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west virginia department of environmental protection

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

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

Monday, March 20, 2017  
WELL WORK PERMIT  
Coal Bed Methane Well / Plugging

CONSOLIDATION COAL COMPANY (A)  
1 BRIDGE STREET

MONONGAH, WV 265540000

Re: Permit approval for MC 43  
47-051-01096-00-00

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.

Please be advised that form WR-35, Well Operators Report of Well Work 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: MC 43  
Farm Name: GAREY, PAUL & GERALD  
U.S. WELL NUMBER: 47-051-01096-00-00  
Coal Bed Methane Well / Plugging  
Date Issued: 3/20/2017

Promoting a healthy environment.

03/24/2017

## 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

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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.

5101096P

FORM WW-4(B)  
Rev. 2/01

1.) Date: February 16, 20 17  
2.) Operator's Well No. MC-43  
3.) API Well No. 47 - 51 - 01096  
State County Permit

STATE OF WEST VIRGINIA  
DIVISION OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL & GAS  
APPLICATION FOR A PERMIT TO PLUG & ABANDON

4.) WELL TYPE: Oil \_\_\_\_\_ / Gas X / Liquid injection \_\_\_\_\_ / Waste disposal \_\_\_\_\_ /  
(IF "Gas", Production \_\_\_\_\_ / Underground storage \_\_\_\_\_ / Deep \_\_\_\_\_ / Shallow X)

5.) LOCATION: Elevation: 1292.57' Watershed: French Run of Grave Creek  
District: Cameron County: Marshall Quadrangle: Glen Easton, WV 7.5'

6.) WELL OPERATOR Consolidation Coal Co. 7.) DESIGNATED AGENT Ronnie Harsh  
Address 1 Bridge St. Address 1 Bridge St.  
Monongah, WV 26554 Monongah, WV 26554

8.) OIL & GAS INSPECTOR TO BE NOTIFIED 9.) PLUGGING CONTRACTOR  
Name James Nicholson Name \_\_\_\_\_  
Address PO BOX 44 Address \_\_\_\_\_  
Moundsville, WV 26041 \_\_\_\_\_

10.) WORK ORDER: The work order for the manner of plugging this well is as follows:

SEE EXHIBIT NO. 1

EX 101C EXEMPTION  
ATTACHED

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

Work order approved by inspector \_\_\_\_\_ Date \_\_\_\_\_

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## Exhibit Number 1

Consolidation Coal Company in WV will utilize the following methods to plug CBM wells.

CBM wells are a directionally drilled well with horizontal wellbores through the Pittsburgh coal seam. The wellbores through the coal will be water infused for first intersection of the laterals. Then the lateral system will be cemented/grouted. The vertical wellbore will be cleaned out to the total depth or attainable bottom (PBSD). The well sump, 7" casing, and packer will be pulled if possible. This proposed method of plugging the wellbore will apply to that portion of the wellbore from the top of the coal seam to be mined to the surface. All Casings will be removed and at no time will more than a single string be left in the wellbore.

All casing will be removed so that only a single string will be left in the wellbore, if it cannot be removed. Intact and uncemented casings as determined by electronic logging shall be perforated, ripped, or milled at no greater than 100' intervals to the top of the casing. A borehole survey will be conducted to determine the top and bottom of the coal seam to be mined. In addition, starting at a point 5' below through 5' above the coal to be mined, any casing shall be ripped, cut or perforated on no greater than a 5' interval. <sup>CLASS A</sup> Before or after mine through this well will be plugged with cement to the surface from a point at or above the Pittsburgh Coal with a solid plug.

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## U.S. Department of Labor

Mine Safety and Health Administration  
1100 Wilson Boulevard  
Arlington, Virginia 22209-3939



MAY 12 2015

In the matter of:  
McElroy Coal Company  
McElroy Mine  
I.D. No. 46-01437

Petition for Modification

Docket No. M-2014-020-C

Proposed Decision and Order

On May 28, 2014, a petition was filed seeking a modification of the application of 30 C.F.R. § 75.1700 to Petitioner's McElroy Mine located in Marshall County, West Virginia. The Petitioner alleges that the proposed alternative method of compliance with the standard with respect to vertical coalbed methane degasification wells with horizontal laterals in the coal seam will at all times guarantee no less than the same measure of protection afforded by the standard. The petitioned standard, 30 C.F.R. § 75.1700, states:

*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 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. Drill holes are deviated in both the horizontal and vertical planes using these techniques. These techniques differ from vertical gas wells and require different techniques in order to plug them. Procedures to address the potential hazards presented by CBM wells must be implemented to protect the coal miners who will be exposed to these wells. When coal mines intersect inadequately plugged CBM wells, methane inundations, ignitions and explosions are possible.

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The alternative method proposed by the Petitioner includes well plugging procedures, water infusion and ventilation methods, and procedures for mining through a CBM well with horizontal laterals.

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

### Findings of Fact and Conclusions of Law

The McElroy Mine opens into the Pittsburgh #8 coal seam by means of 12 shafts and two slope openings. The mine employs approximately 970 persons working three shifts per day, seven days per week. The mine has six advancing continuous mining working sections and two retreating longwall working sections. Average production is 58,000 raw tons of material per day. The Pittsburgh #8 coal seam ranges from 60 inches to 72 inches in height. The mine is ventilated by ten exhausting fans and liberates approximately 12 million cubic feet of methane per 24 hours.

The McElroy Mine plans to mine through coalbed methane wells. 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.

Based on information gathered during the investigation, MSHA evaluated Petitioner's proposed alternative method and, as amended by the terms and conditions of MSHA, concluded that it would provide the same measure of protection afforded by 30 C.F.R. § 75.1700. This alternative method has been successfully used to prepare CBM wells for safe intersection by using one or more of the following methods: (1) Cement Plug, (2) Polymer Gel, (3) Bentonite Gel, (4) Active Pressure Management and Water Infusion, and (5) Remedial Work. The alternative method will prevent the CBM well methane from entering the underground mine.

Accordingly, after a review of the entire record, including the petition and MSHA's investigative report, McElroy Coal Company is granted a modification of the application of 30 C.F.R. § 75.1700 to its McElroy Mine, and this Proposed Decision and Order (PDO) is issued.

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**ORDER**

Wherefore, pursuant to the authority delegated by the Secretary of Labor to the Administrator for Coal Mine Safety and Health, and pursuant to Section 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 the McElroy Mine is hereby:

**GRANTED**, to allow mining within or through the 300 foot barrier around SDD oil and gas wells, conditioned upon compliance with the following terms and conditions:

**1. DISTRICT MANAGER APPROVAL REQUIRED**

A minimum working barrier of 300 feet in diameter shall be maintained around all SDD 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. The District Manager may choose to approve each branch intersection, each well, or a group of wells as applicable to the conditions. The District Manager may require a certified review of the proposed methods to prepare the SDD wells for intersection by a professional engineer in order to assess the applicability of the proposed system(s) to the mine-specific conditions.

**2. 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 and 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 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 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.

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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 in the mine ventilation plan one or more of the following methods to prepare SDD wells for safe intersection. 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 cement creating a pressurized void or series of interconnected

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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 crosslinked 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. The chemistry used for plugging SDD wells should be resistant to storage, 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 meet the required strength. Water in the holes should be removed before the

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FEB 23 2017  
FEB 23 2017  
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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.

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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 infused prior to the initial intersection, the water level in the hole must be lowered to the coal seam elevation 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.

5. **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 cemented 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.

3. **MANDATORY PROCEDURES AFTER APPROVAL HAS BEEN GRANTED BY THE DISTRICT MANAGER TO MINE WITHIN THE MINIMUM WORKING BARRIER AROUND THE WELL OR BRANCH OF THE WELL**

- a. The mine operator, the District Manager, the miners' representative, or the State may request a conference prior to any intersection or after any intersection to discuss issues or concerns. Upon receipt of any such request, the District Manager shall schedule 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.
- b. The mine operator must notify the District Manager, the State and the miners' representative at least 48 hours prior to the intended intersection of any coalbed methane well.
- c. The initial intersection of a well or branch of a well typically has a higher risk than subsequent intersections. The initial intersection typically indicates if the well preparation is sufficient to prevent the inundation of methane. For the initial intersection of a well or branch, the following procedures are mandatory:
  1. When mining advances within the minimum barrier distance of the well or branches of the well, the entries that will intersect the well or branches must be posted with a readily visible marking. For longwalls, both the head and tailgate entries must be so marked. Marks must be advanced to within 100 feet of the working face as mining progresses. Marks will be removed after well or branches are intersected in each

entry or after mining has exited the minimum barrier distance of the well.

2. Entries that will intersect vertical segments of a well shall be marked with drivage sights in the last open crosscut when mining is within 100 feet of the well. When a vertical segment of a well will be intersected by a longwall, drivage sights shall be installed on 10-foot centers starting 50 feet in advance of the anticipated intersection. Drivage sights shall be installed in both the headgate and tailgate entries of the longwall.
3. 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 mine-through (when either the conventional or the continuous mining method is used) is available and operable during all well mine-throughs. 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. All fire hoses shall be connected and ready for use, but do not have to be charged with water, during the cut-through.
4. The operator shall ensure that sufficient supplies of roof support and ventilation materials are available at the working section. In addition, emergency plugs, packers, and setting tools to seal both sides of the well or branch shall be available in the immediate area of the cut-through.
5. When mining advances within the minimum working barrier distance from the well or branch of the well, the operator shall service all equipment and check for permissibility at least once daily. Daily permissibility examinations must continue until the well or branch is intersected or until mining exits the minimum working barrier around the well or branch.
6. When mining advances within the minimum working barrier distance from the well or branch of the well, the operator shall calibrate the methane monitor(s) on the longwall, continuous mining machine, or cutting machine and loading machine at least once daily. Daily methane monitor calibration must continue until the well or branch is intersected or until mining exits the minimum working barrier around the well or branch.

7. 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 the minimum working barrier around the well or branch. During the cutting process, no individual shall be allowed on the return side until the mine-through has been completed and the area has been examined and declared safe. The shearer must be idle when any miners are inby the tail drum.
8. 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 within 20 feet of the face when mining through the well or branch. On longwall sections, rock dust shall be applied on the roof, rib, and floor up to both the headgate and tailgate pillared area.
9. Immediately after the well or branch is intersected, the operator shall de-energize all equipment, and the certified person shall thoroughly examine and determine the working place safe before mining is resumed.
10. After a well or branch has been intersected and the working place determined safe, mining shall continue inby the well a sufficient distance to permit adequate ventilation around the area of the well or branch.
11. No open flame shall be permitted in the area until adequate ventilation has been established around the well bore or branch. Any casing, tubing or stuck tools will be removed using the methods approved in the ventilation plan.
12. No person shall be permitted in the area of the mine-through operation inby the last open crosscut during active mining except those actually engaged in the operation, including company personnel, representatives of the miners, personnel from MSHA, and personnel from the appropriate State agency.
13. The operator shall warn all personnel in the mine of 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 intersected.



14. The mine-through operation shall be under the direct supervision of a certified person. Instructions concerning the mine-through operation shall be issued only by the certified person in charge.
  15. All miners shall be in known locations and in constant two-way communications with the responsible person under 30 C.F.R. § 75.1501 when active mining occurs within the minimum working barrier of the well or branch.
  16. The responsible person required under 30 C.F.R. § 75.1501 is responsible for well intersection emergencies. The well intersection procedures must be reviewed by the responsible person prior to any planned intersection.
  17. A copy of this Order shall be maintained at the mine and be available to the miners.
  18. The provisions of this Order do not impair the authority of representatives of MSHA to interrupt or halt the mine-through operation 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 mine-through operation and/or a withdrawal of personnel by issuing either a verbal or a 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 of mine-through operations. 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.
- d. For subsequent intersections of branches of a well, appropriate procedures to protect the miners shall be specified in the ventilation plan.

3. **MANDATORY PROCEDURES AFTER SDD INTERSECTIONS**

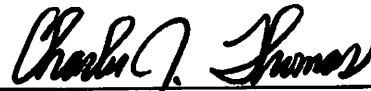
- a. All intersections with SDD wells and branches that are in intake air courses shall be examined as part of the pre-shift examinations required under 30 C.F.R. § 75.360.
- b. All other intersections with SDD wells and branches shall be examined as part of the weekly examinations required under 30 C.F.R. § 75.364.

**4. OTHER REQUIREMENTS**

- a. Within 30 days after this Order becomes final, the operator shall submit proposed revisions for its approved 30 C.F.R. Part 48 training plan to the District Manager. These proposed revisions shall include initial and refresher training regarding compliance with the terms and conditions stated in this Order. The operator shall provide all miners involved in the mine-through of a well or branch with training regarding the requirements of this Order prior to mining within the minimum working barrier of the next well or branch intended to be mined through.
- b. 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 by 30 C.F.R § 75.1502. The operator shall revise the program to include the hazards and evacuation procedures to be used for well intersections. All underground miners shall be trained in this revised program within 30 days of the approval of the revised mine emergency evacuation and firefighting program of instruction.

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 Coal Mine Safety and Health, 1100 Wilson Boulevard, Arlington, Virginia 22209-3939.

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 may 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 Proposed Decision and Order will become final and must be posted by the operator on the mine bulletin board at the mine.



---

Charles J. Thomas  
Deputy Administrator for  
Coal Mine Safety and Health

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 12th day of May, 2015, to:

Eric S. Grimm, General Superintendent  
McElroy Coal Company  
57 Goshorn Woods Road  
Cameron, WV 26033

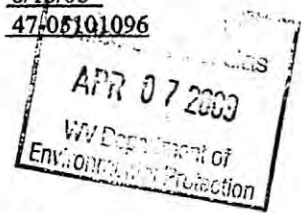
  
\_\_\_\_\_  
Don Braenovich

cc: Eugene White, Director, West Virginia Office of Miners' Health Safety & Training

WW-9  
Rev (2-01)

COMPLETION REPORT

DATE: 6/10/08  
API #: 47-05101096



State of West Virginia  
Department of Environmental Protection  
Office of Oil and Gas  
Well Operator's Report of Well Work

Farm name: Garey, Paul & Gerald Operator Well No.: MC-43

LOCATION: Elevation: 1294' Quadrangle: Glen Easton, WV quad

District: Cameron County: Marshall  
Latitude:      Feet South of 39 Deg. 52 Min. 30 Sec.  
Longitude:      Feet West of 80 Deg. 37 Min. 30 Sec.

Company: CNX Gas Company, LLC

	Casing & Tubing	Used in drilling	Left in well	Cement Fill Up (# of Sacks)
Address: 2481 John Nash Blvd., Bluefield, WV 24701	13-3/8"	42	42	Sanded In
Agent: Les Arrington	9-5/8"	354.2'	354.2'	130sks
Inspector: Bill Hatfield	7"	1098.8'	1098.8'	150sks
Date Permit Issued: 3/19/2008				
Date Well Work Commenced: 4/21/2008				
Date Well Work Completed: 5/18/2008				
Verbal Plugging: N/A				
Date Permission granted on: 3/19/2008				
Rotary Cable <u>Rig</u>				
Total Depth (feet): 1101'				
Fresh Water Depth (ft.): 195 ft				
Salt Water Depth (ft.): N/A				
Is coal being mined in area (N/Y)? No				

Coal Depths (ft.): 775', 855'

OPEN FLOW DATA

Producing formation Pittsburgh Coal Seam depth (ft) 855'-860'  
Gas: Initial open flow 0 MCF/d Oil: Initial open flow NA Bbl/d  
Final open flow NA MCF/d Final open flow NA Bbl/d  
Time of open flow between initial and final tests NA Hours  
Static rock Pressure NA psig (surface pressure) after NA 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 CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

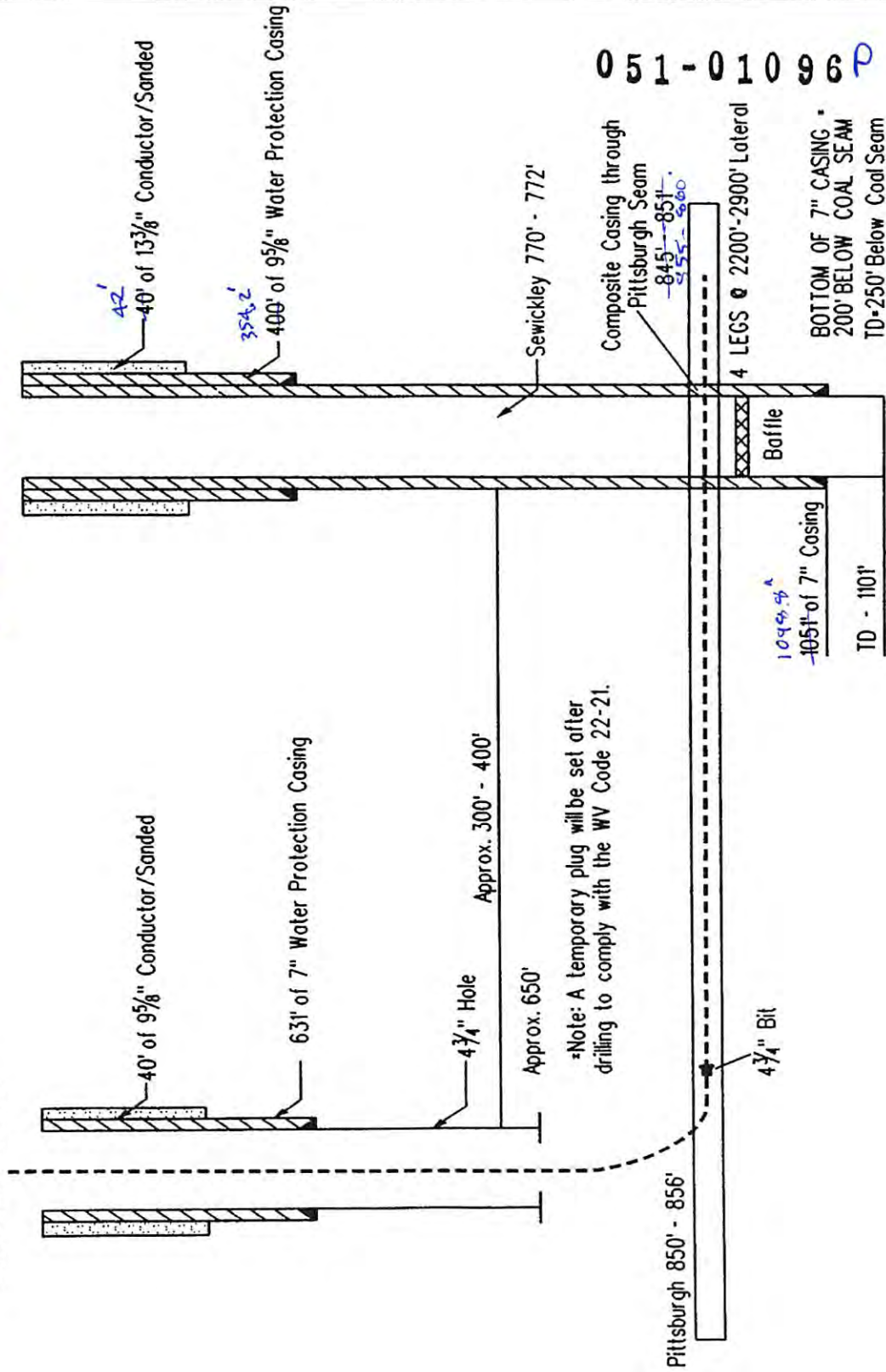
Gas Well MC-43 (API No. 47-510-1096) is a horizontal well for CNX Gas Company, LLC. Refer to the attached information for additional information.

Signed: Geoff Fanning  
By: Geoff Fanning, Drill Foreman  
Date: June 10, 2008

FIGURE 1  
CNX GAS COMPANY LLC

★ PRODUCTION MC43

ACCESS MC43A



Note: A temporary plug will be set after drilling to comply with the WV Code 22-21.

NOTE: Additional casing string may be used depending on hole conditions

NOT TO SCALE

051-01096D

### Alternate Method

The following method describes a process to drain water and methane from the Pittsburgh coal seam ahead of mining operations. The drilling of two wells is required to complete this process. The first well will be used ONLY to access the Pittsburgh Seam and will intercept the second wellbore. The second well will be a vertical production hole. This well will be used to lift water to the surface and to collect the methane. This well will be equipped with a meter and connected to a sales pipeline. NOTE: The access well could be used at a later time for necessary cleanout or remedial work.

#### Access Hole:

This hole will be drilled to a depth 200'-300' above the Pittsburgh coal seam. Conductor, water/shale strata protection casing will be set in this hole. The water/shale strata protection string will be set at a depth of approximately 631'. All casing strings will be cemented to surface. The casing will be equipped with a shutoff valve at surface. An additional string of casing may be required to address unforeseen hole conditions. Where the casing ends and into the Pittsburgh Seam, CNX will utilize a blocking and sealing system to seal off water and gas from entering the borehole. The sealing system is a proprietary process developed by Schlumberger (PermaBlok). This system has been proven most effective in stabilizing the formations and preventing migration and or inflow of water and gas.

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#### Production Well:

This hole will be drilled to a depth of 250' below the Pittsburgh coal seam. Conductor, water protection and production casing will be set in this hole. The water protection string will be set at a depth of approximately 400'. An additional string may be required based on hole conditions. The production casing will be 7" and set at a depth 200' below the Pittsburgh coal seam. All casing strings will be cemented to surface. The 7" casing string will include two joints (60') of fiberglass. This fiberglass casing will be set across the Pittsburgh coal seam interval to facilitate future mining. A baffle will be included in the 7" casing string and will be placed approximately 10-20' below the Pittsburgh coal seam. The baffle will be knocked out at the conclusion of horizontal drilling.

WV Department of  
Environmental Protection

#### Directional Drilling Details:

Horizontal drilling operations will begin in the access hole using a 4 3/4" bit, bent sub and motor. The plan is to exit the vertical casing, build an angle and continue drilling 4 3/4" vertical to approximately 400' above the coal where we will then build angle to 90-degrees and achieve a horizontal status. PermaBlok will be used to seal the coals and formations below the casing in the access hole. Once this is accomplished, we will penetrate the 7" string of fiberglass that is in the production hole. Upon penetration we will drill through and continue drilling until 2900± of lateral section has been achieved. We will then trip back to approximately 400' short of the production hole and create a sidetrack at a 28° ± angle and drill 2200'±. We will then trip back to the production hole and create a sidetrack at a 60° ± angle and continue drilling until 2600'±. We will now trip back and create a sidetrack at a 36° ± angle to a distance of 2900'±. ~~Note, that the length and or number of horizontal holes will be dependent on coal control and down hole conditions~~

**ATTACHMENT A****Marshall County CBM Well No. MC-43 Prod. Drill Log**

API #47-5101096

<b>Depth</b>	<b>Description</b>
0-6	Table to GL
6-25	Fill
25-28	Dirt and Clay
28-38	Loose Shale
38-110	Shale
110-195	Sand
195-270	Shale
270-340	Sand
340-370	Shale
370-670	Shale
670-770	Sand
770-775	Coal
775-855	Shale
855-860	Coal
860-950	Sand & Shale
950-1090	Shale
1090-1120	Sand
1120-1170, TD	Sand & Shale



"Pipeline"

Select County: (051) Marshall Select datatypes: (Check All)

Enter Permit #: 1096

Get Data Reset

Location  Production  Plugging  
 Owner/Completion  Stratigraphy  Sample  
 Pay/Show/Water  Logs  Btn Hole Loc

- [Table Descriptions](#)
- [County Code Transitions](#)
- [Permit-Numbering Series](#)
- [Usage Notes](#)
- [Contact Information](#)
- [Disclaimer](#)
- [WVGES Main](#)
- ["Pipeline-Plus" New](#)

WV Geological & Economic Survey:

Well: County = 051 Permit = 1096

Report Time: Wednesday, February 15, 2017 9:47:11 AM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705101096	Marshall	1096	Cameron	Glen Easton	Cameron	39.86733	-80.630714	531583.1	4413097.6

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
4705101096	5/18/2008	Original Loc	Completed	Paul & Gerald Garey/Lois Garey-Moninger	MC43		Paul & Gerald Garey			CNX Gas Co. LLC (North)		T101	Pittsburgh coal	

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	G_BEF	G_AFT	O_BEF	O_AFT	NGL_BEF	NGL_AFT	P_BEF	TI_BEF	TI_AFT	BL_BEF	BL_AFT	MSRD_BY	
4705101096	5/18/2008	4/21/2008	1294	Ground Level	Unnamed	Pittsburgh Fr	Pittsburgh coal	Development Well	Development Well	Methane (CBM)	Rotary	Fractured	1101		1101		0										

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
4705101096	5/18/2008	Water	Fresh Water	Vertical			195						
4705101096	5/18/2008	Methane Pay	Gas	Vertical	855	Pittsburgh coal	860	Pittsburgh 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
4705101096	CNX Gas Co. LLC (North)	2008	12,509	0	0	0	0	0	0	0	0	1,526	2,912	4,067	4,004
4705101096	CNX Gas Co. LLC (North)	2009	38,385	3,527	3,238	3,618	1,157	3,795	3,287	3,462	3,246	3,111	3,431	3,237	3,276
4705101096	CNX Gas Co. LLC (North)	2010	33,979	3,596	2,869	2,841	2,616	2,807	2,940	2,842	2,871	2,732	2,690	2,528	2,647
4705101096	CNX Gas Co. LLC (North)	2011	16,879	2,273	1,978	1,558	1,168	880	375	496	557	1,640	2,124	1,802	2,028
4705101096	CNX Gas Co. LLC (North)	2012	19,802	1,670	1,670	1,592	1,815	1,746	1,550	1,599	1,694	1,679	1,736	1,520	1,631
4705101096	CNX Gas Co. LLC (North)	2013	17,485	1,418	1,400	1,537	1,423	1,584	1,525	1,395	1,565	1,523	1,521	1,389	1,205
4705101096	CNX Gas Co. LLC (North)	2014	15,224	1,219	1,147	1,183	1,104	1,150	1,193	1,080	1,569	1,361	1,501	1,394	1,323
4705101096	CNX Gas Co. LLC (North)	2015	13,873	1,206	983	1,285	1,156	1,506	1,307	1,301	793	228	682	1,771	1,654

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
4705101096	CNX Gas Co. LLC (North)	2008	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101096	CNX Gas Co. LLC (North)	2009	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101096	CNX Gas Co. LLC (North)	2010	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101096	CNX Gas Co. LLC (North)	2011	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101096	CNX Gas Co. LLC (North)	2012	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101096	CNX Gas Co. LLC (North)	2013	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101096	CNX Gas Co. LLC (North)	2014	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101096	CNX Gas Co. LLC (North)	2015	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
4705101096	CNX Gas Co. LLC (North)	2013	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101096	CNX Gas Co. LLC (North)	2014	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101096	CNX Gas Co. LLC (North)	2015	0	0	0	0	0	0	0	0	0	0	0	0	0

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
4705101096	Original Loc	unidentified coal	CBM: Drill Hole	770	Reasonable	5	Reasonable	1294
4705101096	Original Loc	unidentified coal	CBM: Drill Hole	855	Reasonable	5	Reasonable	1294

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

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 WV Department of  
 Environmental Protection





## Well Completion Report

**May 20, 2008**

Customer: CNX Gas  
Well Name: MC-43  
Location: Marshall County, WV  
Declination: 8.44° West, True

Nevis Energy Services, Inc.  
327 E. Welch Court, Traverse City, MI 49686  
(231) 995-0100



Nevis Energy  
Survey Report

Company: CNX Gas Company,LLC  
Project: WEST VIRGINIA2  
Site: MARSHALL COUNTY3  
Well: MC-43  
Wellbore: WEST LEG  
Design: AD WEST LEG

Local Co-ordinate Reference: Well MC-43  
TVD Reference: WELL @ 0.00ft (Original Well Elev)  
MD Reference: WELL @ 0.00ft (Original Well Elev)  
North Reference: True  
Survey Calculation Method: Minimum Curvature  
Database: EDM 2003.14 Single User Db

Project	WEST VIRGINIA2		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		

Site	MARSHALL COUNTY3				
Site Position:		Northing:	499,997.97 ft	Latitude:	39° 52' 2.130 N
From:	Lat/Long	Easting:	1,651,076.94 ft	Longitude:	80° 37' 51.220 W
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	-0.72 °

Well	MC-43					
Well Position	+N/-S	0.00 ft	Northing:	499,997.97 ft	Latitude:	39° 52' 2.130 N
	+E/-W	0.00 ft	Easting:	1,651,076.94 ft	Longitude:	80° 37' 51.220 W
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft	Ground Level:	0.00 ft	

Wellbore	WEST LEG				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	5/2/2008	-8.44	67.84	53,303

Design	AD WEST LEG				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	20.14	

Survey Program	Date 5/20/2008			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
50.00	3,659.00	AD WLEG (WEST LEG)		

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Buld Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	0.33	159.00	50.00	-0.13	0.05	-0.11	0.66	0.66	0.00
100.00	0.34	202.90	100.00	-0.41	0.05	-0.37	0.50	0.02	87.80
150.00	0.57	215.40	150.00	-0.74	-0.16	-0.75	0.50	0.46	25.00
200.00	0.62	209.00	199.99	-1.18	-0.43	-1.26	0.17	0.10	-12.80
250.00	0.67	214.90	249.99	-1.66	-0.73	-1.81	0.17	0.10	11.80
300.00	0.54	219.60	299.99	-2.08	-1.05	-2.32	0.28	-0.26	9.40
350.00	0.55	225.40	349.99	-2.43	-1.37	-2.75	0.11	0.02	11.60
400.00	0.46	203.90	399.98	-2.78	-1.62	-3.17	0.42	-0.18	-43.00
450.00	0.46	211.70	449.98	-3.14	-1.81	-3.57	0.13	0.00	15.60
500.00	0.55	227.10	499.98	-3.47	-2.09	-3.98	0.32	0.18	30.80
550.00	0.85	204.20	549.98	-3.97	-2.42	-4.56	0.81	0.60	-45.80
600.00	0.36	186.90	599.97	-4.47	-2.59	-5.09	1.03	-0.98	-34.60

5101096P



# Nevis Energy

## Survey Report

Company: CNX Gas Company, LLC  
 Project: WEST VIRGINIA2  
 Site: MARSHALL COUNTY3  
 Well: MC-43  
 Wellbore: WEST LEG  
 Design: AD WEST LEG

Local Co-ordinate Reference: Well MC-43  
 TVD Reference: WELL @ 0.00ft (Original Well Elev)  
 MD Reference: WELL @ 0.00ft (Original Well Elev)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 2003.14 Single User Db

**Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
650.00	1.22	60.60	649.97	-4.36	-2.14	-4.83	2.92	1.72	-252.60
662.00	1.38	62.50	661.97	-4.23	-1.90	-4.63	1.38	1.33	15.83
672.00	3.50	47.40	671.96	-3.97	-1.57	-4.27	21.97	21.20	-151.00
687.00	9.70	44.90	686.85	-2.76	-0.34	-2.71	41.37	41.33	-16.67
703.00	16.30	45.80	702.43	-0.24	2.22	0.54	41.27	41.25	5.62
719.00	22.30	46.90	717.53	3.40	6.05	5.28	37.57	37.50	6.87
734.00	27.60	47.70	731.12	7.69	10.70	10.90	35.40	35.33	5.33
751.00	31.80	49.80	745.89	13.23	17.04	18.29	25.45	24.71	12.35
767.00	35.60	51.30	759.20	18.87	23.90	25.94	24.31	23.75	9.37
783.00	39.30	52.10	771.90	24.89	31.53	34.23	23.32	23.12	5.00
799.00	43.70	52.90	783.88	31.34	39.94	43.18	27.70	27.50	5.00
814.00	46.90	53.10	794.43	37.76	48.46	52.13	21.35	21.33	1.33
830.00	50.90	54.50	804.94	44.87	58.19	62.16	25.85	25.00	8.75
846.00	54.60	55.70	814.62	52.16	68.63	72.60	23.88	23.12	7.50
862.00	58.80	55.80	823.41	59.68	79.68	83.47	26.26	26.25	0.62
877.00	63.20	55.50	830.68	67.08	90.51	94.14	29.39	29.33	-2.00
893.00	67.30	55.50	837.37	75.31	102.49	105.99	25.62	25.62	0.00
909.00	70.30	55.90	843.16	83.71	114.81	118.13	18.89	18.75	2.50
925.00	71.10	56.00	848.45	92.17	127.32	130.37	5.03	5.00	0.62
935.00	72.40	56.60	851.58	97.44	135.22	138.04	14.19	13.00	6.00
941.00	73.30	56.50	853.35	100.60	140.00	142.65	15.08	15.00	-1.67
951.00	75.00	55.90	856.08	105.95	148.00	150.43	17.95	17.00	-6.00
961.00	76.10	54.70	858.58	111.46	155.96	158.35	16.00	11.00	-12.00
973.00	77.80	53.40	861.28	118.33	165.42	168.05	17.67	14.17	-10.83
983.00	79.40	52.90	863.26	124.20	173.26	176.27	16.73	16.00	-5.00
993.00	81.20	53.00	864.95	130.14	181.13	184.55	18.03	18.00	1.00
1,005.00	82.90	52.90	866.61	137.30	190.62	194.54	14.19	14.17	-0.83
1,015.00	85.00	52.70	867.66	143.32	198.54	202.91	21.09	21.00	-2.00
1,025.00	88.00	52.60	868.27	149.37	206.47	211.33	30.02	30.00	-1.00
1,036.00	90.90	52.50	868.38	156.06	215.20	220.61	26.38	26.36	-0.91
1,046.00	93.00	51.40	868.04	162.22	223.07	229.11	23.70	21.00	-11.00
1,058.00	93.40	49.60	867.37	169.84	232.32	239.44	15.34	3.33	-15.00
1,063.00	93.00	48.30	867.09	173.12	236.08	243.82	27.16	-8.00	-26.00
1,068.00	92.50	47.80	866.85	176.46	239.79	248.23	14.13	-10.00	-10.00
1,078.00	91.90	46.50	866.46	183.25	247.12	257.13	14.31	-6.00	-13.00
1,084.00	91.80	46.50	866.27	187.38	251.47	262.51	1.67	-1.67	0.00
1,104.00	91.10	48.90	865.76	200.83	266.26	280.23	12.50	-3.50	12.00
1,139.00	89.30	48.40	865.64	223.96	292.53	310.98	5.34	-5.14	-1.43
1,171.00	89.30	46.40	866.03	245.61	316.08	339.43	6.25	0.00	-6.25
1,202.00	87.50	40.90	866.90	268.03	337.46	367.83	18.66	-5.81	-17.74
1,234.00	89.20	38.40	867.82	292.65	357.87	397.98	9.44	5.31	-7.81
1,266.00	91.30	36.40	867.68	318.07	377.30	428.53	9.06	6.56	-6.25
1,297.00	91.60	32.70	866.90	343.59	394.88	458.54	11.97	0.97	-11.94
1,329.00	91.40	28.20	866.06	371.16	411.08	490.01	14.07	-0.62	-14.06
1,361.00	91.10	25.30	865.36	399.72	425.48	521.78	9.11	-0.94	-9.06
1,393.00	90.70	21.20	864.86	429.12	438.11	553.72	12.87	-1.25	-12.81
1,425.00	89.50	17.40	864.80	459.31	448.68	585.71	12.45	-3.75	-11.87
1,457.00	89.50	13.20	865.08	490.17	457.13	617.59	13.12	0.00	-13.12
1,488.00	90.00	9.80	865.21	520.54	463.31	648.24	11.09	1.61	-10.97
1,520.00	89.50	4.60	865.35	552.28	467.31	679.41	16.32	-1.56	-16.25
1,552.00	90.90	2.00	865.24	584.22	469.16	710.04	9.23	4.37	-8.12
1,583.00	90.70	1.00	864.81	615.21	469.97	739.41	3.29	-0.65	-3.23
1,615.00	89.90	1.20	864.64	647.20	470.58	769.66	2.58	-2.50	0.62
1,647.00	90.20	359.00	864.61	679.20	470.64	799.72	6.94	0.94	-6.87

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### Nevis Energy Survey Report

Company: CNX Gas Company, LLC  
 Project: WEST VIRGINIA2  
 Site: MARSHALL COUNTY3  
 Well: MC-43  
 Wellbore: WEST LEG  
 Design: AD WEST LEG

Local Co-ordinate Reference: Well MC-43  
 TVD Reference: WELL @ 0.00ft (Original Well Elev)  
 MD Reference: WELL @ 0.00ft (Original Well Elev)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 2003.14 Single User Db

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,680.00	90.40	359.40	864.44	712.19	470.18	830.54	1.36	0.61	1.21
1,713.00	90.20	1.50	864.27	745.19	470.44	861.60	6.39	-0.61	6.36
1,744.00	90.10	4.60	864.19	776.14	472.09	891.23	10.01	-0.32	10.00
1,775.00	88.80	8.60	864.49	806.93	475.65	921.36	13.57	-4.19	12.90
1,807.00	89.20	8.80	865.04	838.56	480.49	952.72	1.40	1.25	0.62
1,838.00	87.50	8.50	865.94	869.19	485.15	983.09	5.57	-5.48	-0.97
1,870.00	90.60	10.30	866.47	900.75	490.37	1,014.52	11.20	9.69	5.62
1,902.00	89.60	12.00	866.41	932.15	496.56	1,046.12	6.16	-3.12	5.31
1,933.00	89.90	12.20	866.55	962.46	503.06	1,076.82	1.16	0.97	0.65
1,965.00	88.60	13.90	866.97	993.63	510.28	1,108.57	6.69	-4.06	5.31
1,997.00	91.90	16.80	866.83	1,024.48	518.75	1,140.45	13.73	10.31	9.06
2,028.00	91.50	16.60	865.91	1,054.16	527.66	1,171.38	1.44	-1.29	-0.65
2,060.00	91.10	16.70	865.18	1,084.81	536.82	1,203.31	1.29	-1.25	0.31
2,092.00	90.60	16.60	864.71	1,115.46	545.99	1,235.25	1.59	-1.56	-0.31
2,123.00	89.70	15.00	864.62	1,145.29	554.43	1,266.16	5.92	-2.90	-5.16
2,155.00	91.20	15.60	864.37	1,176.15	562.87	1,298.04	5.05	4.69	1.87
2,187.00	89.60	15.30	864.15	1,206.99	571.40	1,329.93	5.09	-5.00	-0.94
2,219.00	88.80	15.20	864.60	1,237.86	579.81	1,361.81	2.52	-2.50	-0.31
2,250.00	89.50	14.50	865.06	1,267.82	587.76	1,392.68	3.19	2.26	-2.26
2,282.00	89.90	14.70	865.22	1,298.79	595.82	1,424.53	1.40	1.25	0.62
2,313.00	90.00	14.50	865.25	1,328.79	603.64	1,455.38	0.72	0.32	-0.65
2,345.00	89.30	14.10	865.45	1,359.80	611.54	1,487.21	2.52	-2.19	-1.25
2,377.00	88.90	13.26	865.95	1,390.89	619.11	1,519.01	2.91	-1.25	-2.62
2,408.00	90.00	13.86	866.25	1,421.02	626.38	1,549.80	4.04	3.55	1.94
2,440.00	89.00	13.50	866.53	1,452.11	633.94	1,581.60	3.32	-3.12	-1.12
2,471.00	89.80	13.60	866.85	1,482.25	641.21	1,612.39	2.60	2.58	0.32
2,503.00	90.10	13.50	866.88	1,513.35	648.70	1,644.18	0.99	0.94	-0.31
2,534.00	90.50	12.80	866.72	1,543.54	655.76	1,674.95	2.60	1.29	-2.26
2,566.00	89.10	13.60	866.83	1,574.69	663.06	1,706.71	5.04	-4.37	2.50
2,598.00	92.70	16.50	866.32	1,605.58	671.37	1,738.57	14.44	11.25	9.06
2,629.00	92.60	16.80	864.89	1,635.25	680.24	1,769.48	1.02	-0.32	0.97
2,662.00	90.60	16.20	863.97	1,666.88	689.61	1,802.40	6.33	-6.06	-1.82
2,694.00	92.60	15.80	863.08	1,697.63	698.43	1,834.30	6.37	6.25	-1.25
2,726.00	94.30	15.60	861.15	1,728.38	707.07	1,866.15	5.35	5.31	-0.62
2,757.00	91.20	15.60	859.66	1,758.20	715.40	1,897.01	10.00	-10.00	0.00
2,788.00	89.50	14.60	859.47	1,788.12	723.47	1,927.89	6.36	-5.48	-3.23
2,820.00	87.40	14.40	860.34	1,819.09	731.48	1,959.72	6.59	-6.56	-0.62
2,851.00	88.50	14.00	861.45	1,849.12	739.08	1,990.53	3.78	3.55	-1.29
2,883.00	86.80	12.80	862.76	1,880.23	746.49	2,022.28	6.50	-5.31	-3.75
2,915.00	89.10	13.90	863.91	1,911.34	753.87	2,054.04	7.97	7.19	3.44
2,947.00	90.10	14.00	864.13	1,942.39	761.59	2,085.85	3.14	3.12	0.31
2,978.00	91.20	12.80	863.78	1,972.55	768.77	2,116.63	5.25	3.55	-3.87
3,010.00	89.90	12.30	863.47	2,003.78	775.72	2,148.35	4.35	-4.06	-1.56
3,041.00	90.40	13.40	863.39	2,034.00	782.62	2,179.10	3.90	1.61	3.55
3,073.00	89.00	13.60	863.56	2,065.12	790.09	2,210.88	4.42	-4.37	0.62
3,104.00	89.50	13.10	863.96	2,095.28	797.24	2,241.66	2.28	2.28	-1.61
3,136.00	88.70	14.90	864.47	2,126.32	804.98	2,273.47	6.15	-2.50	5.62
3,167.00	89.60	17.00	864.93	2,156.12	813.50	2,304.38	7.37	2.99	6.77
3,199.00	90.00	16.60	865.04	2,186.76	822.75	2,336.33	1.77	1.25	-0.25
3,230.00	89.60	16.30	865.15	2,216.49	831.53	2,367.27	1.61	-1.29	-0.97
3,262.00	89.60	16.80	865.37	2,247.16	840.64	2,399.20	1.56	0.00	1.56
3,294.00	91.50	18.00	865.06	2,277.69	850.21	2,431.16	7.02	5.94	3.75
3,325.00	91.20	17.40	864.33	2,307.22	859.63	2,462.12	2.16	-0.97	-1.94
3,357.00	90.00	17.06	864.00	2,337.78	869.11	2,494.08	1.80	1.80	-1.06

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## Nevis Energy Survey Report

**Company:** CNX Gas Company, LLC  
**Project:** WEST VIRGINIA2  
**Site:** MARSHALL COUNTY3  
**Well:** MC-43  
**Wellbore:** WEST LEG  
**Design:** AD WEST LEG

**Local Co-ordinate Reference:** Well MC-43  
**TVD Reference:** WELL @ 0.00ft (Original Well Elev)  
**MD Reference:** WELL @ 0.00ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 2003.14 Single User Db

### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Buld Rate (°/100ft)	Turn Rate (°/100ft)
3,388.00	89.90	16.40	864.02	2,367.47	878.04	2,525.03	2.15	-0.32	-2.13
3,420.00	89.80	16.40	864.11	2,398.16	887.07	2,556.96	0.31	-0.31	0.00
3,451.00	90.10	15.70	864.13	2,427.96	895.64	2,587.88	2.46	0.97	-2.26
3,483.00	90.10	14.90	864.08	2,458.82	904.09	2,619.76	2.50	0.00	-2.50
3,515.00	90.80	15.20	863.83	2,489.72	912.39	2,651.64	2.38	2.19	0.94
3,546.00	90.60	15.60	863.45	2,519.61	920.63	2,682.53	1.44	-0.65	1.29
3,578.00	90.00	15.00	863.28	2,550.47	929.07	2,714.41	2.65	-1.87	-1.87
3,610.00	90.30	13.90	863.20	2,581.46	937.05	2,746.26	3.56	0.94	-3.44
3,630.00	90.50	13.80	863.06	2,600.88	941.84	2,766.13	1.12	1.00	-0.50
3,659.00	90.50	13.80	862.80	2,629.04	948.76	2,794.96	0.00	0.00	0.00

### Targets

#### Target Name

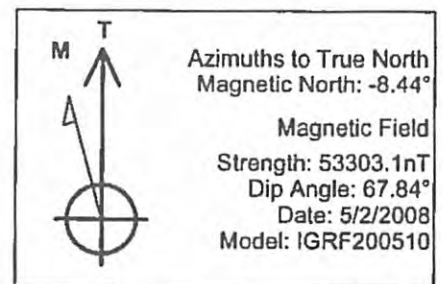
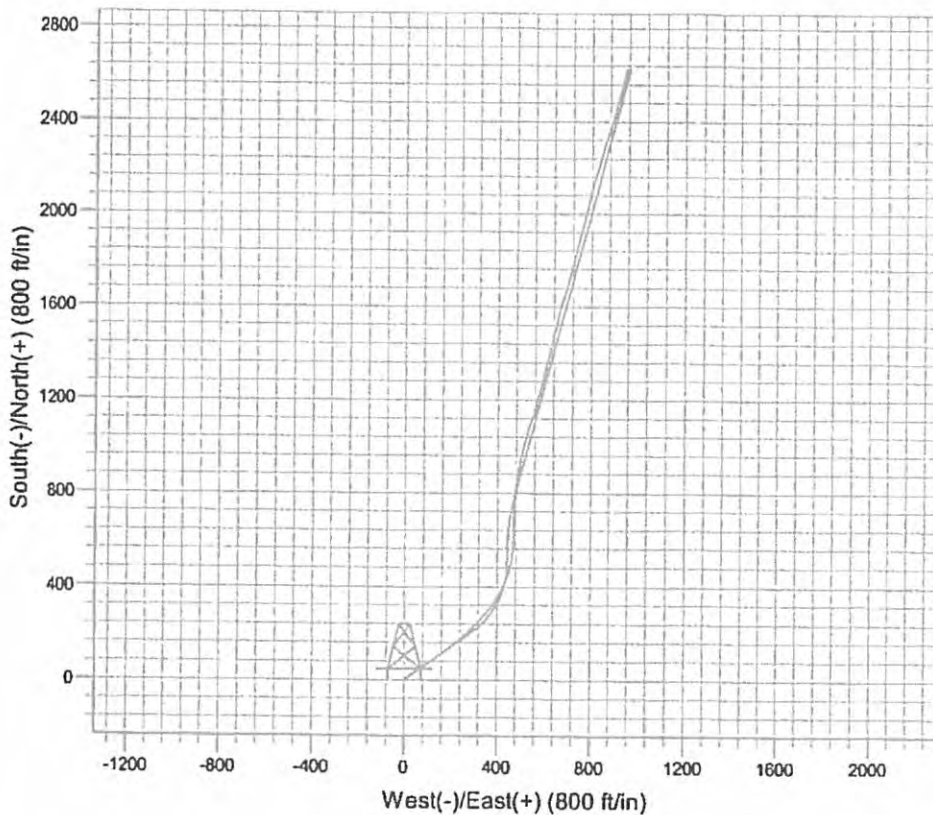
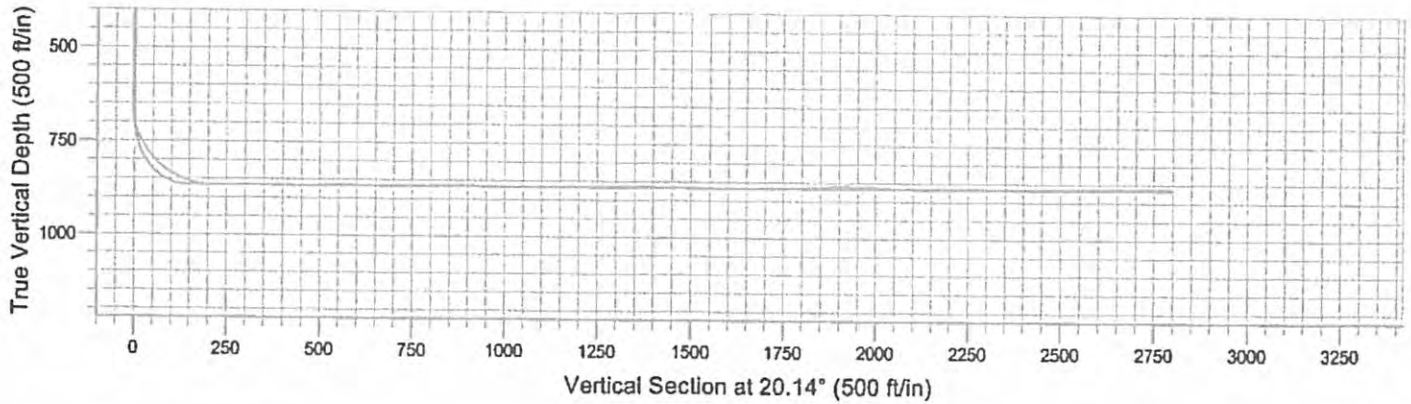
- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
GT1, MC-43 - survey misses by 254.51ft at 1292.86ft MD (867.00 TVD, 340.18 N, 392.53 E) - Point	0.00	0.00	867.00	589.51	443.61	500,581.85	1,651,527.94	39° 52' 7.956 N	80° 37' 45.530 W
WBHL, MC-43 - survey misses by 2354.80ft at 1292.86ft MD (867.00 TVD, 340.18 N, 392.53 E) - Point	0.00	0.00	867.00	2,624.88	962.83	502,610.52	1,652,072.74	39° 52' 28.072 N	80° 37' 38.870 W
HZ, MC-43 - survey misses by 68.46ft at 1064.80ft MD (867.00 TVD, 174.32 N, 237.42 E) - Point	0.00	0.00	867.00	209.30	296.27	500,203.52	1,651,375.83	39° 52' 4.198 N	80° 37' 47.420 W

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



CNX Gas Company, LLC

MC-43 - WEST LEG  
MARSHALL COUNTY  
WEST VIRGINIA



**LEGEND**

- MC-43, WEST LEG, AD WLEG
- PLANNED WELL

5101096P



**Nevis Energy**  
Survey Report

Company: CNX Gas Company, LLC  
 Project: WEST VIRGINIA2  
 Site: MARSHALL COUNTY3  
 Well: MC-43  
 Wellbore: EAST LEG  
 Design: AD EAST LEG

Local Co-ordinate Reference: Well MC-43  
 TVD Reference: WELL @ 0.00ft (Original Well Elev)  
 MD Reference: WELL @ 0.00ft (Original Well Elev)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 2003.14 Single User Db

Project	WEST VIRGINIA2		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		

Site	MARSHALL COUNTY3				
Site Position:		Northing:	499,997.97 ft	Latitude:	39° 52' 2.130 N
From:	Lat/Long	Easting:	1,651,076.94 ft	Longitude:	80° 37' 51.220 W
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	-0.72 °

Well	MC-43					
Well Position	+N/-S	0.00 ft	Northing:	499,997.97 ft	Latitude:	39° 52' 2.130 N
	+E/-W	0.00 ft	Easting:	1,651,076.94 ft	Longitude:	80° 37' 51.220 W
Position Uncertainty	0.00 ft		Wellhead Elevation:	ft	Ground Level:	0.00 ft

Wellbore	EAST LEG				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	5/5/2008	-8.44	67.84	53,302

Design	AD EAST LEG				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	1,743.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	75.46	

Survey Program	Date 5/20/2008				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
50.00	1,743.00	AD WLEG (WEST LEG)			
1,743.00	3,696.00	AD ELEG (EAST LEG)			

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,743.00	90.37	75.44	866.77	273.36	894.25	934.24	0.00	0.00	0.00
1,777.00	89.50	83.50	866.80	279.57	927.65	968.13	23.84	-2.57	23.70
1,808.00	89.90	85.10	866.97	282.65	958.49	998.76	5.32	1.29	5.16
1,840.00	90.20	86.20	866.94	285.08	990.40	1,030.25	3.56	0.94	3.44
1,871.00	90.20	87.30	866.83	286.83	1,021.35	1,060.65	3.56	0.00	3.55
1,903.00	90.30	88.80	866.69	287.92	1,053.33	1,091.88	4.70	0.31	4.69
1,935.00	89.60	87.90	866.72	288.84	1,085.32	1,123.07	3.56	-2.19	2.89
1,966.00	89.70	88.40	866.91	289.84	1,116.30	1,153.32	1.64	0.22	1.61
1,998.00	89.30	86.90	867.19	291.16	1,148.27	1,184.59	4.85	2.25	-4.69
2,030.00	88.50	86.80	867.80	292.91	1,180.22	1,215.96	2.52	-2.50	-0.31
2,062.00	89.10	88.00	868.47	294.36	1,212.18	1,247.26	4.19	1.87	3.75
2,093.00	90.10	89.00	868.69	295.18	1,243.16	1,277.46	1.56	3.88	3.23

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 WV Department of Environmental Protection

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 Design: AD EAST LEG

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 MD Reference: WELL @ 0.00ft (Original Well Elev)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 2003.14 Single User Db

## Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,125.00	90.10	90.40	868.63	295.34	1,275.16	1,308.47	4.37	0.00	4.37
2,157.00	90.20	87.90	868.55	295.82	1,307.16	1,339.56	7.82	0.31	-7.81
2,190.00	89.50	87.30	868.64	297.20	1,340.13	1,371.82	2.79	-2.12	-1.82
2,222.00	89.30	87.00	868.97	298.79	1,372.09	1,403.16	1.13	-0.62	-0.94
2,253.00	89.30	90.10	869.35	299.58	1,403.07	1,433.34	10.00	0.00	10.00
2,285.00	90.00	89.90	869.54	299.58	1,435.07	1,464.32	2.28	2.19	-0.62
2,316.00	89.20	89.30	869.76	299.79	1,466.07	1,494.38	3.23	-2.58	-1.94
2,348.00	90.40	89.30	869.87	300.18	1,498.06	1,525.45	3.75	3.75	0.00
2,382.00	90.60	88.60	869.58	300.81	1,532.06	1,558.51	2.14	0.59	-2.06
2,411.00	91.10	87.90	869.15	301.69	1,561.04	1,586.79	2.97	1.72	-2.41
2,443.00	90.40	87.90	868.73	302.86	1,593.02	1,618.03	2.19	-2.19	0.00
2,474.00	90.60	89.80	868.46	303.49	1,624.01	1,648.19	6.16	0.65	6.13
2,506.00	91.00	90.60	868.01	303.37	1,656.00	1,679.13	2.79	1.25	2.50
2,537.00	91.10	91.30	867.44	302.86	1,686.99	1,709.00	2.28	0.32	2.26
2,569.00	90.60	92.10	866.97	301.91	1,718.98	1,739.72	2.95	-1.56	2.50
2,601.00	89.90	90.50	866.83	301.19	1,750.97	1,770.50	5.46	-2.19	-5.00
2,632.00	88.80	90.50	867.18	300.91	1,781.96	1,800.44	3.55	-3.55	0.00
2,664.00	89.70	90.40	867.60	300.66	1,813.96	1,831.35	2.83	2.81	-0.31
2,695.00	88.50	90.40	868.08	300.45	1,844.95	1,861.29	3.87	-3.87	0.00
2,727.00	89.40	89.80	868.67	300.39	1,876.95	1,892.25	3.38	2.81	-1.87
2,758.00	91.20	91.20	868.51	300.12	1,907.94	1,922.18	7.36	5.81	4.52
2,790.00	90.50	90.80	868.03	299.56	1,939.93	1,953.01	2.52	-2.19	-1.25
2,821.00	91.50	90.10	867.49	299.32	1,970.93	1,982.95	3.94	3.23	-2.26
2,853.00	90.80	90.30	866.85	299.21	2,002.92	2,013.89	2.27	-2.19	0.62
2,885.00	89.50	89.70	866.77	299.21	2,034.92	2,044.87	4.47	-4.06	-1.87
2,916.00	89.90	90.00	866.93	299.29	2,065.92	2,074.89	1.61	1.29	0.97
2,948.00	89.90	89.00	866.99	299.57	2,097.92	2,105.94	3.12	0.00	-3.12
2,979.00	88.30	88.20	867.47	300.33	2,128.90	2,136.12	5.77	-5.16	-2.58
3,011.00	87.00	88.00	868.78	301.39	2,160.86	2,167.32	4.11	-4.06	-0.62
3,043.00	91.20	89.40	869.29	302.11	2,192.84	2,198.45	13.83	13.12	4.37
3,076.00	90.80	89.10	868.71	302.54	2,225.83	2,230.50	1.52	-1.21	-0.91
3,107.00	90.90	89.80	868.25	302.84	2,256.83	2,260.58	2.28	0.32	2.26
3,138.00	90.60	89.00	867.85	303.16	2,287.82	2,290.66	2.76	-0.97	-2.58
3,170.00	90.50	90.00	867.54	303.44	2,319.82	2,321.70	3.14	-0.31	3.12
3,202.00	89.50	89.50	867.54	303.58	2,351.82	2,352.71	3.49	-3.12	-1.56
3,233.00	90.70	89.60	867.48	303.83	2,382.82	2,382.78	3.88	3.87	0.32
3,265.00	90.20	89.70	867.23	304.02	2,414.81	2,413.80	1.59	-1.56	0.31
3,297.00	89.30	89.30	867.37	304.30	2,446.81	2,444.84	3.08	-2.81	-1.25
3,328.00	90.50	90.30	867.43	304.41	2,477.81	2,474.88	5.04	3.87	3.23
3,360.00	90.70	89.60	867.09	304.44	2,509.81	2,505.86	2.27	0.62	-2.19
3,391.00	90.90	89.00	866.66	304.82	2,540.80	2,535.95	2.04	0.65	-1.94
3,423.00	90.50	88.60	866.27	305.49	2,572.79	2,567.09	1.77	-1.25	-1.25
3,454.00	89.00	88.40	866.40	306.30	2,603.78	2,597.29	4.88	-4.84	-0.65
3,486.00	88.60	87.90	867.07	307.33	2,635.76	2,628.50	2.00	-1.25	-1.56
3,518.00	90.00	88.10	867.46	308.45	2,667.74	2,659.73	4.42	4.37	0.62
3,549.00	89.30	89.10	867.65	309.20	2,698.73	2,689.92	3.94	3.26	3.23
3,581.00	89.20	89.40	868.07	309.62	2,730.72	2,720.99	0.96	-0.31	0.94
3,613.00	89.50	89.20	868.44	310.01	2,762.72	2,752.06	1.13	0.94	-0.62
3,645.00	90.00	88.80	868.57	310.57	2,794.71	2,783.17	2.00	1.56	-1.25
3,665.00	89.30	88.10	868.70	311.11	2,814.70	2,802.66	4.95	3.59	-3.50
3,696.00	89.30	88.10	869.08	312.14	2,845.68	2,832.91	0.00	0.00	0.00

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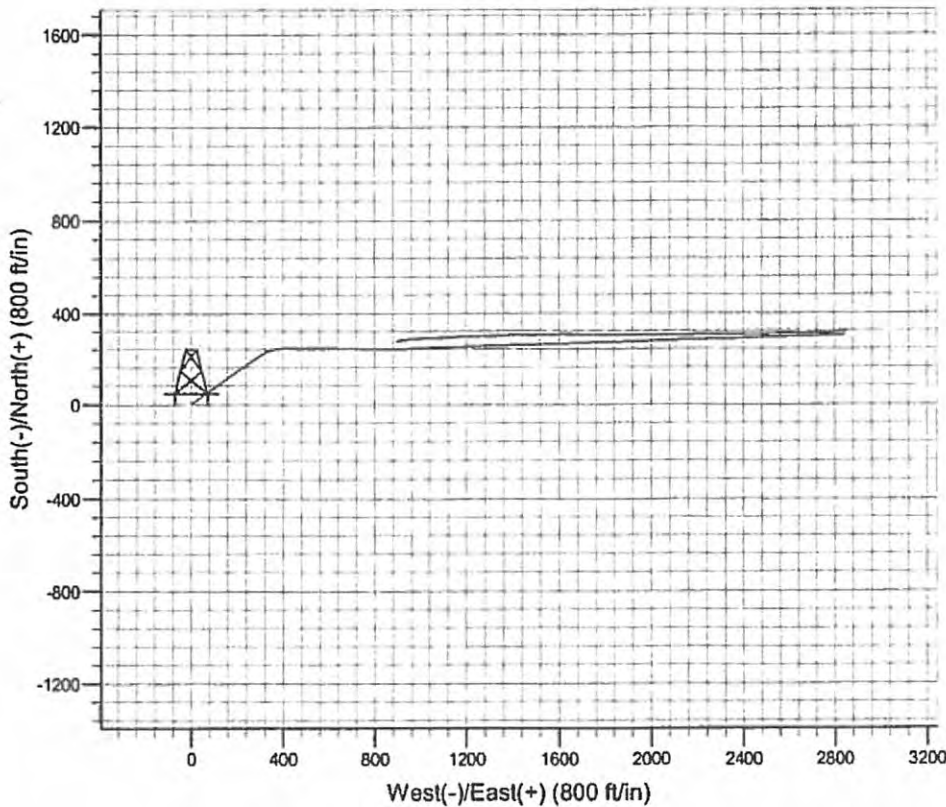
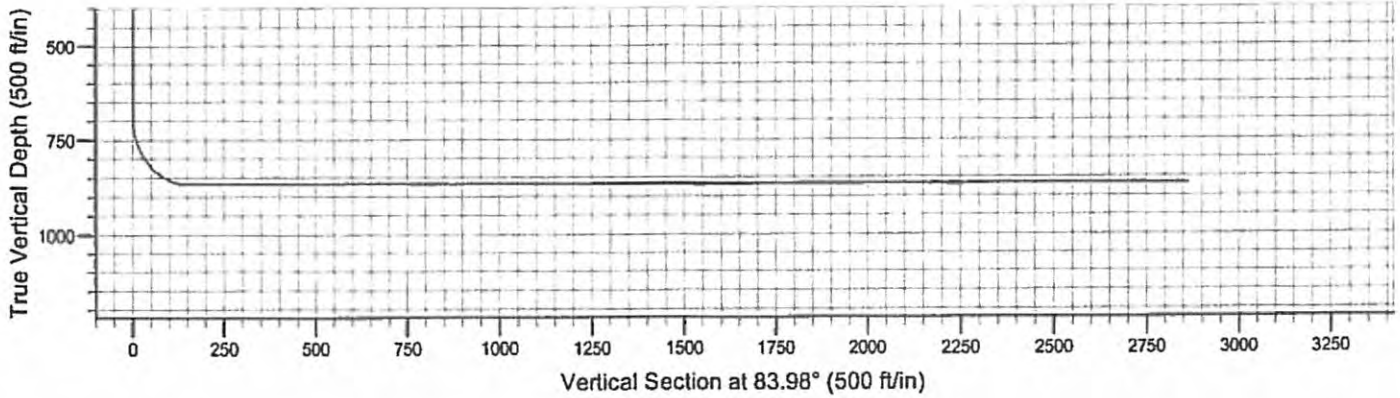
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 Environmental Protection  
 COMPASS 2003.14 Build 57  
 03/24/2017





CNX Gas Company, LLC

MC-43 - EAST LEG  
MARSHALL COUNTY  
WEST VIRGINIA



Azimuths to True North  
 Magnetic North: -8.44°  
 Magnetic Field  
 Strength: 53302.0nT  
 Dip Angle: 67.84°  
 Date: 5/5/2008  
 Model: IGRF200510

**LEGEND**

- MC-43, EAST LEG, AD ELEG
- ⊠ PLANNED WELL

5101096P



# Nevis Energy Survey Report

Company: CNX Gas Company, LLC  
 Project: WEST VIRGINIA2  
 Site: MARSHALL COUNTY3  
 Well: MC-43  
 Wellbore: WEST CENTER LEG  
 Design: AD WEST CENTER LEG

Local Co-ordinate Reference: Well MC-43  
 TVD Reference: WELL @ 0.00ft (Original Well Elev)  
 MD Reference: WELL @ 0.00ft (Original Well Elev)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 2003.14 Single User Db

Project:	WEST VIRGINIA2		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		

Site:	MARSHALL COUNTY3			
Site Position:	Northing:	499,997.97 ft	Latitude:	39° 52' 2.130 N
From: Lat/Long	Easting:	1,651,076.94 ft	Longitude:	80° 37' 51.220 W
Position Uncertainty: 0.00 ft	Slot Radius:	"	Grid Convergence:	-0.72 °

Well:	MC-43				
Well Position +N/-S	0.00 ft	Northing:	499,997.97 ft	Latitude:	39° 52' 2.130 N
+E/-W	0.00 ft	Easting:	1,651,076.94 ft	Longitude:	80° 37' 51.220 W
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft	Ground Level:	0.00 ft

Wellbore:	WEST CENTER LEG				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	5/5/2008	-8.44	67.84	53,302

Design:	AD WEST CENTER LEG				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	1,615.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	39.58	

Survey Program:	Date 5/20/2008				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
50.00	1,615.00	AD WLEG (WEST LEG)			
1,615.00	4,022.00	AD WCTR LEG (WEST CENTER LEG)			

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,615.00	89.90	1.20	864.64	647.20	470.58	798.65	0.00	0.00	0.00
1,644.00	90.17	359.21	864.62	676.20	470.68	821.07	6.92	0.93	-6.86
1,682.00	87.90	2.00	865.26	714.18	471.08	850.60	9.46	-5.97	7.34
1,713.00	88.10	4.60	866.34	745.11	472.87	875.57	8.41	0.65	8.39
1,745.00	89.50	7.80	867.01	776.91	476.32	902.29	10.91	4.87	10.00
1,777.00	90.40	11.90	867.04	808.43	481.80	930.07	13.12	2.88	12.81
1,808.00	90.50	15.00	866.80	838.58	489.01	957.89	10.00	0.32	10.00
1,840.00	90.80	20.10	866.44	869.08	498.65	987.55	15.96	0.94	15.94
1,871.00	89.40	24.10	866.38	897.79	510.31	1,017.11	13.67	1.52	12.90
1,903.00	90.00	28.40	866.55	926.49	524.46	1,048.24	13.57	1.87	13.44
1,935.00	90.70	32.90	866.35	954.01	540.77	1,079.84	14.23	2.19	14.06
1,966.00	90.20	37.70	866.11	979.30	558.68	1,110.75	15.57	1.87	15.48

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## Nevis Energy Survey Report

Company: CNX Gas Company,LLC  
 Project: WEST VIRGINIA2  
 Site: MARSHALL COUNTY3  
 Well: MC-43  
 Wellbore: WEST CENTER LEG  
 Design: AD WEST CENTER LEG

Local Co-ordinate Reference: Well MC-43  
 TVD Reference: WELL @ 0.00ft (Original Well Elev)  
 MD Reference: WELL @ 0.00ft (Original Well Elev)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 2003.14 Single User Db

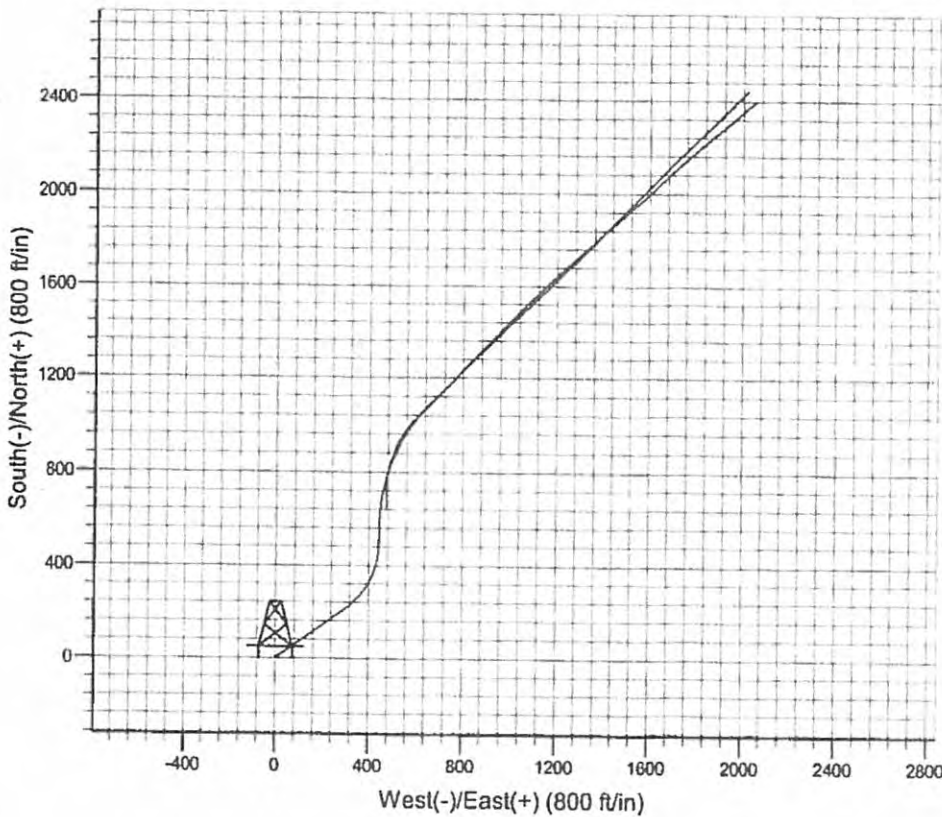
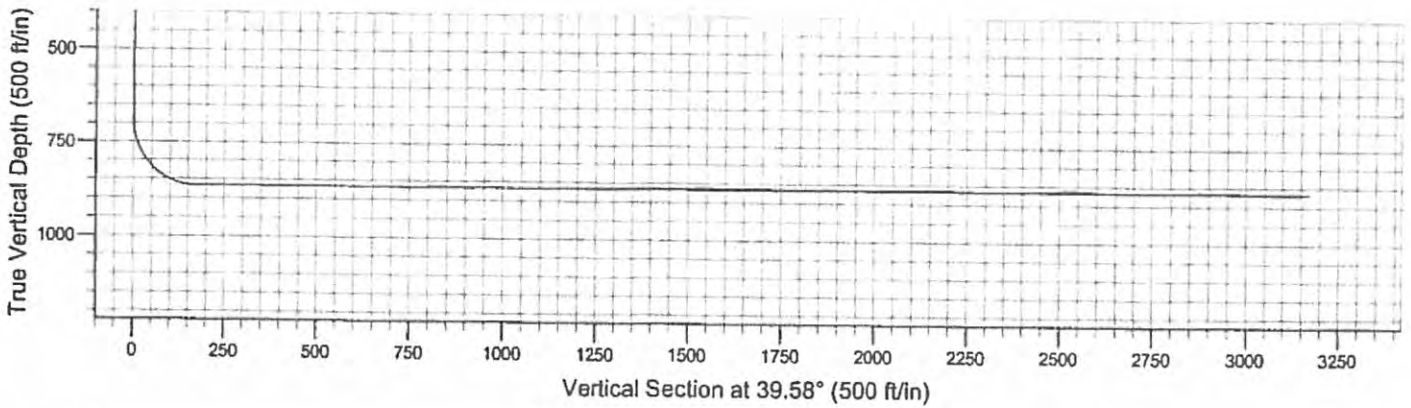
**Survey**


Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,998.00	89.30	41.60	866.25	1,003.93	579.09	1,142.74	12.51	-2.81	12.19
2,030.00	90.80	43.50	866.22	1,027.51	600.73	1,174.69	7.56	4.69	5.94
2,062.00	90.10	45.70	865.97	1,050.29	623.20	1,206.57	7.21	-2.19	6.87
2,093.00	90.40	46.00	865.84	1,071.88	645.44	1,237.38	1.37	0.97	0.97
2,125.00	90.50	45.10	865.58	1,094.29	668.28	1,269.21	2.83	0.31	-2.81
2,157.00	90.90	44.10	865.19	1,117.07	690.75	1,301.08	3.37	1.25	-3.12
2,188.00	89.80	44.80	865.00	1,139.20	712.46	1,331.97	4.21	-3.55	2.26
2,219.00	89.90	45.30	865.08	1,161.10	734.40	1,362.83	1.64	0.32	1.61
2,252.00	89.90	43.10	865.14	1,184.76	757.40	1,395.72	6.67	0.00	-6.67
2,283.00	90.20	42.30	865.12	1,207.54	778.42	1,426.87	2.76	0.97	-2.58
2,315.00	91.40	42.50	864.67	1,231.17	800.00	1,458.63	3.80	3.75	0.62
2,347.00	90.90	44.30	864.03	1,254.41	821.98	1,490.55	5.84	-1.56	5.62
2,378.00	91.40	43.70	863.40	1,276.71	843.51	1,521.45	2.52	1.61	-1.94
2,410.00	89.80	43.70	863.07	1,299.84	865.62	1,553.37	5.00	-5.00	0.00
2,441.00	89.70	43.00	863.20	1,322.38	886.90	1,584.30	2.28	-0.32	-2.26
2,473.00	89.00	42.10	863.57	1,345.95	908.53	1,616.25	3.56	-2.19	-2.81
2,504.00	89.10	43.86	864.08	1,368.63	929.66	1,647.19	5.69	0.32	5.68
2,536.00	89.70	43.40	864.42	1,391.79	951.74	1,679.11	2.36	1.87	-1.44
2,568.00	90.30	43.30	864.42	1,415.06	973.71	1,711.04	1.90	1.87	-0.31
2,599.00	89.20	43.50	864.55	1,437.58	995.01	1,741.97	3.61	-3.55	0.65
2,631.00	89.60	42.60	864.89	1,460.97	1,016.85	1,773.91	3.08	1.25	-2.81
2,662.00	90.40	43.40	864.89	1,483.64	1,037.99	1,804.85	3.65	2.58	2.58
2,694.00	89.80	43.60	864.83	1,506.85	1,060.02	1,836.78	1.98	-1.87	0.62
2,725.00	89.20	45.20	865.10	1,529.00	1,081.71	1,867.67	5.51	-1.94	5.16
2,757.00	89.60	45.60	865.44	1,551.46	1,104.49	1,899.50	1.77	1.25	1.25
2,788.00	89.60	45.00	865.65	1,573.27	1,126.53	1,930.35	1.94	0.00	-1.94
2,820.00	90.70	46.70	865.57	1,595.56	1,149.48	1,962.15	6.33	3.44	5.31
2,851.00	91.10	46.00	865.08	1,616.95	1,171.91	1,992.93	2.60	1.29	-2.26
2,883.00	89.40	45.60	864.94	1,639.26	1,194.85	2,024.74	5.46	-5.31	-1.25
2,915.00	90.10	48.20	865.08	1,661.12	1,218.22	2,056.48	8.41	2.19	8.12
2,946.00	92.00	48.30	864.51	1,681.76	1,241.34	2,087.12	6.14	6.13	0.32
2,978.00	91.40	47.60	863.56	1,703.18	1,265.09	2,118.76	2.88	-1.87	-2.19
3,010.00	91.10	48.00	862.87	1,724.67	1,288.79	2,150.43	1.56	-0.94	1.25
3,041.00	88.70	47.40	862.92	1,745.53	1,311.72	2,181.11	7.98	-7.74	-1.94
3,073.00	89.30	47.90	863.48	1,767.09	1,335.36	2,212.79	2.44	1.87	1.56
3,117.00	86.80	47.70	864.98	1,796.62	1,367.94	2,256.31	5.70	-5.68	-0.45
3,136.00	88.70	48.20	865.72	1,809.34	1,382.03	2,275.09	10.34	10.00	2.63
3,167.00	90.30	48.80	865.99	1,829.88	1,405.25	2,305.71	5.51	5.16	1.94
3,199.00	90.60	49.50	865.74	1,850.81	1,429.45	2,337.27	2.38	0.94	2.19
3,230.00	90.10	49.90	865.55	1,870.86	1,453.10	2,367.79	2.07	-1.61	1.29
3,262.00	91.00	49.10	865.25	1,891.64	1,477.43	2,399.30	3.76	2.81	-2.50
3,294.00	91.50	48.70	864.55	1,912.67	1,501.54	2,430.87	2.00	1.56	-1.25
3,325.00	91.30	49.10	863.79	1,933.04	1,524.89	2,461.46	1.44	-0.65	1.29
3,357.00	90.60	48.90	863.26	1,954.03	1,549.04	2,493.02	2.28	-2.19	-0.62
3,388.00	90.50	48.20	862.96	1,974.55	1,572.27	2,523.64	2.28	-0.32	-2.26
3,420.00	88.80	46.90	863.16	1,996.15	1,595.88	2,555.33	6.69	-5.31	-4.06
3,451.00	85.80	46.70	864.62	2,017.35	1,618.45	2,586.04	9.70	-9.68	-0.65
3,483.00	87.90	46.70	866.38	2,039.26	1,641.70	2,617.75	6.56	6.56	0.00
3,516.00	88.50	47.50	867.41	2,061.71	1,665.86	2,650.45	3.03	1.82	2.42
3,548.00	90.40	47.80	867.72	2,083.27	1,689.51	2,682.13	6.01	5.94	0.94
3,580.00	90.10	47.90	867.58	2,104.74	1,713.24	2,713.79	0.99	-0.94	0.31
3,612.00	90.90	48.50	867.30	2,126.07	1,737.09	2,745.43	3.12	2.50	1.87
3,643.00	90.80	48.20	866.84	2,146.67	1,760.25	2,776.07	1.02	-0.32	-0.97
3,675.00	91.30	49.50	866.25	2,167.72	1,784.34	2,807.64	4.35	1.56	4.06



**CNX Gas Company, LLC**

MC-43 - WEST CENTER LEG  
MARSHALL COUNTY  
WEST VIRGINIA





**Azimuths to True North**  
 Magnetic North: -8.44°  
  
**Magnetic Field**  
 Strength: 53302.0nT  
 Dip Angle: 67.84°  
 Date: 5/5/2008  
 Model: IGRF200510

**LEGEND**

— MC-43, WEST CENTER LEG, AD WCTR LEG

⊠ PLANNED WELL

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# Nevis Energy Survey Report

Company: CNX Gas Company, LLC  
 Project: WEST VIRGINIA2  
 Site: MARSHALL COUNTY3  
 Well: MC-43  
 Wellbore: EAST CENTER LEG  
 Design: AD EAST CENTER LEG

Local Co-ordinate Reference: Well MC-43  
 TVD Reference: WELL @ 0.00ft (Original Well Elev)  
 MD Reference: WELL @ 0.00ft (Original Well Elev)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 2003.14 Single User Db

Project	WEST VIRGINIA2		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		

Site	MARSHALL COUNTY3				
Site Position:		Northing:	499,997.97 ft	Latitude:	39° 52' 2.130 N
From:	Lat/Long	Easting:	1,651,076.94 ft	Longitude:	80° 37' 51.220 W
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	-0.72 °

Well	MC-43					
Well Position	+N/-S	0.00 ft	Northing:	499,997.97 ft	Latitude:	39° 52' 2.130 N
	+E/-W	0.00 ft	Easting:	1,651,076.94 ft	Longitude:	80° 37' 51.220 W
Position Uncertainty	0.00 ft		Wellhead Elevation:	ft	Ground Level:	0.00 ft

Wellbore	EAST CENTER LEG				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	5/5/2008	-8.44	67.84	53,302

Design	AD EAST CENTER LEG				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	1,069.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	57.49	

Survey Program	Date	5/20/2008			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
50.00	1,069.00	AD WLEG (WEST LEG)			
1,069.00	4,311.00	AD ECTR LEG (EAST CENTER LEG)			

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,069.00	92.44	47.67	866.80	177.13	240.53	298.04	0.00	0.00	0.00
1,076.00	92.70	51.70	866.49	181.65	245.86	304.96	57.63	3.21	57.57
1,108.00	91.00	56.40	865.46	200.42	271.74	336.88	15.61	5.31	14.69
1,139.00	90.00	61.70	865.19	216.36	298.32	367.85	17.40	3.23	17.10
1,172.00	88.90	68.10	865.50	230.35	328.19	400.56	19.68	-3.33	19.39
1,204.00	89.50	74.70	865.95	240.55	358.49	431.60	20.71	2.87	20.62
1,236.00	90.50	81.20	865.95	247.23	389.77	461.57	20.55	3.12	20.31
1,269.00	90.00	86.80	865.81	250.68	422.58	491.08	17.04	-1.52	16.97
1,301.00	89.10	89.90	866.06	251.60	454.56	518.55	10.09	2.81	9.69
1,331.00	89.30	90.90	866.48	251.39	484.56	543.73	10.48	0.67	3.33
1,363.00	91.20	91.90	866.34	250.61	516.54	570.29	6.71	5.94	3.12
1,394.00	90.60	91.30	865.85	249.74	547.53	595.95	2.74	-1.94	0.91

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Survey Report

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Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,426.00	91.40	90.30	865.29	249.29	579.52	622.69	4.00	2.50	-3.12
1,457.00	89.50	91.30	865.05	248.86	610.51	648.59	6.93	-6.13	3.23
1,490.00	87.80	91.90	865.82	247.94	643.49	675.91	5.46	-5.15	1.82
1,522.00	88.10	90.90	866.97	247.16	675.46	702.45	3.26	0.94	-3.12
1,553.00	90.30	88.20	867.40	247.40	706.45	728.71	11.23	7.10	-8.71
1,585.00	89.60	86.90	867.43	248.77	738.42	756.41	4.61	-2.19	-4.06
1,617.00	90.20	84.20	867.49	251.25	770.32	784.64	8.64	1.87	-8.44
1,650.00	90.90	81.70	867.17	255.30	803.07	814.44	7.87	2.12	-7.58
1,682.00	90.10	80.10	866.89	260.36	834.66	843.80	5.59	-2.50	-5.00
1,714.00	90.00	77.50	866.86	266.58	866.05	873.61	8.13	-0.31	-8.12
1,745.00	90.40	75.30	866.75	273.87	896.18	902.93	7.21	1.29	-7.10
1,777.00	91.60	74.40	866.20	282.23	927.06	933.47	4.69	3.75	-2.81
1,808.00	89.60	74.00	865.87	290.67	956.89	963.16	6.58	-6.45	-1.29
1,840.00	90.40	75.40	865.87	299.11	987.75	993.72	5.04	2.50	4.37
1,870.00	88.10	72.90	866.26	307.30	1,016.60	1,022.46	11.32	-7.67	-8.33
1,903.00	89.20	72.90	867.04	317.00	1,048.14	1,054.26	3.33	3.33	0.00
1,935.00	91.20	72.70	866.93	326.47	1,078.70	1,085.13	6.28	6.25	-0.62
1,966.00	91.90	71.90	866.09	335.89	1,108.22	1,115.08	3.43	2.26	-2.58
1,998.00	89.70	69.10	865.64	346.57	1,138.38	1,146.25	11.13	-6.87	-8.75
2,030.00	91.00	69.40	865.45	357.90	1,168.30	1,177.58	4.17	4.06	0.94
2,062.00	90.00	66.50	865.17	369.91	1,197.96	1,209.04	9.59	-3.12	-9.06
2,095.00	88.60	63.90	865.57	383.75	1,227.91	1,241.74	8.95	-4.24	-7.88
2,126.00	89.60	65.10	866.06	397.10	1,255.89	1,272.50	5.04	3.23	3.87
2,158.00	89.00	62.20	866.45	411.30	1,284.55	1,304.31	9.25	-1.87	-9.06
2,190.00	88.60	58.60	867.12	427.10	1,312.37	1,336.26	11.32	-1.25	-11.25
2,222.00	89.50	55.70	867.65	444.45	1,339.24	1,368.25	9.49	2.81	-9.06
2,253.00	90.40	54.00	867.68	462.30	1,364.59	1,399.22	6.20	2.90	-5.48
2,285.00	90.60	53.30	867.40	481.26	1,390.36	1,431.14	2.27	0.62	-2.19
2,316.00	89.90	49.90	867.26	500.52	1,414.65	1,461.97	11.20	-2.26	-10.97
2,348.00	87.70	47.60	867.93	521.61	1,438.70	1,493.59	9.94	-6.87	-7.19
2,380.00	88.10	46.20	869.11	543.46	1,462.05	1,525.02	4.55	1.25	-4.37
2,411.00	89.60	44.70	869.73	565.20	1,484.14	1,555.34	6.84	4.84	-4.84
2,443.00	91.20	44.60	869.51	587.96	1,506.63	1,586.53	5.01	5.00	-0.31
2,474.00	90.80	44.70	868.96	610.01	1,528.41	1,616.75	1.33	-1.29	0.32
2,506.00	89.80	43.80	868.80	632.94	1,550.74	1,647.90	4.20	-3.12	-2.81
2,537.00	90.50	44.80	868.72	655.12	1,572.39	1,678.08	3.94	2.26	3.23
2,569.00	90.40	45.50	868.46	677.69	1,595.07	1,709.34	2.21	-0.31	2.19
2,601.00	89.50	44.50	868.49	700.32	1,617.70	1,740.58	4.20	-2.81	-3.12
2,632.00	89.90	46.00	868.65	722.14	1,639.71	1,770.88	5.01	1.29	4.84
2,664.00	89.90	47.60	868.71	744.04	1,663.04	1,802.32	5.00	0.00	5.00
2,695.00	89.60	47.20	868.85	765.03	1,685.86	1,832.84	1.61	-0.97	-1.29
2,727.00	88.90	45.90	869.26	787.03	1,709.09	1,864.26	4.61	-2.19	-4.06
2,758.00	89.60	47.70	869.67	808.25	1,731.68	1,894.72	6.23	2.26	5.81
2,790.00	90.80	48.30	869.56	829.66	1,755.46	1,926.28	4.19	3.75	1.87
2,821.00	90.50	47.90	869.21	850.36	1,778.54	1,956.86	1.61	-0.97	-1.29
2,853.00	91.50	47.80	868.65	871.83	1,802.26	1,988.40	3.14	3.12	-0.31
2,885.00	91.80	48.20	867.73	893.24	1,826.03	2,019.95	1.56	0.94	1.25
2,916.00	89.80	48.50	867.29	913.84	1,849.19	2,050.55	6.52	-6.45	0.97
2,948.00	89.60	47.40	867.46	935.27	1,872.95	2,082.11	3.49	-0.62	-3.44
2,979.00	89.10	46.60	867.81	956.41	1,895.62	2,112.59	3.04	-1.61	-2.58
3,011.00	89.40	47.70	868.23	978.17	1,919.08	2,144.07	3.56	0.94	3.44
3,043.00	88.80	48.60	868.74	999.51	1,942.91	2,175.64	3.38	-1.87	2.81
3,076.00	90.40	48.80	868.97	1,021.29	1,967.70	2,208.25	4.89	4.85	0.61
3,107.00	90.80	48.30	868.64	1,041.81	1,990.93	2,238.87	2.07	1.29	-1.61



**Nevis Energy**  
Survey Report

Company: CNX Gas Company, LLC  
 Project: WEST VIRGINIA2  
 Site: MARSHALL COUNTY3  
 Well: MC-43  
 Wellbore: EAST CENTER LEG  
 Design: AD EAST CENTER LEG

Local Co-ordinate Reference: Well MC-43  
 TVD Reference: WELL @ 0.00ft (Original Well Elev)  
 MD Reference: WELL @ 0.00ft (Original Well Elev)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 2003.14 Single User Db

**Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,139.00	89.80	47.70	868.47	1,063.23	2,014.71	2,270.43	3.64	-3.12	-1.87
3,170.00	91.00	46.20	868.26	1,084.39	2,037.37	2,300.91	6.20	3.87	-4.84
3,202.00	89.90	47.20	868.01	1,106.33	2,060.65	2,332.34	4.65	-3.44	3.12
3,233.00	91.10	48.00	867.74	1,127.23	2,083.54	2,362.87	4.65	3.87	2.58
3,265.00	90.10	48.40	867.40	1,148.56	2,107.40	2,394.45	3.37	-3.12	1.25
3,297.00	90.30	46.50	867.29	1,170.20	2,130.97	2,425.96	5.97	0.62	-5.94
3,328.00	89.10	47.80	867.45	1,191.28	2,153.70	2,456.46	5.71	-3.87	4.19
3,360.00	88.10	46.90	868.23	1,212.95	2,177.22	2,487.95	4.20	-3.12	-2.81
3,391.00	89.50	47.00	868.88	1,234.11	2,199.87	2,518.42	4.53	4.52	0.32
3,423.00	90.50	48.30	868.88	1,255.67	2,223.52	2,549.94	5.13	3.12	4.06
3,454.00	90.10	50.20	868.72	1,275.90	2,247.00	2,580.62	6.26	-1.29	6.13
3,486.00	89.10	49.40	868.94	1,296.55	2,271.44	2,612.33	4.00	-3.12	-2.50
3,518.00	90.90	50.40	868.94	1,317.16	2,295.92	2,644.05	6.43	5.62	3.12
3,549.00	90.80	50.40	868.48	1,336.92	2,319.80	2,674.81	0.32	-0.32	0.00
3,581.00	90.20	50.30	868.20	1,357.34	2,344.44	2,706.56	1.90	-1.87	-0.31
3,613.00	89.30	48.60	868.34	1,378.14	2,368.76	2,738.24	6.01	-2.81	-5.31
3,645.00	88.90	47.60	868.85	1,399.51	2,392.57	2,769.81	3.37	-1.25	-3.12
3,671.00	89.00	47.60	869.32	1,417.04	2,411.77	2,795.42	0.38	0.38	0.00
3,703.00	89.20	47.40	869.82	1,438.66	2,435.36	2,826.93	0.88	0.62	-0.62
3,735.00	90.90	48.70	869.80	1,460.05	2,459.15	2,858.50	6.69	5.31	4.06
3,767.00	89.80	46.20	869.60	1,481.68	2,482.73	2,890.00	8.54	-3.44	-7.81
3,798.00	90.60	46.00	869.49	1,503.18	2,505.06	2,920.39	2.66	2.58	-0.65
3,829.00	92.20	46.90	868.74	1,524.53	2,527.52	2,950.81	5.92	5.16	2.90
3,860.00	91.50	46.70	867.74	1,545.74	2,550.11	2,981.25	2.35	-2.26	-0.65
3,893.00	91.00	46.60	867.02	1,568.39	2,574.10	3,013.66	1.55	-1.52	-0.30
3,925.00	90.10	46.00	866.71	1,590.49	2,597.23	3,045.05	3.38	-2.81	-1.87
3,956.00	89.30	44.50	866.87	1,612.32	2,619.25	3,075.34	5.48	-2.58	-4.84
3,987.00	89.20	44.50	867.28	1,634.43	2,640.97	3,105.54	0.32	-0.32	0.00
4,019.00	89.20	45.00	867.72	1,657.15	2,663.50	3,136.75	1.56	0.00	1.56
4,051.00	90.60	43.80	867.78	1,680.01	2,685.89	3,167.92	5.76	4.37	-3.75
4,080.00	90.40	44.20	867.53	1,700.87	2,706.03	3,196.12	1.54	-0.69	1.38
4,106.00	89.40	42.90	867.57	1,719.72	2,723.95	3,221.35	6.31	-3.85	-5.00
4,136.00	89.10	43.30	867.96	1,741.62	2,744.44	3,250.41	1.67	-1.00	1.33
4,168.00	90.50	47.10	868.08	1,764.16	2,767.14	3,281.67	12.65	4.37	11.87
4,200.00	90.70	49.10	867.74	1,785.53	2,790.96	3,313.24	6.28	0.62	6.25
4,231.00	90.70	51.30	867.36	1,805.37	2,814.77	3,343.98	7.10	0.00	7.10
4,248.00	90.40	52.30	867.20	1,815.88	2,828.13	3,360.90	6.14	-1.76	5.88
4,280.00	89.30	55.30	867.28	1,834.78	2,853.95	3,392.83	9.99	-3.44	9.37
4,311.00	89.30	55.30	867.66	1,852.43	2,879.44	3,423.80	0.00	0.00	0.00

**Targets**

**Target Name**

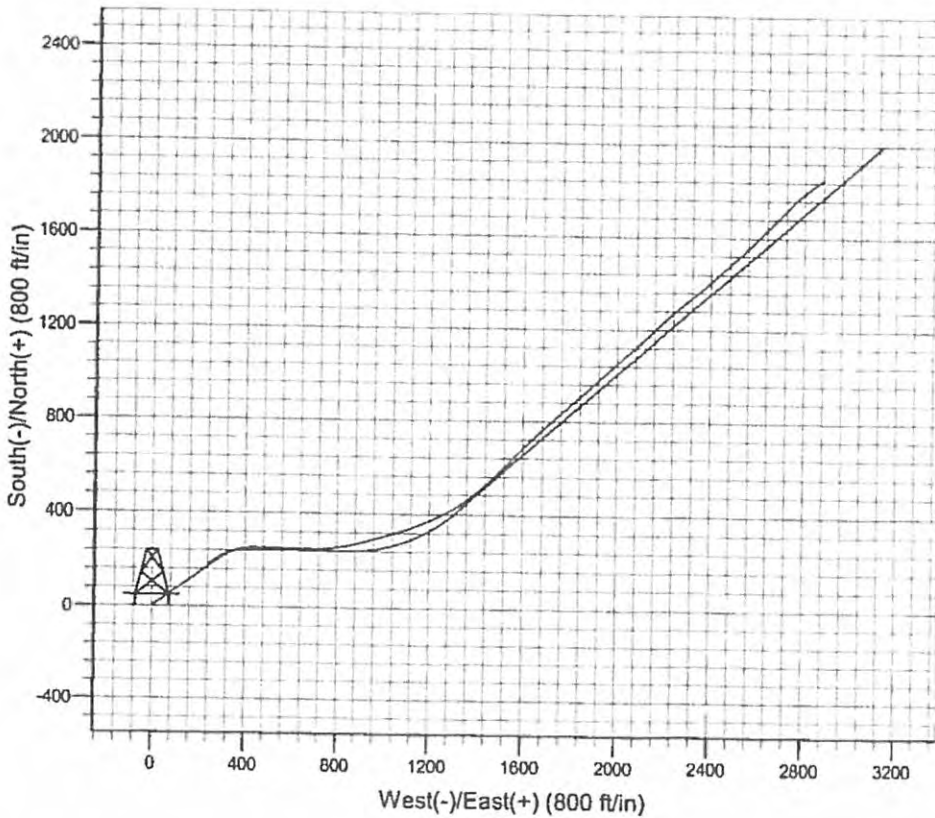
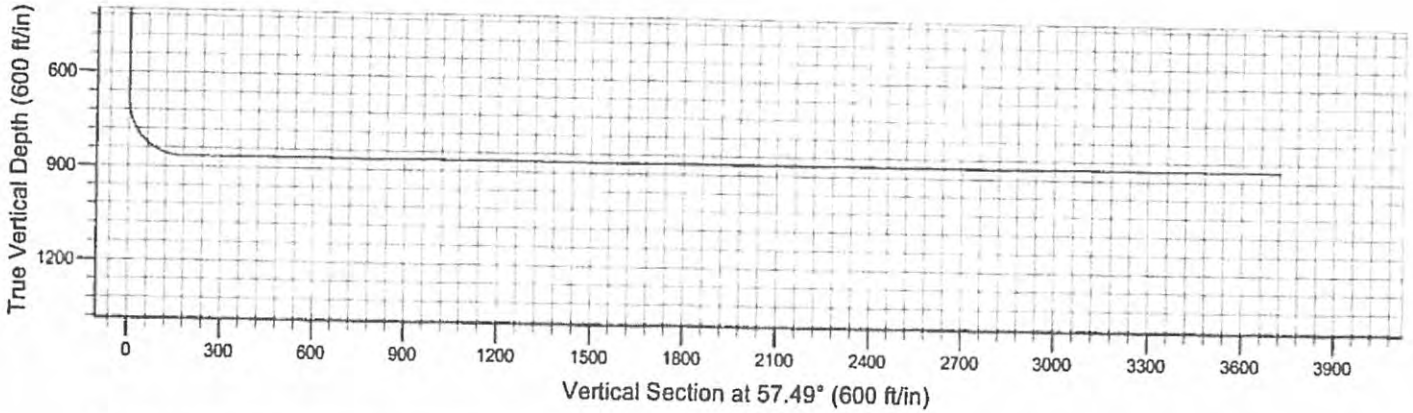
- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
ECTRBHL, MC-43	0.00	0.00	867.00	2,000.88	3,138.98	501,959.18	1,654,240.86	39° 52' 21.903 N	80° 37' 10.958 W
- survey misses by 638.69ft at 3966.36ft MD (867.00 TVD, 1619.70 N, 2626.51 E)									
- Point									

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



CNX Gas Company, LLC

MC-43 - EAST CENTER LEG  
MARSHALL COUNTY  
WEST VIRGINIA



Azimuths to True North  
 Magnetic North: -8.44°  
 Magnetic Field  
 Strength: 53302.0nT  
 Dip Angle: 67.84°  
 Date: 5/5/2008  
 Model: IGRF200510

**LEGEND**

- MC-43, EAST CENTER LEG, AD ECTR LEG
- PLANNED WELL



5101096A

1) Date: February 16, 2017  
2) Operator's Well No. MC-43  
3) API Well No. 47-51-01096  
State County Permit

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

4) SURFACE OWNER(S) TO BE SERVED  
(a) Name Wiley R. Garey (Life) c/o Paul Garey  
Address 45 G & W Drive  
Moundsville, WV 26041

(b) Name \_\_\_\_\_  
Address \_\_\_\_\_

(c) Name \_\_\_\_\_  
Address \_\_\_\_\_

(6) INSPECTOR James Nicholson  
Address PO BOX 44  
Moundsville, WV 26041  
Telephone (304) 552-3874

5)a) COAL OPERATOR  
Name CONSOLIDATION COAL CO.  
Address 1 Bridge Street  
Monongah, WV 26554

(b) COAL OWNER(S) WITH DECLARATION:  
Name \_\_\_\_\_  
Address \_\_\_\_\_

(c) COAL LESSEE WITH DECLARATION:  
Name \_\_\_\_\_  
Address \_\_\_\_\_

TO THE PERSON(S) 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 and its location 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 REVERSE SIDE OF THE COPY OF THE APPLICATION (FORM WW-4(B) DESIGNATED FOR YOU. HOWEVER, YOU ARE NOT REQUIRED TO TAKE ANY ACTION AT ALL.

Take notice 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 delivery by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of mailing or delivery by the Chief.

WELL OPERATOR Consolidation Coal Company  
By Mason Smith  
Its Project Engineer  
Address 6126 Energy Road  
Moundsville, WV 26041  
Telephone (304) - 843 - 3565

Subscribed and sworn before me this 20<sup>th</sup> day of February, 2017  
Joseph E. Williams Joseph E. Williams Notary Public  
Marshall County, State of West Virginia  
My commission expires June 5<sup>th</sup>, 2024



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 dep@privacyofficer.org

FEB 28 2017  
WV Department of  
Environmental Protection  
03/24/2017



Sheriff of Marshall County • P.O. Box 648 • Moundsville, WV 26041  
(304) 843-1400

**Marshall County Real Property - Tax Year: 2016**

Ticket Number: 000004085      Account Number: 00002464  
District: 03 - CAMERON      Taxpayer I.D.:

Owner Name: GAREY WILEY R - LIFE In Care of: GAREY PAUL Address: 45 G & W DR MOUNDSVILLE WV 26041 Lending Inst:	Property: 108.46 A FORK RIDGE  Map: 10      Parcel: 0010 0000 0300 Lot Size:      Acreage: Book: 0602      Page: 0103
Tax Class: 2      Homestead Exemption:	Back Tax:      Exoneration:      Prior Delinquents:      Special Disposition:

**AMOUNTS DUE:**      First Half: none due      Second Half: none due      Total Due: none due

**ASSESSMENT:**

Assessment	GROSS	NET	TAX (1/2 Year)
Land	13020	13020	
Building	23640	23640	
<b>Total</b>	<b>36660</b>	<b>36660</b>	<b>188.21</b>

**PAYMENTS RECEIVED:**

	First Half	Second Half
Net	188.21	188.21
Discount	4.71	4.71
Interest	.00	.00
<b>Total</b>	<b>183.50</b>	<b>183.50</b>
Date	08/02/2016	08/02/2016

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03/24/2017

RECEIVED  
Office of Oil and Gas

FEB 23 2017

WV Department of  
Environmental Protection

7010 3090 0002 4253 9733

U.S. Postal Service™  
**CERTIFIED MAIL™ RECEIPT**  
 (Domestic Mail Only; No Insurance Coverage Provided)  
 For delivery information visit our website at [www.usps.com](http://www.usps.com)

**OFFICIAL USE**

MC-43 Postage	\$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	\$

Postmark Here

MOUNDSVILLE POST OFFICE MOUNDSVILLE, WV 26041  
 FEB 21 2017

Sent To Wiley P. Gavey & Paul Gavey  
 Street, Apt. No., or PO Box No. 456 & W Drive  
 City, State, ZIP+4 Moundsville, WV, 26041

PS Form 3800, August 2006 See Reverse for Instructions

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

CONSTRUCTION AND RECLAMATION PLAN AND SITE REGISTRATION APPLICATION FORM  
GENERAL PERMIT FOR OIL AND GAS PIT WASTE DISCHARGE

Operator Name Consolidation Coal Company OP Code \_\_\_\_\_

Watershed French Run of Grave Creek Quadrangle Glen Easton, WV

Elevation 1292.57' County Marshall District Cameron

Description of anticipated Pit Waste: N/A NO PITS.

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

Will a synthetic liner be used in the pit? N/A. If so, what mil.? \_\_\_\_\_

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number \_\_\_\_\_)
- Reuse (at API Number \_\_\_\_\_)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain Tanks, see attached letter)

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Freshwater

If oil based, what type? Synthetic, petroleum, etc.? \_\_\_\_\_

Additives to be used? Bentonite, Bicarbonate of Soda

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Reused or Disposed (see attached letter)

-If left in pit and plan to solidify what medium will be used? Cement, lime, sawdust \_\_\_\_\_

-Landfill or offsite name/permit number? \_\_\_\_\_

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, 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 *Mason Smith*

Company Official (Typed Name) Mason Smith

Company Official Title Project Engineer

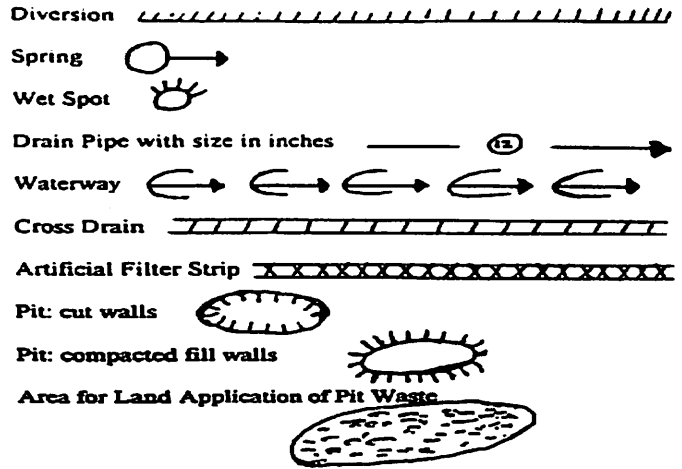
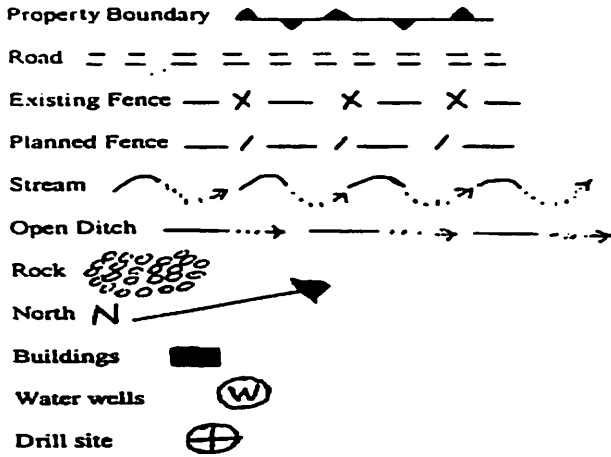
Subscribed and sworn before me this 20<sup>th</sup> day of February, 2017

Joseph E. Williams Joseph E. Williams

My commission expires June 5<sup>th</sup>, 2024



**LEGEND**



Proposed Revegetation Treatment: Acres Disturbed <5 Prevegetation pH 6

Lime 2 Tons/acre or to correct to pH 6

Fertilizer (10-20-20 or equivalent) 500 lbs/acre (500 lbs minimum)

Mulch 2 Tons/acre

Seed Mixtures

Seed Type	Area I	lbs/acre	Seed Type	Area II	lbs/acre
			Seed mix in accordance with WVDEP oil and gas Erosion and Sediment Control Field Manual		

Attach: Drawing(s) of road, location, pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: \_\_\_\_\_

Comments: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Field Reviewed? ( ) Yes ( ) No

**RECEIVED**  
Office of Oil and Gas

FEB 28 2017

WV Department of  
Environmental Protection

03/24/2017

5101096P

**MURRAY AMERICAN ENERGY, INC.  
& CONSOLIDATION COAL COMPANY**

**MURRAY AMERICAN ENERGY,  
INC. & CONSOLIDATION COAL  
COMPANY**

46226 National Road  
St. Clairsville, OH 43950

*phone:* 304.843.3565

*fax:* 304.843.3546

*e-mail:* [MasonSmith@coalsource.com](mailto:MasonSmith@coalsource.com)

**MASON SMITH**

*Project Engineer*

February 20, 2017

Department of Environmental Protection  
Office of Oil and Gas  
601-57<sup>th</sup> Street  
Charleston, WV 25320

To Whom It May Concern,

As per the Division of Environmental Protection, Office of Oil and Gas request, Consolidation Coal Company submits the following procedures utilizing pit waste.

Upon submitting a well work application (without a general permit for Oil & Gas Pit Waste Discharge Application), Consolidation Coal Company will construct no pits, but instead will use mud tanks to contain all drilling muds.

Once the well is completed, that material (minus the cave material) will be trucked to the next well to be plugged or to DEP facilities number U-0033-83, O-78-83, U-140-83, or U-1011-93.

Sincerely,



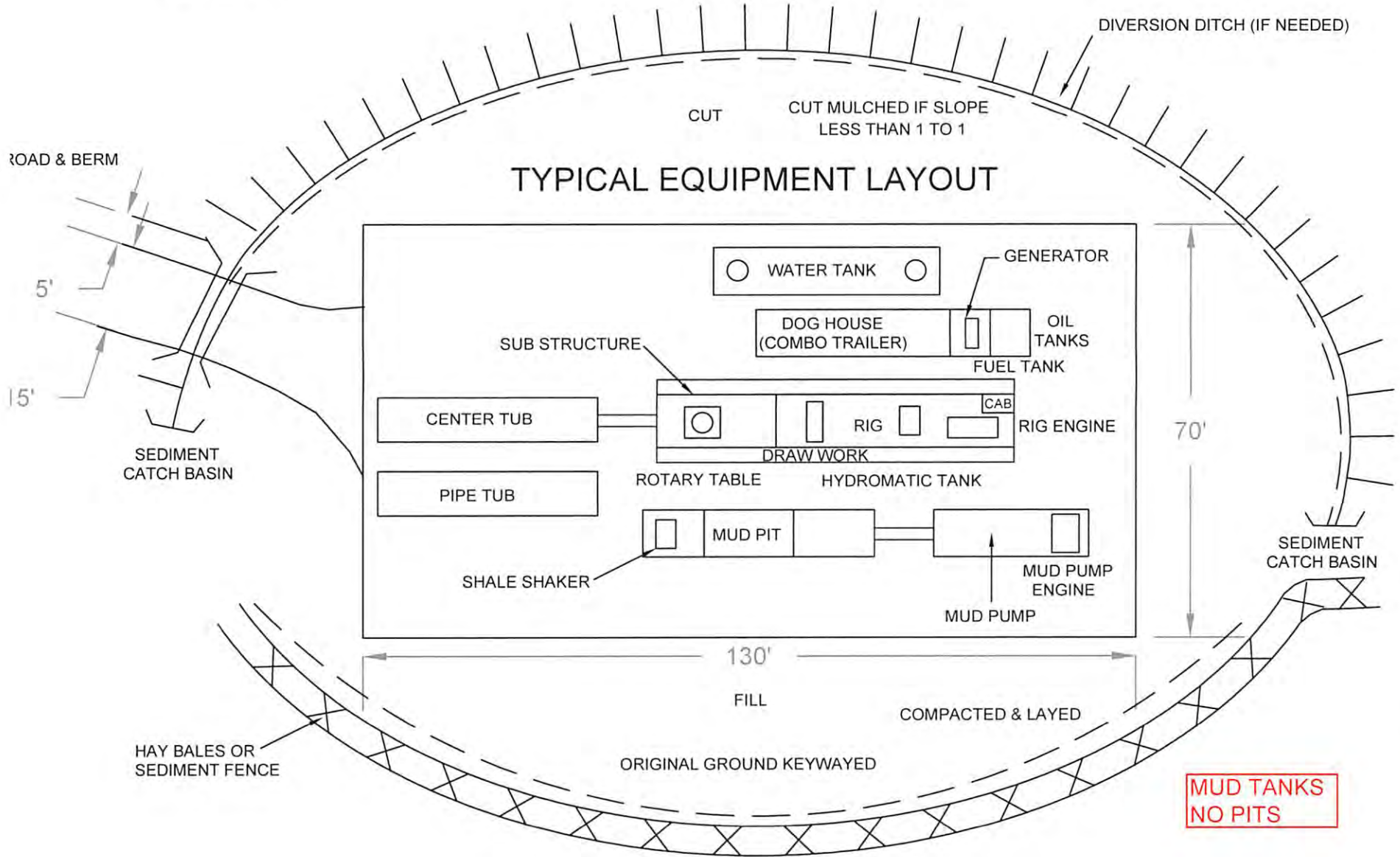
Mason Smith  
Project Engineer

RECEIVED  
Office of Oil and Gas  
FEB 23 2017  
WV Department of  
Environmental Protection

03/24/2017

CONSOLIDATION COAL COMPANY  
NORTHERN WEST VIRGINIA  
OPERATIONS

### TYPICAL DRAWING OF WELL PLUGGING SITE PLAN



5101096P

5101096A





### Marshall County, WV Parcel Map

Item	Value
marshal_parcelclass	
Legend	
Layer Tree	
Print	
dist	3
map	10
pid	10
sp1month	0
sp1day	0
sp1year	0
acres	101.025457200
dismap	03-0010
parid	03.100010000000000
shape_leng	12911.1325001
shape_area	4400668.91562
bas_acres	108.46
own1	GAREY WILEY R - LIFE
addr1	RD 4 BOX 192
cityname	CAMERON
statecode	WV
zip1	26033
legal	108.46 A FORK RIDGE
addrstr	FORK
book	0602
page	0103
calc_acres	108.460000000
aprland	16890.0000000
blgval	32800.0000000
nbhd	0470
gis_acres	101.109273018278

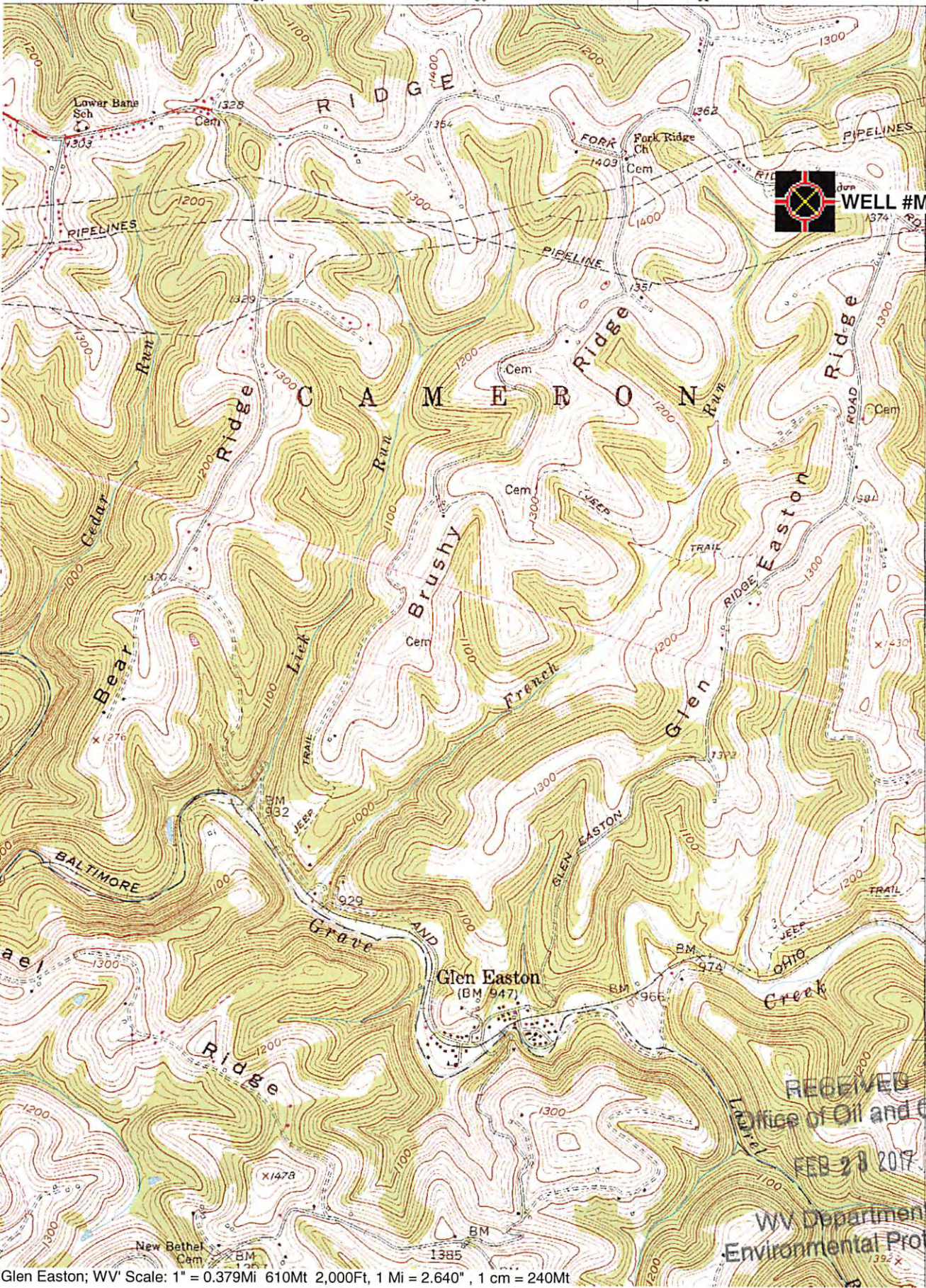


5101096P

GLEN EASTON QUADRANGLE  
WEST VIRGINIA—MARSHALL CO.  
7.5 MINUTE SERIES (TOPOGRAPHIC)  
SW/4 CAMERON 15' QUADRANGLE

4883' N.E.  
(MAJORSVILLE)

528 40' 529 530 1 680 000 FEET 531 80° 37' 30" 39° 52' 30"



WELL #MC-43

RECEIVED  
Office of Oil and Gas  
FEB 28 2017

WV Department of  
Environmental Protection  
03/24/2017

'Glen Easton; WV' Scale: 1" = 0.379Mi 610Mt 2,000Ft, 1 Mi = 2.640" , 1 cm = 240Mt

WW-7  
8-30-06



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

API: 47-051-01096 WELL NO.: MC-43

FARM NAME: Peter Crow

RESPONSIBLE PARTY NAME: Consolidation Coal Company

COUNTY: Marshall DISTRICT: Cameron

QUADRANGLE: Glen Easton, WV

SURFACE OWNER: Wiley R. Garey (Life) c/o Paul Garey

ROYALTY OWNER: \_\_\_\_\_

UTM GPS NORTHING: 4,413,079 m

UTM GPS EASTING: 531,551 m GPS ELEVATION: 394 m (1293')

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:

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

Survey grade GPS X: Post Processed Differential \_\_\_\_\_  
Real-Time Differential X

Mapping Grade GPS \_\_\_\_\_: Post Processed Differential \_\_\_\_\_  
Real-Time Differential \_\_\_\_\_

- 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.

[Signature]  
Signature

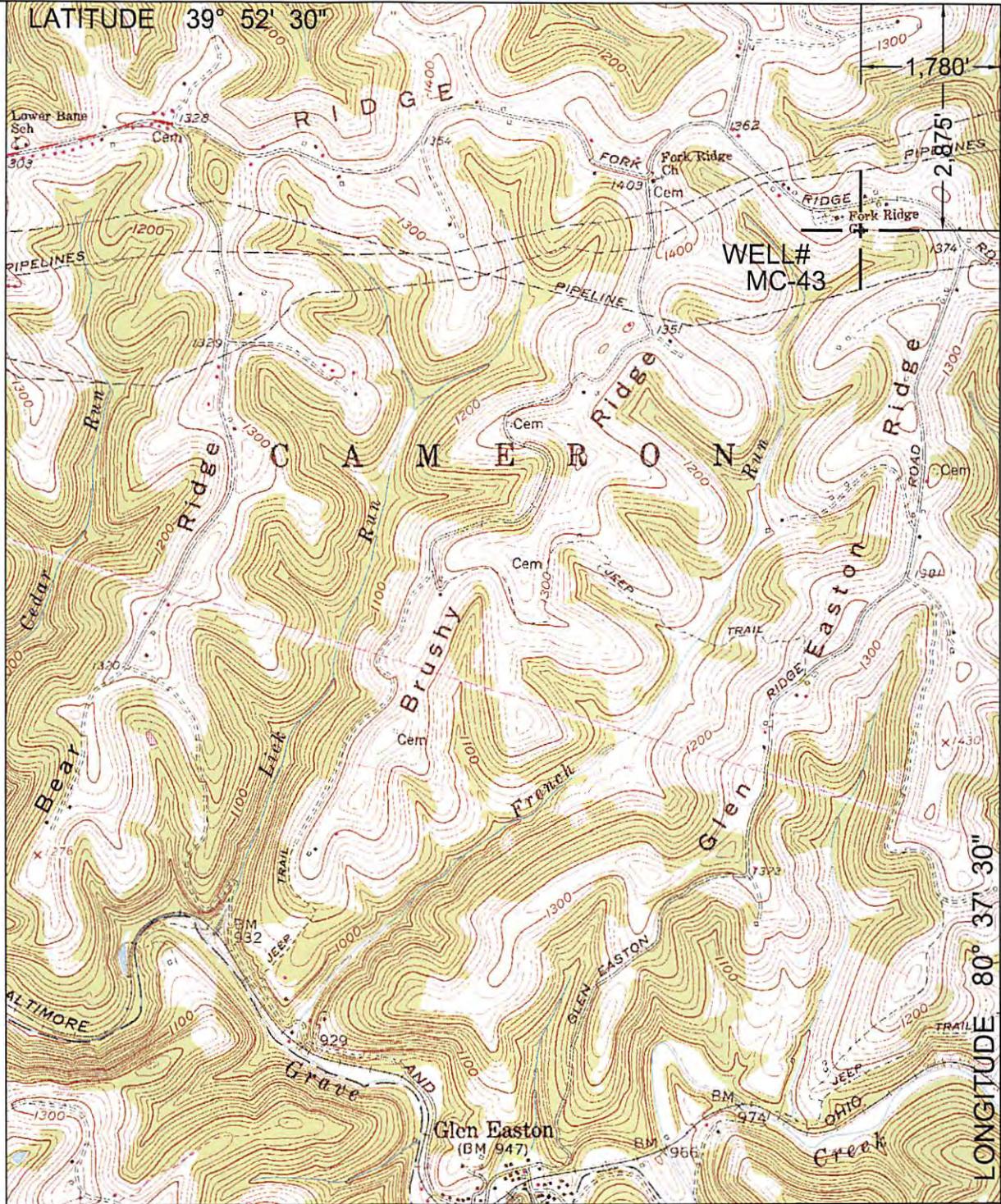
February 16, 2017  
Date

Professional Surveyor  
Title  
WV Department of Environmental Protection

RECEIVED  
Office of Oil and Gas  
FEB 23 2017

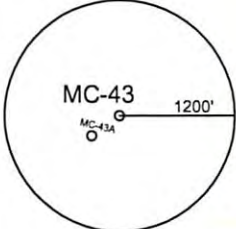
5101096P

FORM WW 6



NORTH

SURROUNDING WELLS WITHIN 1200' RADIUS



UTM ZONE 17N NAD83 CONUS	LAT/LONG NAD27 CONUS
NORTHING 4,413,079 METERS	39° 52' 01.5" N
EASTING 531,551 METERS	80° 37' 52.7" W

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT 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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.  
 P.S. 2002



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
 DATE FEBRUARY 16, 20 17  
 OPERATORS WELL NO. MC-43  
 API WELL NO. 47  
 STATE COUNTY PERMIT 01906 c P

MINIMUM DEGREE OF ACCURACY: 1 / 2500  
 FILE NO.: CAMERON 1.DWG  
 SCALE: 1"=2000'  
 PROVEN SOURCE OF ELEVATION: GPS METADATA OR COMPANY NETWORK TIED INTO U.S.G.S.

WV DEP  
 OFFICE OF OIL AND GAS  
 601 57TH ST., CHARLESTON, WV 25304  
 WV Department of Environmental Protection



WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  "GAS" PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION: ELEVATION: 1292.57' WATERSHED: FRENCH RUN OF GRAVE CREEK  
 DISTRICT: CAMERON COUNTY: MARSHALL QUADRANGLE: GLEN EASTON, WV 7.5'  
 SURFACE OWNER: WILEY R. GAREY (LIFE) C/O PAUL GAREY ACREAGE: 108.46± ACRES  
 ROYALTY OWNER: LEASE ACREAGE: LEASE NO.: 03/24/2017  
 PROPOSED WORK: DRILL: CONVERT: DRILL DEEPER: REDRILL: FRACTURE OR STIMULATE: PLUG OFF OLD:  
 FORMATION: PERFORATE NEW FORMATION: PLUG AND ABANDON: X CLEAN OUT AND REPLUG: OTHER:  
 PHYSICAL CHANGE IN WELL (SPECIFY): TARGET FORMATION: NONE ESTIMATED DEPTH:

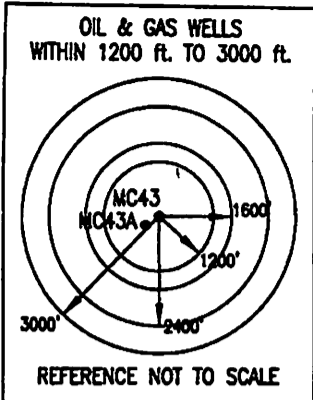
WELL OPERATOR: CONSOLIDATION COAL COMPANY DESIGNATED AGENT: RONNIE HARSH  
 ADDRESS: 6126 ENERGY DRIVE, MOUNDSVILLE WV 26041 ADDRESS: 6126 ENERGY DRIVE, MOUNDSVILLE WV 26041

COUNTY NAME PERMIT

5101096P

LATITUDE 39°52'30"

LONGITUDE 80°37'30"

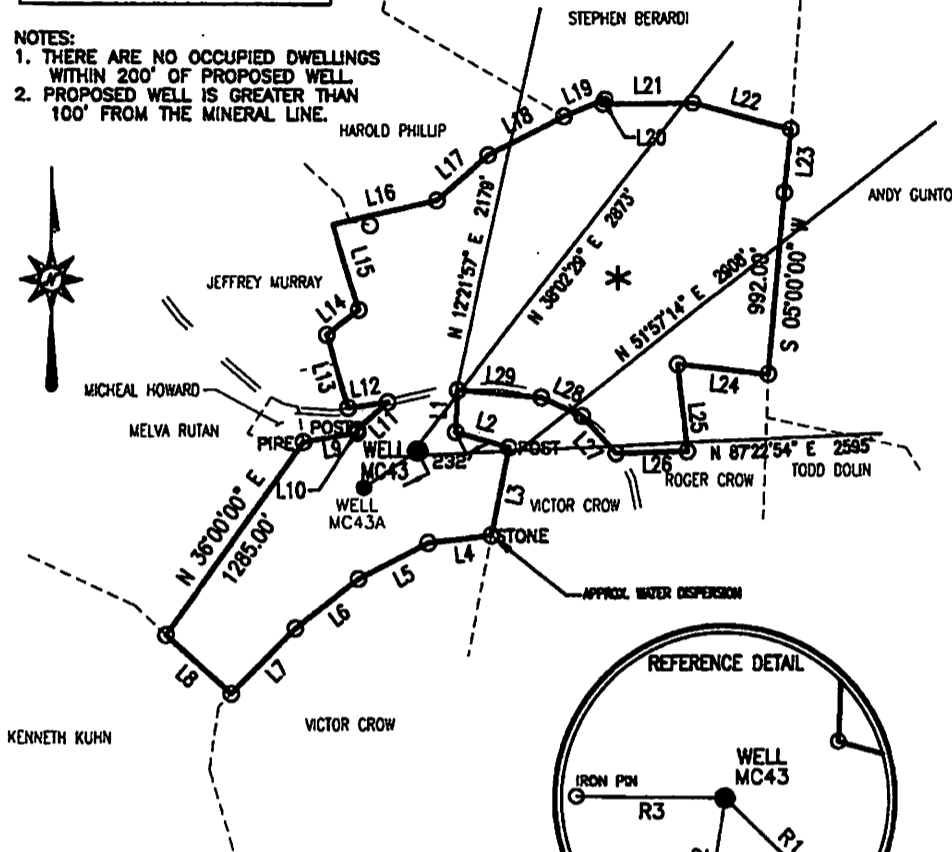


\*  
PAUL GAREY, GERALD GAREY  
AND LOIS GAREY-MONINGER  
TM/PAR 10/10  
DB/PG 602/104  
54.14 ACRES ±

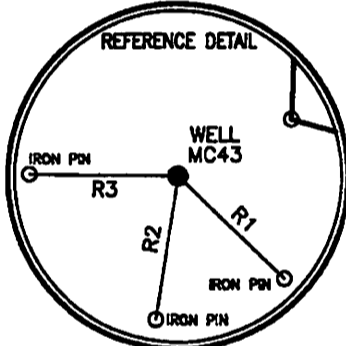
COORDINATES:  
1,714' WEST (80°37'51.28")  
2,883' SOUTH (39°52'02.11")

NOTES:

1. THERE ARE NO OCCUPIED DWELLINGS WITHIN 200' OF PROPOSED WELL.
2. PROPOSED WELL IS GREATER THAN 100' FROM THE MINERAL LINE.



LINE	BEARING	DISTANCE
L1	S 02°48'00" W	228.00'
L2	S 73°49'00" E	308.72'
L3	S 11°15'55" W	486.59'
L4	S 83°49'44" W	351.49'
L5	S 63°19'00" W	428.00'
L6	S 52°47'00" W	438.00'
L7	S 44°42'00" W	496.50'
L8	N 48°35'00" W	481.00'
L9	N 80°35'00" E	303.50'
L10	N 08°40'00" W	16.00'
L11	N 48°00'00" E	226.00'
L12	S 81°35'00" W	219.00'
L13	N 17°00'00" W	413.00'
L14	N 52°46'07" E	222.35'
L15	N 17°00'00" W	488.00'
L16	N 77°00'00" E	585.00'
L17	N 49°00'00" E	375.00'
L18	N 62°30'00" E	466.00'
L19	N 67°18'44" E	245.50'
L20	S 26°15'00" W	27.50'
L21	N 89°35'00" E	494.00'
L22	S 75°15'00" E	561.00'
L23	S 05°47'18" W	350.93'
L24	N 84°02'08" W	502.09'
L25	S 06°26'00" E	480.00'
L26	S 88°59'53" W	392.14'
L27	N 42°31'07" W	277.81'
L28	N 65°55'00" W	245.00'
L29	N 85°00'00" W	463.00'



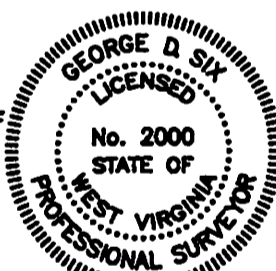
REFERENCE LINES		
LINE	BEARING	DISTANCE
R1	S 46°17'17" E	268.79'
R2	S 09°01'52" W	262.30'
R3	N 88°57'42" W	272.86'



**Blue Mountain Engineering**  
11023 MASON DIXON HIGHWAY  
BURTON, WV 28562  
PHONE: (304) 662-6486

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT 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 DEPARTMENT OF ENERGY.

P.S.  
No. 2000



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

DATE NOVEMBER 8 20 07  
OPERATOR'S WELL NO. MC43  
API WELL NO. 47-051-01096C  
STATE            COUNTY            PERMIT           

MINIMUM DEGREE OF ACCURACY: 1/2500 FILE No.: MC43

SCALE: 1" = 1,000'

PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT - THOMAS 1498.81'

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



WELL TYPE: OIL            GAS X LIQUID INJECTION            WASTE DISPOSAL            "GAS" PRODUCTION X STORAGE            DEEP            SHALLOW X

LOCATION: ELEVATION: 1293.52' WATERSHED: FRENCH RUN

DISTRICT: CAMERON COUNTY: MARSHALL QUADRANGLE: GLEN EASTON, WV 7.5'

SURFACE OWNER: PAUL GAREY, GERALD GAREY AND LOIS GAREY-MONINGER ACREAGE: 54.14±

ROYALTY OWNER: SEE ATTACHED LEASE ACREAGE:           

PROPOSED WORK:            LEASE No.:           

DRILL: X CONVERT:            DRILL DEEPER:            REDRILL:            FRACTURE OR STIMULATE:            PLUG OFF OLD:           

FORMATION:            PERFORATE NEW FORMATION:            PLUG AND ABANDON:            CLEAN OUT AND REPLUG:            OTHER:           

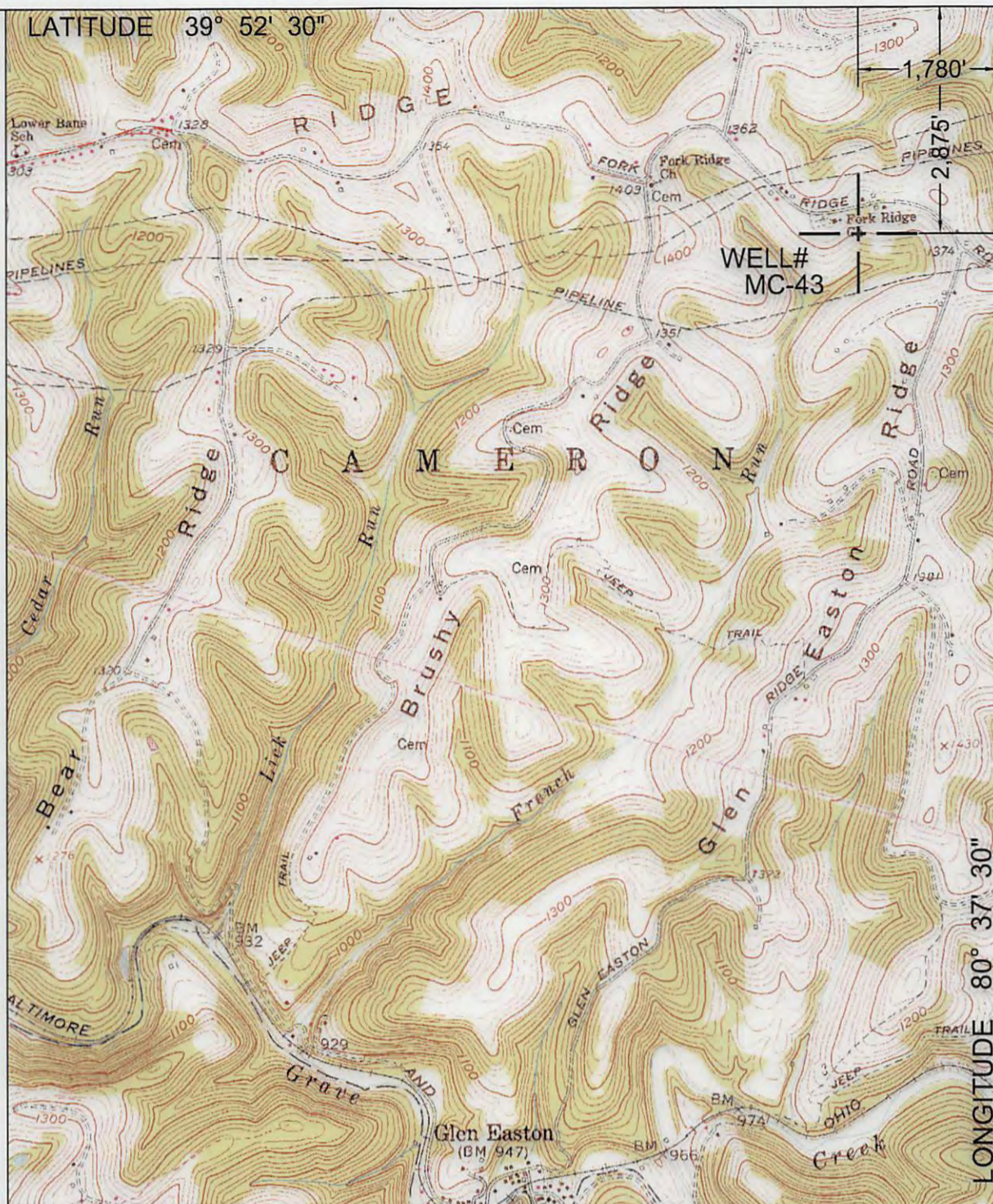
PHYSICAL CHANGE IN WELL (SPECIFY): NONE TARGET FORMATION: PITTSBURGH

ESTIMATED DEPTH: 1101'±

WELL OPERATOR: CNX Gas Company LLC DESIGNATED AGENT: JOHN H. JOHNSTON  
ADDRESS: 2481 JOHN NASH BLVD., BLUEFIELD, WV 24701 ADDRESS: BANK ONE CENTER, PO BOX 1588, CHARLESTON, WV 25326-1598

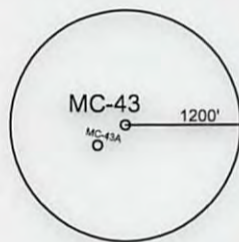
03/24/2017

LATITUDE 39° 52' 30"



NORTH

SURROUNDING WELLS WITHIN 1200' RADIUS



LONGITUDE 80° 37' 30"

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PROVEN SOURCE OF ELEVATION: GPS METADATA OR COMPANY NETWORK TIED INTO U.S.G.S.

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ADDRESS: 6126 ENERGY DRIVE, MOUNDSVILLE WV 26041 ADDRESS: 6126 ENERGY DRIVE, MOUNDSVILLE WV 26041

COUNTY NAME PERMIT