west virginia department of environmental protection

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

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Thursday, September 1, 2022

WELL WORK PLUGGING PERMIT
Coal Bed Methane Well Plugging

CENTURY MINING, LLC
7004 BUCKHANNON RD.
VOLGA, WV 26238

Re: Permit approval for NCRHC-1
47-001-02790-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Upon completion of the plugging well work, the above named operator will reclaim the site according to the provisions of WV Code 22-6-30. Please be advised that form WR-38, Affidavit of Plugging and Filling Well, is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

Operator's Well Number: NCRHC-1
Farm Name: NORTH CENTRAL RESOURCE
U.S. WELL NUMBER: 47-001-02790-00-00
Coal Bed Methane Well Plugging
Date Issued: 9/1/2022

09/02/2022

4701027 90P

PERMIT CONDITIONS

West Virginia Code § 22-6-11 allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. All pits must be lined with a minimum of 20 mil thickness synthetic liner.

2. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.

3. Well work activities shall not constitute a hazard to the safety of persons.

09/02/2022

4700102790P

CENTURY
MINING, LLC

August 5, 2022

RECEIVED
Office of Oil and Gas
AUG 08 2022
WV Department of
Environmental Protection

WV Department of Environmental Protection
Office of Oil & Gas
601 57th Street, SE
Charleston, WV 25304-2345

Re: Permit to Plug and Abandon Well API 47-001-02790

Dear Sir:

Please find attached for your review a completed WW-48b Application for a Permit to Plug and Abandon the Well API 47-001-02790. This well is located on Left Branch of Gnatty Creek near Volga, WV in Barbour County as shown on the attached location map.

If you should have any additional question or need any additional information, please feel free to contact me at your convenience at (304)809-1167.

Respectfully,

Gary W. Miles

Gary W. Miles
Chief Engineer
Century Mining, LLC

7004 BUCKHANNON ROAD, VOLGA, WV 26238
T (304) 809-1167 E: GMILES@CENTURMININGLLC.COM

09/02/2022

WW-4B
Rev. 2/01

4700102790 P

1) Date 07/26, 2022
2) Operator's
Well No. NCRHC-1
3) API Well No. 47- 001 - 02790

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

APPLICATION FOR A PERMIT TO PLUG AND ABANDON FOR A CBM WELL

4) Well Type: Oil ____/ Gas X / Liquid injection ____/ Waste disposal ____/
(If "Gas, Production ____ or Underground storage ____) Deep ____/ Shallow____

5) Location: Elevation 1452.13 Watershed Left Branch of Gnatty Creek
District Union County Barbour Quadrangle Century

6) Well Operator ____
Address ____

7) Designated Agent Gary Miles
Address 7004 Buckhannon Road
Volga, WV 26238

8) Oil and Gas Inspector to be notified
Name Sam Ward
Address P.O. Box 2327
Buckhannon, WV 26201

9) Plugging Contractor
Name Target Drilling, Inc.
Address 1112 Glacier Dr.
Smithton, PA 15479

10) Work Order: The work order for the manner of plugging this well is as follows:

See Plan to Cleanout CBM Wells and Plug Coal Laterals, Calculated Volumes, & MSHA 101C Exemption

AFTER LATERAL CBM UNCASED BORE HOLE HAS BEEN FILLED PER MSHA 101C EXEMPTION, THE CASED WELL BORE MUST BE FILLED WITH EXPANDING CEMENT FROM 1121' TO 100' ABOVE THE SHALLOWEST COAL. FROM THERE A GEL SPACER MAY BE PLACED TO 100' FROM SURFACE, THEN A 100' CLASS A CEMENT PLUG SET TO SURFACE, AND A MONUMENT PLACED PER WV STATE CODE.

RECEIVED
Office of Oil and Gas
AUG 08 2022
WV Department of
Environmental Protection

Notification must be given to the district oil and gas inspector 24 hours before permitted work can commence.

Work order approved by inspector [signature] Date 8/4/2022

09/02/2022

4700102790P

Century Mining, LLC
Longview Mine – MSHA ID NO: 46-09447
WV State ID: U-2015-12
Plan to Cleanout CBM Wells and Plug Coal Laterals in Lower Kittanning Coal With Polymer Gel
July 20, 2022

Procedures to Cleanout and Regain Circulation with CBM Wells NCRHC-1 and NCRHC-2 Prior to Plugging with Polymer Gel

Background:

Both of these single well or access CBM wells were drilled in late 2004 and early 2005 by Penn VA Oil & Gas Company in the Lower Kittanning Coal owned by NCR. WV DEP Oil & Gas [O & G] assigned drilling permits API-47-001-02790C for NCRHC-1 and API 47-001-02795C for NCRHC-2. Actual As-Built final surveyed coordinates and elevations of the coal laterals drilled from their respective cased single access wells have not been found after contacting WV DEP O&G; and failed attempts to contact Penn Virgina O&G, and Directional Drilling Contractors who did the directional drilling for Penn VA O&G, both are no longer in business.

Century Mining, LLC has obtained copies of the approved DEP O&G drilling permits and various other documents pertaining to the drilling of the two CBM wells including data of measured depths casing was drilled and cemented into each well; measured depths of the fiberglass casing sandwiching the LK coal; and measured depths of bottom of the steel casing set below the LK coal. True vertical depths have been estimated for the access well casing in addition to surface elevations of each well from the well permit plats. The planned and permitted course of the CBM wells and their coal laterals are provided in the permit plats and have been placed on the Longview Mine Map including a +/- 1.5 – 2 degree placement variance.

Directional Cleanout Procedures

Century Mining, LLC's service drilling contractor has pulled the downhole pumps and tubing from the two CBM Well cased access wells and circulated water to clean out the wells. However, re-entering the kickoff of the last portion of the access well curves connected to the coal laterals was not feasible without directional drilling capabilities. Century Mining, LLC has contracted Target Drilling, Inc. to attempt enter the window cut into the fiberglass casing to clean out bottom portion of the directional curve landing in the Lower Kittanning coal [LK] and establish communication with the last coal lateral drilled in each well. The procedures to conduct the directional cleanout are as follows:

1. Rig up vertical rig over NCRHC-1 CBM Well.
2. Install wellhead, diverter, valves, flow line, etc. [continuous methane monitoring at wellhead during all operations].
3. Trip drill string into cased access well through 6.1" ID fiberglass casing sandwiching coal and into steel casing about 100 feet below LK coal circulating compressed air.

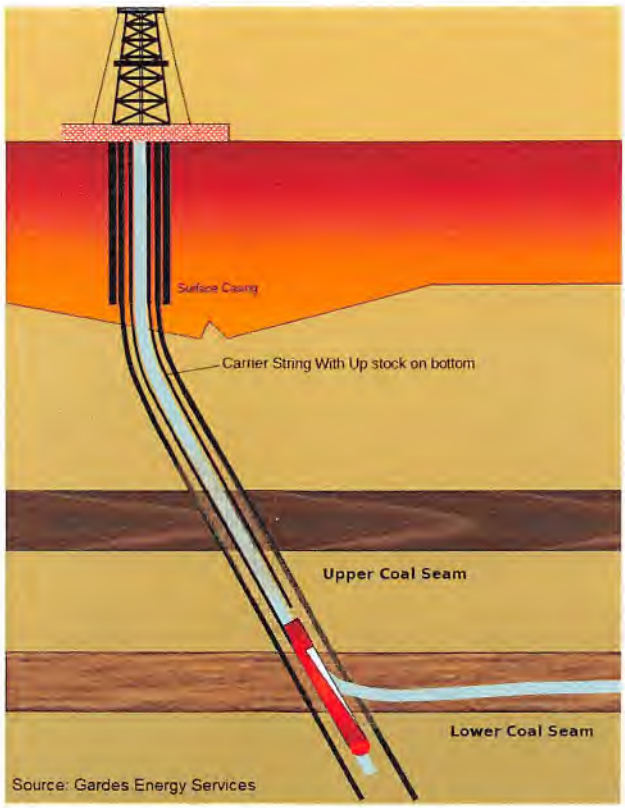
Century Mining, LLC
Longview Mine – MSHA ID NO: 46-09447
WV State ID: U-2015-12
Plan to Cleanout CBM Wells and Plug Coal Laterals in Lower Kittanning Coal With Polymer Gel
July 20, 2022

4. Establish circulation return through CBM well and into flow line and steel pits. Measure and record air pressures and time it takes for circulation return.

5. Run a Gyro survey downhole to verify azimuth of access wells and compare to the drilling permit wellplan.

6. Run borehole camera down the cleaned out access well to verify measured depth of window cut in fiberglass casing for curve [see the figure below – red shaded segment is the window cut using up-stock or whipstock].

7. Run directional drill string, downhole motor with bit and survey tool downhole to attempt to re-enter window in fiberglass casing to cleanout curve drilled in roof rock steered into the LK coal and the last lateral drilled. Circulate air and water mix until circulation return to the surface measuring and monitoring volumes and pressures experienced.



8. If attempts to re-enter the window cut in the fiberglass and enter the curve are unsuccessful, run 5 ½" OD casing equipped with whipstock on the bottom of the 5 ½" casing into the access well oriented to re-enter the window cut in the fiberglass.

9. Trip in the directional drilling bottom hole assembly including downhole motor, bit and survey tool and follow the whipstock through window and into curve.

10. Inject compressed air into annulus between 5 ½" casing and access well casing while cleaning out the curve and initial part of the last lateral drilled.

11. For either step 7 or 10 when successful, circulate compressed air until cuttings and water in the LK are flushed to the surface and the return air flow is clean of water and cuttings.

12. After successfully cleaning out curve and the initial part of the lateral, trip drill string out of the 5 ½" casing.

13. Trip 5 ½" casing and whipstock out of access well.

14. Trip drill string equipped with pneumatic inflatable packer and pressure transducer to 30 feet above the window in fiberglass. Inflate packer and measure and record the downhole pressure in the LK laterals for 24 hours in preparation to plug with polymer gel.

15. Repeat Steps 1-15 on CBM Well NCRHC-2.

NCRHC-1 and NCRHC-2 Polymer Gel Plugging Procedures

1. Produced formation water from the CBM wells will be collected and tested for water chemistry.

2. Polymer gel chemicals mixed with potable water will be placed in with produced water to verify the gel mix cures.

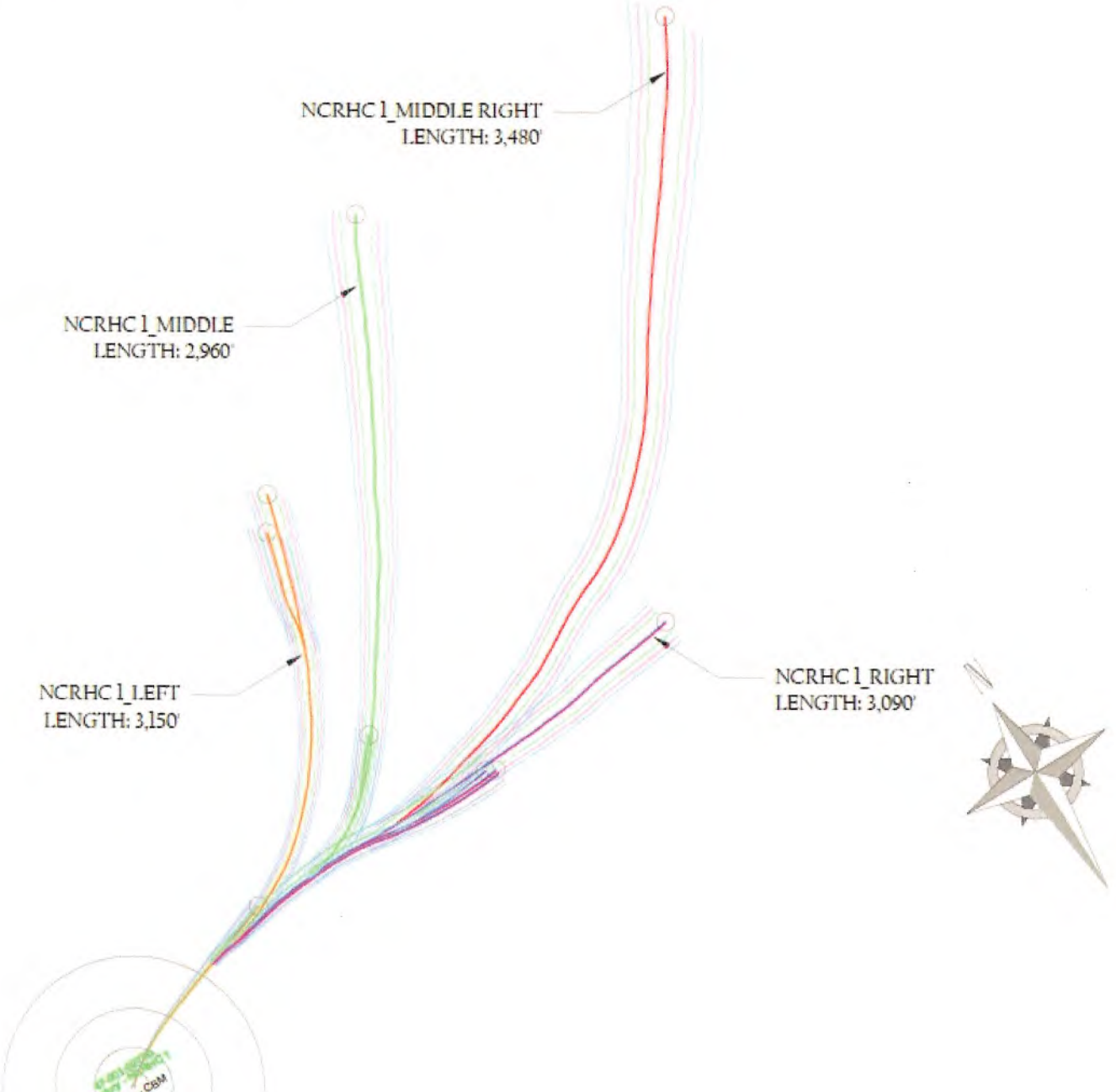
3. Wellhead shut-in pressure will be measured and recorded for a minimum of 24 hours after the CBM well curves are cleaned out.

4. Target Drilling Polymer Gel Plugging Plans and procedures are attached.

5. The following Polymer Gel Plugging Plans estimated volume of polymer gel.

6. The volume of polymer gel required is at least 100% of the coal lateral volumes, preferably over 200% [2X] will be pumped with Target's polymer gel mixing and pumping unit used to uniformly mix gel chemicals with potable water. Polymer gel pumping pressures are expected to increase to over 100 psi when the gel volume is near 100% and continue to increase as up to or over 200% of lateral volume is pumped.

Longview Mine Lower Kittanning CBM Well NCRHC-1 Polymer Gel Plugging Plan—July 20, 2022



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LONGVIEW MINE NCRHC-1 CBM Well Polymer Plugging Volumes	
July 19, 2022	
MD = Estimated Measured Depths	Estimated Total [feet]
Coal Laterals:	
Lateral #1 Left with Sidetracks	3490
Lateral #2 Middle Left	2960
Lateral #3 Middle Right	3480
Lateral #4 Right	3090
Lateral #4 Right - Sidetracks	490
TOTAL [4.75" Dia.] Lateral or Leg Coal Footage	13510
CBM Lateral Footage Volume Gallons (Total Lateral Footage x 0.92 Gal/ft) ✓	12429 ?
100% LK CBM Well Laterals With Cavity [Gallons]	12429
125% LK CBM Well Laterals With Cavity [Gallons]	15537
150% LK CBM Well Laterals With Cavity [Gallons]	18644
200% LK CBM Well Laterals With Cavity [Gallons]	24858
Plugging will be done in accordance with the approved 101C Petition for Modification and Polymer Gel Pumping Can Be Stopped if Measured Gel Pressure Reaches 200 PSI or if ~ 200 +% Volume of Laterals is Pumped. Volumes and pressures above the minimum is acceptable, if deemed suitable by the mine.	

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www.targetdrilling.com

Target Drilling Surface Procedures for Safely Plugging Surface Drilled CBM Well Horizontal Coal Laterals or In-Mine Boreholes Using Target Drilling's Cross-Linked Polyacrylamide Polymer Gel

This brief narrative describes Target Drilling's [Target] procedures and equipment used to safely plug in-mine boreholes or surface drilled horizontal coalbed methane coal laterals using Target's cross-linked polyacrylamide [polymer] gel. Target has used its proprietary polymer gel mix to plug nearly 186 miles on surface drilled horizontal coal laterals and in-mine degas boreholes since the spring of 2004. Although primarily pumped from the surface to conduct the gel plugging, Target has applied polymer gel plugging from within coal mines [a chemical description of the polymer gel mix including HMIS rating and safety precautions is included at the end of this document].

Target Drilling's [Target] Proprietary Polymer Gel Chemical Description

Target's polymer gel mix is a man made, proprietary inorganic, metal cross-linked polymer gel consisting of: 1) 97-99% water by weight, 2) 2-3% by weight liquid high molecular weight water-soluble, partially hydrated, polyacrylimide polymer product called VMA-003; 3) less than 1/2% by weight valiant chromium ion XLR-C, used to "cross-link" or complex the polyacrylimide material (VMA 007) to change the polymer from water soluble to insoluble and; 4) less than 1/4% by weight liquid accelerator and conditioner to control reaction rate (Activators- B & M). In simple terms, the polyacrylimide, in excess of 2 million molecular lengths, is allowed to hydrate with water creating a mixture similar to a bowl of noodles. Then at a specific time, based on the mix design, chromium III ions attach at bonding points in between the noodles creating extremely over cooked noodles. Target contracted an independent laboratory to develop specific concentrations of the individual components for the gel mix based on the desired times required for mixing, pumping, setting and maintaining its semi-solid state by conducting tests in their laboratory.

Table 1 is an Information Document for the metal cross-linked polymer gel mix structured as a SDS sheet, but it is *NOT* an actual MSDS sheet. Slight variations in mixing in the field make it difficult to develop a representative MSDS. Before the gel was used initially to seal degas boreholes, meetings were held between representatives from the local work force's safety department, mine management, MSHA District 2; an MSHA Toxologist, and TDI. The meetings resulted in concluding that the gel ingredients and mixed gel were not toxic or hazardous providing adequate training was conducted for safe handling, mixing and pumping of the gel ingredients and that the final gel mix- either as a viscous liquid or semi-solid- would not be hazardous or jeopardize the safety and well-

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being of the local workforce if they came in contact with the gel. It is important to note, this product combination of gel mix was developed specifically for this application and to overcome the deficiencies of using a modified guar. The material is resistant to bacterial attack and stable to decay for long periods of time. Other natural gel systems (guar and low cost oilfield viscosity agents) consist of food type materials which present bacteria issues and long-term stability problems.

Table 1 - Polyacrylamide Gel Mixture Information Safety Data Sheet

Section Number	Metal Cross-Linked Poly Acrylimide Gel
1. Product Identification	Proprietary Blend
2. Ingredients	Non-Hazardous
3. Hazard Identification	Light green to powder blue gel with no distinct odor
4. First Aid Measures	Eye Contact-water flush; Skin Contact-soap & water; Ingestion-physician; Inhalation-fresh air; artificial respiration
5. National Fire Prevention Code	Health = 0; Flammability = 0; Reactivity = 0; Special Hazard = None
6. Accidental Release Measures	Wear personal protective equipment and remove with absorbent materials
7. Handling and Storage	Keep away from heat and incompatible materials
8. Personal Protection	Chemical resistant personal protective equipment
9. Physical and chemical properties	pH:6-9; SG:1.00-1.05g/ml; Insoluble to water; Boiling Point: >100 deg. C; Freezing Point: 0 deg. C; light gray to blue green gel with no odor
10. Stability and Reactivity	Hazardous polymerization will not occur
11. Toxological Information	No information available
12. Ecological Information	No information available
13. Disposal	Not an RCRA hazardous material. Discard according to regulatory agencies
14. Transportation	Primary Hazard Class / Division: Not restricted
15. Regulatory Information	OSHA Hazard Communication Status: Non-Hazardous
16. Other Communication	HMIS Ratings: Health = 1; Flammability = 0; Reactivity = 0

Initial Steps Surface Plugging Coal Laterals or Boreholes with Polymer Gel

1. The coal client provides Target with the specific description of the borehole or coal lateral to be plugged with polymer gel, including, but not limited to:

    a. Borehole or lateral diameter and length to be plugged to calculate the volume of polymer gel required to fill the borehole to 200-175% of its volume including branches and sidetracks.

    b. Reservoir pressure measured or estimated in the current borehole

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c. Water chemistry of the produced water from the lateral or borehole and mine water

d. History or genesis of the borehole, when drilled, problems encountered, current gas and water production, etc.

e. Ramifications and timing of the borehole when drilled and desired underground plugging pertinent to mining

2. Target develops a technical and operational strategy for polymer gel plugging the specific borehole or CBM Well coal laterals:

a. Conduct sample mixes of the polymer gel with produced water from the lateral or in-mine borehole after conducting water chemistry tests

b. If the lateral or borehole is not producing water, conduct sample gel mixes using the mine water, and or potable water if available underground to verify the gel formulation will cure.

c. Determine what the entry point to pump the polymer gel in the coal lateral or borehole will be, either through a packer installed in the CBM Vertical well or Access well, or through a slickline suspended down a vertical well connected to an existing in-mine borehole wellhead, or installing a flow through packer with a two (2) inch pass-through pipe and valve that requires grouting in the open borehole or coal lateral with cement, polyurethane or combination of both, prior to mixing and pumping the gel polymer.

d. Develop and coordinate with the mine the plan and strategy to mix and pump the polymer gel with Target's staff and Surface Polymer Gel Mixing and Pumping Unit including but not limited to the mine client supplying potable water to mix with the polymer gel chemicals.

e. Meet with the mine operation who are assigned to coordinate and provide the necessary support surface [and underground if necessary] resources to facilitate and conduct the polymer gel plugging operation.

f. Target transport the gel chemicals and its mixing and pumping equipment to the surface well location one day prior to, or the same day, the polymer gel plugging is scheduled.

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www.targetdrilling.com

Safety Description of Target's Polymer Mix

Target's polymer gel is a water INSOLUBLE gel composed of several components:

1) Water (97-99 wt %)
2) Polymer Gelling Agent (2-3 wt %)
3) Metal Crosslinking Agent to make Gel Water Insoluble (<1/10th wt %)

The HMIS rating for the gel is: HMIS RATINGS: Health = 1 Flammability = 0 Reactivity = 0 [HMIS stands for: Hazardous Material Information System] Hazard Rating Scale: 0=Minimal; 1=Slight; 2=Moderate; 3=Serious; 4=Severe

A chemical rating for health is based on objective criteria inherent to the material, such as its toxicity (ingestion/skin contact LD50, LC50), and its ability to cause skin and eye irritation. This product has a low-order of toxicity. There is a chance of a rash if the material is frequently handled without gloves. Scientists studies have found no evidence linking the ingredients to cancer. Workers exposed over a 20 to 25 year period to components of this product were not observed to have any adverse health effects.

This rating indicates that the gel is nonflammable, nonexplosive and nonreactive with most chemicals, and presents very little health risk from handling the project. The gel is virtually odorless after curing so vapors are not anticipated as an issue. The product is a gel and there is very little risk associated with airborne contamination such as dust or particulars.

The gel will burn if heated with sufficient temperature and for a substantial time. This only would occur after all water is driven from the gel. Byproducts from the surrounding materials (i.e. coal, wood, wire insulation, etc.) would be of more concern than vapors emitted from a fire required to combust the gel.

Certain precautions should be taken when handling the polymer gel:

1) Wear chemical impermeable gloves when handling the product.

2) Wear protective safety glasses with side shields handling the product.

3) Wash hands after handling the product.

4) Wash clothes if gel is spilled onto clothing.

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5) Do not eat or taste the material.

Target's Polymer Gel Mixing and Pumping Unit

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TARGET DRILLING

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www.targetdrilling.com

In-Mine Procedures for Safely Plugging In-Mine Horizontal Boreholes or Surface Drilled Horizontal Coal Laterals Using Target Drilling's Cross-Linked Polyacrylamide Polymer Gel

This brief narrative describes Target Drilling's [Target] In-Mine procedures and equipment used to safely plug in-mine boreholes or surface drilled horizontal coalbed methane coal laterals using Target's cross-linked polyacrylamide polymer gel [polymer gel]. Target has used its proprietary polymer gel mix to plug 188 miles on surface drilled horizontal coal laterals and in-mine degas boreholes since the spring of 2004. Although primarily pumped from the surface to conduct the polymer gel plugging, Target has applied polymer gel plugging from within coal mines; mixing and pumping from underground, and mixing and pumping on the surface, pumped through PVC slickline suspended down a shaft or vertical borehole and then to the in-mine wellhead thousands of feet away [a chemical description of the polymer gel mix including HMIS rating and safety precautions is included at the end of this document].

Initial Steps and Protocol Plugging Boreholes From Underground with Polymer Gel

1. The coal client provides Target with the specific description of the borehole or coal lateral to be plugged with polymer gel from underground, including, but not limited to:
    a. Borehole or lateral diameter and length to be plugged to calculate the volume of polymer gel required to fill the borehole to 175% to 200% of its volume.
    b. Reservoir pressure measured or estimated in the current borehole
    c. Water chemistry of the produced water from the lateral or borehole and mine water
    d. History or genesis of the borehole, when drilled, problems encountered, current gas and water production, etc.
    e. Ramifications and timing of the borehole when drilled and desired underground plugging pertinent to mining
    f. Available resources at the underground site [scoop, power, water, etc.] to facilitate powering Target's mixing and pumping equipment.

2. Similar to surface gel plugging, Target develops a technical and operational strategy for gel plugging the specific borehole or coal lateral from underground:
    a. Conduct sample mixes of the polymer gel with produced water from the lateral or in-mine borehole after conducting water chemistry tests

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b. If the lateral or borehole is not producing water, conduct sample gel mixes using the mine water, and or potable water if available underground to verify the gel formulation will cure.
c. Determine what the entry point to pump the polymer gel in the coal lateral or borehole will be, either requiring plumbing to an existing in-mine borehole wellhead, or installing a foam packer, inflatable packer or mechanical packer with a two (2) inch pass-through pipe and valve that requires grouting in the open borehole or coal lateral with cement, polyurethane or combination of both, prior to mixing and pumping the gel polymer.
d. Develop and coordinate with the mine the resources required to mix and pump the gel mix underground, including verifying the mine has the primary hydraulic power to power Target's hydraulically powered triplex pump used to circulate and mix the gel chemicals with the water and then pump into the borehole or coal lateral [or Target supplies a source of hydraulic power]. A secondary source of hydraulic power at the underground gel site is desired.
e. Meet with the mine operation staff who are assigned to coordinate and provide the necessary resources to facilitate and conduct the underground gel plugging operation underground to finalize the strategy, schedule the job and review all necessary precautions.
f. Target transport the gel chemicals and its mixing and pumping equipment to the mine site several days prior to the underground gel plugging is scheduled, and after Target makes an underground site reconnaissance visit.

In-Mine Gel Mixing and Pumping Operations Procedures

1. PPE including metatarsal boots, safety glasses, rubber metatarsal gloves, are worn by all staff.
2. Premixed, specifically sized volumes of each gel chemical for the batch size are put in individual containers and taken underground for mixing underground. In other words, Target only adds accurately premixed volumes of each gel chemical to each batch underground.
3. Only Target personnel are permitted to handle, mix and pump the polymer gel chemicals and mix.
4. An inventory of the gel chemicals is conducted prior to beginning mixing.
5. All hoses, fittings, plumbing including Target's equipment and the wellhead or packer are rated for greater than 50 psi. The mixing and pumping equipment is tested underground at the gel site prior to begin mixing and pumping the gel.

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6. Polymer gel and water batches of 150-200 gallons are mixed and pumped at a time. Then the next batch is mixed and pumped. Target gives the client samples of each gel mix batch labeled and monitored for curing. Target also saves a set of the gel batch samples for the client.
7. Polymer gel mixed batches are measured and recorded including volume mixed, pumped and pressures.
8. The borehole or coal lateral is pumped with polymer gel until ~150 to 200% of the borehole volume is filled, or ~50 psi polymer pump pressure is measured.
9. It is important to note, Target makes no guarantee, direct, indirect or implied, that the entire borehole or coal lateral will be filled with gel and the gel cures, even if 200% of the borehole volume is pumped. Consequently, Target does not warranty or accept any direct, indirect or implied responsibility towards the result of the in-mine gel plugging to the client pertaining to current or future mining conditions.
10. All unused gel chemicals are removed from the underground mine as are all containers of the gel chemicals.

Chemical Description and Precautions Using the Gel Chemical Mix

Target's polymer gel is a water INSOLUBLE gel composed of several components:

1) Water (97-99 wt %)
2) Polymer Gelling Agent (2-3 wt %)
3) Metal Crosslinking Agent to make Gel Water Insoluble (<1/10th wt %)

The HMIS rating for the gel is: HMIS RATINGS: Health = 1 Flammability = 0 Reactivity = 0 [HMIS stands for: Hazardous Material Information System]
Hazard Rating Scale: 0=Minimal; 1=Slight; 2=Moderate; 3=Serious; 4=Severe

A chemical rating for health is based on objective criteria inherent to the material, such as its toxicity (ingestion/skin contact LD50, LC50), and its ability to cause skin and eye irritation. This product has a low-order of toxicity. There is a chance of a rash if the material is frequently handled without gloves. Scientists studies have found no evidence linking the ingredients to cancer. Workers exposed over a 20 to 25 year period to components of this product were not observed to have any adverse health effects.

This rating indicates that the gel is nonflammable, nonexplosive and nonreactive with most chemicals, and presents very little health risk from handling the project. The gel is virtually odorless after curing so vapors are not anticipated as an issue. The product

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www.targetdrilling.com

is a gel and there is very little risk associated with airborne contamination such as dust or particulars.

The gel will burn if heated with sufficient temperature and for a substantial time. This only would occur after all water is driven from the gel. Byproducts from the surrounding materials (i.e. coal, wood, wire insulation, etc.) would be of more concern than vapors emitted from a fire required to combust the gel.

Precautions should be taken when handling the gel, and there are:

1) Wear chemical impermeable gloves when handling the product.
2) Wash hands after handling the product.
3) Wash clothes if gel is spilled onto clothing.
4) Do not eat or taste the material.

File: 2019 Polymer Gel / Target Drilling Procedures Polymer Gel Plugging Boreholes and Surface Drilled Laterals from In-Mine 3 1 19

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Target Drilling Inc
1112 Glacier Dr
Smithton, PA 15479

Polymer Gel

SECTION 1: PRODUCT IDENTIFICATION

PRODUCT NAME: Polymer Gel
CHEMICAL DESCRIPTION: metal cross-linked polymer gel
PRODUCT CLASS: Special Products
VERSION: 11-25-04

SECTION 2: INFORMATION ON INGREDIENTS

Chemical Name*	CAS #	Weight %	OSHA PEL	ACGIH TLV

*This product is not considered to be hazardous according to the criteria of the U.S. Federal OSHA Hazard Communication Standard (29 CFR 1910.1200)

SECTION 3: HAZARDS IDENTIFICATION

**********EMERGENCY OVERVIEW**********
Gray to blue green gel with no distinct odor

WARNING!
May cause skin irritation.
Wash thoroughly after handling.

****

PRIMARY ROUTES OF ENTRY: Skin contact and ingestion.

TARGET ORGANS: None known

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None known

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: This product would not be expected to produce irritation upon contact with the eye.

SKIN CONTACT: Skin contact may cause irritation and an allergic skin rash, especially upon with prolonged contact.

INGESTION: Ingestion of this product may cause gastrointestinal irritation and diarrhea.

INHALATION: This product is not expected to present an inhalation hazard.

SUBCHRONIC, CHRONIC: No applicable information was found concerning any potential health effects resulting from subchronic or chronic exposure to the product.

CARCINOGENICITY:
NTP: No ingredients listed in this section
IARC: No ingredients listed in this section
OSHA: No ingredients listed in this section

SECTION 4: FIRST AID MEASURES

EYE CONTACT: In case of contact, flush eyes with plenty of water for at least 15 minutes, lifting the upper and lower eyelids occasionally to ensure complete rinsing. Seek medical aid if irritation persists.

SKIN CONTACT: In case of contact, wash the affected area with soap and water. Seek medical aid if symptoms occur.

INGESTION: If swallowed, do not induce vomiting. Never give anything by mouth to an unconscious person. Call a physician.

INHALATION: Not an expected route of overexposure.

SECTION 5: FIRE-FIGHTING MEASURES

FLASHPOINT: None
This product is not by definition a "flammable liquid" or a "combustible liquid".

FLAMMABLE LIMITS:
LEL: Not applicable
UEL: Not applicable

AUTO-IGNITION TEMPERATURE: Not applicable

EXTINGUISHING MEDIA: Water, carbon dioxide or dry chemical

FIRE-FIGHTING INSTRUCTIONS: Exercise caution when fighting any chemical fire. A self-contained breathing apparatus and protective clothing are essential.

FIRE & EXPLOSION HAZARDS: N/A

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, ammonia, nitrogen oxides, and hydrogen chloride.

NFPA RATINGS: Health =0 Flammability = 0 Reactivity =0 Special Hazard = None

Hazard Rating Scale: 0=Minimal; 1=Slight; 2=Moderate; 3=Serious; 4=Severe

SECTION 6: ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Wear appropriate personal protective equipment. Collect spill onto inert absorbent and place spent absorbent in a suitable container. Since spilled product may make floor slippery, spills should be cleaned up immediately to prevent falls.

SECTION 7: HANDLING AND STORAGE

HANDLING:
Avoid contact with eyes, skin, and clothing.
Wash thoroughly after handling.
Protect containers from physical damage

STORAGE:
Stable gel, maintain in a humid area away from heat, strong reducing agents and other incompatible materials.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE/FACE PROTECTION: Chemical splash goggles are recommended as a good industrial hygiene practice.

SKIN PROTECTION: Chemical resistant gloves and protective clothing to minimize skin exposure.

RESPIRATORY PROTECTION: None required.

ENGINEERING CONTROLS: No specific recommendations

WORK PRACTICES: An eye wash station and safety shower should be accessible in the immediate area of use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

pH: 6.0 – 9.5

SPECIFIC GRAVITY: 0.99 -1.05 g/mL

SOLUBILITY IN WATER: Insoluble

BOILING POINT: >212 °F (>100 °C)

FREEZING POINT: <32 °F (<0 °C)

VAPOR PRESSURE (mm Hg): Not available

VAPOR DENSITY (Air = 1): Not available

APPEARANCE AND ODOR: Gray to powder blue green gel with no distinct odor

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: Product is Stable.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Strong acids, strong reducing agents, and dry environments.

INCOMPATIBILITIES: Strong acids, strong reducing agents

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, ammonia, nitrogen oxides, and hydrogen chloride

SECTION 11: TOXOLOGICAL INFORMATION

No information was available.

SECTION 12: ECOLOGICAL INFORMATION

No information was available.

SECTION 13: DISPOSAL

RCRA STATUS: Discarded product, as prepared using the recommended ingredient percentages, would not be considered a RCRA Hazardous Waste.

DISPOSAL: Dispose of in accordance with local, state and federal regulations.

SECTION 14: TRANSPORTATION

DOT CLASSIFICATION:
Class/Division: Not restricted
Proper Shipping Name: Not applicable
Label: None
Packing Group: Not applicable
ID Number: Not applicable

SECTION 15: REGULATORY INFORMATION

OSHA Hazard Communication Status: NonHazardous

TSCA: The ingredients of this product are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.

CERCLA: EPA Hazardous Substances (40 CFR 302):

Chemical Name	CERCLA Reportable Quantity (RQ)
None	

SARA TITLE III (Sections 302, 311, 312, and 313):

Section 302 Extremely Hazardous Substances (40 CFR 355):

Chemical Name	CAS#	RQ	TPQ
None			

Section 311 and 312 Health and Physical Hazards:

Immediate	Delayed	Fire	Pressure	Reactivity
no	no	no	no	no

Section 313 Toxic Chemicals (40 CFR 372):

Chemical Name	CAS Number	Percent by Weight
None		

SECTION 16: OTHER INFORMATION

HMIS RATINGS: Health =1 Flammability = 0 Reactivity = 0

Hazard Rating Scale: 0=Minimal; 1=Slight; 2=Moderate; 3=Serious; 4=Severe

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The preceding information is accurate to the best of our knowledge. However, since data, safety standards, and government regulations are subject to change, and the conditions of handling and use or misuse are beyond our control, Concrete Construction Materials, Inc. makes no warranty, either express or implied, with respect to the completeness or continuing accuracy of the information contained herein, and disclaims all liability for reliance thereon. User should satisfy himself that he has all current data relevant to his particular use.

U. S. Department of Labor

Mine Safety and Health Administration
201 12th Street South, Suite 401
Arlington, VA 22202-5452

April 30, 2021

In the matter of:
Century Mining LLC
Longview Mine
I.D. No. 46-09447

MSHA 101 C EXEMPTION

Petition for Modification

Docket No. M-2020-010-C

PROPOSED DECISION AND ORDER

On June 26, 2020, a petition was filed seeking a modification of the application of 30 C.F.R. § 75.1700 to Century Mining LLC's Longview mine located in Barbour County, West Virginia. The Petitioner filed the petition to permit an alternative method of compliance with the standard with respect to vertical oil and gas wells and surface directional drilled (SDD) wells[1] into the underground coal seams. The Petitioner alleges that the proposed alternative method will at all times guarantee no less than the same measure of protection afforded miners under 30 C.F.R. § 75.1700 as that provided by the standard, which states:

> **§ 75.1700 Oil and gas wells.**
> Each operator of a coal mine shall take reasonable measures to locate oil and gas wells penetrating coalbeds or any underground area of a coal mine. When located, such operator shall establish and maintain barriers around such oil and gas wells in accordance with State laws and regulations, except that such barriers shall not be less than 300 feet in diameter, unless the Secretary or his authorized representative permits a lesser barrier consistent with the applicable State laws and regulations where such lesser barrier will be adequate to protect against hazards from such wells to the miners in such mine, or unless the Secretary or his authorized representative requires a greater barrier where the depth of the mine, other geologic conditions, or other factors warrant such a greater barrier.

The petition addresses items for which District Manager approval is required, procedures for cleaning out and preparing oil and gas wells prior to plugging or re-plugging, procedures for plugging or re-plugging oil or gas wells to the surface, procedures for plugging or re-plugging oil or gas wells for use as degasification boreholes, alternative procedures for preparing and plugging or re-plugging oil or gas

[1] The extraction of methane from coal seams and surrounding strata is a rapidly growing component of the domestic natural gas supply. Recent innovations in drilling techniques have resulted in development of several types of wells and production methods to extract coalbed methane (CBM) resources. The wells are drilled from the surface using directional drilling technology to develop horizontal branches within the coal seam being mined. Drill holes may be deviated in both the horizontal and vertical planes using these techniques. Multiple horizontal branches may be developed from a single well and multiple seams may be developed from a single well. The drilling industry has trademarked several different proprietary names for these drilling processes. For purposes of this Order, these proprietary drilling processes will be referred to as generic "surface directional drilled" (SDD) wells.

wells, and procedures after approval has been granted to mine through a plugged or re-plugged well. In addition to conventional oil and gas wells, the petition addresses specific SDD well plugging procedures, water infusion and ventilation methods, and procedures for mining through an SDD well and/or its branches.

On October 26, 2020, MSHA personnel conducted an investigation of the petition and filed a report of their findings with the Administrator for Mine Safety and Health Enforcement. After a careful review of the entire record, including the petition and MSHA's investigative report this Proposed Decision and Order is issued.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

The Longview Mine is located at 620 Peel Tree Road, Volga, West Virginia. The Longview Mine will operate and extract coal from the Lower Kittanning and Upper Mercer coal seams. The average mining height will be 6.5 feet. At the Longview Portal, the Lower Kittanning coal seam is approximately 880 feet below the surface. The mine will be ventilated by a 16-foot diameter intake air shaft and fan which is located at the portal site. A 24-foot combination return and hoist divided shaft will be used for exhaust air and personnel access via a 5-ton rated hoist and cage. The return and personnel combination shaft is located at the portal site.

The Longview Mine will utilize the room and pillar and longwall mining methods to extract coal and employ approximately 375 coal miners. Additional access for people and supplies will be by a 125 ton mine hoist system which will travel down a 3,500 foot, 15-degree slope. The slope floor will have rail installed for a brake car which personnel can use. The slope entry will also contain a 72-inch mine conveyor, in the top portion of the slope, which will transport coal from the seam to the surface.

In order to efficiently develop and mine the reserve, the Longview Mine plans to mine through conventional vertical and coal bed methane (CBM) wells in lieu of the 300-foot barrier required in 30 C.F.R. § 75.1700, by cleaning out, preparing, plugging, and/or re-plugging each well. The first gas well to be mined through is located within 700 feet from the mines bottom development and is anticipated to be cut through in the summer of 2022.

In the Longview mine permit area, there are approximately 185 known conventional and 4 known CBM wells of which, 112 are active, 19 abandoned, and 58 plugged. These identified wells restrict the intended mining operations of the Longview Mine.

The natural gas formations penetrated by the gas wells are the Riley sandstone and the Benson sandstone. The depth of the formations range from approximately 4,100 feet deep down to approximately 4,500 feet deep, which is approximately 3,200 feet to 3,600 feet below the Lower Kittanning coal seam.

The miners at the Longview mine are not represented by a labor union and do not have a miner's representative.

Although MSHA has granted modifications of this standard at different mines over the years, changing circumstances in oil and gas drilling technology and practices compels MSHA to reconsider the safest approach to mining around or through such wells. In recent years, changes in hydraulic fracturing (fracking) technology, marketplace and resource conditions have led to an increase in the number and depth of oil and gas wells penetrating the Pittsburgh and other coal seams. Since deeper wells are usually associated with higher well pressures, modifications of § 75.1700 must include appropriate measures to better protect miners. In addition to the risks associated with higher well pressures, MSHA is concerned that operators may be preparing and plugging wells to inadequate depths for convenience or to lower costs, which may result in reduced safety for miners.

This PDO addresses these concerns as they affect the Longview mine. There are several differences between the petitioner's proposal and the amended terms and conditions set forth by MSHA. The essential changes include:

1. Making a diligent effort to clean out the well bore to the original total depth. MSHA believes that cleaning wells to the original total depth provides miners with a higher degree of safety by ensuring all gas producing zones have been effectively sealed.

2. Unknown total depth: If the total depth of the well is unknown the operator must contact the District Manager before proceeding. MSHA believes, by including this step in the process, that miner safety will be better served because the petitioner and the District Manager can work together to evaluate the conditions of the well to be plugged as well as the safest way to accomplish the plugging.

3. Inadvertently intersecting an uncharted gas well: MSHA believes such an occurrence presents a hazard to the mine and the environment, requiring immediate cessation of mining, de-energizing power, notifying MSHA, and taking corrective action as dictated by the specific occurrence.

4. Requirement that the Longview mine ventilation plan and ventilation map provides SDD well information, and the plan provides specific information regarding SDD well plugging or replugging procedures.

Wells vary in depth. The petitioner's proposed alternate method does not specify the depths of wells to be plugged, only that the operator will plug wells to 200 feet below the lowest mineable coal seam. The terms and conditions required by MSHA will prepare these wells for safe intersection by making a diligent effort to clean the wells to the original total depth, removing all casing and plugging to the total depth by pumping

expanding cement slurry and pressurizing to at least 200 psi. If the total depth cannot be reached and casing cannot be removed, these alternative methods included in this proposed decision and order have proven safe and effective when properly implemented.

Therefore, the terms and conditions as amended by MSHA will at all times guarantee no less than the same measure of protection afforded the miners under 30 CFR 75.1700 for wells at least 2,000 to 4,000 feet or greater in depth, as well as SDD wells and branches. On the basis of the petition, comments received, and the findings of MSHA's investigation, Century Mining LLC is granted a modification of the application of 30 C.F.R. § 75.1700 to its Longview mine.

ORDER

Under the authority delegated by the Secretary of Labor to the Administrator for Mine Safety and Health Enforcement, and under § 101(c) of the Federal Mine Safety and Health Act of 1977, 30 U.S.C. § 811(c), and 30 C.F.R. Part 44, a modification of the application of 30 C.F.R. § 75.1700 at Century Mining LLC's Longview mine is hereby:

GRANTED, subject to the following terms and conditions:

1. DISTRICT MANAGER APPROVAL REQUIRED

a. The type of oil or gas well that will be considered under this Petition includes wells that have been depleted of oil or gas production or have not produced oil or gas and may have been plugged, or active conventional vertical wells which are not producing gas or oil, subject to the provisions below. Unconventional wells in the Marcellus, Utica, and all other unconventional shale oil and gas wells are not subject to this modification. Nothing in these provisions is meant to lessen, diminish, or substitute any provision found in applicable state laws or regulations.

b. A safety barrier of 300 feet in diameter (150 feet between any mined area and a well) shall be maintained around all oil and gas wells (defined herein to include all active, inactive, abandoned, shut-in, previously plugged wells, water injection wells, coalbed methane wells and carbon dioxide sequestration wells) until approval to proceed with mining has been obtained from the District Manager. This barrier extends around all vertical and horizontal branches drilled in the coal seam. This barrier also extends around all vertical and horizontal branches within overlying coal seams subject to caving or subsidence from the coal seam being mined when methane leakage through the subsidence zone is possible. Wells that were drilled into potential oil or gas producing formations that did not produce commercial quantities of either gas

or oil (exploratory wells, wildcat wells or dry holes) are classified as oil or gas wells by MSHA.

c. Prior to mining within the safety barrier around any well that the mine plans to intersect, the mine operator shall provide to the District Manager a sworn affidavit or declaration executed by a company official stating that all mandatory procedures for cleaning out, preparing, and plugging each gas or oil well have been completed as described by the terms and conditions of this order. The District Manager may choose to approve each branch intersection, each well, or a group of wells as applicable to the conditions.

The affidavit or declaration must be accompanied by all logs described in subparagraphs 2(a)(2) and 2(a)(3) below and any other records described in those subparagraphs which the District Manager may request. The District Manager will review the affidavit or declaration, the logs and any other records that have been requested, and may inspect the well itself, and will then determine if the operator has complied with the procedures for cleaning out, preparing, and plugging each well as described by the terms and conditions of this Order. If the District Manager determines that the procedures have been complied with, he will provide his approval, and the mine operator may then mine within the safety barrier of the well, subject to the terms of this Order.

If well intersection is not planned, the mine operator may request a permit to reduce the 300 foot diameter of the safety barrier that does not include intersection of the well. The District Manager may require documents and information that help verify the accuracy of the location of the well in respect to the mine maps and mining projections. This information may include survey closure data, down-hole well deviation logs, historical well intersection location data and any additional data required by the District Manager. If the District Manager determines that the proposed barrier reduction is reasonable, he will provide his approval, and the mine operator may then mine within the safety barrier of the well.

d. In the event an uncharted well is inadvertently mined into, mining shall cease immediately on the section, electrical power shall be deenergized in the affected area, and MSHA shall be notified immediately via the emergency phone number posted on MSHA's website for reporting of this hazardous condition. In addition to its potential for liberating methane, the well may also be an open connection from the mine to the surface that presents a hazard to the mine and the environment. The District will respond with a timely investigation, issue a K Order if needed, and allow resumption of mining once a suitable action plan is in place.

e. The terms and conditions of this Order apply to all types of underground coal mining.

2. **MANDATORY PROCEDURES FOR CLEANING OUT, PREPARING, PLUGGING, AND RE-PLUGGING OIL OR GAS WELLS**

a. MANDATORY PROCEDURES FOR CLEANING OUT AND **PREPARING VERTICAL OIL AND GAS WELLS** PRIOR TO PLUGGING OR RE-PLUGGING

The mine operator shall test for gas emissions inside the hole before cleaning out, preparing, plugging, and re-plugging oil and gas wells. The District Manager shall be contacted if gas is being produced.

(1) A diligent effort shall be made to clean the well to the original total depth. The mine operator shall contact the District Manager prior to stopping the operation to pull casing or clean out the total depth of the well.

If this depth cannot be reached, and the total depth of the well is less than 4,000 feet, the operator shall completely clean out the well from the surface to at least 200 feet below the base of the lowest mineable coal seam, unless the District Manager requires cleaning to a greater depth based on his judgment as to what is required due to the geological strata, or due to the pressure within the well. The operator shall provide the District Manager with all information it possesses concerning the geological nature of the strata and the pressure of the well. **If the total depth of the well is 4,000 feet, or greater, the operator shall completely clean out the well from the surface to at least 400 feet below the base of the lowest mineable coal seam. Wells of this greater depth are under greater pressure, so the 400 feet requirement provides greater protection for miners.** The operator shall remove all material from the entire diameter of the well, wall to wall. If the total depth of the well is unknown and there is no historical information, the mine operator must contact the District Manager before proceeding.

(2) The operator shall prepare down-hole logs for each well. Logs shall consist of a caliper survey, a gamma log, a bond log and a deviation survey for determining the top, bottom, and thickness of all coal seams down to the lowest minable coal seam, potential hydrocarbon producing strata and the location of any existing bridge plug. In addition, a journal shall be maintained describing the depth of each material encountered; the nature of each material encountered; bit size and type used to drill each portion of the hole; length and type of each material used to plug the well; length of casing(s) removed, perforated or ripped or left in place; any sections where casing was cut or milled; and other pertinent information concerning cleaning and sealing the

well. Invoices, work-orders, and other records relating to all work on the well shall be maintained as part of this journal and provided to MSHA upon request.

(3) When cleaning out the well as provided for in subparagraph (a)(1), the operator shall make a diligent effort to remove all of the casing in the well. After the well is completely cleaned out and all the casing removed, the well should be plugged to the total depth by pumping expanding cement slurry and pressurizing to at least 200 psi. If the casing cannot be removed, it must be cut, milled, perforated or ripped at all mineable coal seam levels to facilitate the removal of any remaining casing in the coal seam by the mining equipment. Any casing which remains shall be perforated or ripped to permit the injection of cement into voids within and around the well. All casing remaining at mineable coal seam levels shall be perforated or ripped at least every 5 feet from 10 feet below the coal seam to 10 feet above the coal seam, as shown in Appendix A.

Perforations or rips are required at least every 50 feet from 200 feet (400 feet if the total well depth is 4,000 feet or greater) below the base of the lowest mineable coal seam up to 100 feet above the uppermost mineable coal seam. See Appendix A. The mine operator must take appropriate steps to ensure that the annulus between the casing and the well walls are filled with expanding (minimum 0.5% expansion upon setting) cement and contain no voids.

If it is not possible to remove all of the casing, the operator shall notify the District Manager before any other work is performed. **If the well cannot be cleaned out or the casing removed, the operator shall prepare the well as described from the surface to at least 200 feet below the base of the lowest mineable coal seam for wells less than 4000 feet in depth and 400 feet below the lowest mineable coal seam for wells 4000 feet or greater, unless the District Manager requires cleaning out and removal of casing to a greater depth based on his judgement as to what is required due to geological strata, or due to the pressure within the well.**

If the operator, using a casing bond log can demonstrate to the satisfaction of the District Manager that all annuli in the well are already adequately sealed with cement, then the operator will not be required to perforate or rip the casing for that particular well. When multiple casing and tubing strings are present in the coal horizon(s), any casing which remains shall be ripped or perforated and filled with expanding cement as indicated above. An acceptable casing bond log for each casing and tubing string is needed if used in lieu of ripping or perforating multiple strings.

(4) If the District Manager concludes that the completely cleaned-out well is emitting excessive amounts of gas, the operator must place a mechanical bridge plug in the well. **It must be placed in a competent stratum at least 200 feet (400 feet if the total well depth is 4,000 feet or greater) below the base of the lowest mineable coal seam, but above the top of the uppermost hydrocarbon-producing stratum, unless the District Manager requires a greater distance based on his judgment that it is required due to the geological strata, or due to the pressure within the well.** The operator shall provide the District Manager with all information it possesses concerning the geological nature of the strata and the pressure of the well. If it is not possible to set a mechanical bridge plug, an appropriately sized packer may be used. The mine operator shall document what has been done to "kill the well" and plug the carbon producing strata.

(5) If the upper-most hydrocarbon-producing stratum is within 300 feet of the base of the lowest minable coal seam, the operator shall properly place mechanical bridge plugs as described in subparagraph (a)(4) to isolate the hydrocarbon-producing stratum from the expanding cement plug.
Nevertheless, the operator shall place a minimum of 200 feet (400 feet if the total well depth is 4,000 feet or greater) of expanding cement below the lowest mineable coal seam, unless the District Manager requires a greater distance based on his judgment that it is required due to the geological strata, or due to the pressure within the well.

b. <u>MANDATORY PROCEDURES FOR PLUGGING OR RE-PLUGGING OIL OR GAS WELLS TO THE SURFACE</u>

After completely cleaning out the well as specified in paragraph 2(a) above, the following procedures shall be used to plug or re-plug wells:

(1) **The operator shall pump expanding cement slurry down the well to form a plug which runs from at least 200 feet (400 feet if the total well depth is 4,000 feet or greater) below the base of the lowest mineable coal seam (or lower if required by the District Manager based on his judgment that a lower depth is required due to the geological strata, or due to the pressure within the well) to the surface.** The expanding cement will be placed in the well under a pressure of at least 200 pounds per square inch.

Portland cement or a lightweight cement mixture may be used to fill the area from 100 feet above the top of the uppermost mineable coal seam (or higher if required by the District Manager based on his judgment that a higher distance is required due to the geological strata, or due to the pressure within the well) to the surface.

(2) The operator shall embed steel turnings or other small magnetic particles in the top of the cement near the surface to serve as a permanent magnetic monument of the well. In the alternative, a 4-inch or larger diameter casing, set in cement, shall extend at least 36 inches above the ground level with the API well number engraved or welded on the casing. When the hole cannot be marked with a physical monument (e.g. prime farmland), high-resolution GPS coordinates (one-half meter resolution) are required.

c. MANDATORY PROCEDURES FOR PLUGGING OR RE-PLUGGING OIL AND GAS WELLS FOR USE AS DEGASIFICATION WELLS

After completely cleaning out the well as specified in paragraph 2(a) above, the following procedures shall be utilized when plugging or re-plugging wells that are to be used as degasification wells:

(1) **The operator shall set a cement plug in the well by pumping an expanding cement slurry down the tubing to provide at least 200 feet (400 feet if the total well depth is 4,000 feet or greater) of expanding cement below the lowest mineable coal seam, unless the District Manager requires a greater depth based on his judgment that a greater depth is required due to the geological strata, or due to the pressure within the well.** The expanding cement will be placed in the well under a pressure of at least 200 pounds per square inch. The top of the expanding cement shall extend at least 50 feet above the top of the coal seam being mined, unless the District Manager requires a greater distance based on his judgment that a greater distance is required due to the geological strata, or due to the pressure within the well.

(2) The operator shall securely grout into the bedrock of the upper portion of the degasification well a suitable casing in order to protect it. The remainder of this well may be cased or uncased.

(3) The operator shall fit the top of the degasification casing with a wellhead equipped as required by the District Manager in the approved ventilation plan. Such equipment may include check valves, shut-in valves, sampling ports, flame arrestor equipment, and security fencing.

(4) Operation of the degasification well shall be addressed in the approved ventilation plan. This may include periodic tests of methane levels and limits on the minimum methane concentrations that may be extracted.

(5) After the area of the coal mine that is degassed by a well is sealed or the coal mine is abandoned, the operator must plug all degasification wells using the following procedures:

(i) The operator shall insert a tube to the bottom of the well or, if not possible, to within 100 feet above the coal seam being mined. Any blockage must be removed to ensure that the tube can be inserted to this depth.

(ii) The operator shall set a cement plug in the well by pumping Portland cement or a lightweight cement mixture down the tubing until the well is filled to the surface.

(iii) The operator shall embed steel turnings or other small magnetic particles in the top of the cement near the surface to serve as a permanent magnetic monument of the well. In the alternative, a 4-inch or larger casing, set in cement, shall extend at least 36 inches above the ground level with the API well number engraved or welded on the casing.

d. MANDATORY ALTERNATIVE PROCEDURES FOR PREPARING AND PLUGGING OR RE-PLUGGING OIL OR GAS WELLS

The following provisions apply to all wells which the operator determines, and with which the MSHA District Manager agrees, cannot be completely cleaned out due to damage to the well caused by subsidence, caving, or other factors.

(1) The operator shall drill a hole adjacent and parallel to the well, to a depth of at least 200 feet (400 feet if the total well depth is 4,000 feet or greater) below the lowest mineable coal seam, unless the District Manager requires a greater depth based on his judgment that a greater depth is required due to the geological strata, or due to the pressure within the well.

(2) The operator shall use a geophysical sensing device to locate any casing which may remain in the well.

(3) If the well contains casing(s), the operator shall drill into the well from the parallel hole. From 10 feet below the coal seam to 10 feet above the coal seam, the operator shall perforate or rip all casings at least every 5 feet. **Beyond this distance, the operator shall perforate or rip at least every 50 feet from at least 200 feet (400 feet if the total well depth is 4,000 feet or greater) below the base of the lowest mineable coal seam up to 100 feet above the seam being mined, unless the District Manager requires a greater distance based on his judgment that a greater distance is required due to the geological strata, or due to the pressure within the well.** The diagram shown in Appendix A is representative of the locations of the perforations or ripping that must be done. The operator shall fill the annulus between the casings and between the casings and the well wall with expanding (minimum 0.5% expansion upon setting) cement, and shall ensure that these areas contain no voids. If the operator, using a casing bond log, can demonstrate to the satisfaction of the

District Manager that the annulus of the well is adequately sealed with cement, then the operator will not be required to perforate or rip the casing for that particular well, or fill these areas with cement. When multiple casing and tubing strings are present in the coal horizon(s), any casing which remains shall be ripped or perforated and filled with expanding cement as indicated above. An acceptable casing bond log for each casing and tubing string is needed if used in lieu of ripping or perforating multiple strings.

(4) Where the operator determines, and the District Manager agrees, that there is insufficient casing in the well to allow the method outlined in subparagraph (d)(3) to be used, then the operator shall use a horizontal hydraulic fracturing technique to intercept the original well. **From at least 200 feet (400 feet if the total well depth is 4,000 feet or greater) below the base of the lowest mineable coal seam to a point at least 50 feet above the seam being mined, the operator shall fracture in at least six places at intervals to be agreed upon by the operator and the District Manager after considering the geological strata and the pressure within the well.** The operator shall then pump expanding cement into the fractured well in sufficient quantities and in a manner which fills all intercepted voids.

(5) The operator shall prepare down-hole logs for each well. Logs shall consist of a caliper survey, a gamma log, a bond log and a deviation survey for determining the top, bottom, and thickness of all coal seams down to the lowest minable coal seam, potential hydrocarbon producing strata and the location of any existing bridge plug. The operator may obtain the logs from the adjacent hole rather than the well if the condition of the well makes it impractical to insert the equipment necessary to obtain the log.

(6) A journal shall be maintained describing the depth of each material encountered; the nature of each material encountered; bit size and type used to drill each portion of the hole; length and type of each material used to plug the well; length of casing(s) removed, perforated or ripped or left in place; any sections where casing was cut or milled; and other pertinent information concerning sealing the well. Invoices, work-orders, and other records relating to all work on the well shall be maintained as part of this journal and provided to MSHA upon request.

(7) After the operator has plugged the well as described in subparagraphs (d)(3) and/or (d)(4), the operator shall plug the adjacent hole, from the bottom to the surface, with Portland cement or a lightweight cement mixture. The operator shall embed steel turnings or other small magnetic particles in the top of the cement near the surface to serve as a permanent magnetic monument of the well. In the alternative, a 4-inch or larger casing, set in cement, shall extend at least 36 inches above the ground level.

A combination of the methods outlined in subparagraphs (d)(3) and (d)(4) may have to be used in a single well, depending upon the conditions of the hole and the presence of casings. The operator and the District Manager shall discuss the nature of each hole.

The District Manager may require that more than one method be utilized. The mine operator may submit an alternative plan to the District Manager for approval to use different methods to address wells that cannot be completely cleaned out. The District Manager may require additional documentation and certification by a registered petroleum engineer to support the proposed alternative methods.

3. MANDATORY PROCEDURES FOR PREPARING, PLUGGING, AND REPLUGGING SDD WELLS

a. MANDATORY COMPUTATIONS AND ADMINISTRATIVE PROCEDURES PRIOR TO PLUGGING OR REPLUGGING

1. Probable Error of Location – Directional drilling systems rely on sophisticated angular measurement systems and computer models to calculate the estimated location of the well bore. This estimated hole location is subject to cumulative measurement errors so that the distance between actual and estimated location of the well bore increases with the depth of the hole. Modern directional drilling systems are typically accurate within one or two degrees depending on the specific equipment and techniques.

   The probable error of location is defined by a cone described by the average accuracy of angular measurement around the length of the hole. For example: a hole that is drilled 500 vertical feet and deviated into a coal seam at a depth of 700 feet would have a probable error of location at a point that is 4,000 feet from the hole collar (about 2,986 ft. horizontally from the well collar) of 69.8 ft. (4,000 ft. x sine (1.0 degree)) if the average accuracy of angular measurement was one degree and 139.6 ft. if the average accuracy of angular measurement was two degrees. In addition to the probable error of location, the true hole location is also affected by underground survey errors, surface survey errors, and random survey errors.

2. Minimum Working Barrier Around Well – For purposes of this Order, the minimum working barrier around any coalbed methane well or branches of a coalbed methane well in the coal seam is 50 feet plus the probable error of location. For example: for a hole that is drilled 500 vertical feet and deviated into a coal seam at a depth of 700 feet using drilling equipment that has an

average accuracy of angular measurement of one degree, the probable error of location at a point that is 4,000 feet from the hole collar is 69.8 ft. Therefore, the minimum working barrier around this point of the well bore is 120 ft. (69.8 ft. plus 50 ft., rounded up to the nearest foot). The 50 additional feet is a reasonable separation between the probable location of the well and mining operations. When mining is within the minimum working barrier distance from a coalbed methane well or branch, the mine operator must comply with the provisions of this Order. Coalbed methane wells must be prepared in advance for safe intersection and specific procedures must be followed on the mining section in order to protect the miners when mining within this minimum working barrier around the well.

The District Manager may require a greater minimum working barrier around coalbed methane wells where geologic conditions, historical location errors, or other factors warrant a greater barrier.

3. Ventilation Plan Requirements – The ventilation plan shall contain a description of all SDD coalbed methane wells drilled in the area to be mined. This description should include the well numbers, the date drilled, the diameter, the casing information, the coal seams developed, maximum depth of the wells, abandonment pressures, and any other information required by the District Manager. All or part of this information may be listed on the 30 C.F.R. § 75.372 map.

   The ventilation plan shall include the techniques that the mine operator plans to use to prepare the SDD wells for safe intersection, the specifications and steps necessary to implement these techniques, and the required operational precautions that are required when mining within the minimum working barrier. In addition, the ventilation plan will contain any additional information or provisions related to the SDD wells required by the District Manager.

4. Ventilation Map – The ventilation map specified in 30 C.F.R. § 75.372 shall contain the following information:

   i. The surface location of all coalbed methane wells in the active mining area and any projected mining area as specified in 30 C.F.R. § 75.372(b)(14);
   ii. Identifying information of coalbed methane wells (i.e. API hole number or equivalent);
   iii. The date that gas production began from the well;
   iv. The coal seam intersection of all coalbed methane wells;
   v. The horizontal extents in the coal seam of all coalbed methane wells and branches;

vi. The outline of the probable error of location of all coalbed methane wells; and

vii. The date of mine intersection and the distance between estimated and actual locations for all intersections of the coalbed methane well and branches.

b. MANDATORY PROCEDURES FOR PLUGGING OR REPLUGGING SDD WELLS

The mine operator shall include one or more of the following methods to prepare SDD wells for safe intersection in the mine ventilation plan. The methods approved in the ventilation plan must be completed on each SDD well before mining encroaches on the minimum working barrier around the well or branch of the well in the coal seam being mined.
If methane leakage through subsidence cracks is a problem when retreat mining, the minimum working barrier must be maintained around wells and branches in overlying coal seams or the wells and branches must be prepared for safe intersection as specified in the mine ventilation plan.

1. Cement Plug - Cement may be used to fill the entire SDD hole system. Squeeze cementing techniques are necessary for SDD plugging due to the lack of tubing in the hole. Cement should fill void spaces and eliminate methane leakage along the hole. Once the cement has cured, the SDD system may be intersected multiple times without further hole preparation. Gas cutting occurs if the placement pressure of the cement is less than the methane pressure in the coal seam. Under these conditions, gas will bubble out of the coal seam and into the unset cement creating a pressurized void or series of interconnected pressurized voids. Water cutting occurs when formation water and standing water in the hole invades or displaces the unset cement. Standing water has to be bailed out of the hole or driven into the formation with compressed gas to minimize water cutting. The cement pressure must be maintained higher than the formation pressure until the cement sets to minimize both gas and water cutting. The cementing program in the ventilation plan must address both gas and water cutting.

Due to the large volume to be cemented and potential problems with cement setting prior to filling the entire SDD system, adequately sized pumping units with back-up capacity must be used. Various additives such as retarders, lightweight extenders, viscosity modifiers, thixotropic modifiers, and fly ash may be used in the cement mix. The volume of cement pumped should exceed the estimated hole volume to ensure the complete filling of all voids. The complete cementing program, including hole dewatering, cement, additives, pressures, pumping times and equipment must be specified in the ventilation plan.

The material safety data sheets (MSDS) for all cements, additives and components and any personal protective equipment and techniques to protect workers from the potentially harmful effects of the cement and cement components should be included in the ventilation plan. Records of cement mixes, cement quantities, pump pressures, and flow rates and times should be retained for each hole plugged.

SDD holes may be plugged with cement years in advance of mining. However, the District Manager shall require suitable documentation of the cement plugging in order to approve mining within the minimum working barrier around coalbed methane wells.

2. Polymer Gel - Polymer gels start out as low viscosity, water-based mixtures of organic polymers that are cross-linked using time-delayed activators to form a water-insoluble, high-viscosity gel after being pumped into the SDD system. Although polymer gel systems never solidify, the activated gel should develop sufficient strength to resist gas flow. A gel that is suitable for treating SDD wells for mine intersection will reliably fill the SDD system and prevent gas-filled voids. Any gel chemistry used for plugging SDD wells should be resistant to bacterial and chemical degradation and remain stable for the duration of mining through a SDD system.

   Water may dilute the gel mixture to the point where it will not set to the required strength. Water in the holes should be removed before injecting the gel mixture. Water removal can be accomplished by conventional bailing and then injecting compressed gas to squeeze the water that accumulates in low spots back into the formation. Gas pressurization should be continued until the hole is dry. Another potential problem with gels is that dissolved salts in the formation waters may interfere with the cross-linking reactions. Any proposed gel mixtures must be tested with actual formation waters.

   Equipment to mix and pump gels should have adequate capacity to fill the hole before the gel sets. Back-up units should be available in case something breaks while pumping. The volume of gel pumped should exceed the estimated hole volume to ensure the complete filling of all voids and allow for gel to infiltrate the joints in the coal seam surrounding the hole. Gel injection and setting pressures should be specified in the ventilation plan.

   To reduce the potential for an inundation of gel, the final level of gel should be close to the level of the coal seam and the remainder of the hole

should remain open to the atmosphere until mining in the vicinity of the SDD system is completed. Packers may be used to isolate portions of the SDD system.

The complete polymer gel program, including advance testing of the gel with formation water, dewatering systems, gel specifications, gel quantities, gel placement, pressures, and pumping equipment must be specified in the ventilation plan. The MSDS for all gel components and any personal protective equipment and techniques to protect workers from the potentially harmful effects of the gel and gel components should be included in the ventilation plan. A record of the calculated hole volume, gel quantities, gel formulation, pump pressures, and flow rates and times should be retained for each hole that is treated with gel. Other gel chemistries other than organic polymers may be included in the ventilation plan with appropriate methods, parameters, and safety precautions.

3. Bentonite Gel – High-pressure injection of bentonite gel into the SDD system will infiltrate the cleat and butt joints of the coal seam near the well bore and effectively seal these conduits against the flow of methane. Bentonite gel is a thixotropic fluid that sets when it stops moving. Bentonite gel has a significantly lower setting viscosity than polymer gel. While the polymer gel fills and seals the borehole, the lower strength bentonite gel must penetrate the fractures and jointing in the coal seam in order to be effective in reducing formation permeability around the hole. The use of bentonite gel is restricted to depleted CBM applications that have low abandonment pressures and limited recharge potential. In general, these applications will be mature CBM fields with long production histories.

   A slug of water should be injected prior to the bentonite gel in order to minimize moisture-loss bridging near the well bore. The volume of gel pumped should exceed the estimated hole volume to ensure that the gel infiltrates the joints in the coal seam for several feet surrounding the hole. Due to the large gel volume and potential problems with premature thixotropic setting, adequately sized pumping units with back-up capacity are required.

   Additives to the gel may be required to modify viscosity, reduce filtrates, reduce surface tension, and promote sealing of the cracks and joints around the hole. To reduce the potential for an inundation of bentonite gel, the final level of gel should be approximately the elevation of the coal seam and the remainder of the hole should remain open to the atmosphere until mining in the vicinity of the SDD system is completed. If a water

column is used to pressurize the gel, it must be bailed down to the coal seam elevation prior to intersection.

The complete bentonite gel program, including formation infiltration and permeability reduction data, hole pretreatment, gel specifications, additives, gel quantities flow rates, injection pressures and infiltration times, must be specified in the ventilation plan. The ventilation plan should list the equipment used to prepare and pump the gel. The MSDS for all gel components and any personal protective equipment and techniques to protect workers from the potentially harmful effects of the gel and additives should be included in the ventilation plan. A record of hole preparation, gel quantities, gel formulation, pump pressures, and flow rates and times should be retained for each hole that is treated with bentonite gel.

4. Active Pressure Management and Water Infusion - Reducing the pressure in the hole to less than atmospheric pressure by operating a vacuum blower connected to the wellhead may facilitate safe intersection of the hole by a coal mine. The negative pressure in the hole will limit the quantity of methane released into the higher pressure mine atmosphere. If the mine intersection is near the end of a horizontal branch of the SDD system, air will flow from the mine into the upstream side of the hole and be exhausted through the blower on the surface. On the downstream side of the intersection, if the open hole length is short, the methane emitted from this side of the hole may be diluted to safe levels with ventilation air. Conversely, safely intersecting this system near the bottom of the vertical hole may not be possible because the methane emissions from the multiple downstream branches may be too great to dilute with ventilation air. The methane emission rate is directly proportional to the length of the open hole. Successful application of vacuum systems may be limited by caving of the hole or water collected in dips in the SDD system.

Another important factor in the success of vacuum systems is the methane liberation rate of the coal formation around the well—older, more depleted wells that have lower methane emission rates are more amenable to this technique. The remaining methane content and the formation permeability should be addressed in the ventilation plan.

Packers may be used to reduce methane inflow into the coal mine after intersection. All packers on the downstream side of the hole must be equipped with a center pipe so that the inby methane pressure may be measured or so that water may be injected. Subsequent intersections should not take place if pressure in a packer-sealed hole is excessive. Alternatively, methane produced by the downstream hole may be piped to an in-mine degas system to safely transport the methane out of the mine or may be piped to the return air course for dilution. In-mine methane piping should be protected as stipulated in "Piping Methane in Underground Coal Mines," MSHA IR 1094, (1978). Protected methane diffusion zones may be established in return air courses if needed. Detailed sketches and safety precautions for methane collection, piping and diffusion systems must be included in the ventilation plan (30 C.F.R. § 75.371(ee)).

Water infusion prior to intersecting the well will temporarily limit methane flow. Water infusion may also help control coal dust levels during mining. High water infusion pressures may be obtained prior to the initial intersection by the hydraulic head resulting from the hole depth or by pumping. Water infusion pressures for subsequent intersections are limited by leakage around in-mine packers and limitations of the mine water distribution system. If water is infused prior to the initial intersection, the water level in the hole shall not be more than 100 feet before the intersection.

The complete pressure management strategy including negative pressure application, wellhead equipment, and use of packers, in-mine piping, methane dilution, and water infusion must be specified in the ventilation plan. Procedures for controlling methane in the downstream hole must be specified in the ventilation plan. The remaining methane content and formation permeability should be addressed in the ventilation plan. The potential for the coal seam to cave into the well should be addressed in the ventilation plan. Dewatering methods should be included in the ventilation plan.

A record of the negative pressures applied to the system, methane liberation, use of packers and any water infusion pressures and application time should be retained for each intersection.

Remedial work – If problems are encountered in preparing the holes for safe intersection, then remedial measures must be taken to protect the miners. For example: if only one-half of the calculated hole volume of cement could be placed into a SDD well due to hole blockage, holes should be drilled near each branch that will be intersected and squeeze cement using pressures sufficient to fracture into the potentially empty SDD holes. The District Manager will approve remedial work in the ventilation plan on a case-by-case basis.

4. MANDATORY PROCEDURES AFTER APPROVAL HAS BEEN GRANTED BY THE DISTRICT MANAGER TO MINE WITHIN A 100-FOOT DIAMETER BARRIER AROUND WELL OR WITHIN THE MINIMUM WORKING BARRIER AROUND THE SDD WELL OR BRANCH OF THE SDD WELL

a. A representative of the operator, a representative of the miners, the appropriate State agency, or the MSHA District Manager may request that a conference be conducted prior to intersecting any plugged or re-plugged well. Upon receipt of any such request, the District Manager shall schedule such a conference. The party requesting the conference shall notify all other parties listed above within a reasonable time prior to the conference to provide opportunity for participation. The purpose of the conference shall be to review, evaluate, and accommodate any abnormal or unusual circumstance related to the condition of the well or surrounding strata when such conditions are encountered.

b. The operator shall intersect a well on a shift approved by the District Manager. The operator shall notify the District Manager and the miners' representative in sufficient time prior to intersecting a well in order to provide an opportunity to have representatives present.

c. When using continuous mining methods, the operator shall install drivage sights at the last open crosscut near the place to be mined to ensure intersection of the well. The drivage sites shall not be more than 50 feet from the well. When using longwall mining methods, distance markers shall be installed on 5-foot centers for a distance of 50 feet in advance of the well or branch in the headgate entry and in the tailgate entry.

d. The operator shall ensure that fire-fighting equipment including fire extinguishers, rock dust, and sufficient fire hose to reach the working face area of the well or branch intersection (when either the conventional or continuous mining method is used) is available and operable during all well or branch intersections. The fire hose shall be located in the last open crosscut of the entry or room. The operator shall maintain the water line to the belt conveyor

tailpiece along with a sufficient amount of fire hose to reach the farthest point of penetration on the section. When the longwall mining method is used, a hose to the longwall water supply is sufficient.

e. The operator shall ensure that sufficient supplies of roof support and ventilation materials shall be available and located at the last open crosscut. In addition, emergency plugs and suitable sealing materials shall be available in the immediate area of the well or branch intersection.

f. On the shift prior to intersecting the well or branch, the operator shall service all equipment and check it for permissibility. Water sprays, water pressures, and water flow rates used for dust and spark suppression shall be examined and any deficiencies corrected.

g. The operator shall calibrate the methane monitor(s) on the longwall, continuous mining machine, or cutting machine and loading machine on the shift prior to intersecting the well or branch.

h. When mining is in progress, the operator shall perform tests for methane with a handheld methane detector at least every 10 minutes from the time that mining with the continuous mining machine or longwall face is within 30 feet of the well or branch until the well or branch is intersected. During the actual cutting process, no individual shall be allowed on the return side until the well or branch intersection has been completed, and the area has been examined and declared safe. All workplace examinations on the return side of the shearer will be conducted while the shearer is idle. The operator's most current Approved Ventilation Plan will be followed at all times unless the District Manager deems a greater air velocity for the intersect is necessary.

i. When using continuous or conventional mining methods, the working place shall be free from accumulations of coal dust and coal spillages, and rock dust shall be placed on the roof, rib, and floor to within 20 feet of the face when intersecting the well or branch. On longwall sections, rock dusting shall be conducted and placed on the roof, rib, and floor up to both the headgate and tailgate gob.

j. When the well or branch is intersected, the operator shall de-energize all equipment, and thoroughly examine and determine the area to be safe before permitting mining to resume.

k. After a well or branch has been intersected and the working place determined to be safe, mining shall continue inby the well or branch a sufficient distance to permit adequate ventilation around the area of the well or branch. A packer

will be installed in any open or unplugged portion of the hole as soon as it is safe to do so.

l. If the casing is cut or milled at the coal seam level, the use of torches should not be necessary. However, in rare instances, torches may be used for inadequately or inaccurately cut or milled casings. No open flame shall be permitted in the area until adequate ventilation has been established around the well or branch bore and methane levels of less than 1.0% are present in all areas that will be exposed to flames and sparks from the torch. The operator shall apply a thick layer of rock dust to the roof, face, floor, ribs and any exposed coal within 20 feet of the casing prior to the use of torches.

m. Non-sparking (brass) tools will be located on the working section and will be used exclusively to expose and examine cased well or branches.

n. No person shall be permitted in the area of the well or branch intersection except those actually engaged in the operation, including company personnel, representatives of the miners, personnel from MSHA, and personnel from the appropriate State agency.

o. The operator shall alert all personnel in the mine to the planned intersection of the well or branch prior to their going underground if the planned intersection is to occur during their shift. This warning shall be repeated for all shifts until the well or branch has been mined through.

p. The well or branch intersection shall be under the direct supervision of a certified individual. Instructions concerning the well or branch intersection shall be issued only by the certified individual in charge.

q. If the mine operator cannot find the well or branch in the middle of the panel or a gate section misses the anticipated intersection, mining shall cease and the District Manager shall be notified.

r. The provisions of this Order do not impair the authority of representatives of MSHA to interrupt or halt the well or branch intersection, and to issue a withdrawal order, when they deem it necessary for the safety of the miners. MSHA may order an interruption or cessation of the well or branch intersection and/or a withdrawal of personnel by issuing either a verbal or written order to that effect to a representative of the operator, which order shall include the basis for the order. Operations in the affected area of the mine may not resume until a representative of MSHA permits resumption. The mine operator and miners shall comply with verbal or written MSHA orders immediately. All verbal orders shall be committed to writing within a reasonable time as conditions permit.

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s. A copy of this Order shall be maintained at the mine and be available to the miners.

t. If the well or branch is not plugged to the total depth of all minable coal seams identified in the core hole logs, any coal seams beneath the lowest plug will remain subject to the barrier requirements of 30 C.F.R. § 75.1700, should those coal seams be developed in the future.

u. All necessary safety precautions and safe practices according to Industry Standards, required by MSHA regulations and State regulatory agencies having jurisdiction over the plugging site will be followed to provide the utmost protection to the miners involved in the process.

v. All miners involved in the plugging or re-plugging operations will be trained on the contents of this petition prior to starting the process and a copy of this petition will be posted at the well or branch site until the plugging or re-plugging has been completed.

w. Mechanical bridge plugs should incorporate the best available technologies that are either required or recognized by the State regulatory agency and/or oil and gas industry.

x. Within 30 days after this Order becomes final, the operator shall submit proposed revisions for it's approved 30 C.F.R. Part 48 training plan to the District Manager. These proposed revisions shall include initial and refresher training on compliance with the terms and conditions stated in the Order. The operator shall provide all miners involved in well or branch intersection with training on the requirements of this Order prior to mining within 150 feet of the next well or branch intended to be mined through.

y. The responsible person required under 30 C.F.R. § 75.1501 Emergency Evacuations, is responsible for well or branch intersection emergencies. The well or branch intersection procedures should be reviewed by the responsible person prior to any planned intersection.

z. Within 30 days after this Order becomes final, the operator shall submit proposed revisions for its approved mine emergency evacuation and firefighting program of instruction required under 30 C.F.R § 75.1502. The operator will revise the program of instruction to include the hazards and evacuation procedures to be used for well or branch intersections. All underground miners will be trained in this revised plan within 30 days of submittal.

5. MANDATORY PROCEDURES SPECIFIC TO SDD INTERSECTIONS

a. Following the initial intersection of a branch of an SDD well, subsequent intersections of the same branch of the SDD well typically have lower risk. Appropriate procedures to protect the miners prior to these subsequent intersections or a given branch shall be specified in the ventilation plan.
b. All intersections with SDD wells and branches that are in intake air courses shall be examined as part of the pre-shift examinations required under 30 C.F.R. § 75.360.
c. All other intersection with SDD wells and branches shall be examined as part of the weekly examinations required under 30 C.F.R. § 75.364.

Any party to this action desiring a hearing on this matter must file in accordance with 30 C.F.R. § 44.14, within 30 days. The request for hearing must be filed with the Administrator for Mine Safety and Health Enforcement, 201 12th Street South, Suite 401, Arlington, Virginia 22202-5452.

If a hearing is requested, the request shall contain a concise summary of position on the issues of fact or law desired to be raised by the party requesting the hearing, including specific objections to the proposed decision.

A party other than Petitioner who has requested a hearing shall also comment upon all issues of fact or law presented in the petition, and any party to this action requesting a hearing may indicate a desired hearing site. If no request for a hearing is filed within 30 days after service thereof, the Decision and Order will become final and must be posted by the operator on the mine bulletin board at the mine.

TIMOTHY WATKINS

Digitally signed by TIMOTHY WATKINS
Date: 2021.04.30 14:10:38 -04'00'

Timothy R. Watkins
Administrator for
Mine Safety and Health Enforcement

4700102790P

Certificate of Service

I hereby certify that a copy of this proposed decision was served personally or mailed, postage prepaid, or provided by other electronic means this 30th day of April 2021, to:

Ryan Toler
General Manager
Century Mining LLC – Longview Mine
200 Chapel Brook Drive
Bridgeport, WV 26330

DONALD VICKERS

Digitally signed by DONALD VICKERS
Date: 2021.04.30 14:31:02 -04'00'

Don Vickers
Safety and Health Specialist

cc: Eugene White, Director Office of Miners' Health Safety & Training
#7 Players Club Dr. Suite 2, Charleston WV 25311
Eugene.E.White@wv.gov

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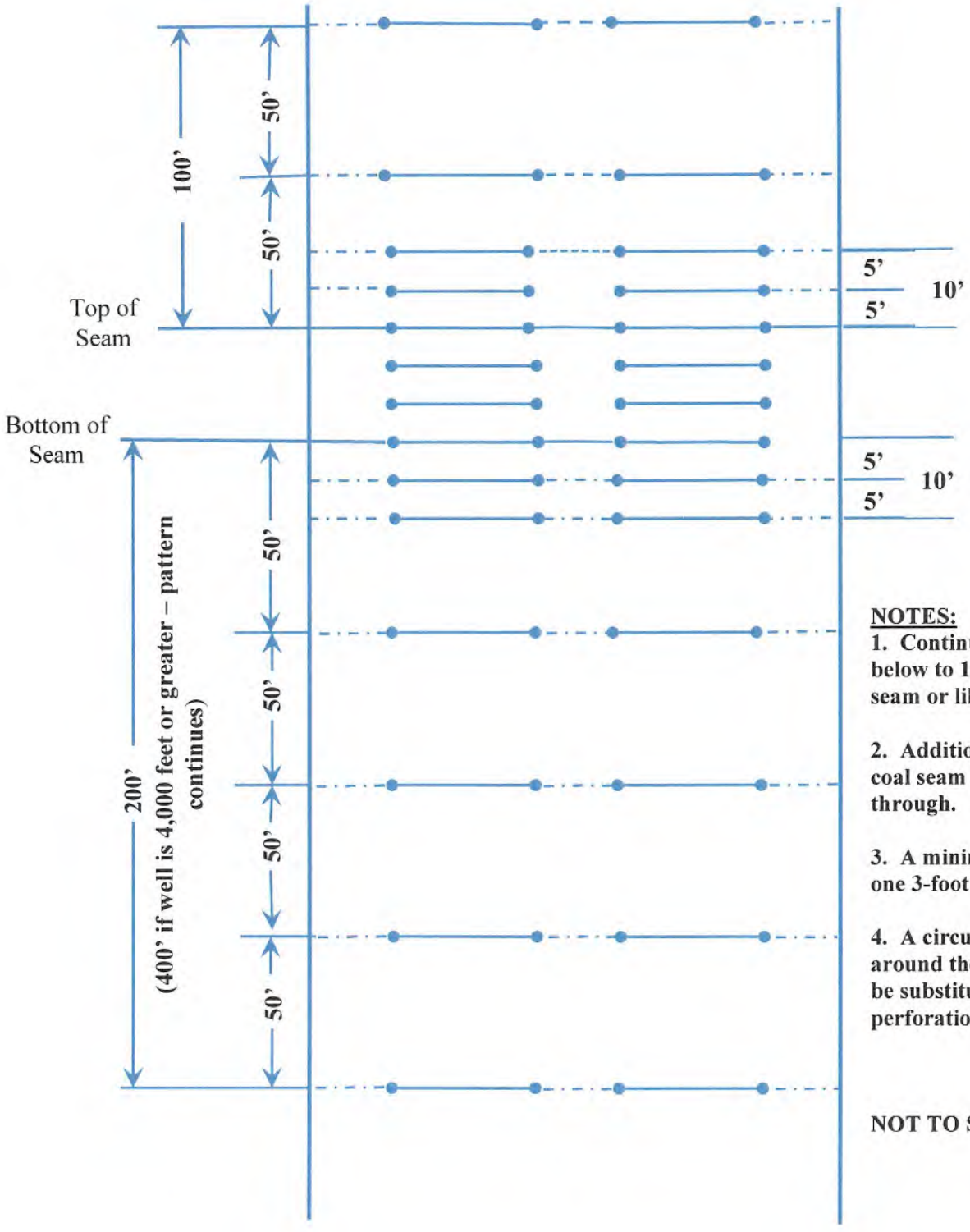
Appendix A



NOTES:

1. **Continuous rip from 10 feet below to 10 feet above coal seam or like sketch.**

2. **Additional rips made across coal seam to facilitate mine through.**

3. **A minimum of 4 shots or one 3-foot rip at each location.**

4. **A circumferential cut around the entire casing may be substituted for the perforation or ripping.**

NOT TO SCALE

4700102790P ✓

WR-35

DATE: 10/01/2004
API#: 4700102790 Ap B

State of West Virginia
Division of Environmental Production
Section of Oil and Gas

Well Operator's Report of Well Work

Farm Name North Central Resources — Operator Well No.: NCRHC-1

LOCATION: Elevation: 1454.03 — Quadrangle: Century

District: Union — County: Barbour

Latitude: 4,435.76 Feet South of 39 Deg. 07 Min. 30 Sec.

Longitude: 9,947.79 Feet West of 80 Deg. 07 Min. 30 Sec.

Company: Penn Virginia Oil & Gas Corporation	Casing and Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
Address: 2550 East Stone Drive, Suite 110	20"	20'	20'	0
Kingsport, TN 37660	16"	105'	105'	6
Agent: Harry Jewell	10 3/4"	535'	535'	556
Inspector: Craig Duckworth	7 5/8"	1468	1468	475
Date Permit Issued: 05/21/2004				
Date Well Work Commenced: 06/05/2004				
Date Well Work Completed: 07/11/2004				
Verbal Plugging:				
Date Permission granted on:				
Rotary X Cable Rig				
Total Depth (feet): 921				
Fresh Water Depth (ft):				
Salt Water Depth (ft):				
Is coal being mined in area (N/Y)?				
Coal Depths (ft): None Reported				

OPEN FLOW DATA

Producing formation L. Kittanning Coal — Pay zone depth (ft) 881

Gas: Initial open flow NA MCF/d — Oil: Initial open flow --- Bbl/d

Final open flow NA MCF/d — Final open flow --- Bbl/d

Time of open flow between initial and final tests: --- Hours

Static rock pressure 256 psig (surface pressure) after 288 Hours

Second producing formation ____ — Pay zone depth (ft) ____

Gas: Initial open flow ____ MCF/d — Oil: Initial open flow ____ Bbl/d

Final open flow ____ MCF/d — Final open flow ____ Bbl/d

Time of open flow between initial and final tests: ____ Hours

Static rock pressure ____ psig (surface pressure) after ____ Hours

NOTE: ON BACK OF THIS FORM PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANE, TEC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

Signed: William M. Ryan

By:

Date: 10/11/04

RECEIVED
Office of Oil & Gas
Office of Chief
OCT 27 2004
WV Department of
Environmental Protection

RECEIVED
Office of Oil and Gas
AUG 08 2022
09/02/2022
WV Department of
Environmental Protection

FORM WR-35R
(REVERSE)

PERMIT #:4700102790
WELL #: NCRHC-1

4700102790P

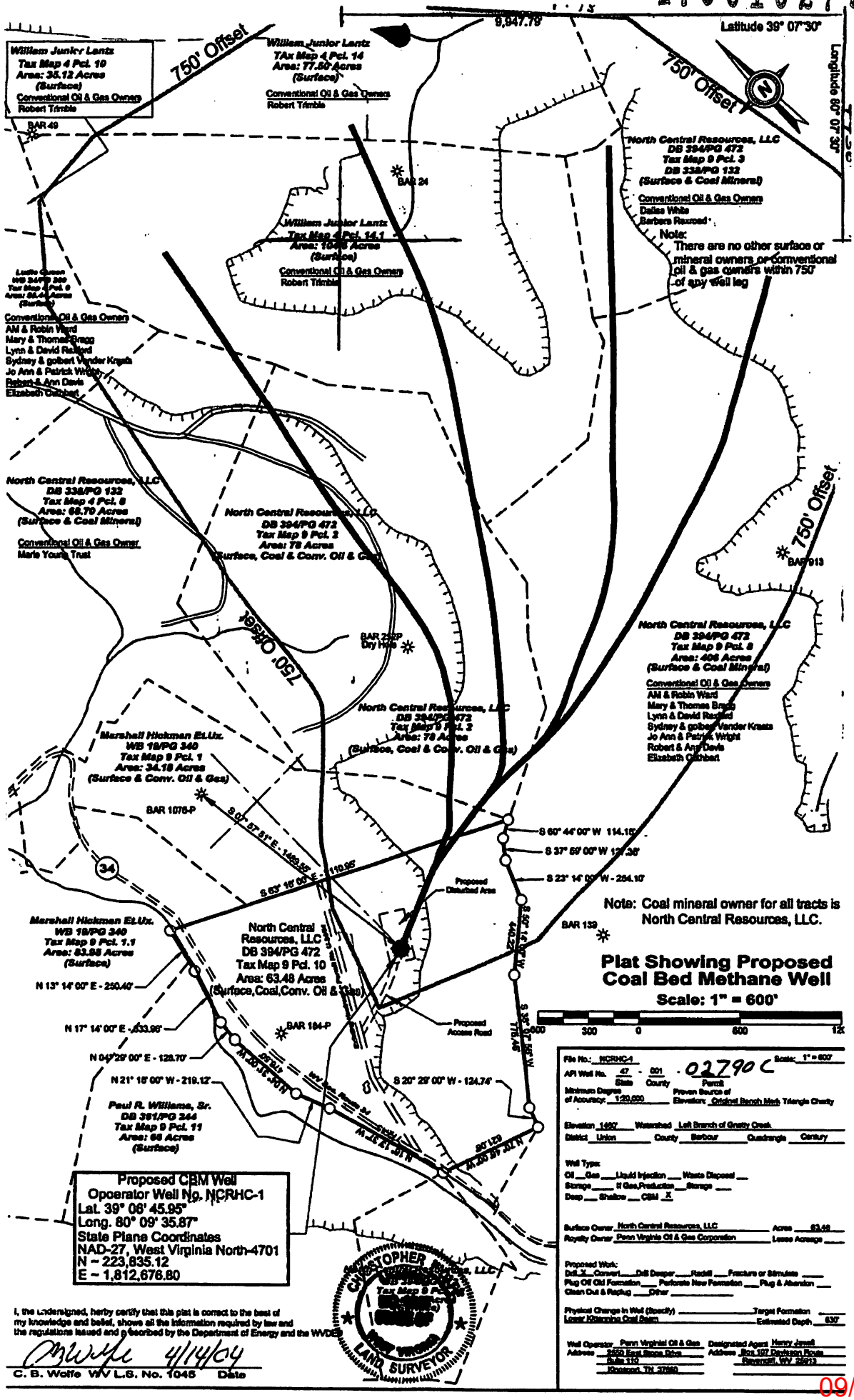
DETAILS OF PERFORATIONS, FRACTURING, OR PHYSICAL CHANGE, ETC.

NA

FORMATIONS	TOP	BOTTOM	REMARKS
Sand & Shale	0	280	TVD
Shale & Red Rock	280	550	TVD
Sand & Shale	550	TD	(921'TVD)
			Horizontal CBM well - total footage drilled 11,824'

09/02/2022

4700102790P



09/02/2022

4700102790P

WVGES GEOLOGY UNDERLIES IT ALL
"Pipeline"

Select County: (001) Barbour Select datatypes: (Check All)
Enter Permit #: 02790
Location, Production, Plugging, Owner/Completion, Stratigraphy, Sample, Pay/Show/Water, Logs, Btm Hole Loc
Get Data Reset

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

Well: County = 1 Permit = 02790

Report Time: Thursday, September 01, 2022 9:58:36 AM

Location Information: View Map

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4700102790	Barbour	2790	Union	Century	Philippi	39.112915	-80.1598	572639.2	4329643

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4700102790	7/1/2004	Dvtd Orgnl Loc	Completed	North Central Resources LLC		NCRHC-1			Penn Virginia O&G	Penn Virginia Oil & Gas Corp.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT
4700102790	7/1/2004	6/5/2004	1454	Ground Level	Buckhn-Century	Allegheny Fm	Lo Kittanning coal	Development Well	Development Well	Methane (CBM)	Rotary	CBM Mltlt	921	11824	11824			

Pay/Show/Water Information:

API	CMP_DT	ACTIVITY	PRODUCT	SECTION	DEPTH_TOP	FM_TOP	DEPTH_BOT	FM_BOT	G_BEF	G_AFT	O_BEF	O_AFT	WATER_QNTY
4700102790	7/1/2004	Methane Pay	Gas	Deviated			881	Lo Kittanning coal					

Production Gas Information: (Volumes in Mcf)

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4700102790	Dominion Exploration & Production, Inc.	2004	30,246	0	0	0	0	0	0	565	3,707	5,030	6,093	7,640	7,211
4700102790	Penn Virginia Oil & Gas Corp.	2004	15,287	0	0	0	0	0	0	0	0	0	3,706	5,594	5,987
4700102790	Dominion Exploration & Production, Inc.	2005	64,618	6,683	6,333	4,773	4,378	4,812	7,018	5,604	3,783	6,014	5,868	5,592	3,760
4700102790	Dominion Exploration & Production, Inc.	2006	46,719	5,361	4,566	5,442	4,915	4,779	4,166	4,062	2,974	3,041	2,850	2,766	1,797
4700102790	Dominion Exploration & Production, Inc.	2007	32,915	1,415	2,486	3,809	2,743	3,776	3,156	2,946	2,819	2,628	2,695	2,203	2,239
4700102790	Dominion Exploration & Production, Inc.	2008	33,734	2,425	4,600	2,674	2,868	0	2,810	3,277	3,270	3,244	2,916	2,778	2,872
4700102790	Dominion Exploration & Production, Inc.	2009	30,687	2,483	1,908	2,851	2,498	2,499	2,547	2,197	2,921	2,648	2,594	2,738	2,803
4700102790	CNX Gas Co. LLC (North)	2010	31,152	2,757	2,524	2,553	2,893	2,845	2,490	2,569	2,152	2,656	2,385	2,540	2,788
4700102790	CNX Gas Co. LLC (North)	2011	27,103	2,814	2,537	2,478	2,841	2,661	2,285	2,919	2,482	1,524	1,259	2,733	570
4700102790	Consol Gas Company	2012	23,148	0	0	0	1,553	4,286	3,743	1,150	2,926	2,906	3,022	1,050	2,512
4700102790	Consol Gas Company	2013	25,283	2,675	2,357	2,383	2,414	2,221	2,089	2,047	2,102	1,605	2,084	1,810	1,496
4700102790	Consol Gas Company	2014	21,814	1,204	1,987	2,073	1,054	374	2,659	2,630	2,488	2,094	1,822	1,563	1,866
4700102790	CNX Gas Co. LLC (North)	2015	12,312	795	1,634	1,623	1,892	1,302	2,069	1,481	0	0	0	0	1,516
4700102790	CNX Gas Co. LLC (North)	2016	13,511	618	1,597	2,098	824	2,129	1,271	1,502	430	1,660	1,239	63	75
4700102790	Alliance Petroleum Co., LLC	2017	13,553	1,774	1,597	993	567	1,355	619	636	796	1,211	1,519	1,262	1,224
4700102790	Alliance Petroleum Co., LLC	2018	1,298	0	0	0	0	0	0	332	599	0	117	60	190
4700102790	Alliance Petroleum Co., LLC	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Century Mining, LLC	2020	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Century Mining, LLC	2021	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_OIL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4700102790	Dominion Exploration & Production, Inc.	2004	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Penn Virginia Oil & Gas Corp.	2004	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Dominion Exploration & Production, Inc.	2005	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Dominion Exploration & Production, Inc.	2006	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Dominion Exploration & Production, Inc.	2007	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Dominion Exploration & Production, Inc.	2008	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Dominion Exploration & Production, Inc.	2009	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	CNX Gas Co. LLC (North)	2010	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	CNX Gas Co. LLC (North)	2011	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Consol Gas Company	2012	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Consol Gas Company	2013	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Consol Gas Company	2014	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	CNX Gas Co. LLC (North)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	CNX Gas Co. LLC (North)	2016	0												
4700102790	Alliance Petroleum Co., LLC	2017	0	0											
4700102790	Alliance Petroleum Co., LLC	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Alliance Petroleum Co., LLC	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Century Mining, LLC	2020	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Century Mining, LLC	2021	0	0	0	0	0	0	0	0	0	0	0	0	0

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_NGL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4700102790	Consol Gas Company	2013	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Consol Gas Company	2014	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	CNX Gas Co. LLC (North)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	CNX Gas Co. LLC (North)	2016	0												
4700102790	Alliance Petroleum Co., LLC	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Alliance Petroleum Co., LLC	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Century Mining, LLC	2020	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Century Mining, LLC	2021	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Water Information: (Volumes in Gallons)

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_WTR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4700102790	CNX Gas Co. LLC (North)	2016	0												
4700102790	Alliance Petroleum Co., LLC	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Alliance Petroleum Co., LLC	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Century Mining, LLC	2020	0	0	0	0	0	0	0	0	0	0	0	0	0
4700102790	Century Mining, LLC	2021	0	0	0	0	0	0	0	0	0	0	0	0	0

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

There is no Plugging data for this well

There is no Sample data for this well

09/02/2022

4700102790P

WVDEP Office of Oil and Gas - Well Search

Disclaimer: Per §22-6-6. Permit required for all well work; permit fee; application; soil erosion control plan.

(a) It is unlawful for any person to commence any well work, including site preparation work, which involves any disturbance of land, without first securing a well work permit from the director of the WVDEP Office of Oil and Gas.

The appearance of an API number on the web page does not signify that a permit has been issued. The API number is used as a tracking mechanism until the permit has been issued. Under no circumstances should well work be commenced without a signed permit.

Current Operator

Well API	Operator	Surface Owner	Well Number	Well Status	Well Type	Last Permit Issue Date
4700102790	CENTURY MINING, LLC	NORTH CENTRAL RESOURCES	NCRHC-1	Abandoned Well	Coal Bed Methane Well	05/21/2004

Note: The operator listed above is the CURRENT operator of the well. This operator may or may not have recorded production for this well for the years listed below. The production listed below spans the years shown, regardless of the operator who originally recorded a particular year's production numbers.

Production by Energy Type

Well Lifetime Gas Production

All amounts expressed in mcfg (thousand cubic feet)

Reporting Operator	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
CENTURY MINING, LLC	2021	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CENTURY MINING, LLC	2020	0	0	0	0	0	0	0	0	0	0	0	0	**0**
ALLIANCE PETROLEUM CO., LLC	2019	0	0	0	0	0	0	0	0	0	0	0	0	**0**
ALLIANCE PETROLEUM CORPORATION	2018	0	0	0	0	0	0	332	599	0	117	60	190	**1,298**
CNX GAS COMPANY LLC	2017	1,774	1,597	993	567	1,355	619	636	796	1,211	1,519	1,262	1,224	**13,553**
CNX GAS COMPANY LLC	2016	618	1,597	2,098	824	2,130	1,271	1,503	431	1,661	1,240	63	75	**13,511**
CNX GAS COMPANY LLC	2015	795	1,634	1,623	1,892	1,302	2,069	1,481	0	0	0	0	1,516	**12,312**
CONSOL GAS COMPANY	2014	1,204	1,987	2,073	1,054	374	2,659	2,630	2,488	2,094	1,822	1,563	1,866	**21,814**
CONSOL GAS COMPANY	2013	2,675	2,357	2,383	2,414	2,221	2,089	2,047	2,102	1,605	2,084	1,810	1,496	**25,283**
CONSOL GAS COMPANY	2012	0	0	0	1,553	4,286	3,743	1,150	2,926	2,906	3,022	1,050	2,512	**23,148**
CNX GAS COMPANY LLC	2011	2,814	2,537	2,478	2,841	2,661	2,285	2,919	2,482	1,524	1,259	2,733	570	**27,103**
CNX GAS COMPANY LLC	2010	2,757	2,524	2,553	2,893	2,845	2,490	2,569	2,152	2,656	2,385	2,540	2,788	**31,152**
DOMINION EXPLORATION & PRODUCTION, INC.	2009	2,483	1,908	2,851	2,498	2,499	2,547	2,197	2,921	2,648	2,594	2,738	2,803	**30,687**
DOMINION EXPLORATION & PRODUCTION, INC.	2008	2,425	4,600	2,674	2,868	0	2,810	3,277	3,270	3,244	2,916	2,778	2,872	**33,734**
DOMINION EXPLORATION & PRODUCTION, INC.	2007	1,415	2,486	3,809	2,743	3,776	3,156	2,946	2,819	2,628	2,695	2,203	2,239	**32,915**
DOMINION EXPLORATION & PRODUCTION, INC.	2006	5,361	4,566	5,442	4,915	4,779	4,166	4,062	2,974	3,041	2,850	2,766	1,797	**46,719**
DOMINION EXPLORATION & PRODUCTION, INC.	2005	6,683	6,333	4,773	4,378	4,812	7,018	5,604	3,783	6,014	5,868	5,592	3,760	**64,618**
DOMINION EXPLORATION & PRODUCTION, INC.	2004	0	0	0	0	0	0	565	3,707	5,030	6,093	7,640	7,211	**30,246**
PENN VIRGINIA OIL AND GAS CORPORATION	2004	0	0	0	0	0	0	0	0	0	3,706	5,594	5,987	**15,287**

09/02/2022

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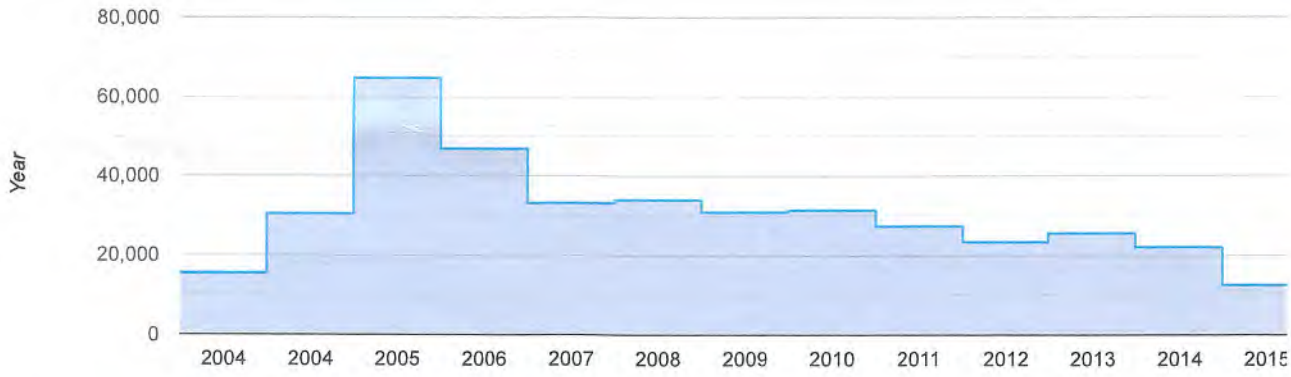

Well Lifetime Oil Production

All amounts expressed in barrels

Reporting Operator	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
CENTURY MINING, LLC	2021	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CENTURY MINING, LLC	2020	0	0	0	0	0	0	0	0	0	0	0	0	**0**
ALLIANCE PETROLEUM CO., LLC	2019	0	0	0	0	0	0	0	0	0	0	0	0	**0**
ALLIANCE PETROLEUM CORPORATION	2018	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CNX GAS COMPANY LLC	2017	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CNX GAS COMPANY LLC	2016	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CNX GAS COMPANY LLC	2015	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CONSOL GAS COMPANY	2014	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CONSOL GAS COMPANY	2013	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CONSOL GAS COMPANY	2012	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CNX GAS COMPANY LLC	2011	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CNX GAS COMPANY LLC	2010	0	0	0	0	0	0	0	0	0	0	0	0	**0**
DOMINION EXPLORATION & PRODUCTION, INC.	2009	0	0	0	0	0	0	0	0	0	0	0	0	**0**
DOMINION EXPLORATION & PRODUCTION, INC.	2008	0	0	0	0	0	0	0	0	0	0	0	0	**0**
DOMINION EXPLORATION & PRODUCTION, INC.	2007	0	0	0	0	0	0	0	0	0	0	0	0	**0**
DOMINION EXPLORATION & PRODUCTION, INC.	2006	0	0	0	0	0	0	0	0	0	0	0	0	**0**
DOMINION EXPLORATION & PRODUCTION, INC.	2005	0	0	0	0	0	0	0	0	0	0	0	0	**0**
DOMINION EXPLORATION & PRODUCTION, INC.	2004	0	0	0	0	0	0	0	0	0	0	0	0	**0**
PENN VIRGINIA OIL AND GAS CORPORATION	2004	0	0	0	0	0	0	0	0	0	0	0	0	**0**

09/02/2022

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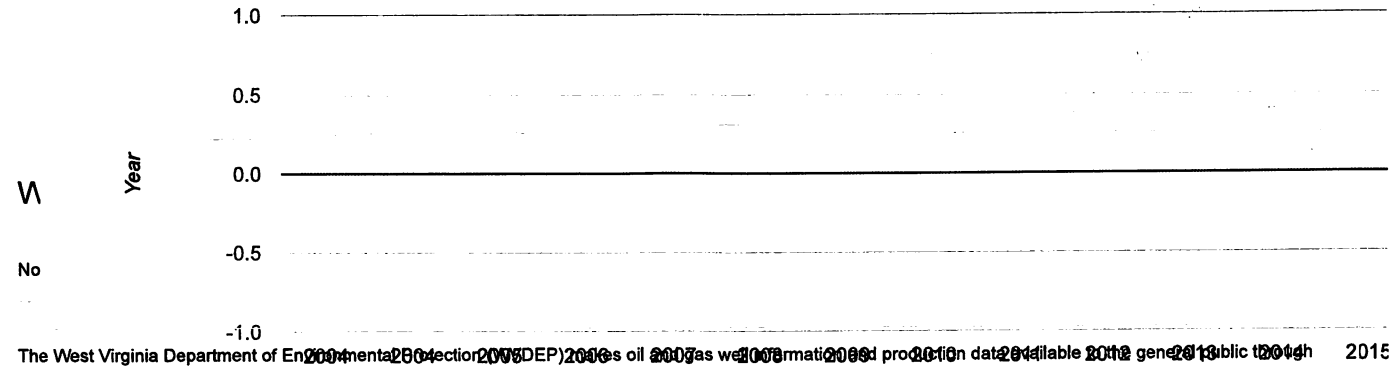

W

No

The West Virginia Department of Environmental Protection (WVDEP) makes oil and gas well information and production data available to the general public through this internet service free of charge.

The oil and gas related data originate from the information reported to the Office of Oil and Gas at WVDEP by West Virginia oil and gas operators. The WVDEP does not guarantee their accuracy, precision, or completeness.

Neither the West Virginia Department of Environmental Protection nor its staff members are liable or responsible for any damage or loss resulting from the use of these data or from inaccuracies contained in the data.

We encourage you to report any problems, inconsistencies, or errors noted in using this data to the Office of Oil and Gas so that we can correct them and provide better service.

Office of Oil and Gas
Department of Environmental Protection
601 57th St
Charleston, West Virginia 25304
Phone: (304) 926-0499
Fax: (304) 926-0452

09/02/2022

4700102790 P

WW-4A
Revised 6-07

1) Date: July 26, 2022
2) Operator's Well Number
NCRHC-1

3) API Well No.: 47 - 001 - 02790

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE 0F APPLICATION TO PLUG AND ABANDON A WELL

4) Surface Owner(s) to be served:
(a) Name: North Central Resources, LLC
Address: 7004 Buckhannon Road
Volga, WV 26238
(b) Name
Address
(c) Name
Address

6) Inspector: Sam Ward
Address: P.O. Box 2327
Buckhannon, WV 26201
Telephone: 304-389-7583

5) (a) Coal Operator
Name: Century Mining, LLC
Address: 7004 Buckhannon Road
Volga, WV 26238
(b) Coal Owner(s) with Declaration
Name
Address
Name
Address
(c) Coal Lessee with Declaration
Name
Address

TO THE PERSONS NAMED ABOVE: You should have received this Form and the following documents:

(1) The application to Plug and Abandon a Well on Form WW-4B, which sets out the parties involved in the work and describes the well its and the plugging work order; and
(2) The plat (surveyor's map) showing the well location on Form WW-6.

The reason you received these documents is that you have rights regarding the application which are summarized in the instructions on the reverses side. However, you are not required to take any action at all.

Take notice that under Chapter 22-6 of the West Virginia Code, the undersigned well operator proposes to file or has filed this Notice and Application and accompanying documents for a permit to plug and abandon a well with the Chief of the Office of Oil and Gas, West Virginia Department of Environmental Protection, with respect to the well at the location described on the attached Application and depicted on the attached Form WW-6. Copies of this Notice, the Application, and the plat have been mailed by registered or certified mail or delivered by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of mailing or delivery to the Chief.

RECEIVED
Office of Oil and Gas
AUG 08 2022
WV Department of
Environmental Protection

NOTARY PUBLIC OFFICIAL SEAL
MATTHEW B BEALKO
State of West Virginia
My Commission Expires May 19, 2026
7004 BUCKHANNON RD. VOLGA, WV 26238

Well Operator: Century Mining, LLC
By: Gary Miles
Its: Agent - Chief Engineer
Address: 7004 Buckhannon Road
Volga, WV 26238
Telephone:

Subscribed and sworn before me this 5th day of August 2022
Notary Public
My Commission Expires May 19, 2026

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use of your personal information, please contact DEP's Chief Privacy Officer at depprivacyoffier@wv.gov.

09/02/2022

SURFACE OWNER WAIVER 4700102790P

Operator's Well Number NCRHC-1

INSTRUCTIONS TO SURFACE OWNERS NAMED ON PAGE WW4-A

The well operator named on page WW-4A is applying for a permit from the State to plug and abandon a well. (Note: If the surface tract is owned by more than three persons, then these materials were served on you because your name appeared on the Sheriff's tax ticket on the land or because you actually occupy the surface tract. In either case, you may be the only owner who will actually receive these materials.) See Chapter 22 of the West Virginia Code. Well work permits are valid for 24 months. If you do not own any interest in the surface tract, please forward these materials to the true owner immediately if you know who it is. Also, please notify the well operator and the Office of Oil and Gas.

NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.
WHERE TO FILE COMMENTS AND OBTAIN ADDITIONAL INFORMATION:

Chief, Office of Oil and Gas
Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304
(304) 926-0450

Time Limits and methods for filing comments. The law requires these materials to be served on or before the date the operator files his Application. You have **FIVE (5) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Comments must be in writing. Your comments must include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

The Chief has the power to deny or condition a well work permit based on comments on the following grounds:

1) The proposed well work will constitute a hazard to the safety of persons.
2) The soil erosion and sediment control plan is not adequate or effective;
3) Damage would occur to publicly owned lands or resources;
4) The proposed well work fails to protect fresh water sources or supplies;
5) The applicant has committed a substantial violation of a previous permit or a substantial violation of one or more of the rules promulgated under Chapter 22, and has failed to abate or seek review of the violation...".

If you want a copy of the permit as it is issued or a copy of the order denying the permit, you should request a copy from the Chief.

VOLUNTARY STATEMENT OF NO OBJECTION

I hereby state that I have read the instructions to surface owners and that I have received copies of a Notice and Application For A Permit To Plug And Abandon on Forms WW-4A and WW-4B, and a survey plat.

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

FOR EXECUTION BY A NATURAL PERSON ETC.

Steven R Stroupe
Signature

Date 8/2/2022

FOR EXECUTION BY A CORPORATION,

Name North Central Resources, LLC
By Steven R. Stroupe
Its Secretary/Treasurer

Signature Date

09/02/2022

WW-4B

API No. 47-001-02790 P
Farm Name North Central Resources
Well No. NCRHC-1

INSTRUCTIONS TO COAL OPERATORS
OWNERS AND LESSEE

4700102790P

The well operator named on the obverse side of WW-4 (B) is about to abandon the well described in the enclosed materials and will commence the work of plugging and abandoning said well on the date the inspector is notified. Which date shall not be less then five days after the day on which this notice and application so mailed is received, or in due course should be received by the Department of Environmental Protection Office of Oil & Gas.

This notice and application is given to you in order that your respective representatives may be present at the plugging and filling of said well. You are further notified that whether you are represented or not the operator will proceed to plug and fill said well in the manner required by Section 24, Article 6, Chapter 22 of the Code and given in detail on obverse side of this application.

NOTE: If you wish this well to be plugged according to 22-6-24(d) then as per Regulation 35CSR4-13.9 you must complete and return to this office on form OB-16 "Request by Coal Operator, Owner, or Lessee for plugging" prior to the issuance of this plugging permit.

WAIVER

The undersigned coal operator X / owner ____ / lessee X / of the coal under this well location has examined this proposed plugging work order. The undersigned has no objection to the work proposed to be done at this location, provided, the well operator has complied with all applicable requirements of the West Virginia Code and the governing regulations.

Date: 8/2/2022

Steven R Stroupe
By: Steven R. Stroupe
Its Secretary/Treasurer - Century Mining LLC

09/02/2022

4700102790P

WW-9
(5/16)

API Number 47 - 001 - 02790
Operator's Well No. NCRHC-1

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Century Mining, LLC OP Code _____

Watershed (HUC 10) Left Branch of Gnatty Creek Quadrangle Century

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes ☐ No ☑

Will a pit be used? Yes ☐ No ☑

If so, please describe anticipated pit waste: _____

Will a synthetic liner be used in the pit? Yes ☐ No ☐ If so, what ml.? _____

Proposed Disposal Method For Treated Pit Wastes:

SDW
8/4/2022

_____ Land Application (if selected provide a completed form WW-9-GPP)
_____ Underground Injection (UIC Permit Number _____)
_____ Reuse (at API Number _____)
_____ Off Site Disposal (Supply form WW-9 for disposal location)
■ Other (Explain Tanks or existing ponds. DEP Permit No. O-2001-13

Will closed loop systembe used? If so, describe: _____

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. _____

-If oil based, what type? Synthetic, petroleum, etc. _____

Additives to be used in drilling medium? _____

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. _____

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) _____

-Landfill or offsite name/permit number? _____

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on April 1, 2016, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto 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 or imprisonment.

Company Official Signature Gary W. Miles

Company Official (Typed Name) Gary W. Miles

Company Official Title Chief Engineer

Subscribed and sworn before me this 5th day of August 2022, 20 22

Matthew Bealko Notary Public

My commission expires May 19, 2026

NOTARY PUBLIC OFFICIAL SEAL
MATTHEW B BEALKO
State of West Virginia
My Commission Expires May 19, 2026
7004 BUCKHANNON RD. VOLGA, WV 26238

09/02/2022

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Form WW-9

Operator's Well No. NCRHC-1

Proposed Revegetation Treatment: Acres Disturbed 1 Prevegetation pH _____

Lime 3 Tons/acre or to correct to pH 6.0

Fertilizer type 10-20-20 or equivalent

Fertilizer amount 500 lbs/acre

Mulch 2 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
See Attached.	100	See Attached.	100

Attach:
Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, provide water volume, include dimensions (L, W, D) of the pit, and dimensions (L, W), and area in acres, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Samuel D Ward II

Comments: _____

Title: OOG Inspector Date: 8/4/2022

Field Reviewed? (_____) Yes (X) No

09/02/2022

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O-9. PROVIDE A PLANTING PLAN WHICH INCLUDES THE FOLLOWING:

A. A PREDICTION OF THE MINESOIL CHARACTER BASED ON OVERBURDEN ANALYSIS, SOIL ANALYSIS, AND OTHER AVAILABLE INFORMATION;

A site-specific test of the soils to be used for reclamation will be performed. These tests will be used to determine the amount of lime and fertilizer to be added prior to seeding.

B. PROPOSED TREATMENT TO NEUTRALIZE ACIDITY;

Soil shall be treated with ground limestone or an equivalent amendment to maintain a pH of 6.0. Liming requirements will be determined by approved testing of soil conducted during or just prior to regrading.

C. METHOD OF MECHANICAL SEED BED PREPARATION;

A minimum of 6 inches of topsoil material will be spread over the regrade area to provide a suitable base for vegetation. Where and when possible, as promoted by the FRA, the surface soil layer will be four feet deep and only lightly graded. Ability to achieve this FRA surface soil layer depth will be determined by the steepness of the slopes and available material. Heavily compacted areas such as road beds shall be ripped or disked prior to revegetation in order to create a loose growth medium.

D. APPLICATION RATES AND ANALYSIS OF FERTILIZATION;

Fertilizer shall be at the rate of 600 pounds per acre of 10-20-10 or as required by the results of approved soil testing prior to hydroseeding. Higher levels of application will be applied if specified by post mining soils test analyses. As suggested by the FRA, lower nitrogen fertilizers will be utilized, as this should discourage over growth of ground cover while allowing for optimal tree growth.

E. APPLICATION RATES AND TYPES OF MULCH;

Mulch will be applied at a rate of 1,000 lbs/acre of wood fiber or wood cellulose. If shredded bark is used, it will be applied at a rate of 50 cy/acre. Straw or hay will be used at 1½ - 2 tons/acre.

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F. APPLICATION RATES AND SPECIES OF PERENNIAL VEGETATION INCLUDING THE HERBACEOUS AND WOODY PLANTS;

Seed Mixture	Permanent Vegetation Seed Rate Rate[a]	Seeding time(s)[b]
Winter Wheat	15 lbs/acre	Sept – Nov
Foxtail Millet	5 lbs/acre	March 1 – June 15
Redtop	2 lbs/acre	March 1 – June 15
Perennial Ryegrass	2 lbs/acre	March 1 – June 15
Orchardgrass	5 lbs/acre	March 1 – June 15
Weeping Lovegrass	2 lbs/acre	March 1 – June 15
Kobe Lespedeza	5 lbs/acre	March 1 – June 15
Birdsfoot trefoil	10 lbs/acre	March 1 – June 15
White Clover	3 lbs/acre	March 1 – June 15

[a]Seeding rate suggested is for Pure Live Seed (PLS) in pounds/acre.
[b]Fall and winter seeding mixtures should vary as shown.
[c]Herbaceous legumes must be treated with the appropriate bacterium before seeding.

G. AREAS TO BE PLANTED OR SEEDED TO TREES AND SHRUBS;

All areas shall be revegetated to hayland/pasture.

H. A MAINTENANCE SCHEDULE AND PROCEDURES; AND

During the active life of the mining operation and after final planting has occurred, the areas which were seeded, will be inspected prior to the spring and fall planting seasons. Any areas, which have not met the revegetation success standards, as required by the West Virginia Department of Environmental Protection, shall be reseeded. Reseeding application rates and species shall be the same as those specified herein. A temporary vegetative cover shall be established as contemporaneously as possible with backfilling and grading until a permanent vegetative cover can be established. At a minimum, a temporary or permanent vegetative cover shall be established by the end of the first growing season and a permanent vegetative cover shall be established after the areas have been regraded for final reclamation.

I. A PLAN FOR TEMPORARY VEGETATION COVER TO INCLUDE THE FOLLOWING:

- SPECIES
- SEEDING RATE; AND
- TIMING.

A temporary vegetative cover shall be established as soon as possible in coordination with backfilling and regrading until such a time that permanent vegetative cover shall be established

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and will serve as a form of erosion control. At a minimum, a temporary vegetative cover shall be established by the end of the first growing season and a permanent cover shall be established after associated structures have been removed and the areas have been regraded for final reclamation. The following mixtures, rates and seeding times are outlined below:

	Temporary Vegetation Seed Rate	
Seed Mixture	Rate[a]	Seeding time(s)[b]
Winter Wheat	15 lbs/acre	Sept – Nov
Foxtail Millet	5 lbs/acre	March 1 – June 15
Redtop	2 lbs/acre	March 1 – June 15
Perennial Ryegrass	2 lbs/acre	March 1 – June 15
Orchardgrass	5 lbs/acre	March 1 – June 15
Weeping Lovegrass	2 lbs/acre	March 1 – June 15
Kobe Lespedeza	5 lbs/acre	March 1 – June 15
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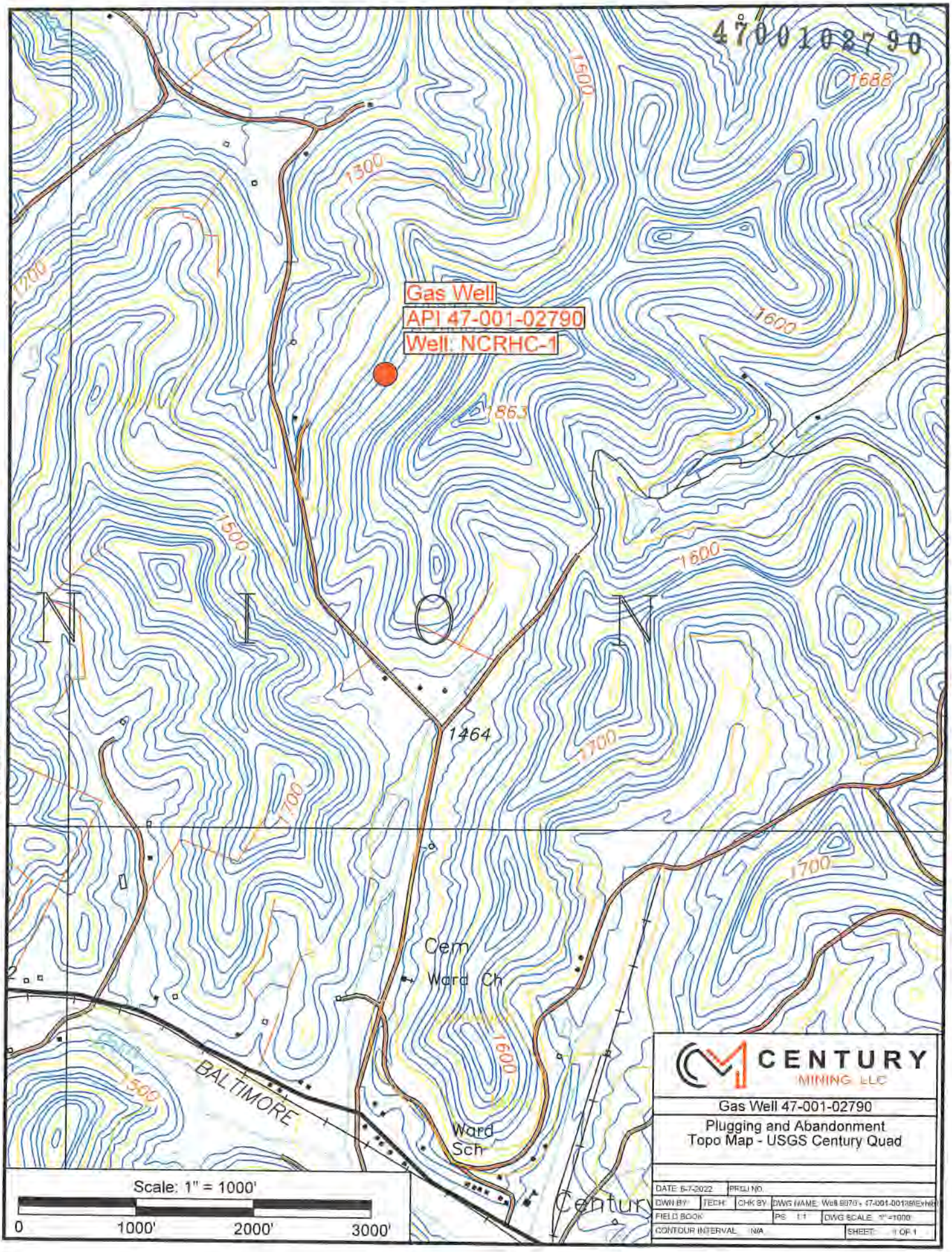
[a]Seeding rate suggested is for Pure Live Seed (PLS) in pounds/acre.
[b]Fall and winter seeding mixtures should vary as shown.
[c]Herbaceous legumes must be treated with the appropriate bacterium before seeding.



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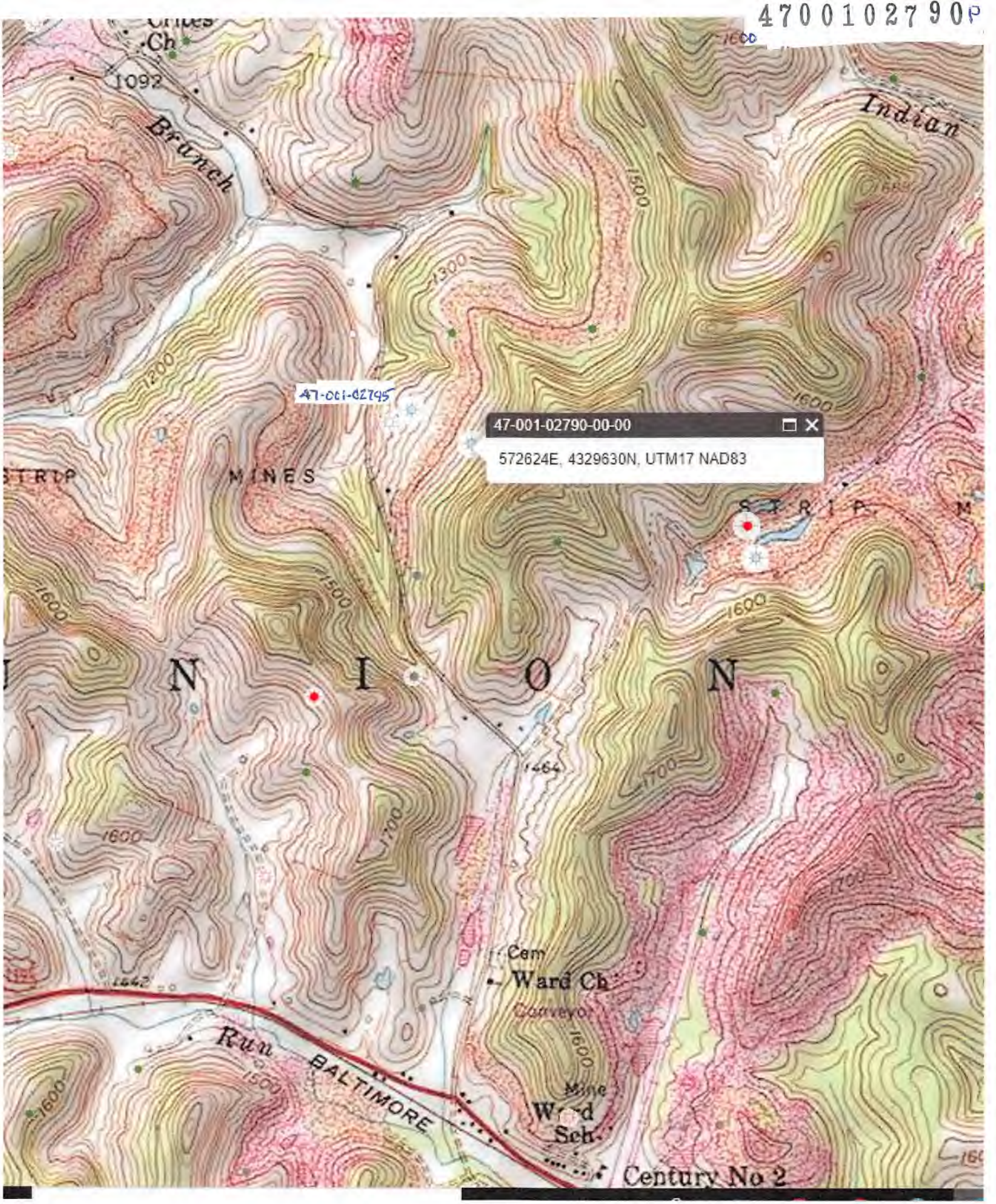
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WW-7
8-30-06

West Virginia Department of Environmental Protection
Office of Oil and Gas
WELL LOCATION FORM: GPS

API: 47-001-02790 **WELL NO.:** NCRHC-1

FARM NAME: North Central Resources

RESPONSIBLE PARTY NAME: Century Mining, LLC

COUNTY: Barbour **DISTRICT:** Union

QUADRANGLE: Century Mining, LLC

SURFACE OWNER: North Central Resources, LLC

ROYALTY OWNER: North Central Resources, LLC

UTM GPS NORTHING: 4329630.882

UTM GPS EASTING: 572624.202 **GPS ELEVATION:** 442.609

1452.13 Feet

The Responsible Party named above has chosen to submit GPS coordinates in lieu of preparing a new well location plat for a plugging permit or assigned API number on the above well. The Office of Oil and Gas will not accept GPS coordinates that do not meet the following requirements:

1. Datum: NAD 1983, Zone: 17 North, Coordinate Units: meters, Altitude: height above mean sea level (MSL) – meters.
2. Accuracy to Datum – 3.05 meters
3. Data Collection Method:

Survey grade GPS X : Post Processed Differential _____

Real-Time Differential X

Mapping Grade GPS ____: Post Processed Differential _____

Real-Time Differential _____

4. **Letter size copy of the topography map showing the well location.**

I the undersigned, hereby certify this data is correct to the best of my knowledge and belief and shows all the information required by law and the regulations issued and prescribed by the Office of Oil and Gas.

Gary V. Miles — Signature

Chief Engineer — Title

8/5/22 — Date

09/02/2022

Stansberry, Wade A <wade.a.stansberry@wv.gov>

Plugging Vertical Well Work Permits API: (47-001-02790)

1 message

Stansberry, Wade A <wade.a.stansberry@wv.gov> Thu, Sep 1, 2022 at 2:58 PM
To: Gary Miles <gmiles@centuryminingllc.com>, jfarley@centuryminingllc.com, "Ward, Samuel D" <samuel.d.ward@wv.gov>, Derick Spencer <spencer@assessor.state.wv.us>

I have attached a copy of the newly issued well permit numbers:

47-001-02790 - NCRHC-1

These will serve as your copy.

Thank you,

Wade A. Stansberry

Environmental Resource Specialist 3

West Virginia Department of Environmental Protection

Office of Oil & Gas

601 57th St. SE

Charleston, WV 25304

(304) 926-0499 ext. 41115

(304) 926-0452 fax

Wade.A.Stansberry@wv.gov

47-001-02790 - Copy.pdf
5385K

09/02/2022