



west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Wednesday, July 11, 2018
WELL WORK PERMIT
Vertical / New Drill

KEYROCK ENERGY LLC
PO BOX 2223

JOHNSON CITY, TN 37605

Re: Permit approval for SPENCER 1
47-011-01001-00-00

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: SPENCER 1
Farm Name: THEADORE A. & KELLIE D. S.
U.S. WELL NUMBER: 47-011-01001-00-00
Vertical New Drill
Date Issued: 7/11/2018

PERMIT CONDITIONS

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

CONDITIONS

1. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code §22-6-20, which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
2. Pursuant to 35 CSR 4-19.1.a, at the request of the surface owner all water wells or springs within 1000 feet of the proposed well that are actually utilized for human consumption, domestic animals or other general use shall be sampled and analyzed.
3. Pursuant to 35 CSR 4-19.1.c, if the operator is unable to sample and analyze any water well or spring with one thousand (1,000) feet of the permitted well location, the Office of Oil and Gas requires the operator to sample, at a minimum, one water well or spring located between one thousand (1,000) feet and two thousand (2,000) feet of the permitted well location.
4. All pits must be lined with a minimum of 20 mil thickness synthetic liner.
5. 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.
6. During the surface casing and cementing process, in the event cement does not return to the surface, or any other casing string that is permitted to circulate cement to the surface and does not return to the surface, the oil and gas inspector shall be notified within twenty-four (24) hours.
7. Well work activities shall not constitute a hazard to the safety of persons.
8. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Keyrock Energy LLC 494507629 Cabell Grant Milton 7.5'
 _____ Operator ID County District Quadrangle

2) Operator's Well Number: Spencer No. 1 3) Elevation: 601'

4) Well Type: (a) Oil or Gas _____
 (b) If Gas: Production / Underground Storage _____
 Deep _____ / Shallow

5) Proposed Target Formation(s): Lower Huron Proposed Target Depth: 3,400'

6) Proposed Total Depth: 3,450' Feet Formation at Proposed Total Depth: Lower Huron

7) Approximate fresh water strata depths: No fresh water expected below 600'

8) Approximate salt water depths: Salt Sand at 1,300'

9) Approximate coal seam depths: No coal expected below 600'

10) Approximate void depths,(coal, Karst, other): None

11) Does land contain coal seams tributary to active mine? No

12) Describe proposed well work and fracturing methods in detail (attach additional sheets if needed)

Drill and stimulate using a foam frac for a new well (estimated using 40k lbs. foam frac).

Will not produce from the Marcellus Formation.

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13) **CASING AND TUBING PROGRAM**

| TYPE | SPECIFICATIONS | | | FOOTAGE | INTERVALS | CEMENT |
|--------------|----------------|-------|---------------|------------------|------------------|------------------|
| | Size | Grade | Weight per ft | | | |
| Conductor | 13 3/8" | | | For Drilling 30' | Left in Well 30' | 15 Cu. Ft., CTS |
| Fresh Water | 9 5/8" | | | 590' | 590' | 165 Co. Ft., CTS |
| Coal | | | | | | |
| Intermediate | | | | | | |
| Production | 4 1/2" | | | 3,300' | 3,300' | 323 Cu. Ft., CTS |
| Tubing | 2 3/8" | | | 3,250' | 3,250' | Per WV DEP Rule |
| Liners | | | | | | |

Packers: Kind: _____
 Sizes: _____
 Depths Set _____ *AF. 6-6-2018*



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STATE OF WEST VIRGINIA
DEPARTMENT OF MINES

OIL & GAS DIVISION
DEPT. OF MINES

Oil and Gas Division

WELL RECORD 4

Quadrangle Milton 7 1/2

Permit No. Cab - 598

Rotary _____ Oil _____
Cable X Gas _____
Recycling _____ Comb. _____
Water Flood _____ Storage _____
Disposal _____ DRY
(Kind)

Company SPARTAN GAS COMPANY
Address P. O. Box 766, Charleston, WV
Farm James E. Lewis Acres 144
Location (waters) Little Fudges Creek
Well No. 1 - S - 197 Elev. 712.19
District Grant County Cabell
The surface of tract is owned in fee by _____
James E. Lewis
Address Barboursville, WV
Mineral rights are owned by Same
Address _____
Drilling Commenced 7-7-78
Drilling Completed 8-31-78
Initial open flow Show cu. ft. _____ bbls.
Final production Dry cu. ft. per day _____ bbls.
Well open _____ hrs. before test NA RP.
Well treatment details:

| Casing and Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. (Sks.) |
|-------------------|------------------|--------------|-------------------------------|
| Size 20-16 | | | To surface |
| Cond. 18-10" | 20' | 20' | |
| 9 5/8 | | | |
| 8 5/8 | 456' | 456' | |
| 7 | 1,950' | -- | |
| 5 1/2 | | | |
| 4 1/2 | | | |
| 3 | | | |
| 2 | | | |
| Liners Used | | | |

Attach copy of cementing record.

Shot from 3,140 to 3,520 feet with 4,000 Gelatin

Coal was encountered at _____ Feet _____ Inches
Fresh water 70' Feet _____ Salt Water _____ Feet _____
Producing Sand _____ Depth _____

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | * Remarks |
|-----------|-------|--------------|----------|-------------|-------------------|-----------------|
| Surface | | | 0 | 12 | | |
| Slate | | | 12 | 50 | | |
| Red Rock | | | 50 | 85 | | Water at 70' |
| Slate | | | 85 | 130 | | " 710' 4 BPH |
| Sand | | | 130 | 205 | | " 900' HFW |
| | | | | | | Oil 2,363' Show |
| Red Rock | | | 205 | 212 | | |
| Slate | | | 212 | 250 | | |
| Red Rock | | | 250 | 270 | | |
| Slate | | | 270 | 400 | | |
| Red Rock | | | 400 | 415 | | |
| Slate | | | 415 | 700 | | |
| Sand | | | 700 | 790 | | |
| Slate | | | 790 | 1100 | | |
| Sand | | | 1100 | 1140 | | |
| Slate | | | 1140 | 1218 | | |
| Sand | | | 1218 | 1358 | | |
| Slate | | | 1358 | 1372 | | |
| Sand | | | 1372 | 1420 | | |
| Slate | | | 1420 | 1454 | | |
| Lime | | | 1454 | 1510 | | |

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* Indicates Electric Log tops in the remarks section.

(over)

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | * Remarks |
|-------------|-------|--------------|----------|-------------|-------------------|-----------|
| Slate | | | 1510 | 1528 | | |
| Red Rock | | | 1528 | 1532 | | |
| Lime | | | 1532 | 1542 | | |
| Slate | | | 1542 | 1565 | | |
| Little Lime | | | 1565 | 1585 | | |
| Big Lime | | | 1585 | 1755 | | |
| Injun Sand | | | 1755 | 1785 | | |
| Slate | | | 1785 | 1818 | | |
| Slate-Shell | | | 1818 | 1826 | | |
| Sand | | | 1826 | 1910 | | |
| Slate-Shell | | | 1910 | 2345 | | |
| Brown Shale | | | 2345 | 2355 | | |
| Berea Grit | | | 2355 | 2378 | | |
| Slate Lime | | | 2378 | 2770 | | |
| Brown Shale | | | 2770 | 2875 | | |
| Slate | | | 2875 | 3160 | | |
| Brown Shale | | | 3160 | 3205 | | |
| Slate-Shell | | | 3205 | 3250 | | |
| Brown Shale | | | 3250 | 3500 | | |
| Slate | | | 3500 | 3523 | | |
| TOTAL DEPTH | | | 3523 | | | |

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WV Department of
Environmental Protection

Date September 13,

19 78

APPROVED SPARTAN GAS COMPANY

By

William J. [Signature]

(1)(c)

Owner



STATE OF WEST VIRGINIA
DEPARTMENT OF MINES

Oil and Gas Division

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OIL & GAS DIVISION
DEPT. OF MINES

OIL AND GAS WELL PERMIT APPLICATION

TO THE DEPARTMENT OF MINES,
Charleston, W. Va.

DATE June 29, 1978

Surface Owner James E. Lewis
Address Barboursville, WV
Mineral Owner Same
Address _____
Coal Owner Same
Address _____
Coal Operator None
Address _____

Company SPARTAN GAS COMPANY
Address P. O. Box 766, Charleston, WV
Farm James E. Lewis Acres 145
Location (waters) Little Fudges Creek
Well No. 1-S-107 Elevation 712.19
District Grant County Cabell
Quadrangle Milton 7 1/2'

THIS PERMIT MUST BE POSTED AT THE WELL SITE

All provisions being in accordance with Chapter 22, of the W. Va. Code, the location is hereby approved for drilling. This permit shall expire if operations have not commenced by 10-30-78.

INSPECTOR TO BE NOTIFIED Kenneth Butcher
ADDRESS Barboursville, W. Va.
PHONE 736-4885

Robert E. Hill
Deputy Director - Oil & Gas Division

GENTLEMEN:

The undersigned well operator is entitled to drill upon the above named farm or tract of land for oil and gas, having fee title thereto, (or as the case may be) under grant or lease dated May 10 1978 by James E. Lewis made to Spartan Gas Company and recorded on the 19 day of May 1978, in Cabell County, Book 231 Page 144

NEW WELL DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 OIL AND GAS WELL ORIGINALLY DRILLED BEFORE JUNE 5, 1969.

The enclosed plat was prepared by a registered engineer or licensed land surveyor and all coal owners and/or operators have been notified as of the above date.

The above named coal owners and/or operator are hereby notified that any objection they wish to make, or are required to make by Section 3 of the Code, must be received by, or filed with the Department of Mines within ten (10) days. *

Copies of this notice and the enclosed plat were mailed by registered mail, or delivered to the above named coal operators or coal owners at their above shown respective address _____ day _____ before, or on the same day with the mailing or delivery of this copy to the Department of Mines at Charleston, West Virginia.

PLEASE SUBMIT COPIES OF ALL GEOPHYSICAL LOGS DIRECTLY TO:

WEST VIRGINIA GEOLOGICAL AND ECONOMIC SURVEY
P. O. BOX 879
MORGANTOWN, WEST VIRGINIA 26505
AC-304 - 292-6331

Very truly yours, SPARTAN GAS COMPANY
(Sign Name) By: _____
Well Operator

Address of Well Operator

P. O. Box 766 Street
Charleston City or Town
West Virginia State
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JUN 06 2018
WV Department of Environmental Protection

BLANKET BOND

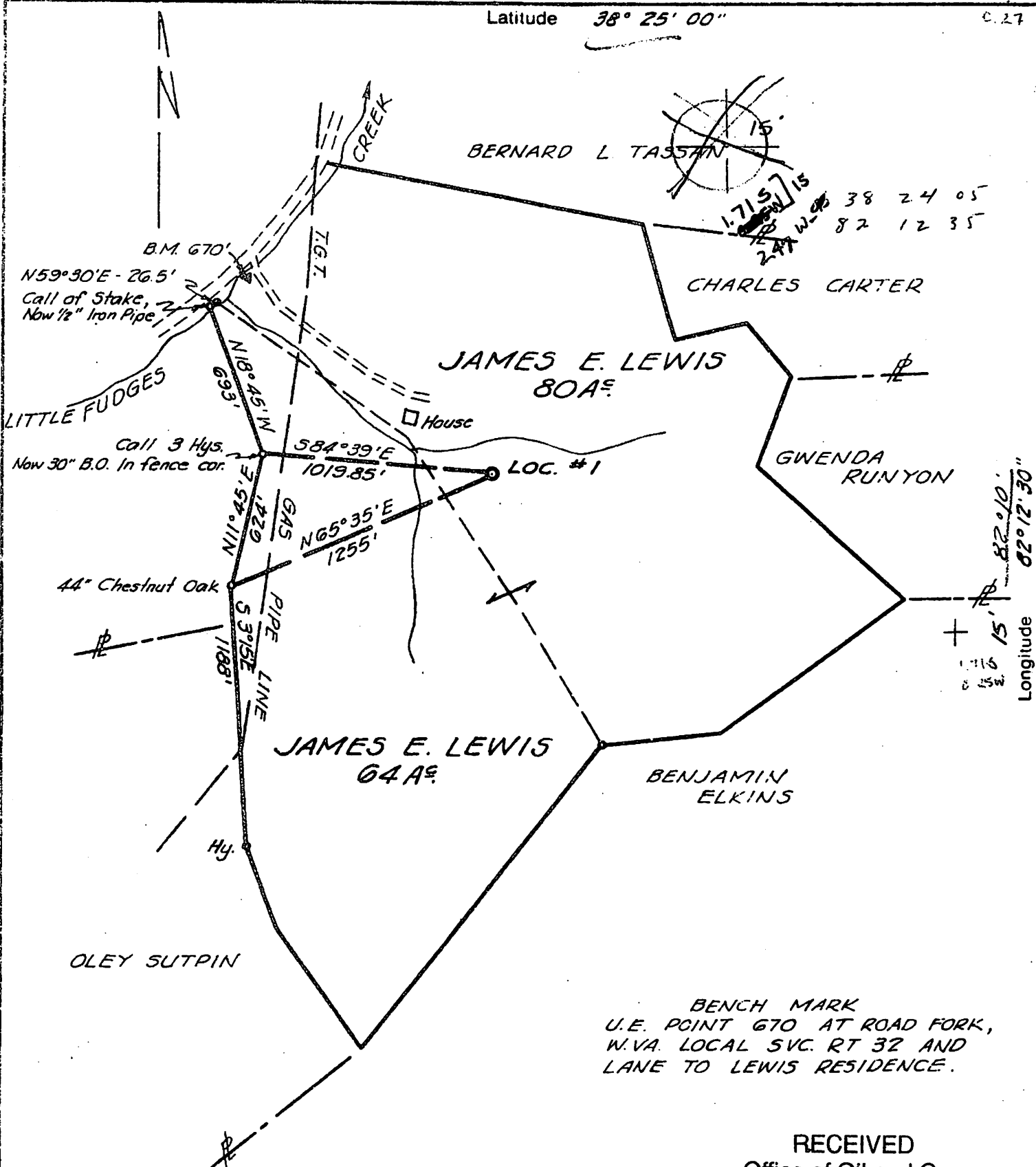
*SECTION 3 If no objections are filed or found by the Department of mines, within said period of ten days from the receipt of notice and plat by the department of mines, to said proposed location, the department shall forthwith issue to the well operator a permit reciting the filing of such plat, that no objections have been made by the coal operators or found thereto by the department and that the same is approved and the well operator authorized to proceed.

CAB-598 PERMIT NUMBER

47-011

"I have read and understand the reclamation requirements as set forth in Chapter 22, Article 4, Section 12-b and will carry out the specified requirements."

Signed by _____



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Office of Oil and Gas

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"I, the undersigned, hereby certify that this map is correct to the best of my knowledge and belief and shows all the information required by the rules and regulations of the oil and gas section of the mining laws of West Virginia. Minimum degree of accuracy is one part in 200"

SURVEYOR'S REG. NO. 259

WV Department of Environmental Protection
Signed _____

- New Location
- Storage
- Drill Deeper
- Abandonment
- Re-Drill/Fracture

Company SPARTAN GAS COMPANY
 Address CHARLESTON, W. VA.
 Farm JAMES E. LEWIS
 Lease 80 of 144 Acres
 Well Farm No. 1 Ser. No. 5-197
 Elevation - Spirit Level 712.19'
 Quadrangle MILTON 7 1/2 15'
 Township or District GRANT
 County CABELL
 Sec., Lot, Gr. _____ T _____ R _____
 Coordinates _____
 File No. 1-43 Dwg. No. _____
 Date JUNE 27, 1978 Scale 1" = 600'

WELL LOCATION MAP
STATE OF WEST VIRGINIA

(+) Denotes Values Of Well On United States Topographic Maps

CAB-598 P

Scale 15' 7 1/2'

47-011 JUL 13 1978

WW-2A
(Rev. 6-14)

1). Date: 5/8/2018
2.) Operator's Well Number Spencer No. 1
State County Permit
3.) API Well No.: 47- Cabell -

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE AND APPLICATION FOR A WELL WORK PERMIT

4) Surface Owner(s) to be served:
(a) Name Theodore A. Spencer
Address 596 Fudges Creek Rd.
Barboursville, WV 25504
(b) Name _____
Address _____
(c) Name _____
Address _____
5) (a) Coal Operator
Name n/a
Address _____
(b) Coal Owner(s) with Declaration
Name n/a
Address _____
(c) Coal Lessee with Declaration
Name n/a
Address _____
6) Inspector Allen Flowers
Address 165 Grassy Lick Ln.
Liberty, WV 25124
Telephone 304-552-8308

TO THE PERSONS NAMED ABOVE TAKE NOTICE THAT:

Included is the lease or leases or other continuing contract or contracts by which I hold the right to extract oil and gas
OR

_____ Included is the information required by Chapter 22, Article 6, Section 8(d) of the Code of West Virginia (see page 2)

I certify that as required under Chapter 22-6 of the West Virginia Code I have served copies of this notice and application, a location plat, and accompanying documents pages 1 through all on the above named parties by:

- _____ Personal Service (Affidavit attached)
- Certified Mail (Postmarked postal receipt attached)
- _____ Publication (Notice of Publication attached)

I have read and understand Chapter 22-6 and 35 CSR 4, and I agree to the terms and conditions of any permit issued under this application.

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, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.



Well Operator Keyrock Energy LLC
By: Morgan Pabe
Its: Geologist
Address: PO Box 2223, 207 E. Main St., Suite 2-D
Johnson City, TN 37605
Telephone: 423-726-2070
Email: _____

Subscribed and sworn before me this 30th day of May

Sharon G. Bullock Notary Public
My Commission Expires MARCH 30, 2019

Oil and Gas Privacy Notice RECEIVED
Office of Oil and Gas
JUN 06 2018

**ACCESS ROAD OWNERS
FOR
KEYROCK ENERGY, LLC
WELL SPENCER 1**

SURFACE OWNERS OF ACCESS ROAD FOR PROPOSED WELL SITE:

**Theadore A. & Kelli D. Spencer
596 Fudges Creek Rd.
Barboursville, WV 25504**

WW-2A1
(Rev. 1/11)

Operator's Well Number Spencer No. 1

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6, Section 8(d)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

| Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Book/Page |
|--|-----------------------|---------|-----------|
| Theadore A. Spencer and Kellie D. Spencer, or survivor | Keyrock Energy LLC | 1/8 | 393/422 |

**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources
- WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

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The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further that any additional permits/approvals should be acquired from the appropriate authority before the affected protection is initiated.

Well Operator: Christopher Shea
 By: Its: Morgan Pak
Keyrock Energy LLC
Operations Manager Geologist

WV Department of
Environmental Protection

WW-2B1
(5-12)

Well No. Spencer No. 1

West Virginia Department of Environmental Protection
Office of Oil and Gas

NOTICE TO SURFACE OWNERS

The well operator named below is preparing to file for a permit from the state to drill a new well. Before a well work permit can be filed with the Chief of the Office of Oil and Gas, the well operator is required to have given notice of the right to request water well or spring analytical testing. This notice shall be given to the owners or occupants of land which have a water well or spring being utilized for human consumption, domestic animals, or other general use and which is located within 1000 feet of the proposed well site.

With this form, the operator is giving you notice of your right to request analytical testing. The operator is required to sample and analyze the water wells or springs of all owners or occupants who request it. Therefore, if you wish to have your water well or spring tested, contact the operator named below.

All sampling shall be completed prior to drilling. Within thirty (30) days of the receipt of such sample analyses the operator shall submit the results to the Chief of the Office of Oil and Gas and to the owners or occupants who may have requested them.

Be advised, you have the right to sample and analyze any water supply at your own expense.

Listed below is the laboratory chosen by operator to perform analysis, and contractor chosen to collect sample.

Certified Laboratory Name Pace Analytical
Sampling Contractor True Line Surveying

Well Operator Keyrock Energy LLC
Address PO Box 2223, 207 E. Main St., Suite 2-D
Johnson City, TN 37605
Telephone 423-726-2070

FOR OPERATOR'S USE ONLY: Below, or on an attached page, list those persons which were given this notice. Place an asterisk beside the one(s) that contacted you and requested sampling and analyses. If there were no requests made, indicate by underling which one you have selected to sample and analyze. If there are no water wells or springs within 1000 feet of the proposed site, the Chief may require the operator to test wells up to 2000 feet from the proposed site.

SEE ATTACHED WATER NOTICE.

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Office of Oil and Gas
JUN 06 2018
WV Department of
Environmental Protection

WATER NOTICE
FOR
KEYROCK ENERGY, LLC
WELL SPENCER 1

WATER SOURCES IDENTIFIED WITHIN 1,000' OF PROPOSED WELL SITE:

Theadore A. & Kelli D. Spencer
596 Fudges Creek Rd.
Barboursville, WV 25504
304 743-1100

Otelia A Huffman Dotts
1635 Simonton Dr.
Statesville NC 28625

Bruce & Cristi Wetherholt
538 Fudges Creek Rd.
Barboursville, WV 25504

ONE OF THESE SOURCES MUST BE SAMPLED AND TESTED.
RESULTS OF TESTING MUST BE SENT TO WATER SOURCE
OWNER AND THE OFFICE OF OIL & GAS WITHIN 30
DAYS OF RECEIVING THE WATER TEST RESULTS.

Jm/m

WW-9
(5/16)

API Number 47 - Cabell - _____
Operator's Well No. Spencer No. 1

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

Operator Name Keyrock Energy LLC OP Code 494507629

Watershed (HUC 10) Fudges Creek Quadrangle Milton 7.5'

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

Will a pit be used? Yes No

If so, please describe anticipated pit waste: Drill water and cement cuttings

Will a synthetic liner be used in the pit? Yes No If so, what ml.? 20ml.

Proposed Disposal Method For Treated Pit Wastes:

- Land Application (if selected provide a completed form WW-9-GPP)
- Underground Injection (UIC Permit Number _____)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain _____)

Will closed loop system be used? If so, describe: No

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

-If oil based, what type? Synthetic, petroleum, etc. n/a

Additives to be used in drilling medium? n/a

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

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

-Landfill or offsite name/permit number? _____

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

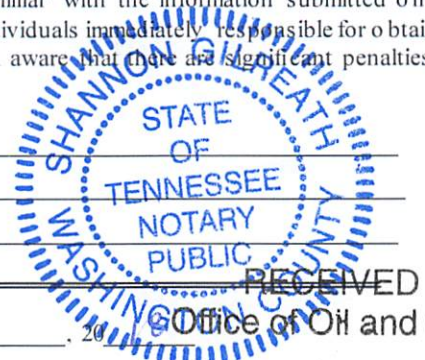
I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on April 1, 2016, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations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

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature _____

Company Official (Typed Name) Christopher Shea Morgan Pak

Company Official Title Operations Manager Geologist



Subscribed and sworn before me this 30th day of MAY, 2018

Shannon Greathouse

Notary Public JUN 06 2018

My commission expires MARCH 30, 2019

Form WW-9

Operator's Well No. Spencer No. 1

Proposed Revegetation Treatment: Acres Disturbed < 1.5 acres Prevegetation pH 6.2

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20 or equivalent

Fertilizer amount 1/3 ton lbs/acre

Mulch Hay 2 Tons/acre

Seed Mixtures

Temporary

Permanent

| Seed Type | lbs/acre | Seed Type | lbs/acre |
|----------------------|-----------|----------------------|-----------|
| <u>KY-31</u> | <u>40</u> | <u>Orchard Grass</u> | <u>15</u> |
| <u>Alsike Clover</u> | <u>5</u> | <u>Alsike Clover</u> | <u>5</u> |
| <u>Annual Rye</u> | <u>15</u> | | |

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: A M W Flowers

Comments:

24 H. notice for site construction.
mulch & reseed. per COG regulation.

Title: State Inspector

Date: 5-28-2018

Field Reviewed? Yes No

Office of Oil and Gas

JUN 06 2018

WV Department of Environmental Protection

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

Operator Name: Keyrock Energy LLC

Watershed (HUC 10): Fudges Creek Quad: Milton 7.5'

Farm Name: Theadore A. & Kellie D. Spencer

- 1. List the procedures used for the treatment and discharge of fluids. Include a list of all operations that could contaminate the groundwater.

Pit water will be tested, then aerated with lime being added to bring the ph to 7.0 plus. In the event of excessive chlorides, the pit fluids will be evaluated to either dilute with fresh water or hauled to an approved disposal facility. Pit water will sit a minimum of ten days to let the solids drop out.

- 2. Describe procedures and equipment used to protect groundwater quality from the list of potential contaminant sources above.

Once the drilling pit fluids are at acceptable levels for discharge then teh pumps intake line will be floated approximately 12" below the water level and teh discharge line will be set up

- 3. List the closest water body, distance to closest water body, and distance from closest Well Head Protection Area to the discharge area.

FUDGES CREEK ABOUT 120 FEET FROM LOCATION'S EDGE.

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

n/a

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

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JUN 06 2018
WV Department of
Environmental Protection

WW-9- GPP
Rev. 5/16

Page 2 of 2
API Number 47 - Cabell - _____
Operator's Well No. Spencer No. 1

No known groundwater quality data. Samples have been offered for non-public water sources within 1,000' of the proposed well

6. Provide a statement that no waste material will be used for deicing or fill material on the property.

No waste material will be used for deicing of fill material on the property.

7. Describe the groundwater protection instruction and training to be provided to the employees. Job procedures shall provide direction on how to prevent groundwater contamination.

All employees will be familiar with the contents of the groundwater protection plan and how to implement it. Work practices will support the protection of groundwater from contamination per company HSE Policy.

8. Provide provisions and frequency for inspections of all GPP elements and equipment.

All GPP elements and equipment present will be inspected daily prior to use and in the event of a problem. Work will not commence until any problems are remediated and documented.

Signature: 

Date: _____

RECEIVED
Office of Oil and Gas

JUN 06 2018

WV Department of
Environmental Protection

**KEYROCK ENERGY LLC**

June 27, 2016

West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th St. SE
Charleston, WV 25304

ATTACHMENT TO ADDRESS LAND APPLICATION OF PIT FLUIDS

Re: Proposed Spencer #1 Permit Application

To whom it may concern:

Keyrock Energy has requested a permit to drill the Spencer #1 well location, which includes a pit capable of holding approximately 4,800 bbls. Due to surface constraints, our proposed land application area is inadequate in size to land apply the total pit volume in one application. We propose applying no more than 1,000 bbls from our pit to the proposed land application area at one time. Furthermore, we will wait a minimum of 30 days before applying additional fluids from our pit to the application area.

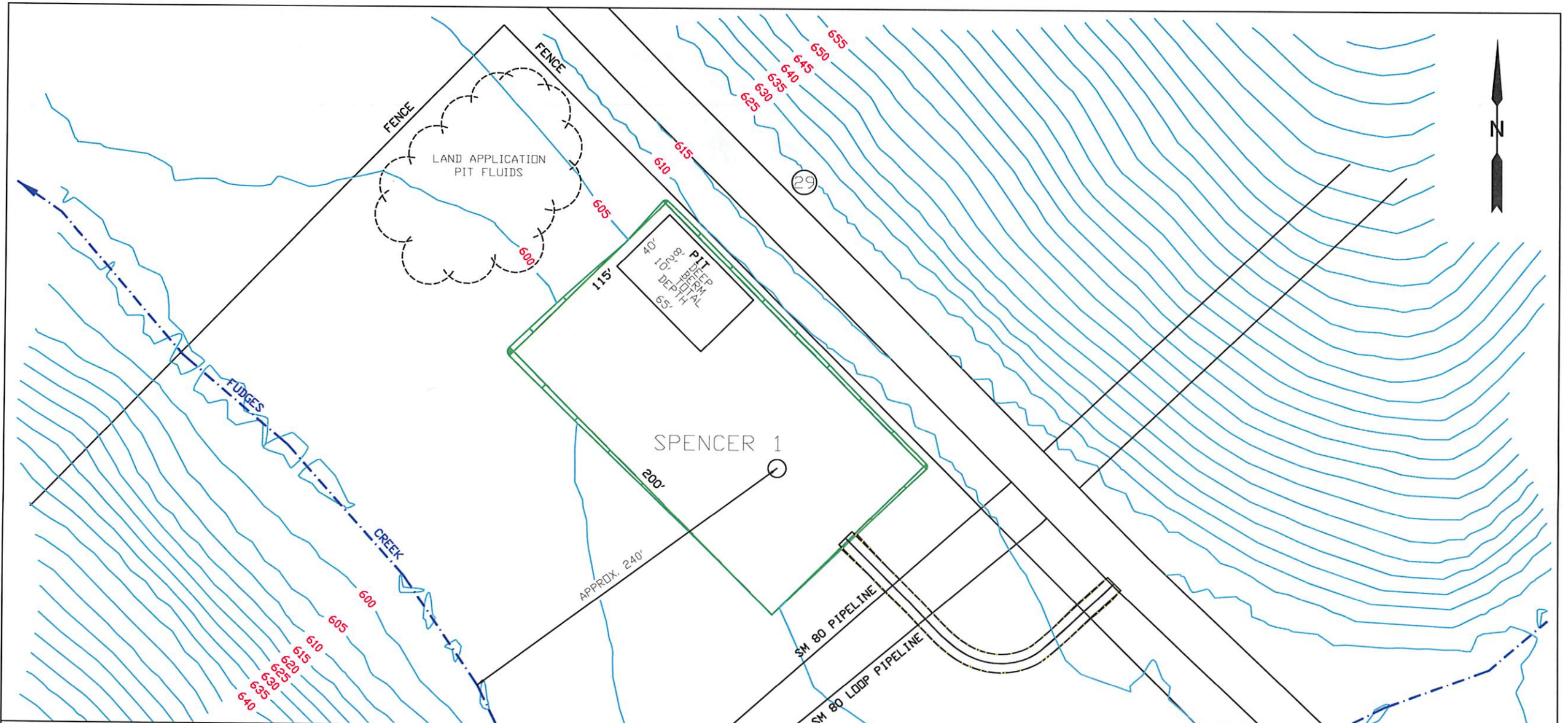
Sincerely,

Morgan Pate
Geologist
Keyrock Energy LLC

RECEIVED
Office of Oil and Gas

JUN 27 2018

WV Department of
Environmental Protection

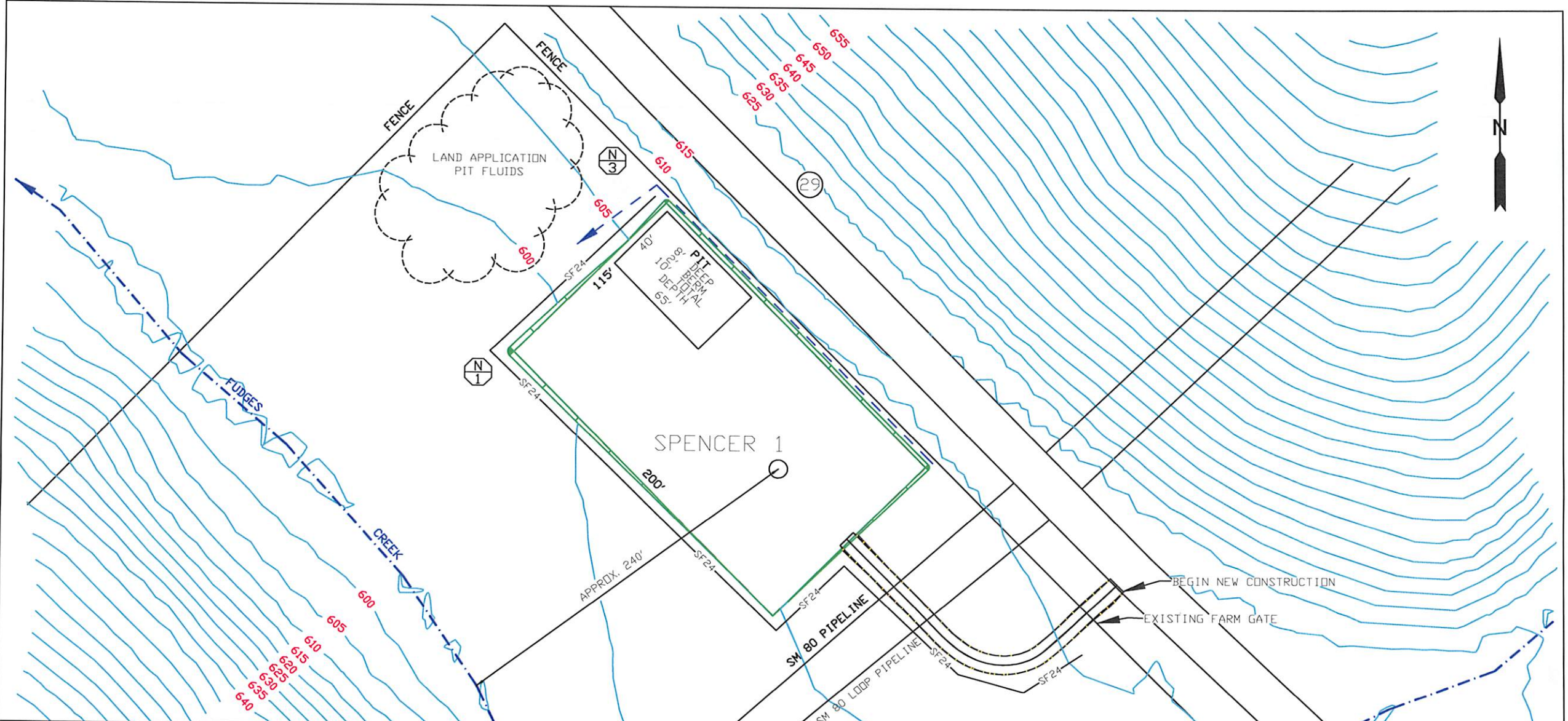


| DISTURBED AREAS | |
|------------------------------|-----------------|
| WELL PAD CONSTRUCTION | 0.55 AC. |
| NEW ACCESS ROAD CONSTRUCTION | 0.04 AC. |
| | |
| TOTAL DISTURBED AREA | 0.59 AC. |

| LEGEND | |
|--------|---------------|
| | STREAM |
| | PROPERTY LINE |
| | SLOPE AREA |
| | WETLAND |
| | BUFFER AREA |

| SITE PLAN | |
|--|--|
| KEYROCK ENERGY, LLC PROPOSED WELL NO. SPENCER 1 | |
| FUDGES CREEK GRANT DISTRICT, CABELL COUNTY, WV | |
| REV JUNE 26, 2018 | |
| TRUE LINE SURVEYING, INC. 6211 FAIRVIEW DR. HUNTINGTON, WV 25705 | |
| | |
| PAGE <u>1</u> OF <u>1</u> | |

47-011-01001



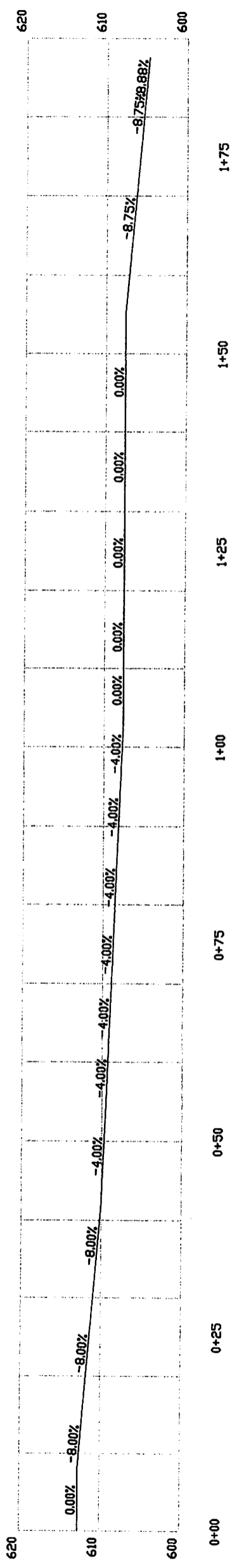
LEGEND

| | | | |
|--|--|--|----------------------------|
| | RESEED AND PROVIDE GROUND COVER ON ALL CUT AND FILL SLOPES | | STREAM |
| | LEVEL SPREADER | | PROPERTY LINE |
| | DIVERSION DITCH | | SLOPE AREA |
| | BERM OUTLET | | WETLAND |
| | | | 24" SILT FENCE AS REQUIRED |

EROSION AND SEDIMENT CONTROL PLAN

| | |
|--|--|
| KEYROCK ENERGY, LLC PROPOSED WELL # SPENCER 1 | |
| FUDGES CREEK GRANT DISTRICT, CABELL COUNTY, WV | |
| REV JUNE 26, 2018 | |
| TRUE LINE SURVEYING 6211 FAIRVIEW DR. HUNTINGTON, WV 25705 | |
| PAGE <u>1</u> OF <u>1</u> | |

47-011-01001



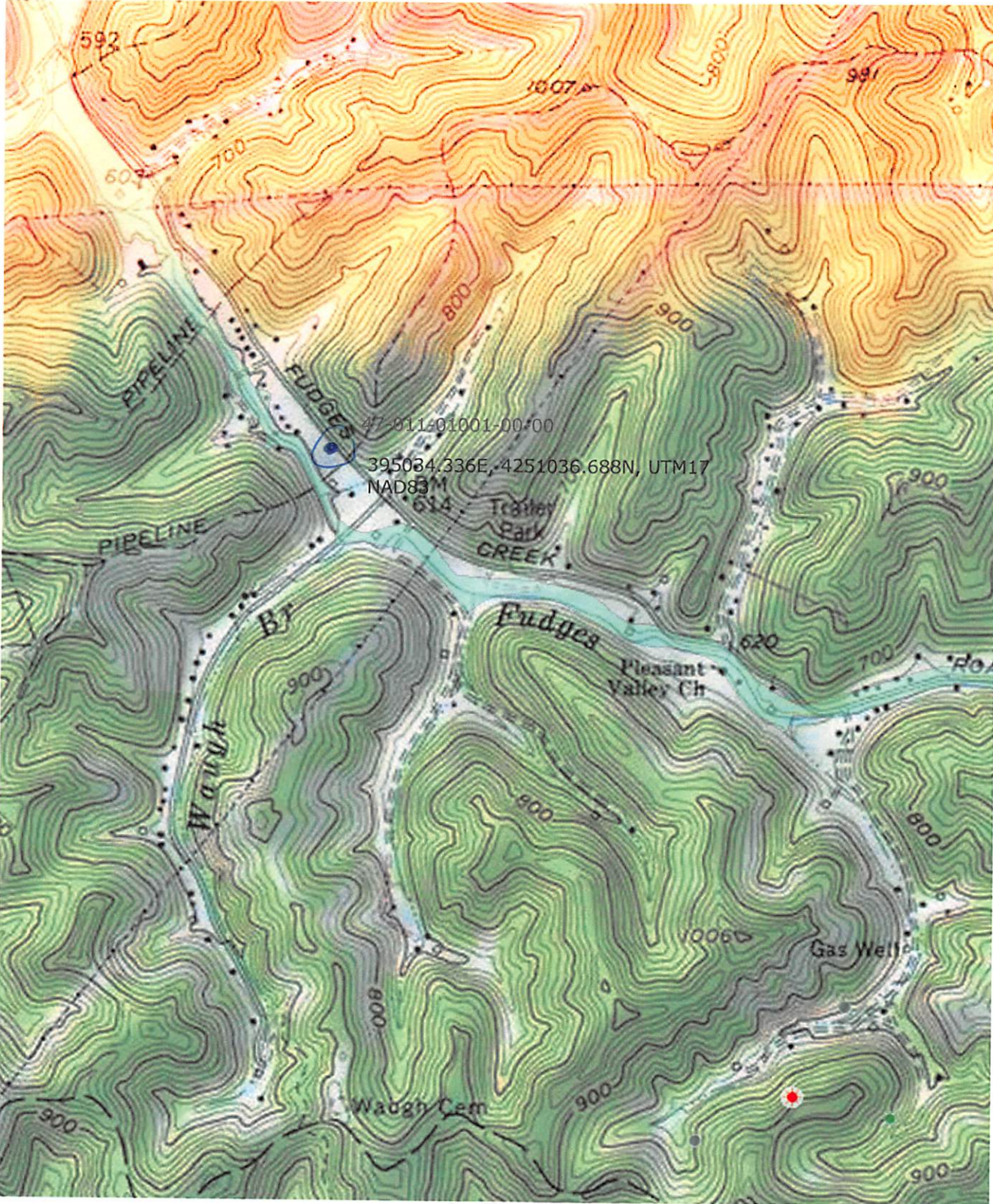
ACCESS ROAD PROFILE GRID

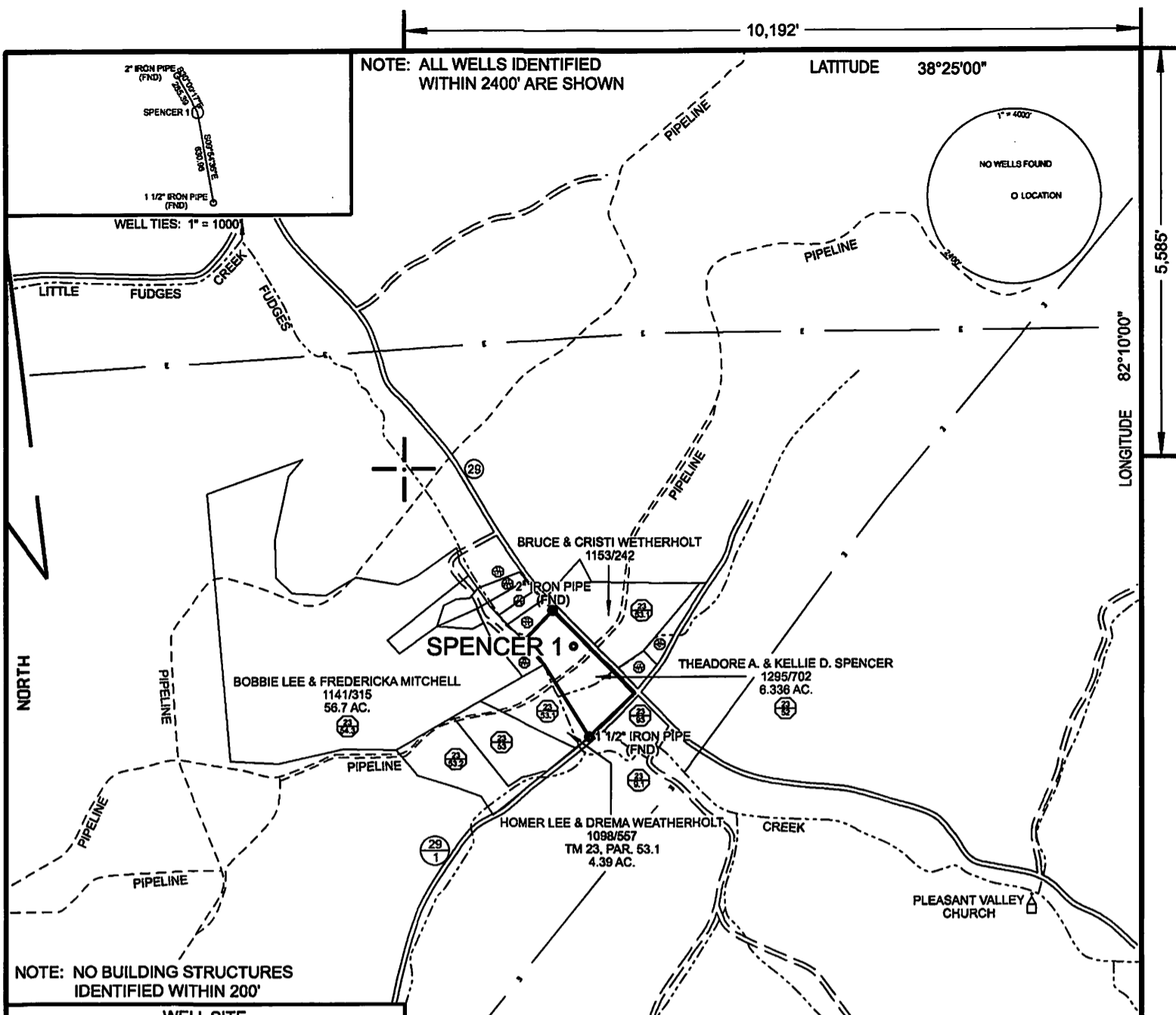
KEYROCK ENERGY, LLC
 PROPOSED WELL # SPENCER 1

FUDGES CREEK
 GRANT DISTRICT, CABELL COUNTY, WV
 APRIL 29, 2018

TRUE LINE SURVEYING
 6211 FAIRVIEW DR.
 HUNTINGTON, WV 25705







NOTE: ALL WELLS IDENTIFIED WITHIN 2400' ARE SHOWN

LATITUDE 38°25'00"

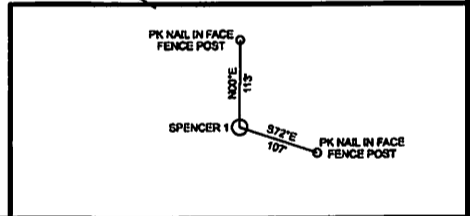
LONGITUDE 82°10'00"

WELL TIES: 1" = 1000'

REFERENCES: 1" = 250'

NOTE: NO BUILDING STRUCTURES IDENTIFIED WITHIN 200'

| | |
|---------------------------------------|--|
| WELL SITE | |
| STATE PLANE WV SOUTH ZONE NAD 1927 | |
| N - 512,493.267 : E - 1,655,478.538 | |
| NAD83 | |
| LATITUDE: (N) 38.4013994° | |
| LONGITUDE: (W) 82.2021067° | |
| UTM, NAD83 | |
| 17 - 84W TO 78W, METERS | |
| (N): 4,251,036.688 : (E): 395,034.336 | |

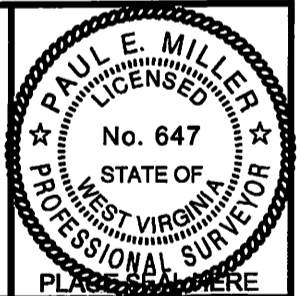


(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

| | |
|----------------------------|-------------------|
| FILE NO. | SPENCER 1.DGN |
| DRAWING NO. | SPENCER 1 PLAT |
| SCALE | 1" = 1000' |
| MINIMUM DEGREE OF ACCURACY | 1:200 |
| PROVEN SOURCE OF ELEVATION | MAPPING GRADE GPS |

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.

(SIGNED) *Paul E. Miller*
R.P.E. _____ L.L.S. 647



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



DATE MAY 01, 20 18
OPERATOR'S WELL NO. SPENCER 1
API WELL NO.

47 011 01001
STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF "GAS,") PRODUCTION STORAGE DEEP SHALLOW

LOCATION: ELEVATION 601' WATER SHED FUDGES CREEK

DISTRICT GRANT COUNTY CABELL

QUADRANGLE MILTON, WV 7.5'

SURFACE OWNER THEADORE A. & KELLIE D. SPENCER ACREAGE 6.336

OIL & GAS ROYALTY OWNER THEADORE A. & KELLIE D. SPENCER LEASE ACREAGE 6.336

LEASE NO. _____

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____

PLUG AND ABANDON CLEAN OUT AND REPLUG

TARGET FORMATION LOWER HURON ESTIMATED DEPTH 3,400'

WELL OPERATOR KEYROCK ENERGY LLC DESIGNATED AGENT LINDA SADLER

ADDRESS P. O. BOX 2223, JOHNSON CITY, TN 37605 ADDRESS 209 CAPITAL STREET, CHARLESTON, WV 25301

FORM WW-6

COUNTY NAME

PERMIT