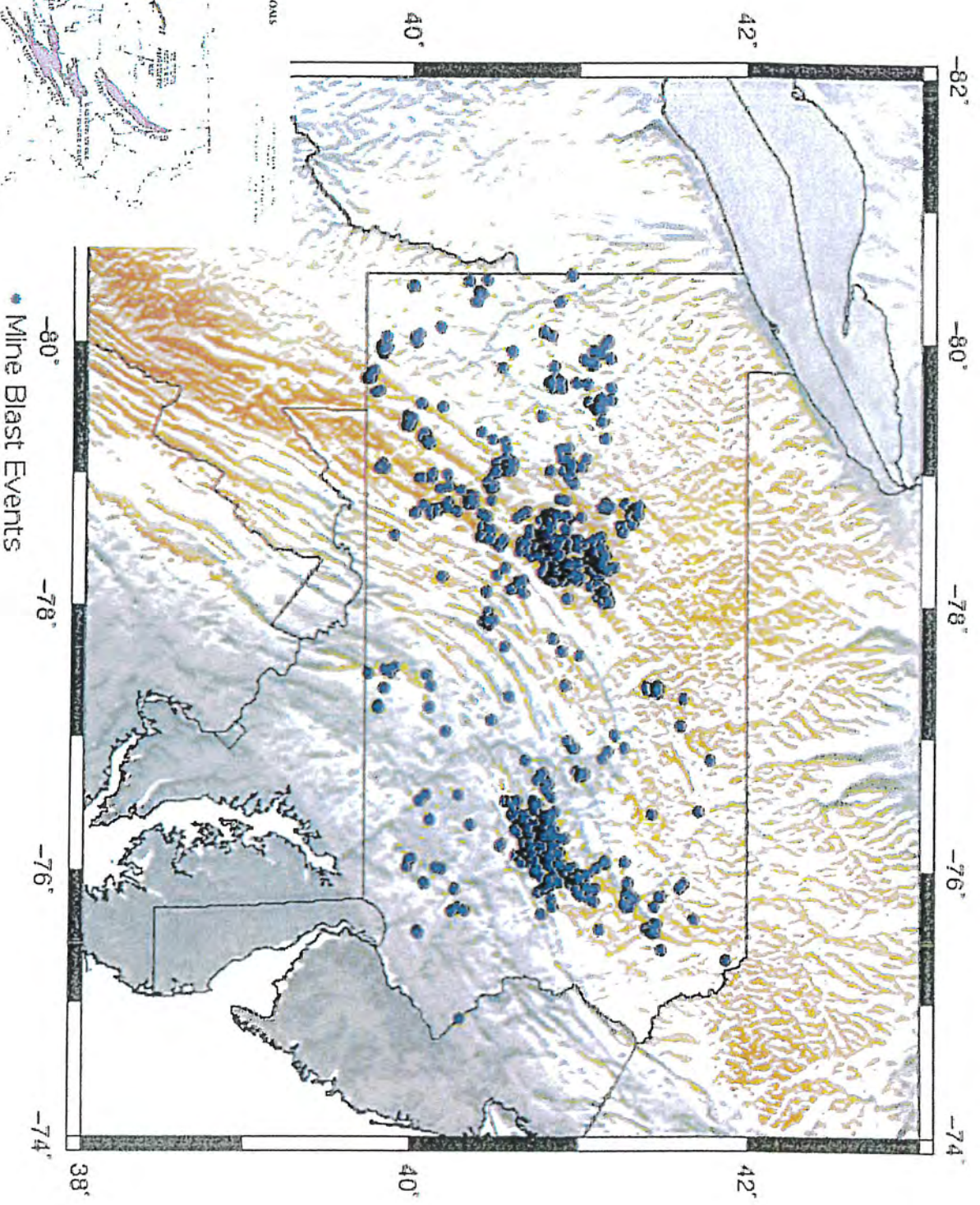
- Emergent phase arrivals
- Lack of clear S-wave arrivals
- Excessive low-frequency signal



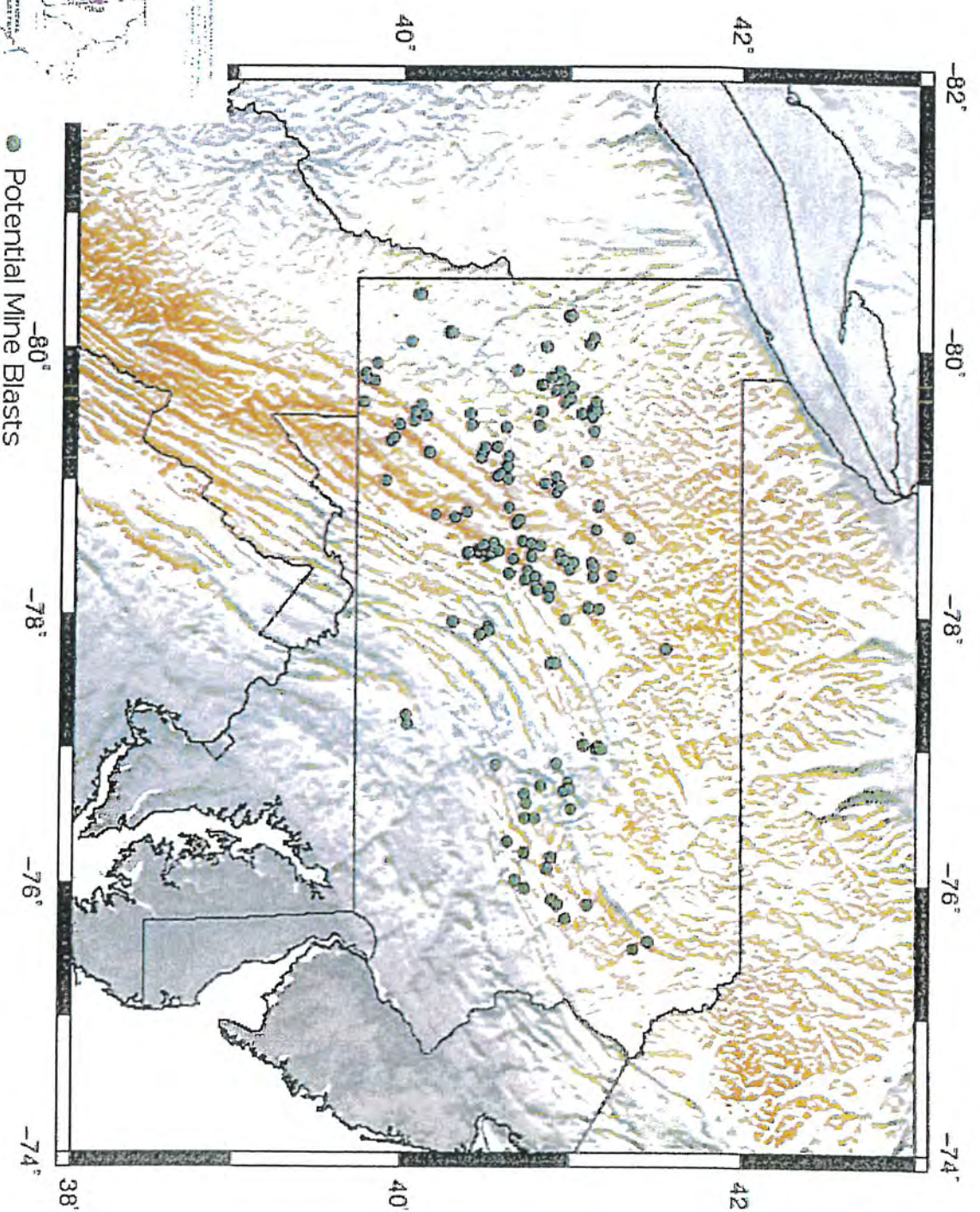
- Presence of a short period surface wave

Earthquake

Mine or Quarry Blasts (1117 events)

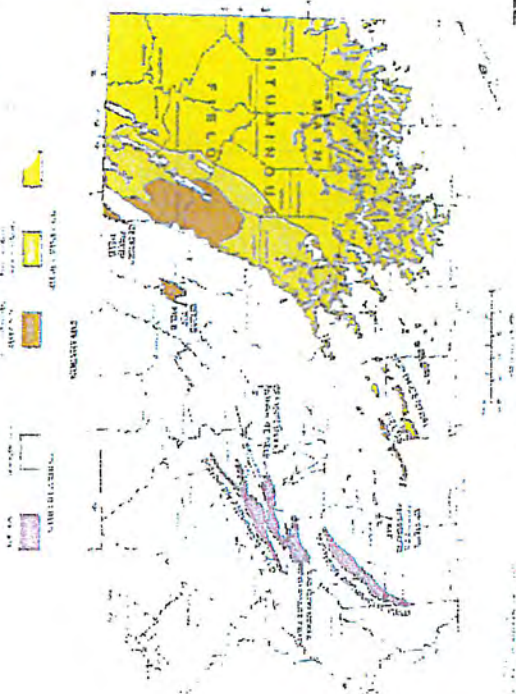


Potential Mine or Quarry Blasts (165 events)

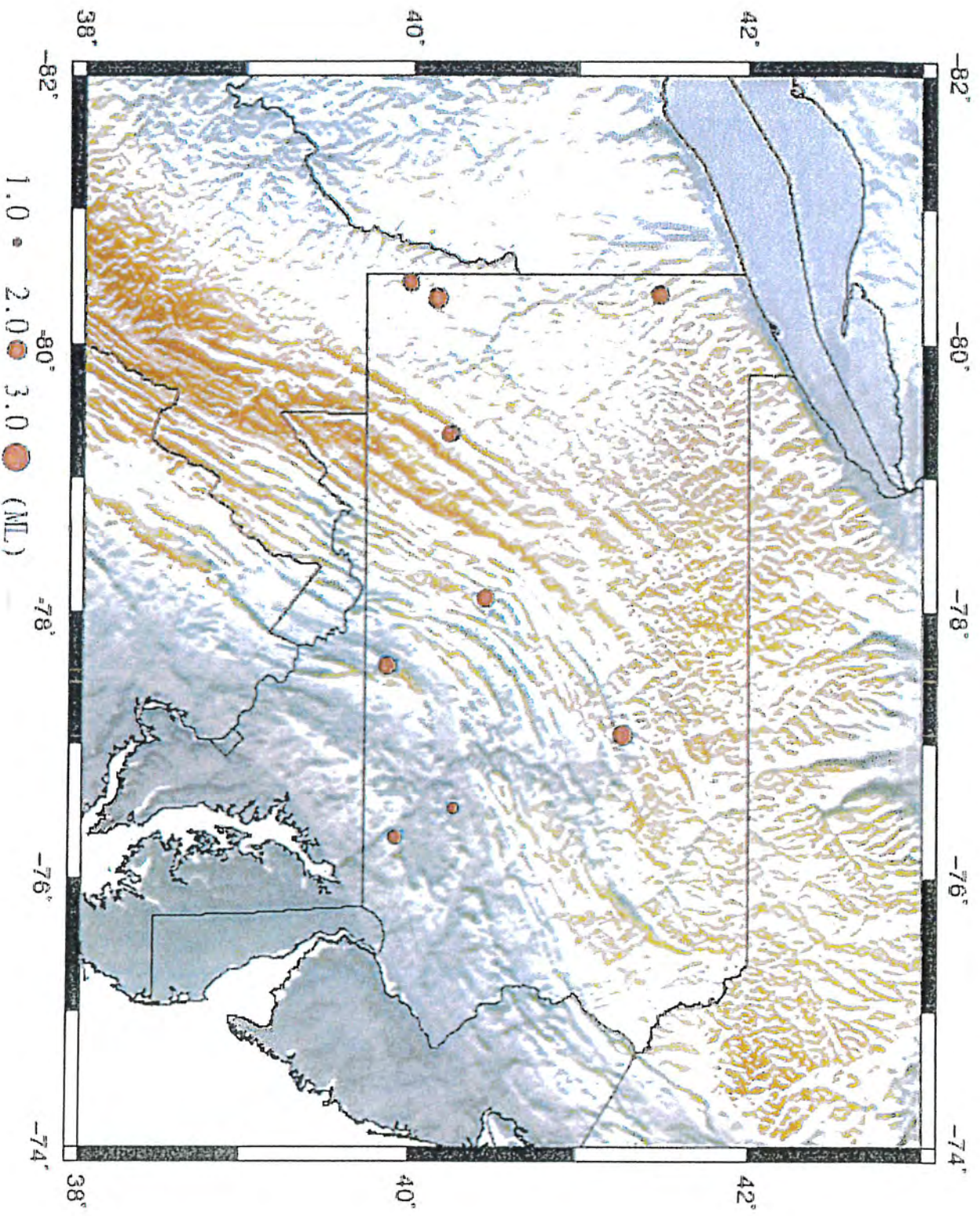


MAP 11
D-210

DISTRIBUTION OF PENNSYLVANIA COALS



Non-mining events – 11 of them.



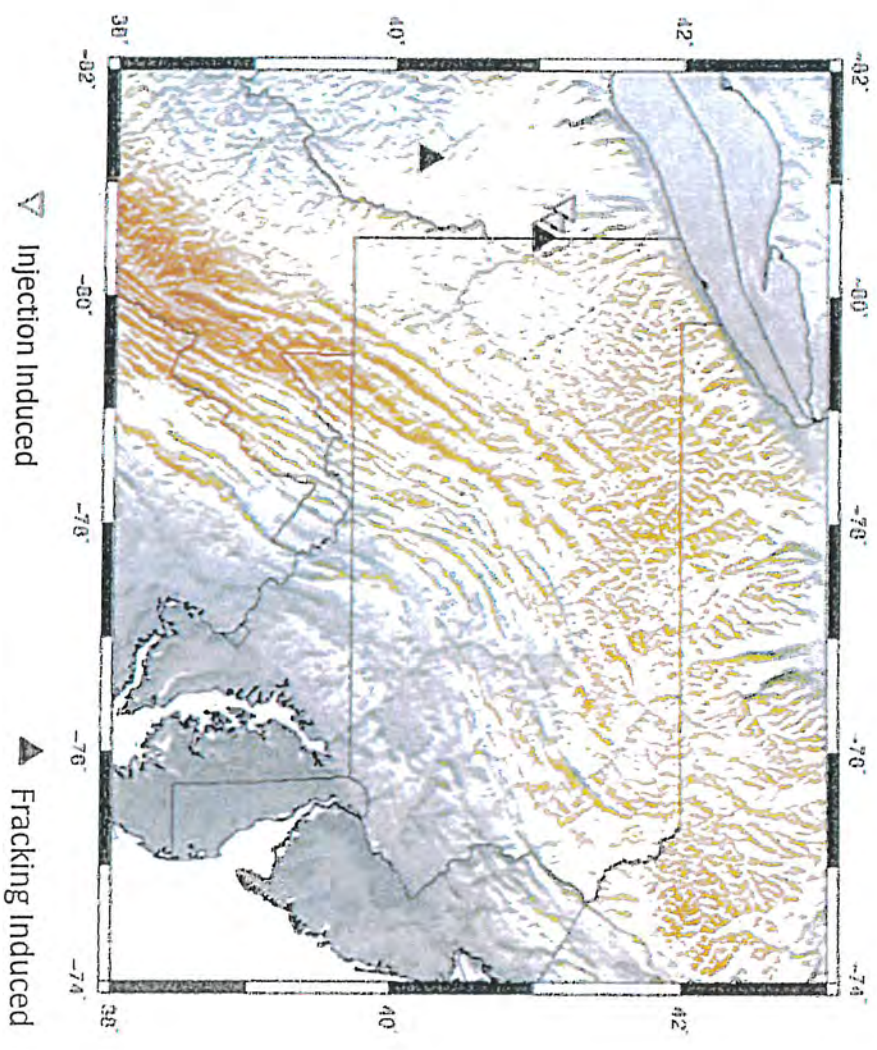
What are the sources of the non-mining seismic events?

Several possibilities

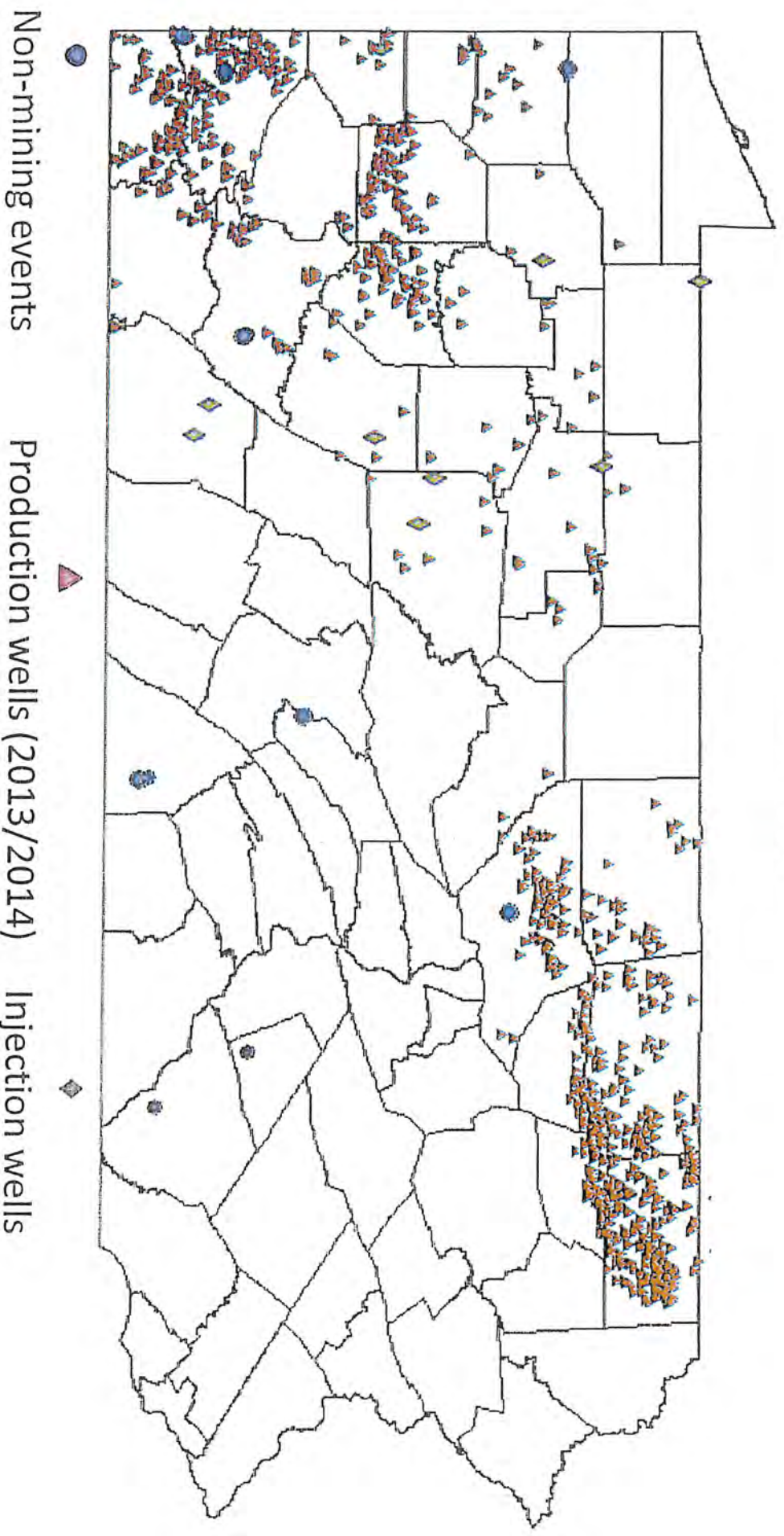
- tectonic earthquakes
- induced seismicity from wastewater disposal wells
- induced seismicity from hydraulic fracking

Induced Seismicity

- Induced events have occurred in several areas of the US
- Both wastewater injection and hydraulic fracturing can induce seismic activity – events of both kinds in Ohio
- Pennsylvania has both hydraulic fracture wells and wastewater injection wells

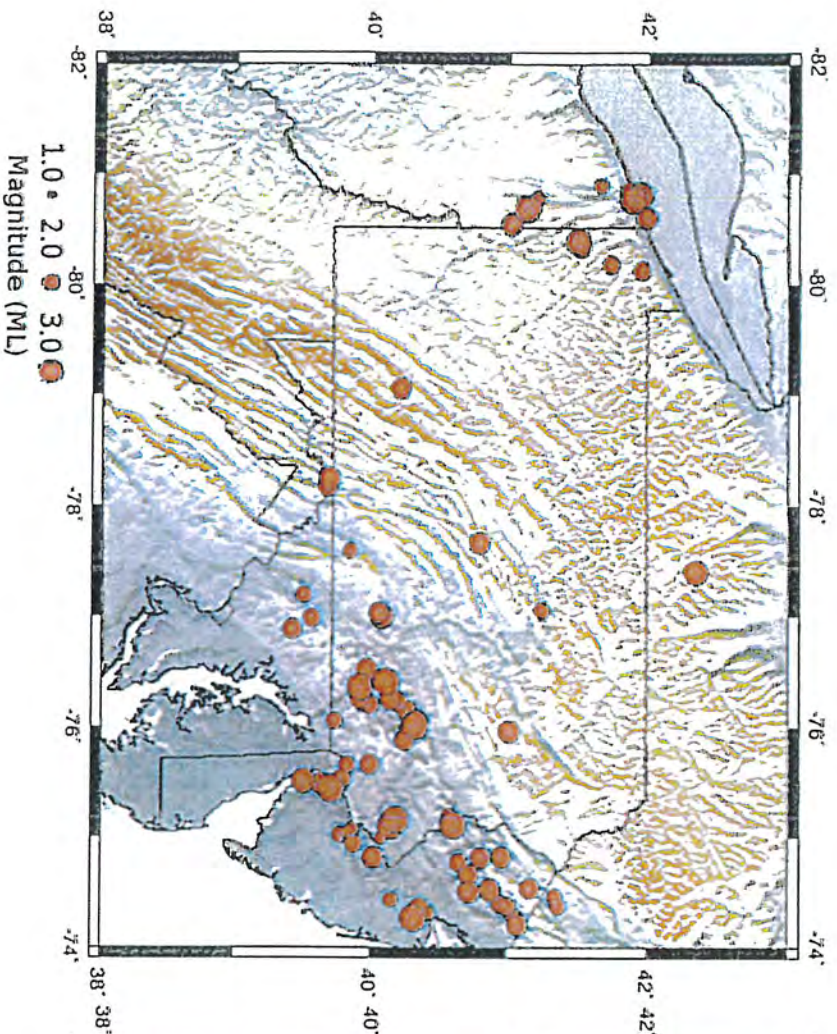


Are there spatial and temporal correlations with well activity?

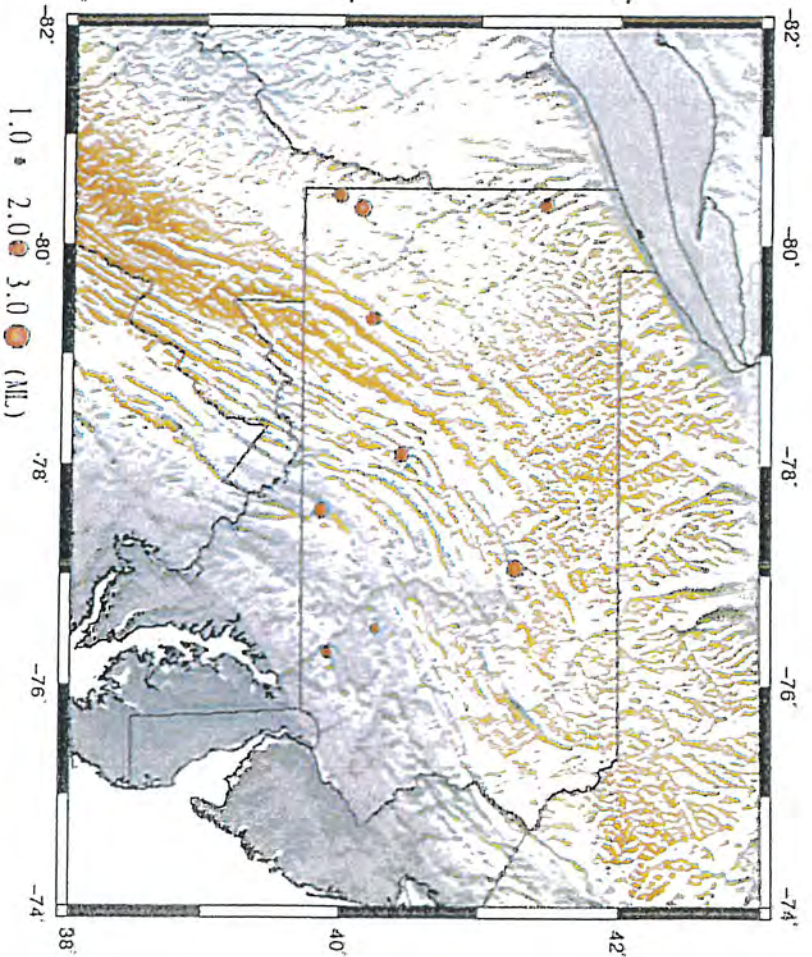


-No correlation has been found with either injection wells or fracked wells

Summary of findings: 1344 mining related events
11 Non-mining events – they are all probably tectonic earthquakes



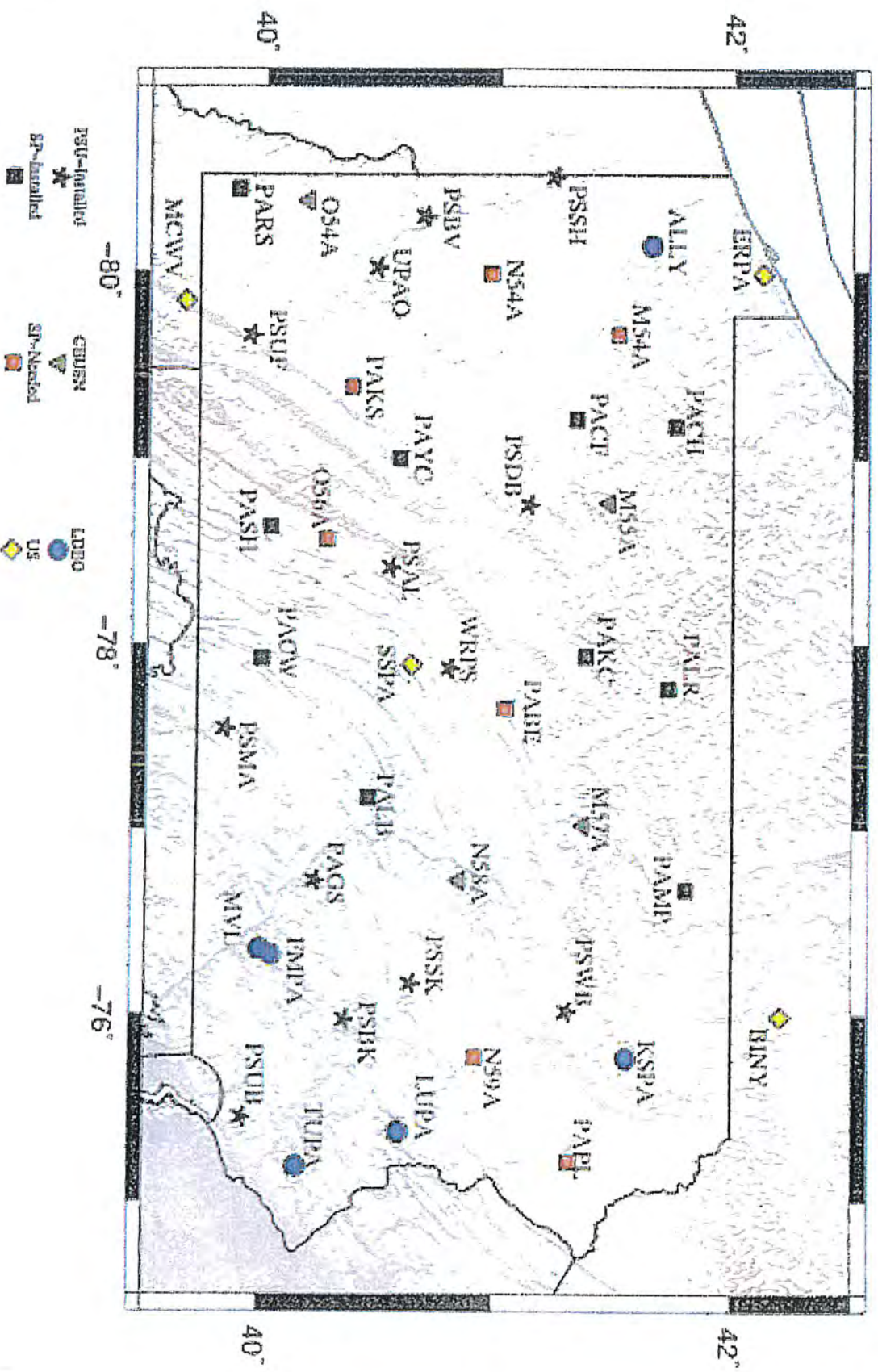
Historical



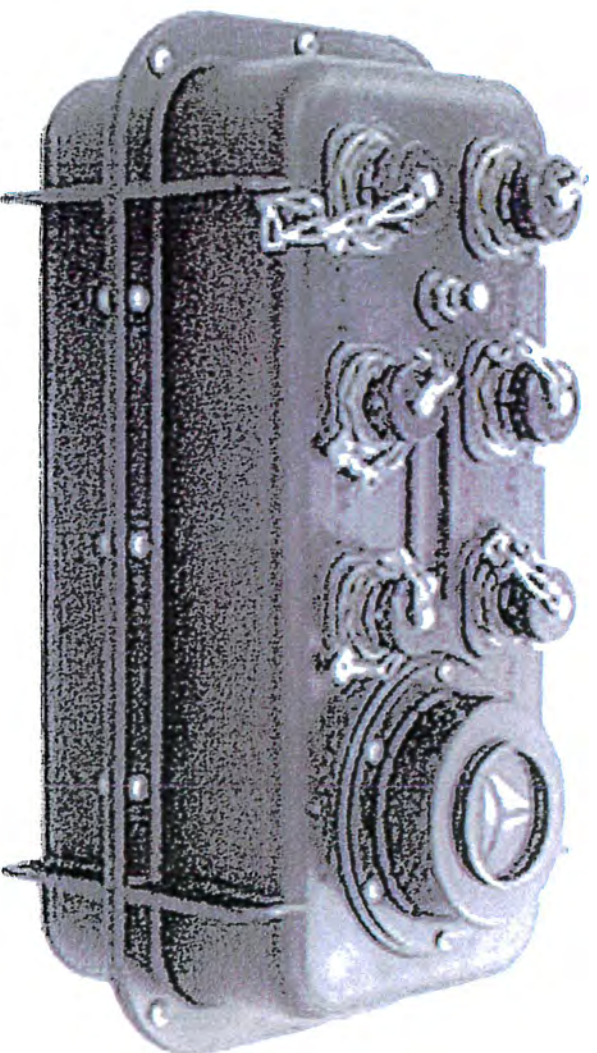
2013-2014

Expanding the Pennsylvania State Seismic Network

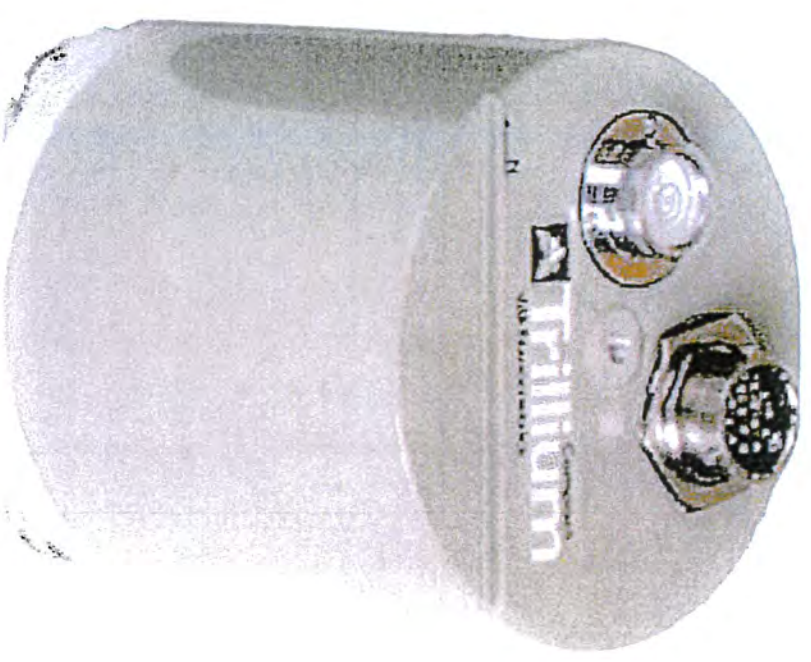
- 30 stations in the PASEIS network by summer 2016
 - 6 stations operated by LCSN (LDEO)
 - 2 stations operated by the USGS (US)
 - 4 stations in the CEUSN network operated by IRIS/USGS
- + several stations in neighboring states



PASEIS Seismic Equipment

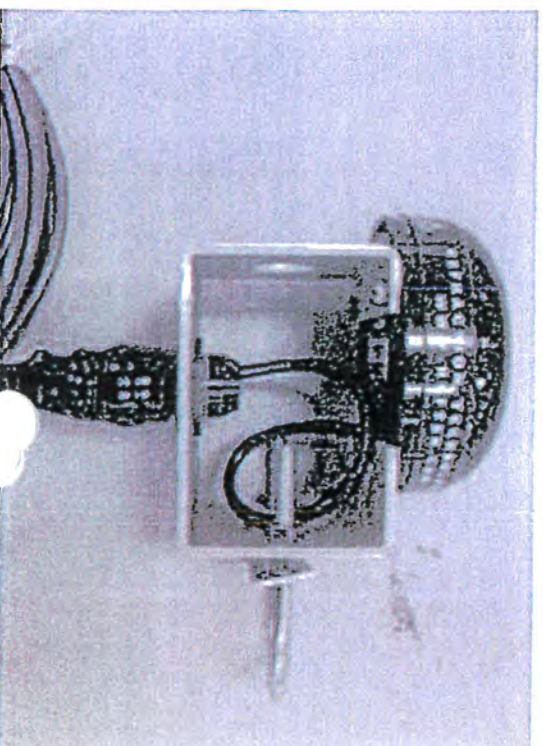


Data logger/Digitizer

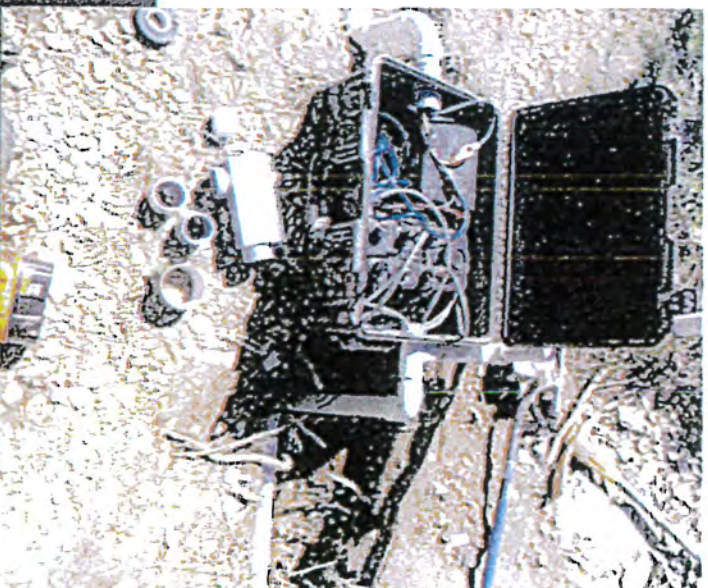


3-component
ground motion
sensor (vertical,
north-south,
east-west)

GPS clock



What does a PASEIS station look like?



PASEIS data are openly available from the IRIS Data Management Center
 [\(http://ds.iris.edu/mda/ PENN\)](http://ds.iris.edu/mda/ PENN) or [\(http://ds.iris.edu/mda/PE\)](http://ds.iris.edu/mda/PE)

Virtual network summary (1 time span)

Virtual Network _PENN :: Pennsylvania State Geological Survey :: _PENN Network Map

Start

2004/04/01 00:00:00

End

2599/12/31 23:59:59

Stations for _PENN virtual network (25 stations) :: Click column title to sort

	Network	Station	Site	Latitude	Longitude	Elevation	Virtual start	Virtual end
PA PE	NCAT	NC A&T Campus		36.078938	-79.771183	243	2004/01/01 00:00:00	2500/12/30 23:59:59
PA PE	PACU	Chapman State Park, Clarondon, PA		41.756660	-79.171430	431	2004/01/01 00:00:00	2500/12/30 23:59:59
PA PE	PAGS	PA Geological Survey, Middletown, PA, USA		40.230400	-76.720000	120	2004/01/01 00:00:00	2500/12/30 23:59:59
PA PE	PACC	Kettle Creek State Park, Renovo, PA		41.374710	-77.932530	294	2004/01/01 00:00:00	2500/12/30 23:59:59
PA PE	PALB	Little Buffalo State Park, PA, USA		40.458910	-77.167830	145	2004/01/01 00:00:00	2500/12/30 23:59:59
PA PE	PALK	Lyman Run State Park, Galeton, PA		41.725095	-77.760062	537	2004/01/01 00:00:00	2500/12/30 23:59:59
PA PE	PAMP	Mt. Pisgah State Park, Troy, PA		41.805900	-76.668890	348	2004/01/01 00:00:00	2500/12/30 23:59:59
PA PE	PARS	Chapman State Park, Clarondon, PA		39.886320	-80.445220	305	2004/01/01 00:00:00	2500/12/30 23:59:59
PA PE	PASH	Shawnee State Park, Schellsburg, PA		40.026000	-78.635090	393	2004/01/01 00:00:00	2500/12/30 23:59:59
PA PE	PSAL	PSU Altoona Campus, PA, USA		40.543700	-78.414500	402	2004/01/01 00:00:00	2500/12/30 23:59:59



Station summary (1 time span)

Network	PE :: Penn State Network :: PE Network Map		
Station	PACH :: Chapman State Park, Clarendon, PA :: Penn State Network :: PACH Station Map :: RESP :: SAC PZs :: XML		
Latitude	41.756660		
Longitude	-79.171430		
Elevation	431		
Start	2016/03/18 (078) 00:00:00		
End	2599/12/31 (365) 23:59:59		
Epoch	2016/03/18 (078) 00:00:00 - 2599/12/31 (365) 23:59:59		
Instrument	Rctek 130 Datalogger		
Channels (Hz)	Location ==: LOG (0)		
Instrument	Nanometrics Trillium Compact/Rctek 130 Datalogger		
Channels (Hz)	Location ==: HHE (100) RA , HHN (100) RA , HHZ (100) RA , LHE (1), LHN (1), LHZ (1)		
MetaData Load	2016/04/15 (106) 14:10:37		

Virtual network affiliations:

Name	Description	Primary DC	Secondary DC
_PENN	Pennsylvania State Geological Survey	PENN	IRIS DMC
_REALTIME	Stations collected and served in real time at the DMC	IRIS DMC	IRIS DMC
_UNRESTRICTED	All unrestricted stations, generated via cron	IRIS DMC	IRIS DMC
_US-REGIONAL	US Regional Networks	PSU	IRIS DMC

Real-time data availability ([view Station Monitor](#))

Earliest	Latest
--------------------------	------------------------

[2016/05/06 \(127\) 00:00:00](#) [2016/05/18 \(139\) 00:00:00](#)

Archive data availability - [Make a batch request for data \(Dreq_fast\)](#) - ([data access overview](#))

View some of
the data

Information on
how to request
the data

Station Monitor

Choose a station

Network: PE

Station: WRPS

or choose: [List Stations in Network](#) [WRPS - PSU, University Park, PA, USA](#)

[Show Station](#)

WRPS - PSU, University Park, PA, USA

Network: PE - Penn State Network

Location: 40.79°N - 77.87°W

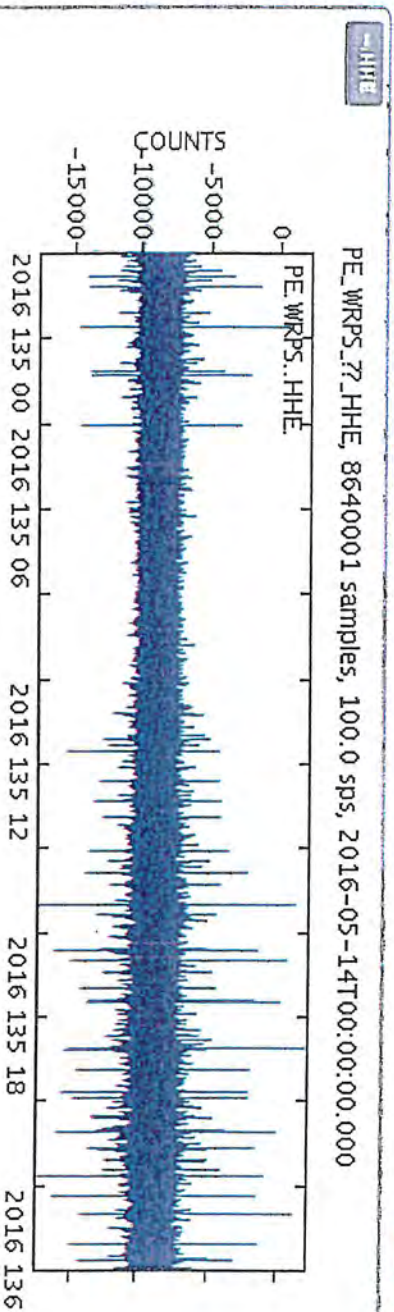
Daily Data

Day: 2016-05-14



Location/Channels: --:HHH/HHN/HHZ

[Update](#)



PASEIS web site – coming soon

- Station information
- Station and event maps
- Instructions on obtaining data
- Seismic event information determined from the 42 stations in PA plus open stations in neighboring states – event location, depth, origin time and magnitude

Minor earthquake measures near city

Posted: Tuesday, April 19, 2016 12:00 am

By Stetla Ruggiero stetla@titusvilleherald.com | 0 comments

A small earthquake, which was likely too weak to be noticed by anyone other than geologists, measured in the Titusville area on Monday, around 6:34 a.m.

The quake was magnitude 2.2, according to AccuWeather meteorologist Jordan Root. He said it was fairly weak on the scale, and not likely felt by many people, or maybe no one at all. As of late Monday afternoon, Root had received no reports of anyone experiencing the quake.



What do the data look like? (Chapman State Park)

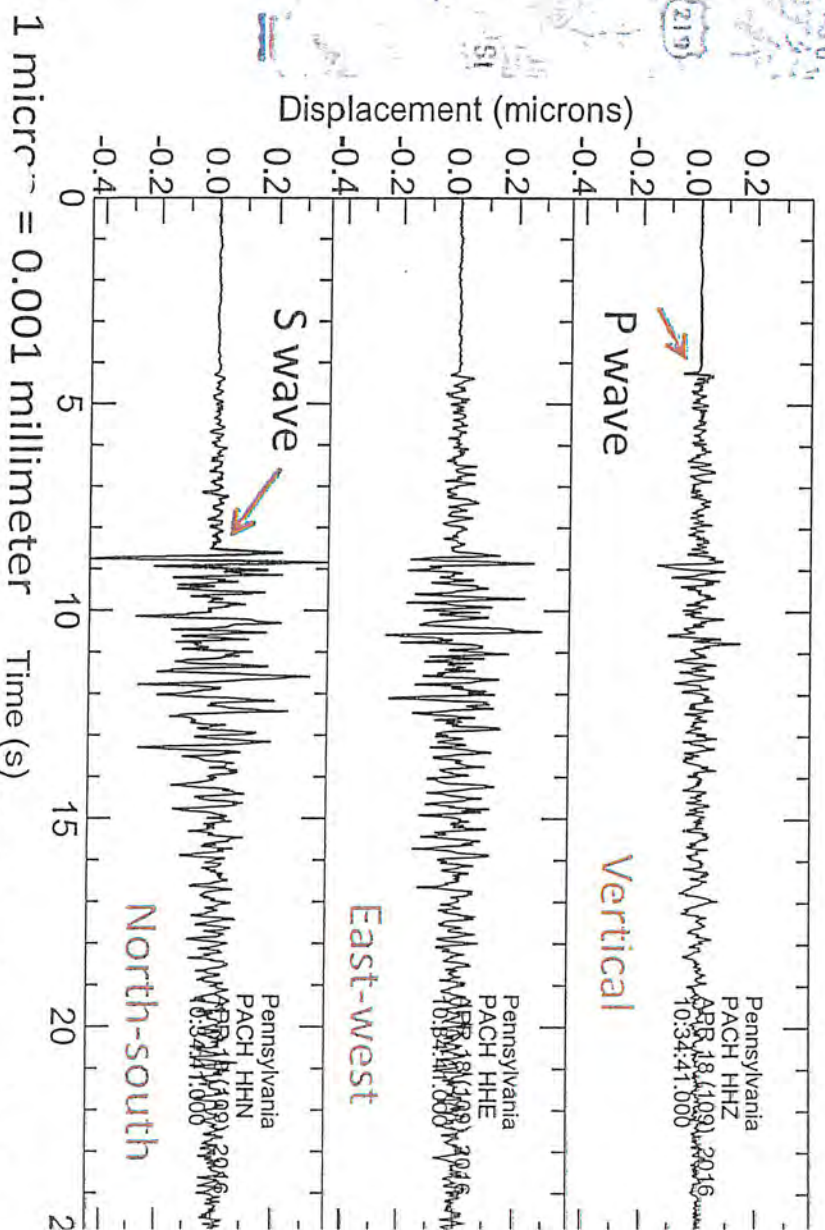
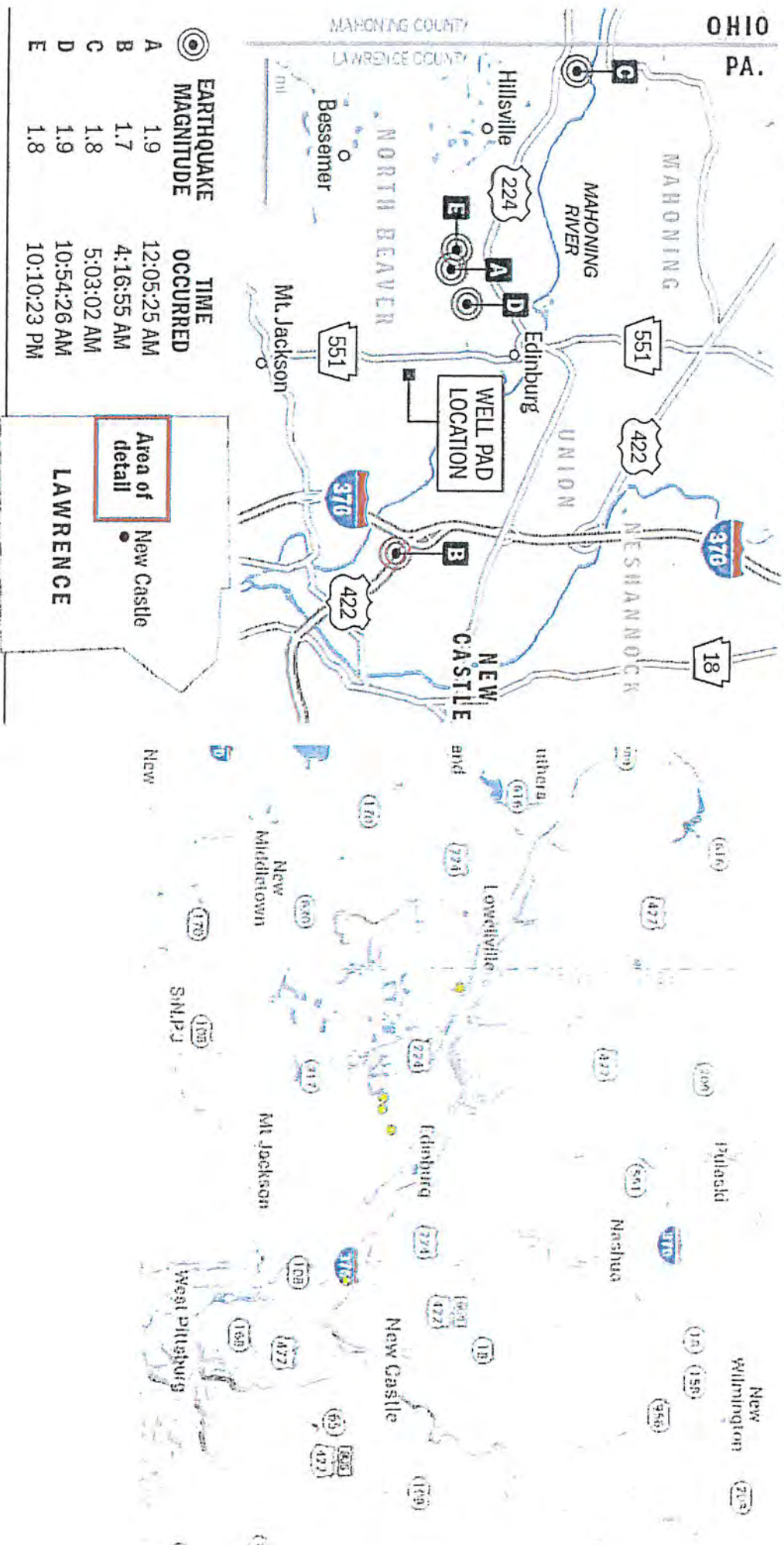


Figure courtesy of C. Ammon

State studying link between fracking, Lawrence County earthquakes

By Laura Legere / Pittsburgh Post-Gazette April 29, 2016

Epicenters of Monday's earthquakes in Lawrence County compared with the location of the shale gas well pad that potentially triggered them.

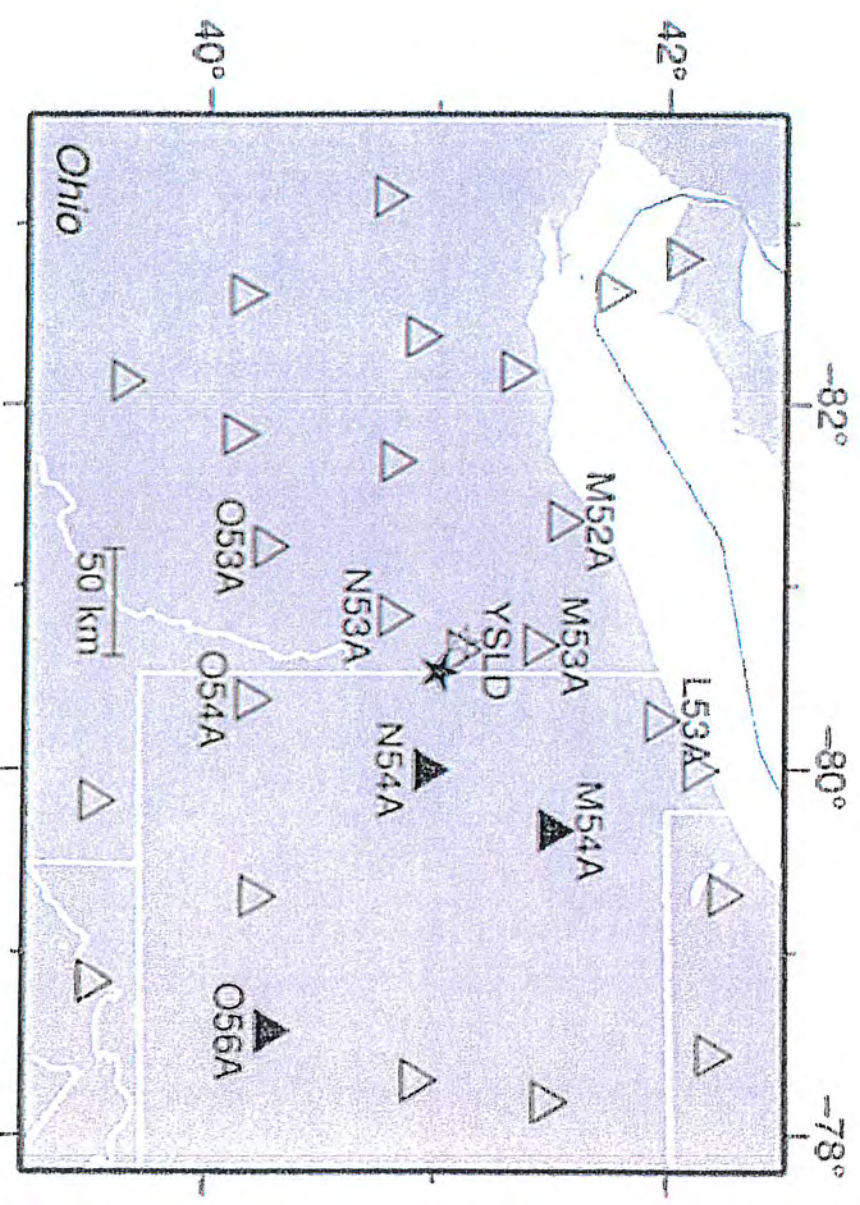


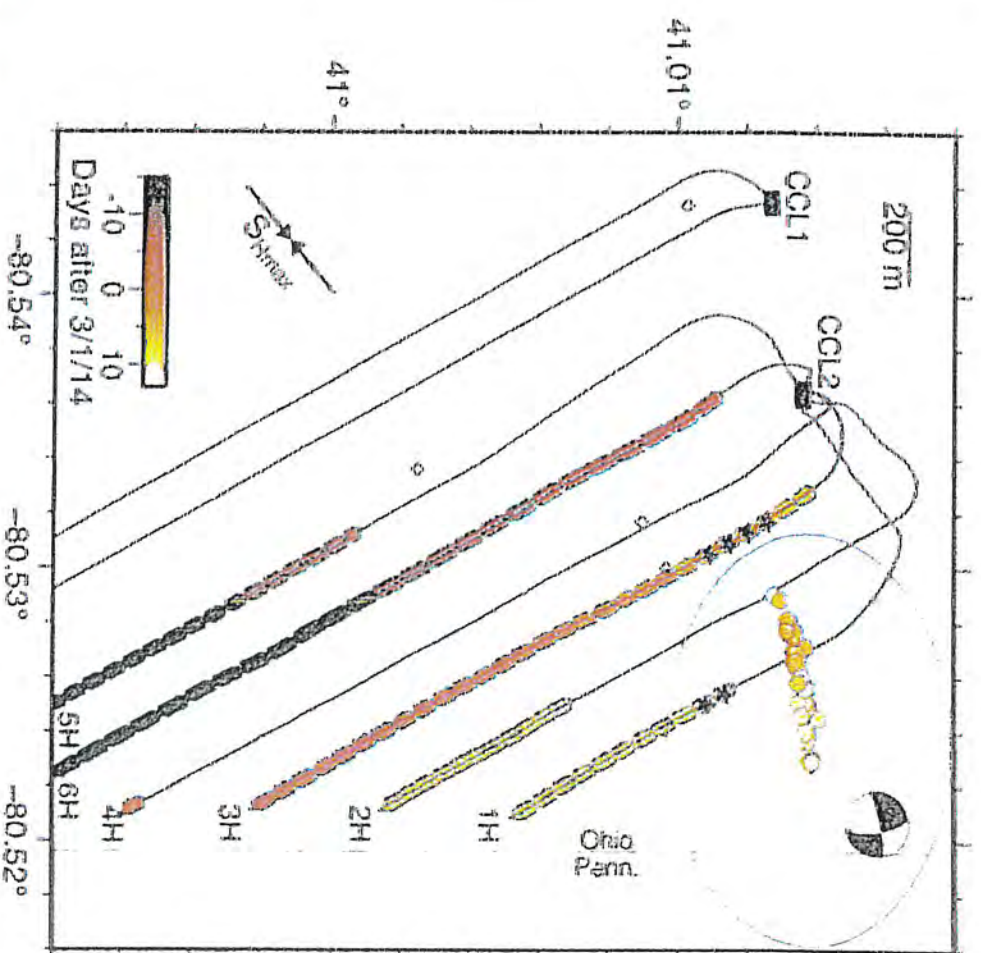
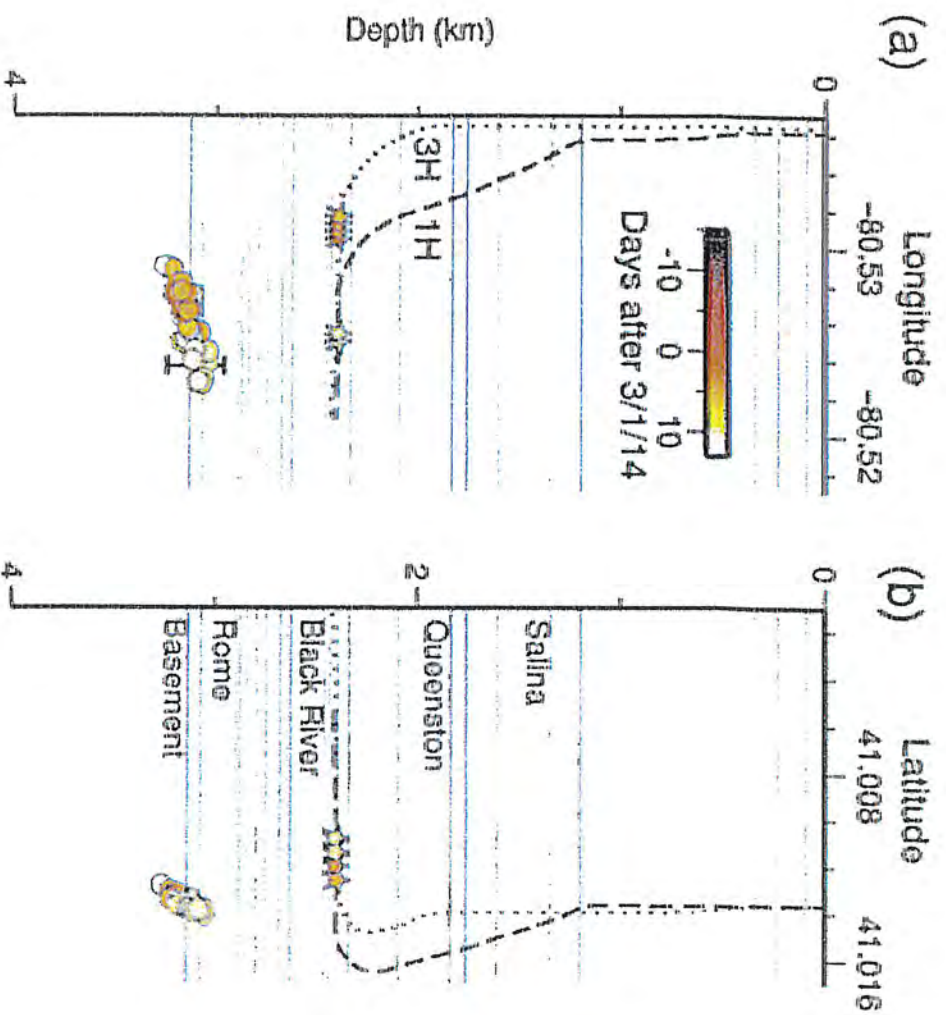
Source: Earthquake data from the Pennsylvania Department of Environmental Protection and the United States Geological Survey. Post-Gazette

Earthquakes Induced by Hydraulic Fracturing in Poland Township, Ohio

by Robert J. Skoumal, Michael R. Brudzinski, and Brian S. Currie

- March 4–12, 2014
- 77 events identified
- Magnitudes 1 to 3
- Correlated with fracking of the Utica Shale





Did a similar thing happen with the Lawrence County earthquakes? Possibly.

-initial analysis of data indicates >30 events with magnitude >1

Initial Performance of PASEIS network

2014 Poland Township events:

- Initial event detected was magnitude 3

2016 Lawrence County events:

- Initial event detected was magnitude 1.9

PASEIS network is designed for detecting and locating magnitude 2 and larger events.

Thanks to DCNR and DEP for promoting open data access!



Thanks to IRIS for providing data archiving and distribution!



Seismic Monitoring and Mitigation Plan

for

Penneco Environmental Solutions, LLC

Sedat #3A Class II-D Injection Well

Plum Borough, Allegheny County, PA

June 4, 2020

Prepared for

Penneco Environmental Solutions, LLC

6608 Route 22

Delmont, PA 15626-0300

and

Pennsylvania Department of Environmental Protection

Prepared by

GeoEnergy Monitoring Systems, Inc.

PO Box 4994

White Rock, NM 87547

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Background

This document is a Seismic Monitoring and Mitigation Plan designed specifically to satisfy permit requirements for continuous seismic monitoring at the Penneco Environmental Solutions, LLC (“Penneco”) Sedat #3A Class II-D commercial brine disposal Injection Well located in Plum Borough, Allegheny County, PA (Figure 1). The coordinates of the Injection Well are: Latitude 40° 31’ 38.5” and Longitude -79° 42’ 48.5”.

Purpose of Monitoring

The purpose of this monitoring effort is to provide a continuous record of any seismic and earthquake events, with detection and notification of specific naturally occurring and man-made seismic occurrences or events at the Penneco facility and vicinity. The specific sources of seismic events can include the following:

- Tectonic derived earthquakes, activity
- Mine blasts (quarries, coal, stone, etc.)
- Induced seismicity (from hydraulic fracturing, and injection well activity)

All seismic events of magnitude 1.0 or greater occurring within 10 kilometers (6.21 miles) of each injection well, and earthquakes of magnitude 1.5 and above, located within 20 kilometers (12.42 miles) of each well will be recorded and reported to Penneco (Figure 2). The detection levels shown on Figure 2 will cover the entire facility.

Installation of System

GeoEnergy Monitoring Systems, Inc. (GeoEMS) of Los Alamos, NM will install two seismometer stations at the Sedat facility consisting of a primary station (Station SED1) whose data is to be transmitted to Incorporated Research Institutions for Seismology (IRIS; <https://www.iris.edu/hq/>), and shared with Pennsylvania Seismic Network (PASEIS) via Penn State University, and an auxiliary station (Station SED2) as back-up.

This two-station approach is employed to:

- 1) reduce false detections,
- 2) provide verification to aid in defining the location of small events and,
- 3) provide backup hardware redundancy for Station SED1.

The auxiliary sensor will be deployed at a separate location from the main sensor, far enough away that it can be used to reduce false detections. The system is configured the same as the primary station, but will not be transmitting data to IRIS. GeoEMS stations also record continuously on an SD card in the units.

Monitoring Equipment

The installed equipment is from GeoSpace, LP, a seismic monitoring equipment manufacturer in Houston, TX, which provides instruments for real-time data acquisition of seismic events. The GeoSpace, LP GS-11D is a high output, rotating coil geophone designed and built to withstand the shocks of rough handling. The precision springs of this field-proven geophone are computer designed and matched to optimize performance specifications under even the most extreme conditions. The natural frequency is 4.5 Hz, with standard coil resistance of 4000 ohms. The PC-21 Land Case is used with the GS-11D geophone. An example station configuration is shown in Figure 3. Appendix A provides a detailed specification sheet for the equipment used.

Operations

The seismic monitoring equipment from GeoSpace, LP will be integrated into the Penneco operations program with remote regular daily checks of the equipment, and confirmation of recording and transmission to IRIS and PASEIS networks. In addition, a regular calibration cycle is in place to check instrumentation, providing a complete record of date of calibration, etc. starting from the original installation date. Penneco operations personnel will be trained by GeoEMS to troubleshoot minor items, and to clean and check the equipment, mitigating any weather derived effects or other problems that may arise.

Monitoring

The procedure for seismic monitoring of the Penneco site consists of GeoEMS and Penneco personnel reviewing all anomalies, annotating data and reporting any unexpected occurrences. If

significant events or anomalies are identified or recorded, evaluation and interpretation of the data will be made by GeoEMS personnel in concert with Penneco personnel.

Seismic data will be stored digitally on flash memory in the instrument, and SED1 data also transferred via website digitally to IRIS and PASEIS, and downloadable as well. Additionally, data will be recorded at the other Station SED2, as part of the redundancy aspect of the system.

Special Permit Conditions (Permit conditions are shown in **Bold**)

Penneco will work with GeoEMS to insure that all aspects of the PA-DEP Seismic Monitoring and Mitigation Plan Special Permit Conditions are implemented, as follows:

(1) Installation of a seismometer that, at minimum, includes the following: One 3-component velocity sensor (X, Y, Z axes), high-frequency seismometer. (e) All seismometers shall be installed in accordance with the manufacturer's instructions prior to operation of the disposal well.

The primary and auxiliary seismic stations SED1 and SED2 will be installed at the Penneco site by GeoEMS and Penneco. Each station consists of a 3-component high-frequency seismometer. The seismometers will be installed in accordance with the manufacturer's instructions. Installation requires a separate bubble level to be placed on top of the geophone for proper leveling per manufacturer's instructions. Should circumstances require the subsequent incorporation of four-station network, GeoEMS will provide Penneco with 3 additional seismic stations that can be rapidly deployed at predetermined locations around the Sedat facility.

(2) A description of and specification sheet for the seismometer installed at the disposal well site.

The seismometer is a 3-component, 4.5 Hz GS-11D manufactured by GeoSpace, LP of Houston, TX. The instrument specification and response data sheets are provided in Appendix A.

(3) The installation of a recorder that, at a minimum, continuously records 100 samples per second using a data logger with 24-bit digitizer and Global Positioning System (GPS) timing, in accordance with the manufacturer's instructions prior to operation of the disposal well.

The stations will be at different areas of the Penneco facility. A 24-bit digitizer is used for sampling at a frequency rate of 125 samples per second with GPS timing.

(4) A description of and specification sheet for the seismic recorder installed at the disposal well site.

The station consists of a ground-mounted protective external housing placed for the electronics and battery, a sensor buried 12 inches deep approximately 10 feet from the housing, and a 5-foot antenna mast. Sensors include Geo Space GS-11D 3C seismometers (See system diagram in Figure 4 and the system specification sheet in Appendix B). The system also records continuous data on-site using standard flash data storage drives.

(5) A description of the protocol for operating and completing calibration of the seismometer and seismic recorder installed at the disposal well site demonstrating that it conforms with the standards employed by the Pennsylvania State Seismic Network (PASEIS) and the manufacturer's instructions.

The system has been calibrated using a shake table, and also by comparison of waveforms with collocated commercial sensors. Metadata will be available for the equipment, including instrument response through the IRIS MetaData Aggregator.

(6) A description of the routine maintenance and service checks that will be implemented to monitor the operability or running condition of the seismometer and seismic recorder installed at the disposal well site. The description should detail how the checks satisfy the manufacturer's instructions.

Daily State-of-Health (SOH) of the system is monitored by examination of seismograms and from SOH on-board diagnostics such as internal temperature and battery voltage. No routine maintenance is required or planned except for visual inspection, but if there appear to be SOH problems, Penneco on-site personnel are trained to perform maintenance tasks. Penneco personnel will perform maintenance and service checks, as required, under the guidance of GeoEMS.

(7) Verification that tectonic seismic event data will be captured at the disposal well electronically and in a manner that is suitable for tectonic seismic event recordation and analysis.

Baseline data collection is occurring and shows successful installation and recording of data. These same units have been deployed at numerous injection sites nationwide and have recorded potential Injection-Induced Seismic Events with high fidelity.

(8) Verification that seismic data will be provided to the Incorporated Research Institutions for Seismology (IRIS) Network in real time and that the continuous, real time data conforms to the data format required by IRIS for archiving under PASEIS' network code (PE) and open distribution. If data transmission is interrupted, notification will be provided to the Department verbally within 24 hours and in writing within seven (7) days.

GeoEMS has previously transmitted seismic data to IRIS. The output from the IRIS MetaData Aggregator for GeoEMS station PBL2 is shown in Figure 5, providing verification that seismic data is being provided to IRIS as part of PASEIS network code (PE). Penneco will notify

PADEP verbally within 24 hours and in writing within seven (7) days if data transmission from both on-site stations are interrupted for 72 hours. If data transmission is interrupted for a significant period of time, Penneco personnel can still acquire continuous recording of data from the on-board flash drive. Note that minor data interruptions are almost a daily occurrence for many IRIS stations and those will not be reported to PADEP. The IRIS Buffer of Uniform Data (BUD) Monitor can be used to examine data and feed latency times (http://ds.iris.edu/bud_stuff/dmc/bud_monitor.ALL.html) for all stations of the PE network.

(9) A description of measures that will be taken to install the seismometer in a manner that will minimize interference from background sources and allow for optimal Seismic Event identification and location (epicenter and hypocenter). This shall include a plan view map of proposed seismometer location(s).

The seismometer locations will be chosen through coordination of GeoEMS and Penneco personnel in order to minimize interference and surface noise sources. Penneco will provide DEP with a plan view map of the seismometer locations.

(10) Contact information for the responsible person in charge of conduction seismic monitoring activities at the disposal well site.

Penneco personnel responsible for seismic monitoring activities on-site is Marc Jacobs (dmarcj@penneco.com, 724-468-8232).

GeoEMS personnel responsible for the seismometer and instruments are Stephen P. Jarpe (jarpe@pobox.com, 928-899-1875) and Steven R. Taylor (srt-rmg@comcast.net, 505-412-2841), either of which may be contacted for detailed information on the equipment.

(11) If the one sensor option is chosen, a tectonic seismic event contingency plan that includes monitoring, reporting and mitigation provisions consistent with the following:

- a. Contingent upon analyst review, immediate electronic notification to the Department and the Department of Conservation and Natural Resources' Bureau of Topographic and Geologic Survey (BTGS) of detection of any measurable event, within six (6) miles measured radially from the disposal well.
- b. Notification within 10 minutes via email to the Department and 1 hour via telephone to the Department's statewide toll-free number in the case of seismic activity reference in a. above. Within 24 hours the operator will provide this data including filtering/processing of raw seismic data to identify and remove non-tectonic events (e.g. mine blasts or system noise).
- c. Should an Injection-Induced Seismic Event occur (i.e. not a surface-related event or system noise), the Operator will reduce the well's operation injection rates. Reduction of the disposal well's operating injection rates in use at the time of the Injection-Induced Seismic Event by 50% within 48 hours of the occurrence of 3 or more consecutive Injection-Induced Seismic Events greater than 1.0 and less than 2.0 local magnitude

(ML) over a seven (7) day period occurring within three (3) miles measured radially from the disposal well. The seven (7) day period is defined as starting with the occurrence of any Injection-Induced Seismic Event of local magnitude 1.0 or greater. Reduced operating injection rates shall be maintained until the Department provides written notice addressing injection rates.

- d. Termination of all injection activities within 48 hours of the occurrence of an Injection-Induced Seismic Event of local magnitude 2.0 or greater within three (3) miles measured radially from the disposal well until receipt of a written notice from the Department addressing continued well usage and operating conditions. The assessment of continued usage will include, but not limited to, the following criteria:**

GeoEMS, together with Penneco, will insure that all aspects of the Seismic Monitoring and Mitigation Plan conform to Special Permit Conditions of PA-DEP. All actions for Item (11) will be followed by Penneco based on communication and input from GeoEMS. GeoEMS will monitor Station SED1 on a daily basis. Additionally, on a daily basis, GeoEMS will perform single-station reporting statistics as shown in Figure 6 and include the number of events recorded per day, cumulative number of events, and magnitude and slant (radial) distance from station. GeoEMS will monitor seismicity in the vicinity of Sedat#3A on a daily basis and, upon analyst review, will notify Penneco immediately if notable trends or changes in micro-seismicity occur. Direct notification to PA-DEP will occur pending confirmation of event(s).

(13) Provisions for submitting an updated Seismic Monitoring and Mitigation Plan

This Seismic Monitoring and Mitigation Plan meets the requirements of the PADEP Special Permit Conditions. Should conditions in the field alter or change any parameter or monitoring approach, a revised updated Plan will be submitted to PADEP.

(14) Upon commencement of disposal activities at the disposal well, the permittee shall record tectonic seismic event data electronically for review at the request of the Department. Tectonic seismic event records must be maintained for one (1) year.

Data archival of all Station recorded monitoring data will be permanently maintained by Penneco, LLC, GeoEMS, IRIS and PASEIS.

(15) The permittee shall maintain all calibration, maintenance and repair records for the seismometer for at least (5) years.

Penneco, LLC and GeoEMS will maintain these calibration, maintenance, test, and repair records for the seismometer and provide them to PA-DEP or IRIS and PASEIS upon request.

16) The permittee shall maintain all calibration, maintenance and repair records for the seismic recorder for at least five (5) years.

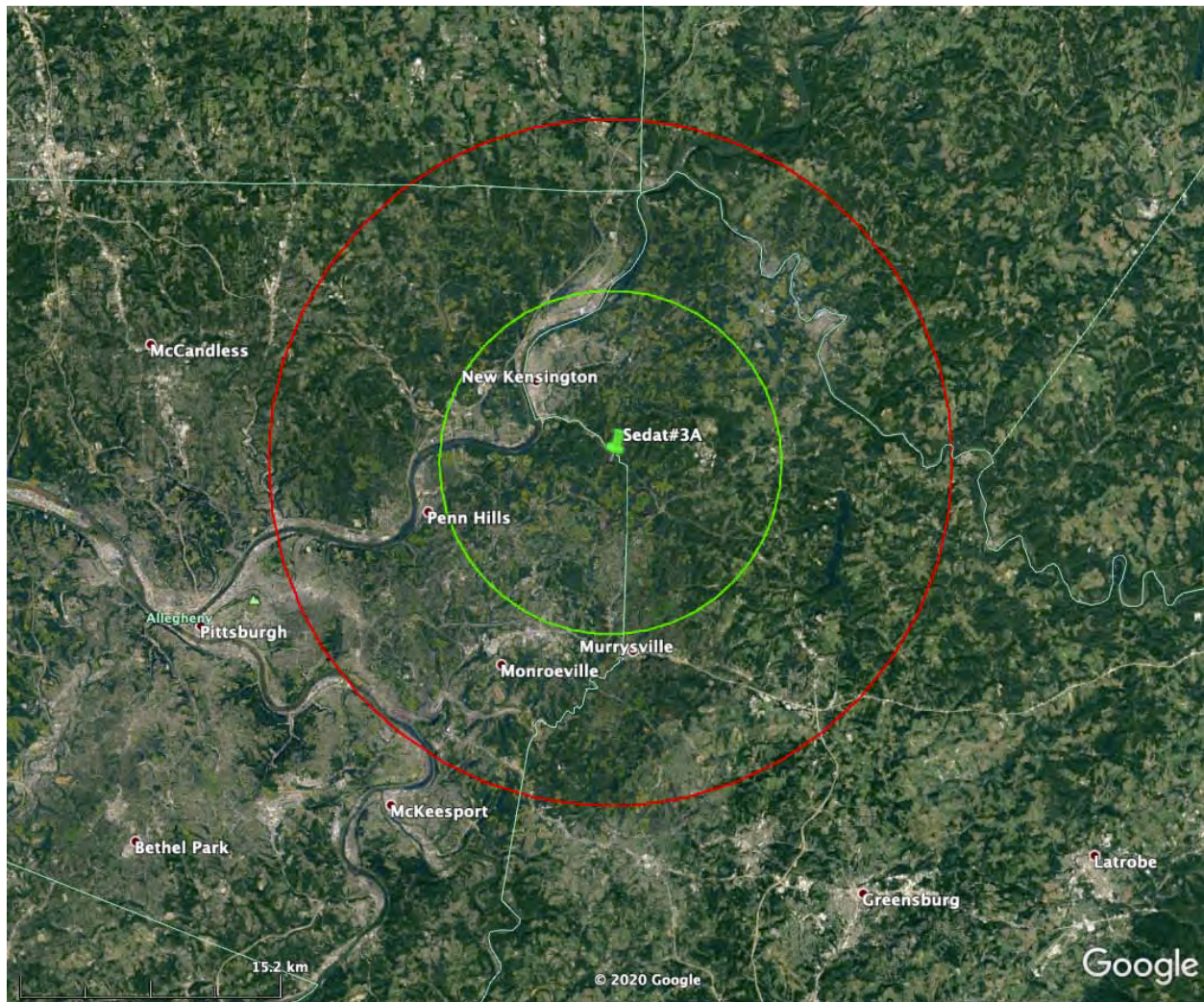


Figure 2. Seismic station as green push pin near Sedat #3A well. Green circle of radius 10 km and red circle of radius 20 km indicate estimated epicentral detection limits for ML 1.0 and ML 1.5 events.



Figure 3. Example station configuration.

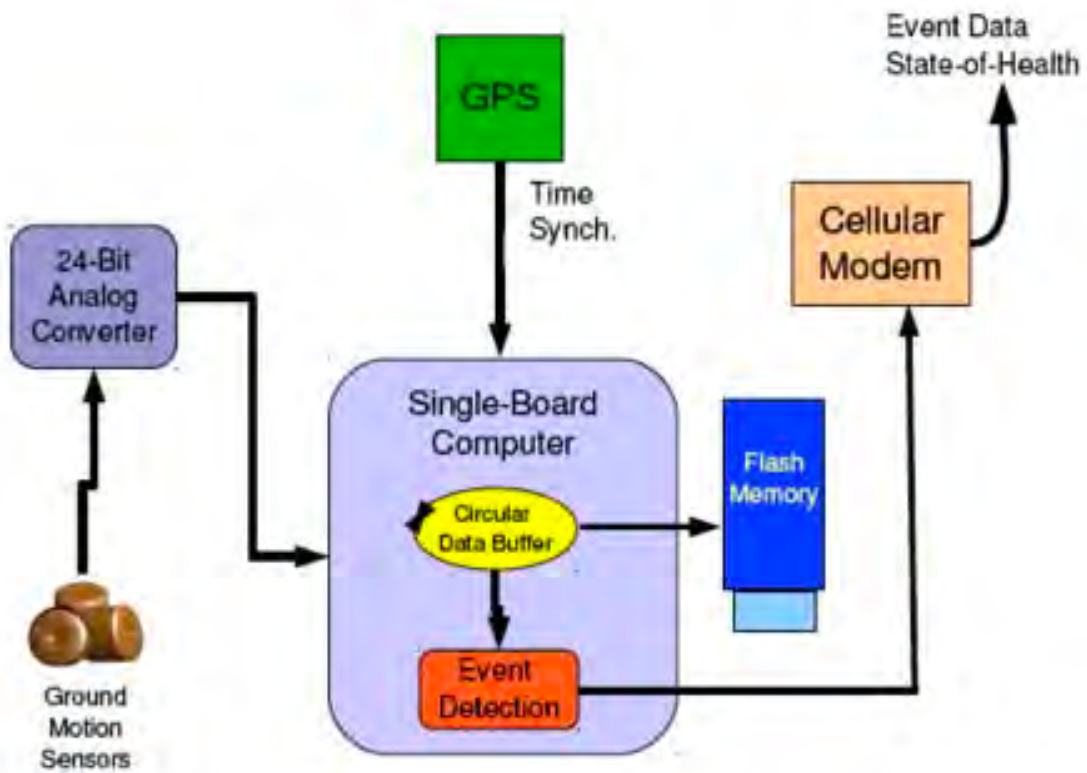


Figure 4. Seismic Monitoring system diagram.

Channel summary (1 time span)

Information limited to 2017/09/29 00:00:00 to 2599/12/31 23:59:59 - [Clear timewindow](#)

Network	PE :: Penn State Network :: PE Network Map :: DOI
Station	PBL2 :: Bear Lake Properties offload facility :: GeoEnergy Monitoring Systems :: PBL2 Station Map
Location	--
Channel	ELZ :: RESP :: SAC PZs :: XML
Latitude	41.998100
Longitude	-79.528808
Elevation (m)	506
Depth (m)	0 :: (Local depth or overburden)
Azimuth	0 :: (SEED convention: Clockwise from north, Z=0, reversed=0)
Dip	90 :: (SEED convention: From horizontal, Z=-90, reversed=90)
Start	2017/09/29 (272) 00:00:00
End	2599/12/31 (365) 23:59:59
Sample Rate (Hz)	125.00
Max Drift (s)	0.0000 :: (Seconds per sample)
Instrument	GS-11D, 4.5 Hz, 96.4 V/m/s, Rc=4000 Ohms, Rs=56160
Units	Instrument: M/S (Velocity in Meters Per Second) Response: M/S (Velocity in Meters Per Second)
Sensitivity	6.738850e+09 @ 1.000e+01 Hz (SEED Stage 0)
Optional Comment	
MetaData Load	2017/10/06 (279) 08:25:02

No data available in real-time systems for 2017/09/29 00:00:00 - 2599/12/31 23:59:59

No data available in archive for 2017/09/29 00:00:00 - 2599/12/31 23:59:59

Frequency and phase response plot ([RESP](#) [SAC PZs](#) [XML](#)):

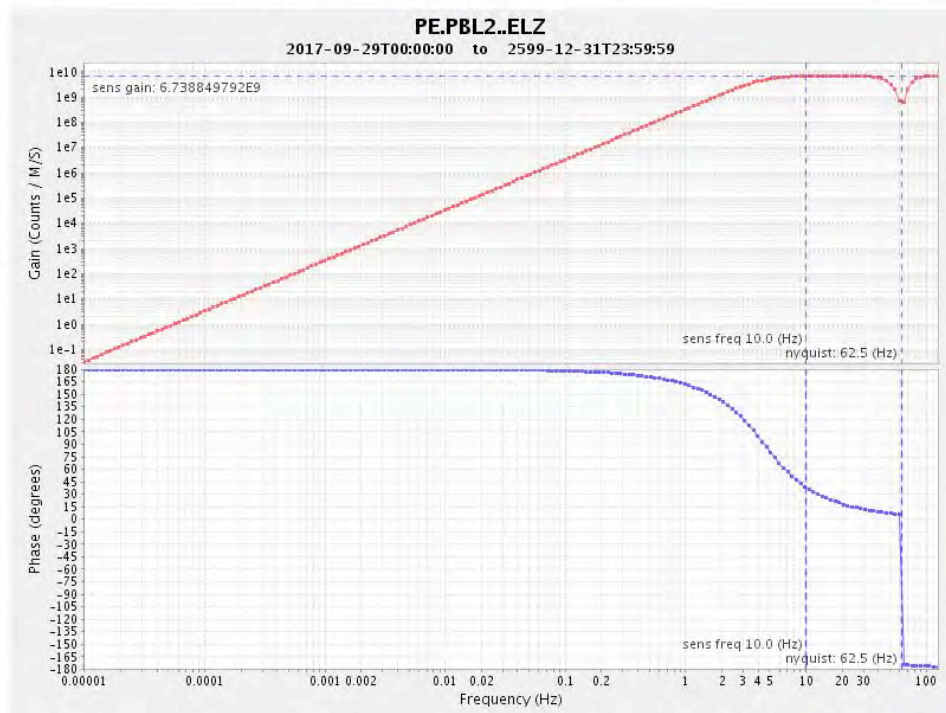


Figure 5. GeoEMS station PBL2 IRIS MetaData Aggregator Listing

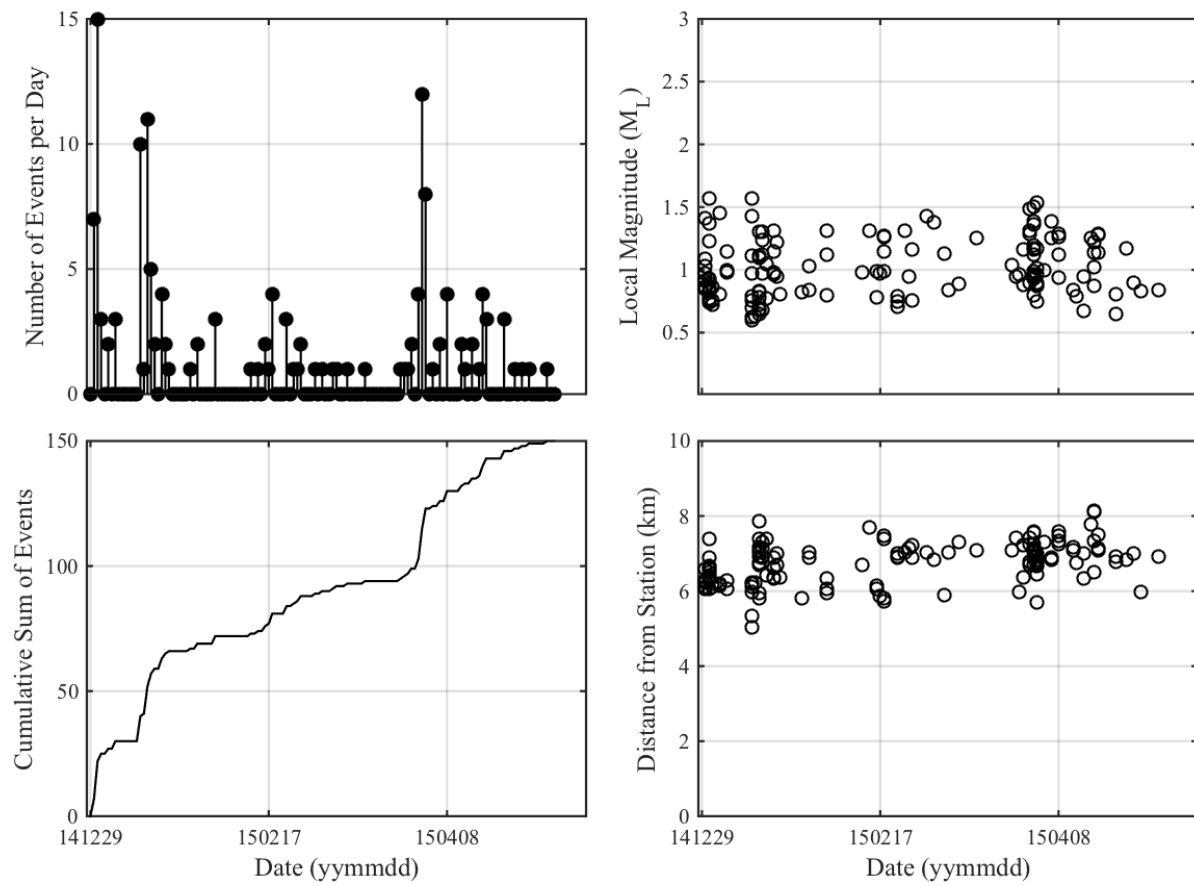


Figure 6. Example of single station reporting statistics.

APPENDICES

Appendix A. Specification Sheet and Response Diagram for GS-11D Seismometer

Geophones GS-11D

February 7, 2012 By

GS-11D

Rotating Coil Geophone

- Field proven design
- Shock resistant, rotating dual coil construction
- Gold plated contacts for positive electrical connection
- Precision springs, computer designed and matched
- Full one year warranty



The GS-11D is a high output, rotating coil geophone designed and built to withstand the shocks of rough handling. The precision springs of this field proven geophone are computer designed and matched to optimize performance specifications even under the most extreme conditions.

Gold plated contacts assure positive electrical connections. The Geo Space manufacturing process includes checking all geophone operating parameters with the ATS, an automated computerized test system.

Natural frequencies are 4.5, 8, 10 and 14 Hz, with standard coil resistance of 380 ohms. The PC-21 Land Case is used with the GS-11D geophone.

Cases Available

PC-21 Land Case

Spec Sheet:

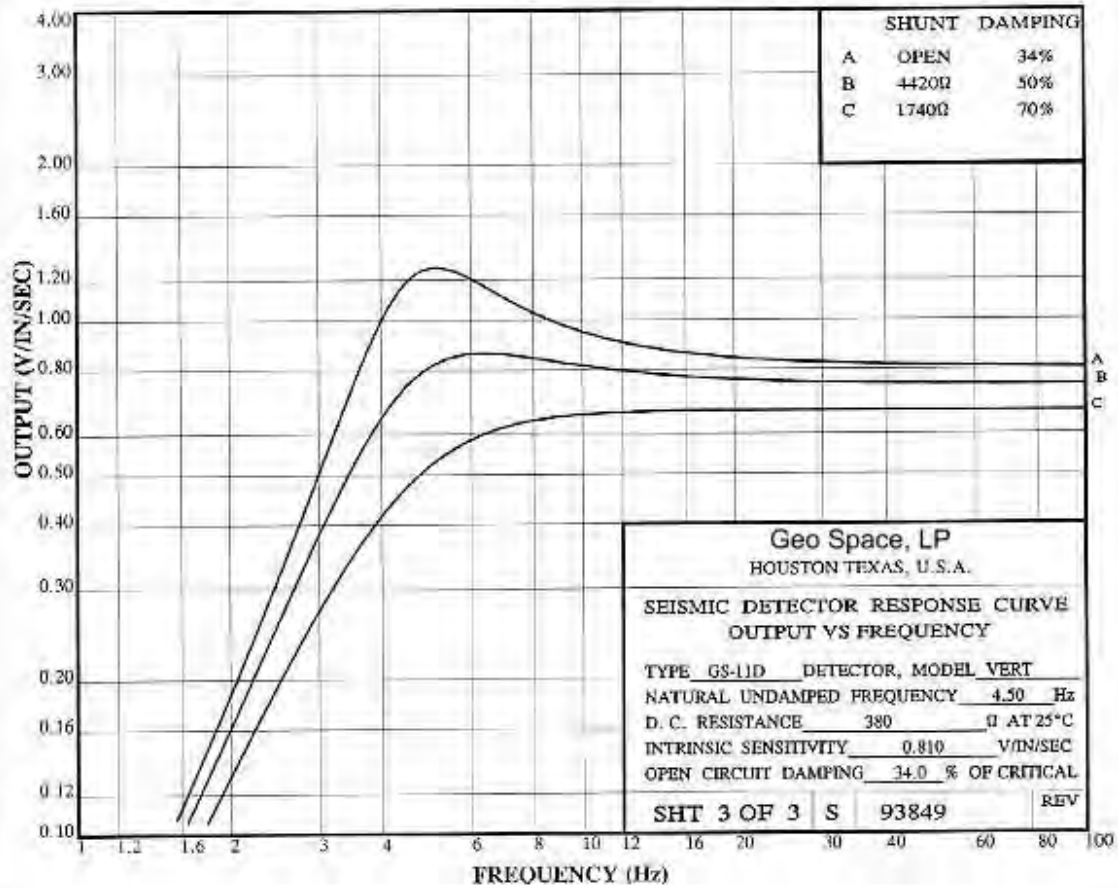
GS-11D Specifications

	4.5 ± .75 Hz	8 ± .75 Hz	10 ± .75 Hz	14 ± .75 Hz
Natural Frequency				
Coil Resistance @ 25°C ± 5%		—380 Ohms—		
Intrinsic Voltage Sensitivity with 380 Ohm Coil ± 10%		—.81 V/in/sec (.32 V/cm/sec)		
Normalized Transduction Constant (V/in/sec)		—.042 (sq.root of Rc)		
Open Circuit Damping	.34 ± 20%	.39 ± 10%	.32 ± 10%	.23 ± 10%
Damping Constant with 380 Ohm Coil	762	602	482	344
Optional Coil Resistances ± 5%		—56,160 Ohms—		
Moving Mass ± 5%	23.6 g	16.8 g	16.8 g	16.8 g
Typical Case to Coil Motion P-P	.07 in (.18 cm)	.07 in (.18 cm)	.07 in (.18 cm)	.07 in (.18 cm)
Harmonic Distortion with Driving Velocity of 0.7 in/sec (1.8 cm/sec) P-P	N/S	—0.2% or less— @ 12 Hz @ 12 Hz @ 12 Hz		
Dimensions				
Height (less terminals*)		—1.32 in (3.35 cm)		
Diameter		—1.25 in (3.18 cm)		
Weight		—3.9 oz (111 g)		

*Terminal height is .135 inches

Specifications are subject to change without notice.

GS-11D Seismic Detector Response Curve
Output vs. Frequency Chart (GS-11D @ 4.5 Hz @ 380 Ohms)



Appendix B. Specification Sheet for GeoEMS Seismic Recording System

Specifications

Mechanical

Size: 30x20x18 cm

Base unit, NEMA 4X watertight enclosure.

Weight: 5 kg

Includes sensors. Battery: 12 kg, solar panel: 5 kg

Power

Input Voltage: 10 to 16 VDC

System includes 35 amp-hour sealed lead acid battery.

Charging: 100 watt solar panel

Solar panel and brackets for T-post mounting included.

Power: 2.8 watts

230 mA @ 12V

Communications

CDMA or GSM Cellular

Other options available: Orbcomm low-bandwidth satellite, wired ethernet, local low-power radio.

Sensors

3-component, 4.5 Hz, Oyo GS-11D

Mounted inside enclosure.

Data Conversion

Type: Delta-sigma, 24 bit

Synchronous sampling for all channels

Channels: 3 or 6

Analog inputs

Gain: x10,x20,x40,x80

Gain is fixed at time of shipment.

Input full scale: 1.2V / gain

Noise: At 150 sps and x10 gain, 1uV RMS Gain and sample rate dependent

Sample Rates: 10 to 500 sps

Accelerometer:

MEMS, $\pm 2g$ full scale, 14-bit resolution

Time Base

Type: GPS

GPS receiver is integrated into system electronics.
GPS antenna is external.

Accuracy with continuous GPS:

1 msec

Recording

Continuous and event-detected

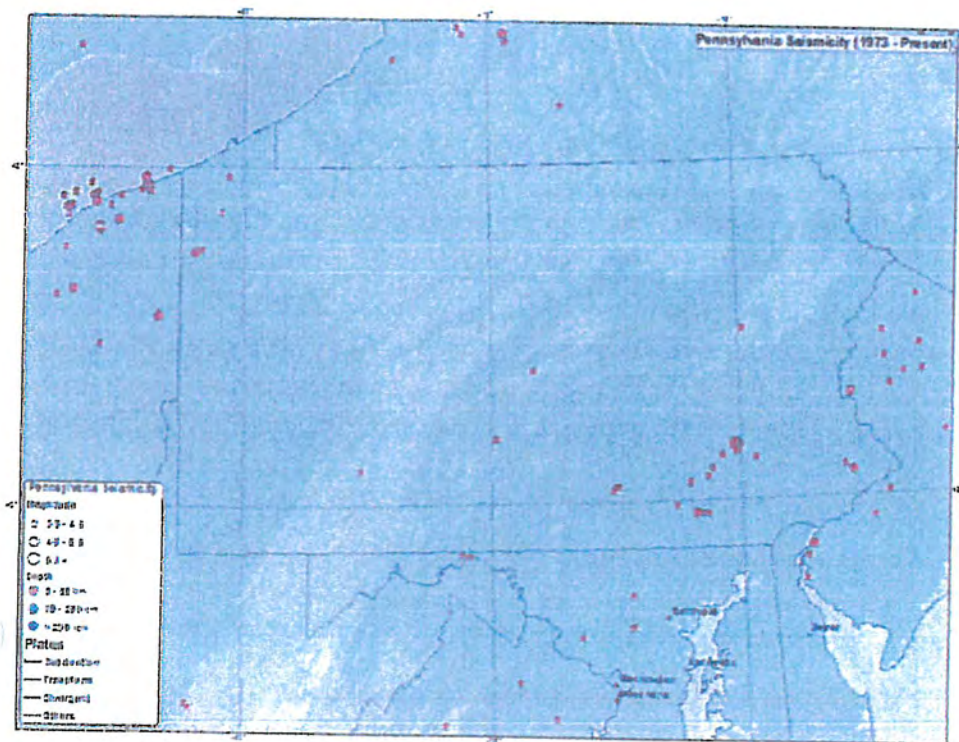
Event data is transmitted within minutes of detection,
continuous data is stored on USB flash memory.



Earthquake Hazards Program

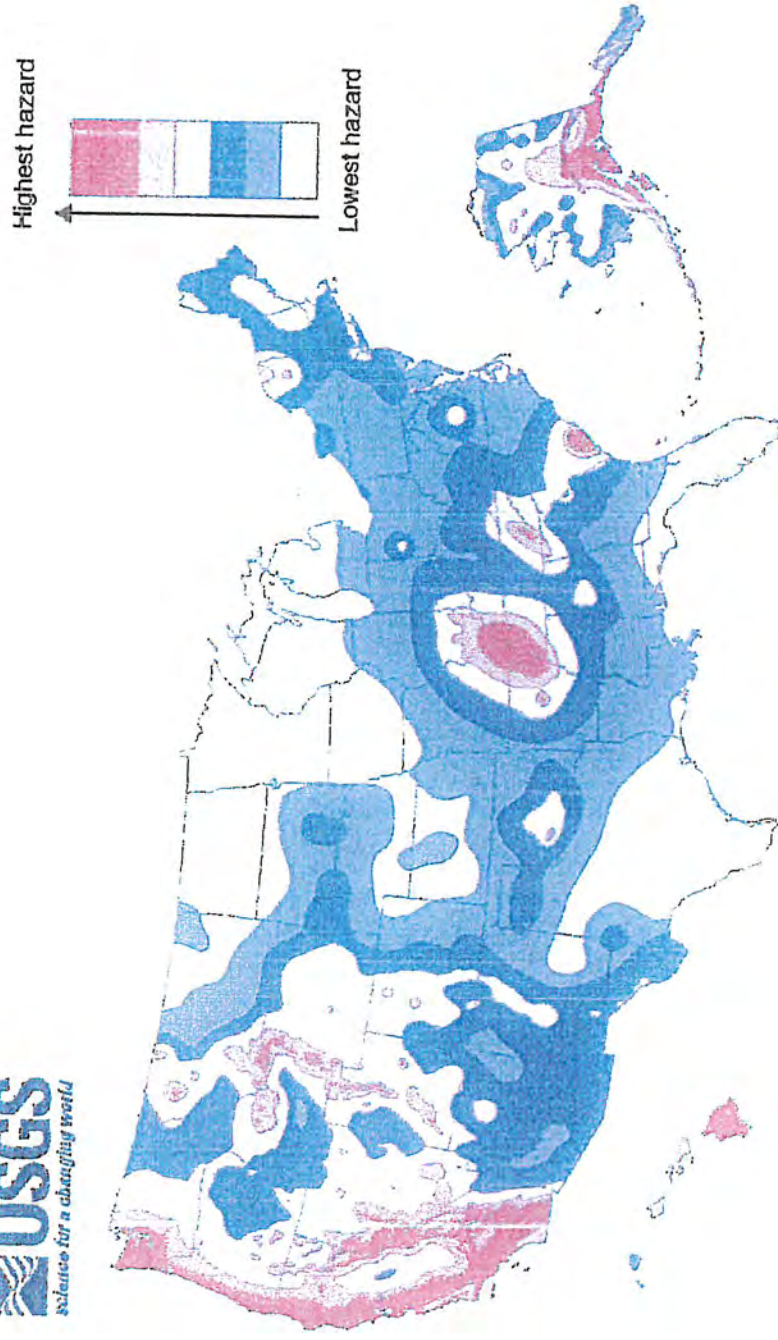
Pennsylvania

Seismicity Map - 1973 to March 2012



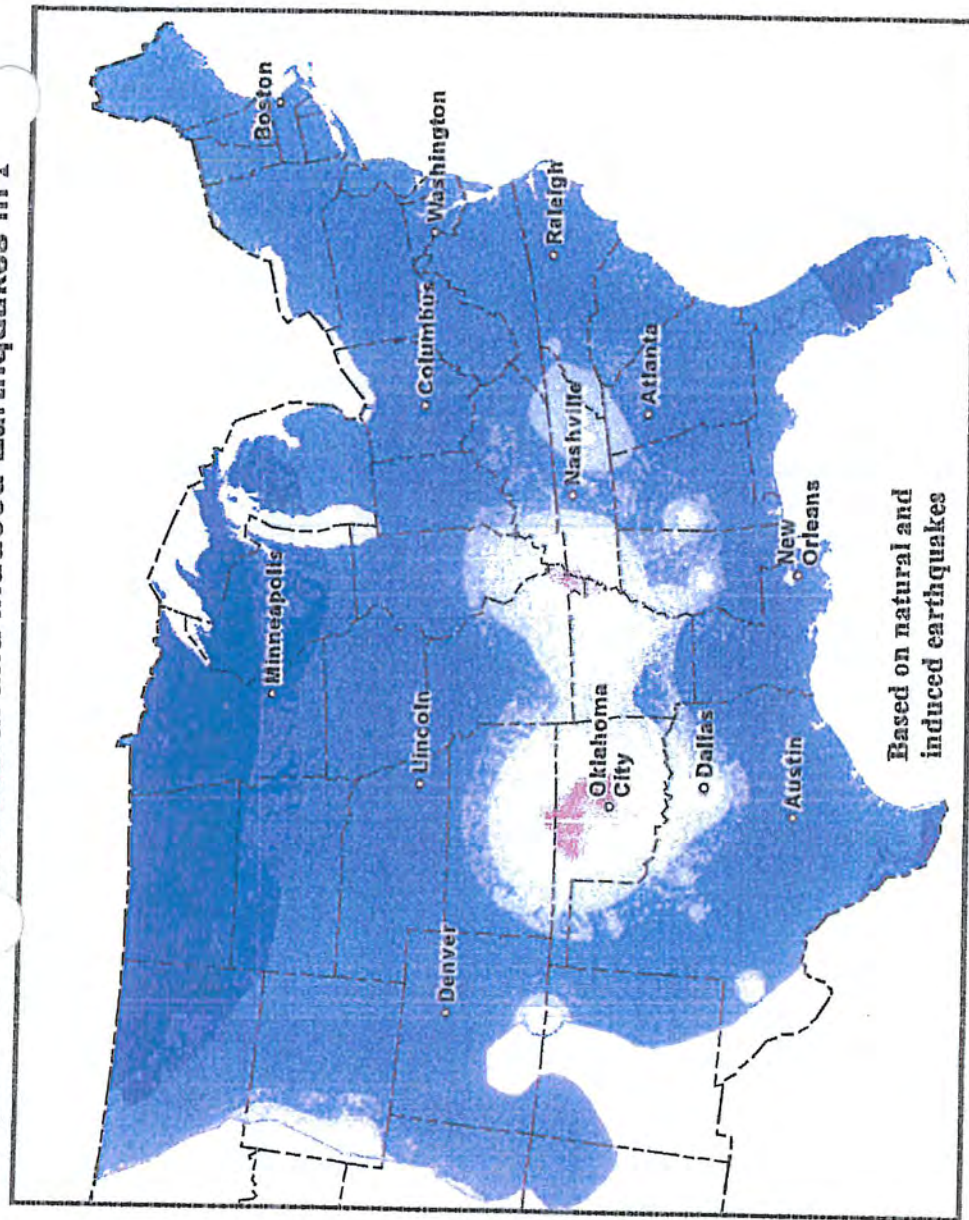
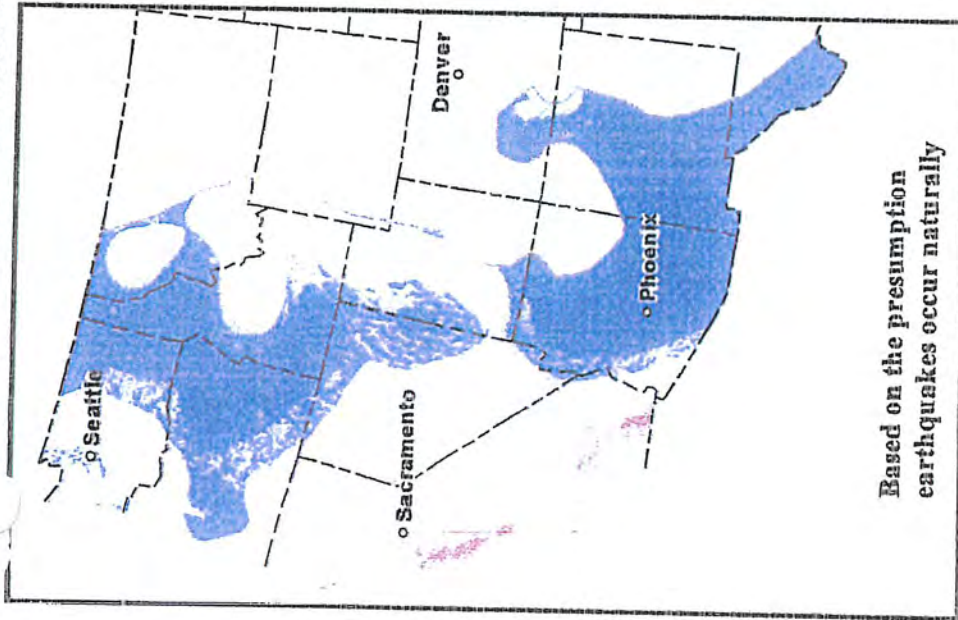
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Earthquake Map 1



Earthquake Map 2

USGS Forecast for Ground Shaking Intensity from Natural and Induced Earthquakes in 1



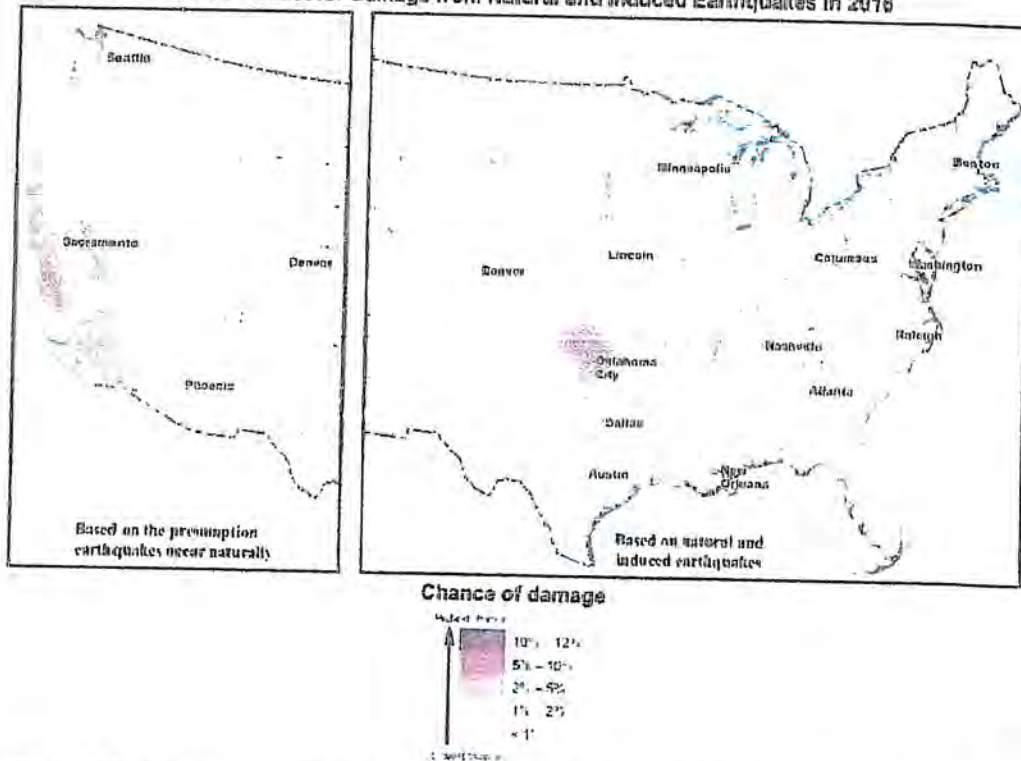
Modified Mercalli Intensity

VIII+	Shaking severe, heavier damage
VII	Shaking very strong, moderate damage
VI	Shaking strong, felt by all, minor damage
V	Shaking moderate, felt indoors by most, outdoors by many
IV	Shaking light, felt indoors by many, outdoors by few
III	Shaking weak, felt indoors by several

Earthquake Map 3

USGS map displaying intensity of potential ground shaking from natural and human-induced earthquakes. There is a small chance (one percent) that ground shaking intensity will occur at this level or higher. There is a greater chance (99 percent) that ground shaking will be lower than what is displayed in these maps.

USGS Forecast for Damage from Natural and Induced Earthquakes in 2016



USGS map displaying potential to experience damage from natural or human-induced earthquakes in 2016. Chances range from less than 1 percent to 12 percent.

USGS map displaying potential to experience damage from a natural or human-induced earthquake in 2016. Chances range from less than one percent to 12 percent.

Six States Face the Highest Hazards

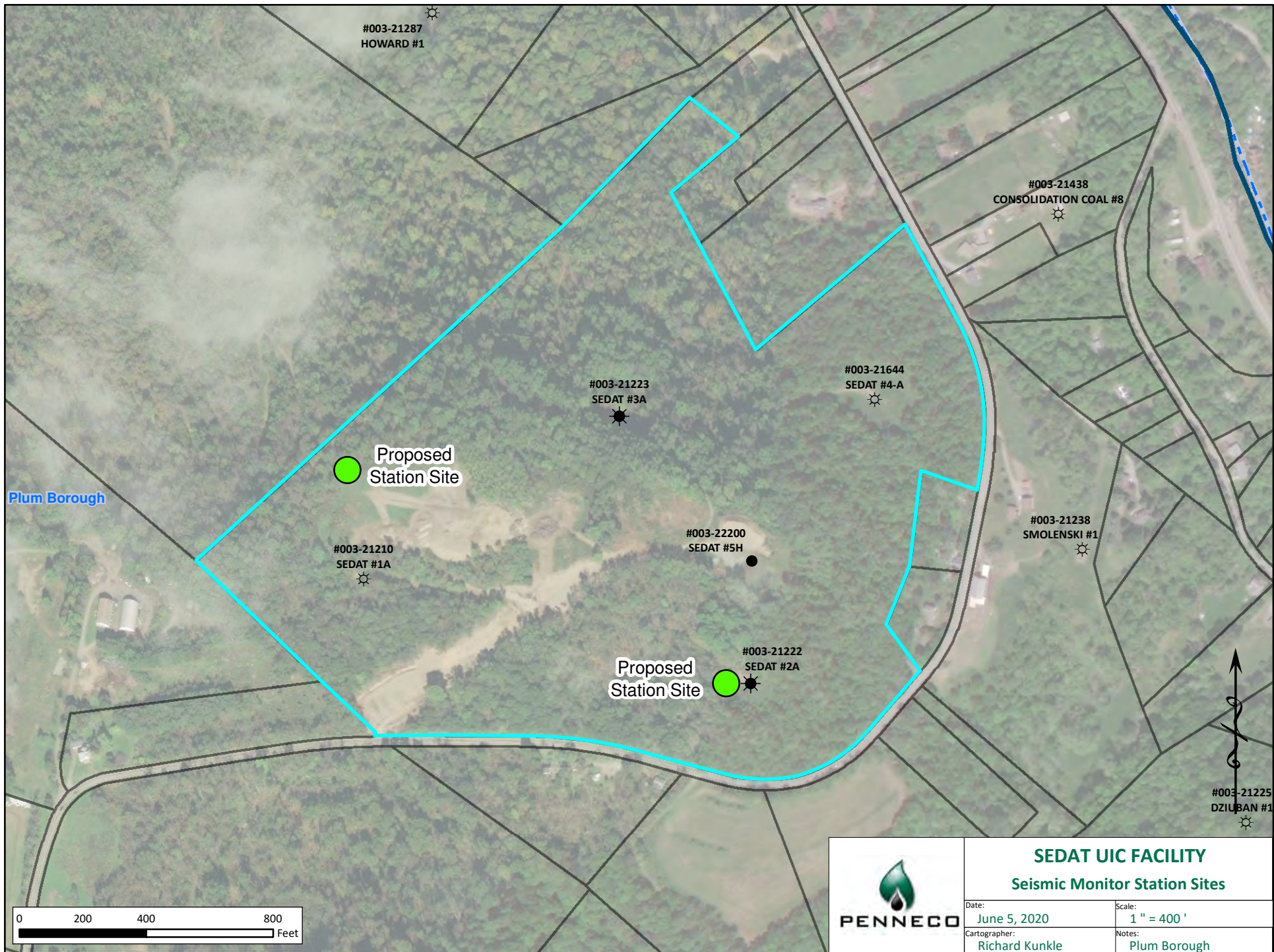
The most significant hazards from induced seismicity are in six states, listed in order from highest to lowest potential hazard: Oklahoma, Kansas, Texas, Colorado, New Mexico and Arkansas. Oklahoma and Texas have the largest populations exposed to induced earthquakes.

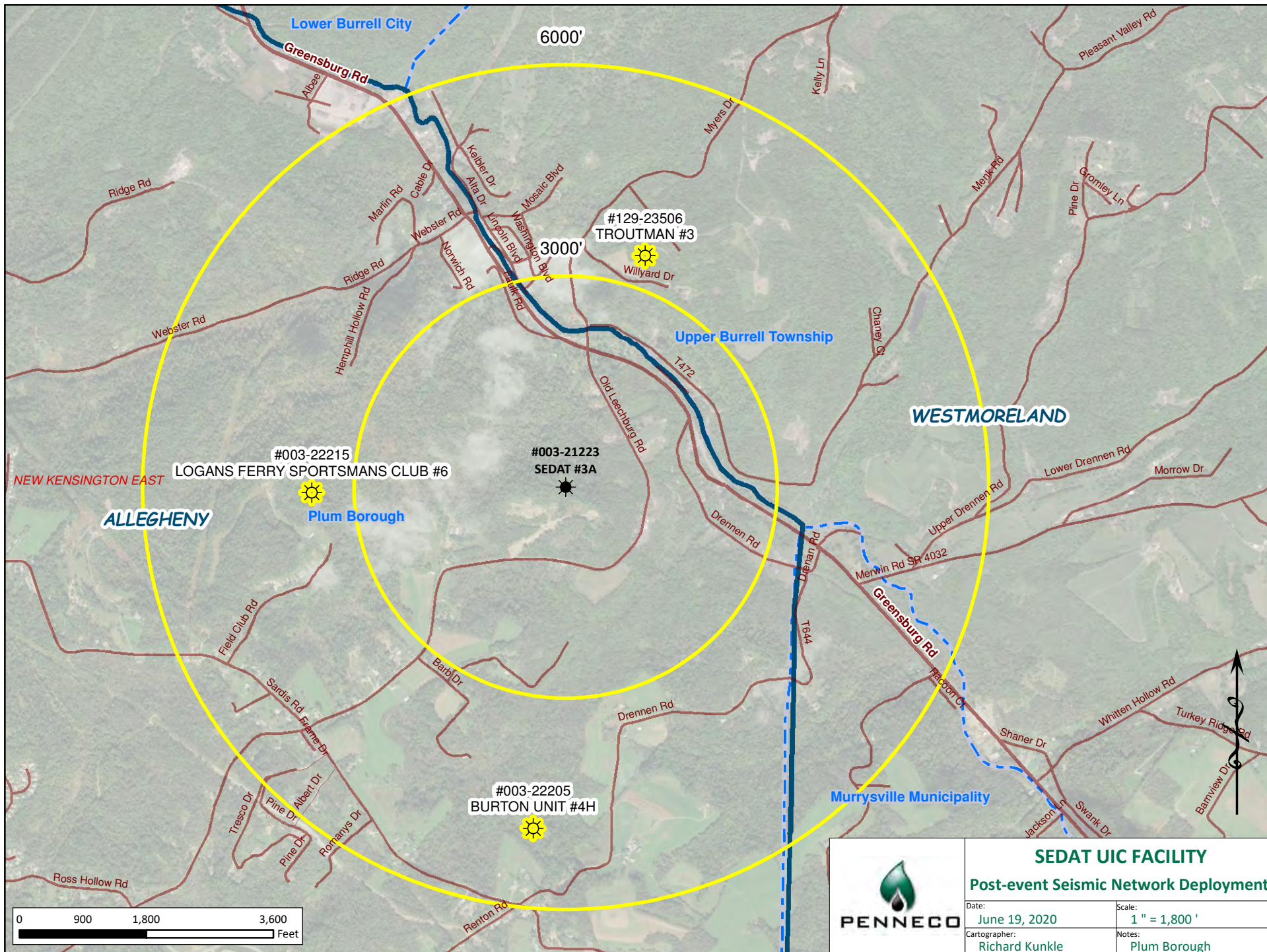
"In the past five years, the USGS has documented high shaking and damage in areas of these six states, mostly from induced earthquakes," said Petersen. "Furthermore, the [USGS Did You Feel It?](#) website has archived tens of thousands of reports from the public who experienced shaking in those states, including about 1,500 reports of strong shaking or damage."

In developing this new product, USGS scientists identified 21 areas with increased rates of induced seismicity. Induced earthquakes have occurred within small areas of Alabama and Ohio but a recent decrease in induced earthquake activity has resulted in a lower hazard forecast in these states for the next year. In other areas of Alabama and small parts of Mississippi, there has been an increase in activity, and scientists are still investigating whether those events were induced or natural.

People living in areas of higher earthquake hazard should learn how to be prepared for earthquakes, and guidance can be found through FEMA's Ready Campaign.

Earthquake Map 4





	SEDAT UIC FACILITY	
	Post-event Seismic Network Deployment	
	Date: June 19, 2020	Scale: 1" = 1,800'
Cartographer: Richard Kunkle	Notes: Plum Borough	



July 21, 2021

Mr. D. Marc Jacobs, Jr.
Senior Vice President
Penneco Environmental Solutions, LLC
6608 Route 22
Delmont, PA 15626-2408

**Subject: Zone of Endangering Influence (ZEI) Modeling
Underground Injection
Penneco - Sedat #3A and Sedat 4A Wells
Allegheny County, PA**

Dear Mr. Jacobs:

This letter report summarizes the analytical modeling performed by Tetra Tech, Inc. (Tetra Tech) for the Area of Review (AOR) /Zone of Endangering Influence (ZEI) analysis for the Penneco Environmental Solutions, LLC (Penneco) Sedat #3A and #4A wells. Sedat #3A has received its UIC Class IID well permits from US EPA and PADEP and is operational, while Sedat #4A has not yet received its UIC well permits from US EPA and PADEP. Both wells are located in Plum Borough of Allegheny County, Pennsylvania and target the Murrysville Sand as the injection zone. We understand that as part of the permit application review process, US EPA has requested a ZEI analysis be performed under the condition of both the Sedat #3A and Sedat #4A injecting. As such, the scenario we have modeled involved injecting simultaneously at both wells. The relevant parameters for our analysis were obtained from existing permit-related documents and information provided by Penneco or estimated/based on literature values in the absence of any well-specific information. Our analysis is described in more detail below.

OVERVIEW AND METHODOLOGY

There are several methods proposed for calculating the ZEI of an injection well. The most simplistic method is the use of a fixed radius, based on the type of injection well being permitted. Other methods involve calculation of the radius based on well and formation properties. Most regulatory agencies require the use of calculations to determine the ZEI. The method used here is the graphical method first used by US EPA Region 6. It involves the calculation of the increase of pressure in the formation due to injection, then converting that pressure into equivalent feet of head. The increase in head in the formation due to injection is then compared to the equivalent head of the lowest most underground source of drinking water (USDW). When plotted graphically, the intersection of those two curves at some radial distance, r , determines the radius of the ZEI.

The increase in pressure in the formation due to injection depends on the properties of the injection fluid and the formation, the rate of fluid injection, and the length of time of injection. The most common mathematical expression to describe this increase in pressure was developed by Matthews and Russell (1967). Matthews and Russell assume that, for a single well injecting into an infinite, homogeneous and isotropic, non-leaking formation, the increase in pressure (Δp) can be described as:

$$\Delta p = 162.6 \frac{Q\mu}{kh} * [(\log(kt / \Phi\mu Cr^2) - 3.23)] \text{ where:}$$

Δp = pressure change (psi) at radius, r and time, t

Q = injection rate (barrels (bbls)/day)

μ = injectate viscosity (centipoise)

k = formation permeability (millidarcies (md))

h = formation thickness (feet)

t = time since injection began (hours)

C = compressibility (total, sum of water and rock compressibility) (psi^{-1})

r = radial distance from wellbore to point of investigation (feet)

Φ = average formation porosity (decimal)

PARAMETERS USED IN THE ANALYSIS

The following parameters were used in the ZEI analysis. For injection rate, we used a daily rate of 3,600 bbls/day for the Sedat #3A well (based on the permitted monthly rate of 108,000 bbls divided by 30 days) and the proposed daily rate of 1,800 bbls/day for the Sedat #4A well (based on the proposed monthly rate of 54,000 bbls divided by 30 days). For this analysis, permeability was assigned a value of 100 md, which is based on literature values which state that permeability of the Murrysville Sand in southwest Pennsylvania ranges from 0.005 to 1,000 md, with an average of 100 md (Sager, 2007; Smosna and Sager, 2008). The literature shows that permeability is related to porosity, with higher porosity values corresponding to higher permeability values (Figure 1). As indicated in the US EPA Statement of Basis for the Sedat #3A draft UIC Class IID well permit, average porosity for Murrysville Sand in the Sedat #3A area averages 24%. The 100 md average permeability value is also referenced in the US EPA Statement of Basis document. It is noted that HFRAC, as part of formation testing on the Sedat #3A well, estimated a permeability value of 1.8 md; however, as indicated in the attached technical memo from HFRAC, the result is considered to not be representative of formation conditions primarily due to only a small percentage of perforations being accessed during the test and near well bore tortuosity. The initial pressure at the top of the injection formation was based upon observed measurements during the formation test for the Sedat #3A well conducted by HFRAC. The above input parameters and others required

for the modeling are provided below for each well along with the basis for the assigned input parameter value.

Sadat #3A Murrysville Sand Well

$Q = 3600$ barrels/day (Permitted monthly injection rate / 30 days)

$t = 10$ years = 87,600 hours (Modeled scenario)

$\mu = 1$ centipoise (Default)

$k = 100$ md (Based on average Murrysville permeability per Sager (2007))

$h = 81$ feet (Thickness of proposed perforated interval)

$C = 3.0e-06$ psi⁻¹ (Default)

$\Phi = 0.24$ (Porosity log value)

Specific gravity of injectate = 1.23 (Anticipated specific gravity of injected brine)

Surface elevation = 1106 feet (Well Completion Report)

Depth to injection formation = 1896 feet (EPA UIC Well Permit)

Base of lowest most USDW (MSL) = 656 feet (Surface elevation – 450 feet (depth to lowest most USDW from Sadat #3A USEPA Statement of Basis document))

Initial pressure at top of injection formation = 232 psi (Initial reservoir pressure reported by HFRAC for the Sadat #3A well as part of formation testing)

Sadat #4A Murrysville Sand Well

$Q = 1800$ barrels/day (Proposed monthly injection rate / 30 days)

$t = 10$ years = 87,600 hours (Modeled scenario)

$\mu = 1$ centipoise (Default)

$k = 100$ md (Based on average Murrysville permeability per Sager (2007))

$h = 60$ feet (Thickness of proposed perforated interval)

$C = 3.0e-06$ psi⁻¹ (Default)

$\Phi = 0.24$ (Porosity log)

Specific gravity of injectate = 1.23 (Anticipated specific gravity of injected brine)

Surface elevation = 1068 feet (Well Completion Report)

Depth to injection formation = 1740 feet (UIC Well Permit Application)

Base of lowest most USDW (MSL) = 656 feet (Surface elevation – 412 feet (depth to lowest most USDW elevation from Sadat #3A USEPA Statement of Basis document))

Initial pressure at top of injection formation = 232 psi (Initial reservoir pressure reported by HFRAC for the Sadat #3A well as part of formation testing)



RESULTS

The Matthews and Russell equation was solved for the distance from the wells based on the parameters listed above. The distance between the Sedat #3A and Sedat #4A wells is approximately 815 ft.

The Matthews and Russell equation was used to calculate the increase in pressure in the formation with only one well injecting. This was done for both wells. Then, this value was added to the value of existing pressure in the injection formation to obtain the total pressure in the formation when both wells are injecting.

These values were then converted to feet of head of formation brine. The values are plotted against distance from the wellbore and are shown in Figure 2 for the Sedat #3A well and Figure 3 for the Sedat #4A well. The plot shows the calculated pressure surface within the injection formation, measured as feet of head of formation brine above the top of the injection formation. Also shown is the head of the lowest most USDW. Where the two lines intersect, the radius of the ZEI can be estimated. The results indicate that the radial distance of the ZEI is approximately 360 feet for the Sedat #3A well and approximately 250 feet for the Sedat #4A well. These distances are well within the $\frac{1}{4}$ mile standard fixed radius for AOR/ZEI.

CONCLUSIONS

Our analysis of the AOR/ZEI for the Sedat #3A and #4A wells (injecting together) is based on a methodology typically used by US EPA. Based on the results, we believe the Sedat #3A and #4A wells are excellent candidates for use as brine disposal wells from a ZEI perspective. The analysis indicates that the AOR of $\frac{1}{4}$ mile is sufficiently protective given the ZEI results of 360 feet for Sedat #3A and 250 feet for Sedat #4A.

REFERENCES

- Matthews, C.S., Russell, D.G., (1967) Pressure Buildup and Flow Test in Wells, SPE Monograph Series, Volume1, New York.
- Sager, M., (2007) Petrologic Study of the Murrysville Sandstone in Southwestern Pennsylvania, West Virginia University Libraries.
- Smosna, R., Sager, M., (2008) The Making of a High-Porosity, High-Permeability Reservoir – The Murrysville Sandstone of Pennsylvania, AAPG Eastern Section Meeting, Pittsburgh, PA.



TETRA TECH

Please feel free to contact me at 724-766-5987 or by email at dale.skoff@tetrattech.com with any questions or comments.

Respectfully submitted,
Tetra Tech, Inc.

Dale E. Skoff, PG, CHMM
Account Manager

cc: Jeff Benegar – Tetra Tech

Figures

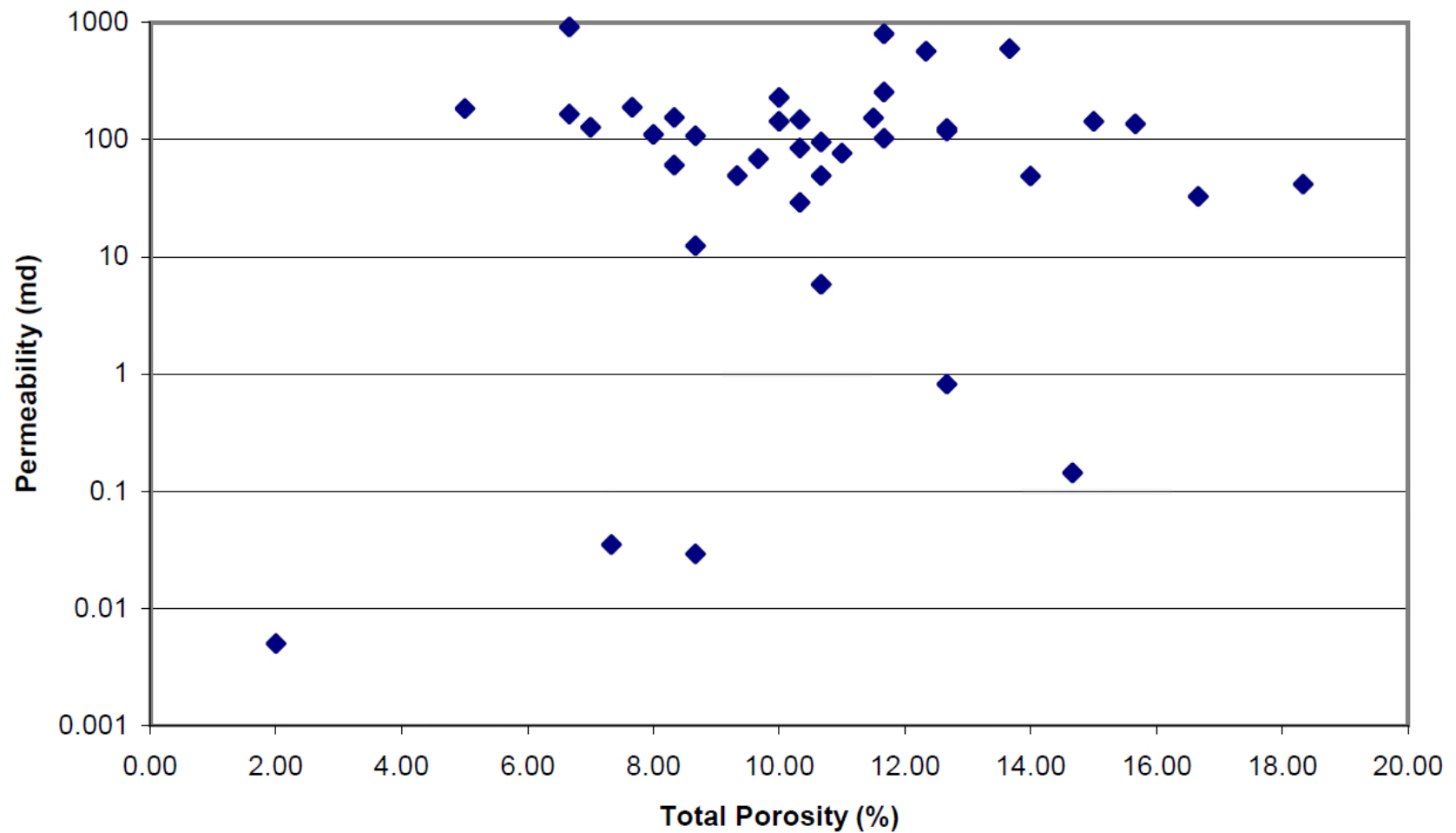


Figure 1. Porosity vs. permeability for the Murrysville Sand (from Sager, 2007)

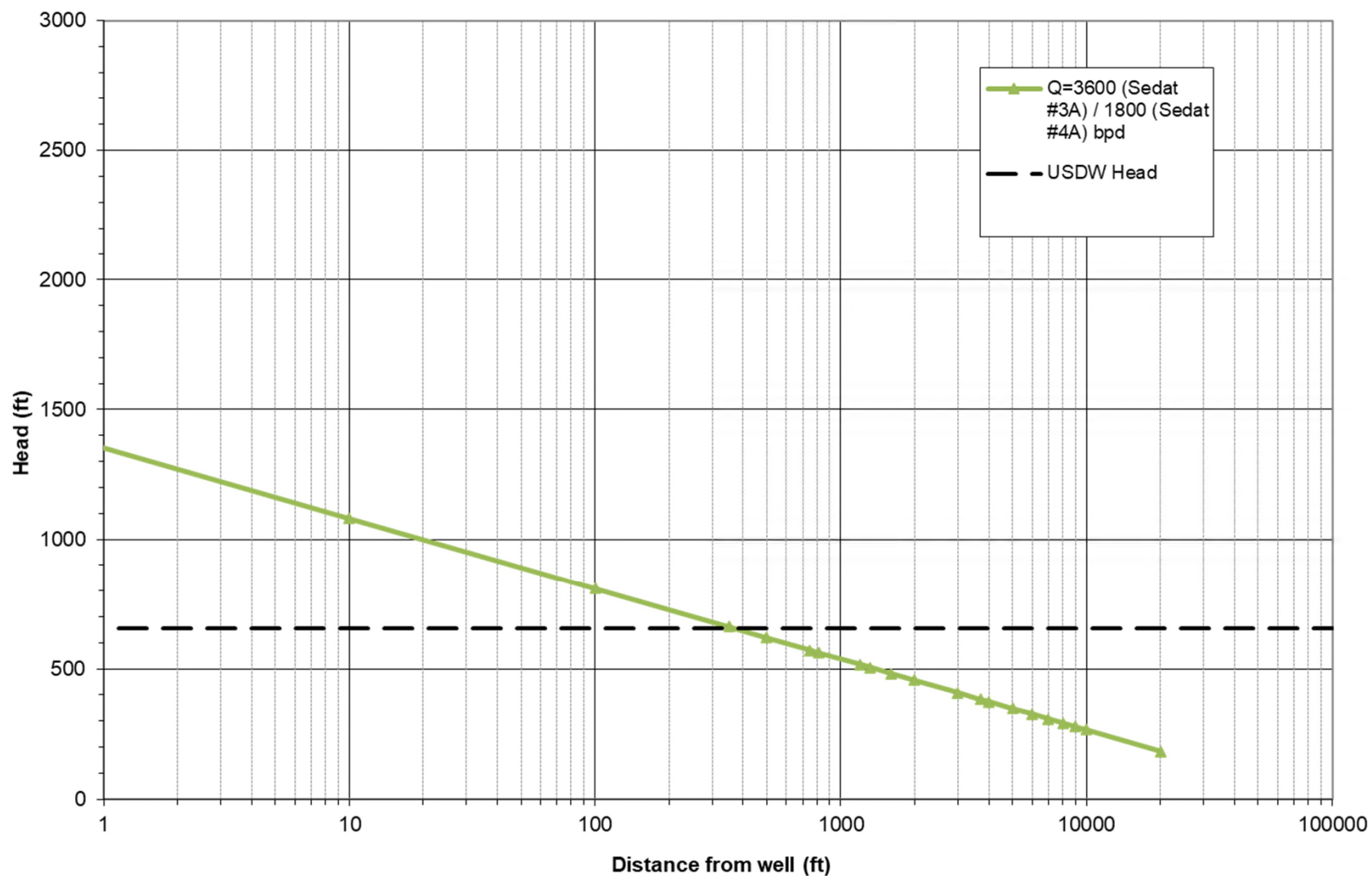


Figure 2. Feet of head of injection formation and USDW vs. distance for Sedat #3A when both wells (Sedat #3A and #4A) are injecting, $K = 100$ md

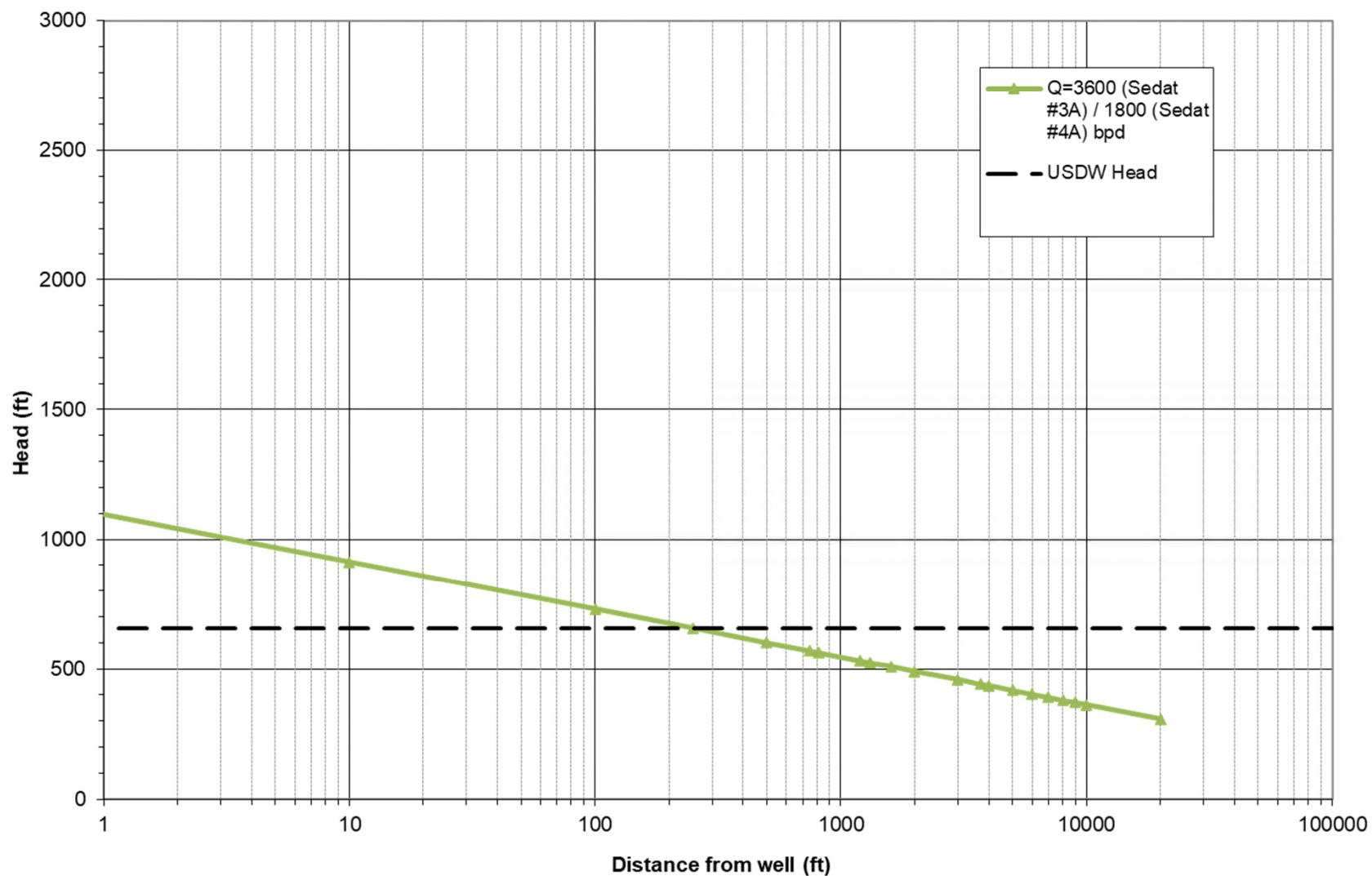


Figure 3. Feet of head of injection formation and USDW vs. distance for Sedat #4A when both wells (Sedat #3A and #4A) are injecting, $K = 100$ md

HFRAC January 14, 2019 Letter

Sedat #3A (Murrysville) – Permeability Determination



January 14, 2019

Mr. Marc Jacobs, Jr.
Senior Vice President
Penneco
6608 Route 22
Delmont, PA 15626

Re: Sedat #3A (Murrysville) – Permeability Determination

Dear Marc,

On September 1, 2015 a DFIT was pumped to determine the closure stress, reservoir pressure, and reservoir transmissibility (kH/ μ). The DFIT was pumped at 4 bpm for 1500 gals. Bottomhole pressure was recorded with a bottomhole gauge set 1910 ft. The results from the DFIT using the Nolte G function gave a bottomhole closure stress of 553 psi which gives a closure stress gradient of 0.29 psi/ft. The pressure decline data after closure (ACA) was analyzed with the Nolte FR function to determine reservoir transmissibility. Based on the pressure response it appears that pseudoradial flow was reached. The reservoir transmissibility was 88 mD-ft/cP assuming a reservoir fluid viscosity of 1 cP. The actual results will vary based on the actual reservoir fluid viscosity. The formation capacity (kH) was 88 mD-ft. Assuming a height of 50 ft gives a reservoir permeability of 1.8 mD.

The reservoir permeability of 1.8 mD is less than the reported permeability values for the Murrysville formation. The permeability values reported in the “Petrologic Study of the Murrysville Sandstone in Southwestern PA” are shown to be closer to 100 mD.

A possible reason for the difference in the permeability determined from the DFIT and the permeability reported in the study is a poor connection between the wellbore and reservoir. The injection test was the first injection into the formation. Subsequent injections were conducted to breakdown additional perforations and remove near wellbore tortuosity.

The rate stepdown test indicated only five out of forty perforations open.

As a result of the poor connection between the wellbore and the reservoir the reservoir permeability of 1.8 mD may not be representative of the actual Murrysville reservoir permeability which may be closer to 100 mD as stated in the “Petrologic Study of the Murrysville Sandstone in Southwestern Pennsylvania”.

Thank you for the opportunity to work on the Sedat #3A project with Penneco. If you have any questions or comments let me know.

Sincerely,

Henry Jacot

Attachment “H”
Operating Data

**Attachment H
Operating Data
Sedat #4A Injection Well**

Injection Rates and Volumes

- 1) The proposed average injection rate is 1,800 BBLs of water per day and the maximum rate should be no greater than 2,000 BBLs of water per day or 54,000 BBLs per month.

Injection Pressures

- 2) Injection pressure is expected to be at minimum MASIP of 1,322 psi while injecting 1.23 Sg water, the calculated maximum injection pressure at the well head, without accounting for any friction through the perforations in the 7" casing and the pipe friction through the 2 $\frac{7}{8}$ " injection string. The measured bottom hole reservoir pressure as measured with a bottom hole pressure gage during testing at #3A is 232 psi static.

The maximum allowable surface injection pressure baseline of 1,322 psi, is calculated using the formula published in 40 CFR Subpart NN - Pennsylvania § 147.1953, $P_m = [(FG \text{ (generically } .733) - (0.433)(S_g)]D$, for a column of water. The fracture gradient of this well is 1.23 PSI/FT calculated from the Reservoir and Characterization study at Sedat #3A found at the end of Attachment G. The maximum Sg baseline used for the calculation is 1.23 Sg (not to be confused with the 1.23 Psi/ft. fracture gradient), the maximum Sg of the produced brine water anticipated at the facility. Therefore, the Maximum Allowable Surface Injection Pressure (MASIP or Pressure Maximum- PM) for this well would be $[P_m = 1.23 \text{ FG} - (0.433 \text{ PSI/ft. of Sg } 1.0) (1.23 \text{ Sg of worst case local produced brine water})]1896 \text{ (test depth at Sedat \#3)}]$; $P_m = 1,322 \text{ PSI}$ while pumping 1.23 SG (10.25/gal). Should the Sg of the injectate fall below the value baseline (1.23 Sg), the maximum surface injection pressure will correspondingly adjust higher through automation to maintain the measured bottom hole pressure of 2332 psi. Example assuming no effect from friction:

$1.08 \text{ SG} = 1.23 - (.433 \times 1.08) \times 1896 \text{ Or } 1.23 - .4676 = .7624 \text{ PSI/ft} \times 1896 = 1446 \text{ PW}$. This example equates to $.4676 \text{ PSI/ft.} \times 1896 = 886.57 \text{ PSI} + 1446 \text{ MASIP/PW} = 2332 \text{ Bottom Hole injection pressure without regard to friction loss}$. See attached spreadsheet.

Annulus Fluid

- 3) Fresh water will be in placed in the 2 $\frac{7}{8}$ " by 4 $\frac{1}{2}$ " annulus, mixed with a chemical such as Corr Plex 300 which acts as a corrosion inhibitor and bacteria growth preventer. Twenty gallons of Corr Plex 300 will be mixed with approximately 2,500 gallons of fresh water. The MSD sheet for the chemical mixture Corr Plex

300 listing ingredients and physical data is included in this section. Positive pressure will be maintained on the annulus to monitor mechanical integrity.

Source and Analysis of Injection Fluid

- 4) The source of the injection fluid will be produced water from oil and gas wells and flow back fluid from oil and gas well stimulation activities and rainwater that falls into the un-roofed PES facility containments. Three representative sample analyses are included with this attachment. Before injection the produced fluid will be analyzed for the parameters required by the permit. The produced fluid and flow back water will be subjected to treatment and passed through a filter to remove large particles and suspended solids from the fluid before injection. The solids removed will be transported to an appropriate waste disposal site.

Unchanging MASIP based on Max Sg 1.23

1322 MASIP no matter the SPG .9-1.23

MASIP at 1.23Sg	SPG	BHP Injecting	BHP psi Loss
1322	0.90	2061	-271
1322	0.91	2069	-263
1322	0.92	2077	-255
1322	0.93	2086	-246
1322	0.94	2094	-238
1322	0.95	2102	-230
1322	0.96	2110	-222
1322	0.97	2118	-214
1322	0.98	2127	-205
1322	0.99	2135	-197
1322	1.00	2143	-189
1322	1.01	2151	-181
1322	1.02	2159	-173
1322	1.03	2168	-164
1322	1.04	2176	-156
1322	1.05	2184	-148
1322	1.06	2192	-140
1322	1.07	2200	-132
1322	1.08	2209	-123
1322	1.09	2217	-115
1322	1.10	2225	-107
1322	1.11	2233	-99
1322	1.12	2241	-91
1322	1.13	2250	-82
1322	1.14	2258	-74
1322	1.15	2266	-66
1322	1.16	2274	-58
1322	1.17	2283	-49
1322	1.18	2291	-41
1322	1.19	2299	-33
1322	1.20	2307	-25
1322	1.21	2315	-17
1322	1.22	2324	-8
1322	1.23	2332	0

MASIP (PW) by Sg

Sg x.433 x 1896=xxxx.x		MASIP (PW) by Sg		BHP w/ Various Sg No Friction BHP	
At SPG	Hydrostatic at 1896 ft.	'MASIPat Sg Steady BHP 2332 PSI MASIP (PW)			
0.90	738.9	+	1593	=	2332.0
0.91	747.1	+	1585	=	2332.0
0.92	755.3	+	1577	=	2332.0
0.93	763.5	+	1568	=	2332.0
0.94	771.7	+	1560	=	2332.0
0.95	779.9	+	1552	=	2332.0
0.96	788.1	+	1544	=	2332.0
0.97	796.3	+	1536	=	2332.0
0.98	804.5	+	1527	=	2332.0
0.99	812.8	+	1519	=	2332.0
1.00	821.0	+	1511	=	2332.0
1.01	829.2	+	1503	=	2332.0
1.02	837.4	+	1495	=	2332.0
1.03	845.6	+	1486	=	2332.0
1.04	853.8	+	1478	=	2332.0
1.05	862.0	+	1470	=	2332.0
1.06	870.2	+	1462	=	2332.0
1.07	878.4	+	1454	=	2332.0
1.08	886.6	+	1445	=	2332.0
1.09	894.9	+	1437	=	2332.0
1.10	903.1	+	1429	=	2332.0
1.11	911.3	+	1421	=	2332.0
1.12	919.5	+	1413	=	2332.0
1.13	927.7	+	1404	=	2332.0
1.14	935.9	+	1396	=	2332.0
1.15	944.1	+	1388	=	2332.0
1.16	952.3	+	1380	=	2332.0
1.17	960.5	+	1371	=	2332.0
1.18	968.7	+	1363	=	2332.0
1.19	977.0	+	1355	=	2332.0
1.20	985.2	+	1347	=	2332.0
1.21	993.4	+	1339	=	2332.0
1.22	1001.6	+	1330	=	2332.0
1.23	1009.8	+	1322	=	2332.0



Reliance
LABORATORIES

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Martinsburg, WV 25403
Phone: 304.596.2084 | Fax: 304.596.2086

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

LABORATORY REPORT SUMMARY

Client: C00117

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

WV 26351-

Tuesday, April 18, 2017

Total Number of Pages: 7
(Not Including C.O.C.)
Page 1 of 7

Lab ID	Sample ID	Sample ID 2	Sample Date
265743-2017-W	CONVENTIONAL REPRESENTATIVE	CONV	4/12/2017
265744-2017-W	MARCELLUS REPRESENTATIVE	MARC	4/12/2017
265745-2017-W	ORISKANY REPRESENTATIVE	ORSK	4/12/2017

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

Report Reviewed By: *Tenley Miller*
Digitally signed by Tenley Miller
Date: 2017.04.20 09:28:17 -04'00'



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MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

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Tuesday, April 18, 2017
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GLENVILLE, WV 26351-

Lab Number: 265743-2017-W Sample ID: CONVENTIONAL REPRESENTATIVE
CONV

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: <u>Inorganics</u>							
Total Organic Carbon	ND	mg/l	SM5310C-00	4/17/2017	9:50 TH	0.1	0.5
Total Suspended Solids	5920	mg/l	SM2540D-97	4/13/2017	12:25 AAB	4	5
Specific Gravity	1.13	g/cc	ASTM D1429-08	4/18/2017	11:00 TM		
E.coli(MPN)**	< 1	Index/100ml	SM9223B-97	4/12/2017	16:22 CP		
pH	# 4.28	S.U.	SM4500H+B-00	4/13/2017	16:12 AAB		
Total Aluminum	105	mg/l	EPA 200.7 R4.4	4/14/2017	13:04 TH	0.009	0.05
Total Arsenic	15.1	mg/l	EPA 200.7 R4.4	4/14/2017	13:04 TH	0.007	0.05
Total Barium	288	mg/l	EPA 200.7 R4.4	4/14/2017	13:04 TH	0.003	0.05
Total Calcium	17130	mg/l	EPA 200.7 R4.4	4/14/2017	13:04 TH	0.078	0.5
Total Chloride	235742	mg/l	EPA 300.0 R2.1	4/18/2017	11:28 TM	0.15	0.5
Total Coliform(MPN)**	< 1	Index/100ml	SM9223B-97	4/12/2017	16:22 CP		
Total Dissolved Solids	210110	mg/l	SM2540C-97	4/13/2017	12:25 AAB	10	20
Total Iron	210	mg/l	EPA 200.7 R4.4	4/14/2017	13:04 TH	0.004	0.05
Total Manganese	48.4	mg/l	EPA 200.7 R4.4	4/14/2017	13:04 TH	0.007	0.05
Total Sodium	57890	mg/l	EPA 200.7 R4.4	4/14/2017	13:04 TH	0.011	0.5
Total Sulfate	479	mg/l	EPA 300.0 R2.1	4/18/2017	11:28 TM	0.12	0.5
Total Surfactant	1.20	mg/l	SM5540C-00	4/14/2017	10:38 JL	0.05	0.2

Remarks:

Date Sample Collected: 4/12/2017 11:30

Sample Submitted By: A.WILSON

Date Sample Received: 4/12/2017 13:55

Sample temp. upon receipt: 3.8 Deg C

MDL - Minimum Detectable Limit

MCL - Maximum Contaminant Level, USEPA Regulated

ND = Not Detected at the MDL or MRL

MRL - Minimum Reporting Limit

J = Reported value is an estimate because concentration is less than the MRL

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

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



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Tuesday, April 18, 2017
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GLENVILLE, WV 26351-

Lab Number: 265743-2017-W Sample ID: CONVENTIONAL REPRESENTATIVE
CONV

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: <u>Total Petroleum Hydrocarbons</u>							
Benzene	ND	mg/l	SW8021B/5030B	4/18/2017	13:07 TM	0.0007	0.01
Ethylbenzene	ND	mg/l	SW8021B/5030B	4/18/2017	13:07 TM	0.0014	0.01
MTBE	ND	mg/l	SW8021B/5030B	4/18/2017	13:07 TM	0.003	0.005
Toluene	ND	mg/l	SW8021B/5030B	4/18/2017	13:07 TM	0.002	0.01
TPH - DRO	ND	mg/l	SW8015B/3535A	4/18/2017	11:48 TM	0.68	1
TPH - GRO	ND	mg/l	SW8015B/5030B	4/18/2017	13:07 TM	0.04	0.5
Xylene	ND	mg/l	SW8021B/5030B	4/18/2017	13:07 TM	0.003	0.01
4-Bromochlorobenzene (Surrogate)	127	%	SW8021B/8015B	4/18/2017	13:07 TM		
o-Terphenyl (Surrogate)	75.8	%	SW8015B	4/18/2017	11:48 TM		
TPH - ORO	ND	mg/l	SW8015B/3535A	4/18/2017	11:48 TM	0.54	1
o-Terphenyl (Surrogate)	75.8	%	SW8015B	4/18/2017	11:48 TM		

Remarks:

Date Sample Collected: 4/12/2017 11:30

Sample Submitted By: A.WILSON

Date Sample Received: 4/12/2017 13:55

Sample temp. upon receipt: 3.8 Deg C

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CLIENT NAME SLS LAND & ENERGY DEV.

ADDRESS P.O. Box 150, GLENVILLE, WV 26351

CUSTOMER # 060117 *TEL. # 304-462-5634 FAX # 304-462-5656

SAMPLER (S) A. WILSON E-MAIL awilson@slsenergy.com

SHEET NO. 1 OF 1

*PROJECT/REMARKS

LABORATORY #	DATE	TIME	TEMP. °C	# OF CONTAIN.	HN03	H2SO4	HCL	NaOH	BAC-T	NO PRES.
CONV	4-12-17	11:30 AM	3.8	11	1		SV		1	16
MARC	4-12-17	11:30 AM		11	1		SV		1	16
ORSK	4-12-17	11:30 AM		11	1		SV		1	16

265743 CONVENTIONAL REPRESENTATIVE
265744 MARCELLUS REPRESENTATIVE
265745 ORISKANY REPRESENTATIVE

IMPLES DO ☒ DO NOT ☐ MEET USEPA GUIDELINES FOR HOLDING TIMES
IMPLES DO ☒ DO NOT ☐ MEET USEPA GUIDELINES FOR CHEMICAL PRESERVATIVES
IMPLES DO ☒ DO NOT ☐ MEET USEPA GUIDELINES FOR SAMPLE CONTAINERS
IMPLES ARE ☒ ARE NOT ☐ FOR REGULATORY COMPLIANCE PURPOSES

*RELINQUISHED BY: PRINT: <u>Adam Wilson</u> GN: <u>awilson</u>	*DATE/TIME DATE: <u>4-12-17</u> TIME: <u>1:55 PM</u>	*RECEIVED BY: PRINT: <u>C. Shand</u> SIGN: <u>[Signature]</u>
*RELINQUISHED BY:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: SIGN:
*RELINQUISHED BY:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: SIGN:
*RELINQUISHED BY:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: SIGN:

REMARKS:

PWS#

Results by Monday

WEATHER/TEMPERATURE:

☒ RUSH STATUS (INITIAL ACCEPTANCE ADW)

*** ADDITIONAL LABORATORY FEES MAY APPLY ***

EXTENT OF LIABILITY

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

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

TO BE COMPLETED BY CLIENT

ORIGINAL CHAIN OF CUSTODY DOCUMENT MUST BE EXECUTED IN INK

WHITE - LABORATORY

YELLOW - CLIENT

From: Adam Wilson [mailto:awilson@slssurveys.com]
Sent: March 16, 2017 7:52 AM
To: Tenley Miller <tmiller@wvdsi.net>
Subject: Bottle Requirements

Tenley,

We are going to be taking a few representative samples of some brine water and the DEP wants them analyzed for the specifics listed below; how much fluid would we need in order to fill all the bottles or if you gave me the sizes of all the bottles needed I can add it up.

Total Petroleum Hydrocarbons (DRO, GRO, ORO), BTEX, pH, Aluminum, Arsenic, Barium, Calcium, Chloride, Iron, Manganese, Sodium, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Total Organic Carbon (TOC), Sulfate, Detergents (MBAS), Dissolved Methane, Dissolved Ethane, Dissolved Butane, Dissolved Propane, Bacteria (total coliform), Radiation (NORM), and specific gravity.

Total Petroleum

Hydrocarbons (GRO, DRO, ORO), BTEX, pH, Aluminum, Arsenic, Barium, Calcium, Chloride, Detergents (MBAS), Iron, Manganese, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Total Organic Carbon (TOC), Sulfate, Dissolved Methane, Dissolved Ethane, Dissolved Butane, Dissolved Propane, and Bacteria (total coliform).

Thanks,

Adam Wilson

Environmental Services Manager

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MD Department of Environment #: 336, 337 | US Environmental Protection Agency #: WV00042, WV00901

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Tuesday, April 18, 2017

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GLENVILLE, WV 26351-

Lab Number: 265744-2017-W Sample ID: MARCELLUS REPRESENTATIVE
MARC

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: <u>Inorganics</u>							
Total Organic Carbon	ND	mg/l	SM5310C-00	4/17/2017	9:50 TH	0.1	0.5
Total Suspended Solids	6370	mg/l	SM2540D-97	4/13/2017	12:25 AAB	4	5
Specific Gravity	1.19	g/cc	ASTM D1429-08	4/18/2017	11:00 TM		
E.coli(MPN)**	< 1	Index/100ml	SM9223B-97	4/12/2017	16:22 CP		
pH	# 5.44	S.U.	SM4500H+B-00	4/13/2017	15:12 AAB		
Total Aluminum	1.47	mg/l	EPA 200.7 R4.4	4/14/2017	13:06 TH	0.009	0.05
Total Arsenic	24.5	mg/l	EPA 200.7 R4.4	4/14/2017	13:06 TH	0.007	0.05
Total Barium	707	mg/l	EPA 200.7 R4.4	4/14/2017	13:06 TH	0.003	0.05
Total Calcium	20270	mg/l	EPA 200.7 R4.4	4/14/2017	13:06 TH	0.078	0.5
Total Chloride	476956	mg/l	EPA 300.0 R2.1	4/18/2017	11:41 TM	0.15	0.5
Total Coliform(MPN)**	< 1	Index/100ml	SM9223B-97	4/12/2017	16:22 CP		
Total Dissolved Solids	298340	mg/l	SM2540C-97	4/13/2017	12:25 AAB	10	20
Total Iron	138	mg/l	EPA 200.7 R4.4	4/14/2017	13:06 TH	0.004	0.05
Total Manganese	1.91	mg/l	EPA 200.7 R4.4	4/14/2017	13:06 TH	0.007	0.05
Total Sodium	74370	mg/l	EPA 200.7 R4.4	4/14/2017	13:06 TH	0.011	0.5
Total Sulfate	298	mg/l	EPA 300.0 R2.1	4/18/2017	11:41 TM	0.12	0.5
Total Surfactant	0.58	mg/l	SM5540C-00	4/14/2017	10:38 JL	0.05	0.2

Remarks:

Date Sample Collected: 4/12/2017 11:30

Sample Submitted By: A.WILSON

Date Sample Received: 4/12/2017 13:55

Sample temp. upon receipt: 3.8 Deg C

MDL - Minimum Detectable Limit

MCL - Maximum Contaminant Level, USEPA Regulated

ND = Not Detected at the MDL or MRL

MRL - Minimum Reporting Limit

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

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Tuesday, April 18, 2017
Page 5 of 7

GLENVILLE, WV 26351-

Lab Number: 265744-2017-W Sample ID: MARCELLUS REPRESENTATIVE
MARC

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: <u>Total Petroleum Hydrocarbons</u>							
Benzene	ND	mg/l	SW8021B/5030B	4/18/2017	14:20 TM	0.0007	0.01
Ethylbenzene	ND	mg/l	SW8021B/5030B	4/18/2017	14:20 TM	0.0014	0.01
MTBE	ND	mg/l	SW8021B/5030B	4/18/2017	14:20 TM	0.003	0.005
Toluene	ND	mg/l	SW8021B/5030B	4/18/2017	14:20 TM	0.002	0.01
TPH - DRO	3.58	mg/l	SW8015B/3535A	4/18/2017	12:29 TM	0.68	1
TPH - GRO	ND	mg/l	SW8015B/5030B	4/18/2017	14:20 TM	0.04	0.5
Xylene	ND	mg/l	SW8021B/5030B	4/18/2017	14:20 TM	0.003	0.01
4-Bromochlorobenzene (Surrogate)	118	%	SW8021B/8015B	4/18/2017	14:20 TM		
o-Terphenyl (Surrogate)	79.7	%	SW8015B	4/18/2017	12:29 TM		
TPH - ORO	1.42	mg/l	SW8015B/3535A	4/18/2017	12:29 TM	0.54	1
o-Terphenyl (Surrogate)	79.7	%	SW8015B	4/18/2017	12:29 TM		

Remarks:

Date Sample Collected: 4/12/2017 11:30

Sample Submitted By: A. WILSON

Date Sample Received: 4/12/2017 13:55

Sample temp. upon receipt: 3.8 Deg C

MDL - Minimum Detectable Limit

MCL - Maximum Contaminant Level, USEPA Regulated

ND = Not Detected at the MDL or MRL

MRL - Minimum Reporting Limit

J = Reported value is an estimate because concentration is less than the MRL

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

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Tuesday, April 18, 2017
Page 6 of 7

GLENVILLE, WV 26351-

Lab Number: 265745-2017-W Sample ID: ORISKANY REPRESENTATIVE
ORSK

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: <u>Inorganics</u>							
Total Organic Carbon	39.8	mg/l	SM5310C-00	4/17/2017	9:50 TH	0.1	0.5
Total Suspended Solids	3840	mg/l	SM2540D-97	4/13/2017	12:25 AAB	4	5
Specific Gravity	1.14	g/cc	ASTM D1429-08	4/18/2017	11:00 TM		
E.coli(MPN)**	< 1	Index/100ml	SM9223B-97	4/12/2017	16:22 CP		
pH	# 5.79	S.U.	SM4500H+B-00	4/13/2017	15:12 AAB		
Total Aluminum	0.43	mg/l	EPA 200.7 R4.4	4/14/2017	13:09 TH	0.009	0.05
Total Arsenic	ND	mg/l	EPA 200.7 R4.4	4/14/2017	13:09 TH	0.007	0.05
Total Barium	2762	mg/l	EPA 200.7 R4.4	4/14/2017	13:09 TH	0.003	0.05
Total Calcium	15210	mg/l	EPA 200.7 R4.4	4/14/2017	13:09 TH	0.078	0.5
Total Chloride	382047	mg/l	EPA 300.0 R2.1	4/18/2017	11:54 TM	0.15	0.5
Total Coliform(MPN)**	< 1	Index/100ml	SM9223B-97	4/12/2017	16:22 CP		
Total Dissolved Solids	219310	mg/l	SM2540C-97	4/13/2017	12:25 AAB	10	20
Total Iron	98.1	mg/l	EPA 200.7 R4.4	4/14/2017	13:09 TH	0.004	0.05
Total Manganese	3.33	mg/l	EPA 200.7 R4.4	4/14/2017	13:09 TH	0.007	0.05
Total Sodium	67480	mg/l	EPA 200.7 R4.4	4/14/2017	13:09 TH	0.011	0.5
Total Sulfate	282	mg/l	EPA 300.0 R2.1	4/18/2017	11:54 TM	0.12	0.5
Total Surfactant	1.44	mg/l	SM5540C-00	4/14/2017	10:38 JL	0.05	0.2

Remarks:

Date Sample Collected: 4/12/2017 11:30
Sample Submitted By: A.WILSON
Date Sample Received: 4/12/2017 13:55
Sample temp. upon receipt: 3.8 Deg C
MDL - Minimum Detectable Limit
MCL - Maximum Contaminant Level, USEPA Regulated

ND = Not Detected at the MDL or MRL
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Tuesday, April 18, 2017
Page 7 of 7

GLENVILLE, WV 26351-

Lab Number: 265745-2017-W Sample ID: ORISKANY REPRESENTATIVE
ORSK

Parameter	Value	Units	Method	Date/Time Analyzed	Analyst	MDL	MRL
Analyte Group: <u>Total Petroleum Hydrocarbons</u>							
Benzene	ND	mg/l	SW8021B/5030B	4/18/2017	15:17 TM	0.0007	0.01
Ethylbenzene	ND	mg/l	SW8021B/5030B	4/18/2017	15:17 TM	0.0014	0.01
MTBE	ND	mg/l	SW8021B/5030B	4/18/2017	15:17 TM	0.003	0.005
Toluene	ND	mg/l	SW8021B/5030B	4/18/2017	15:17 TM	0.002	0.01
TPH - DRO	ND	mg/l	SW8015B/3535A	4/18/2017	14:16 TM	0.68	1
TPH - GRO	ND	mg/l	SW8015B/5030B	4/18/2017	15:17 TM	0.04	0.5
Xylene	ND	mg/l	SW8021B/5030B	4/18/2017	15:17 TM	0.003	0.01
4-Bromochlorobenzene (Surrogate)	109	%	SW8021B/8015B	4/18/2017	15:17 TM		
o-Terphenyl (Surrogate)	79.6	%	SW8015B	4/18/2017	14:16 TM		
TPH - ORO	ND	mg/l	SW8015B/3535A	4/18/2017	14:16 TM	0.54	1
o-Terphenyl (Surrogate)	79.6	%	SW8015B	4/18/2017	14:16 TM		

Remarks:

Date Sample Collected: 4/12/2017 11:30
Sample Submitted By: A.WILSON
Date Sample Received: 4/12/2017 13:55

Sample temp. upon receipt: 3.8 Deg C

MDL - Minimum Detectable Limit

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MRL - Minimum Reporting Limit

J = Reported value is an estimate because concentration is less than the MRL

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

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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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

TestAmerica Job ID: 490-126242-1
Client Project/Site: RSK / 265743, 265744, 265745

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

Attn: Tenley Miller

Jennifer Gambill

Authorized for release by:
4/18/2017 4:22:20 PM

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

LINKS

Review your project
results through

TotalAccess

Have a Question?



**Ask
The
Expert**

Visit us at:

www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Sample Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 265743, 265744, 265745

TestAmerica Job ID: 490-126242-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-126242-1	265743-2017-W	Water	04/12/17 11:30	04/13/17 09:45
490-126242-2	265744-2017-W	Water	04/12/17 11:30	04/13/17 09:45
490-126242-3	265745-2017-W	Water	04/12/17 11:30	04/13/17 09:45

Case Narrative

Client: Reliance Laboratories Inc
Object/Site: RSK / 265743, 265744, 265745

TestAmerica Job ID: 490-126242-1

Job ID: 490-126242-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-126242-1

Comments

No additional comments.

Receipt

The samples were received on 4/13/2017 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.3° C.

GC Semi VOA

Method(s) RSK-175: Surrogate recovery for the following samples were outside the upper control limit: 265743-2017-W (490-126242-1) and 265744-2017-W (490-126242-2). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Method(s) RSK-175: Surrogate recovery for the following sample was outside control limits: 265745-2017-W (490-126242-3). Evidence of matrix interference is present and there is insufficient volume for re-extraction; therefore, re-extraction and/or re-analysis was not performed.

Method(s) RSK-175: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 490-422627. A laboratory control sample duplicate (9LCSD) and sample duplicate (DU) were analyzed for batch precision.

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

Definitions/Glossary

Client: Reliance Laboratories Inc
Project/Site: RSK / 265743, 265744, 265745

TestAmerica Job ID: 490-126242-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

Glossary

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

Client Sample Results

Client: Reliance Laboratories Inc
 Project/Site: RSK / 265743, 265744, 265745

TestAmerica Job ID: 490-126242-1

Client Sample ID: 265743-2017-W

Lab Sample ID: 490-126242-1

Date Collected: 04/12/17 11:30

Matrix: Water

Date Received: 04/13/17 09:45

Method: RSK-175 - Dissolved Gases in Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			04/17/17 11:14	1
Ethane	ND		5.00	2.70	ug/L			04/17/17 11:14	1
Methane	ND		5.00	1.70	ug/L			04/17/17 11:14	1
Propane	ND		5.00	3.30	ug/L			04/17/17 11:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Acetylene (Surr)	157	X	62 - 124					04/17/17 11:14	1

Client Sample Results

Client: Reliance Laboratories Inc
 Project/Site: RSK / 265743, 265744, 265745

TestAmerica Job ID: 490-126242-1

Client Sample ID: 265744-2017-W

Lab Sample ID: 490-126242-2

Date Collected: 04/12/17 11:30

Matrix: Water

Date Received: 04/13/17 09:45

Method: RSK-175 - Dissolved Gases in Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			04/17/17 11:18	1
Ethane	ND		5.00	2.70	ug/L			04/17/17 11:18	1
Methane	ND		5.00	1.70	ug/L			04/17/17 11:18	1
Propane	ND		5.00	3.30	ug/L			04/17/17 11:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Acetylene (Surr)	225	X	62 - 124		04/17/17 11:18	1

Client Sample Results

Client: Reliance Laboratories Inc
 Project/Site: RSK / 265743, 265744, 265745

TestAmerica Job ID: 490-126242-1

Client Sample ID: 265745-2017-W

Lab Sample ID: 490-126242-3

Date Collected: 04/12/17 11:30

Matrix: Water

Date Received: 04/13/17 09:45

Method: RSK-175 - Dissolved Gases in Water									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			04/17/17 11:23	1
Ethane	ND		5.00	2.70	ug/L			04/17/17 11:23	1
Methane	39.5		5.00	1.70	ug/L			04/17/17 11:23	1
Propane	ND		5.00	3.30	ug/L			04/17/17 11:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Acetylene (Surr)	186	X	62 - 124					04/17/17 11:23	1

QC Sample Results

Client: Reliance Laboratories Inc
 Project/Site: RSK / 265743, 265744, 265745

TestAmerica Job ID: 490-126242-1

Method: RSK-175 - Dissolved Gases in Water

Lab Sample ID: MB 490-422627/7
 Matrix: Water
 Analysis Batch: 422627

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Butane	ND		10.0	5.80	ug/L			04/17/17 10:43	1
Ethane	ND		5.00	2.70	ug/L			04/17/17 10:43	1
Methane	ND		5.00	1.70	ug/L			04/17/17 10:43	1
Propane	ND		5.00	3.30	ug/L			04/17/17 10:43	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Acetylene (Surr)	91		62 - 124		04/17/17 10:43	1

Lab Sample ID: LCS 490-422627/3
 Matrix: Water
 Analysis Batch: 422627

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Butane	1020	994.7		ug/L		98	80 - 120
Ethane	527	532.2		ug/L		101	80 - 120
Methane	287	288.8		ug/L		101	80 - 120
Propane	771	777.6		ug/L		101	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Acetylene (Surr)	97		62 - 124

Lab Sample ID: LCSD 490-422627/9
 Matrix: Water
 Analysis Batch: 422627

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Butane	1020	998.0		ug/L		98	80 - 120	0	33
Ethane	527	530.8		ug/L		101	80 - 120	0	30
Methane	287	287.4		ug/L		100	80 - 120	1	33
Propane	771	772.8		ug/L		100	80 - 120	1	33

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Acetylene (Surr)	96		62 - 124

Lab Sample ID: 490-126350-I-1 DU
 Matrix: Water
 Analysis Batch: 422627

Client Sample ID: Duplicate
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Butane	ND		ND		ug/L		NC	30
Ethane	ND		ND		ug/L		NC	30
Methane	ND		ND		ug/L		NC	30
Propane	ND		ND		ug/L		NC	30

Surrogate	DU %Recovery	DU Qualifier	Limits
Acetylene (Surr)	80		62 - 124

TestAmerica Nashville

QC Association Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 265743, 265744, 265745

TestAmerica Job ID: 490-126242-1

GC VOA

Analysis Batch: 422527

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-126242-1	265743-2017-W	Total/NA	Water	RSK-175	
490-126242-2	265744-2017-W	Total/NA	Water	RSK-175	
490-126242-3	265745-2017-W	Total/NA	Water	RSK-175	
MB 490-422627/7	Method Blank	Total/NA	Water	RSK-175	
LCS 490-422627/8	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 490-422627/9	Lab Control Sample Dup	Total/NA	Water	RSK-175	
490-126350-I-1 DU	Duplicate	Total/NA	Water	RSK-175	

Lab Chronicle

Client: Reliance Laboratories Inc
Project/Site: RSK / 265743, 265744, 265745

TestAmerica Job ID: 490-126242-1

Client Sample ID: 265743-2017-W

Lab Sample ID: 490-126242-1

Date Collected: 04/12/17 11:30

Matrix: Water

Date Received: 04/13/17 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	422627	04/17/17 11:14	AAB	TAL NSH

Client Sample ID: 265744-2017-W

Lab Sample ID: 490-126242-2

Date Collected: 04/12/17 11:30

Matrix: Water

Date Received: 04/13/17 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	422627	04/17/17 11:18	AAB	TAL NSH

Client Sample ID: 265745-2017-W

Lab Sample ID: 490-126242-3

Date Collected: 04/12/17 11:30

Matrix: Water

Date Received: 04/13/17 09:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	21 mL	21 mL	422627	04/17/17 11:23	AAB	TAL NSH

Laboratory References:

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

Method Summary

Client: Reliance Laboratories Inc
Project/Site: RSK / 265743, 265744, 265745

TestAmerica Job ID: 490-126242-1

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

Protocol References:

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

Laboratory References:

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

Accreditation/Certification Summary

Client: Reliance Laboratories Inc
Object/Site: RSK / 265743, 265744, 265745

TestAmerica Job ID: 490-126242-1

Laboratory: TestAmerica Nashville

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

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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM



490-126242 Chain of Custody

Cooler Received/Opened On 4-13-17 @ 0945

Time Samples Removed From Cooler 1621 Time Samples Placed In Storage 1710 (2 Hour Window)

1. Tracking # 3756 (last 4 digits, FedEx) Courier: FedEx
IR Gun ID 31470368 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 4.3 Degrees Celsius

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

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

If yes, how many and where:

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

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

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

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

Were these signed and dated correctly?

YES...NO...NA

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

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

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

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

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

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

b. Was there any observable headspace present in any VOA vial?

YES...NO...NA

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

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

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

b. Did the bottle labels indicate that the correct preservatives were used

YES...NO...NA

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

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

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

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

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

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

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

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

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



RELIANCE LABORATORIES, INC.

ENVIRONMENTAL ANALYSTS AND CONSULTANTS

BRIDGEPORT, WV

www.RelianceLabs.net

MARTINSBURG, WV

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

Wednesday, April 12, 2017

Loc: 490

126242

TestAmerica - Nashville
2960 Foster Creighton Drive
Nashville, TN 37204

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

Please identify as:

265743-2017-W	DATE/TIME SAMPLED: 4/12/2017 11:30
265744-2017-W	DATE/TIME SAMPLED: 4/12/2017 11:30
265745-2017-W	DATE/TIME SAMPLED: 4/12/2017 11:30

Sampled by: A. Wilson

3 DAY RUSH

PLEASE SEND RESULTS & INVOICE TO:

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

Thank You

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

Login Sample Receipt Checklist

Client: Reliance Laboratories Inc

Job Number: 490-126242-1

Login Number: 126242

List Source: TestAmerica Nashville

List Number: 1

Creator: Vest, Laura E

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

13

April 19, 2017

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

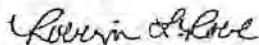
RE: Project: 265743
Pace Project No.: 30216038

Dear Ms. Miller:

Enclosed are the analytical results for sample(s) received by the laboratory on April 13, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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CERTIFICATIONS

Project: 265743
Pace Project No.: 30216038

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235

Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 265743
Pace Project No.: 30216038

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30216038001	265743-2017-W	Water	04/12/17 11:30	04/13/17 09:20
30216038002	265744-2017-W	Water	04/12/17 11:30	04/13/17 09:20
30216038003	265745-2017-W	Water	04/12/17 11:30	04/13/17 09:20

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 265743
Pace Project No.: 30216038

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30216038001	265743-2017-W	EPA 901.1	MAH	8
30216038002	265744-2017-W	EPA 901.1	MAH	8
30216038003	265745-2017-W	EPA 901.1	MAH	8

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 265743
Pace Project No.: 30216038

Method: EPA 901.1
Description: 901.1 Gamma Spec
Client: Reliance Laboratories, Inc.
Date: April 19, 2017

General Information:

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

Hold Time:

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

Method Blank:

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

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

11 percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 265743
Pace Project No.: 30216038

Sample: 265743-2017-W		Lab ID: 30216038001	Collected: 04/12/17 11:30	Received: 04/13/17 09:20	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Bismuth-212	EPA 901.1	327.610 ± 132.230 (123.400) C:NA T:NA	pCi/L	04/17/17 15:26	14913-49-6	
Bismuth-214	EPA 901.1	700.010 ± 82.638 (23.440) C:NA T:NA	pCi/L	04/17/17 15:26	14733-03-0	
Lead-212	EPA 901.1	68.421 ± 15.874 (20.090) C:NA T:NA	pCi/L	04/17/17 15:26	15092-94-1	
Lead-214	EPA 901.1	663.130 ± 79.557 (25.140) C:NA T:NA	pCi/L	04/17/17 15:26	15067-28-4	
Potassium-40	EPA 901.1	799.020 ± 145.850 (87.120) C:NA T:NA	pCi/L	04/17/17 15:26	13966-00-2	
Radium-226	EPA 901.1	1707.900 ± 365.970 (317.300) C:NA T:NA	pCi/L	04/17/17 15:26	13982-63-3	
Radium-228	EPA 901.1	949.540 ± 112.330 (38.070) C:NA T:NA	pCi/L	04/17/17 15:26	15262-20-1	
Thallium-208	EPA 901.1	34.798 ± 11.241 (9.934) C:NA T:NA	pCi/L	04/17/17 15:26	14913-50-9	

Sample: 265744-2017-W		Lab ID: 30216038002	Collected: 04/12/17 11:30	Received: 04/13/17 09:20	Matrix: Water	
VS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Bismuth-212	EPA 901.1	175.570 ± 263.500 (286.400) C:NA T:NA	pCi/L	04/17/17 15:27	14913-49-6	
Bismuth-214	EPA 901.1	1131.200 ± 136.550 (40.350) C:NA T:NA	pCi/L	04/17/17 15:27	14733-03-0	
Lead-212	EPA 901.1	33.941 ± 22.117 (34.830) C:NA T:NA	pCi/L	04/17/17 15:27	15092-94-1	
Lead-214	EPA 901.1	999.290 ± 123.980 (42.150) C:NA T:NA	pCi/L	04/17/17 15:27	15067-28-4	
Potassium-40	EPA 901.1	2450.300 ± 367.940 (146.900) C:NA T:NA	pCi/L	04/17/17 15:27	13966-00-2	
Radium-226	EPA 901.1	3655.400 ± 668.800 (496.800) C:NA T:NA	pCi/L	04/17/17 15:27	13982-63-3	
Radium-228	EPA 901.1	1592.900 ± 189.230 (74.450) C:NA T:NA	pCi/L	04/17/17 15:27	15262-20-1	
Thallium-208	EPA 901.1	15.320 ± 20.399 (22.260) C:NA T:NA	pCi/L	04/17/17 15:27	14913-50-9	

Sample: 265745-2017-W		Lab ID: 30216038003	Collected: 04/12/17 11:30	Received: 04/13/17 09:20	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Bismuth-212	EPA 901.1	403.510 ± 194.930 (188.800) C:NA T:NA	pCi/L	04/18/17 11:27	14913-49-6	
Bismuth-214	EPA 901.1	1907.300 ± 209.730 (34.160) C:NA T:NA	pCi/L	04/18/17 11:27	14733-03-0	
Lead-212	EPA 901.1	131.490 ± 24.734 (29.610) C:NA T:NA	pCi/L	04/18/17 11:27	15092-94-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 265743
Pace Project No.: 30216038

Sample: 265745-2017-W Lab ID: 30216038003 Collected: 04/12/17 11:30 Received: 04/13/17 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Lead-214	EPA 901.1	1704.900 ± 189.800 (37,460) C:NA T:NA	pCi/L	04/18/17 11:27	15067-28-4	
Potassium-40	EPA 901.1	1318.000 ± 209.980 (113.900) C:NA T:NA	pCi/L	04/18/17 11:27	13966-00-2	
Radium-226	EPA 901.1	7002.700 ± 867.150 (423,200) C:NA T:NA	pCi/L	04/18/17 11:27	13982-63-3	
Radium-228	EPA 901.1	2456.700 ± 276.420 (54,680) C:NA T:NA	pCi/L	04/18/17 11:27	15262-20-1	
Thallium-208	EPA 901.1	31.429 ± 14.206 (14,640) C:NA T:NA	pCi/L	04/18/17 11:27	14913-50-9	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 265743
Pace Project No.: 30216038

QC Batch: 255497 Analysis Method: EPA 901.1
QC Batch Method: EPA 901.1 Analysis Description: 901.1 Gamma Spec
Associated Lab Samples: 30216038001, 30216038002, 30216038003

METHOD BLANK: 1258651 Matrix: Water
Associated Lab Samples: 30216038001, 30216038002, 30216038003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Bismuth-212	0.000 ± 15.492 (71.680) C:NA T:NA	pCi/L	04/17/17 12:10	
Bismuth-214	6.097 ± 5.947 (12.140) C:NA T:NA	pCi/L	04/17/17 12:10	
Lead-212	2.314 ± 7.344 (8.978) C:NA T:NA	pCi/L	04/17/17 12:10	
Lead-214	0.000 ± 4.170 (10.510) C:NA T:NA	pCi/L	04/17/17 12:10	
Potassium-40	10.855 ± 44.170 (54.910) C:NA T:NA	pCi/L	04/17/17 12:10	
Radium-226	0.000 ± 63.151 (129.200) C:NA T:NA	pCi/L	04/17/17 12:10	
Radium-228	0.000 ± 3.671 (23.390) C:NA T:NA	pCi/L	04/17/17 12:10	
Thallium-208	1.081 ± 3.881 (4.683) C:NA T:NA	pCi/L	04/17/17 12:10	

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 265743
Pace Project No.: 30216038

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Act - Activity

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

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

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CHAIN OF CUSTODY RECORD

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

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

67622 10354 00

*CLIENT NAME Reliance Laboratories

*ADDRESS _____

CUSTOMER # _____ *TEL. # _____ FAX # _____

*SAMPLER (S) A Wilson E-MAIL _____

SHEET NO. 1 OF 1

*PROJECT/REMARKS

[illegible]

WO#: 30216038



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

REMARKS:

PWS# _____

*RELINQUISHED BY: PRINT: C. Grant SIGN:	*DATE/TIME DATE: 4/12/2017 TIME: 13:53	*RECEIVED BY: PRINT: FedEx SIGN:
*RELINQUISHED BY: PRINT: FedEx SIGN:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: Kellyn R. Buchanan SIGN: 4/13/17
*RELINQUISHED BY: PRINT: Paycom SIGN:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: Paycom SIGN: 4/13/17
*COURIER: TRACKING #:	*DATE/TIME DATE: TIME:	*RECEIVED BY: PRINT: SIGN:

WEATHER/TEMPERATURE:

EXPURSH STATUS (INITIAL ACCEPTANCE EG) 3 May
*** ADDITIONAL LABORATORY FEES MAY APPLY ***

EXTENT OF LIABILITY

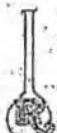
SHOULD RELIANCE LABORATORIES, INC. BE AT FAULT AND ANY DISPUTE ARISE REGARDING ANALYTICAL DATA GENERATED BY THE LABORATORY, THE EXTENT OF THE LIABILITY TO RELIANCE WILL BE DUPLICATE ANALYSIS OF THAT SAMPLE (PROVIDING ADEQUATE SAMPLE REMAINS) OR CORRECTION OF THE ANALYTICAL FEE. IN NO EVENT WILL RELIANCE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

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

TO BE COMPLETED BY CLIENT

ORIGINAL CHAIN OF CUSTODY DOCUMENT MUST BE EXECUTED IN INK

WHITE - LABORATORY YELLOW - CLIENT



RELIANCE LABORATORIES, INC.

ENVIRONMENTAL ANALYSTS AND CONSULTANTS

30216038

BRIDGEPORT, WV

www.RelianceLabs.net

MARTINSBURG, WV

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

Wednesday, April 12, 2017

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

Please analyze the following sample for: NORM

Please identify as:

265743-2017-W

Date/Time Sampled: 4/12/2017 11:30

265744-2017-W

Date/Time Sampled: 4/12/2017 11:30

265745-2017-W

Date/Time Sampled: 4/12/2017 11:30

Sampled by: A. Wilson

*****3 DAY RUSH*****

PLEASE SEND RESULTS & INVOICE TO:

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

Thank You

Sample Condition Upon Receipt Pittsburgh

RTB

Client Name: RelianceProject # 30216038Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____Tracking #: 778889239405Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals Intact: ☐ yes ☐ noThermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: ARM 4/13/17

Comments:

Yes No N/A

Chain of Custody Present:	☒	☐	☐	1.
Chain of Custody Filled Out:	☒	☐	☐	2.
Chain of Custody Relinquished:	☒	☐	☐	3.
Sampler Name & Signature on COC:	☒	☐	☐	4.
Sample Labels match COC:	☒	☐	☐	5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	☒	☐	☐	6.
Short Hold Time Analysis (<72hr remaining):	☒	☐	☐	7.
Rush Turn Around Time Requested:	☒	☐	☐	8.
Sufficient Volume:	☒	☐	☐	9.
Correct Containers Used:	☒	☐	☐	10.
-Pace Containers Used:	☒	☐	☐	
Containers Intact:	☒	☐	☐	11.
Orthophosphate field filtered	☐	☐	☒	12.
Organic Samples checked for dechlorination:	☒	☐	☐	13.
Filtered volume received for Dissolved tests	☒	☐	☐	14.
All containers have been checked for preservation.	☒	☐	☐	15.
All containers needing preservation are found to be in compliance with EPA recommendation.	☒	☐	☐	<u>PHL2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				
				Initial when completed <u>ARM</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):	☐	☐	☒	16.
Trip Blank Present:	☐	☐	☒	17.
Trip Blank Custody Seals Present	☐	☐	☒	
Rad Aqueous Samples Screened > 0.5 mrem/hr	☒	☐	☐	Initial when completed: <u>ARM</u> Date: <u>4/10/17</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

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

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

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



CLEARWATER

Engineered Chemistry

Material Safety Data Sheet
ALPHA 3207

HEALTH	2
FLAMMABILITY	4
REACTIVITY	0
PERSONAL PROTECTION	G

24 hr. Emergency Contact (CHEMTREC) US Tel: 1-800-424-9300 - Int'l. Tel. 703-527-3887

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

SUPPLIER: CLEARWATER INTERNATIONAL L.L.C.
515 POST OAK BLVD., SUITE 600
HOUSTON, TX 77027

MANUFACTURER: CLEARWATER INTERNATIONAL L.L.C.
4420 SOUTH FLORES RD
ELMENDORF, TEXAS 78112

PRODUCT NAME: ALPHA 3207
PRODUCT CODE: XFP0477B
PRODUCT USE/CLASS: CORROSION INHIBITOR

MSDS REVISION DATE: 06/15/04

PREPARER: MJW

PHONE: 724-318-1050

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	EXPOSURE LIMITS	CAS#	% BY WEIGHT
ISOPROPANOL	ACGIH TLV - 400 ppm TWA, 500 ppm STEL OSHA PEL - 400 ppm TWA	67-63-0	10-30 %

3. HAZARD IDENTIFICATION

EYE: Liquid, aerosols and vapors of this product may be irritating and can cause pain, tearing, reddening and swelling accompanied by a stinging sensation and/or a feeling like that of fine dust in the eyes.

SKIN: May cause skin irritation. Allergic reactions are possible.

INGESTION: This material may be harmful if swallowed. May be irritating to mouth, throat, and stomach.

INHALATION: Prolonged inhalation may be harmful and can cause headaches, dizziness, nausea, anesthesia, narcosis, decreased blood pressure, changes in heart rate and cyanosis. May be irritating to mucous membranes and lung tissue.

CHRONIC INFORMATION: None Known

PRIMARY ROUTE(S) OF ENTRY: Inhalation, Ingestion

4. FIRST-AID MEASURES

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Get medical attention, if irritation persists.

SKIN CONTACT: Wash with soap and water. Get medical attention if irritation develops or persists.

INHALATION: Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

INGESTION: Place victim on left side with head down to prevent aspiration into lungs. Induce vomiting as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately.

5. FIRE FIGHTING MEASURES

FLASH POINT: 70 F
(TAGLIABUE CLOSED CUP)

LOWER EXPLOSIVE LIMIT: N.D.
UPPER EXPLOSIVE LIMIT: N.D.

Material Safety Data Sheet

ALPHA 3207

AUTOIGNITION TEMPERATURE: N.D.

EXTINGUISHING MEDIA: ALCOHOL FOAM CO2 DRY CHEMICAL

UNUSUAL FIRE AND EXPLOSION HAZARDS: Can release vapors that form explosive mixtures at temperatures at or above the flash point. Empty containers retain product residue (liquid and/or vapor) and can be dangerous.

SPECIAL FIRE FIGHTING PROCEDURES: Containers can build up pressure if exposed to heat (fire). As in any fire, wear a self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent) and full protective gear. Apply alcohol-type foam or all purpose foam by manufacturers recommended techniques for large fires. Use carbon dioxide or dry chemical for small fires. Use water spray to keep containers cool.

5. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Extinguish any possible ignition source until the area is determined to be free from fire or explosion hazard. Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. (See exposure controls / personal protection section) Spilled material should be disposed of according to applicable regulations.

7. HANDLING AND STORAGE

HANDLING: Handle all chemicals with care. Ground and bond containers when transferring materials.

STORAGE: Keep away from heat, sparks, and flames. Keep container closed when not in use. Store in a cool, dry, well ventilated place away from incompatible materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Local exhaust ventilation may be necessary to control any air contaminants to within their exposure limits.

RESPIRATORY PROTECTION: No protection needed under normal use and conditions. Use a NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge when airborne concentrations are expected to exceed exposure limits. Protection by air purifying respirators is limited.

SKIN PROTECTION: When contact is likely wear chemical resistant gloves and boots.

EYE PROTECTION: Wear safety glasses with side shields or goggles.

OTHER PROTECTIVE EQUIPMENT: Emergency eye wash stations and deluge showers should be available in the work area.

HYGIENIC PRACTICES: Wash hands before eating. Use only with adequate ventilation. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Dark amber

ODOR: St alcohol

BOILING POINT (RANGE): N.D.

FREEZE POINT: N.D.

VAPOR DENSITY: Heavier than air

VAPOR PRESSURE: N.D.

PHYSICAL STATE: Liquid

SOLUBILITY IN WATER: Soluble

PH (AS IS): 4.5-6.0

SPECIFIC GRAVITY: 0.94-1.00

10. STABILITY AND REACTIVITY DATA

CONDITIONS TO AVOID: Avoid temperature extremes. Excessive heat causes the vapor pressure to increase rapidly.

Material Safety Data Sheet
ALPHA 3207

INCOMPATIBILITY: Avoid contact with strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of carbon and nitrogen.

HAZARDOUS POLYMERIZATION: Will not occur under normal use and storage conditions.

CHEMICAL STABILITY: This product is stable under normal storage conditions.

11. TOXICOLOGICAL INFORMATION

ORAL: No product information is available.

DERMAL: No product information is available.

INHALATION: No product information is available.

12. ECOLOGICAL INFORMATION

ECOTOXICITY: No product information is available.

CHEMICAL FATE INFORMATION: No product information is available.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Consult local, state, or federal regulatory agencies for acceptable disposal procedures and disposal locations. Disposal in streams or sewers may be prohibited by federal, state, and local regulations.

RCRA STATUS: D001 - Characteristic of ignitability

14. TRANSPORTATION INFORMATION

(NON-BULK SHIPMENTS)

D.O.T. PROPER SHIPPING NAME: Isopropanol Solution

D.O.T. TECHNICAL NAME:

D.O.T. HAZARD CLASS: 3

HAZARD SUBCLASS: N/A

D.O.T. UN NUMBER: UN1219

PACKING GROUP: II

RESP. GUIDE PAGE: 129

(BULK SHIPMENTS)

D.O.T. PROPER SHIPPING NAME: Isopropanol Solution

D.O.T. TECHNICAL NAME:

D.O.T. HAZARD CLASS: 3

HAZARD SUBCLASS: N/A

D.O.T. UN NUMBER: UN1219

PACKING GROUP: II

RESP. GUIDE PAGE: 129

T.D.G. PROPER SHIPPING NAME: Isopropanol Solution

T.D.G. TECHNICAL NAME:

T.D.G. HAZARD CLASS: 3

HAZARD SUBCLASS: N/A

T.D.G. UN NUMBER: UN1219

PACKING GROUP: II

RESP. GUIDE PAGE: 129

IMDG PROPER SHIPPING NAME: Isopropanol Solution

IMDG TECHNICAL NAME:

IMDG HAZARD CLASS: 3.2

HAZARD SUBCLASS: N/A

IMDG UN NUMBER: UN1219

PACKING GROUP: II

EmS No: F-E, S-C

15. REGULATORY INFORMATION

CERCLA - SARA HAZARD CATEGORY:

Material Safety Data Sheet

ALPHA 3207

SECTION 311/312: This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

IMMEDIATE HEALTH HAZARD FIRE HAZARD

SARA SECTION 313: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

COMPONENT	CAS#	% BY WEIGHT
-----------	------	-------------

TSCA STATUS:

All components of this product are listed on the Toxic Substance Control Act Inventory or are excluded from the listing requirements.

INTERNATIONAL REGULATIONS:

CANADIAN WHMIS: This MSDS has been prepared in compliance with Controlled Product Regulations except for the use of the 16 headings.

CANADIAN WHMIS CLASS: B-2, D-2B

CANADIAN ENVIRONMENTAL PROTECTION ACT:

All components of this product are listed on the Canadian Domestic Substance List (DSL).

SECTION 16 OTHER INFORMATION

HMIS RATING - HEALTH: 2 FLAMMABILITY: 4 REACTIVITY: 0 PERSONAL PROTECTIVE RATING: G

LEGEND: N.A. - NOT APPLICABLE, N.E. - NOT ESTABLISHED, N.D. - NOT DETERMINED

THIS PRODUCT'S HEALTH AND SAFETY INFORMATION IS PROVIDED TO ASSIST OUR CUSTOMERS IN ASSESSING COMPLIANCE WITH HEALTH, SAFETY AND ENVIRONMENTAL REGULATIONS. THE INFORMATION CONTAINED HEREIN IS BASED ON DATA AVAILABLE TO US, AND IS BELIEVED TO BE ACCURATE, ALTHOUGH NO GUARANTEE OR WARRANTY IS PROVIDED OR IMPLIED BY THE COMPANY IN THIS RESPECT. SINCE THE USE OF THIS PRODUCT IS WITHIN THE EXCLUSIVE CONTROL OF THE USER, IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE CONDITIONS OF SAFE USE. SUCH CONDITIONS MUST COMPLY WITH ALL GOVERNMENTAL REGULATIONS.

ATTACHMENT "I"
Formation Testing Program

ATTACHMENT “J”
Stimulation Program



December 7, 2015

Mr. Marc Jacobs, Jr.
Senior Vice President
Penneco
6608 Route 22
Delmont, PA 15626

Re: Sedat #3A (Murrysville) – Reservoir and Fracture Characterization

Dear Marc,

The following summarizes the reservoir and fracture characterization for the Murrysville formation in the Sedat #3A located in Plum Borough, Allegheny County, Pennsylvania.

A series of tests were designed and conducted at the Sedat #3A to gain a better understanding of the reservoir and fracture characteristics of the Murrysville formation which underlies a sizeable portion of Penneco's proximate lease acreage.

The tests were comprised of (1) formation breakdown, (2) DFIT (diagnostic fluid injection test) to determine closure stress, reservoir pressure, and reservoir transmissibility (kH/mu), (3) Step Rate to determine the fracture extension pressure, and (4) Rate Stepdown to determine the near wellbore friction which includes perforation friction and friction caused by near wellbore tortuosity.

Table 1 shows the timeline of the work performed on the Sedat #3A.

Several high level observations from the work performed was that (1) the well goes on vacuum very quickly after injection stops (i.e., pressure goes to zero on the surface) and (2) the surface treating pressures were excessively high given the depth of the well and the closure stress.

On September 1, 2015 a DFIT was pumped to determine the closure stress, reservoir pressure, and reservoir transmissibility (kH/mu). The DFIT was pumped at 4 bpm for 1500 gals. Bottomhole pressure was recorded with a bottomhole gauge set 1910 ft. The results from the DFIT using the Nolte G function gave a bottomhole closure stress of 553 psi which gives a closure stress gradient of 0.29 psi/ft.

The pressure decline data after closure (ACA) was analyzed with the Nolte FR function to determine reservoir transmissibility. Based on the pressure response it appears that pseudoradial flow was reached. The reservoir transmissibility was 88 mD-ft/cP assuming a reservoir fluid viscosity of 1 cP. The actual results will vary based on the actual reservoir fluid viscosity. The formation capacity (kH) was 88 mD-ft. Assuming a height of 50 ft gives a reservoir permeability of 1.8 mD.

Following the DFIT, an attempt was made on September 29, 2015 to breakdown additional perforations with 500 gals of 15 percent HCL acid and small concentrations of sand pumped in a 20 lb/1000 gal linear gel. The surface pressure was reduced when the acid entered the perforations but quickly increased as low concentration (0.25 lb/gal) of 40/70 sand entered the perforations. The sand was cut and the well flushed.

On October 1, 2015 a Step Rate was pumped to determine the fracture extension pressure. The initial rate was 0.25 bpm and increased to 1.0 bpm in increments of 0.25 bpm. The rate was then increased to 4 bpm in increments of 0.50 bpm. The injection time for each rate was four hours.

The results from the Step Rate gave a fracture extension pressure of 1.70 psi/ft which is abnormally high and cannot be used for formation evaluation. The cause of the excessively high fracture extension pressure was near wellbore friction comprised of perforation friction and friction caused by tortuosity (i.e., a poor connection between the wellbore and the created hydraulic fracture).

Based on the results from the Step Rate another attempt was made to reduce the near wellbore friction with additional acid and higher injection rates. On November 17, 2015 several injections were performed to reduce near wellbore friction. The first injection consisted of 1500 gals 7.5 percent HCl acid and the second injection used 750 gals 15 percent HCl acid. Following the second acid injection the injection rate was 26 bpm and the surface pressure was 2980 psi.

A Stepdown was performed after the second acid injection to quantify the amount of near wellbore friction and break out the perforation friction and friction caused by tortuosity. Perforation friction varies with the flow rate squared and tortuosity varies with the square root of the flow rate. The results from the Stepdown show a total near wellbore friction of 2011 psi at 26 bpm of which 1300 psi is perforation friction and 711 psi is friction caused by tortuosity. The number of open perforations was 5 assuming a discharge coefficient of 0.60.

The perforation efficiency is very low with only 5 out of 41 perforations open.

The ISIP at the end of the last injection was 1446 psi giving a F.G (fracture gradient) of 1.23 psi/ft suggesting a possible horizontal component to the created fracture. The high fracture gradient could also be the result of near to mid-field fracture complexity. As with the other injections the surface pressure quickly fell to zero. This rapid pressure decrease following the rate shutdown is a common response for mid-field fracture complexity (i.e., restriction away from the wellbore).

The results from the tests on the Sedat #3A are shown in Table 2.

In summary the Murrys ville formation in the Sedat #3A is characterized by low reservoir pressure, 232 psi, low closure stress, 0.29 psi/ft., and higher than anticipated pumping pressures because of complex near or mid-field fracture complexity. Low perforation efficiency also contributed to the higher than expected pumping pressures.

Thank you for the opportunity to work on the Sedat #3A project with Penneco. If you have any questions or comments let me know.

Sincerely,

Henry Jacot
H-Frac Consulting Services, LLC

Table 1 – Timeline

Activity	Date
Perforate	August 7, 2015
Spot Acid and Pull Tubing	August 28, 2015
Break Formation and Pump DFIT	September 1, 2015
Perforation Cleanup	September 29, 2015
Step Rate	October 1, 2015
Perforation Breakdown	November 17, 2015

Table 2 - Results

Parameter	Value
Breakdown Pressure	3115 psi
Bottomhole Closure Stress	553 psi
Closure Stress Gradient	0.29 psi/ft
Surface ISIP	1446 psi
Fracture Gradient	1.23 psi/ft
Reservoir Pressure	232 psi
Reservoir Transmissibility (kH/mu)	88 mD-ft/cP
Formation Capacity (kH)	88 mD-ft
Reservoir Permeability	1.8 mD
Fracture Extension Pressure	N/A

PENNECO
SEDAT #3A
PLUM BOROUGH
ALLEGHENY COUNTY, PA

December 7, 2015



TEST OBJECTIVES

- ✓ Formation Breakdown Pressure
- ✓ Closure Stress
- ✓ Fracture Gradient (F.G.)
- ✓ Reservoir Pressure
- ✓ Reservoir Transmissibility (kH/mu)
- ~~x Fracture Extension Pressure~~



TIME LINE

Activity	Date
Perforate	August 7, 2015
Spot Acid and Pull Tubing	August 28, 2015
Break Formation/Pump DFIT	September 1, 2015
Perforation Cleanup	September 29, 2015
Step Rate	October 1, 2015
Perforation Breakdown	November 17, 2015



TEST RESULTS

Parameter	Value
Breakdown Pressure	3115 psi
Closure Stress	553 psi
Closure Stress Gradient	0.29 psi/ft
ISIP	1446 psi
Fracture Gradient	1.23 psi/ft
Reservoir Pressure	232 psi
Reservoir Transmissibility (kH/mu)	88 mD-ft/cP
Formation Capacity (kH)	88 mD-ft
Reservoir Permeability	1.8 mD
Fracture Extension Pressure	N/A

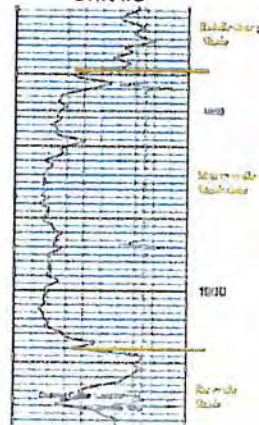


MURRYSVILLE LOGS

Sedat #3A



Snyder
Unit #3

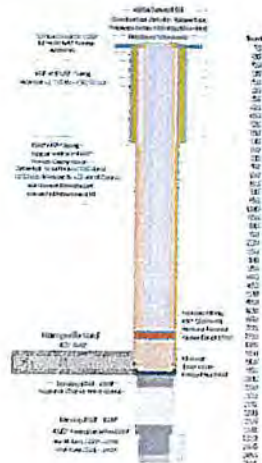


Watt #3



Murrysville type logs.

SEDAT #3A **WELLBORE SCHEMATIC**



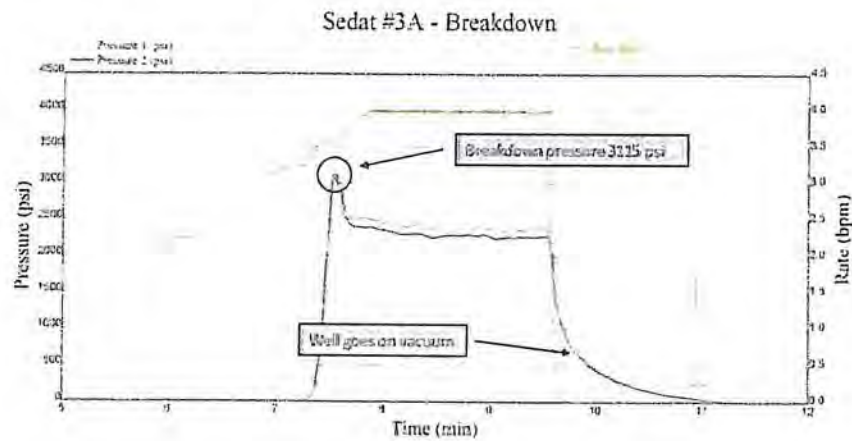
PERFORATION DATA

Description	Value
Entry Hole Diameter	0.58"
Phasing	60 degree
Type	EHC
Charge	25 grams
Depth	1896 ft to 1939 ft
Perforations	41 ea



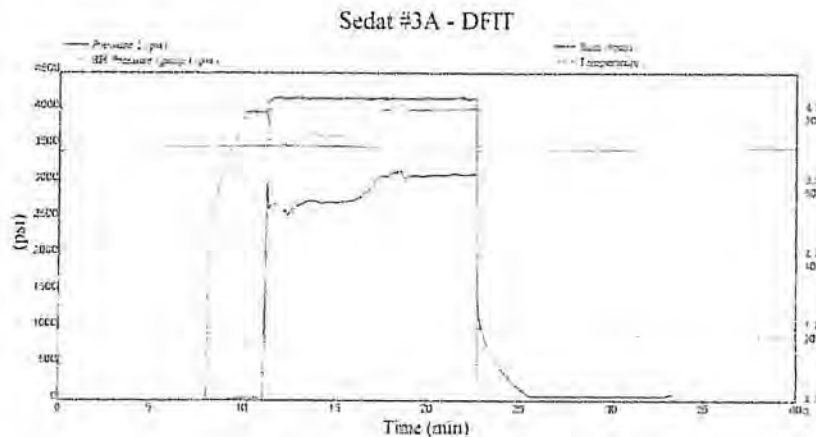
The Sedat #3A was perforated in the Murrysville from 1896 ft to 1939 ft with 41 0.58 in entry hole perforations. Perforation phasing was 60 degrees and the charge was 25 grams.

SEDAT #3A BREAKDOWN



The Murrys ville formation in the Sedat #3A was broke down on September 1, 2015. The breakdown pressure was 3115 psi. Following the breakdown the acid was displaced at 4 bpm The well was on vacuum after shutdown with the pressure decreasing to zero in less than two minutes.

SEDAT #3A DFIT DATA

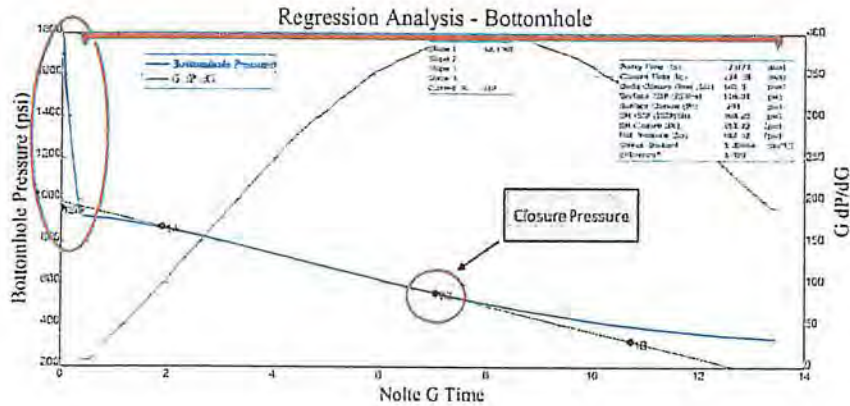


Following the formation breakdown a DFIT (diagnostic fluid injection test) was pumped in the Murrysville to determine closure stress, reservoir pressure, and reservoir transmissibility (kh/mu). Prior to starting the DFIT the whole was loaded with water. After the hole was loaded 1500 gals of water was pumped at 4.1 bpm. The average surface treating pressure was 2902 psi and the average bottomhole treating pressure was 3816 psi.

During the injection the surface pressure increased from 2700 psi to 3100 psi with a constant rate indication some type of restriction.

After the rate went to zero the surface pressure declined rapidly and went to zero. The bottomhole pressure was recorded with a bottomhole pressure gauge at 1910 ft.

SEDAT #3A
NOLTE G FUNCTION



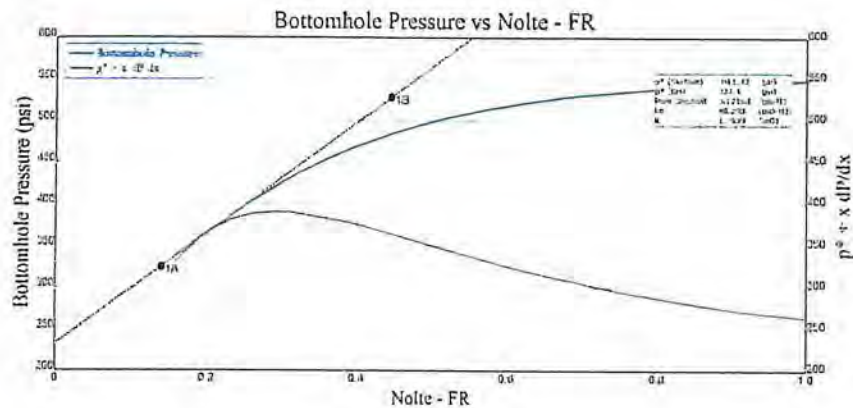
The bottomhole pressure from the DFIT was analyzed with the Nolte G function to determine the closure pressure and closure stress gradient.

Following the injection the pressure declined rapidly. The rapid pressure decline is most likely caused by fracture complexity and low closure stress and not leakoff into the formation.

The estimated bottomhole ISIP is 960 psi resulting in a fracture gradient of 0.50 psi/ft.

Closure occurred at a Nolte G time of 7.2 giving a bottomhole closure of 553 psi. The closure stress gradient is 0.29 psi. The net pressure was 407 psi and the fluid efficiency was 79 percent.

SEDAT #3A AFTER CLOSURE ANALYSIS

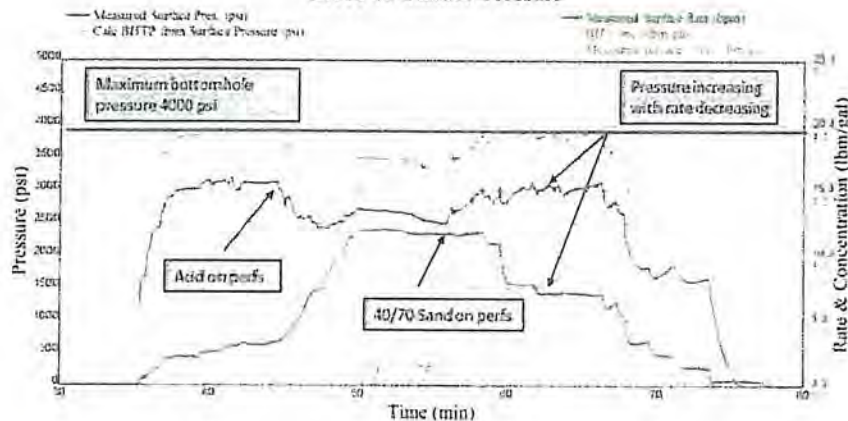


The bottomhole pressure after closure was analyzed using the Nolte FR function. If the late time data reaches pseudoradial flow estimates of reservoir transmissibility (kh/ μ) and reservoir pressure can be determined.

The results from the Nolte FR function show that pseudoradial flow was reached. P^* was 232 psi. The formation capacity (kH) was 88 mD-ft assuming a reservoir fluid viscosity of 1 cP. Using a formation height of 50 ft the reservoir permeability is 1.8 mD.

SEDAT #3A PERFORATION CLEANUP

BHTP & Surface Pressure



On September 29, 2015 an attempt was made to remove excess friction seen on the DFIT. 500 gals of 15% HCL was pumped. A decrease on the surface treating pressure was seen when the acid was on the perforations. The surface pressure decreased and the injection rate was increased to 12 bpm. The surface pressure continued to decrease to 2500 psi.

Low concentration (0.25 lb/gal) of 40/70 sand was pumped in an effort to remove the excess friction. The surface pressure initially decreased with the 40/70 sand on the perforations but increased rapidly to over 3000 psi on the surface. The maximum pressure on the packer was 4000 psi so the injection was decreased to 11 bpm then to 7 bpm.

The calculated bottomhole pressure remained close to 4000 psi and was erratic.

The rate was reduced and the pressure declined to zero in less than two minutes.

SEDAT #3A STEP RATE TEST

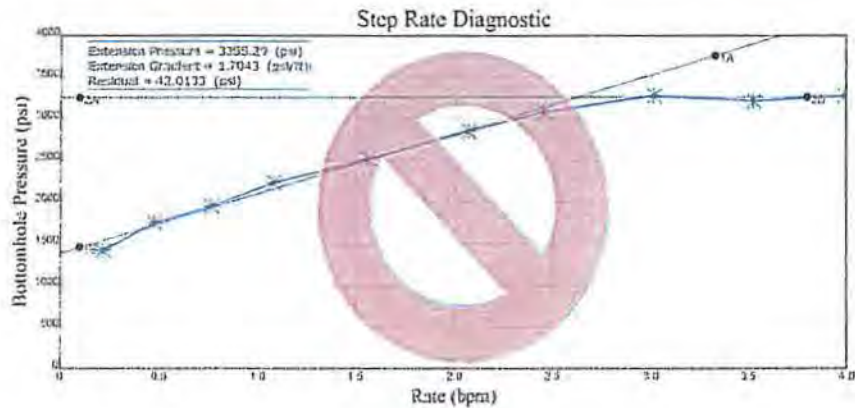


A Step Rate Test was pumped on October 1, 2015 to determine the fracture extension pressure. The initial rate was 0.25 bpm and increased in 0.25 bpm increments until 1 bpm where it was increased to 4 bpm in 0.5 bpm increments. Injection period for each rate stage was 4 hours.

Following the rate increases the rate was decreased from 4 bpm in 1 bpm increments until the rate reached zero.

Total injected volume was 4292 bbls.

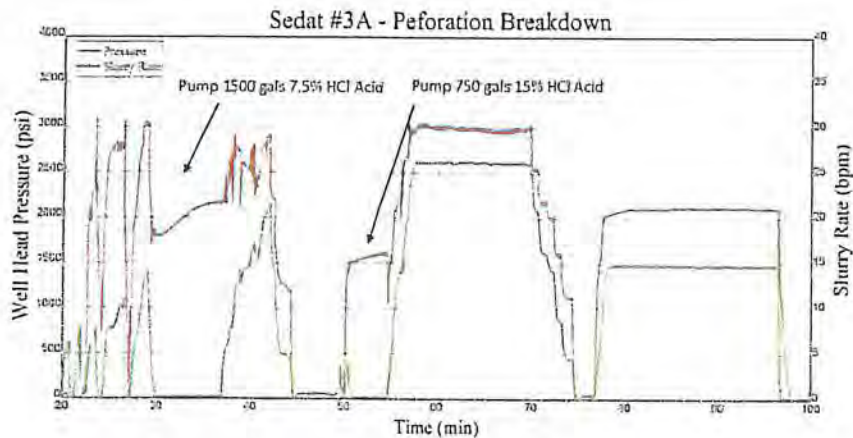
SEDAT #3A STEP RATE



Analysis of the Step Rate gave a fracture extension pressure of 3255 psi and fracture extension gradient of 1.70 psi/ft. This high of extension pressure gradient is unrealistic and cannot be used.

The high fracture extension pressure gradient is a result of excess near wellbore friction as evidenced by the sudden pressure increase with each rate increase (slide 13).

SEDAT #3A PERFORATION BREAKDOWN



On November 17, 2015 additional acid was pumped in an attempt to breakdown additional perforations and remove excess near wellbore friction to establish better communication between the wellbore and created hydraulic fracture.

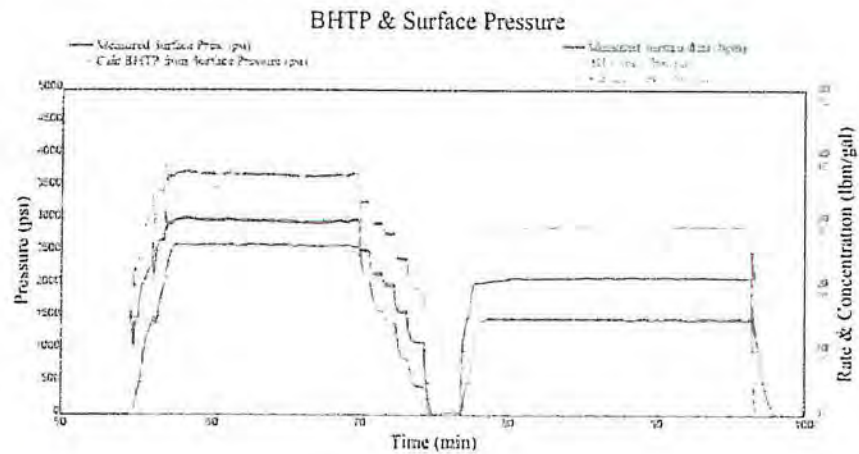
The first acid injection consisted of 1500 gals 7.5% HCl and the second acid injection was 750 gals 15% HCl acid.

Following the acid injections the maximum rate was 26 bpm at an average surface pressure of 2980 psi.

A rate stepdown was performed at the end of the acid breakdown. An additional injection was pumped at 15 bpm to establish an ISIP.

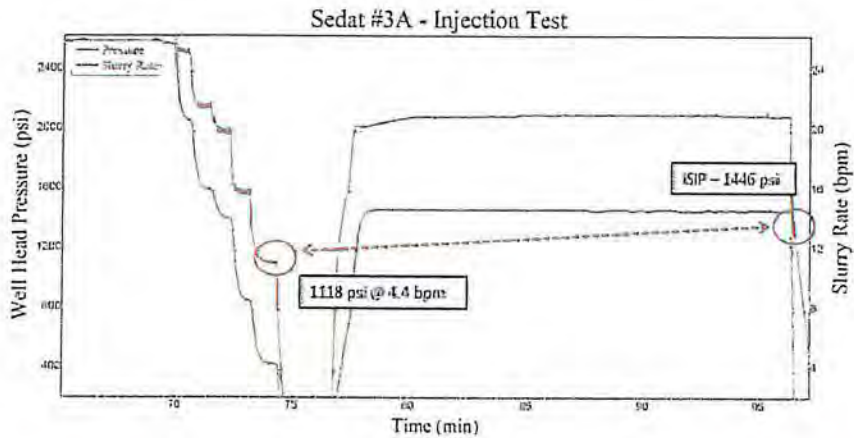
The ISIP was 1441 psi.

SEDAT #3A SURFACE & CALC'D BH PRESSURE



This plot shows the calculated bottomhole pressure from the acid breakdown.

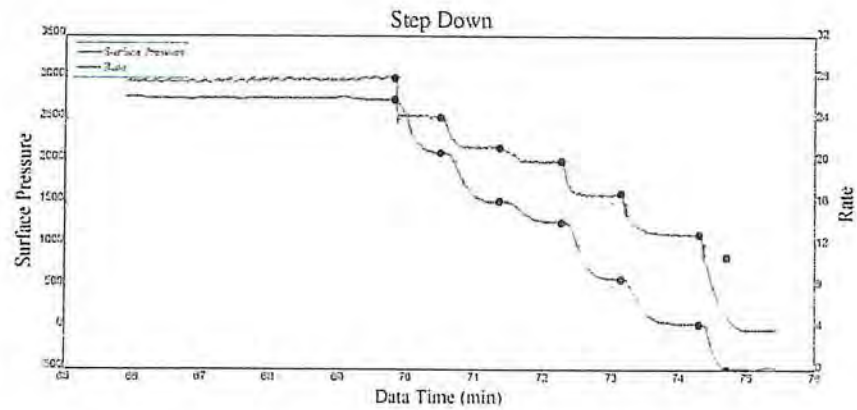
SEDAT #3A INJECTION TEST (ZOOMED)



This plot zooms in on the rate stepdown and final injection. The final rate on the stepdown was 4.4 bpm and the pressure was 1118 psi. The final ISIP was 1446 psi giving a fracture gradient of 1.23 psi/ft

This high of fracture gradient may be caused by either a horizontal fracture or excess fracture complexity.

SEDAT #3A STEPPDOWN POINT SELECTION



A Stepdown Analysis was conducted to determine the cause of the excess near wellbore friction.

SEDAT #3A
STEPDOWN TABLE

Category	Value	Unit
Weight	70.5	kg
Current body fat (%)	15	%
Number of repetitions	5	
Repetition (average) coefficient	1.5	
Performance factor	1.25	%

Time (min)	Rate (rpm)	Surface Distance (m)	Energy Intensity (kcal)	SP Time (min)	SP Rate (rpm)	Change SP Rate - SP Time (min)	SP Total km	SP Total kcal	SP Total rpm	Adjusted Number of Days
1	75.2	100	500	0	0	0	0	0	0	0
2	75.2	100	500	0	0	0	0	0	0	0
3	75.2	100	500	0	0	0	0	0	0	0
4	75.2	100	500	0	0	0	0	0	0	0
5	75.2	100	500	0	0	0	0	0	0	0
6	75.2	100	500	0	0	0	0	0	0	0
7	75.2	100	500	0	0	0	0	0	0	0
8	75.2	100	500	0	0	0	0	0	0	0
9	75.2	100	500	0	0	0	0	0	0	0
10	75.2	100	500	0	0	0	0	0	0	0

Performance

Time: 75.2 min

Rate: 75.2 rpm

Surface Distance: 100 m

Energy Intensity: 500 kcal

SP Time: 0 min

SP Rate: 0 rpm

Change SP Rate - SP Time: 0 min

SP Total km: 0 km

SP Total kcal: 0 kcal

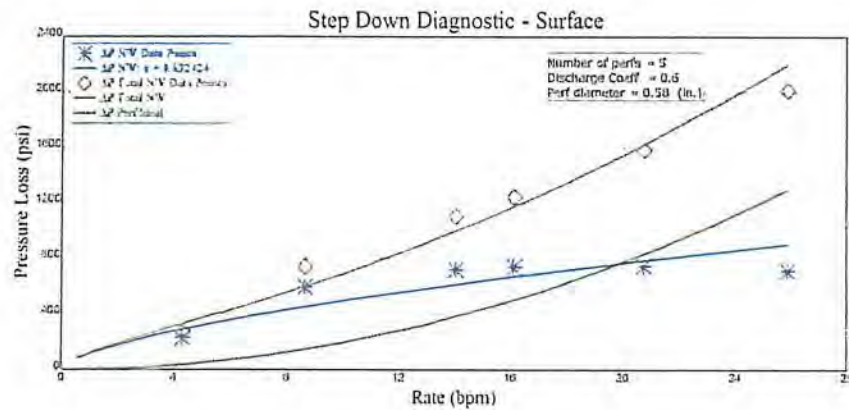
SP Total rpm: 0 rpm

Adjusted Number of Days: 0 days



Stepdown Table showing the point selection and friction values.

SEDAT #3A STEPPDOWN ANALYSIS



The Stepdown Analysis gives a total near wellbore friction of 2011 psi at 26 bpm. Of which 1300 psi is perforation friction and 711 is near wellbore tortuosity. The resulting number of perforations is 5 assuming a discharge coefficient of 0.60.

SEDAT #3A SUMMARY

- A series of injections were pumped on the Sedat #3A to determine closure stress, fracture gradient, reservoir pressure, reservoir transmissibility (permeability), and breakdown pressure.
- During the injection tests excess friction existed either because of limited number of perforations open or near wellbore fracture complexity.
- Attempts were made to reduce the excess friction with acid, higher rates, and low concentrations of 40/70 sand. Acid and higher injection rates removed some of the excess friction but the high excess pressures still existed.
- The rate stepdown analysis showed total near wellbore friction of 2000 psi comprised of 1300 psi of perforation friction and 700 psi of near wellbore tortuosity of fracture complexity.



SEDAT #3A SUMMARY (CONT.)

- The rate stepdown shows only 5 perforations open out of 41 perforations.
- After each injection the pressure quickly fell to zero at the surface because of the low closure stress of the Murrysville.
- The closure stress determined from the DFIT was 553 psi giving a closure stress gradient of 0.29 psi/ft. The Murrysville in the Sedat #3A cannot support a column of water.
- The DFIT reached pseudoradial flow. The After Closure Analysis with the Nolte FR function gave a reservoir transmissibility (kH/μ) of 88 mD-ft/cP assuming a reservoir fluid viscosity of 1 cP. Assuming a height of 50 ft the reservoir permeability is 1.76 mD.



SEDAT #3A

SUMMARY (CONT.)

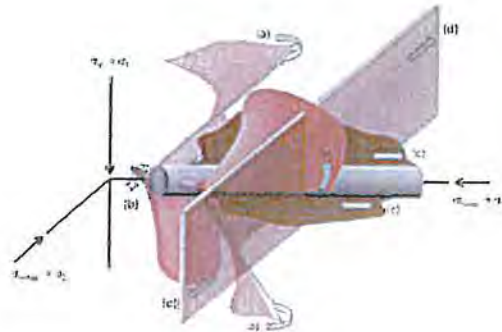
- The ISIP at the end of the last injection was 1446 psi giving a fracture gradient of 1.23 psi/ft suggesting a possible horizontal fracture. The high fracture gradient could also be the result of near or mid-field fracture complexity.



APPENDIX



COMPLEX FRACTURE PROPAGATION HORIZONTAL WELLBORE



Lacoste, D., 2008, SPE 117602-MS



AFTER CLOSURE ANALYSIS

- The reservoir transmissibility (kh/μ) can be calculated by analyzing the pressure decline data after closure; if the late time pressure data reaches pseudo-radial flow.
- Similar to a Horner analysis with the reservoir transmissibility calculated from the slope of the late time data.
- The pressure data when plotted on log-log scale will exhibit a slope of unity when pseudo-radial flow has developed.



RADIAL FLOW TIME FUNCTION

$$F_R(t, t_c) = \frac{1}{4} \ln \left(1 + \frac{\chi t_c}{t - t_c} \right)$$

where

$$\chi = 16 \pi^2$$

t_c = time to closure, min

t = time, min

F_R = radial flow function

15 April 2014



AFTER CLOSURE ANALYSIS

$$kh / \mu = 251,000 \left(\frac{V_i}{m_R t_c} \right)$$

where

k = reservoir permeability, mD

h = net pay, ft

μ = reservoir fluid viscosity, cP

V_i = volume injected, bbl

m_R = slope

t_c = time to closure, min

SLC 2007-01 (01-2007)



A.F.E #: N/A



Job Type: MISC. PUMP PTA

Cement Operator: LANCE SHIREY

Data Censored: 8/28/2015

Drilling Contractor: SERVICE RIG

Cement Slurry Information

No. of Sacks	Cement Blend Composition	Yield (ft ³ /sk)	Mix Water (gal/sk)	Density (lb/gal)	(bbl) Mix Water	(ft ³) Of Slurry	(bbl) Of Slurry
				Totals			

Wellbore Information

	New/Used	Diameter (in)	Weight (lb/ft)	Top (ft)	Bottom (ft)	Collapse/Burst Pressures (psi)		Requested TOC (ft)	SURFACE
Casing	Used	4 1/2	10.5	SURFACE	1,941			TVD (ft)	N/A
Previous Casing								Displacement Depth (ft)	
Tubing or Drillpipe	Used	1 1/2	4.6	SURFACE	1,930				
Open Hole								Displacement (bbl)	
Open Hole									

Pumping Returns

Cement Slurry Temperature Record ("F)

Fluid Information

Spacer or Gel Sweep Return Seen At Surface	Cement	Reading 1	Reading 2	Reading 3	Average	Mix Water Temp (°F)	
Cement Returns Seen at Surface	Bland 1					Displacement Fluid Type	Brine
Amount of Cement Returns (BBL)	Blend 2					Displacement Fluid Temp (°F)	
	Blend 3					Displacement Fluid Density (lb/gal)	8.3

[illegible]

Comments:

HFRAC Report – Page 29

Thank You for your Business

UWS Cement Operator Signature: _____

LANCE SHIREY

Customer Representative Signature: _____

A.F.提供: N/A



Job Types: DFTV

Cement Operator: JAMES CAMPBELL

Data Generated: 10/1/2015

Drilling Contractor: N/A

Cement Slurry Information

Cement Slurry Information							
No. of Sacks	Cement Blend Composition	Yield (ft ³ /sack)	Mix Water (gal/ft ³)	Density (lb/gal)	(bbl) Mix Water	(ft ³) Of Slurry	(bbl) Of Slurry
				Totals			

Wellbore Information

Wellbore Information									
	New/Used	Diameter (in)	Weight (lb/ft)	Top (ft)	Bottom (ft)	Collapse/Burst Pressure (psf)		Requested TOC (ft)	
Casing	USED	4 1/2	10.5	SURFACE	1,930			TVD (ft)	
Previous Casing								Displacement Depth (ft)	
Tubing or Drillpipe									
Open Hole									
Open Hole								Displacement (bbl)	

Pumpkin Pie

Cement Slurry Temperature Record (°F):

Field Information

Pumping Returns		Cement Slurry Temperature Record (°F)					Fluid Information	
Spacer or Gel Slump Returns Seen At Surface		Cement	Reading 1	Reading 2	Reading 3	Average	Mix Water Temp (°F)	
Cement Returns Seen At Surface		Slend 1					Displacement Fluid Type	
Amount of Cement Returns (BSL)		Slend 2					Displacement Fluid Temp (°F)	
		Slend 3					Displacement Fluid Density (lb/gal)	

[illegible]

Comments:

WELL WENT ON VACUUM WHEN PUMPS WERE SHUT DOWN TO MONITOR THE WELL.

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"THANK YOU"

Customer Representative Signature: _____

TREATMENT SUMMARY

Customer Name:	Penneco Oil Co	Acid Breakdown	Date:	11/17/15
Well Name:	Sedat #3A			

PRESSURES IN PSI

CLEAN VOLUMES IN GAL

BREAKDOWN	3114	TOP PERF MD				1896	TOP PERF TVD		1896	PAD	
AVERAGE	2506	BTM PERF MD				1936	BTM PERF TVD		1936	DISPL	
INSTANT		1401	5-MIN	0	10-MIN	0	TREATMENT		27888	TTL VOL	
										1270	36750

HYDRAULIC HORSEPOWER

RATES IN B.P.M.

USED	1130	AVG TREATING	18.4	MAXIMUM	26.3
------	------	--------------	------	---------	------

DESCRIPTION OF JOB

Slickwater Fracture

Time	Rate (bpm)	Slurry Volume (bbl)	Pressure (psi)	Description of Stage or Event
5:00				Arrive on location, rig up
7:06				Hold Safety Meeting
7:31			4160	Test Lines
7:33				Fix Leak
7:37			4665	Re-Test Lines, Good Test
8:09				Open Well
8:17	2.7	0	1766	Pump Water
8:19				Shutdown, Re-Prime Pump
8:21	2.7			Pump Water
8:23				Shutdown, Replace Hose
8:27				Re-Prime Pump, Inspect Pump
8:52	5	32	2320	Pump Water
8:55	7.2	40	3114	Break Formation
8:57	10.7	55	3058	Pump Tripped Out, Resume Pumping
8:58	14.1	68	3031	Establish Rate
8:59	4.0	75	1815	Pump Acid
9:07	6.4	110	2167	Displace Acid
9:09	14.1	126	2733	Acid to Perfs
9:12	20.1	171	2802	Establish Rate
9:13	16.0	183	2236	Stepdown Rate
9:14	5.1	198	1279	Stepdown Rate
9:15	0.0	203	261	Shut Down
9:21	3.7	204	1401	Pump Water
9:21	4.0	204	1520	Pump Acid
9:25	4.0	239	1385	Displace Acid
9:28	26.0	284	3005	Establish Rate
9:41	20.8	609	2541	Stepdown Rate - 20 BPM
9:41	16.1	620	2164	Stepdown Rate - 15 BPM
9:42	14.2	636	2006	Stepdown Rate - 14 BPM
9:43	8.6	650	1387	Stepdown Rate - 10 BPM
9:45	4.4	656	1117	Stepdown Rate - 5 BPM
9:46	0.0	664	0	Shut Down
Totals				

Chemicals	Unigel 5F	0	Lbs
	LEB 10X Breaker	0	Qts
	FRP 121	110	Lbs
Acid	15% HCL	750	Gals
	7.5% HCL	1,500	Gals





CWM Environmental
101 Parkview Drive Ext.
Kittanning, Pennsylvania 16201
724-543-3011
Lab # 03-457

Lab Analysis Report

Sample Number: 07163702

Customer: Penneco Oil Co., Inc.
Site: Gas Well
Monitoring Pt: DeSimone #3
Source Type: Discharge

Collection Date: 07/29/16 13:00
Received Date: 07/29/16 15:43
Matrix: Non Potable Water (NPW)
Collection Method: Grab

07163702	Result	Reporting Limit	Method	Analysis Date	Analyst
Specific Gravity	1.1027 grams/ml	grams/ml	ASTM D1429	8/3/16 0:00	33-325
Total Dissolved Solids	140958 mg/L	5 mg/L	SM 2540 C	8/3/16 8:12	PLP
pH	5.78 SU	SU	SM4500 H+B	8/1/16 13:00	EJK

Sample Comments:

pH: The pH result measured @ temperature of 25 deg C pH: The pH was analyzed outside of the 15 minutes holding time.

Bryan C. Shafer, Vice President of Operations

Analyst Reference: 33-325 - G & C Laboratory

HFRAC Report – Page 33



CWM Environmental
11931 State Route 85
Kittanning, Pennsylvania 16201
724-543-3011
Lab # 03-457

Lab Analysis Report

Sample Number: 09150657

Customer: Penneco Oil Co., Inc.	Collection Date: 08/28/15 08:00
Site: Sedat #3A	Received Date: 09/04/15 16:17
Monitoring Pt: Tank Water	Matrix: Non Potable Water (NPW)
Source Type: Discharge	Collection Method: Grab

09150657	Result	Reporting Limit	Method	Analysis Date	Analyst
Specific Gravity	11084 gr/ml	0 gr/ml	ASTM D-1298	9/9/15 0:00	33-325
pH	4.69 SU	SU	SM4500 H+B	9/9/15 13:30	JRD
Total Dissolved Solids	155476 mg/L	5 mg/L	SM 2540 C	9/8/15 16:03	ARB

Sample Comments:

pH: The pH result measured @ temperature of 25 deg C pH: The pH was analyzed outside of the 15 minutes holding time.

Ryan C Shafer, Vice President of Operations

HFRAC Report – Page 34

Analyst Reference: 33-325 - G & C Laboratory

Analyste names in bold are listed under the laboratory's current NELAP scope of accreditation.

Universal Well Services, Inc.
 Chemical Technology
 13549 S. Mosiertown Road
 Meadville, PA
 814-373-3107



Laboratory Water Analysis

Sample Information

Company	Penneco
Well Name	Sedat 3a
Sample ID	Frac Water
Formation	
Date Sampled	9/23/2015
Date Analyzed	9/23/2015
Analyst	Bilich

Analysis Results

Sample 1 Sample 2

pH	4.90	5.10	
Temperature	74.4	74.3	°F
Specific Gravity	1.110	1.132	
Fluid Density	9.26	9.44	lb/gal
Chlorides (titrated)	100,000	120,000	mg/L
Total Dissolved Solids	159,500	191,400	mg/L
Total Suspended Solids	N/A	N/A	mg/L
Approximate Salt Percentage	14.4	16.9	%
Total Hardness	67,000	70,000	mg/L
Ca Hardness	63,000	60,000	mg/L
Ca ²⁺	25,200	24,000	mg/L
Mg Hardness	4,000	10,000	mg/L
Mg ²⁺	971	2,428	mg/L
Total Iron (titrated)	437	319	mg/L
Sulfates	39	10	mg/L
Hydroxide Alkalinity as CaCO ₃	0	0	mg/L
Carbonate Alkalinity as CaCO ₃	0	0	mg/L
Bicarbonate Alkalinity as CaCO ₃	0	0	mg/L
Total Alkalinity as CaCO ₃	0	0	mg/L
Tannin/ Lignin	N/A	N/A	mg/L
Barium/ Strontium PS	< 1	< 1	mg/L
Specific Conductance	172,500	193,200	umhos/cm

The Fracture Gradient (F.G.) 1.23 psi/ft was calculated using the ISIP (instantaneous shut-in pressure) of 1446 psi and fluid S.G. of 1.10 psi/ft. The mid-perforation depth was 1917.5 ft (1896 ft – 1939 ft).

$$F.G. = \frac{ISIP + Hydrostatic Head}{Depth}$$

$$F.G. = \frac{1446 + 913}{1917.5} = 1.23$$

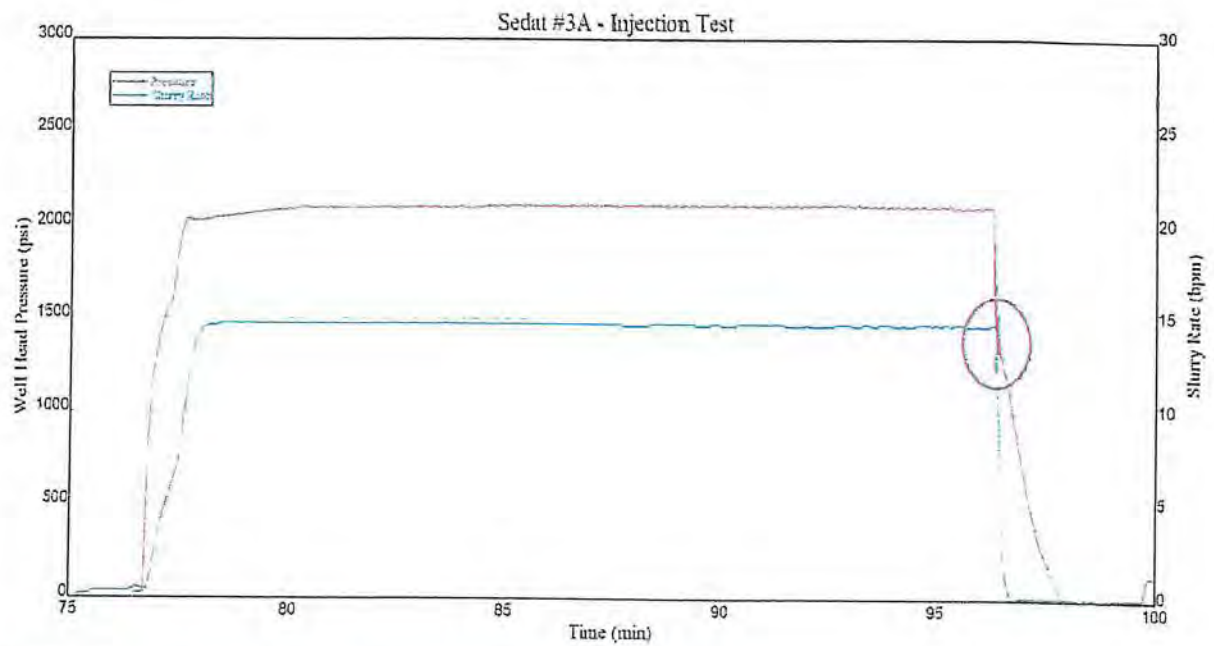


Figure 1 - Sedat 3A Injection Test pumped on November 17, 2013. ISIP 1446 psi

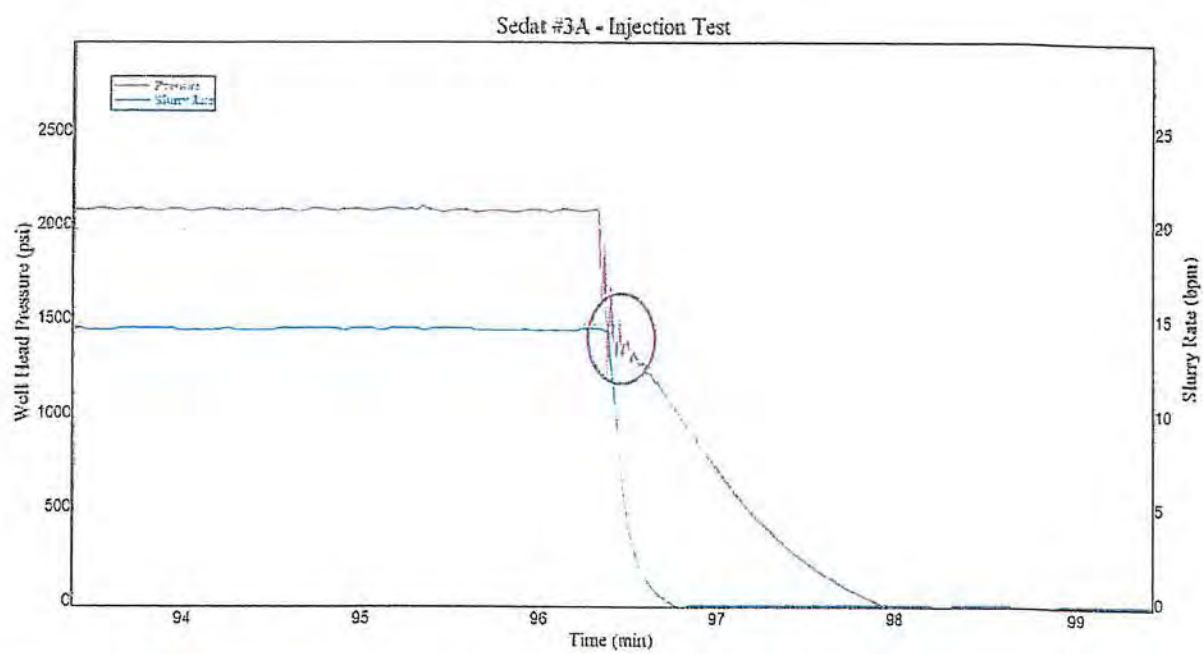


Figure 2 - Sedat #3A Injection Test pumped on November 17, 2013 (zoomed). ISIP 1445 psi

The reservoir permeability of 1.80 mD was an average permeability using a formation height of 50 ft. Using a reservoir permeability of 1.8 mD and formation height of 50 ft the formation capacity (kH) was 90 mD/ft.

The bottomhole pressure after closure was analyzed using the Nolte FR function. If the late time data reaches pseudoradial flow estimates of reservoir transmissibility (kh/mu) and reservoir pressure can be determined.

The results from the Nolte FR function show that pseudoradial flow was reached. P^* was 232 psi. The formation capacity (kH) was 90 mD-ft assuming a reservoir fluid viscosity of 1 cP. Using a formation height of 50 ft the reservoir permeability is 1.8 mD.

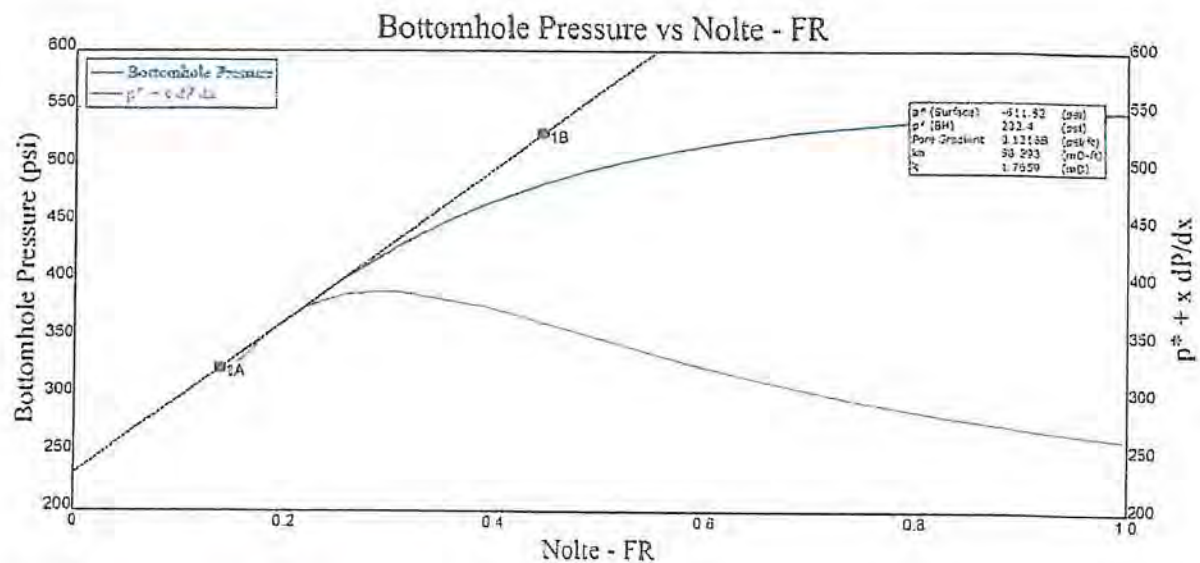


Figure 3 - Sedot #1A After Closure Analysis / 4C1

$$kh / \mu = 251,000 \left(\frac{V_i}{m_R t_c} \right)$$

where

k = reservoir permeability, mD

h = net pay, ft

μ = reservoir fluid viscosity, cP

V_i = volume injected, bbl

m_R = slope

t_c = time to closure, min

Attachment J
Stimulation Program
Sedat #4A Injection Well

Stimulation Program for Sedat #4A Injection Well

There are currently no plans to stimulate the Sedat #4A Injection Well.

ATTACHMENT “K”
Injection Procedures

Attachment K
Injection Procedures
Sedat #4A Well

Injection Procedures:

Injection fluid will be delivered by trucks. Company personnel will measure the specific gravity of the sample with a hydrometer or some other appropriate method. Using the permitted maximum surface injection pressure and specific gravity values as a baseline, automation will throttle the MASIP in response to the actual Sg of the injectate to maintain the measured bottom hole pressure without regard to friction pressure, of 2332 Bottom Hole Injection pressure (BHIP). The produced fluids will be processed through a series of storage tanks and filters and treated with a scale inhibitor, bleach, and/or biocide additives as required.

The fluid will be pulled from the off loading tanks through a 20 micron filter to remove large suspended solids and transported through connecting pipes to additional tanks to hold the filter fluid until injection. From the tanks holding the filtered water the fluid will be transported by pipeline to high pressure pumps for transportation to the injection point where the rate of injection and pressure will be monitored and regulated so as not to exceed the maxim allowable surface injection pressure (MASIP) associated with the Sg being injected. and rate stated in the permit. The fluids will be pumped through a checkvalve at the wellhead down the 4 ½" injection string to the Murrysville injection zone not to exceed 2332 PSI Bottom Hole Injection Pressure (BHIP) ignoring friction loss.

The specific gravity will be continuously monitored by a mass flow meter. Should the specific gravity exceed the value set by permit at the well head P-max will be automatically adjusted to a lower P-max by installed logic controls to compensate for the change in specific gravity or if unable to compensate for the change in specific gravity, automatically shut in the injection well until the specific gravity of the fluid can be adjusted or the P-max is adjusted.

The injection string casing annulus pressures will be monitored and recorded by the Programmable Logic Controller (PLC). Should the annular pressure monitor equipment realize a dramatic, instantaneous increase or begin a steady, inexplicable climb, the EPA will be notified and their guidance followed.

Fluid levels will be checked in all monitoring wells on a quarterly schedule or more frequently if required by permit by either running a wireline or an Echometer fluid shot. Results will be reported to the EPA quarterly or as required by permit.

ATTACHMENT “L”
Construction Procedures

Attachment L
Construction Procedures
Sedat #4A Injection Well

Construction Details For:

Well Name: Sedat #4A
Location: Plum Boro, Allegheny Co, PA
(See AOR Map for Well Location)

The Sedat #4A injection well will be a repurposed depleted natural gas well that was drilled through the Upper Devonian Bradford Sands to a total casing depth of 3,886' and will be plugged back to 1,850' to just below the Murrys ville injection zone.

The Sedat #4A was rotary air drilled with drilling operations starting on 6/21/2004 and finishing on 6/24/2004 reaching a Total Drilled Depth of 3,925'. The company installed 31' of 16" casing as conductor pipe which was sanded in, 302' of 13 $\frac{3}{8}$ " casing cemented to surface, 564' of 9 $\frac{5}{8}$ " casing cement-balanced through the mine and grouted to surface, 1,906' of 7" casing cemented to surface, and 3,886' of 4 $\frac{1}{2}$ " casing cemented to 2,400 $\pm$ '. Four sand formations were hydrofracked and the well was produced until 2018 through the 4 $\frac{1}{2}$ " casing. The company plans to plug back the Sedat #4A to a depth of 1,850' in accordance with Pennsylvania Department of Environmental Protection regulations. The uncemented portion of the 4 $\frac{1}{2}$ " casing will be removed and three cement plugs placed through and above the produced formations. A 7" cast iron solid bridge plug will be set at 1,850' in the 7" casing just below the Murrys ville injection zone. A string of 4 $\frac{1}{2}$ " casing will be installed to a depth of approximately 1,680' and cemented to surface. The injection string will be made up of 2 $\frac{7}{8}$ " 6.5# L80 tubing on a WOS AS1-X Packer set on tension around 1,650' with a tail extended below the 4 $\frac{1}{2}$ " casing shoe. See original well record and completion report, wellbore diagram showing the wellbore configuration, and the casing cement data chart at the end of this Attachment.

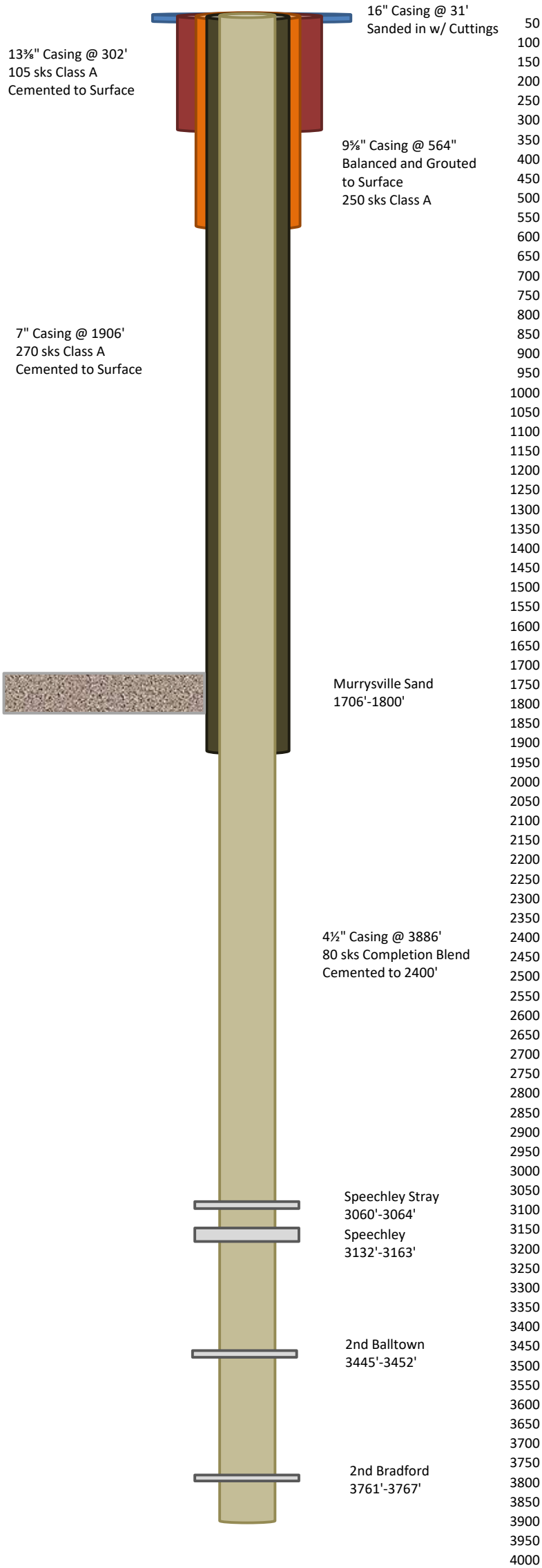
The annulus between the 2 $\frac{7}{8}$ " injection tubing and the 4 $\frac{1}{2}$ " casing will be filled with fresh water mixed with a small amount of corrosion inhibitor and bacteria growth preventer and monitored for injection component integrity.

Logging Program:

The following open hole well logs were run: Gamma Ray, Compensated Density, Neutron, Dual Induction, Temperature and Caliper. The logs were run from TD to the bottom of the 7" with the Gamma Ray run to surface.

Cement bond logs will be run on the existing 7" casing and the new 4 $\frac{1}{2}$ " casing to verify a good cement bond to surface.

Penneco Oil Company
Sedat #4A 003-21644





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

Client Id

Sub-facility Id

WELL RECORD AND COMPLETION REPORT

Well Operator Penneco Oil Company, Inc.		DEP ID# 7674	Well API # (Permit / Reg) 37-003-21644-00	Project Number	Acres 69.54
Address 200 Rt. 22, PO Box 300		Well Farm Name Sedat		Well # 4A	Serial # PS-748
City Delmont	State PA	Zip Code 15626	County Allegheny	Municipality Plum Borough	
Phone 724-468-8232	Fax 724-468-8230	USGS 7.5 min. quadrangle map New Kensington East			
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 06/21/04	Date Drilling Completed 06/24/04	Surface Elevation 1068 ft.	Total Depth - Driller 3925 ft.	Total Depth - Logger 3925 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
17"	16"	N/A	N/A	31	sanded in with cuttings	N/A N/A 31	6/21/04
15"	13 3/8"	48#	thread	302	105 sks Class A Regular	Float Shoe 13 3/8" 302	6/21/04
12"	9 5/8"	29.3#	thread	564	100 sks Class A Regular	Float Shoe 9 5/8" 564	6/22/04
3/4"	7"	19.41#	thread	1906	130 sks Class A Regular	Float Shoe 7" 1906	6/24/04
1/4"	4 1/2"	9.5#	thread	3886	80 sks Completion Blend Cement	Float Shoe 4 1/2" 3886	6/24/04

COMPLETION REPORT

Perforation Record			Stimulation Record					
Date	Interval Perforated From To		Date	Interval Treated	Fluid Type Amount	Propping Agent Type Amount	Average Injection Rate	
7/19/04	3054 3767		7/19/04	3054-3767	Water 11,634 gal	Sand 10,000#	28.4	
7/19/04	3445 3452		7/19/04	3445-3452	Water 15,918 gal	Sand 11,000#	28.4	
7/19/04	3132 3163		7/19/04	3132-3163	Water 36,456 gal	Sand 50,200#	26.7	
7/19/04	3054 3064		7/19/04	3054-3064	Water 15,246 gal	Sand 15,200#	27.7	
JAN 29 2008								

Natural Open Flow	Not Taken	Natural Rock Pressure	Not Taken	DEP SOUTHWEST REGION
After Treatment Open Flow	581 MCFPD	After Treatment Rock Pressure	500 PSI	72 Hours Days

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

Name Hill Drilling	Name BJ Services Company	Name
Address P.O. Box 309	Address Route 2, Box 506	Address
City - State - Zip Bradford, PA 16701	City - State - Zip Clarksburg, WV 26301	City - State - Zip
Phone 814-368-3831	Phone 304-624-9802	Phone

LOG OF FORMATIONS

Well API#: 37-003-21644

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Clay	0	6				Drillers Log
Shale - R bed	6	30				
Sand	30	34				
Sand & Shale	34	50				
Sand & Shale	50	100			Damp @ 100	
Shale & Sand	100	330				
Shale & Sand	330	440			1" @ 440	
Shale	440	510			3" @ 510	
Mine	510	520				
Shale & Sand	520	577				
Shale	577	760				
Sand & Shale	760	940				
Shale	940	1030				
Sand	1030	1150				
Sand & Shale	1150	1775				
Murrysville	1775	1870			2" @ 1789'	
Shale	1870	1900				
100'	1900	1922				
Sand 100'	1922	1935				
Sand & Shale	1935	2240				
Sand	2240	2245				
Shale & Sand	2245	2300				
5 th Sand	2300	2330				
Shale	2330	2700	Show @ 2335			
Shale	2700	3000				
Sand & Shale	3000	3925				

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

Well Operator's Signature

DEP USE ONLYTitle:
ice President

Date: 8/19/04

Reviewed by:

mt

Date:

1/24/08

Comments:



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil and Gas Management Program
WELL LOCATION PLAT

DEP Application Tracking #	G
Permit #	C
Project #	

Well is located on topo map 5366.42 feet south of latitude 40 . 32 . 30 "

Denotes location of well on topo map.

True Latitude NORTH
40 . 31 . 36.9 "
True Longitude WEST
79 . 42 . 39.7 "

Loc-A N 70°03'58" W 384.91'
Loc-B N 09°11'04" E 537.62'
A-B N 48°15'12" E 600.00'

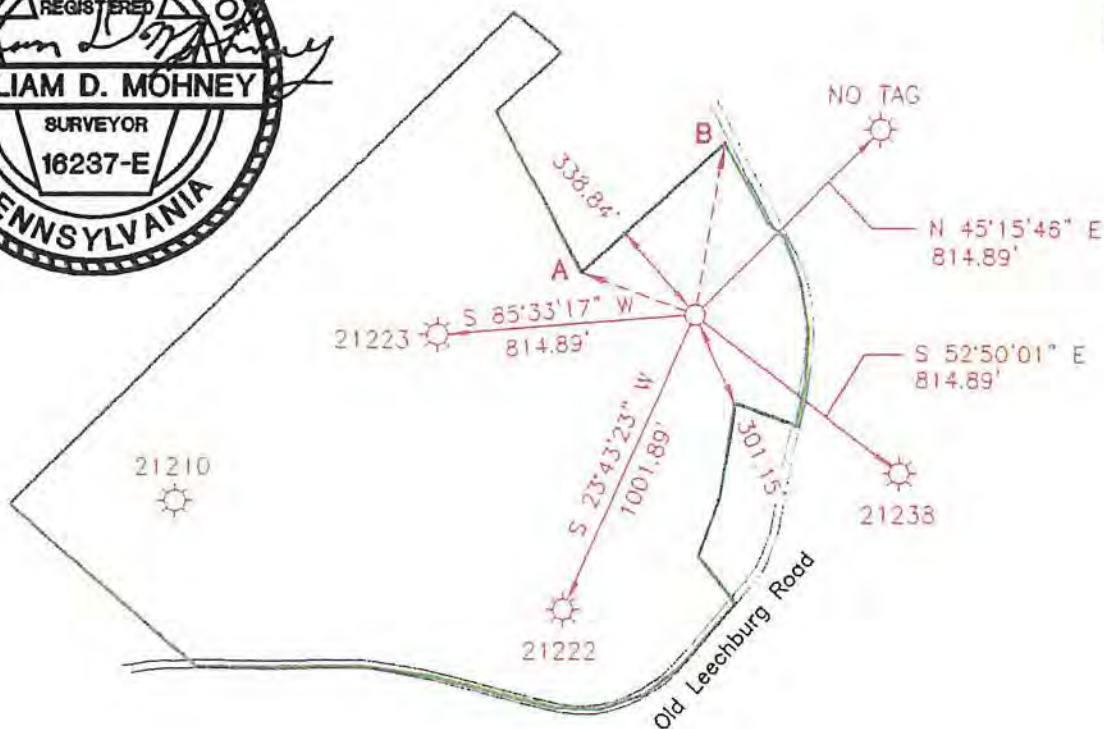
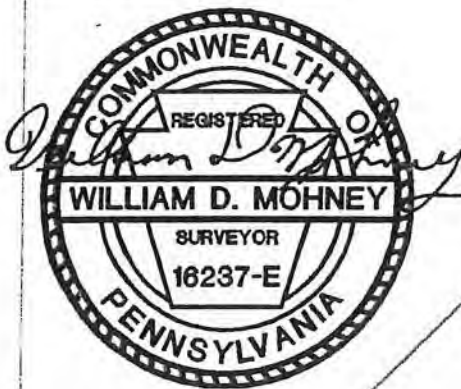


Proposed Well Location
Existing Well
Plugged Well

Lease Line
 Property Line
 Roads
 Streams/Water

Well is located on topo map

749.80 feet west of longitude 79 . 42 . 30 "



Surveyor or Engineer	W.D. Mohney & Associates	Drawn by	sedatplum	Date	December 15, 2003	Scale	1" = 600'	Tract Acreage	69.54 Acres
Applicant / Well Operator Name	Penneco Oil Company, Inc.	DEP ID	7674	Well (Form) Name	SEDAT	Well #	4 A	Serial #	PS-748
Address	P.O. Box 300, 200 US Route 22, Delmont PA 15626	County - Code	Allegheny - 65	Municipality	Plum Borough				
Surface Owner	Sedat Inc.	USGS 7 1/2 Quadrangle Map Name	New Kensington East, PA	Map Section	7				
Surface Lessee	n/a	Angle & Course of Deviation (Drilling)	None	Surface Elevation	1068 ±	Anticipated Total Depth	3800' ±		
Surface Owner or Water Purveyor with a Water Supply within 1000'	See Attached Sheet	Approximate Course and Distance to Water Supply	Noncoal Area	Owner, Lessee, or Operator of Workable Coal Seam	N/A	Name of Coal Seam Owned, Leased, or Operated			

Reliable and Effective

The Workover Solutions AS1-X Packer is designed for applications where a high pressure production packer is needed. The packer is designed for operations in 7" casing. The packer is rated for pressures of up to 7,000 psi. The packer features a large internal by-pass that reduces swabbing when running and retrieving.

The WOS AS1-X Production Packer can be set in tension or compression. It holds pressure from both above and below allowing casing to be isolated and protected during the production of the well. Secondly, the WOS Multi-set Production Packer is used for long term zonal isolation and pressure integrity for the production of oil and gas wells. The WOS Production Multi-set packer can be set and reset multiple times for leak detection.



Applications / Features

- » Production packer
- » Zonal isolation
- » Protection of casing during production
- » Internal bypass to reduce swabbing when running and retrieving
- » Available in 7" casing

Benefits

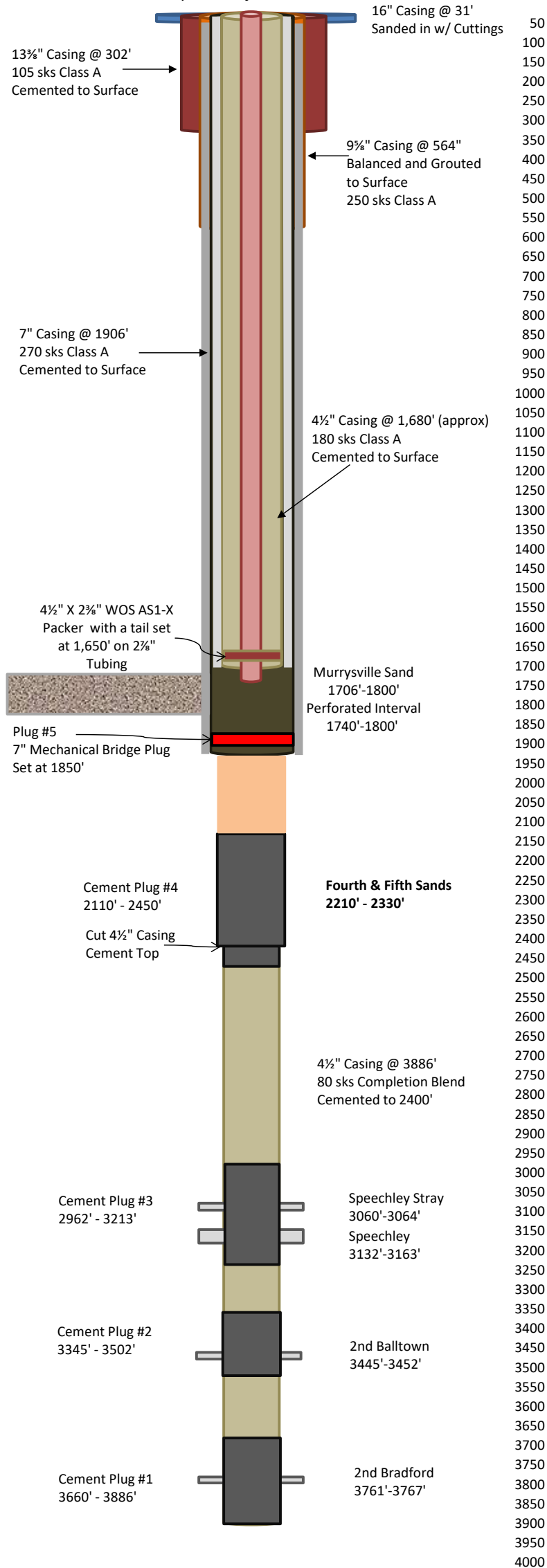
- » Rated for up to 7,000 psi
- » Holds pressure from above or below
- » Can set tubing in compression or tension neutral
- » Right hand set and right hand release

OD	Weight lbs / ft	Recommended Hole Size	Max OD of Tool
7"	17.0 – 26.0	6.276 – 6.538	6.125
7"	26.0 – 32.0	6.094 – 6.276	5.875
7"	35.0	6.004	5.812

Penneco Oil Company

Sedat #4A 003-21644

Proposed Injection Schematic



ATTACHMENT “M”
Construction Details

Attachment M
Casing and Cement Data
Penneco Sedat #4A Injection Well

Casing	Size Inches	Type	Weight Lbs/Ft	Grade	Set Depth Feet	Internal Yield Pressure PSI	Collapse Pressure PSI	Joint Yield Lbs	Body Yield Lbs
Conductor	16"	N/A	N/A	N/A	31	N/A	N/A	N/A	N/A
Surface	13 ³ / ₈ "	LS	48	H-40	302	1730	740	322000	541000
Mine String	9 ⁵ / ₈ "	ST&C	26	H-40	564	2270	1370	254000	365000
Intermediate String	7"	LT&C	20	J-55	1906	3740	2270	257000	316000
Integrity Buffer String	4 ¹ / ₂ "	LT&C	10.5	J-55	1680	4790	4010	203000	166000
Injection String	2 ⁷ / ₈ "	EUE	6.5	L-80	1750	9660	8000	145000	114000

Cement Data

Casing	Size Inches	Class	Amount Sacks	Volume BBLs	Top of Cement
Conductor	16	Sanded in			
Surface	13 ³ / ₈ "	Class A	105	47.4	Surface
Mine String	9 ⁵ / ₈ "	Class A	250	Balance/Grout	Surface
Intermediate String	7"	Class A	270	78.5	Surface
Integrity Buffer String	4 ¹ / ₂ "	Class A	180	80	Surface
Injection String	2 ⁷ / ₈ "				

Attachment M
Formation Tops and Bottoms
Penneco Sedat #4A Injection Well

Formation	Top	Bottom	Thickness
Riddlesburg Shale	1505'	1705'	200'
Murrysville Sand	1706'	1800'	94'
Riceville/Oswayo Shale	1801'	1883'	82'
Hundred Foot (Venango)	1884'	1978'	94'

*The top of the Riddlesburg is difficult to determine from the well log, so the 200' interval of low permeability shale/slit section from 1,505' to 1,705' shown on the gamma ray log is included as part of the upper confining zone.

ATTACHMENT "O"
Plan for Well Failures

Attachment O
Plans for Well Failures
Sedat #4A Injection Well

Plans for Well Failures for Sedat #4A Injection Well

If there is a well failure that involves equipment the well will be shut-in until the faulty equipment is repaired or replaced. If the failure poses no environmental or operational hazard, and the well has been returned to a safe operating condition, the well will be placed back into operation and nothing further will be done.

If there is a casing leak or some other major failure the well will be immediately shut-in and the Pennsylvania DEP and the EPA notified of the problem. Depending on the condition, the corrective action may include squeezing off the leak with cement or running an additional string of casing. The well will not be placed into service until it has been determined that the problem has been corrected and approval is received from the EPA to resume operation. Any fluid produced during the shut-in will be stored on site or disposed of at another approved facility.

ATTACHMENT “P”
Monitoring Program

Attachment P
Monitoring Program
Sedat #4A Injection Well

Monitoring Program for Sedat #4A Injection Well

The Sedat #4A injection well will be monitored for the well's entire life in compliance with all EPA monitoring guidelines and reporting requirements.

The injection site is located so that the facilities cannot be seen from public roads or public or private properties adjacent to the site. The access road is gated and will be locked when the site is not operating.

There will be a second monitoring well on the lease, identified by its Pennsylvania issued permit number, 003-21222, converted in addition to the monitoring well (003-21210) permitted for observation of the Sedat #3A injection well. This is a depleted gas well that will be adapted for use as an observation well and is 1,002' to the south west of the Sedat #4A, see well plat map at end of Attachment. The well has satisfactory spacing and placement to provide adequate sampling area without having to drill a well or wells for the specific propose of sampling. A monitoring string set on a packer immediately above the Murrys ville Sand will be installed to isolate the Murrys ville injection zone. Penneco will sample, monitor, and record the fluid level in the Sedat #2A monitoring well as required by permit. The results will be reported as required by permit or according to EPA guidelines. Should the fluid level rise to within 100' of the base of the USDW, Penneco will stop disposal operations immediately, notify the EPA, and wait for instructions on how to precede.

Pressure and rate monitoring will be at the well site (wellhead); both injection pressure and the pressure on the 7" by 4 ½" annulus will be monitored. The company will also conduct quarterly mechanical integrity testing as required by Pennsylvania Oil and Gas regulations. Pressure will be measured by use of a continuously recording pressure gage and the injection rate by a continuously recording flow meter. Results will be reported to the EPA as required by the injection permit or according to EPA guidelines, but not less than annually.

The specific gravity of each truck load will be monitored to ensure the specific gravity of the fluid to be injected does not exceed the allowed value.

Injection fluids will be sampled and analyzed quarterly with the sample taken at the injection site (wellhead). The results will be reported as required by the permit or according to EPA guidelines.

The company will also be prepared to conduct any other monitoring or sampling as required by the permit.

6190 S 40° 32' 30"
134° 0' W 74° 42' 30"
(G)

RE

39254
39255

3-4: Rev. 6/84

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF OIL AND GAS REGULATION
PITTSBURGH, PENNSYLVANIA 15206-2988

NEW KENSINGTON EAST

21222

Office Use Only

003-21222

WELL RECORD

PERMIT NO. 37-003-21222-00 PROJECT NO. [] TYPE OF WELL Gas and Oil

WELL OPERATOR Penneco Energy Corporation TELEPHONE NO. 412-468-8232

ADDRESS 200 Route 22, Delmont, PA ZIP 15626

FARM NAME Sedat #2A FARM NO. SERIAL NO. PS-8 ACRES 70

TOWNSHIP Plum Borough COUNTY Allegheny

DRILLING COMMENCED 1-12-89 DRILLING COMPLETED 1-19-89

ELEVATION 1162' QUADRANGLE New Kensington East 7 1/2' 15'

CASING AND TUBING RECORD

PIPE SIZE	AMOUNT IN WELL	MATERIAL BEHIND PIPE		PACKER			DATE RUN												
		CEMENT (SKS.)	GEL (SKS.)	TYPE	SIZE	DEPTH													
13-3/8"	16	Cuttings	None	N/A	N/A	16	1-12-89												
9-5/8"	653	225	5	Float Shoe	9-5/8"	663	1-13-89												
7"	1,985	280	11	Float Shoe	7"	1,995	1-17-89												
<table><tr><td>T.D.</td><td>D.D.</td><td>D.P.I.</td><td>Class</td><td>O G</td><td>Lease</td></tr><tr><td>4323</td><td></td><td>2375</td><td>D</td><td>11</td><td></td></tr></table>								T.D.	D.D.	D.P.I.	Class	O G	Lease	4323		2375	D	11	
T.D.	D.D.	D.P.I.	Class	O G	Lease														
4323		2375	D	11															

PERFORATION RECORD			STIMULATION RECORD				
DATE	INTERVAL PERFORATED FROM	TO	DATE	INTERVAL TREATED	AMOUNT FLUID	AMOUNT SAND	INJECTION RATE
NATURAL OPEN FLOW			NATURAL ROCK PRESSURE			72 HRS. DAYS	
294 MCF			50#				
AFTER TREATMENT OPEN FLOW			AFTER TREATMENT ROCK PRESSURE			HRS. DAYS	
N/A			N/A				

REMARKS:

Good cement returned to surface after setting 9-5/8" casing and 7" casing. No water encountered in Renton Mine. Well is to be produced naturally.

RECEIVED

PROD FM - Bradford

FMTP - BRALLIER

JUN 2 1989

PA GEOLOGICAL SURVEY
(Oil & Gas Geology Division)

(FORMATION ON REVERSE SIDE)

11.25
4.25.89

FORMATIONS						
NAME	TOP	BOTTOM	GAS AT	OIL AT	WATER AT (FRESH OR SALT WATER)	SOURCE OF DATA
Clay and Shale	0	10				Driller's Log
Shale and Sand	10	16				
Sand and Shale	16	105			Damp @ 60'	
Sand and Shale	105	460				
Sand and Shale	460	495				
Sandy Shale	495	611				
Shale	611	621				
Shale	621	669				
Sand and Shale	669	865			1/2" @ 700'	
Shale	865	940				
Sand and Shale	940	1040				
Sand	1040	1219				
Sand and Shale	1219	1490				
Sand and Shale	1490	1950				
Sand	1950	2029				
Sand and Shale	2029	2210				
Red Rock	2210	2330				
Sand	2330	2445	2375'			
Sand and Shale	2445	2485				
Shale	2485	2600				
Sand and Shale	2600	3140				
Shale and Sand	3140	3800				
Shale	3800	4323				
t.D.	4323					
APPROVED BY: <i>[Signature]</i> DATE: <i>[Date]</i> GEOPHYSICAL LOG DATA						
Fourth					2334-2351	
Fifth					2391-2426	
Speechley Stray					3170-3188	
Speechley					3250-3286	
2nd Balltown					3561-3570	
2nd Bradford					3874-3884	

March 22, 1989
 DATE
[Signature]
 APPROVED BY
 Vice-President
 TITLE

CORRELATED LOGS - DO NOT REMOVE
SEDAT 2A - PS-8

ALLEGHENY

NUCLEAR

SURVEYS INC.

PENNECO OIL COMPANY, INC.

SEDAT #2A PS-8

APPALACHIAN SUITE

LOCATION PLUM BORO
PRVNC/CO. ALLEGHENY
FIELD PLUM BORO
WELL SEDAT #2A PS-8

COMPANY: PENNECO OIL COMPANY INC.

COMPANY PENNECO OIL COMPANY INC.

WELL SEDAT #2A PS-8

FIELD PLUM BORO

PROVINCE/COUNTY ALLEGHENY

COUNTRY/STATE USA / PA

PERMIT NUMBER 37-003-21222

LOCATION

PLUM BORO

OTHER SERVICES

ANALYSIS

LSD

SEC

TVP

RCE

PERMANENT DATUM GROUND LEVEL ELEVATION 1162 FT.

LOG MEASURED FROM K.B., 10 FT. ABOVE PERMANENT DATUM

DRILLING MEASURED FROM K.B.

ELEVATIONS
KB 1172 FT.
DF 1172 FT.
CL 1162 FT.

DATE	19-JAN-89				
RUN NUMBER	ONE				
DEPTH-DRILLER	4316 FT.				
DEPTH-LOGGER	4323 FT.				
FIRST READING	4323 FT.				
LAST READING	0				
CASING-DRILLER	1993 FT.				
CASING-LOGGER	1996 FT.				
BIT SIZE	6 1/4 IN.				
HOLE FLUID TYPE	AIR DRILLED				
DENS./VISC.					
PH/FLUID LOSS					
SAMPLE SOURCE					
RM @ MEAS TEMP					
RMF @ MEAS TEMP					
RMC @ MEAS TEMP					
SOURCE: RMF/RMC					
RM @ BHT					
TIME SINCE CIRC	3 HRS.				
MAX REC TEMP					
EQUIPMENT/BASE	"262" ELD.				
RECORDED BY	M. RIGGLEMAN				
WITNESSED BY	D. TATLOCK				
WITNESSED BY	T. JACOBS				

1800

1842

1850

1900

1948

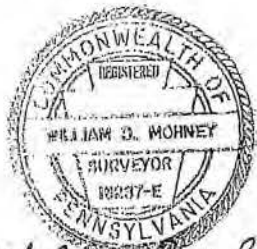
1950

MURRYS
LEE

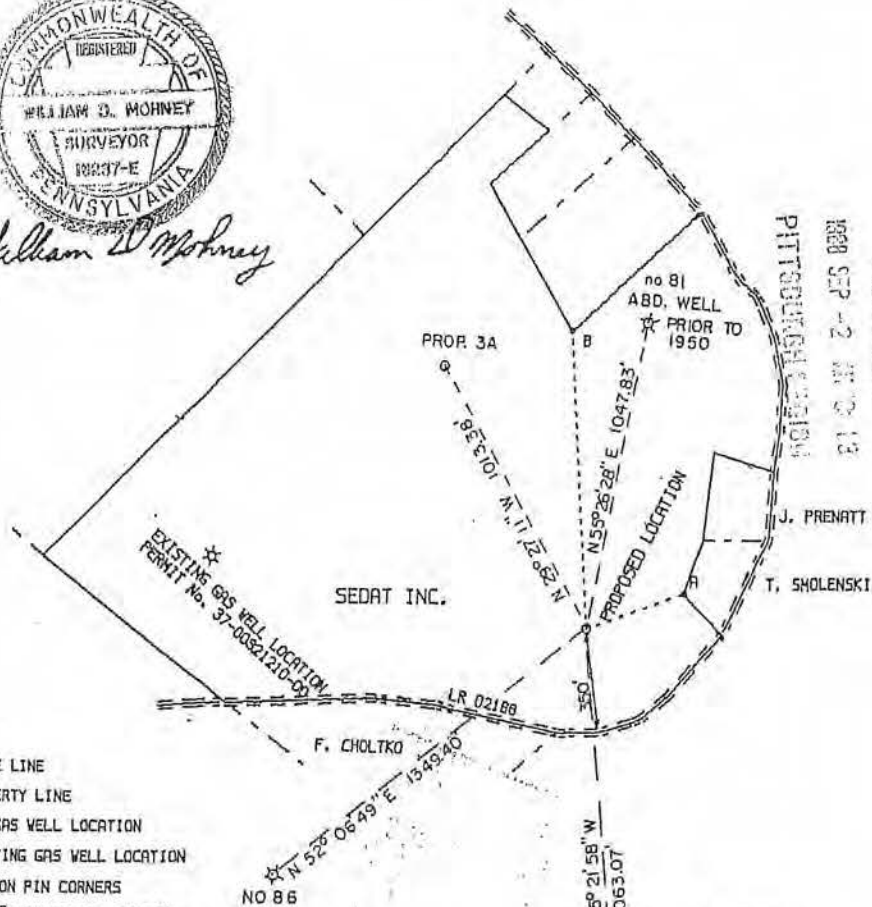
WELL LOCATION PLAT

Well is located on topo map 6190 feet south of LATITUDE 40 ° 32 ' 30 "

NOTE: The locations of the abandoned gas wells No. 80, 81, 86 and 87 have been located on the maps from the old Renton Mine maps due to the absence of any evidence in the field.



William D. Mohney



Well is located on topo map 1290 feet east of LONGITUDE 79 ° 42 ' 30 "

- LEASE LINE
- - - PROPERTY LINE
- NEW GAS WELL LOCATION
- ★ EXISTING GAS WELL LOCATION

* A and B ARE IRON PIN CORNERS

LOC - A = N 70° 47' 28" E 350.3'

LOC - B = N 3° 27' 32" W 991.8'

Include description of the property and courses and distances of the well(s) locations to two or more permanent identifiable points or land marks, all buildings and water supplies within 200', all springs, bodies of water and streams within 100' identified on the most current 7 1/2 topographic map and wetlands within 100'. Reference to buildings, springs, bodies of water wetlands and water supplies within 1,000 (is not required for well plugging)

Denotes location of well on 7 1/2" topo map Permit No. 57-003-21223-00 Project No. _____

NO. 87
PLUGGED
10/9/39
9-8-88
Department Use Only
G C

PENNECO OIL COMPANY INC.

Well Permittee/Registrant

200 U.S. ROUTE 22

Address

DELMONT PA 15626

SEDAT INC.

Surface Owner

N/A

Surface Lessor (if any)

SEDAT

Form Name

2A

PS - 8

Well No.

89.5

Tract

Serial No.

1162

Acres

NONE

Ground Elevation

3400'

if Deviation (Drilling)

HENY

Anticipated TO

PLUM BORO

if

KENSINGTON EAST

Municipality

G

Topo Quadrangle

Section

- Revision ☐
- Alteration ☐
- Storage Recondition ☐
- New Location ☒
- Drill Deeper ☐
- Abandonment ☐
- Registration ☐
- Plugging ☐

Surface landowner and water purveyor with water supply within 1,000'

J. PRENATT

T. SHOLENSKI

F. CHOLTKO

W. D. MOHNEY

Surveyor/Engineer 16237-E

5-2A

Drawing Number

7-12-88, 8-29-88

Date

1" = 500'

Scale

Approximate course and distance to water supply

N 86° E 825'

N 61° E 995'

S 49° W 594'

RECEIVED

SEP 26 1988

Owner/Operator/Lessee

Workable Coal Seams

Name of Seam

VILLA COAL COMPANY

SEDAT INC.

CONSOLIDATION COAL CO.

UPPER FREEPORT

ALL OTHERS

UPPER FREEPORT

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Oil and Gas Management



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil and Gas Management Program
WELL LOCATION PLAT

DEP USE ONLY	DEP Application Tracking #	0
	Permit #	
	Project #	0

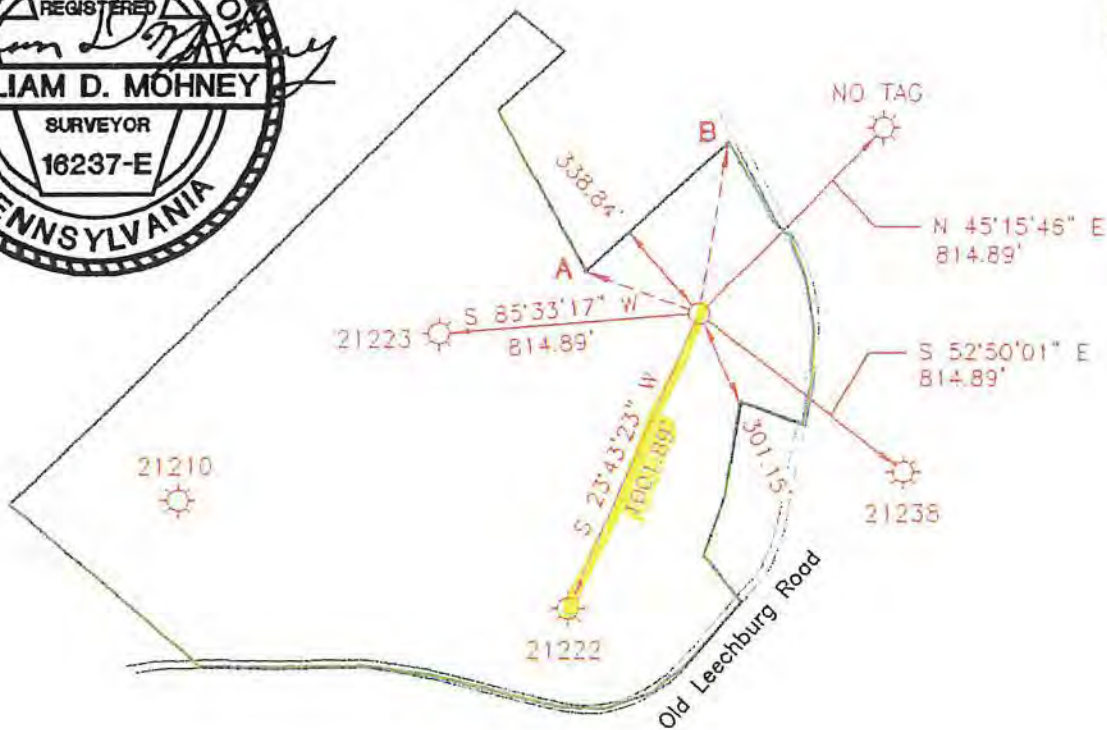
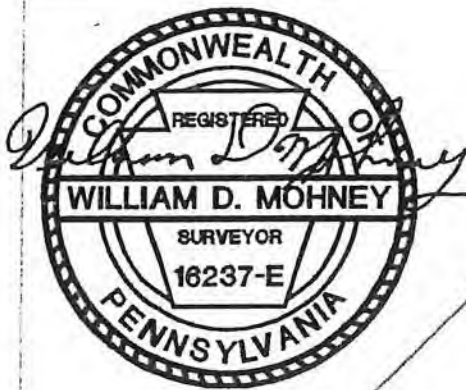
Well is located on topo map 5366.42 feet south of latitude 40 • 32 • 30 "

	Denotes location of well on topo map.
True Latitude: NORTH	
<u>40 • 31 • 36.8 "</u>	
True Longitude: WEST	
<u>79 • 42 • 39.7 "</u>	

Loc-A N 70°03'58" W 384.91'
Loc-B N 09°11'04" E 537.62'
A-B N 48°15'12" E 600.00'

Proposed Well Location
 Existing Well
 Plugged Well

Lease Line
 Property Line
 Roads
 Streams/Water



Well is located on topo map

749.80 feet west of longitude 79 • 42 • 30 "

Surveyor of Engineer	W.D. Mohney & Associates	Eng. #	sedatplum	Date	December 15, 2003	Scale	1" = 600'	Tract acreage	69.54 Acres
Applicant	Well Operator Name	DEP ID#	Lease Form Name	County	State	County	City	Section	Range
	Penneco Oil Company, Inc.	7674	SEDAT	Allegheny	65	Plum Borough		4 A	PS-748
Address	P.O. Box 300, 200 US Route 22, Delmont PA 15626								
Surface Owner	Sedat Inc.								
Surface Lessee	n/a								
Angle & Course of Deviation (Drilling)	None		Surface Elevation	1068		Anticipated Total Depth	3800'		
Surface Owner or Water Purveyor with a Water Supply within 1000'	Approximate Course and Distance to Water Supply	Owner, Lessee, or Operator of Workable Coal Seam	Name of Coal Seam Owned, Leased, or Operated						
See Attached Sheet		Noncoal Area	N/A						



Titanium Environmental Services, LLC

P.O. Box 4029
Longview, Texas 75606-4029

Phone (903) 234-8443
Fax (903) 234-1641

September 28, 2016

Mr. Marc Jacobs
Penneco Environmental Solutions, LLC
6608 Route 22
Delmont, Pa 15626-2408

RE: Proposal for a Surface Facility for your proposed Sedat #3 SWD

Dear Mr. Jacobs,

Titanium Environmental Services, LLC (TES) is pleased to present the draft drawings and process flow for Penneco Environmental Solutions, LLC (PES) Sedat #3 Salt Water Disposal (SWD) well surface facility. As previously discussed, PES and TES agree that safe and environmentally sound design and operations are paramount to meeting PES's expectations for their operation.

In that vein, TES has proposed a facility that would be acceptable for Resource Conservation and Recovery Act (RCRA) waste operations. TES believes that ultimately the requirements for wells and surface facilities that manage class II waste related to exploration and production will be raised to match those presently applicable to class 1 non-hazardous well and facility operations. Some of these requirements will be very expensive or even impossible to incorporate into existing wells and surface structures. As the cost to construct the well(s) and surface equipment with the safeguards that will be regulatory mandates is not significant, if incorporated with the construction design, we recommend and have incorporated these protective components into our plans.

The entire surface facility will be built atop a multilayered secondary containment system/structure. The facility will begin with a base layer of clay, felt liner, 60 mil High Density Polyethylene (HDPE) liner, and another felt liner, perforated liquid collection pipe system covered by pea gravel, concrete containment floor and walls. The edge of the HDPE liner will be folded up against the containment walls to keep rainwater from entering the system. The liquid collection system piping will be extended from under the containment to allow for inspection or liquid (condensation) removal and as the last mechanical containment to intercept a leak.

Notice the truck unloading pad is built to prevent rainwater run on and all rainwater or truck leakage will be collected by the truck bay collection system which empties into the solids settling tank containment which can hold all the trucks that could be in the truck bays. All sump pumps automatically empty the sumps without human intervention. If the receiving tanks can't hold the trucks trying to unload (Level transmitters) the system closes all unloading lines until there is sufficient room to

continue unloading. Further if there is insufficient room in the storage tanks, the system will not let the transfer pumps move fluid from the receiving/settling tanks to the storage tanks. Thus the unloading valves won't open nor will the transfer pumps transfer fluid into tanks that are already full. The water filtering pumps will transfer filtered water into the pre-injection tanks (Filtered Water) as long as the fluid level in the filtered water tanks does not exceed the upper limit established by the operator. The injection pumps will inject water into the well as long as there is sufficient filtered water to inject and all control parameters for the well are within preset value ranges.

All liquid unloading at the facility will enter tanks that are equipped with internal piping that allows fluids to be introduced under the liquid level in the tanks (submerged loading). Submerged loading is a recognized method of reducing emissions. All liquid transfer systems are connected together by a vent header to vapor balance the exchange between the receiving and transferring tanks. All used filters and tank cleanout solids are collected and disposed of to a permitted facility.

TES suggest Standard Operating Procedures (SOP) and daily facility inspections which would not be addendums to the Permit as they will have to be modified over time and could be "Permit Modifications" if they were addendums. All waste should have an approved profile to be accepted at the facility. All trucks would be unloaded through Mass Flow Meters recording density and volume. Likewise Mass Flow Meters would be used for injection measurement for reporting of density and volume.

Simplicity in design with many passive controls that don't require human attention or maintenance is TES's design goal. The design also reduces the number of incidents/accidents caused by operator error or inattention. Tanks that might fail, can be valved out of operation and bypassed with no effect on the operation. There is one transfer pump (plus one standby), one filter pump (plus one standby), one charge pump (plus one standby) and one injection pump (plus one standby). Three unloading bays and only one or two required. Since the PLC logic instructs the continuous filtration and injection of water, the only operator interaction is changing the filters when required and making sure inbound trucks/loads are approved into the facility and then enabling the specific unloading valve. All sump pumps activate automatically and are freeze protected as is the transfer pump. All containments have a fluid level alarm to detect leaks and have reduced height walls between them that together can contain 110% of any of the tank systems plus a twenty-five year 24 hour rainfall event.

If you have any questions about this letter or any of the drawings or process flow diagram please call TES' Special Projects Manager, Lynn Goldston – 903-235-1477.

Penneco Environmental Solutions
Pa. FACILITY
SECONDARY CONTAINMENT CALCULATIONS

Containment and Spill Calculations

NOTE:				
		Total Volume of Primary Containments (Tanks)	7,120	BBL
		Total Storage inside Secondary Containment (Minus Tank Pads)	6512	BBL
Because (4) decimal places were used in calculations there may be minuscule rounding differences!				
1 cuft =	7.4805	Gallons	1 BBL=	42 Gallons

Spill Calculations

	Tanks			BBL		
Tank #1	1	Gun Barrels #1 = 1x500	NA	500		
Tank #2	1	Gun Barrels #2 = 1x500	NA	500		
Tank #15	1	Oil Tank = 1x300	NA	300		
Note: No Tank Pads Required	2	WEIR tanks = (2x255) = 510	NA	510		
Note: No Tank Pads Required	2	WEIR tanks = (2x255) = 510	NA	510		
Tanks #3 thru #12 Manifolder Together	10	Storage Tanks = 10x400		4,000	Gallon	MAX Spill
Tanks #13 & #14 Manifolder Together	2	Filtered H2O Tanks = 2x400		800	33,600	Second Worst
	5"	Rainfall on 13,332 sqft		989	41,105	
Maximum Worst Case Spill (67% of all tanks) + 100 yr. 24 hr. Rainfall (5") to contain =				5,789		5789/6512=89%

		-5,789		
Total Storage inside Secondary Containment Walls - Minus Tank Pads	6,512	(6786 - 274 (pads))		
	723	723/6512=11%		
		BBL	Gallons	Cubic Feet
Excess capacity =		723	30,366	4,059

SEE Calculations on Page 2

Measurements based on Drawing File Name : Penneco - Sheet 1 - 6 - 7 - 2018

Penneco Environmental Solutions
Pa. FACILITY
SECONDARY CONTAINMENT CALCULATIONS

NOTE: Based on all tanks full and power off because of 100 year 24 hour Rainfall Event (tanks can't actually be filled completely ~90%).

See "Sheet With Areas"	AREA	L (ft)	W (ft)	H (ft)	Surface Area (ft ²)	Capacity (ft ³)	Capacity (GAL)	Capacity (BBL)
Weir Settling Tank Containment	W	119.25	24	3	2,862	8,586	64,228	1,529
Oil Tank Containment	X	24	24	3	576	1,728	12,926	308
Gun Barrel & Water Storage Tank Containment	Y	144	46	3	6,624	19,872	148,652	3,539
Unloading Pad with slope considered	U	59	53		3,127			
trough 'CuFt		(59x3x1.91)/2				169	1,260	30
Side 1 CuFt		(59x25x.667)/2				492	3,680	88
Side 2 CuFt		(59x25x.667)/2				492	3,680	88
Area above wall between containment W & X (24x.667)		24	0.667	1	16	16	120	3
Area above wall between containment W + X and Y (144x.667)		144	0.667	1	96	96	718	17
Area above wall between containment Y & Z (46x.667)		46	0.667	1	31	31	232	6
						31,482	235,497	5,607
						31,482	235,497	5,607
Unroofed area open to collect rainfall					13,332			
Less 100 year 24 hour Rainfall event = 5"x144x13,332= 9,599,040 / 1728 = 5,555 CuFt					13,332	(5,555)	(41,554)	(989)
Pump Area Containment with Roof	Z	48	46	3	2,208	6,624	49,551	1,180
Not Subject to Rainfall accumulation								
Total SQFT of ALL Containment Areas					15,540			
						32,551		
CuFt Available After Rainfall							243,494	5,797
Capacity available in Gallons after Rainfall event								
Capacity in Barrels after Rainfall event Calculated on gallons as test							5,797	5,797
Total Secondary Containment volume = 38,106 CuFt							6786 BBL	
MAX spill - 10 manifolded 400 BBL tanks (#3 thru #12) = 4,000 BBL								(4,000)
Instead of 10% or largest use Largest 2 Tank System =800 BBL Filtered water tanks								(800)
Subtotal								997
Containment Capacity After 100 yr. 24 hour Rainfall + worst case spill + 2nd largest tank system								997
Minus Housekeeping pads (15 pads x18.26 BBL = 274 BBL								(274)
Excess Capacity								723

See Detail below

PA Containment Calculations

Per direct conversation between Penneco design consultant, Lynn Goldston and DEP permit application reviewer, Kevin Maskol, Penneco submits the enclosed containment calculation that represents a model of calculation that is more consistent with current expectations across the Pennsylvania oil and gas industry spectrum.

Containment and Spill Calculations

Summary				
Total Volume of Primary Containments (Tanks)	7,120	BBL		
Total Storage inside Secondary Containment	6787	BBL		
Total Storage inside Secondary Containment (Minus Tank Pads)	6513	BBL		
Worst Case Spill by Pennsylvania DEP Rule Plus 10% Precipitation	4400	BBL		
Remaining Capacity after Worst Case Spill and Precipitation by PaDEP Spill Rule	1480	BBL		
Remaining Capacity After 100 year - 24 hour Rainfall Event on un-covered area	491	BBL		
1 CuFt =	7.4805	Gallons	1 BBL=	42 Gallons
				.1781 BBL per ft ³

Primary Containment (Tanks)

	Tanks		BBL	
Tank #1	1	Gun Barrels #1 = 1x500	NA	500
Tank #2	1	Gun Barrels #2 = 1x500	NA	500
Tank #15	1	Oil Tank = 1x300	NA	300
Note: No Tank Pads Required	2	WEIR tanks = (2x255) = 510	NA	510
Note: No Tank Pads Required	2	WEIR tanks = (2x255) = 510	NA	510
Tanks #3 thru #12 Manifoldd Together	10	Storage Tanks = 10x400	4,000	168,000 MAXIMUM Spill
Tanks #13 & #14 Manifoldd Together	2	Filtered H2O Tanks = 2x400	800	
Total Primary Containment			7120	

SEE Containment Calculations on Page 2

Measurements based on Drawing File Name : Penneco - Sheet 1 - 6 - 7 - 2018

Because (4) decimal places were used in calculations there may be minuscule rounding differences!

NOTE: Based on all tanks full and power off because of 100 year 24 hour Rainfall Event (tanks can't actually be filled completely ~90%).

See "Sheet With Areas"	AREA	L (ft)	W (ft)	H (ft)	Surface Area (ft ²)	Capacity (ft ³)	Capacity (GAL)	Capacity (BBL)
Weir Settling Tank Containment	W	119.25	24	3	2,862	8,586	64,228	1,529
Oil Tank Containment	X	24	24	3	576	1,728	12,926	308
Gun Barrel & Water Storage Tank Containment	Y	144	46	3	6,624	19,872	148,652	3,539
Unloading Pad with slope considered	U	59	53		3,127			
trough 'CuFt		(59x3x1.91)/2				169	1,260	30
Side 1 CuFt		(59x25x.667)/2				492	3,680	88
Side 2 CuFt		(59x25x.667)/2				492	3,680	88
Area above wall between containment W & X (24x.667)		24	0.667	1	16	16	120	3
Area above wall between containment W + X and Y (144x.667)		144	0.667	1	96	96	718	17
Area above wall between containment Y & Z (46x.667)		46	0.667	1	31	31	232	6
Pump Area Containment with Roof	Z	48	46	3	2,208	6,624	49,551	1,180
Total Volume of ALL Containment Areas					15,540	38,106	285,048	6,787
Minus Housekeeping pads for 15 tanks on 13' diameter octagonal pads (15 pads x18.26 BBL = 274 BBL)								(274)
Note: No housekeeping pads under solids settling tanks- open 8" I-Beam support = no volume								-
							Subtotal	6,513
Pacode	§78a.64a.(d) Secondary Containment							
	Largest primary containment - 10 manifolded 400 BBL tanks (#3 thru #12)= 10 x400 BBL=							(4,000)
	plus an additional 10% of volume for precipitation							(400)
							Subtotal	2,113
Minus 'the footprint of remaining tanks not part of Largest group of 10 - 5ea 12' diameter tanks on pad = 5x2.33'x20 BBL/ft=								(233)
Minus the footprint of the four settling tanks - 8' "W"x2.33' "T"x 30' "L"= 559 ft³ x .1781 BBL/CuFt=100 BBLx4 Tanks=								(400)
	Remaining containment capacity calculated by Pennsylvania DEP rule= BBL							1,480
However the unroofed portion of the Penneco facility is 13,332 ft² (15540-2208) and PES has prepared for the very worst case:								
Less 100 year 24 hour Rainfall event 5"= (5"x144 in²/ft²)x13,332 ft²= 9,599,040 in³ / 1728 in³/ft³ = 5555 ft³ x .1781 BBL/ft³= 989 BBL								(989)
	Remaining containment capacity by Penneco's environmental conscience = BBL							491

ATTACHMENT “Q”
Plugging and Abandonment Plan

Attachment Q
Plugging and Abandonment Plan
Sedat #4A Injection Well

Plugging and Abandonment Plan:

The company will plug the Sedat #4A in accordance with the Pennsylvania Bureau of Oil and Gas Management and the EPA regulations in place at the time of abandonment. The following actions will be taken:

- * Move in service rig
- * Set 4½" Cast Iron Bridge Plug at approximately 1,680'
- * Run 2 7/8" tubing to 1,680'
- * Spot solid plug from CIBP to Surface
- * Retrieve and lay down tubing string
- * Rig down and move out
- * Haul tubing to storage or disposal
- * Install monument with requisite detail

Form 7520-19 and cost estimate is attached.

United States Environmental Protection Agency



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

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

Penneco Environmental Solutions, LLC
6608 Route 22
Delmont, PA 15626
724-468-8232
dmarej@penneco.com

Permit or EPA ID Number

API Number

Full Well Name

37-003-21644

Sedat #4A

State

Pennsylvania

County

Allegheny

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

Latitude 40.526916

Surface Location

 1/4 of 1/4 of Section Township Range

Longitude -79.711027

 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 Future Date

☐ Report After WorkDate 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.

Upon the determination that the Sedat #4A well is no longer suitable for brine disposal, the well will be plugged starting with a 4½" Cast Iron Bridge Plug at approximately 1,680' (4½" casing seat depth) followed by 130 sks of Type 1 Cement from the CIBP to surface.

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)

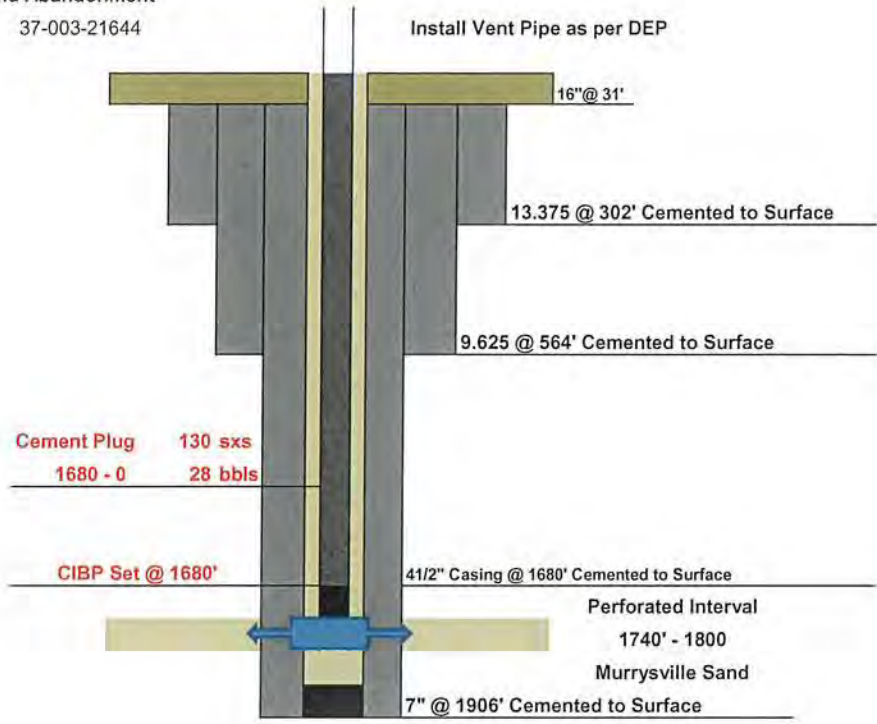
D. Marc Jacobs, Jr.
Senior Vice President

Signature

Date Signed

2/17/22

Penneco Oil Co
Sedat #4A
Plug and Abandonment
P/N 37-003-21644



ATTACHMENT "R"
Necessary Resources

STANDBY TRUST AGREEMENT

U.S. Environmental Protection Agency
Underground Injection Control
Financial Responsibility Requirement

THIS TRUST AGREEMENT (the "Agreement") is entered into as of the 23 day of MARCH, 2016, by and between **PENNECO ENVIRONMENTAL SOLUTIONS, LLC**, owner or operator, a Pennsylvania limited liability company of 6608 State Route 22 Delmont, PA 15626 (the "Grantor"), and **FIRST COMMONWEALTH BANK**, of 600 Philadelphia Street, Indiana, Pennsylvania 15701, a Pennsylvania business corporation (the "Trustee").

WHEREAS, the United States Environmental Protection Agency ("EPA"), an agency of the United States Government, has established certain regulations applicable to the Grantor, requiring that an owner or operator of an injection well shall provide assurance that funds will be available when needed for plugging and abandonment of the injection well or wells; and

WHEREAS, the Grantor has elected to establish a trust to provide all of part of such financial assurance for the facility or facilities identified herein; and

WHEREAS, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this Agreement, and the Trustee is willing to act as trustee.

NOW THEREFORE, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement: (a) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor; (b) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee; and (c) Facility or activity means any "underground injection well" or any other facility or activity that is subject to regulation under the Underground Injection Control Program.

Section 2. Identification of Facilities and Cost Estimates. This Agreement pertains to the facilities and cost estimates identified on attached Schedule A.

Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a trust fund (the "Fund") for the purpose of assuring compliance with the plugging and abandonment requirements established by EPA for the facilities identified on Schedule A. The Underground Injection Control regulations which govern the authorization to inject include a requirement for such financial assurance that the well or wells shall be plugged and abandoned at the time designated by EPA. The Grantor and the Trustee acknowledge that the Fund and all expenditures from the Fund shall be to fulfill the legal obligations of the Grantor under such regulations, and not any obligation of EPA. The Grantor and the Trustee intend that no third party have access to the Fund except as herein provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible, nor shall it undertake any responsibility, for the amount or adequacy of any additional payments necessary to discharge any liabilities of the Grantor established by EPA, nor shall the Trustee have any duty to collect such additional amounts from the Grantor.

Section 4. Payment for Plugging and Abandonment. The Trustee shall make payments from the Fund only for the costs of plugging and abandonment ("P&A") of the injection wells covered by this Agreement and the associated P&A Plan, only after EPA has advised the Trustee that work has been completed under the P&A Plan that complies with 40 C.F.R. § 144.28 and/or § 144.52. The Trustee shall not refund to the Grantor any amounts from the Fund unless and until EPA has advised the Trustee that the P&A Plan has been successfully completed. The Trustee shall not release any funds to the Grantor that are necessary to cover liability for any injection wells covered by this Agreement that remain unplugged.

Section 5. Payments Comprising the Fund. Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.

Section 6. Trustee Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; *except that:* (i) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a-2.(a), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government; (ii) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal or State government; and (iii) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion: (a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and (b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a-I *et seq.*, including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote shares in its discretion.

Section 8. Express Powers of Trustee. Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered: (a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition; (b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted; (c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of

the Fund; (d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or State government; and (e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. The Trustee shall annually, at least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the appropriate EPA Regional Administrator a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the EPA Regional Administrator shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement of any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

Section 13. Successor Trustee. The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the EPA Regional Administrator, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by the EPA Regional Administrator to the Trustee shall be in writing, signed by the EPA Regional Administrators of the Regions in which the facilities are located, or their designees, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the

Grantor or EPA hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or EPA, except as provided for herein.

Section 15. Notice of Nonpayment. The Trustee shall notify the Grantor and the appropriate EPA Regional Administrator, by certified mail within 10 days following the expiration of the 30-day period after the anniversary of the establishment of the Trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to send a notice of nonpayment.

Section 16. Amendment of Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and the appropriate EPA Regional Administrator, or by the Trustee and the appropriate EPA Regional Administrator if the Grantor ceases to exist.

Section 17. Irrevocability and Termination. Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the EPA Regional Administrator, or by the Trustee and the EPA Regional Administrator if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

Section 18. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or the EPA Regional Administrator issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 19. Choice of Law. This Agreement shall be administered, construed, and enforced according to the laws of the Commonwealth of Pennsylvania.

Section 20. Interpretation. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

[The remainder of this page is intentionally left blank. Signatures follow.]

SCHEDULE A

Identification of Facilities and Cost Estimates

Schedule A is referenced in the standby trust agreement dated March 23, 2016 by and between PENNECO ENVIRONMENTAL SOLUTIONS, LLC, the Grantor and
(Name of owner or operator)

FIRST COMMONWEALTH BANK, the Trustee.
(Name of trustee)

EPA identification number	<u>PAS2D701BALL</u>
Name of facility	<u>Sedat 3A Injection Well</u>
Address of facility	<u>1800 Old Leechburg Road</u> <u>Pittsburgh, PA 15239</u>
Current plugging and abandonment cost estimate	<u>\$13,397.10</u>
Date of estimate	<u>02/17/2022</u>
EPA identification number	<u>PAS2D702BALL</u>
Name of facility	<u>Sedat 4A Injection Well</u>
Address of facility	<u>1800 Old Leechburg Road</u> <u>Pittsburgh, PA 15239</u>
Current plugging and abandonment cost estimate	<u>\$13,397.10</u>
Date of estimate	<u>02/17/2022</u>

SCHEDULE B

Description of Property / Financial Instrument

[Surety, Letter of Credit, etc.]

Schedule B is referenced in the Standby Trust Agreement (Section 3) dated 02/22/2022
by and between PENNECO ENVIRONMENTAL SOLUTIONS, LLC, the “Grantor,”
(name of owner or operator)
and FIRST COMMONWEALTH BANK, the “Trustee.”
(name of the trustee)

The fund consists of: (Check one and provide identification number)

- ☒ Irrevocable Letter of Credit No. 491R1397 (Sedat 3A)
- ☐ Surety Performance Bond No. _____
- ☐ Other (Describe) _____

SCHEDULE B

Description of Property / Financial Instrument

[Surety, Letter of Credit, etc.]

Schedule B is referenced in the Standby Trust Agreement (Section 3) dated 02/22/2022
by and between PENNECO ENVIRONMENTAL SOLUTIONS, LLC, the “Grantor,”
(name of owner or operator)
and FIRST COMMONWEALTH BANK, the “Trustee.”
(name of the trustee)

The fund consists of: (Check one and provide identification number)

- ☒ Irrevocable Letter of Credit No. 491R1398 (Sedat 4A)
- ☐ Surety Performance Bond No. _____
- ☐ Other (Describe) _____

IN WITNESS WHEREOF the parties below have caused this Agreement to be executed by their respective representatives duly authorized and their seals to be hereunto affixed and attested as of the date first above written.

GRANTOR:
**PENNECO ENVIRONMENTAL
SOLUTIONS, LLC**

By: [Signature]
Name: Terrence S. Jacobs
Title: President

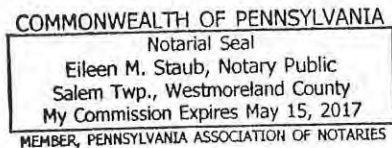
TRUSTEE:
FIRST COMMONWEALTH BANK

By: [Signature]
Name: Douglas I. Sako
Title: Senior Vice President

Before me came the individual whose identity I confirmed as Terrence S. Jacobs and whose true signature is set forth above; wherefore have I set my hand and seal this 18th day of MARCH, 2016.

Eileen M. Staub
Notary Public

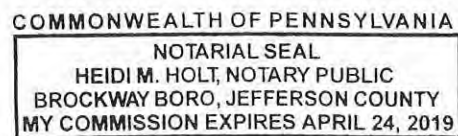
[Seal]



Before me came the individual whose identity I confirmed as Douglas I. Sako and whose true signature is set forth above; wherefore have I set my hand and seal this 23rd day of March, 2016.

Heidi M. Holt
Notary Public

[Seal]



() This bank/institution has the authority to act as trustee and its trust activities are examined and regulated by a State or Federal agency.

**CERTIFICATE OF ACKNOWLEDGMENT
FOR
STANDBY TRUST FUND AGREEMENT**

STATE OF Pennsylvania)
) SS:
COUNTY OF Jefferson)

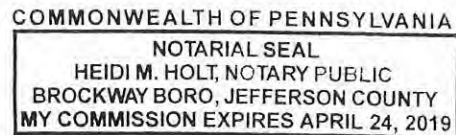
On this, the 23rd day of March, 2016, before me personally came
Douglas I Sako, to me known, who, being by me duly sworn, did depose
and say that he/she resides at 654 Philadelphia St. Indiana, PA 15701
(Address)

that he/she is the Senior Vice President of FIRST COMMONWEALTH BANK
(Title) (Corporation)

the corporation described in and which executed the above instrument; that he/she knows the seal of said corporation; that the seal affixed to such instrument in such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he/she signed his/her name thereto by like order.

Heidi Molt
(Notary Public)

(Seal)



IN WITNESS WHEREOF the parties below have caused this Agreement to be executed by their respective representatives duly authorized and their seals to be hereunto affixed and attested as of the date first above written.

GRANTOR:
**PENNECO ENVIRONMENTAL
SOLUTIONS, LLC**

TRUSTEE:
FIRST COMMONWEALTH BANK

By: _____

Name: _____

Title: _____

By: *Danny Diveley*

Name: Danny Diveley

Title: Trust Officer

Before me came the individual whose identity
I confirmed as _____
and whose true signature is set forth above;
wherefore have I set my hand and seal this
_____ day of _____, 2016.

Notary Public

[Seal]

Before me came the individual whose identity
I confirmed as Danny Diveley
and whose true signature is set forth above;
wherefore have I set my hand and seal this
24th day of March, 2016.

Kelly Perney
Notary Public

[Seal]

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
KELLY PERNEY, NOTARY PUBLIC
CITY OF GREENSBURG, WESTMORELAND CO.
MY COMMISSION EXPIRES NOV. 25, 2018

☒ This bank/institution has the authority to act as trustee and its trust activities are examined and regulated by a State or Federal agency.

**CERTIFICATE OF ACKNOWLEDGMENT
FOR
STANDBY TRUST FUND AGREEMENT**

STATE OF Pennsylvania)
)
COUNTY OF Westmoreland) SS:

On this, the 24th day of March, 2016, before me personally came
Danny Diveley, to me known, who, being by me duly sworn, did depose
and say that he/she resides at 654 Philadelphia Street, Indiana, PA 15601
(Address)

that he/she is the Trust Officer of FIRST COMMONWEALTH BANK
(Title) (Corporation)

the corporation described in and which executed the above instrument; that he/she knows the seal of said corporation; that the seal affixed to such instrument in such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he/she signed his/her name thereto by like order.

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
KELLY PERNEY, NOTARY PUBLIC
CITY OF GREENSBURG, WESTMORELAND CTY.
MY COMMISSION EXPIRES NOV. 25, 2018

(Notary Public)

(Seal)

Kelly Perney



First Commonwealth Bank
Central Offices:
Philadelphia and Sixth Streets
P.O. Box 400
Indiana, PA 15701-0400
800.711.2265
fcbanking.com

IRREVOCABLE STANDBY LETTER OF CREDIT # 491R1398

Issue Date: February 23, 2022

Beneficiary:

Department of Environmental Protection Agency
Regional Administration, Region III
1650 Arch Street
Philadelphia, PA 19103

Applicant:

Penneco Environmental Solutions LLC
6608 State Route 66
Delmont, PA 15626

Dear Beneficiary:

We hereby establish our Irrevocable Standby Letter of Credit No. 491R1398 in your favor as Beneficiary, at the request and for the account of the Applicant, Penneco Environmental Solutions LLC, for drawings up to Thirteen Thousand Four Hundred U.S. Dollars (13,400.00). We hereby authorize you to draw at sight, on First Commonwealth Bank at our office located at 654 Philadelphia Street, P.O. Box 400, Indiana, PA 15701 and expires with our close of business on February 23, 2023.

Funds under this credit are available to you against presentation of your sight draft(s) marked "Drawn under Irrevocable Standby Letter of Credit # 491R1398 dated February 23, 2022" and accompanied by:

1. your statement purportedly signed by an authorized representative of Department of Environmental Protection Agency, stating that "Penneco Environmental Solutions LLC have not performed their obligations required by Department of Environmental Protection Agency and are hereby responsible for payment of 13,400.00

AND

2. this original letter of credit and any amendments hereafter.

Partial draws are permitted.

It is a condition of this letter of credit that it shall be automatically renewable for additional terms of one year from the present or each future expiration date unless we give you and Penneco Environmental Solutions LLC at least ninety (90) days prior to said expiration date written notice by certified mail, return receipt requested, that we elect to terminate this credit at the end of its then current term.



Page 2

February 23, 2022

Letter of Credit No. 491R1398

This Letter of Credit is subject to and shall be governed in accordance with the terms of the Uniform Commercial Code, Article 5, Letters of Credit, 13 Pa.C.S.A. § 5101 *et seq.* ("Article 5"); and shall not be subject to or governed by the provisions of the Uniform Customs and Practice for Documentary Credit (2007 Revision) International Chamber of Commerce Publication No. 600 (the "UCP 600") or International Standby Practices Publication No. 590 (1998 Edition) (the "ISP 98"), except that where Article 5 is silent as to any issue which is addressed by the UCP 600, then the UCP 600 shall govern as to that issue only.

Sincerely,

First Commonwealth Bank

By: 
Name: Jason Colinet
Title: Vice President



LETTER OF CREDIT AGREEMENT

ISSUE DATE: February 23, 2022
LETTER OF CREDIT NO.: 491R1398
AMOUNT: 13,400.00

ISSUING BANK ("BANK")
FIRST COMMONWEALTH BANK
P. O. BOX 400
INDIANA, PA 15701

NAME OF CUSTOMER ("ACCOUNT PARTY")
Penneco Environmental Solutions LLC
6608 State Route 66
Delmont, PA 15626

Account Party hereby directs Bank to fund drafts issued under this letter of credit by drawing against 8900020823 dated February 23, 2022 for the amount of said drafts.

In consideration of the issuance by Bank of the Letter, Account Party hereby:

1. Agrees to reimburse Bank for any charges or commissions incurred by Bank for processing of any drafts presented for payment under the Letter, and authorizes Bank to charge any of Account Party's deposit accounts for payment of said charges.
2. Authorizes Bank to honor any request for payment which is made under and in compliance with the terms of the Letter without regard to, and without any duty on Bank's part to inquire into the existence of any disputes or controversies between Account Party, the beneficiary of the Letter, or any other person, firm, or corporation, or the respective rights, duties or liabilities of any of term or whether any facts or occurrences represented in any of the documents presented under the Letter are true or correct.
3. Affirms that Bank's sole obligation shall be limited to honoring requests for payment under and in compliance with the terms of the Letter, and that this obligation shall remain limited even if Bank has assisted in the wording or preparation of the Letter and any associated documents or may be otherwise aware of the underlying transaction giving rise to the request for the Letter.
4. Assumes all risks of the acts or omissions of the users of the Letter, and releases Bank or responsibility for the validity, sufficiency, genuineness or effect of any documents associated with the Letter, even if such documents should in fact prove to be in any or all respects invalid, insufficient, fraudulent, or forged.
5. Agrees that any extension or modification of the original Letter will be subject to the terms of this Agreement.

Penneco Environmental Solutions LLC

BY: _____

Terrence S Jacobs, President

BY: _____

Darryl M Jacobs, Executive Vice President

SUREFIRE WIRELINE, LLC.**PRICE ESTIMATE**

Customer/Operator: Penneco Oil Company
Representative: Marc Jacobs
Well/Lease/Project Name: Sedat #4A (P&A)
Prepared By: Gary Violi
Date: Thursday, February 17, 2022
Job Type: CIBP Set - 4.5"



GENERAL PRICING		Unit Price	Quantity	Total Price
Mileage Heavy Vehicle	per mile , one way from service point.	6.10	30	183.00
Mobilization / Service Charge				
Service Charge	per job (6 hours on location).....	1,440.00	1	1,440.00
Wireline Bridge Plugs / Frac Plugs				
Plug Setting				
Depth Charge	minimum.....	520.00	1	520.00
4 1/2" Cast Iron	each.....	760.00	1	760.00
Powder Charge/Igniter	each.....	220.00	1	220.00
Gross Price Subtotal				3,123.00
Discount				0.00
Net Price Subtotal				3,123.00
Miscellaneous Charges				
Total Net Price				3,123.00

Note: The above is an estimate only. Actual charges may differ as job parameters and exact services are requested or necessary at the time the work is performed. The Discount and consequently the Net Price are applicable only if payment is made within 30 days of the receipt of the invoice. After 30 days the full Gross Price and any Miscellaneous Charges will apply. Any invoices unpaid after 60 days will be subject to a Finance Charge and any and all Expenses to collect such unpaid invoices will be paid by the customer.

Phone: 724-783-5035
Fax: 724-783-5168

2/17/2022

Company Name:

Sedat #4Aand #3A

Contact Name: Ed Rosenbeger

Contact email: edrosenberger70@gmail.com

[illegible]

Comments:

ATTACHMENT "U"
Description of Business

Attachment U
Description of Business
Sedat #4A Injection Well

Business Description for Sedat #4A Injection Well

The Company's business is the treatment and disposal of oil and gas well produced fluids by injection of the fluid into an underground formation via an injection well constructed by the company for this purpose.