



west virginia department of environmental protection

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

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

Tuesday, December 5, 2023

WELL WORK PERMIT
Horizontal / New Drill

COLUMBIA GAS TRANSMISSION, LLC
1700 MACCORKLE AVENUE SE

CHARLESTON, WV 25314


Re: Permit approval for COCO B / 12644
47-039-06402-00-00

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: COCO B / 12644
Farm Name: JAMES A. & FREDA MARIE 
U.S. WELL NUMBER: 47-039-06402-00-00
Horizontal New Drill
Date Issued: 12/5/2023

Promoting a healthy environment.

12/08/2023

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.

12/08/2023

4703906402 TH
*OK # 43063
900.00*

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

1) Well Operator: Columbia Gas Transmission, LLC

307032	Kanawha	Coco	Elk
Operator ID	County	District	Quadrangle

2) Operator's Well Number: Coco B 12644 3) Elevation: 856 ft PAD 846 ft

4) Well Type: (a) Oil _____ or Gas X
(b) If Gas: Production _____ / Underground Storage X
Deep X / Shallow _____ 5168 ft TVD GL

5) Proposed Target Formation(s): Oriskany Proposed Target Depth: 6135 ft MD GL

6) Proposed Total Depth: 8772 MD 5190 TVD (GL) Feet Formation at Proposed Total Depth: Oriskany

7) Approximate fresh water strata depths: estimated deepest 693 ft (based on evaluation of 18 existing offset storage wells)

8) Approximate salt water depths: 1011 - 1407 ft TVD (GL) (Salt Sand)

9) Approximate coal seam depths: none anticipated

10) Approximate void depths, (coal, Karst, other): none anticipated

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APR 14 2023

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

WV Department of
Environmental Protection

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

Refer to attached wellbore diagram.

Directionally drill well to Oriskany sandstone, open hole complete, HCl acid stimulate reservoir, install pipeline.

13) **CASING AND TUBING PROGRAM**

TYPE	SPECIFICATIONS			FOOTAGE INTERVALS		CEMENT
	Size	Grade	Weight per ft	For Drilling	Left in Well	
Conductor	24			60	40	71
Fresh Water Intermediate	18-5/8	K-55	94.5	770	750	574
Intermediate	13-3/8	K-55	68	2190	2170	1535
Intermediate	9-5/8	N-80	47	5782	5762	1293
Production	7	N-80	26	6155	6135	636
Tubing						
Liners						

*Approved [Signature]
4-5-23*

*CTS x40%
CTS x40 in hole
CTS x40 in hole*

Packers: Kind: _____
Sizes: _____
Depths Set _____

12/08/2023

Well Pad Elevations

Pre Construction: 856 ft
Post Construction: 846 ft
KB: +/-867 ft

Coco B well 12644^T

Proposed as of 12/08/21

~ not to scale ~

Max surface operating pressure 1800 psig
Max reservoir pressure 2075 psig

Minimum Casing Design Safety Factors
Internal Yield: 1.2
Collapse: 1.2
Tensile: 1.6

18-5/8" Surface csg @ 750 ft GL

94.5 ppf K-55 ERW w/ BTC
Internal Yield: 2420 psi
Collapse: 780 psi
Body Yield Strength: 1469 Klbs
Joint Strength: 1427 Klbs
Cement to surface

Deepest fresh water zone is based on an evaluation of 18 existing offset storage wells. The deepest recorded fresh water interval out of all 18 was at a depth of 153 ft above sea level, or relative to subject storage well, at a depth of 693 ft GL.

13-3/8" Intermed1 csg @ 2170 ft TVD / MD GL

68 ppf K-55 ERW w/ API 8rd STC
Internal Yield: 3450 psi (SF = 1.6 relative to max reservoir press)
Collapse: 1950 psi (SF = 1.9 relative to 0.46 psi/ft overburden gradient)
Body Yield Strength: 1069 Klbs (SF = 7.2 relative to dry pipe weight)
Joint Strength: 718 Klbs (SF = 4.8 relative to dry pipe weight)
Cement to surface

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Office of Oil and Gas

APR 14 2023

WV Department of
Environmental Protection

Angela White
4-5-23

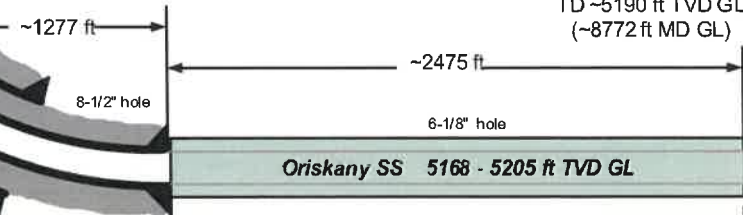
9-5/8" Intermed2 csg @ 5072 ft TVD GL (~5762 ft MD GL)

47 ppf N-80 ERW w/ semi-premium
Internal Yield: 6870 psi (SF = 3.3 relative to max reservoir press)
Collapse: 4760 psi (SF = 1.8 relative to 0.50 psi/ft overburden gradient)
Body Yield Strength: 1086 Klbs (SF = 4.0 relative to dry pipe weight)
Joint Strength: 905 Klbs (SF = 3.3 relative to dry pipe weight)
Uniaxial Bend Ratio: 3.0 - 3.84 deg/100 ft
Cement to 500' overlap into 13-3/8" casing

TD ~5190 ft TVD GL
(~8772 ft MD GL)

Marcellus Shale
5027 - 5051 ft TVD GL (5650 - 5709 ft MD GL)

Onondaga LS
5051 - 5168 ft TVD GL
(5709 - 6135 ft MD GL)



7" Flowstring @ 5169 ft TVD GL (~6135 ft MD GL)

26 ppf N-80 ERW w/ premium thread
Internal Yield: 7240 psi (SF = 3.4 relative to max reservoir press)
Collapse: 5410 psi (SF = 2.0 relative to 0.50 psi/ft overburden gradient)
Body Yield Strength: 604 Klbs (SF = 3.7 relative to dry pipe weight)
Joint Strength: 519 Klbs (SF = 3.2 relative to dry pipe weight)
Uniaxial Bend Ratio: 3.84 deg/100 ft
Cement to 500' overlap into 13-3/8" casing
Estimated Design Day Gas Velocity = 20 ft/sec

12/08/2023

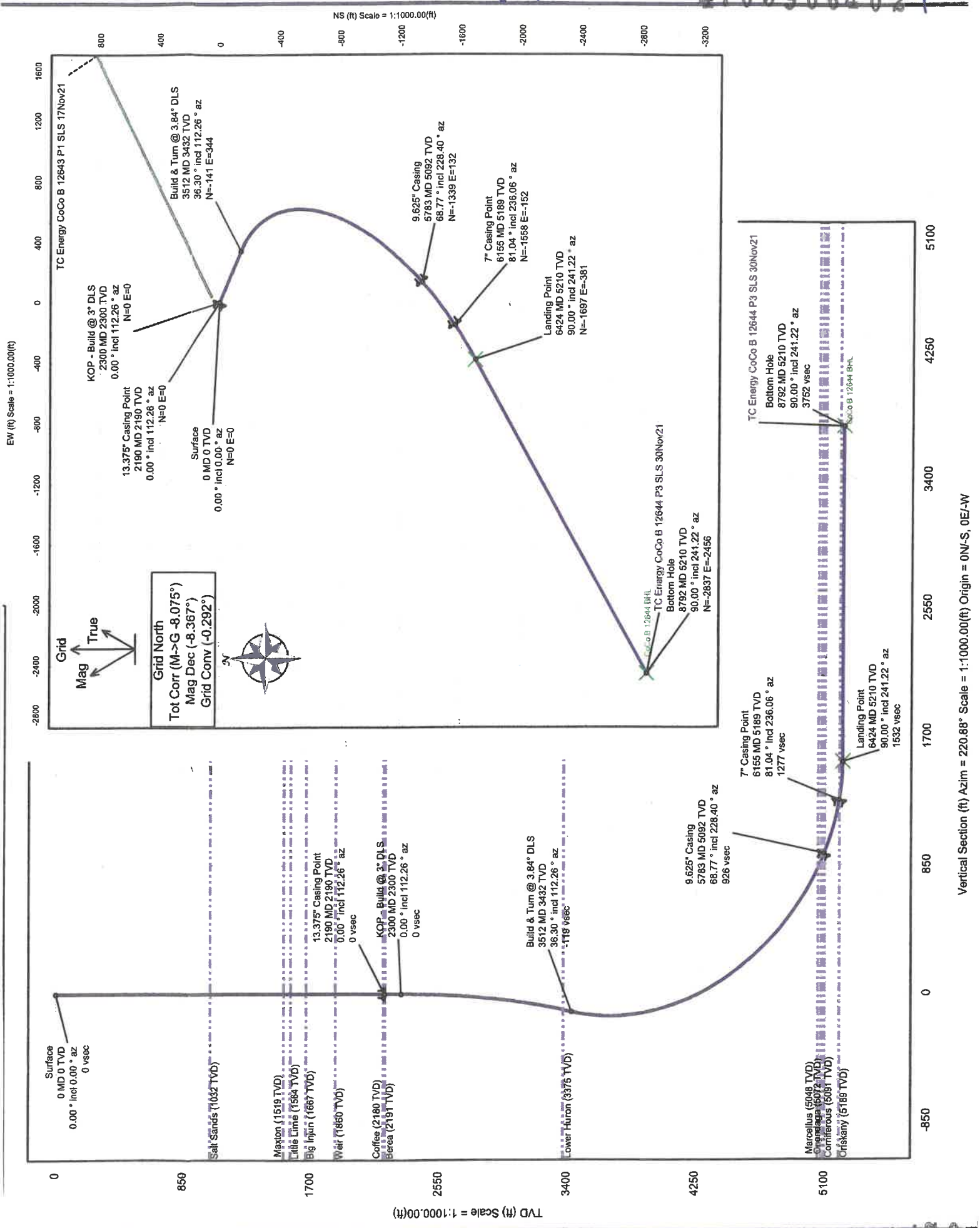
Borehole: Original Borehole	Well: CoCo B 12644	Structure: TC Energy CoCo B Pad
Field: WV Kanawha County (NAD 27)		
Miscellaneous CoCo B Slot: 12644 Plan: TC Energy CoCo B 12644 P3 SLS 30Nov21		
Gravity & Magnetic Parameters HDGM Model: 2021 MagDec: -8.367°	Surface Location Feet Lat: N 38 24 45.34 Lon: W 81 28 20.18	Grid Conv: -0.292° Grid Conv: 1864680.71ft Scale Fact: 0.99993358
Date: 17-Nov-2021 Gravity FS: 999.245mgn (9.80665 Based)	Surface Location NAD83 WEST VIRGINIA STATE PLANE, SOURCE:ITZORR, US	TVD Ref: KB(867.5ft above MSL)

Surface Location	
Longitude: W 81 28 20.18	VSec Azimuth: 220.88
Latitude: N 38 24 45.34	
Grid Coord	
Easting: 1864300.23	VSec: 1532.27
Northing: 511875.20	Local Coord: E(+)/W(-) -1897.22 -2836.99 -2455.75

Target Name	Shape	Point	Point	Dimension	Latitude	Longitude	Northing	DLS
CoCo B 12644 Alternative2	Landing	Point	Point	N/A	N 38 24 28.54	W 81 28 24.85	513014.89	0.00
CoCo B 12644 BHL		Point	Point	N/A	N 38 24 17.17	W 81 28 50.84	511875.20	0.00

RT	Survey Tool	Survey Tool Code	Tool	Size (in)	Case Size (in)	Max Incl (in)	From (ft)	To (ft)	MD To Frequency (ft)	ECU Size (Semi Major) (in)	ECU Size (Minor) (in)	Comments/Contingency
1	B006Mb_MWD+GRF			22	18.625		0	21	1/100	0.917	0.917	
2	B006Mb_MWD+HG			22	18.625		21	750	1/100	4.372	4.372	
3	B006Mb_MWD+HG			17.5	13.375		750	2190	1/100	8.672	8.672	
4	B006Mb_MWD+HG			12.25	9.625		2190	5050	1/100	31.784	18.875	
5	B006Mb_MWD+HG			8.5	7		5050	5790	1/100	40.214	22.729	
6	B006Mb_MWD+HG			6.125	6.125		5790	8732.0	1/100	128.803	32.654	

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
Surface	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salt Sands	1032.00	0.00	112.26	1032.00	0.00	0.00	0.00	0.00
Maxon	1519.00	0.00	112.26	1519.00	0.00	0.00	0.00	0.00
Little Lime	1564.00	0.00	112.26	1564.00	0.00	0.00	0.00	0.00
Big Injun	1667.00	0.00	112.26	1667.00	0.00	0.00	0.00	0.00
Wear	1860.00	0.00	112.26	1860.00	0.00	0.00	0.00	0.00
Coffee	2180.00	0.00	112.26	2180.00	0.00	0.00	0.00	0.00
13.375" Casing Point	2190.00	0.00	112.26	2190.00	0.00	0.00	0.00	0.00
Barea	2191.00	0.00	112.26	2191.00	0.00	0.00	0.00	0.00
KOP - Build @ 3" DLS	2300.00	0.00	112.26	2300.00	0.00	0.00	0.00	0.00
Lower Huron	3441.81	34.25	112.26	3375.00	-105.78	-125.48	306.59	3.00
Build & Turn @ 3.84" DLS	3512.24	36.30	112.26	3432.47	-118.78	-140.90	344.26	0.00
Marcellus	5670.37	65.13	225.87	5048.00	822.82	-1268.39	208.09	3.84
Onondaga	5729.58	67.04	227.22	5072.00	876.68	-1306.61	168.79	3.84
Coniferous	5780.01	68.68	228.34	5091.00	923.04	-1336.99	134.20	3.84
9.625" Casing	5782.76	68.77	228.40	5092.00	923.59	-1338.70	132.28	3.84
7" Casing Point	6155.44	81.04	236.06	5189.00	1277.27	-1557.93	-151.80	3.84
Oriskany	6155.44	81.04	236.06	5189.00	1277.27	-1557.93	-151.80	3.84
Landing Point	6424.42	90.00	241.22	5210.00	1532.27	-1697.22	-380.50	3.84
Bottom Hole	8792.06	90.00	241.22	5210.00	3752.23	-2836.99	-2455.75	0.00



Vertical Section (ft) Azim = 220.68° Scale = 1:1000.00(ft) Origin = 0N-S, 0E-W

12/08/2023

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Comments	Description	MD (ft)	Incl (°)	Azim Grid (°)	MD From (ft)	MD To (ft)	TVD (ft)	TVDSS (ft)	EQU Freq (ft)	VSEC (ft)	Hole Size (in)	Casing Diameter (in)	NS (ft)	EW (ft)	Expected Max Inclination (deg)	DLS (°/100ft)	Survey Tool Type	TF (°)	BR (°/100ft)	TR (°/100ft)	Borehole / Survey	Northing (ftUS)	Easting (ftUS)	Latitude (°)	Longitude (°)	Directional Difficulty Index
			1	0.000		21.000	1/100.000	22.000		18.625		18.625					B006Mlb_MMWD+IGRF-Depth Only				Original Borehole / TC Energy CoCo B 12644 P3 SLS 30Nov21					
			1	21.000		750.000	1/100.000	22.000		18.625		18.625					B006Mlb_MMWD+IGRF				Original Borehole / TC Energy CoCo B 12644 P3 SLS 30Nov21					
			1	750.000		2190.000	1/100.000	17.500		13.375		13.375					B006Mlb_MMWD+IGRF				Original Borehole / TC Energy CoCo B 12644 P3 SLS 30Nov21					
			1	2190.000		5050.000	1/100.000	12.250		9.625		9.625					B006Mlb_MMWD+IGRF				Original Borehole / TC Energy CoCo B 12644 P3 SLS 30Nov21					
			1	5050.000		5790.000	1/100.000	8.500		7.000		7.000					B006Mlb_MMWD+IGRF				Original Borehole / TC Energy CoCo B 12644 P3 SLS 30Nov21					
			1	5790.000		8792.058	1/100.000	6.125		6.125		6.125					B006Mlb_MMWD+IGRF				Original Borehole / TC Energy CoCo B 12644 P3 SLS 30Nov21					

12/08/2023

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Schumberger

TC Energy CoCo B 12644 P3 SLS 30Nov21 Proposal Geodetic Report

(Def Plan)

12/08/2023

Report Date: November 30, 2021 - 02:43 PM
 Client: TC Energy
 Field: WV, Kanawha County (NAD 27)
 Structure / Slot: TC Energy CoCo B Pad / CoCo B 12644
 Well: CoCo B 12644
 Borehole: Original Borehole
 UWI / AP# #: Unknown / Unknown
 Survey Name: TC Energy CoCo B 12644 P3 SLS 30Nov21
 Survey Date: November 17, 2021
 TQI / AHD / DDI / ERD Ratio: 148.156° / 4843.789 ft / 6.083 / 0.930
 Coordinate Reference System: NAD27 West Virginia State Plane, Southern Zone, US Feet
 Location Lat / Long: N 38° 24' 45.34079", W 81° 28' 20.17705"
 Location Grid N/E Y/X: N 514711.994 ftUS, E 1864680.710 ftUS
 CRS Grid Convergence Angle: -0.2920°
 Grid Scale Factor: 0.99993358
 Version / Patch: 2.10.826.8

Survey / DLS Computation: Minimum Curvature / Lubinski
 Survey Section Azimuth: 220.880° (Grid North)
 Vertical Section Origin: 0.000 ft, 0.000 ft
 TVD Reference Datum: KB
 TVD Reference Elevation: 867.500 ft above MSL
 Seabed / Ground Elevation: 846.500 ft above MSL
 Magnetic Declination: -8.367°
 Magnetic Declination: 999.2454mgn (9.80665 Based)
 Gravity Model: GARIM
 Total Gravity Field Strength: 50819.389 mT
 Total Magnetic Field Strength: 65.494°
 Magnetic Dip Angle: November 17, 2021
 Declination Date: HDGM 2021
 Magnetic Declination Model: Grid North
 North Reference: -0.2920°
 Grid Convergence Used: Grid North
 Total Corr Mag North->Grid: -8.0749°
 North: Well Head
 Local Coord Referenced To:

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	TF (°)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (°)	Longitude (°)	Directional Difficulty Index	
Surface	0.00	0.00	0.00	0.00	-867.50	0.00	0.00	0.00	N/A	112.26M	N/A	N/A	514711.99	1864680.71	38.41259466	-81.47227140	0.00	
Salt Sands	1032.00	0.00	112.26	1032.00	164.50	0.00	0.00	0.00	0.00	112.26M	0.00	0.00	514711.99	1864680.71	38.41259466	-81.47227140	0.00	
Maxton	1519.00	0.00	112.26	1519.00	651.50	0.00	0.00	0.00	0.00	112.26M	0.00	0.00	514711.99	1864680.71	38.41259466	-81.47227140	0.00	
Little Lime	1564.00	0.00	112.26	1564.00	696.50	0.00	0.00	0.00	0.00	112.26M	0.00	0.00	514711.99	1864680.71	38.41259466	-81.47227140	0.00	
Big Injun	1667.00	0.00	112.26	1667.00	799.50	0.00	0.00	0.00	0.00	112.26M	0.00	0.00	514711.99	1864680.71	38.41259466	-81.47227140	0.00	
Weir	1860.00	0.00	112.26	1860.00	992.50	0.00	0.00	0.00	0.00	112.26M	0.00	0.00	514711.99	1864680.71	38.41259466	-81.47227140	0.00	
Coffee	2180.00	0.00	112.26	2180.00	1312.50	0.00	0.00	0.00	0.00	112.26M	0.00	0.00	514711.99	1864680.71	38.41259466	-81.47227140	0.00	
13.375" Casing	2190.00	0.00	112.26	2190.00	1322.50	0.00	0.00	0.00	0.00	112.26M	0.00	0.00	514711.99	1864680.71	38.41259466	-81.47227140	0.00	
Point	2191.00	0.00	112.26	2191.00	1323.50	0.00	0.00	0.00	0.00	112.26M	0.00	0.00	514711.99	1864680.71	38.41259466	-81.47227140	0.00	
Berea	2300.00	0.00	112.26	2300.00	1432.50	0.00	0.00	0.00	0.00	112.26M	0.00	0.00	514711.99	1864680.71	38.41259466	-81.47227140	0.00	
KOP - Build @	3441.81	34.25	112.26	3375.00	2507.50	-105.78	-125.48	306.59	3.00	HS	3.00	0.00	514586.52	1864987.28	38.41225440	-81.4719926	4.06	
3" DLS	3509.99	36.30	112.26	3430.65	2563.15	-118.36	-140.39	343.03	3.00	HS	3.00	0.00	514571.61	1865023.71	38.41221396	-81.4710783	4.14	
Lower Huron	3512.24	36.30	112.26	3432.47	2564.97	-118.78	-140.90	344.26	0.00	123.1R	0.00	0.00	514571.11	1865024.95	38.41221259	-81.47106753	4.14	
Build & Turn @	384° DLS	5670.37	65.13	5048.00	4180.50	822.82	-1268.39	208.09	3.84	33.14R	1.34	5.26	513443.69	1864888.79	38.40911475	-81.4715270	5.37	
Marcellus	5729.58	67.04	227.22	5072.00	4204.50	876.68	-1305.61	188.79	3.84	32.59R	3.23	2.28	513406.47	1864849.49	38.40901199	-81.47165918	5.39	
Onondaga	5780.01	68.68	228.34	5091.00	4223.50	923.04	-1336.99	194.20	3.84	32.17R	3.24	2.22	513375.10	1864814.80	38.40892535	-81.47177932	5.41	
Comiferous	5782.76	68.77	228.40	5092.00	4224.50	925.59	-1338.70	132.28	3.84	32.14R	3.25	2.19	513373.39	1864812.98	38.40892064	-81.47178599	5.41	
9.625" Casing	6155.44	81.04	236.06	5189.00	4331.50	1277.27	-1557.93	-151.80	3.84	30.14R	3.29	2.05	513154.17	1864528.92	38.40831469	-81.47277341	5.56	
Oriskany	6424.42	90.00	241.22	5210.00	4342.50	1532.27	-1697.22	-380.50	3.84	HS	3.33	1.92	513014.89	1864300.23	38.40792500	-81.47356900	5.66	
7" Casing Point	8792.06	90.00	241.22	5210.00	4342.50	3752.23	-2836.99	-2455.75	0.00		0.00	0.00	511875.20	1862225.13	38.40477000	-81.48079000	6.08	
Bottom Hole																		

Survey Type: Def Plan

Survey Error Model: ISCWSA Rev 3 *** 3-D 95.000% Confidence 2.7955 sigma
 Survey Program:

4703906402T

WW-2A
(Rev. 6-14)

1.) Date: 03/01/2023
2.) Operator's Well Number Coco B 12644
State County Permit
3.) API Well No.: 47- 039 -

**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 Patricia Joe Ranson Address 906 Teaque Circle Sugarland, TX 77478
(b) Name Address
(c) Name Address
5) (a) Coal Operator Name Address
(b) Coal Owner(s) with Declaration **RECEIVED** Name not operated Office of Oil and Gas Address APR 14 2023
(c) Coal Lessee with Declaration Name not operated Address
6) Inspector Terry Urban Address P.O. Box 1207 Clendenin, WV 25045 Telephone 304-549-5915

TO THE PERSONS NAMED ABOVE TAKE NOTICE THAT:

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

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

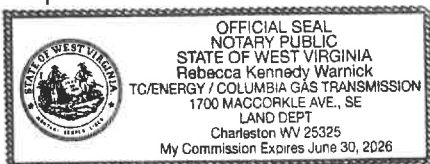
I certify that as required under Chapter 22-6 of the West Virginia Code I have served copies of this notice and application, a location plat, and accompanying documents pages 1 through ___ on the above named parties by:

- Personal Service (Affidavit attached)
- X 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 Columbia Gas Transmission, LLC
By: Brent Criser (ATTN: Maria Medvedeva)
Its: Team Leader - Well Engineering & Technology
Address: 1700 MacCorkle Ave SE Charleston WV 25314-1273
Telephone: 304-410-4313
Email: maria_medvedeva@transcanada.com

Subscribed and sworn before me this 3rd day of April, 2023

Notary Public

My Commission Expires 6/30/26

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 depprivacyofficer@wv.gov

12/08/2023

SURFACE OWNER WAIVER

Columbia Gas Transmission LLC

County 039
Kanawha

Operator
Operator well number Coco B 12644

INSTRUCTIONS TO SURFACE OWNERS NAMED ON PAGE WW2-A

The well operator named on page WW2A is applying for a permit from the State to do oil or gas well work. (Note: If the surface tract is owned by more than three persons, then these materials were served on you because your name appeared on the Sheriff's tax ticket on the land or because you actually occupy the surface tract. In either case, you may be the only owner who will actually receive these materials.) See Chapter 22 of the West Virginia Code. Well work permits are valid for 24 months. If you do not own any interest in the surface tract, please forward these materials to the true owner immediately if you know who it is. Also, please notify the well operator and the Office of Oil and Gas.

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

RECEIVED
Office of Oil and Gas

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

APR 14 2023

WV DEPARTMENT OF
Environmental Protection

Time Limits and methods for filing comments. The law requires these materials to be served on or before the date the operator files his Application. You have **FIFTEEN (15) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

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

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

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

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

List of Water Testing Laboratories. The Office maintains a list of water testing laboratories which you can hire to test your water to establish water quality prior to and after drilling. Contact the Chief to obtain a copy.

VOLUNTARY STATEMENT OF NO OBJECTION

I hereby state that I have read the instructions to surface owners and that I have received copies of a Notice and Application for a Well Work Permit on Form WW2-A, and attachments consisting of pages 1 through ___ including a work order on Form WW2-B, a survey plat, WW-9, and a soil and erosion plan, all for proposed well work on my surface land as described therein.

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

FOR EXECUTION BY A NATURAL PERSON

FOR EXECUTION BY A CORPORATION, ETC.

Signature Date _____

Company
Name _____
By _____
Its _____ Date _____

Print Name

Signature Date _____

12/08/2023

4703906402T

Columbia Gas Transmission, LLC
1700 MacCorkle Ave., SE, Charleston, WV, USA 25314



April 3, 2023

Patricia Joe Ranson
906 Teague Cir
Sugarland, TX 77478

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WV Department of
Environmental Protection

Columbia Gas Transmission, LLC is applying for a permit to the WV Department of Environmental Protection – Office of Oil and Gas, to drill and complete new underground natural gas storage wells located on property owned by you. As reference, the field and well ID is Coco B 12643 and Coco B 12644.

As part of the well permitting process, Columbia, the well operator, is required to provide a copy of all applicable permit application forms for your review and record retention.

Regards,

Maria Medvedeva
Senior Wells Engineer
Well Engineering & Technology
Columbia Gas Transmission, LLC

**U.S. Postal Service™
CERTIFIED MAIL® RECEIPT**
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Sugar Land, TX 77478

Certified Mail Fee	\$4.15
Extra Services & Fees (check box, add fee as appropriate)	\$3.75
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$9.65
Total Postage and Fees	\$17.15

Sent To: Patricia Joe Ranson
Street and Apt. No., or PO Box No.
City, State, ZIP+4®: CB 12643/12644

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Patricia Joe Ranson
906 Teague Cir
Sugarland, TX 77478

2. Article Number (Transfer from service label)
7022 2410 0002 6396 2945

3. Service Type
 Adult Signature
 Adult Signature Restricted Delivery
 Certified Mail®
 Certified Mail Restricted Delivery
 Collect on Delivery
 Collect on Delivery Restricted Delivery
 Certified Mail Restricted Delivery
 Priority Mail Express®
 Registered Mail™
 Registered Mail Restricted Delivery
 Signature Confirmation
 Signature Confirmation Restricted Delivery

B. Received by (Printed Name): D. Wilbur 7803
C. Date of Delivery: 4-7-23

D. Is delivery address different from item 1? Yes
If YES, enter delivery address below: No

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

www.tcenergy.com

12/08/2023

N/A

COAL OPERATOR, OWNER, OR LESSEE WAIVER

* coal not operated

County Kanawha

Operator Columbia Gas Transmission, LLC

Operator's Well Number Coco B 12644

INSTRUCTIONS TO COAL OPERATOR, OWNER, OR LESSEE

To the coal operator, owner, or lessee named on page WW2-A. You are hereby notified that any objection you wish to make or are required to make by WV Code 22-6-15, 16 or 17, must be filed with the Chief of the Office of Oil and Gas within fifteen (15) days after the receipt of this application by the Office. Mail objections to:

Chief, Office of Oil and Gas
Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304
(304) 926-0499 extension 1654

WAIVER

The undersigned coal operator / owner / lessee of the coal under this well location has examined this proposed well location. If a mine map exists which covers the area of well location, the well location has been added to the mine map. The undersigned has no objection to the work proposed to be done at this location, provided, the well operator has complied with all applicable requirements of the West Virginia Code and the governing regulations.

FOR EXECUTION BY A NATURAL PERSON

FOR EXECUTION BY A CORPORATION, ETC.

Signature Date

Company Name By Its Date

Signature Date

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12/08/2023

**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
surface	Matt Amos, et al	Columbia Gas Transmission LLC	Storage Lease	
			#1049098-000	975 / 101
bottom hole	Matt Amos, et al James G. Carper, et ux, et al. George C. Acree, Jr. et al. Nellie F. Cambell, et al. Grace J. Matheny, et al. Grace J. Matheny	Columbia Gas Transmission LLC	Storage Leases	
			#1049098-000	975 / 101
			#1048663-000	1156 / 321
			#1050069-000	989 / 507
			#1049643-001	989 / 53
			#1049643-002	129 / 87
			#1049643-003	1117 / 43

**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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WV Department of
Environmental Protection

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 affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator:
By:Its:

Columbia Gas Transmission, LLC
Brent Criser 
Team Leader - Well Engineering & Technology

12/08/2023

WW-2B1
(5-12)

Well No. Coco B 12644

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 contactor chosen to collect sample.

Certified Laboratory Name	<u>AGES, Applied Geology and Environmental Science, Inc.</u>	<u>RECEIVED</u>
Sampling Contractor	<u>AGES, Applied Geology and Environmental Science, Inc.</u>	<u>Office of Oil and Gas</u>
		APR 14 2023
Well Operator	<u>Columbia Gas Transmission, LLC</u>	<u>WV Department of</u>
Address	<u>1700 MacCorkle Ave. SE</u>	<u>Environmental Protection</u>
	<u>Charleston, WV 25314-1273</u>	
Telephone	<u>304-410-4313</u>	

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.

12/08/2023

4703906402T

WW-9
(5/16)

API Number 47 - 039 -
Operator's Well No. Coco B 12644

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

Operator Name Columbia Gas Transmission, LLC OP Code 307032

Watershed (HUC 10) Coopers Creek-Elk River Quadrangle Blue Creek

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 *HW*

If so, please describe anticipated pit waste: N/A

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

Proposed Disposal Method For Treated Pit Wastes:

- Land Application (if selected provide a completed form WW-9-GPP)
- Underground Injection (UIC Permit Number 34-167-23862)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain Mud Master 64054; Reserve Environmental Services (WMGR 123SW008)
Appalachian Water Services (WMGR 123SW001))

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Will closed loop system be used? If so, describe: yes - steel flow line to tanks

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. air, fresh water, polymer drilling fluid

-If oil based, what type? Synthetic, petroleum, etc. N/A

Additives to be used in drilling medium? NaCl, KCl, biocide, soda ash, polymer, bentonite, attapulgite, starch, surfactant, CaCO3

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

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

-Landfill or offsite name/permit number? To be managed by Waste Management and US Ecology for disposal at permitted landfill

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.

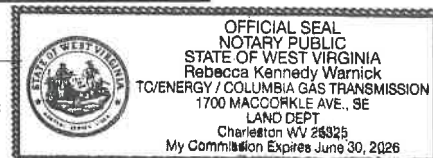
Company Official Signature *Brent Criser* 4/15/23

Company Official (Typed Name) Brent Criser

Company Official Title Team Leader - Well Engineering & Technology Storage Technical Services

Subscribed and sworn before me this 3rd day of April, 2023

My commission expires 6/30/29



12/08/2023

Proposed Revegetation Treatment: Acres Disturbed 15.87 (total impact area) Prevegetation pH 6-7

Lime 2 Tons/acre or to correct to pH 7-8

Fertilizer type 10-10-10

Fertilizer amount 600 lbs/acre

Mulch hay or straw @ 2 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Rye	40	Orchard Grass and/or Tall Fescue	29
		Birdsfoot Trefoil (Empire)	9
		Annual Rye	12

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: [Signature]
Comments: _____

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Title: Inspector O & G Date: 4-5-23

Field Reviewed? Yes No

12/08/2023

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

Operator Name: Columbia Gas Transmission, LLC
Watershed (HUC 10): Coopers Creek-Elk River Quad: Blue Creek
Farm Name: James and Freda Marie Morton

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

No fluids planned to be discharged.

No fertilizer will be stored on site. Fuel, oil, and lubricants will be stored on site, but located within secondary containment. Spills from construction equipment, well treatment fluids, and produced well fluids are the only possible source of contamination to groundwater. Drilling and flowback fluids to be stored in tanks.

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

Earthen berm to be constructed around perimeter of well pad with storm water sumps to control release of captured precipitation.

Construction and well servicing equipment will be monitored and inspected daily for leaks. Tanks to be monitored daily for leaks. Spill kits will be on site.

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

Pinch Creek is at a distance of 0.24 miles N.

The Trail Kitchen WV9908037 is the closest Well Head Protection Area at a distance of 11.4 miles E from discharge area.

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

N/A

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

N/A

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 or 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.

During routine tailgate and JSA meetings groundwater protection will be a topic of discussion.

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

No fertilizer will be stored on site. Fuel, oil, and lubricants will be stored on site, but located within secondary containment. Spills from construction equipment, well treatment fluids, and produced well fluids are the only possible source of contamination to groundwater.

Inspections to be performed daily.

Signature: [Handwritten Signature]

Date: 4/13/23

WV DEP OFFICE OF OIL & GAS
DEEP WELL SAFETY PLAN

COLUMBIA GAS TRANSMISSION, LLC / TC ENERGY

WV Operator ID 307032

Coco B Storage Well 12644
API Permit No. 47 - 039 - XXXXX - 00 - 00
Surface: James A. & Freda Marie Morton
Elk District - Kanawha County, WV

Deep Well Safety Plan (rev 03.01.23) prepared by:

By: Brent Criser Date: 4/3/23

Signature: 

Title: Team Leader - Well Engineering & Technology - Columbia Gas Transmission, LLC

12/08/2023

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PRE-SPUD MEETING

Meeting Date _____

<u>Name</u>	<u>Company</u>	<u>Title</u>
	Columbia / TC Energy	Director – STS
	Columbia / TC Energy	Manager – WET
	Columbia / TC Energy	Engineer – WET
	Columbia / TC Energy	Well Tech – WET
	Columbia / TC Energy	Well Tech – WET
	Columbia / TC Energy	Manager – REG
	Columbia / TC Energy	Engineer – REG
	Columbia / TC Energy	Geologist – REG
	Columbia / TC Energy	Geologist – REG

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CONTACTS and TELEPHONE NUMBERS**Emergency**

<u>County/State</u>	<u>Fire</u>	<u>EMS</u>	<u>Police</u>
Kanawha Co, WV	911	911	911

Non-emergency

Pinch Volunteer Fire Dept	304-965-1657		
CAMC	304-388-5432		
		3200 MacCorkle Ave SE	
		Charleston, WV 25304	
		Left on I-79S to Charleston	
		Merge onto I-77S	
		Exit 98 for 35 th St. Bridge	
		Right on MacCorkle Ave SE	
		Right on 31 st St SE	

Incident Reporting

Columbia Operations Monitoring Center	800-835-7191	
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Spill Reporting

Columbia Operations Monitoring Center	800-835-7191	
WV DEP – Office of Oil & Gas	800-642-3074	

WV Department of
Environmental Protection

Material Safety Data Sheets (MSDS)

3E Hotline (24 hour service)	800-451-8346
------------------------------	--------------

TC Energy / Columbia Personnel

<u>Name</u>	<u>Office</u>	<u>Cell</u>	<u>Home</u>
Brent Criser	740-746-2251	740-503-8231	
Maria Medvedeva	304-410-4313	304-410-4313	907-978-2684
Steve Simmons	304-373-2413	304-590-5528	304-373-9997
Nathan Salyers	681-230-3026	304-932-5831	

Rig and Crew**WV DEP O&G State Inspector**

Kanawha County	Terry Urban	cell:	304-549-5915
----------------	-------------	-------	--------------

Columbia Gas Transmission - Confidential

7

12/08/2023

WELL CONSTRUCTION PROGRAM

General Well Information

Storage Well:	Coco B 12644
API Permit:	47 - 037 - xxxxx - 00 - 00
Surface Owner:	James and Freda Marie Morton
Lease:	Matt Amos, et al (surface) Matt Amos, et al (bottom-hole)
Surface Location:	Coco B, Blue Creek Quad, Elk District, Kanawha County, WV
Elevation:	Pre Site Prep: 856 ft GL Post Site Prep: 846 ft GL Rig KB: 867 ft (21 ft above GL)

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Directions to well (current access): From Charleston, take I-79N
Exit 5 for Big Chimney. Turn Right off exit.
Follow Rt.114 to intersection. At the stop sign go straight.
Turn Left on Indian Creek Rd at light
Follow Indian Creek Rd for 3.3 miles
Turn Left on S Pinch Rd
Turn Right on Pinewood Rd. Follow Pinewood Rd to cattle guard.
Wellsite is at the top of the hill.

Proposed new access road: From Charleston, take I-79N
Exit 5 for Big Chimney. Turn Right off exit.
Follow Rt.114 to intersection. At the stop sign go left on Pennsylvania.
Follow Pennsylvania Ave to N Pinch Rd. Turn Right.
From N Pinch Rd, turn left on New Hope Rd.
Take first Right to Upper Pinch Rd.
New wellpad access road will be on the right off Stella Dr.

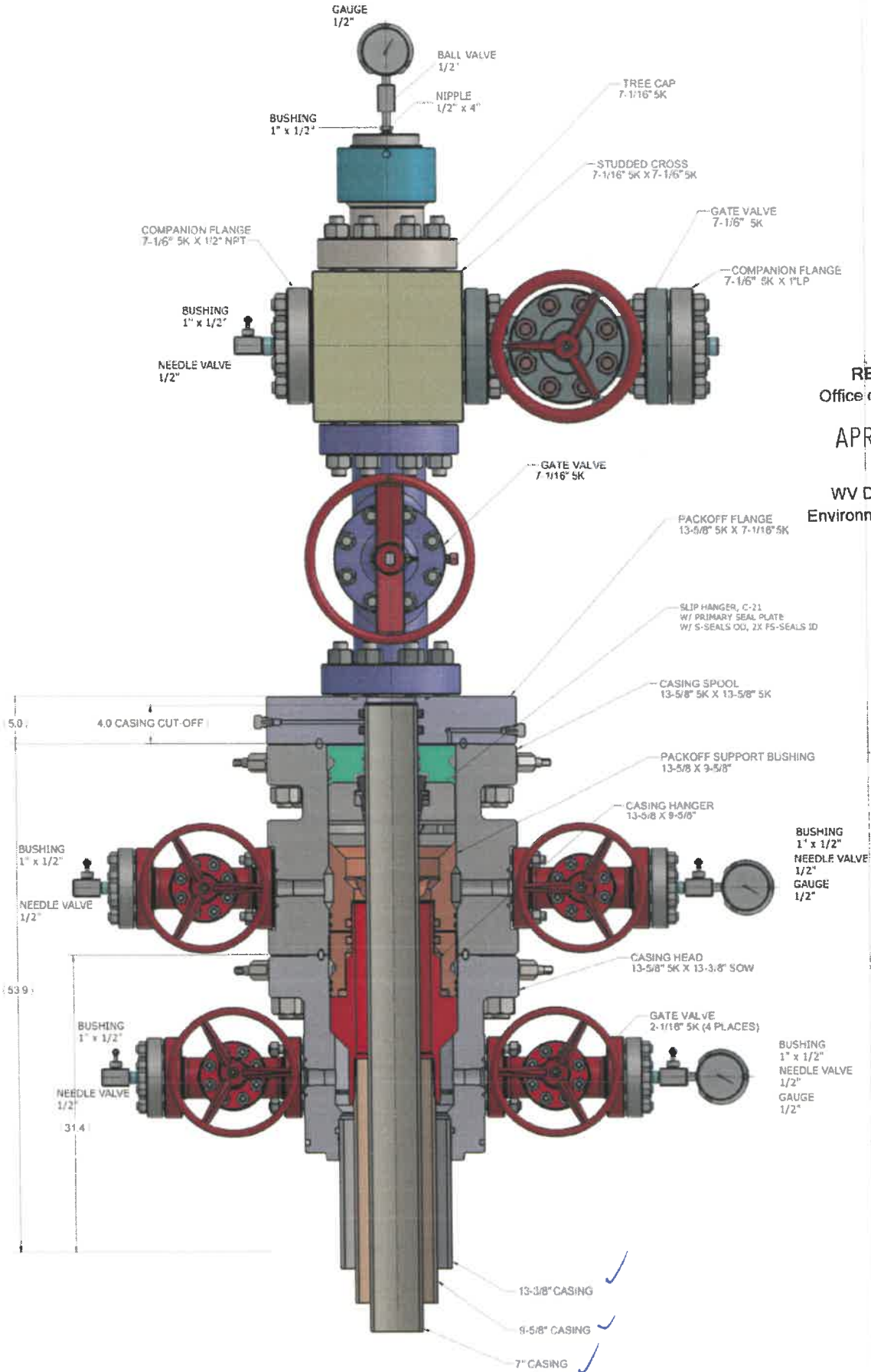
Concise Procedure

Spud and seat 40 ft GL of 24" conductor pipe. Drill 22" hole to +/-750 ft GL. Run 18-5/8" casing to minimum depth of 750 ft GL (60 ft below deepest fresh water) and cement to surface. Drill 17-1/2" hole to +/-2170 ft GL. Run 13-3/8" casing to a minimum depth of 2170 ft GL and cement to surface. Drill 12-1/4" hole to kick-off point at ~2280' MD GL. Directionally drill to a depth of ~53 ft into the Onondaga at +/- 5762' ft MD GL (5072' TVD GL). Run 9-5/8" casing and cement to a 500' overlap into the 13-3/8" casing.

Run cement bond log. Directionally drill 8-1/2" hole into the top of the Oriskany +/- 6135' MD GL (5169' TVD GL). Run 7" casing and also cement to a 500' overlap into the 13-3/8" casing. Run cement bond log. Drill 6-1/8" horizontally through the Oriskany reservoir section to well TD of +/- 8772' MD GL (5190' TVD GL). Install wellhead equipment. Acid stimulate openhole reservoir section using 10,000 gallons HCl acid.

Casing Program						
Type	Size	Planned Setting Depth	Depth Relation	Weight	Grade	Cement Top
Conductor	24"	40 ft GL				surface
Surface	18-5/8"	750 ft GL	60' below fresh water	94.5 ppf	K-55 ERW	surface
Intermediate #1	13-3/8"	2170 ft GL	30' below Berea	68 ppf	K-55 ERW	surface
Intermediate #2	9-5/8"	5762 ft GL	55' below Marcellus	47 ppf	N-80 ERW	1670' MD / TVD
Flow String	7"	6135 ft GL	Oriskany top	26 ppf	N-80 ERW	1670' MD / TVD

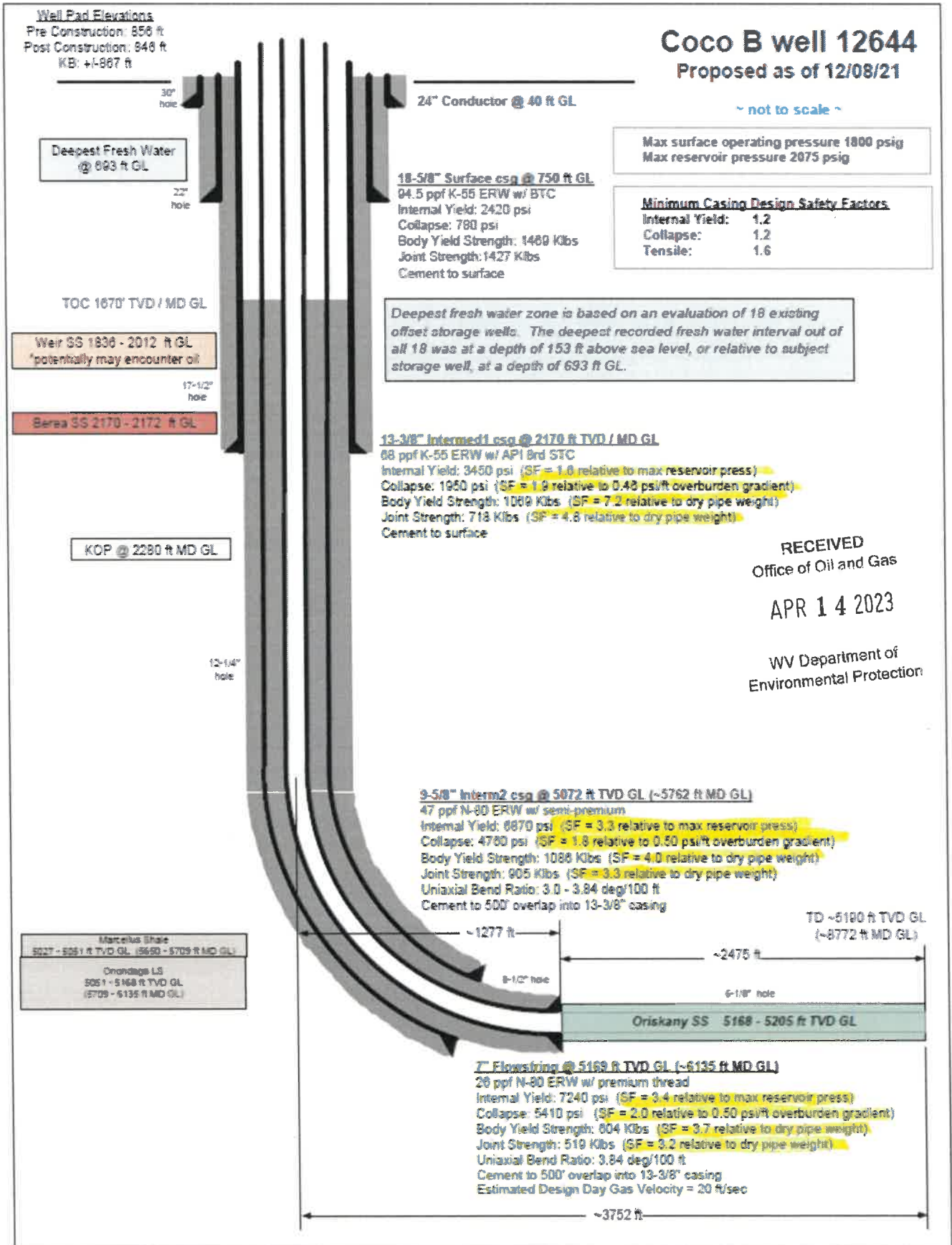
<u>ESTIMATED FORMATION TOPS (GL)</u>				RECEIVED Office of Oil and Gas
<u>Formation</u>	<u>Tops (TVD)</u>	<u>Base (TVD)</u>	<u>Comments</u>	APR 14 2023
Salt Sand	1011	1407	Sandstone	WV Department of Environmental Protection
Maxton	1498	1538	Sandstone	
Little Lime	1543	1578	limestone	
Big Lime	1597	1636	limestone	
Big Injun	1646	1759	Sandstone	
Weir	1839	2012	Sandstone - Potentially may encounter oil	
Coffee	2159	2170	shale	
Berea	2170	2172	sandstone	
Lower Huron	3354	4160	shale	
Marcellus	5027	5051	shale	
Onondaga	5051	5070	limestone	
Corniferous (portion of Onon)	5070	5168	limestone	
Oriskany	5168	5205	sandstone	



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BOP EQUIPMENT

Description of BOP's to be Installed on each Casing String

Casing – 24"	Diverter
Casing – 18-5/8"	BOP Type: Double Ram and Annular Size: 18" Pressure Rating: 5000 psi
Casing – 13-3/8"	BOP Type: Double Ram and Annular Size: 13" Pressure Rating: 5000 psi
Casing – 9-5/8"	BOP Type: Double Ram and Annular Size: 13" Pressure Rating: 5000 psi
Casing – 7"	BOP Type: Double Ram and Annular Size: 13" Pressure Rating: 5000 psi

BOP Installation and Pressure Testing

1. The 18" BOP will be installed when nipping up on the 18-5/8" casing. BOPs to be pressure tested low/high per API recommended practices.
2. The 13" BOP will be installed when nipping up on the 13-3/8" casing. BOPs to be pressure tested low/high per API recommended practices.
3. The 13" BOP stack will be installed when nipping up on the 9-5/8" casing. BOPs to be pressure tested low/high per API recommended practices.
4. The 13" BOP stack will be installed when nipping up on the 7" casing. BOPs to be pressure tested low/high per API recommended practices.

Personnel with IADC Well Control Certifications

Brent Criser	(IADC Wild Well Control)
Steve Simmons	(IADC Wild Well Control)
Nathan Salyers	(IADC Wild Well Control)
Maria Medvedeva	(IADC Wild Well Control)
_____	Tool Pusher
_____	Consultant
_____	Consultant

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Environmental Protection

Recording of Significant Drilling Events

A detailed record of significant drilling events will be recorded in Columbia Gas' well log book or in their digital morning reporting system. The State inspector will be notified upon any significant events, including but not limited to: encountering hydrogen sulfide gas and well control events.

WELL FLARING OPERATIONSFlare Line Installation

1. Flaring operations are not planned. In the event of a well control situation that warrants flaring, a minimally rated 5000 psi double choke manifold with 4-1/2" panic line and 3-1/2" choke lines will be installed. The lines will be a minimum of 175 ft in length. They will be securely anchored with chains to fixed objects and/or buried.

Ignition Methods and Notification

1. Primary – Electronic.
2. Backup – Marine flare pistol.

* Local fire department will be notified prior to flaring operations.

Minimum Distance of Clearing of Flammable Material

All flammable material will be kept a minimum distance of 150 ft from flare.

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WELL KILLING OPERATIONS

In the event well killing operations are required, industry accepted best practices will be utilized. There will be at minimum one person on site at all times that holds an IADC Well Control Certification.

Inventory of Materials to be used to Mix Kill Weight Fluid

Maximum reservoir pore pressure is 2075 psig for Coco B Storage field. A column of fresh water (8.33 ppg) at reservoir depth will exert 2229 psi in hydrostatic pressure. This creates an overbalance of >150 psi.

There will be approximately 300 bbls of pre-mixed viscosified drilling fluid on site, and a minimum of 300 bbls of fresh water. Additives and chemicals sufficient to mix 300 bbls drilling fluid will be stored on site, and extra material available at Paragon Drilling Fluids in Newcomerstown, OH.

Mixing and Fluid Pumping

Either rig mud pumps or dispatched service company will be utilized for mud mixing and pumping in the event of a well control event.

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HYDROGEN SULFIDE OPERATIONS

Wind socks to be present on site to detect direction of prevailing winds.

Monitoring

Mobile monitors will be utilized to detect the presence of H₂S. A detector will be kept in the dog house for use by rig personnel to monitor rig floor and cellar area. Columbia Gas personnel will wear personal monitors at all times.

Training

Personnel involved in drilling operations will be trained in H₂S in drilling operations to a minimum awareness level, to be completed prior to spudding the well.

Notification and Control

If H₂S is detected, all work will cease and personnel on site will be immediately evacuated to a pre-determined muster point until a more comprehensive assessment of source, concentration, and atmospheric conditions are completed.

The WV DEP Office of Oil and Gas, including the local inspector, will be notified of incident.

In the event the existence of H₂S cannot be alleviated from the work site, Columbia will implement an emergency response plan to secure the site, contract a 3rd party H₂S monitoring service to administer a safety program, and provide formal training to all personnel involved in future activities.

Public Notification

The implementation of the emergency response plan will assess the need to notify and evacuate local residence and the general public as deemed appropriate. Atmospheric conditions will be continuously monitored to adjust safe zone perimeters.

Emergency Responders

Emergency responders will be briefed prior to entering site to ensure they are aware and properly trained to respond to an H₂S release event.

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Office of Oil and Gas

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Environmental Protection

Oil&Gas

Wells, Horizontal Only

WellStatus

-  Active Well
-  Permit Issued
-  Permit Application
-  Plugged









Wells, Active Status Only

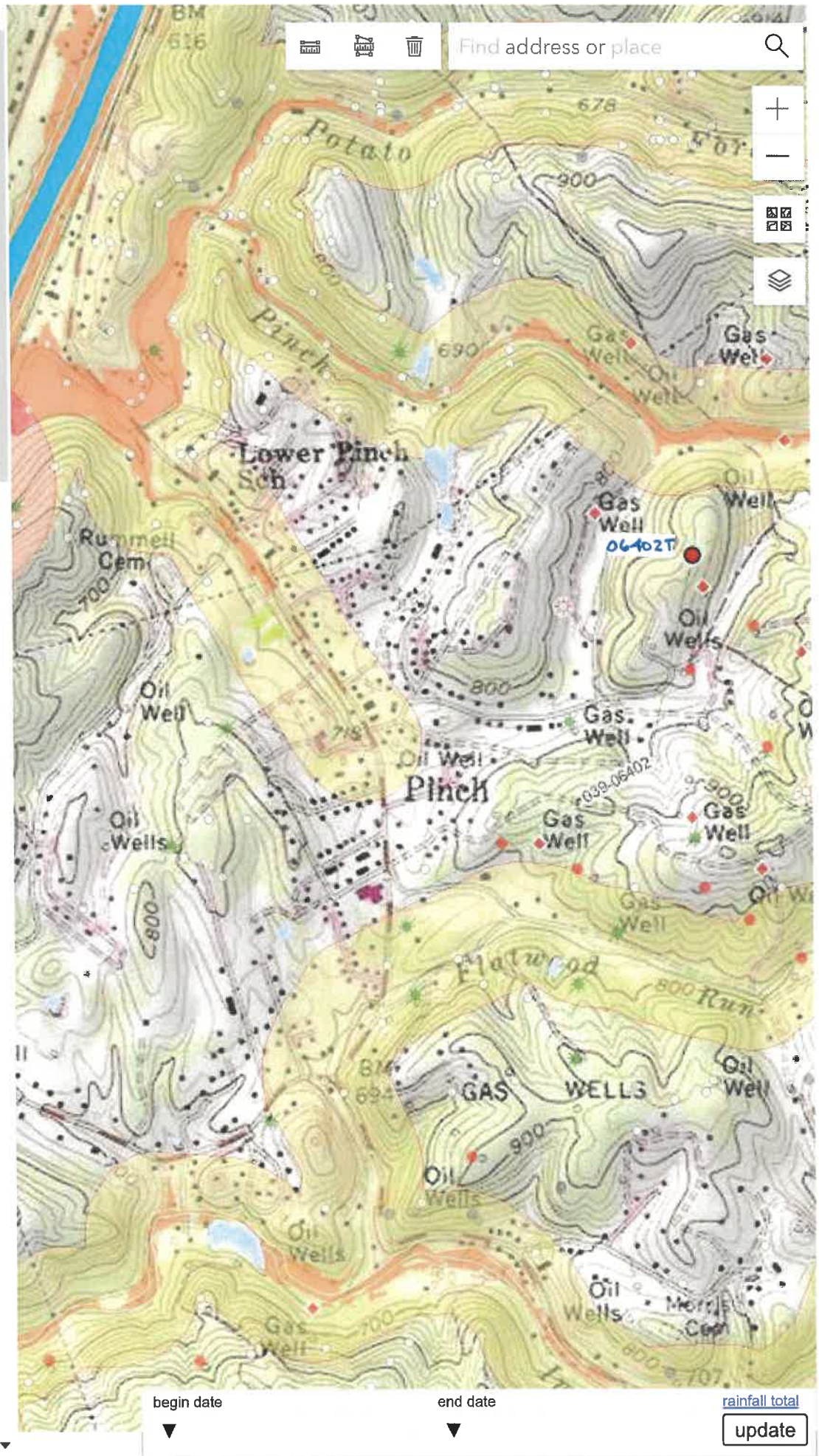
WellUse

-  Brine Disposal
-  Fluid Injection
-  Gas Production
-  House Gas
-  Observation
-  Oil Production
-  Production
-  Solution Mining
-  Storage
-  Vent
-  <all other values>

Wells, Other than Active Status

WellUse

-  Brine Disposal
-  Fluid Injection
-  Gas Production
-  House Gas
-  Observation
-  Oil Production
-  Production
-  Solution Mining



deparcgis1/oogis/index.html?x=458783&y=4251711&datum=NAD83&pntlabel=47-039-06401-00-00

12/08/2023

(CLO)

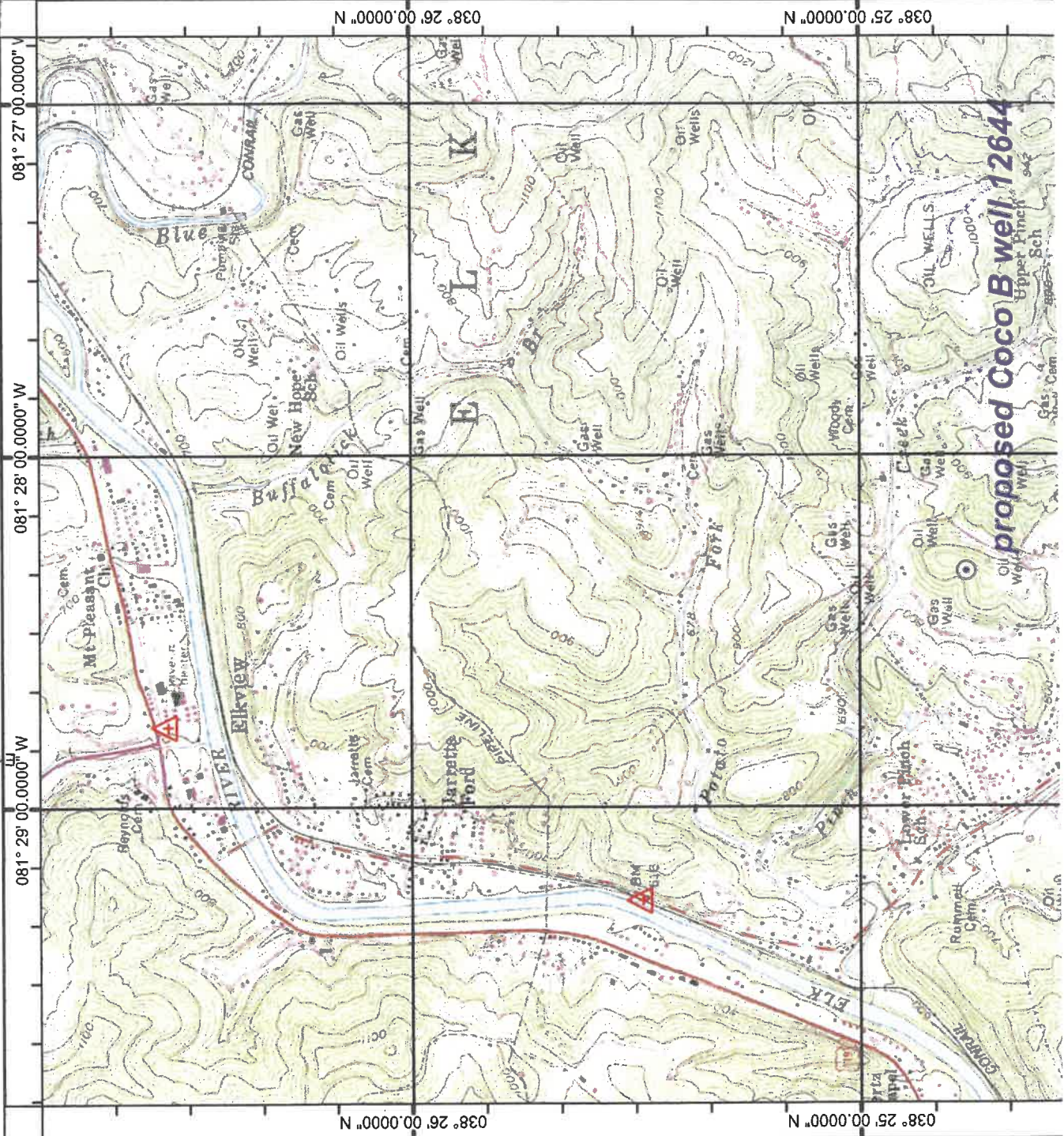
(CLENDENIN)

BLUE CREEK QUADRANGLE
WEST VIRGINIA
TOPOGRAPHIC SERIES

081° 26' 47.8804" W
038° 26' 50.0078" N

(KETTLE)

081° 29' 50.6660" W
038° 26' 50.0078" N

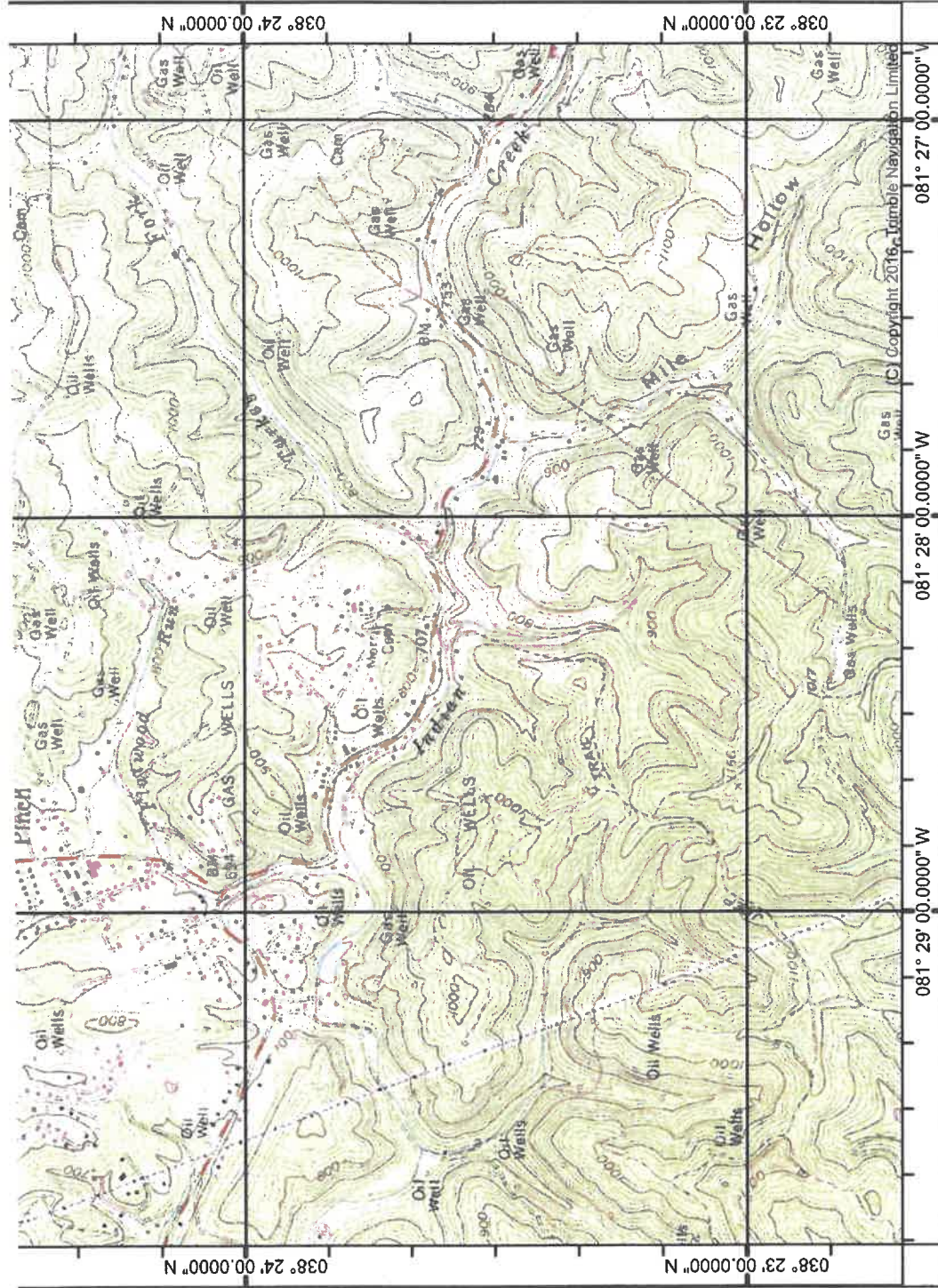


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Office of Oil and Gas
APR 14 2023
WV Department of Environmental Protection



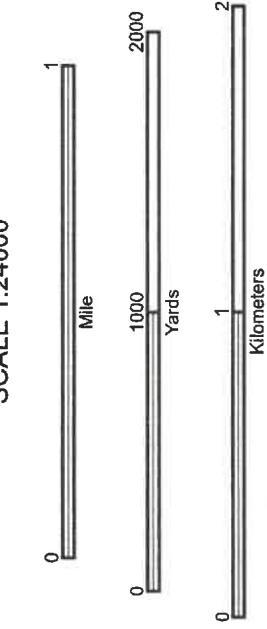
(ROMANCE)

(BIG CHIMNEY)



038° 22' 40.8874" N 081° 29' 50.6660" W (CHARLESTON EAST) 038° 23' 00.0000" N 081° 29' 00.0000" W 038° 24' 00.0000" N 081° 28' 00.0000" W 038° 23' 00.0000" N 081° 27' 00.0000" W 038° 22' 40.8874" N 081° 26' 47.8604" W

(QUICK)
SCALE 1:24000



CONTOUR INTERVAL 20 FT

Declination



(CHARLESTON EAST)

(MAMMOTH)

Produced by Trimble Terrain Navigator Pro
Topography based on USGS 1:24,000 Maps

North American 1983 Datum (NAD83)

To place on the predicted North American 1927 move the
projection lines 11M N and 14M E

38081-D3-TM-024
BLUE CREEK, WV
JAN 1, 1977

Oil&Gas

Wells, Horizontal Only

WellStatus

-  Active Well
-  Permit Issued
-  Permit Application
-  Plugged




Wells, Active Status Only

WellUse

-  Brine Disposal
-  Fluid Injection
-  Gas Production
-  House Gas
-  Observation
-  Oil Production
-  Production
-  Solution Mining
-  Storage
-  Vent
-  <all other values>

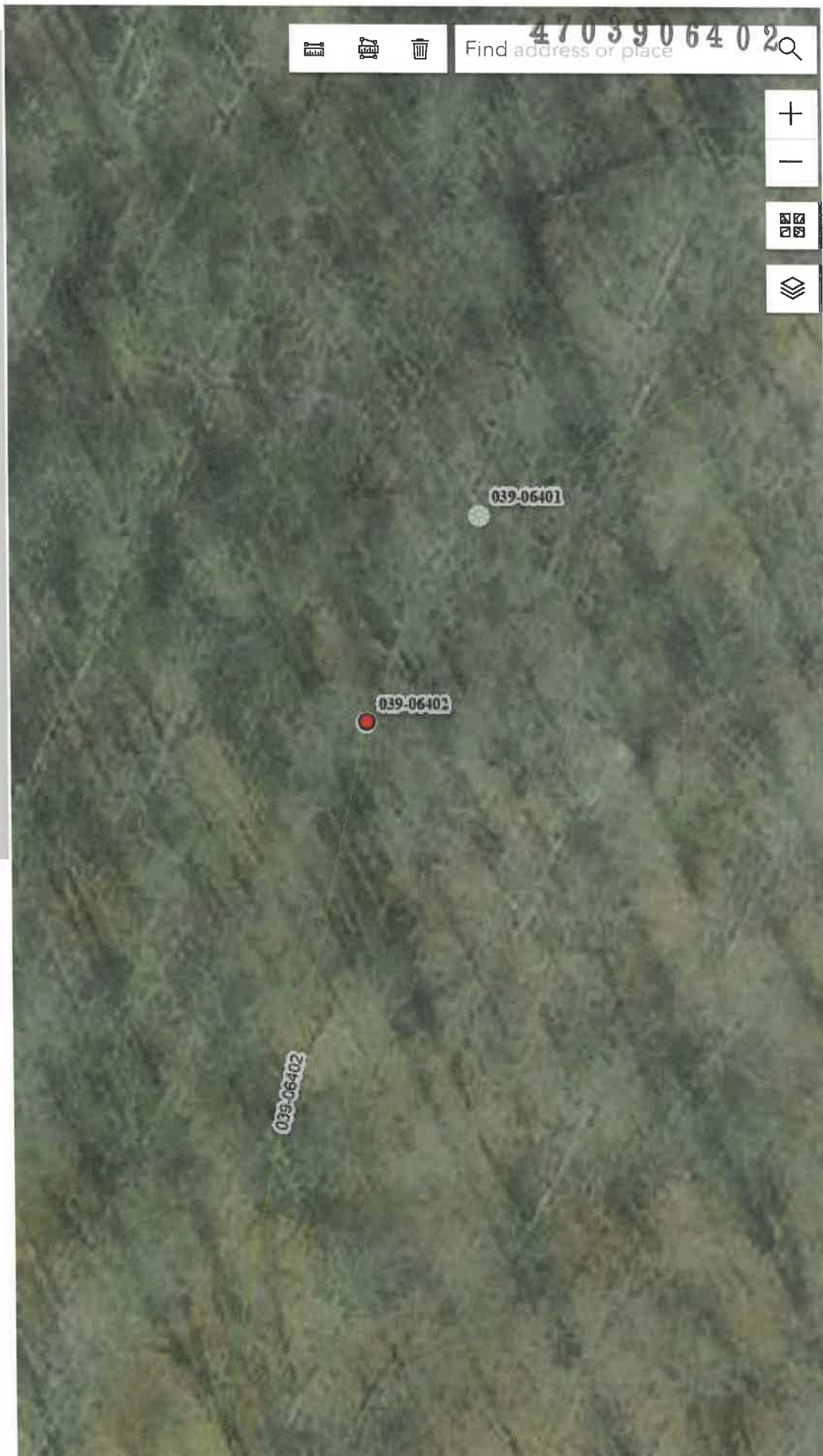
Wells, Other than Active Status

WellUse

-  Brine Disposal
-  Fluid Injection
-  Gas Production
-  House Gas
-  Observation
-  Oil Production
-  Production
-  Solution Mining
-  Storage
-  Vent
-  <all other values>

Wells, Not in DEP Database

Wells, Plugged



12/08/2023

begin date end date [rainfall total](#)

Oil&Gas

Wells, Horizontal Only

WellStatus

- Active Well
- Permit Issued
- Permit Application
- Plugged

Wells, Active Status Only

WellUse

- Brine Disposal
- Fluid Injection
- Gas Production
- House Gas
- Observation
- Oil Production
- Production
- Solution Mining
- Storage
- Vent
- <all other values>

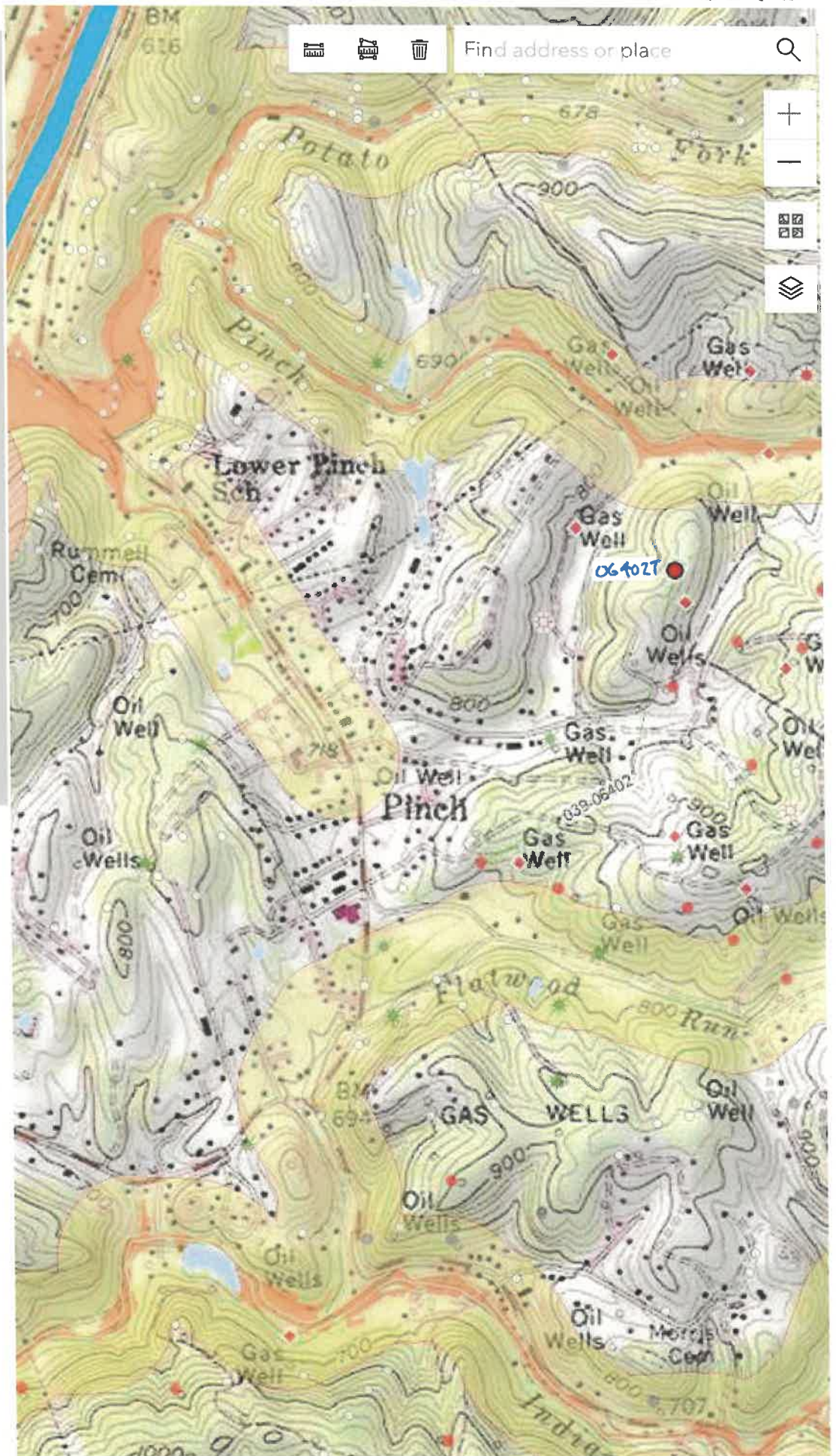
Wells, Other than Active Status

WellUse

- Brine Disposal
- Fluid Injection
- Gas Production
- House Gas
- Observation
- Oil Production
- Production
- Solution Mining
- Storage
- Vent
- <all other values>

Wells, Not in DEP Database

Wells, Plugged



12/08/2023

begin date end date [rainfall total](#)

4703906402T

3,947'

Latitude: 38° 25' 00"

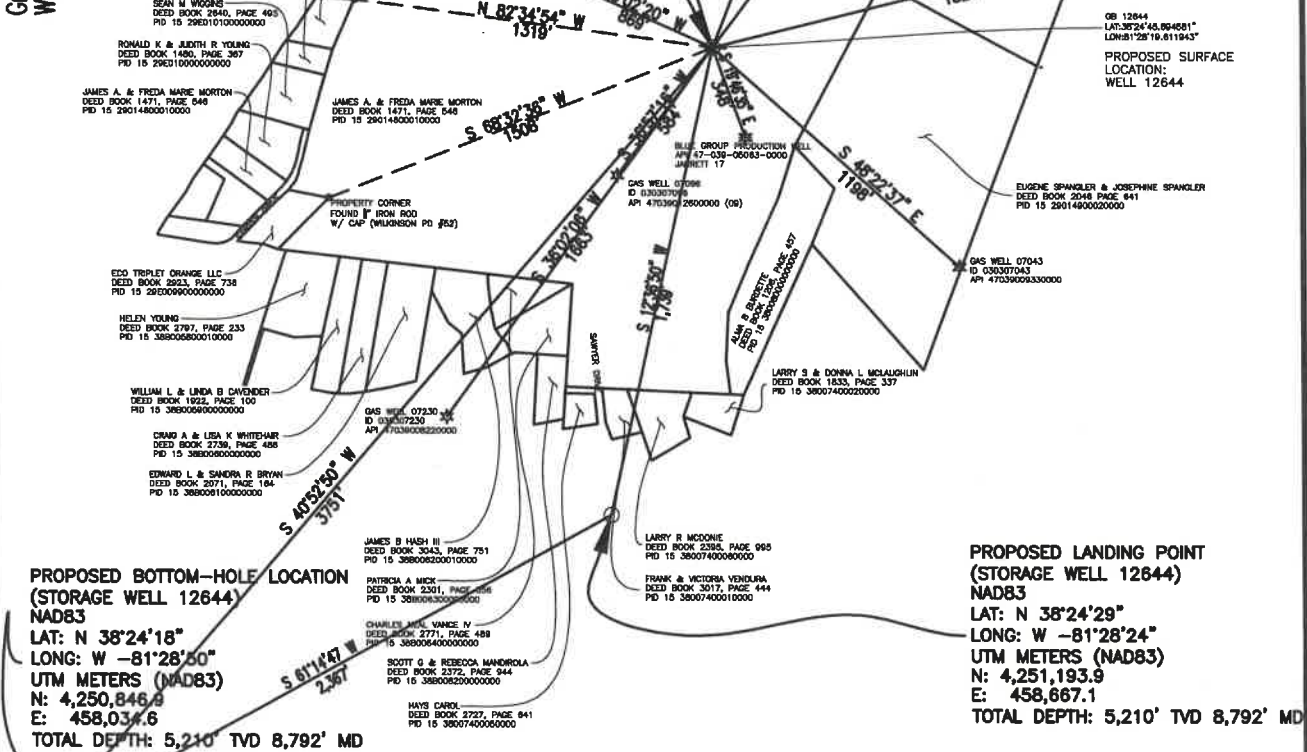
Longitude: 81° 27' 30"

1,449'

SURFACE LOCATION OF WELL ON UNITED STATES (NAD83)
TOPOGRAPHIC MAPS (7 1/2")
(NAD83)
LAT: 38° 24' 45.69"
LONG: -81° 28' 19.61"
(UTM METERS NAD83)
N: 4,251,711.28
E: 458,782.87

PROPOSED SURFACE HOLE LOCATION
(STORAGE WELL 12644)
NAD83
LAT: N 38°24'46"
LONG: W -81°28'20"
UTM METERS (NAD83)
N: 4,251,711.3
E: 458,782.9
TOTAL DEPTH: 5,210' TVD 8,792' MD

Grid North
 WV SOUTH, NAD 83(2011)



PROPOSED BOTTOM-HOLE LOCATION
(STORAGE WELL 12644)
NAD83
LAT: N 38°24'18"
LONG: W -81°28'50"
UTM METERS (NAD83)
N: 4,250,846.0
E: 458,034.6
TOTAL DEPTH: 5,210' TVD 8,792' MD

PROPOSED LANDING POINT
(STORAGE WELL 12644)
NAD83
LAT: N 38°24'29"
LONG: W -81°28'24"
UTM METERS (NAD83)
N: 4,251,193.9
E: 458,667.1
TOTAL DEPTH: 5,210' TVD 8,792' MD

- NOTES:**
 1. THIS PLAT HAS BEEN PREPARED FROM DEEDS AND TAX MAPS NOT A BOUNDARY SURVEY
 2. NO BUILDINGS OR WELLS LOCATED WITHIN 200'

FILE # _____
 DRAWING # 12644
 SCALE: 1" = 700'
 MINIMUM DEGREE OF ACCURACY: 1:2,500'
 PROVEN SOURCE OF ELEVATION: STATIC GPS SURVEY WITH TIES TO NGS DATA

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: _____
 R.P.E.: _____ L.L.S.: 2252

PLACE SEAL HERE

+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304



DATE: 12-08-21
 OPERATOR'S WELL #: 12644
 API WELL #: 47 039 06402T
 STATE COUNTY PERMIT
4703906402T

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: COOPERS CREEK-ELK RIVER (050500070908) ELEVATION: 856'
 COUNTY/DISTRICT: 039-KANAWHA / 4-ELK QUADRANGLE: 258-BLUE CREEK

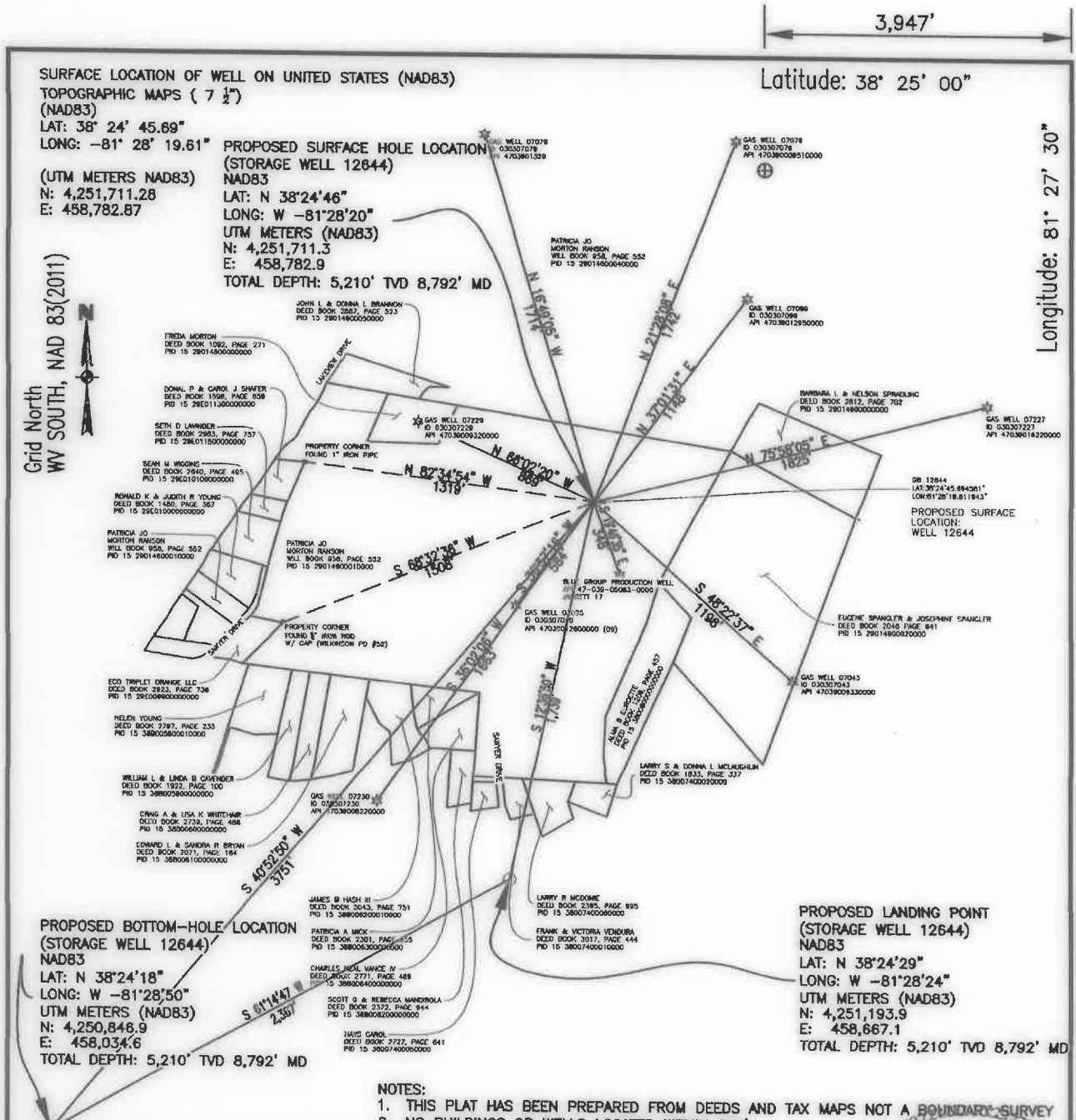
SURFACE OWNER: JAMES A. & FRED A. MORTON ACREAGE: 57 1/2
 OIL & GAS ROYALTY OWNER: MATT AMOS, ET AL GAS ROYALTY OWNER ACREAGE: 851.5

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE SPECIFY): 12/08/2023

TARGET FORMATION: ORISKANY SANDSTONE (STORAGE RESERVOIR) ESTIMATED DEPTH: 5,210 FT. TVD 8,792 FT. MD

WELL OPERATOR COLUMBIA GAS TRANSMISSION DESIGNATED AGENT JAMES AMOS
 Address 1700 MACCORKLE AVE. SE PO BOX 1273 Address 1700 MACCORKLE AVE. SE PO BOX 1273
 City CHARLESTON State WV Zip Code 25325-1273 City CHARLESTON State WV Zip Code 25325-1273

G:\TRANSCANADA\507104926_COCO_B_NEW_WELLS_PIPELINE\DRAWING\LANDPLATS\NEW PLATS_20230605\PLAT_OVERALL.DWG - PLOT TIME: 10/20/2023 10:00 AM



SURFACE LOCATION OF WELL ON UNITED STATES (NAD83)
 TOPOGRAPHIC MAPS (7 1/2")
 (NAD83)
 LAT: 38° 24' 45.69"
 LONG: -81° 28' 19.61"
 (UTM METERS NAD83)
 N: 4,251,711.28
 E: 458,782.87

Latitude: 38° 25' 00"

Longitude: 81° 27' 30"

Grid North
 WV SOUTH, NAD 83(2011)

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 TOTAL DEPTH: 5,210' TVD 8,792' MD

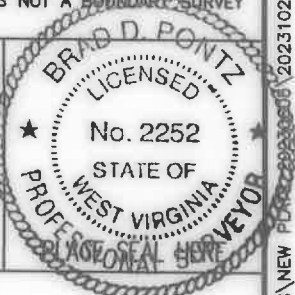
PROPOSED BOTTOM-HOLE LOCATION
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PROPOSED LANDING POINT
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 DRAWING # 12644
 SCALE: 1" = 700'
 MINIMUM DEGREE OF ACCURACY: 1:2,500'
 PROVEN SOURCE: STATIC GPS SURVEY WITH TIES TO NGS DATA

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 Signed: [Signature] 11/13/23
 R.P.E.: _____ L.L.S.: 2252



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SURFACE OWNER: PATRICIA JO MORTON RANSON ACREAGE: 57 1/2
 OIL & GAS ROYALTY OWNER: MATT AMOS, ET AL GAS ROYALTY OWNER ACREAGE: 851.5
 LEASE NO. (SURFACE) 1049098-0000 (BOTTOM HOLE) REFER TO FORM WW-2A1

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE SPECIFY): _____

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 City CHARLESTON State WV Zip Code 25325-1273 City CHARLESTON State WV Zip Code 25325-1273

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