

EXHIBIT 9

This Exhibit is a placeholder and is not required for this Application.

EXHIBIT 10

AEP Transmission Zone: Baseline Breaks - Dorton 69kV Conversion

Process Stage: First Review Solution

Criteria: AEP 715 Criteria

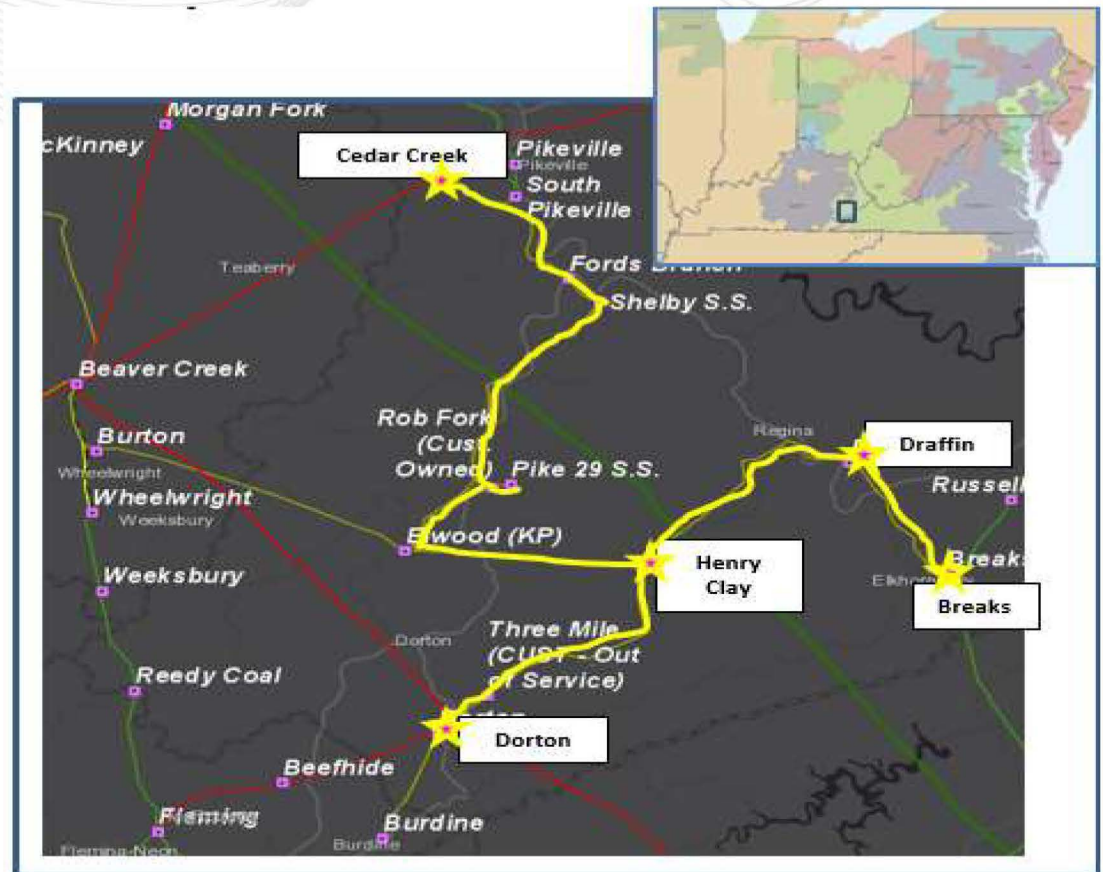
Assumption Reference: 2027 RTEP assumption

Model Used for Analysis: 2027 RTEP Winter case

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: 2022W1-AEP-VM4 through 2022W1-AEP-VM21, 2022W1-AEP-VD5 through 2022W1-AEP-VD24

In 2027 Winter RTEP case, Dorton, Pike 29, Rob Fork, Burdine, Henry Clay, Draffin 46KV buses (along the Cedar Creek - Elwood and Breaks - Dorton - Elwood 46KV circuits) experience voltage magnitude and drop violations under multiple N-1-1 contingency scenarios.





AEP Transmission Zone: Baseline Breaks - Dorton 69kV Conversion

Proposed Solution:

Transmission Components:

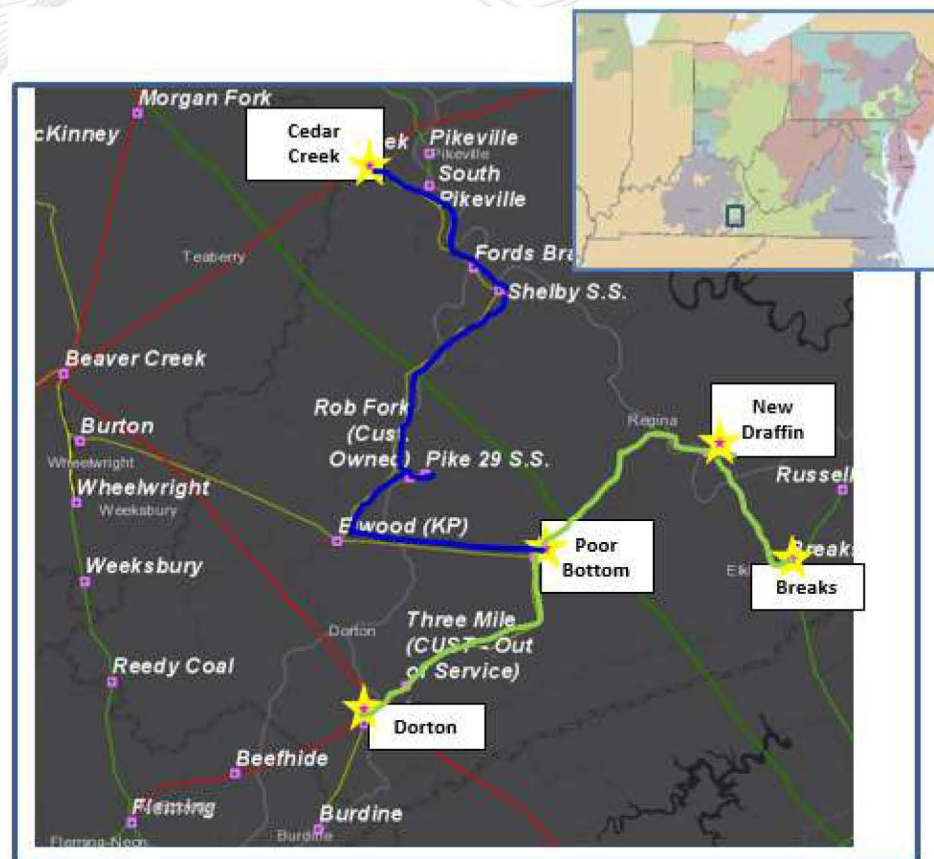
- Establish 69kV bus and new 69 kV line CB at Dorton substation. \$1.13 M
- At Breaks substation, reuse 72kV breaker A as the new 69kV line breaker. \$0.71 M
- Rebuild ~16.7 mi Dorton – Breaks 46kV line to 69kV. \$58.52
- Retire ~17.2 mi Cedar Creek – Elwood 46kV circuit. \$11.15 M
- Retire ~6.2 mi Henry Clay – Elwood 46kV line section. \$4.3 M
- Retire Henry Clay 46 kV substation and replace with Poor Bottom 69 kV station. Install a new 0.7 mi double circuit extension to Poor Bottom 69kV. \$3.42 M
- Retire Draffin substation and replace with a new substation. Install a new 0.25 mi double circuit extension to New Draffin substation. \$2.01M
- Remote End work at Jenkins substation. \$0.03 M
- Provide Transition fiber to Dorton, Breaks, Poor Bottom, Jenkins and New Draffin substations. \$0.41M
- Henry Clay S.S Retirement: \$ 0.3 M
- Cedar Creek substation work: \$0.44 M
- Breaks substation retire 46kV equipment: \$0.25 M
- Retire Pike 29 SS and Rob Fork SS: \$0.42 M

Total Transmission Estimated Cost: \$83M

Distribution Components:

- Serve Pike 29 and Rob Fork customers from nearby 34kV Distribution sources. \$ 2.23 M (D cost)
- Poor Bottom substation install: \$8.46 M (D cost)
- Henry Clay 46kV substation retirement: \$0.82 M (D cost)
- New Draffin 69kV substation install: \$6.66 M (D cost)
- Draffin 46kV substation retirement: \$0.68 M (D cost)

Total Distribution Estimated Cost: \$18.9M



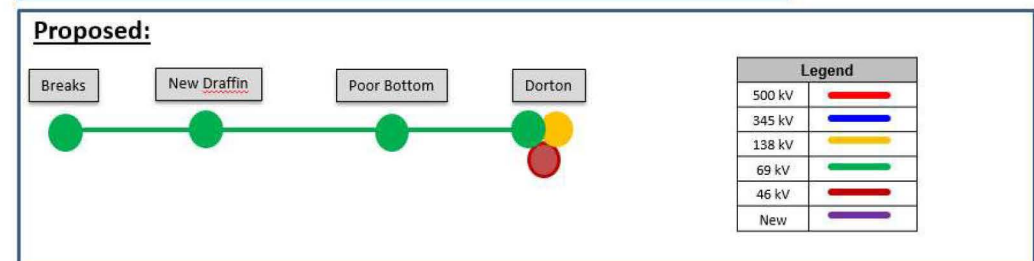
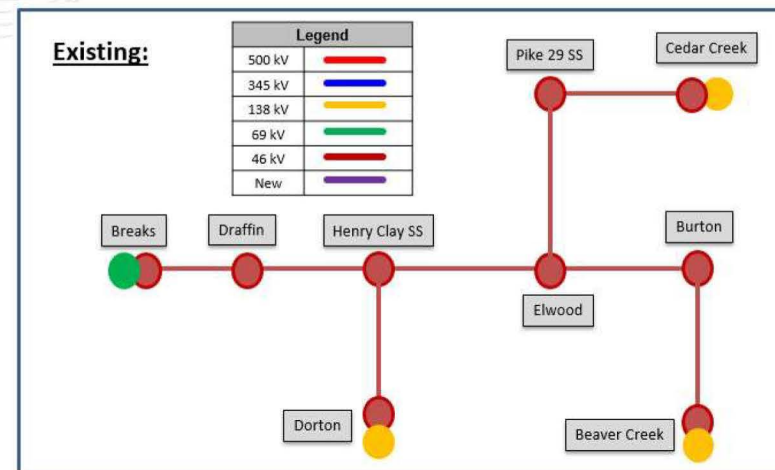
AEP Transmission Zone: Baseline Breaks - Dorton 69kV Conversion

Alternatives: Install 9.6 MVAR 46kV Cap Bank at Dorton substation. This cap bank must be served off the 46kV Bus. Also, install 12.9 MVAR Cap Bank at Cedar Creek substation 46kV Bus. While this fixes the baseline issues identified, it does not address the supplemental needs as identified and mitigated with the proposed solution. (Estimated Cost: \$2.58 M)

Ancillary Benefits: This proposal completely addresses identified supplemental needs on Cedar Creek – Elwood 46kV under Need AEP-2019-AP032 (presented 8/29/2019 W-SRRTEP), and Identified supplemental needs on Breaks – Dorton – Elwood 46kV circuit under AEP-2020-AP012 (presented 2/21/2020 W-SRRTEP). The proposal proposes retirement of roughly 23.4 mi of obsolete 46kV line.

Required in-service date: 12/1/2027

Projected in-service date: 7/31/2027



AEP Transmission Zone: Baseline Breaks - Dorton 69kV Conversion

Process Stage: Recommended Solution

Criteria: AEP 715 Criteria

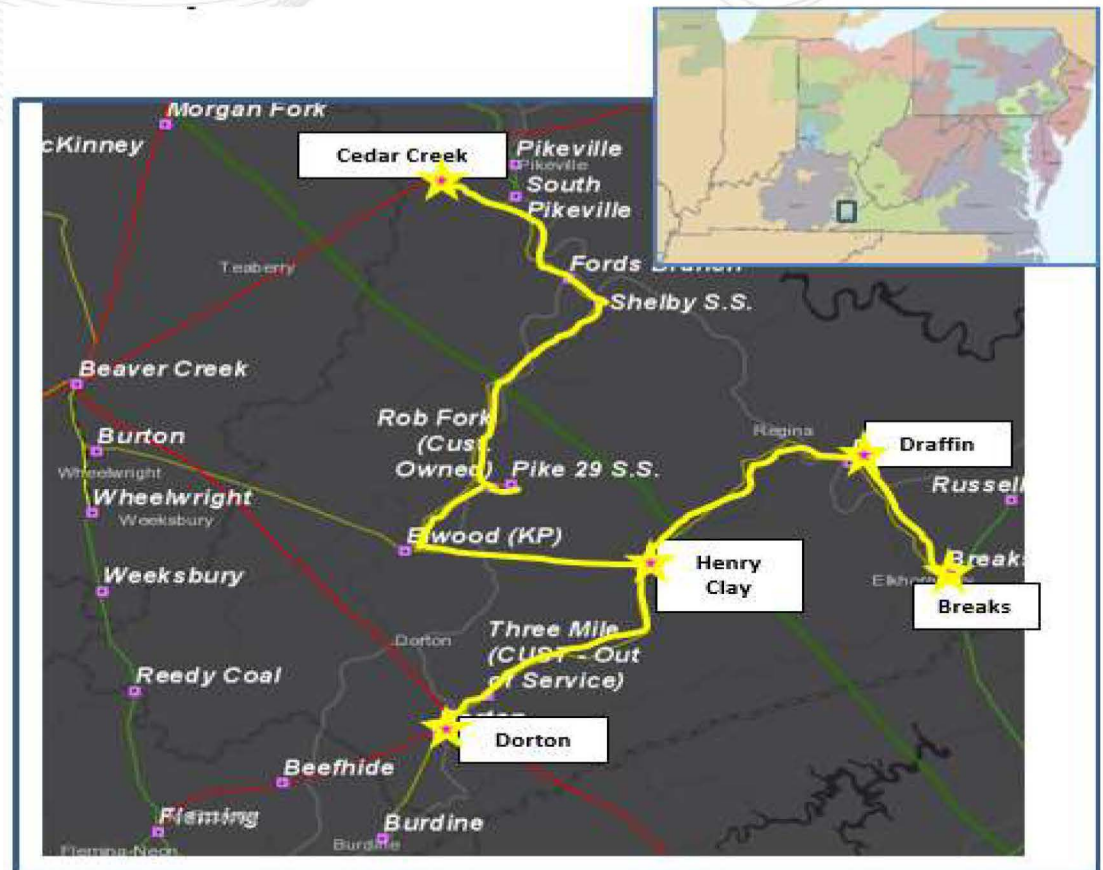
Assumption Reference: 2027 RTEP assumption

Model Used for Analysis: 2027 RTEP Winter case

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: 2022W1-AEP-VM4 through 2022W1-AEP-VM21, 2022W1-AEP-VD5 through 2022W1-AEP-VD24

In 2027 Winter RTEP case, Dorton, Pike 29, Rob Fork, Burdine, Henry Clay, Draffin 46KV buses (along the Cedar Creek - Elwood and Breaks - Dorton - Elwood 46KV circuits) experience voltage magnitude and drop violations under multiple N-1-1 contingency scenarios.





AEP Transmission Zone: Baseline Breaks - Dorton 69kV Conversion

Recommended Solution:

Transmission Components:

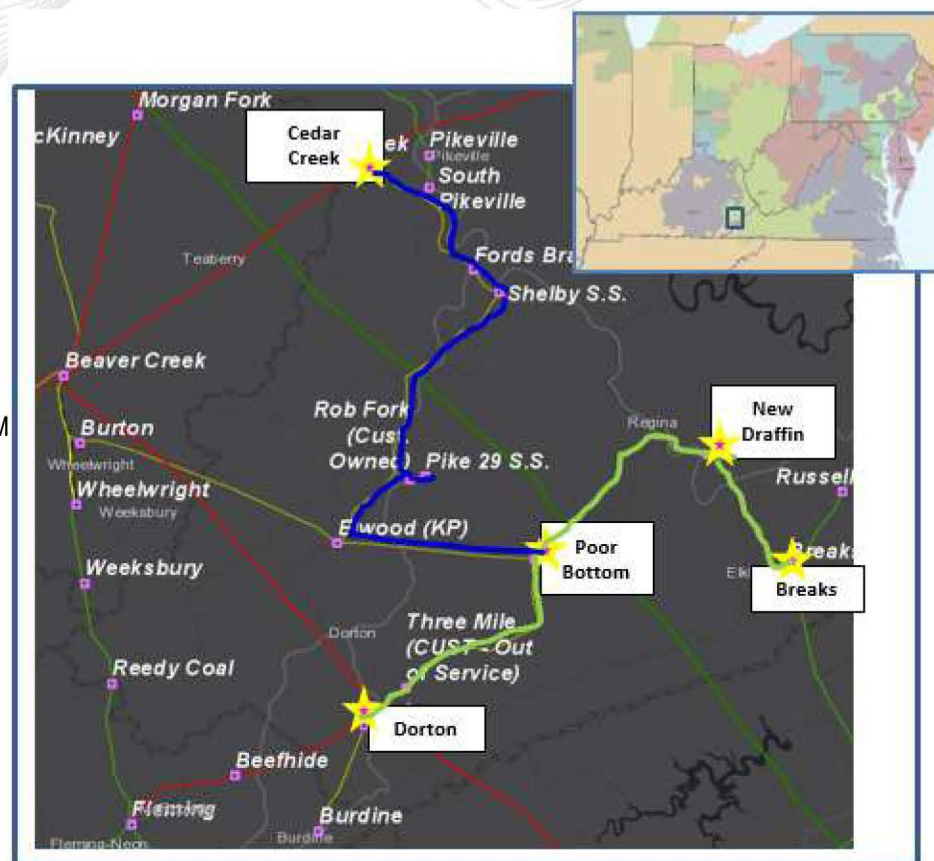
- Establish 69kV bus and new 69 kV line CB at Dorton substation. (B3736.1) \$1.13 M
- At Breaks substation, reuse 72kV breaker A as the new 69kV line breaker. (B3736.2) \$0.71 M
- Rebuild ~16.7 mi Dorton – Breaks 46kV line to 69kV. (B3736.3) \$58.52
- Retire ~17.2 mi Cedar Creek – Elwood 46kV circuit. (B3736.4) \$11.15 M
- Retire ~6.2 mi Henry Clay – Elwood 46kV line section. (B3736.5) \$4.3 M
- Retire Henry Clay 46 kV substation and replace with Poor Bottom 69 kV station. Install a new 0.7 mi double circuit extension to Poor Bottom 69kV. (B3736.6) \$3.42 M
- Retire Draffin substation and replace with a new substation. Install a new 0.25 mi double circuit extension to New Draffin substation. (B3736.7) \$2.01M
- Remote End work at Jenkins substation. (B3736.8) \$0.03 M
- Provide Transition fiber to Dorton, Breaks, Poor Bottom, Jenkins and New Draffin substations. (B3736.9) \$0.41M
- Henry Clay S.S Retirement: . (B3736.10) \$ 0.3 M
- Cedar Creek substation work: . (B3736.11) \$0.44 M
- Breaks substation retire 46kV equipment: (B3736.12) \$0.25 M
- Retire Pike 29 SS and Rob Fork SS: . (B3736.13) \$0.42 M

Total Transmission Estimated Cost: \$83M

Distribution Components:

- Serve Pike 29 and Rob Fork customers from nearby 34kV Distribution sources. . (B3736.14) \$ 2.23 M (D cost)
- Poor Bottom substation install: . (B3736.15) \$8.46 M (D cost)
- Henry Clay 46kV substation retirement: . (B3736.16) \$0.82 M (D cost)
- New Draffin 69kV substation install: . (B3736.17) \$6.66 M (D cost)
- Draffin 46kV substation retirement: . (B3736.18) \$0.68 M (D cost)

Total Distribution Estimated Cost: \$18.9M





AEP Transmission Zone: Baseline Breaks - Dorton 69kV Conversion

Ancillary Benefits: This proposal completely addresses identified supplemental needs on Cedar Creek – Elwood 46kV under Need AEP-2019-AP032 (presented 8/29/2019 W-SRRTEP), and Identified supplemental needs on Breaks – Dorton – Elwood 46kV circuit under AEP-2020-AP012 (presented 2/21/2020 W-SRRTEP). The proposal proposes retirement of roughly 23.4 mi of obsolete 46kV line.

Required in-service date: 12/1/2027

Projected in-service date: 7/31/2027

Previously Presented: 10/14/2022

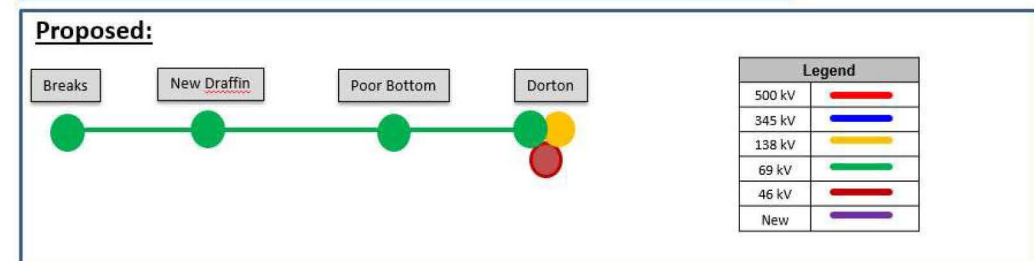
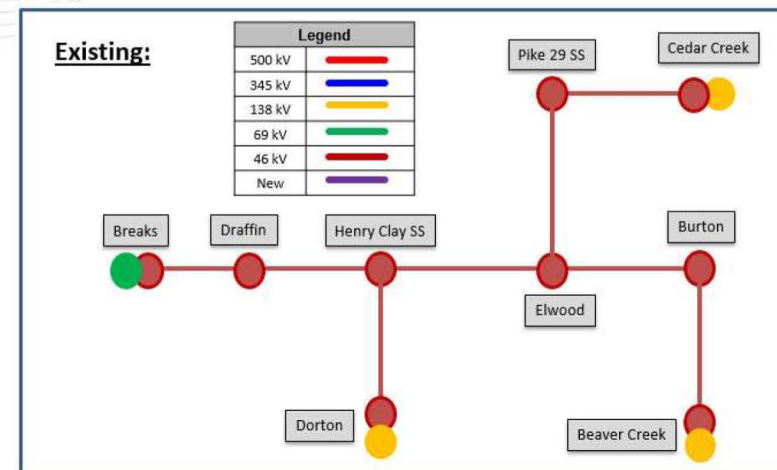


EXHIBIT 11

This Exhibit is a placeholder and is not required for this Application.

EXHIBIT 12



May 11, 2026

Transmission Line	Work Order	BPID
Henry Clay – Dorton Rebuild	T10358849	P19037004
Henry Clay – Ratliff – Breaks Rebuild	T10358858	P19037005
Henry Clay Extension	T10370771	P19037006

*Desktop Study and Geologic Hazard Risk Assessment
Breaks – Ratliff – Henry Clay – Dorton 69kV
Pike County, Kentucky*

Objective

AEP's Civil and Geotechnical Engineering (CGE) group performed a geological and geotechnical hazard (geohazard) study for the Breaks – Ratliff – Henry Clay – Dorton 69kV rebuild in Pike County, Kentucky. This memo summarizes:

- Anticipated geologic conditions along the proposed alignment
- Geo-hazards which may impact construction and foundation design
- Observations from site visits by CGE Representatives
- The results of the geotechnical investigation by Terracon

Project Background

AEP is planning to rebuild the existing transmission line between Breaks Station in Elkhorn City, Kentucky to Dorton Station in Dorton, Kentucky. The transmission line will tap into the new Ratliff Station, also in Elkhorn City, and the existing Henry Clay Station in Marrowbone, KY. In total, the rebuild is approximately 18.5 miles long. There are significant existing and potential slope stability risks along the proposed corridor, as is common in this mountainous terrain and the underlying geology and historical coal mining activity. Most of the transmission line structures will be on ridge tops or mountain sides. These structures predominantly consist of direct embedded pole structures, guyed and un-guyed, with some lattice towers supported on grillage foundations. Custom poles supported on reinforced concrete drilled shaft foundations are proposed outside of the stations, which are in the valleys in flatter terrain.

CGE performed a geologic desktop study to define the geohazard risk across the transmission line alignment. In addition, geoprofessionals from WSP performed site reconnaissance on behalf of CGE at every proposed structure location and access road. Representatives for AEP Construction Management also participated in these site visits.

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The site visits were conducted between June 2025 and November 2025. Terracon performed geotechnical borings at transmission line structures outside of Ratliff, Henry Clay, and Dorton Station.

CGE's understanding of the structure locations is based on a kmz file titled "Breaks – Dorton -Elwood" from WSP received April 24, 2026. CGE's understanding of the access road locations is based on a kmz file titled "COMBINED HENRY CLAY PROJECTS – KMZ – 08-19-2025" from AGE Engineering Services received August 19, 2025.

Geology

Physiographic Province

The rebuild is within the Appalachian Plateau Physiographic Province, which consists of relatively flat to gently folded sedimentary rocks (predominantly sandstone, siltstone, claystone, shale, and coal) as reported by the Kentucky Geological Survey (KGS). In this area, the province is also known as the Eastern Kentucky Coal Field. The terrain consists of steep to very steep hillsides and highly dissected v-shaped valleys (Reference 1).

Project Geology

The Pikeville Formation, consisting of sandstone, siltstone, shale, underclay, coal, and limestone, is present across the rebuild project footprint. The Pikeville Formation is underlain by the Grundy Formation, consisting of sandstone, shale, and coal, and is generally present between Breaks, Ratliff, and Henry Clay Stations. The Hyden Formation, consisting of siltstone, sandstone, and coal, overlays the Pikeville Formation and is generally present between Henry Clay and Dorton Stations. Alluvium deposits are encountered locally throughout within the incised valleys. The Alluvium consists of loosely deposits silt, sand, gravel, and clay soils.

KGS identifies 18 coal seams throughout the project footprint. These coal seams are Hazard, Taylor Rider, Taylor, Fireclay, Whitesburg, Amburgy Coal, unnamed coal in Middle Pennsylvanian, Upper Elkhorn No. 3.5, Upper Elkhorn No. 3, Upper Elkhorn No. 2 and 1, Upper Elkhorn No. 1 Rider, Lower Elkhorn, Clintwood, Eagle Coal, Glamorgan, Hagy, Splashdam, and Elswick. (Reference 1).

The bedrock geology mapping is shown in Attachment 1.

Project Soils

The soil overburden is expected to vary in both thickness and composition depending on the topography, past site use (particularly with regards to coal mining activity), and the underlying bedrock. Table 1 provides a summary of the soil conditions across the rebuild (Reference 2). It should be noted that about 75 percent of the rebuild will be along grades between 20 to 120 percent. In addition, there are significant amounts of mine spoils, most of which are concentrated between Structures 51 and 64.

Table 1 Soil Summary

Soil Description	Approx. Length (mi)	Approx. Percentage Across Alignment (%)
Colluvium (old landslide deposits), 20 to 80% grade, largely present on side slopes, varying depth to bedrock	7	38
Alluvium (old stream and/or flood deposits), urban fill areas, 5 to 12% grade, present in lower valleys, bedrock is deeper (30 ft or more)	1	5
Residuum (highly weathered rock) w/minor colluvium, cobble to boulder size rock fragments common, largely present on ridge tops, 35-75% grade, bedrock is typically shallow (5 to 15 ft, but can vary)	5	27
Rock outcrop areas, 60 to 120% grade, located on side slopes, shallow bedrock (0 to 10 ft, can vary)	1.4	8
Mine Spoils, potentially highly variable fill, varying grade, varying depth to bedrock	3.6	19
Other	0.5	3

Geohazards

Geohazards are geologic, environmental, and/or anthropogenic conditions that may result in damage or unacceptable levels of risk for site development. Mitigation of geohazards may be required to allow for safe construction and protect assets during their service life. Mitigation measures may consist of avoidance, minor design modification, specialized engineered plans, and so on. The most predominant geohazards within the project footprint are related to coal mining and landslides, with some localized areas of potential flood concerns.

Coal Mining

The primary concerns surrounding mining activity relate to slope stability and subsidence hazards. Remnant over-steepened high walls, uncontrolled mine spoil fill, and impounded water resulting from coal mining activity are present within the project footprint and exacerbate the landslide risk. Subsidence risk exists where there are underground voids left by abandoned or active underground mining activity. Subsidence may result in sinkhole features or open fissures (cracks) at the ground surface. The subsidence risk is generally higher where underground voids are present within 50-100 ft of the ground surface and/or where multiple coal seams have been mined at a given location. Approximately 11.7 miles (about 60 percent) of the proposed transmission line crosses reported historical coal mining (Reference 3, Reference 4). A map showing the extent of coal mining activity across the transmission line alignment is provided in Attachment 2.

The following 8 structures have reported underground coal mining activity within 100 ft of the existing grade: 31, 32, K380-1, K380-2, K380-3, 38, 42, and 44.

Table 2 provides a summary of the 37 structures which are underlain by 2 or more deep mines. The higher the number of underground mines, the higher the subsidence risk (Reference 5).

Table 2 Structures with More than 2 Underground Mines

Structure	Potential Number Deep Mines	Coal Seams
12	2	Clintwood, Elswick
28 - 29	2	Upper Elkhorn No. 1 & 2, Lower Elkhorn
31 - 32	3	Upper Elkhorn No. 3.5, Upper Elkhorn No. 1 & 2, Lower Elkhorn
K380-1, K380-2, K380-3	2	Upper Elkhorn No. 1 & 2, Lower Elkhorn
33 - 37	3	Upper Elkhorn No. 3.5, Upper Elkhorn No. 1 & 2, Lower Elkhorn
41	2	Upper Elkhorn No. 1 & 2, Lower Elkhorn
42	4	Fireclay, Upper Elkhorn No. 3.5, Upper Elkhorn No. 1 & 2, Lower Elkhorn
43 - 44	3	Upper Elkhorn No. 3.5, Upper Elkhorn No. 1 & 2, Lower Elkhorn
45 - 64	2	Upper Elkhorn No. 1 & 2, Lower Elkhorn

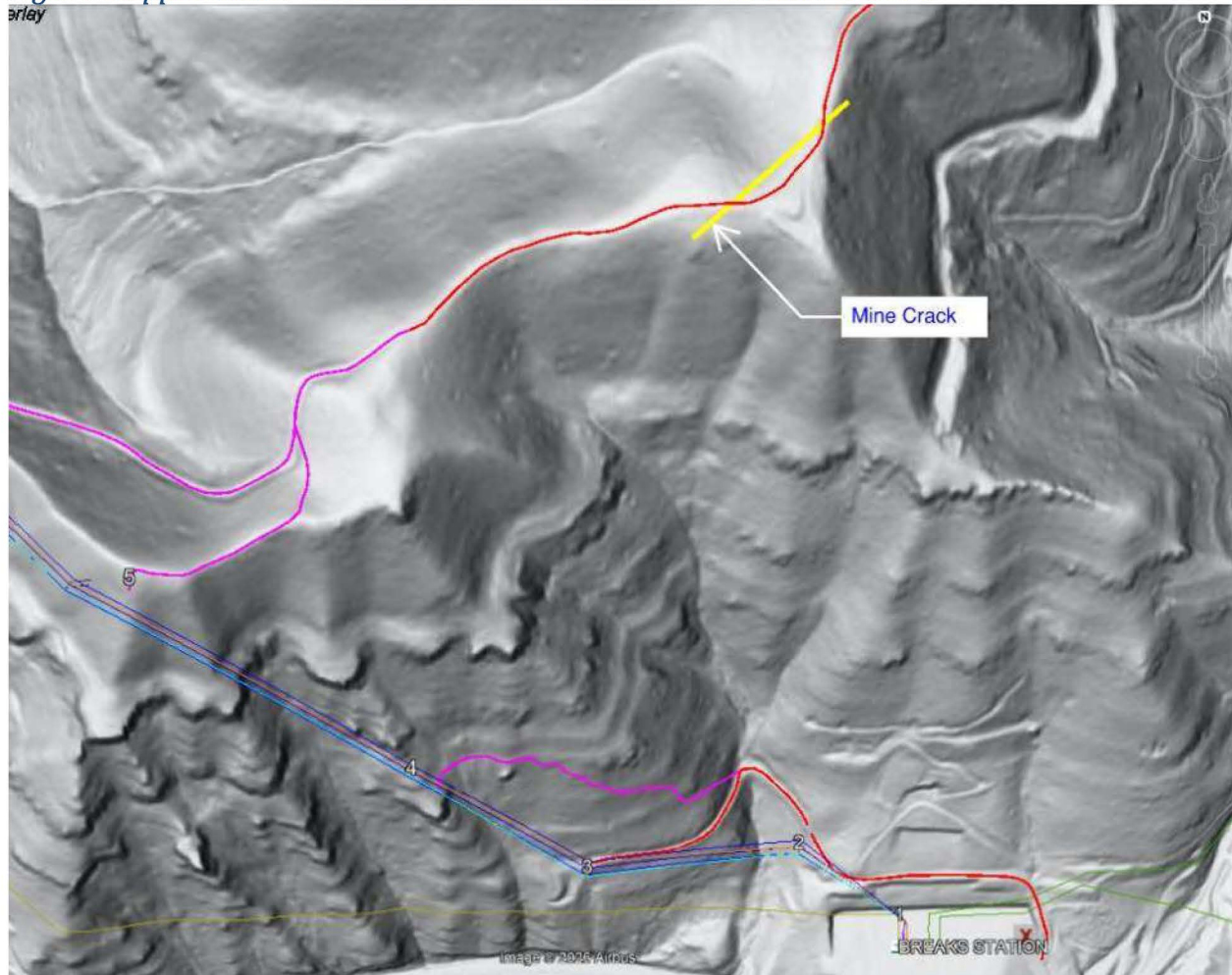
WSP visited each structure location and proposed access road to evaluate for surficial indications of mine subsidence activity. The only location where WSP observed mine subsidence activity was a mine crack along the access road to Structures 5 and 6. The mine crack is about 12 inches wide with an undetermined depth. Refer to Figure 1 and Figure 2. The photograph is from a previous site visit by CGE. WSP stated the mine crack does not appear to have grown wider based on their site visits in 2025. CGE believes the mine crack is associated with underground mining within the Lower Elkhorn coal seam. After discussion with AEP's Environmental and Construction Management teams, the decision was made to air bridge or mat over the mine crack during construction.

Figure 1 Mine Crack Across Access to Str 5 and 6 (dated November 17, 2021)



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Figure 2 Approximate Mine Crack Location Across Access to Str 5 and 6



There is also extensive surface mining and probable mine spoils located throughout. Most notably, mine spoils are noted to be present at Str 30 and Str 51 – 64.

Mine spoils are challenging for foundation design as the material is typically heterogeneous with material ranging from loose fine-grained deposits to small vehicle sized boulders. In addition, mine spoils placed without engineered controls or compaction may have open voids throughout that are prone to collapse. Organics and other deleterious materials which are prone to decomposition and collapse may also be present throughout mine spoils.

The Contractor should be prepared with the appropriate means and methods to extract large boulder-sized rock materials and mitigate excavation sidewall collapse within loose materials. Casing may be necessary to mitigate losing grout or concrete in potential open voids.

Overall settlement, differential settlement, and down drag should be evaluated for structures bearing in mine spoils. Factors such as variability of conditions encountered in

geotechnical borings, any information about the methods for placing the mine spoils, and the age of the mine spoil fill should be considered.

Landslides

Landslides are defined as a form of mass earthen material waste events such as slope creep, landslides, and rockfall caused by gravity. The entire project area is within a zone of high landslide incidence (Reference 6). Landslide incidence is defined as the number of landslides that have occurred in each geographic area. High incidence means greater than 15 percent of a given area has experienced landslides. This high landslide incidence is largely related to the steep topography encountered throughout, the naturally occurring geology, and the presence of colluvial soils. Coal seams, present throughout the project area, are typically underlain by “clay underbeds” which are notoriously weak and highly slide prone. Colluvial soils are formed overtime by an accumulation of historical landslide debris and inherently are unstable.

Water is typically a contributing factor to destabilizing slopes. Coal seams are significantly more porous than other bedrock formations. Therefore, groundwater typically concentrates within coal seams resulting in seeps where the coal seams outcrop. Slope instabilities tend to be concentrated at coal seam outcrop locations. In addition, rainfall is a contributing factor to destabilizing slopes. Therefore, landslides often occur following significant rainfall events.

Within Reference 7, KGS provides a more refined definition of landslide susceptibility, from low to high (refer to Attachment 3). Based on the KGS mapping, the structures are within Low, Low-Moderate, Moderate, Moderate – High, and High as shown in Table 3.

Table 3 Structure Landslide Hazard Susceptibility Rating

Landslide Hazard Susceptibility	Structures	Structure Quantity
Low	4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 1482-1A, 1482-1B, 1482-2A, 1482-2B, 1482-3A, 1482-3B, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, K380-1, K380-2, K380-3, K380-4, K380-5, K380-6, 31, 32, 33, 34, 35, 37, 38, 39, 42, 45, 46, 48, 49, 50, 63, 64, 65, 66, 69	54
Low – Moderate	2, 3, 27, 28, 29, 43, 44, 52, 53, 54, 58, 59	12
Moderate	1, 30, 36, 41, 55, 56, 57, 62, 68	9
Moderate – High	40, 47, 51, 60, 61	5
High	67	1

In general, about 55 percent of the alignment crosses terrain categorized as Moderate, Moderate to High, or High per the KGS Landslide Susceptibility Hazard. As can be seen in Table 3, the line route was optimized to largely avoid placing structures in higher landslide susceptibility risk areas.

KGS also provide an extensive database of reported landslides and drainage ravine areas prone to debris flow (Reference 7). CGE supplemented this data by delineating other landslides and drainage ravines based on review of LiDAR collected by AEP in 2024, hillshade imagery, and aerial imagery. Based on this data, about 12.2 miles (about 66 percent) of the proposed alignment is within 500 ft of an apparent landslide and about 4.7 miles (about 25 percent) of is within 100 ft of a drainage ravine. The locations of these landslides and drainage ravines are shown in Attachment 4.

WSP evaluated the presence of landslides at structure locations and along proposed access roads during the site reconnaissance with Construction Management. Generally, the reported landslides are small and localized movements. The more significant findings from WSP's site visits regarding existing landslide activity are:

- Structure 2 is proposed next to tie back anchor block landslide mitigation completed in 2023 for a landslide impacting Breaks Station. The foundation design and structure pad grading for Structure 2 will need to consider any interactions with the adjacent landslide mitigation.
- Structure 3 was shifted further upslope to avoid an existing landslide which previously impacted another transmission line structure.
- Structure 36 is near an existing landslide. Guy anchors for Structure 36 have been relocated to be outside of the landslide area. Otherwise, WSP and Construction Management were able to optimize structure locations and access to avoid observed landslide activity.
- Sloughing activity was observed along the proposed access road to Structure 67. WSP noted that an AEP TFS crew was onsite and had plans to mitigate the sloughing activity.

There are several areas that will require grading activity within areas with high landslide susceptibility. CGE, Environmental, and Construction Management will continue to work closely together to mitigate the landslide risk through engineered grading plans and robust surface and subsurface water management.

Flood

The primary concern for flooding is the resulting scour which can occur. Scour is typically only a concern for structures within the 100-year floodplain or the floodway. Structures K380-6, 1482-3B, and 69 are located within the 100-year floodplain according to the FEMA National Flood Hazard Map. See Figure 3, Figure 4, and Figure 5. Structures 1482-2A, 1482-2B, and 1482-3A are located within the 500-year floodplain where scour is less of a concern. The potential scour at the structures within the 100-year floodplain should be evaluated. Scour mitigation may consist of proactive riprap treatment or neglecting the scour depth during foundation design and should account for external loading from moving water forces during flood events.

Figure 3 Structure K380-6 in the 100-year Floodplain

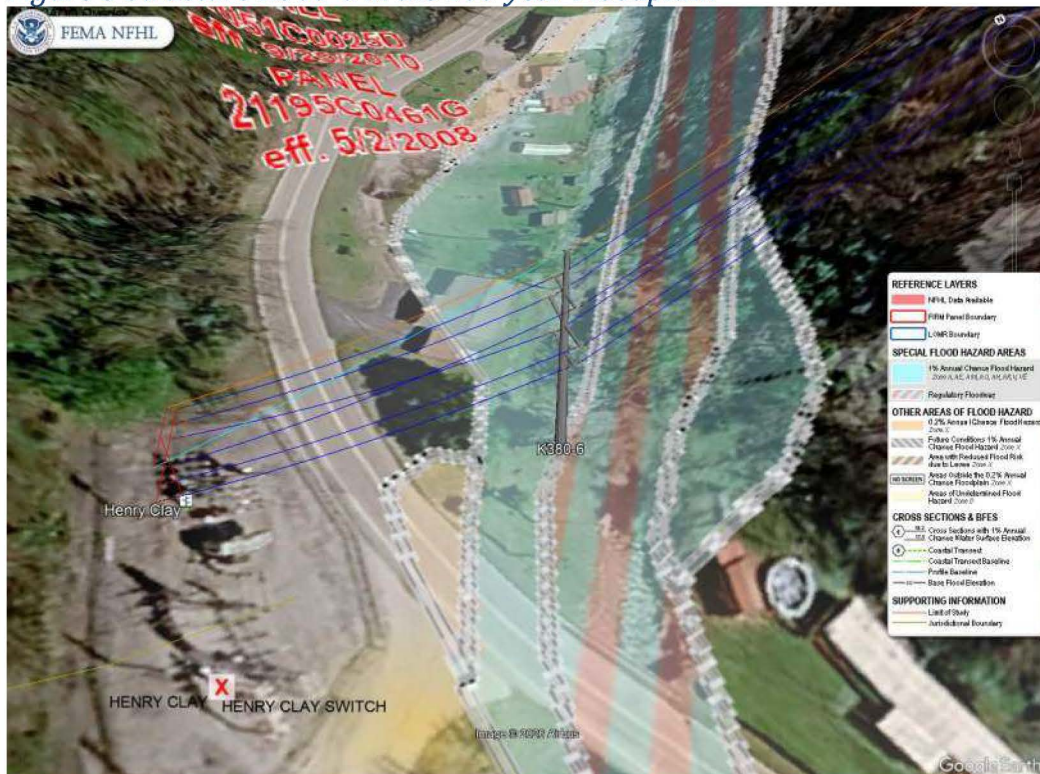
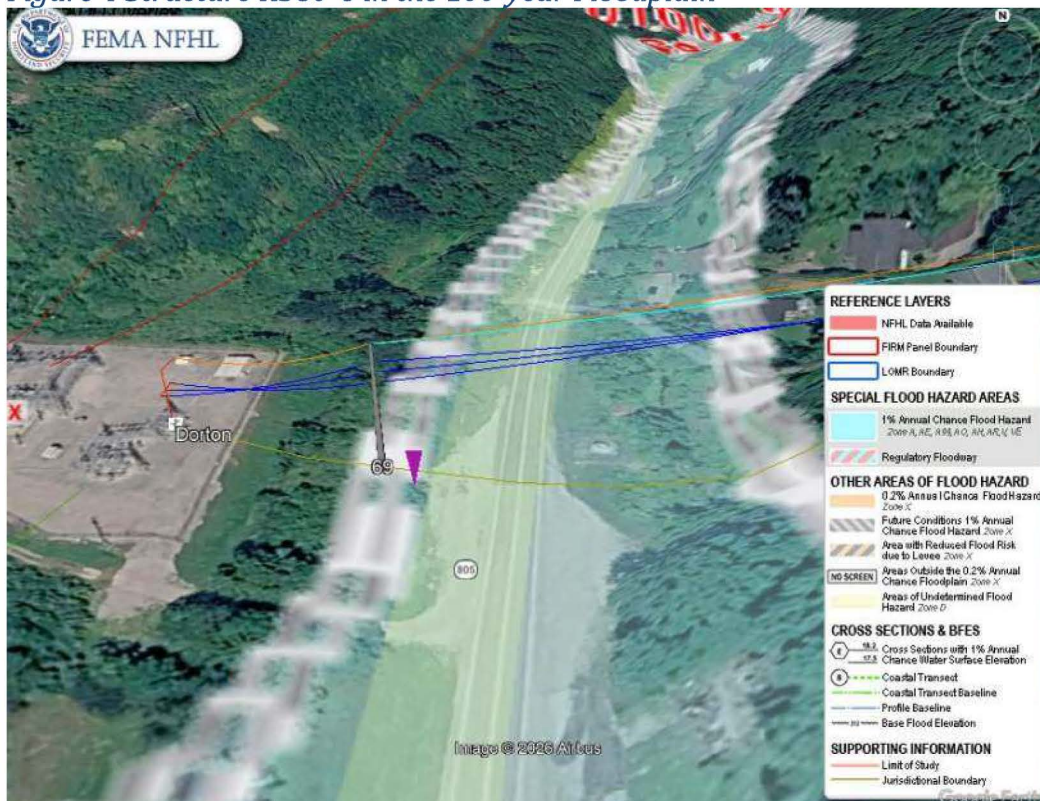


Figure 4 Structure K380-6 in the 100-year Floodplain



Subsurface Exploration

Terracon completed 5 geotechnical borings at the following locations:

- Structure 1482-1A (formerly Str 15B)
- Structure 1482-2B (formerly Str 15D)
- Structure 1482-3A (formerly Str 15E)
- Structure K380-6 (formerly 32F)
- Structure 69

All borings were drilled in valleys and within alluvial deposits. Due to access constraints, Terracon could not get borings for structures on the ridges and side slopes. Terracon's geotechnical report is provided as Attachment 5.

Limitations

Observations and findings presented herein are based on our project understanding, the availability and quality of data use at the time of the desktop study, and surficial observations during site visits. The information herein is based on published data and other information that is generally applicable as of the date of this document. Therefore, the conclusions and recommendations provided are only applicable to the timeframe of the study.

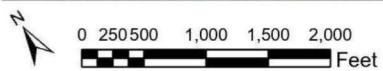
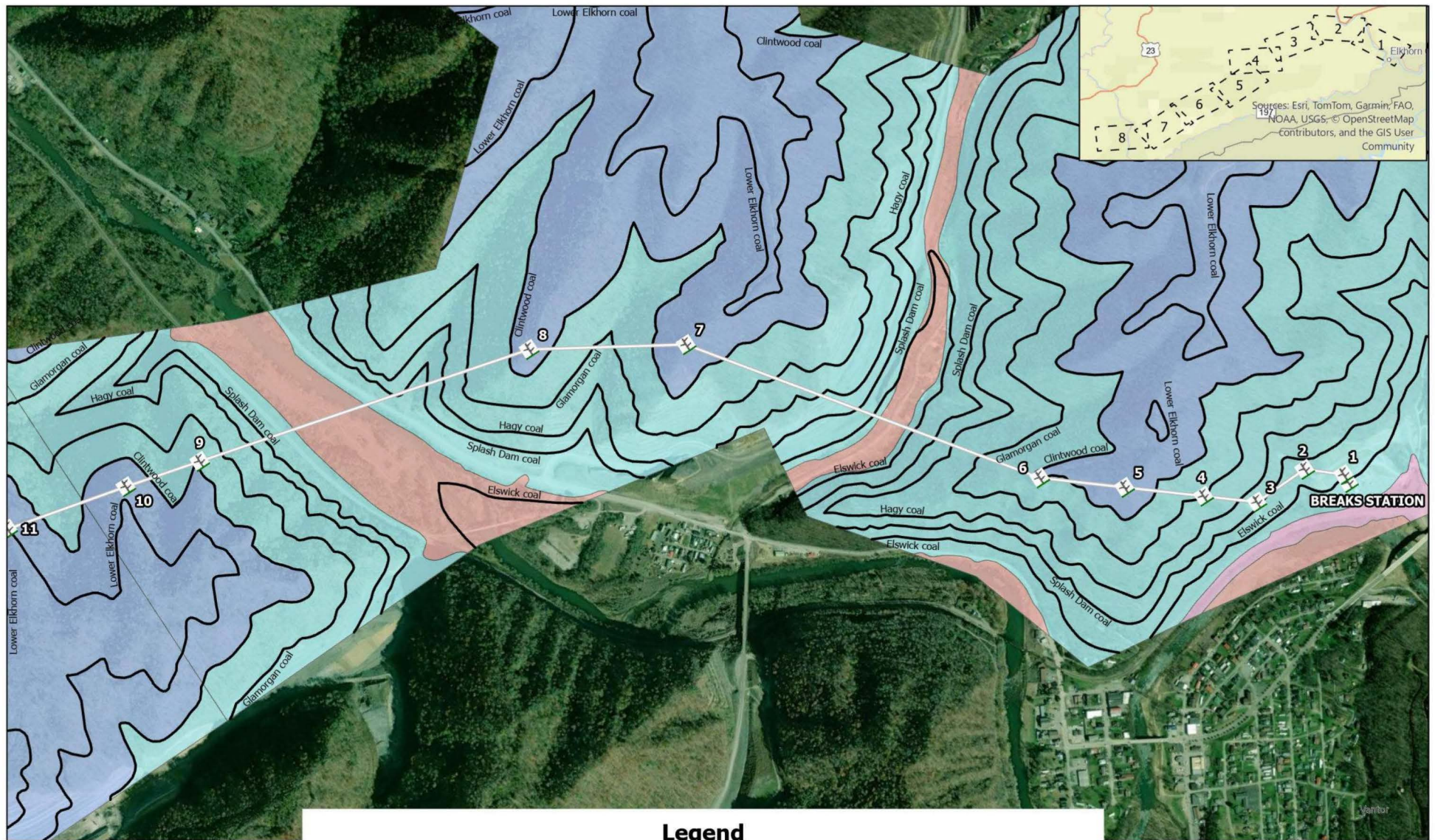
References

1. Kentucky Geologic Map Service, Kentucky Geological Survey, <https://kgs.uky.edu/kygeode/geomap/>, Accessed May 2024 to May 2026.
2. Kentucky Soils Data Viewer (with Detailed NRCS Soils Data), <https://kygeonet.ky.gov/kysoils/>, Accessed May 2026.
3. Kentucky Coal Mine Maps, KY Mine Mapping Information System, <https://eppcgis.ky.gov/minemapping/>, Accessed May 2024 to May 2026.
4. Horton, JD, and San Juan, CA, 2021, Prospect- and Mine-Related Features from U.S. Geological Survey 7.5- and 15-Minutes Topographic Quadrangle Maps of the United States (ver. 10.0, May 2023): U.S. Geological Survey data release, <https://doi.org/10.5066/F78W3CHG>.
5. Kentucky Enhanced Hazard Mitigation Plan for 2023, KEHMP 2023, <https://www.kyem.ky.gov/home/showpublisheddocument/1831/638950880324300000>.
6. Mirus, B. B., Belair, G. M., Wood, N. J., Jones, J., & Martinez, S. N. (2024). Parsimonious high-resolution landslide susceptibility modeling at continental scales. AGU Advances, 5, e2024AV001214. <https://doi.org/10.1029/2024AV001214>
7. Landslide Information Map, Kentucky Geological Survey, <https://kgs.uky.edu/kygeode/geomap/?layoutid=25>, Accessed May 2024 to May 2026.

Attachment 1 – Bedrock Geology

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KGS Bedrock Geology



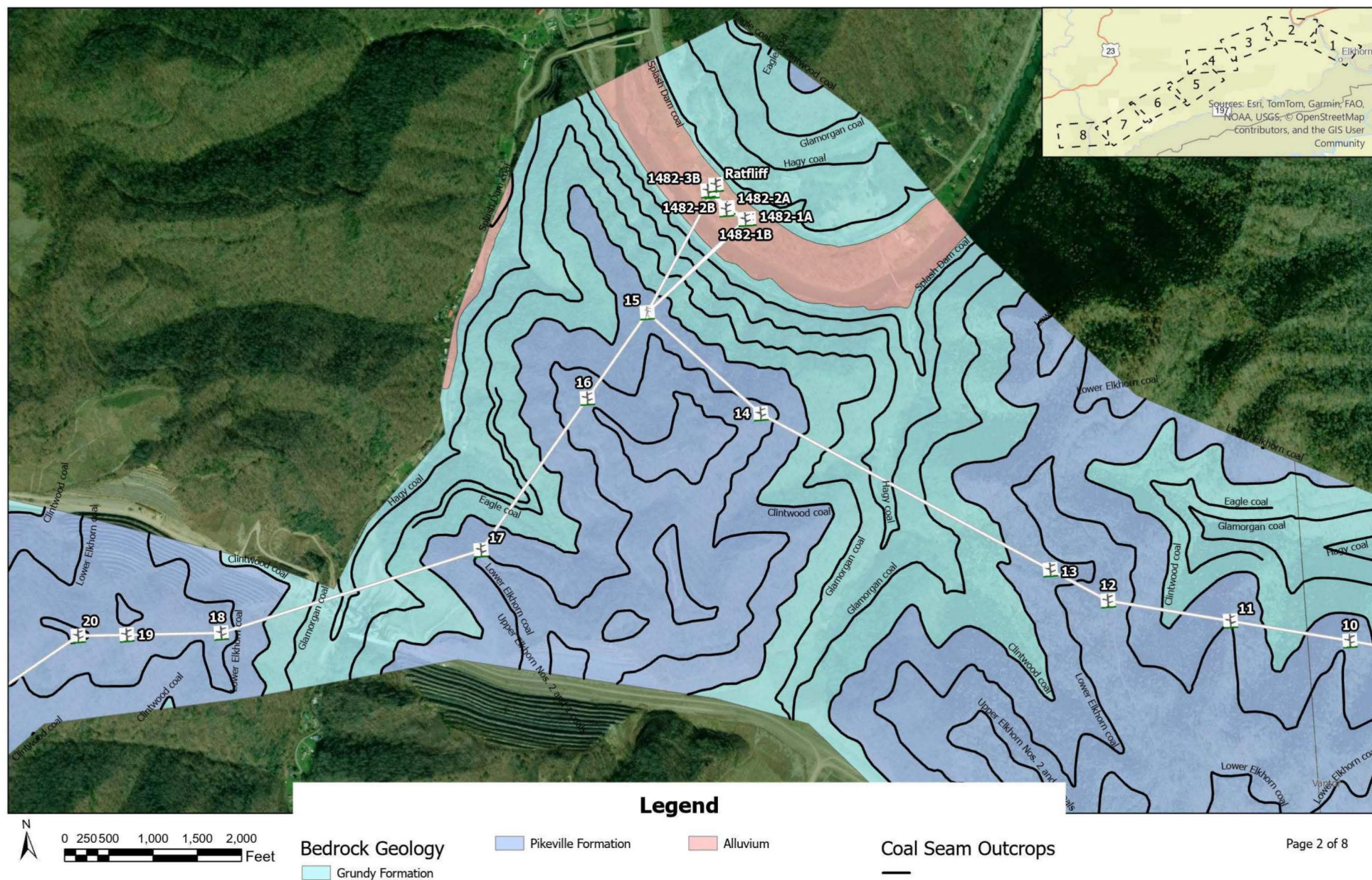
Bedrock Geology

Grundy Formation
Pikeville Formation

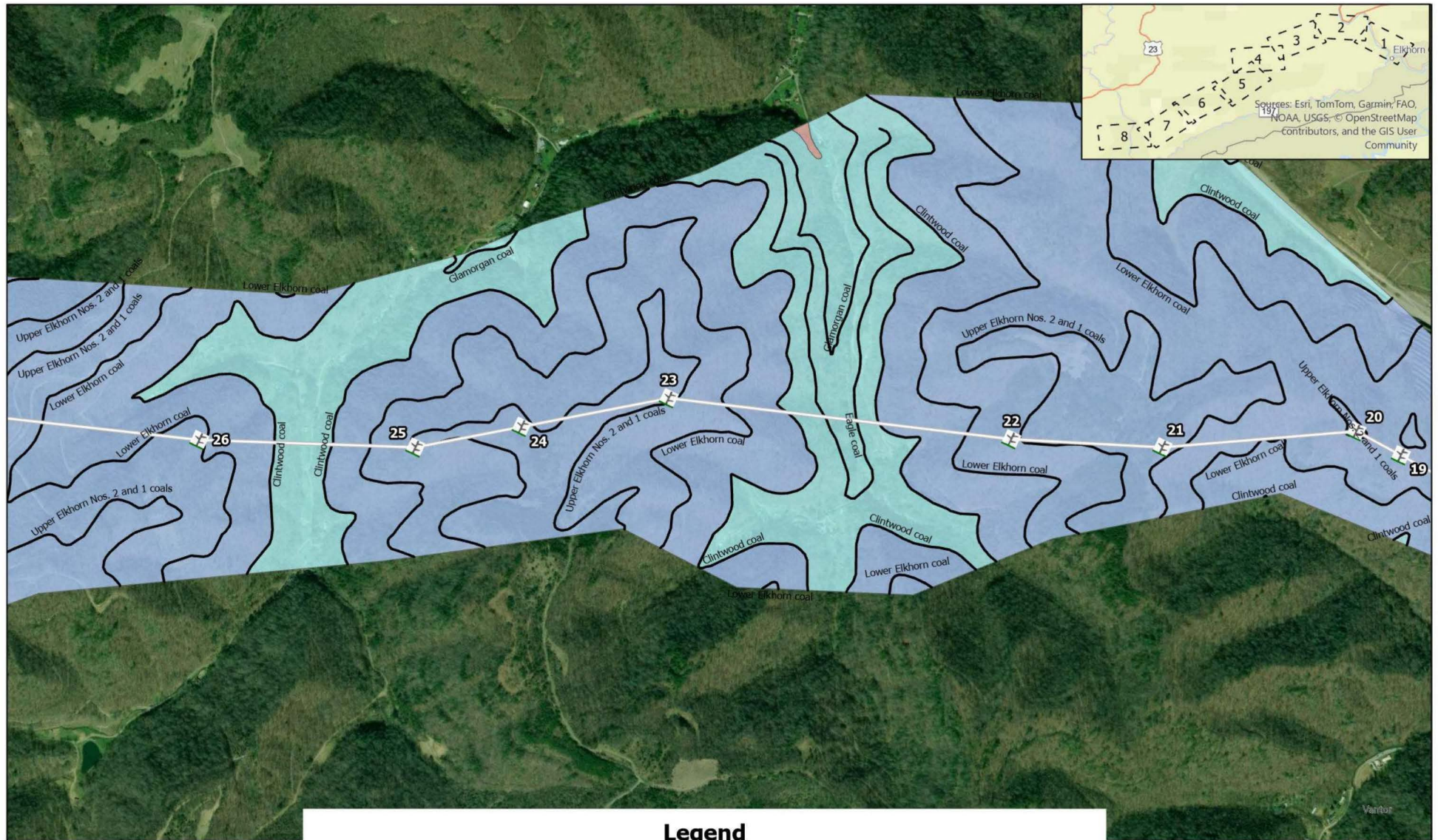
Alluvium

Coal Seam Outcrops

KGS Bedrock Geology



KGS Bedrock Geology



Legend

Bedrock Geology

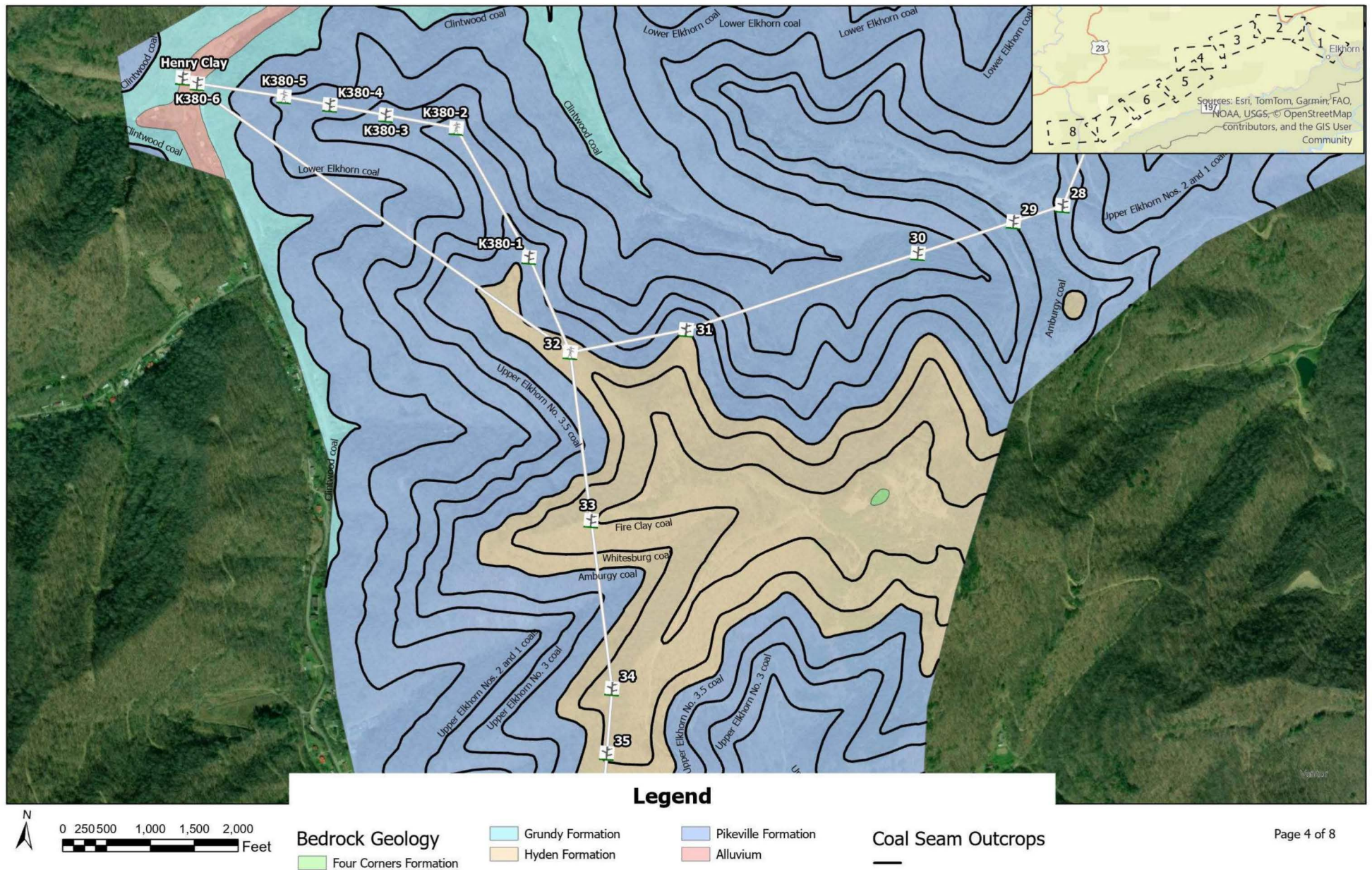
- Grundy Formation

Pikeville Formation

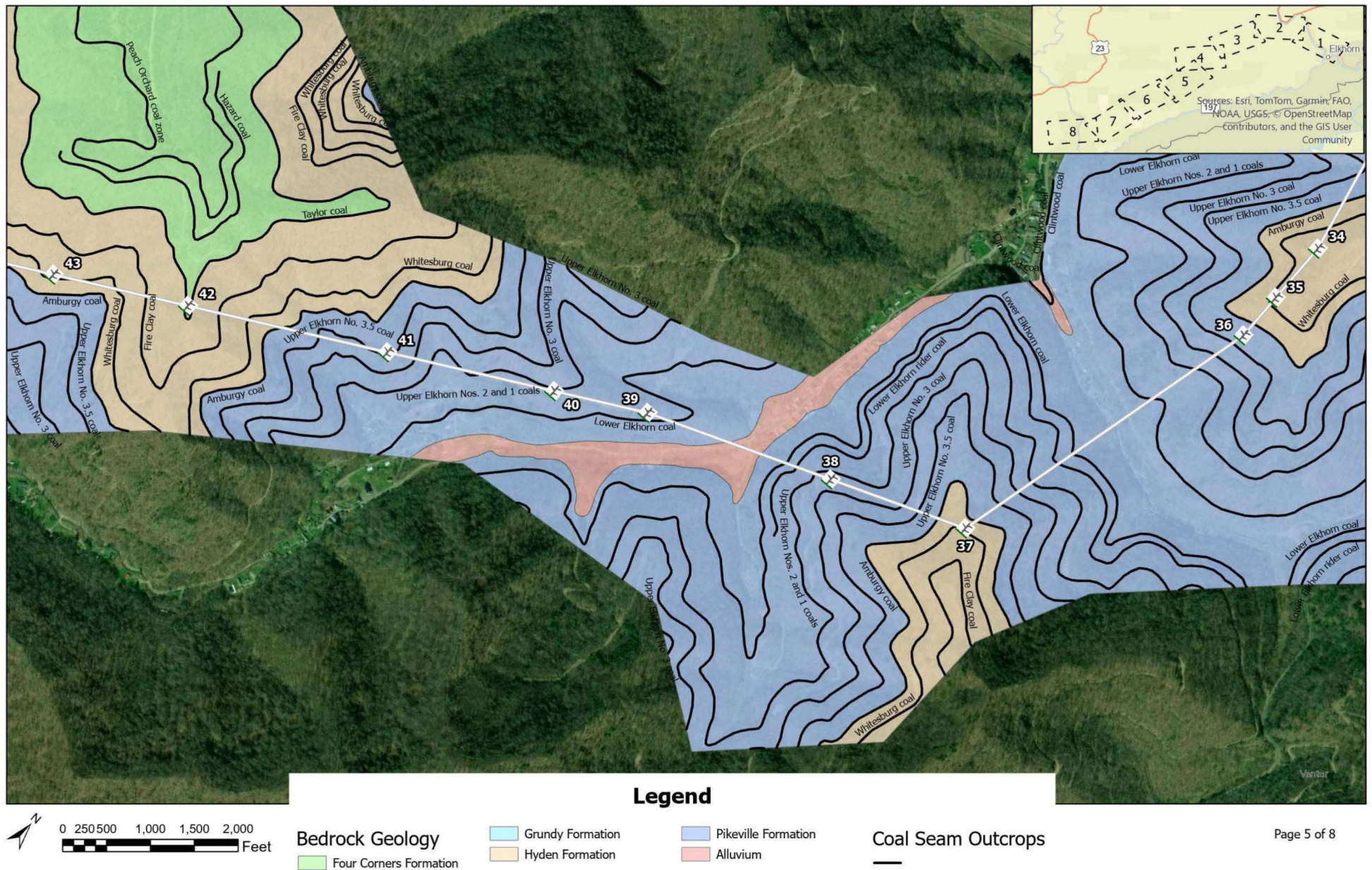
Alluvium

Coal Seam Outcrops

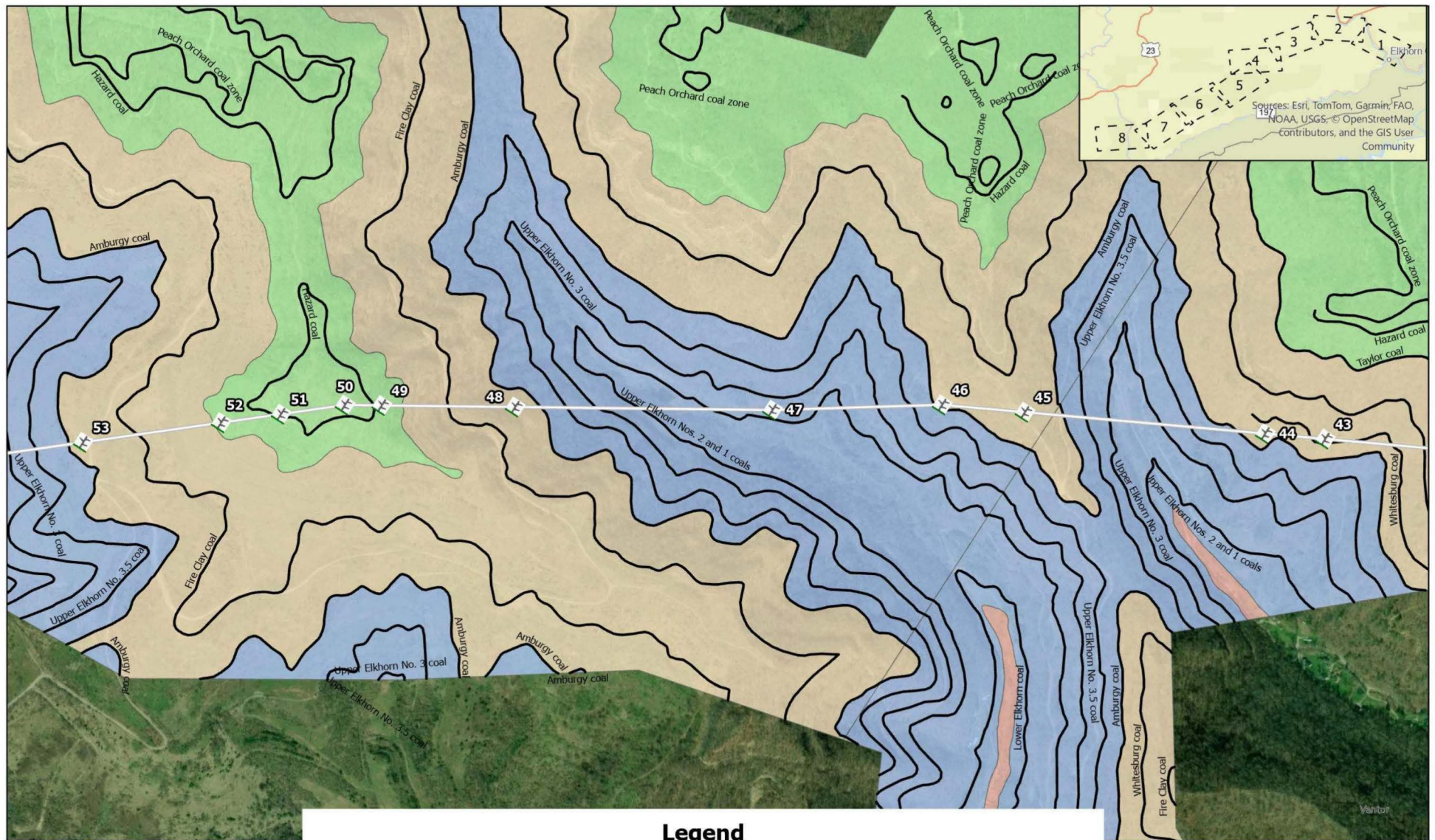
KGS Bedrock Geology



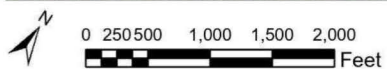
KGS Bedrock Geology



KGS Bedrock Geology



Legend



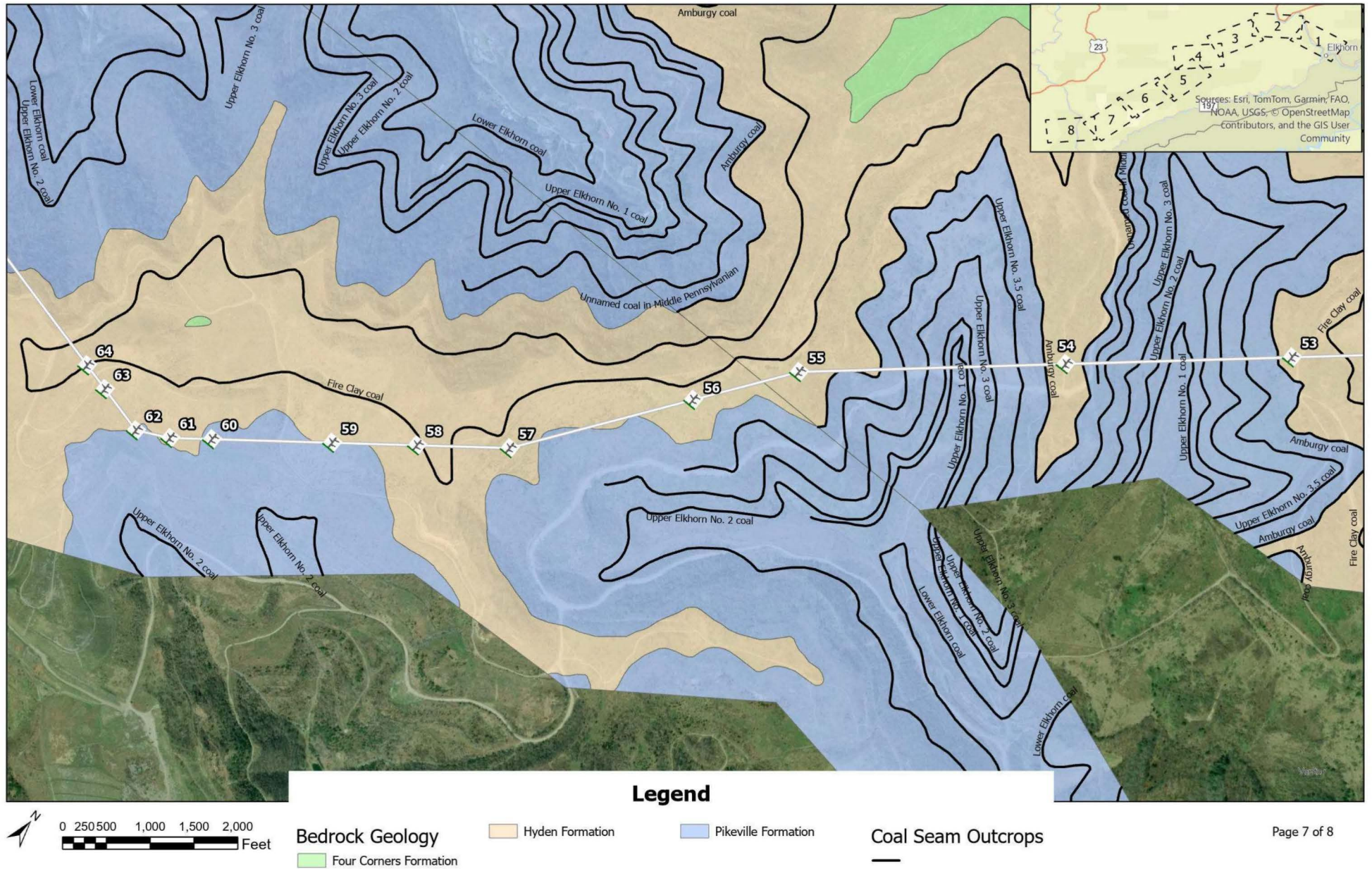
Bedrock Geology
 Four Corners Formation

Hyden Formation
 Pikeville Formation

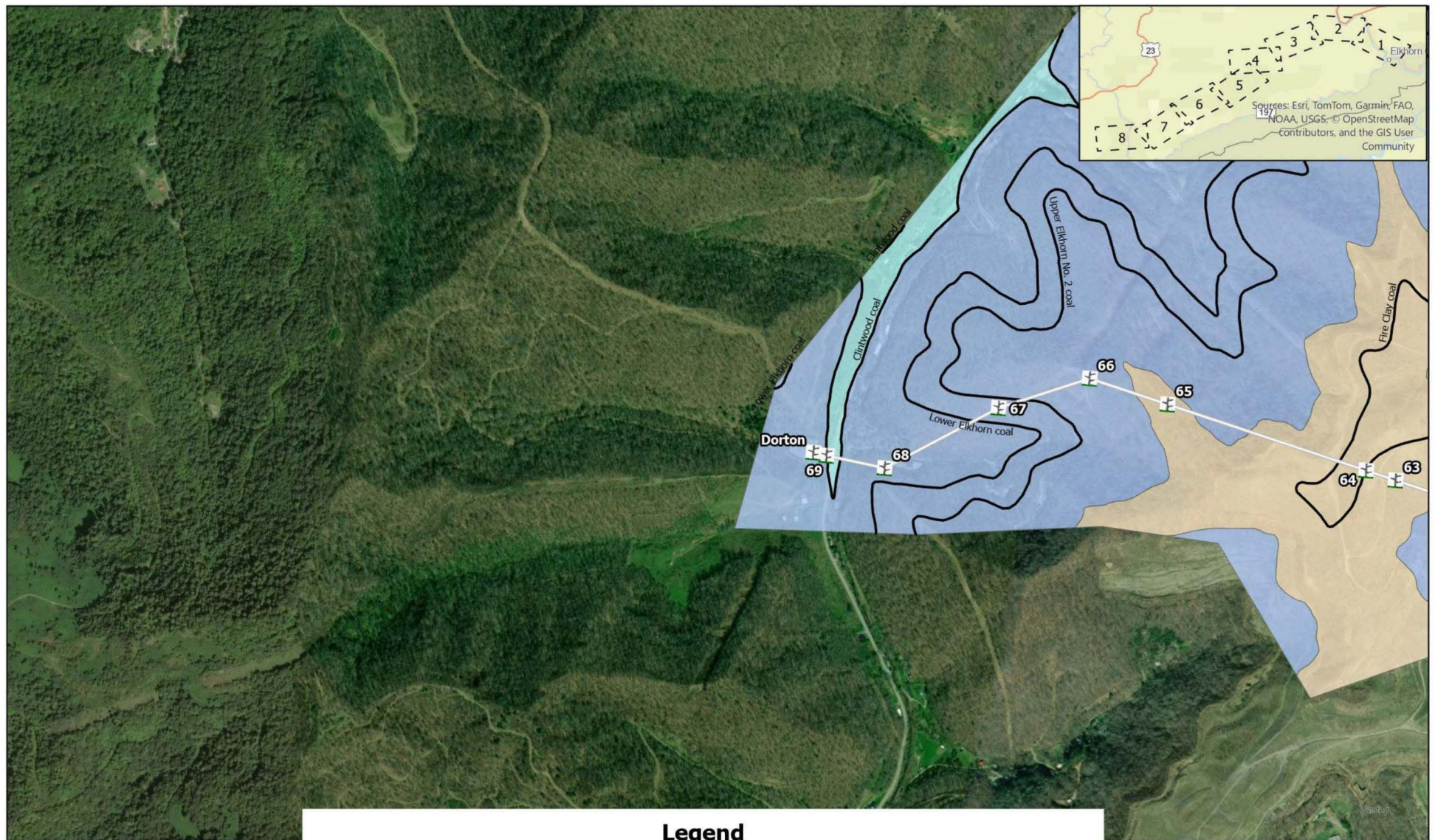
Alluvium

Coal Seam Outcrops

KGS Bedrock Geology



KGS Bedrock Geology



Legend

Bedrock Geology

Four Corners Formation

Grundy Formation

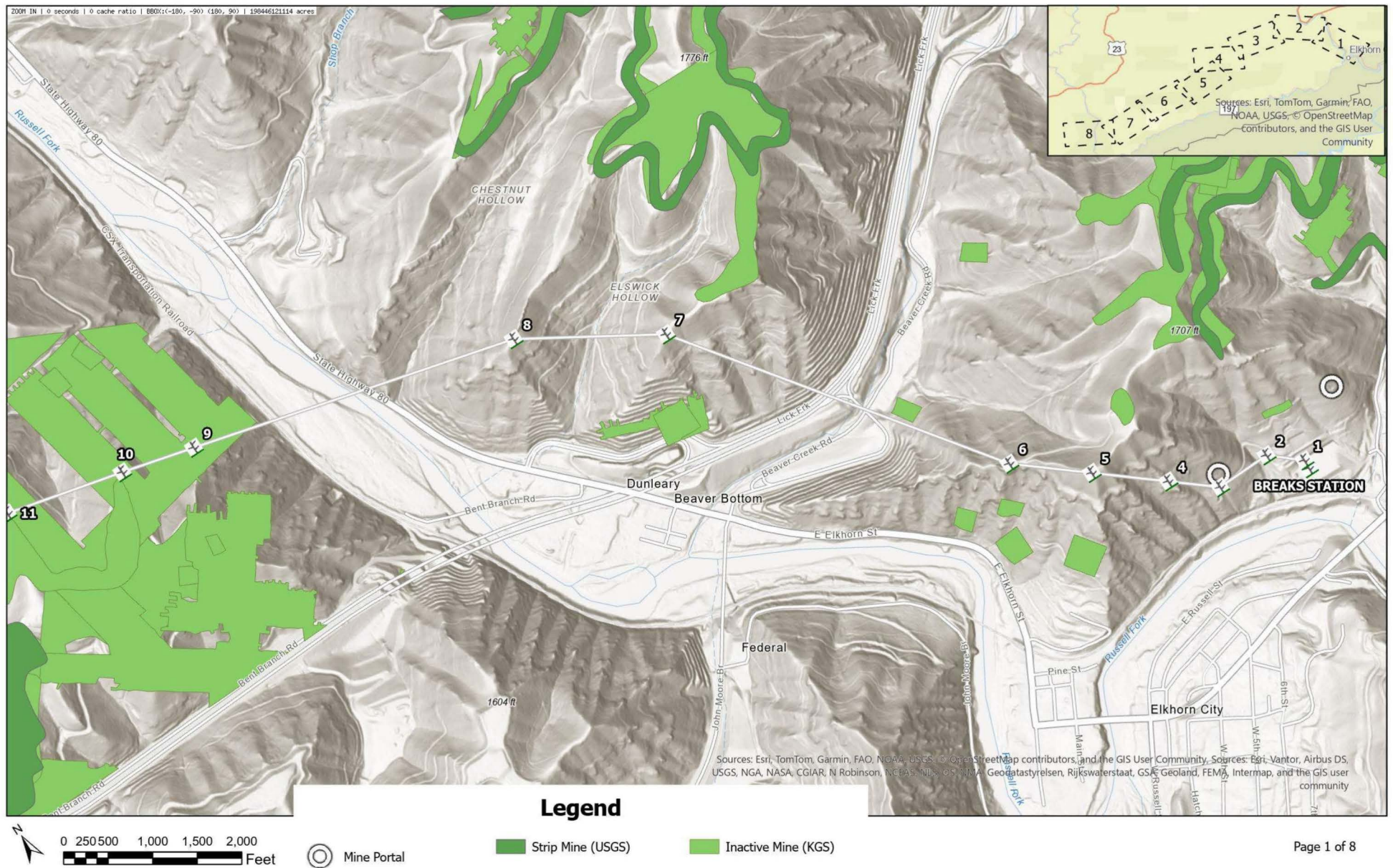
Hyden Formation

Pikeville Formation

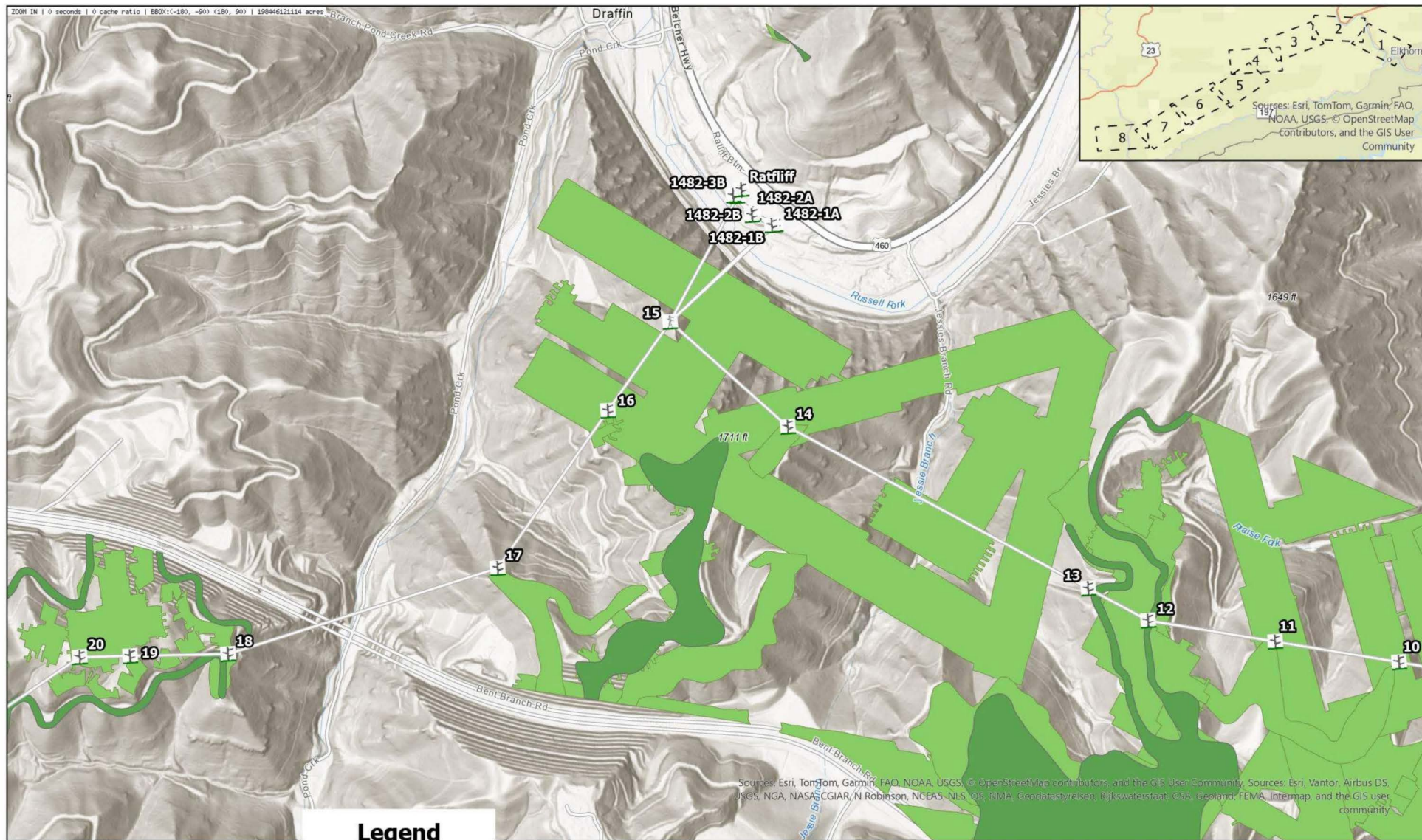
Coal Seam Outcrops

Attachment 2 – Coal Mining Activity

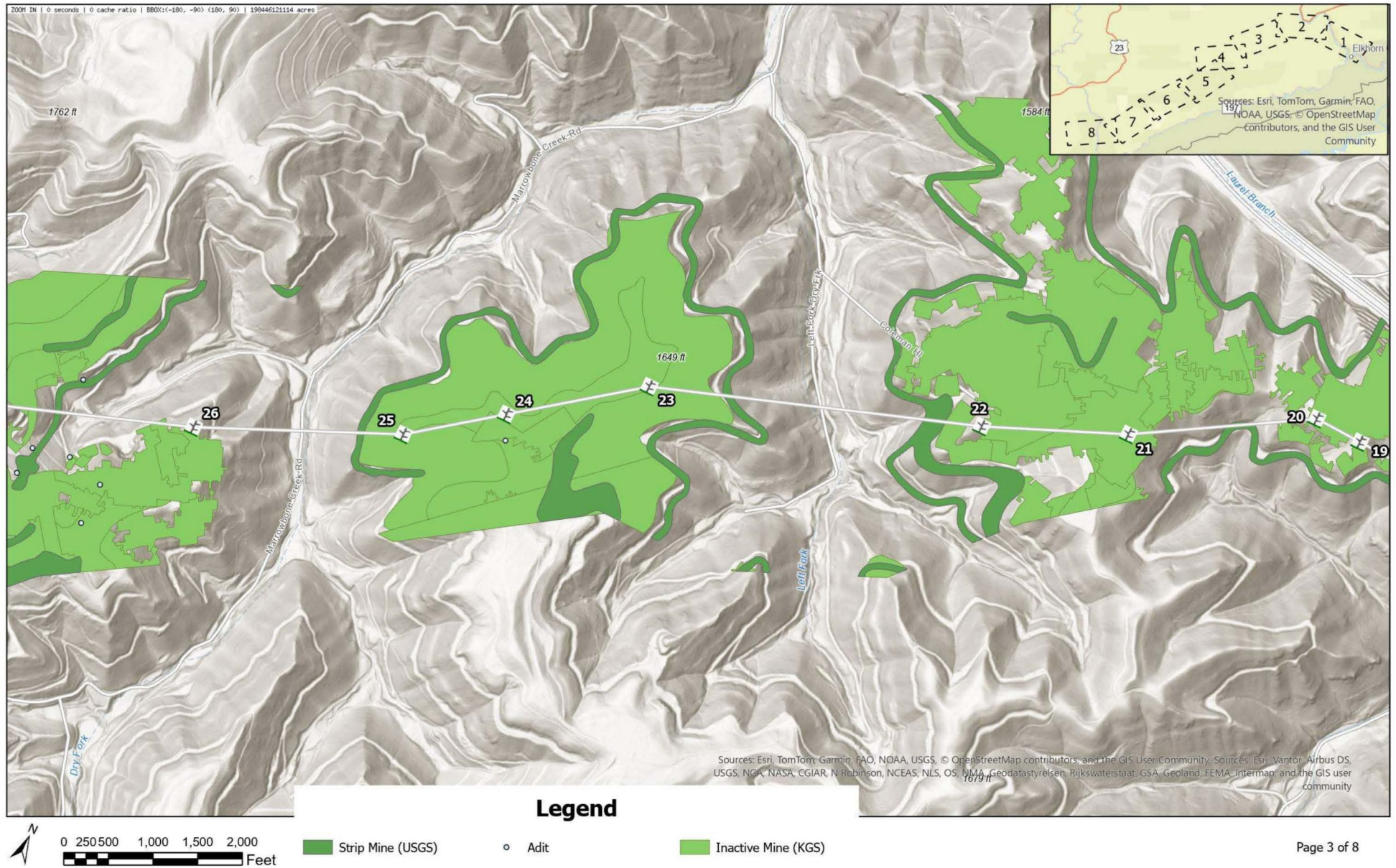
Coal Mining Features



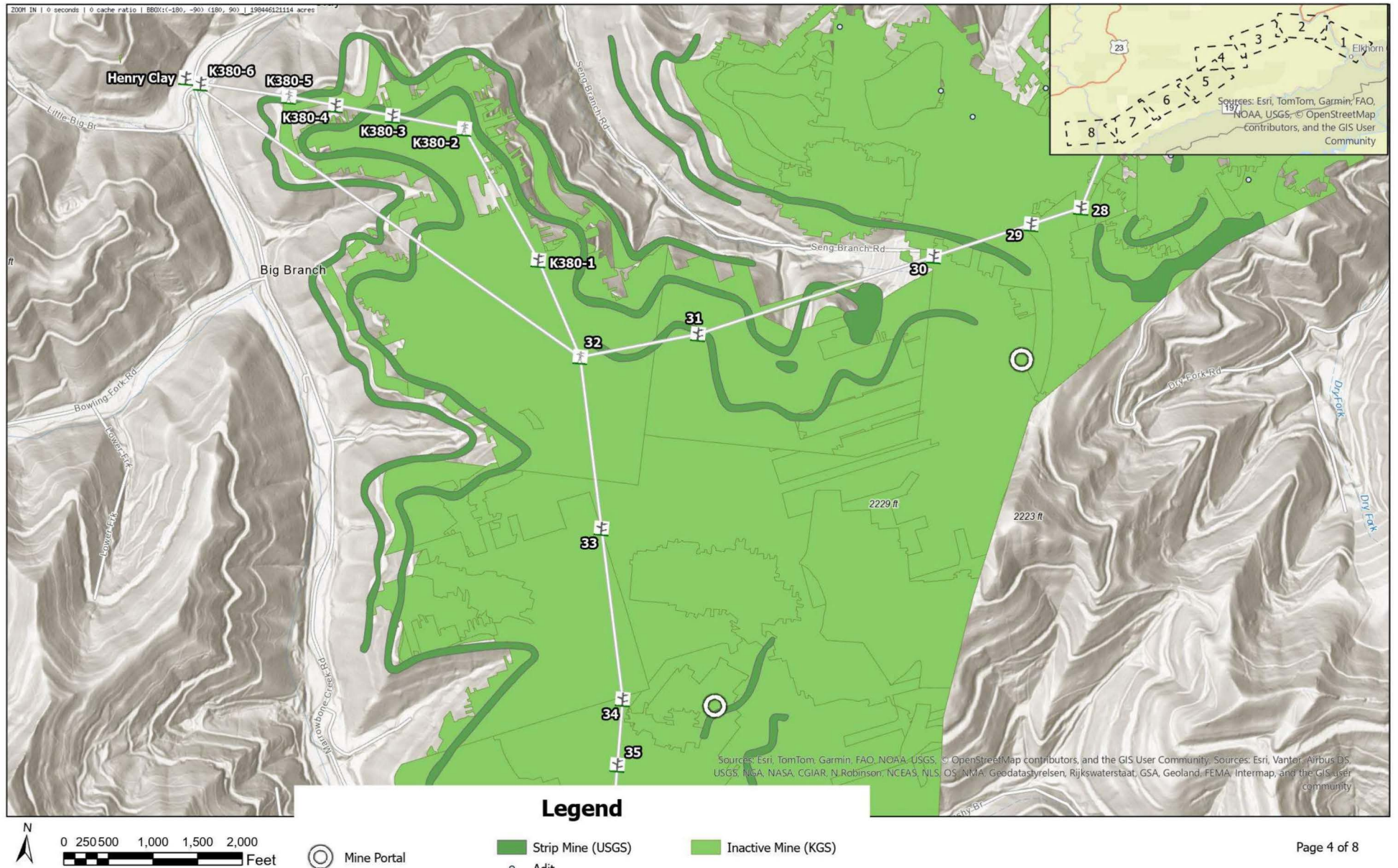
Coal Mining Features



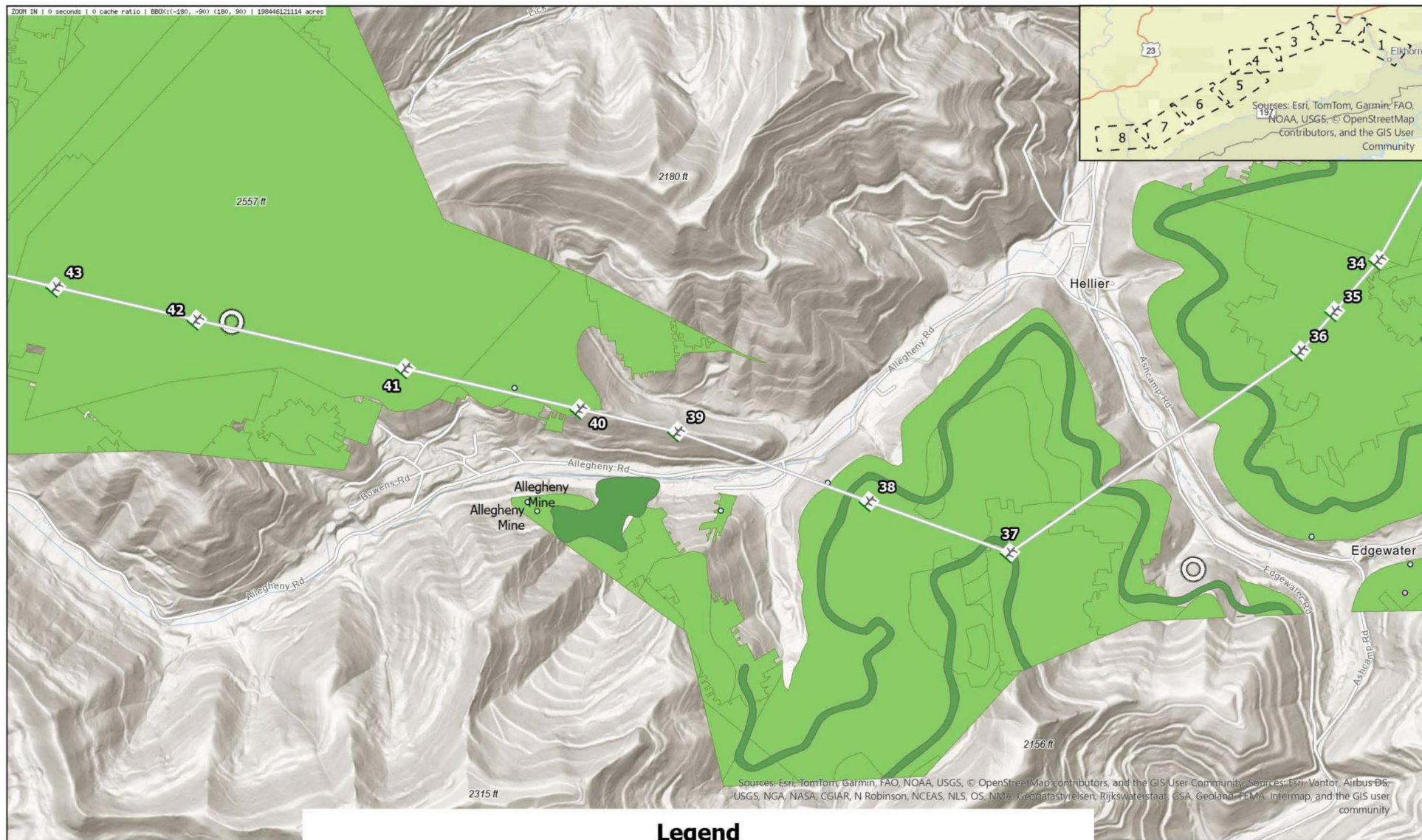
Coal Mining Features



Coal Mining Features



Coal Mining Features



Legend

Strip Mine (USGS)

Adit

Open Pit Mine

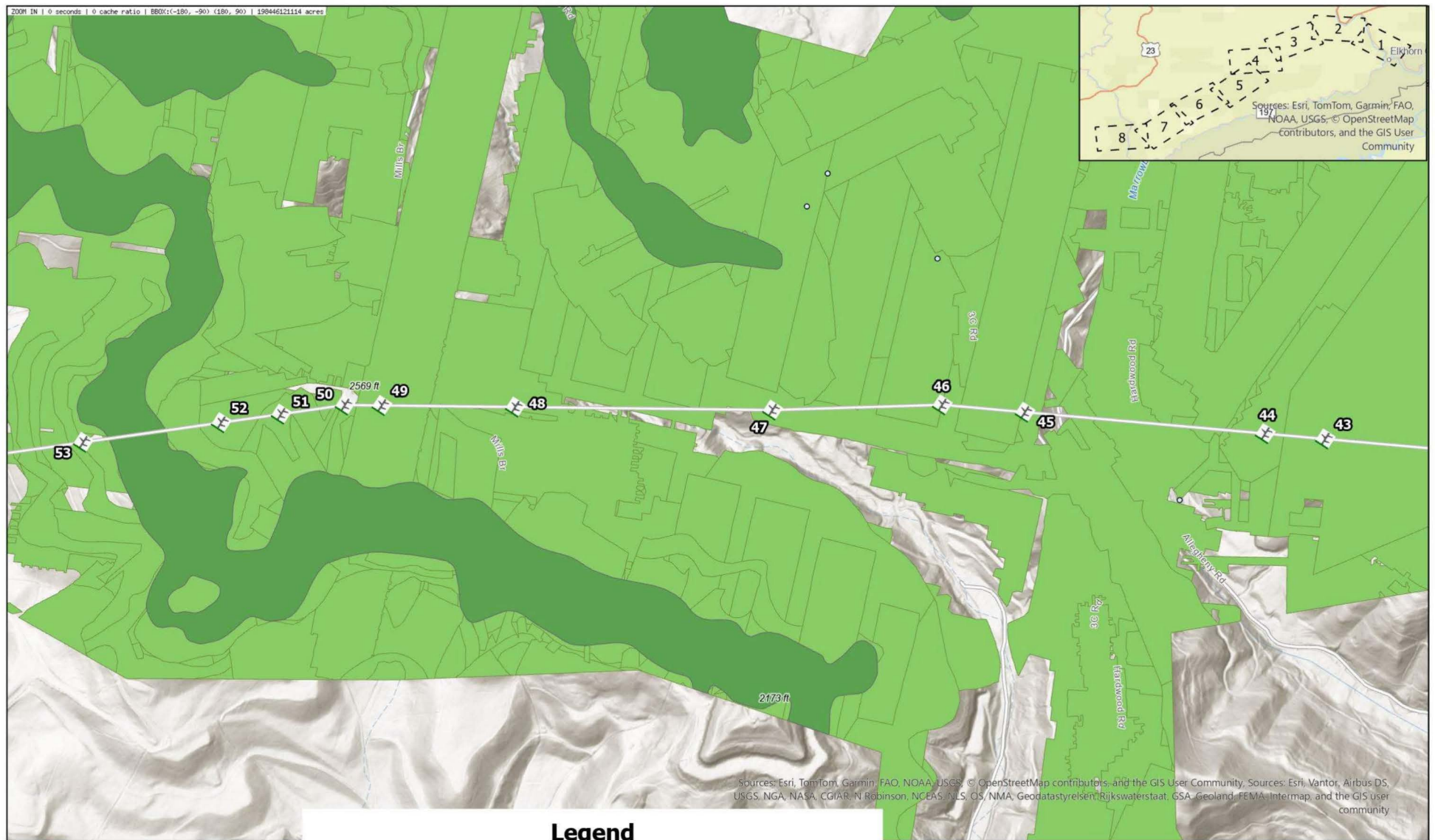
Open Pit Mine or Quarry

Inactive Mine (KGS)

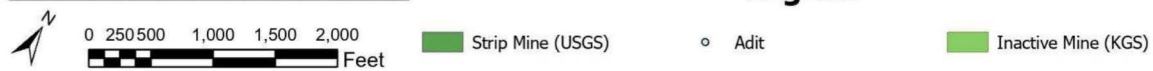
0 250 500 1,000 1,500 2,000 Feet

Mine Portal

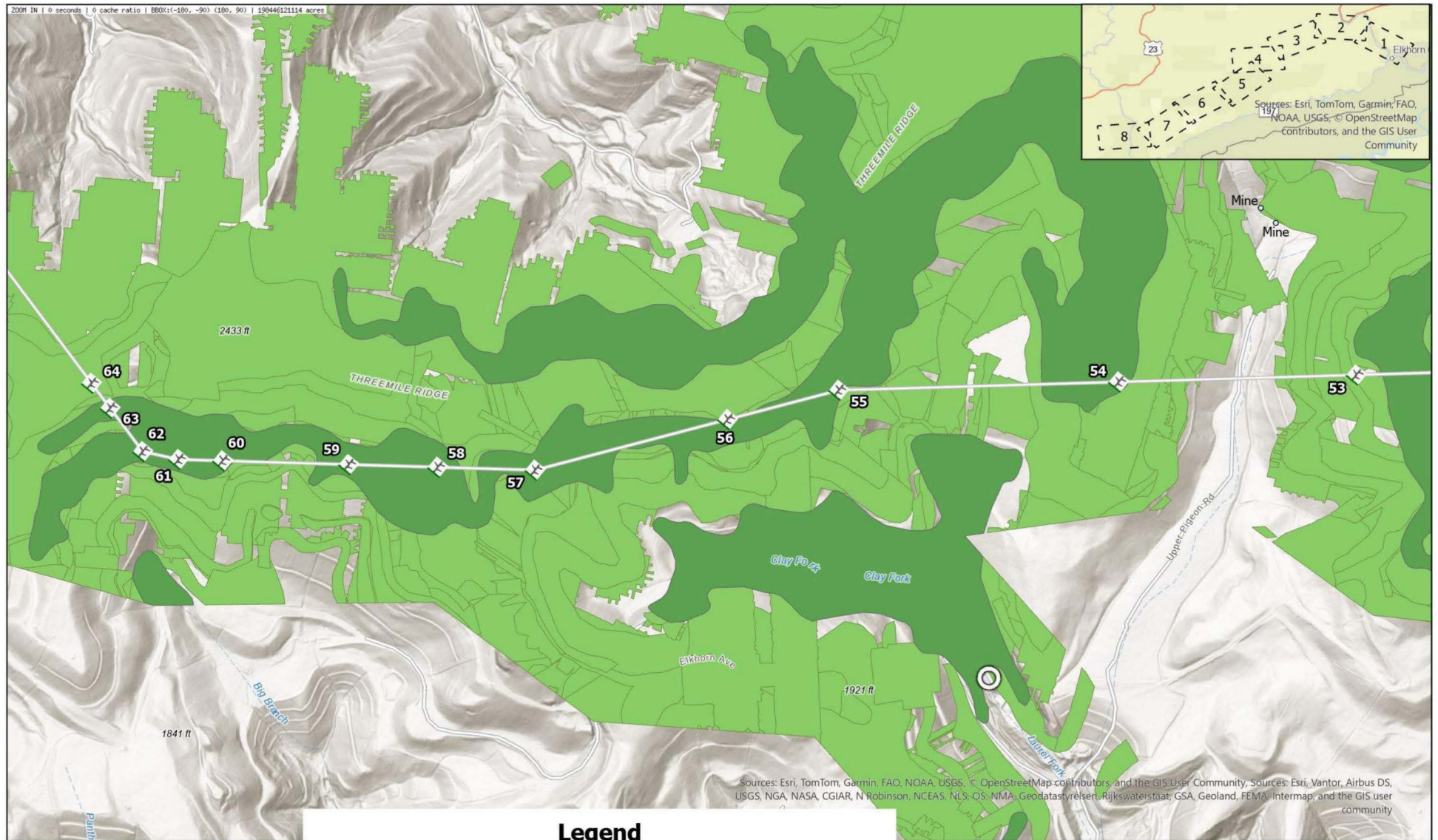
Coal Mining Features



Legend



Coal Mining Features



Legend

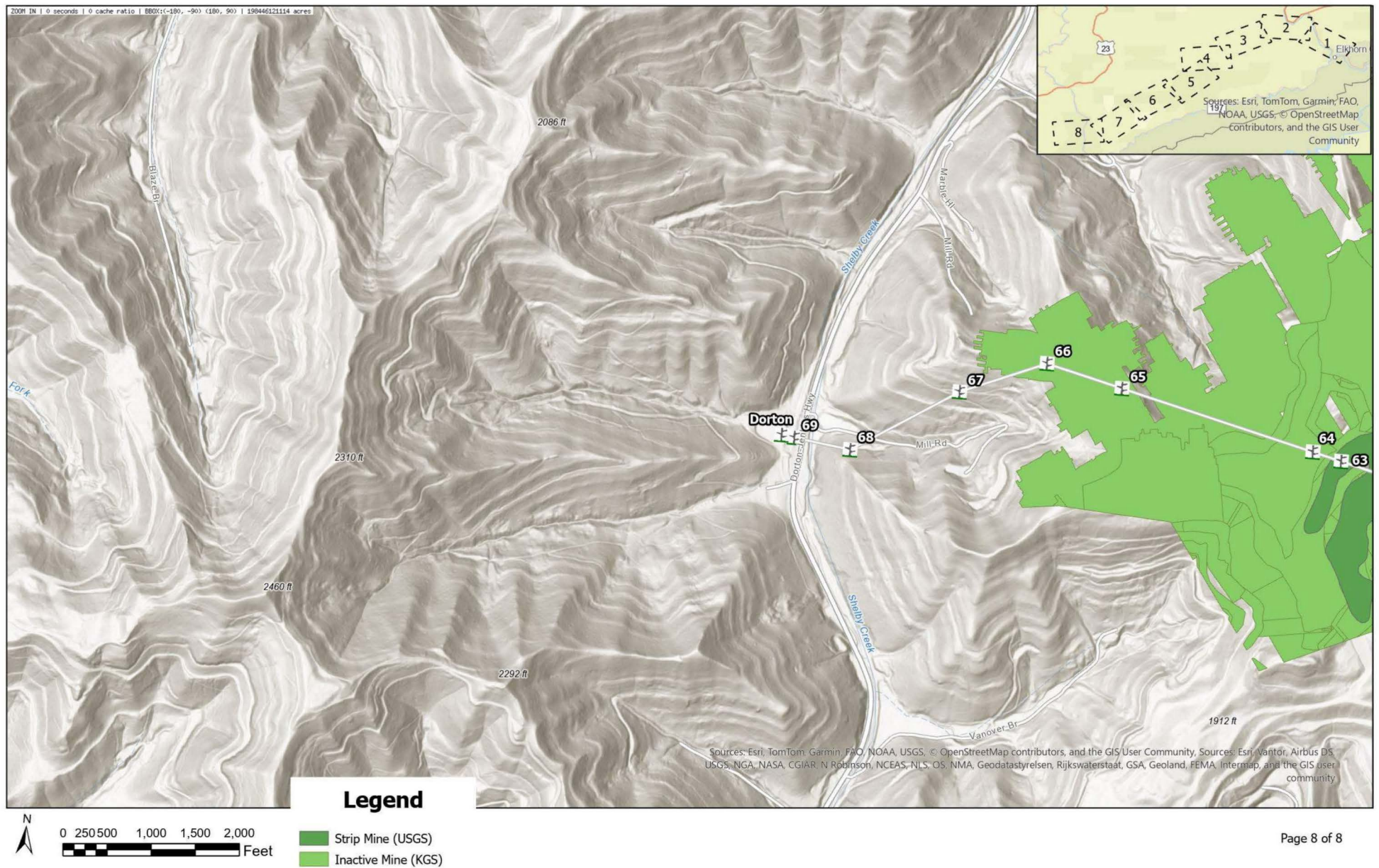
Strip Mine (USGS)
○ Adit

Inactive Mine (KGS)

○ Mine Portal

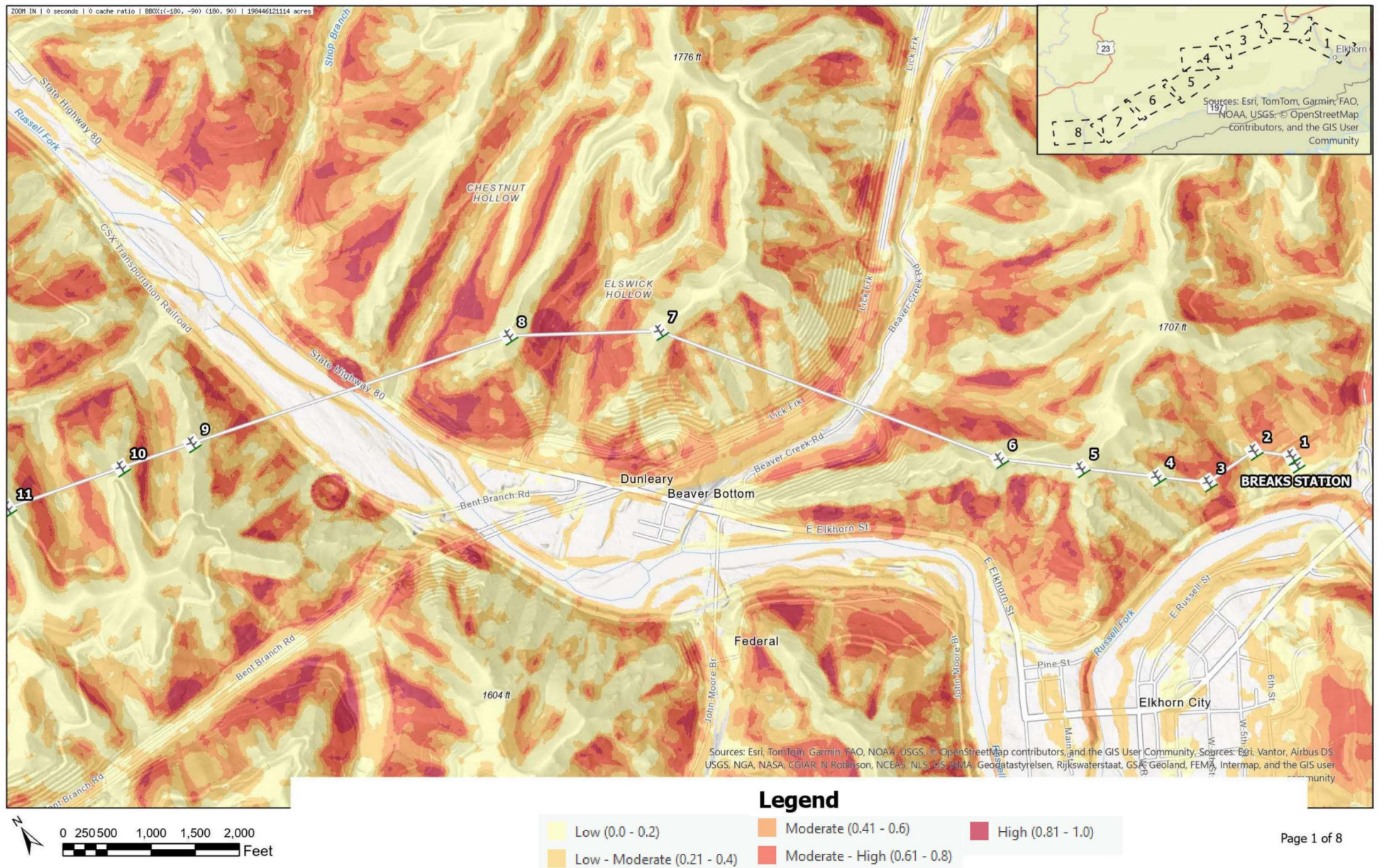
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Coal Mining Features

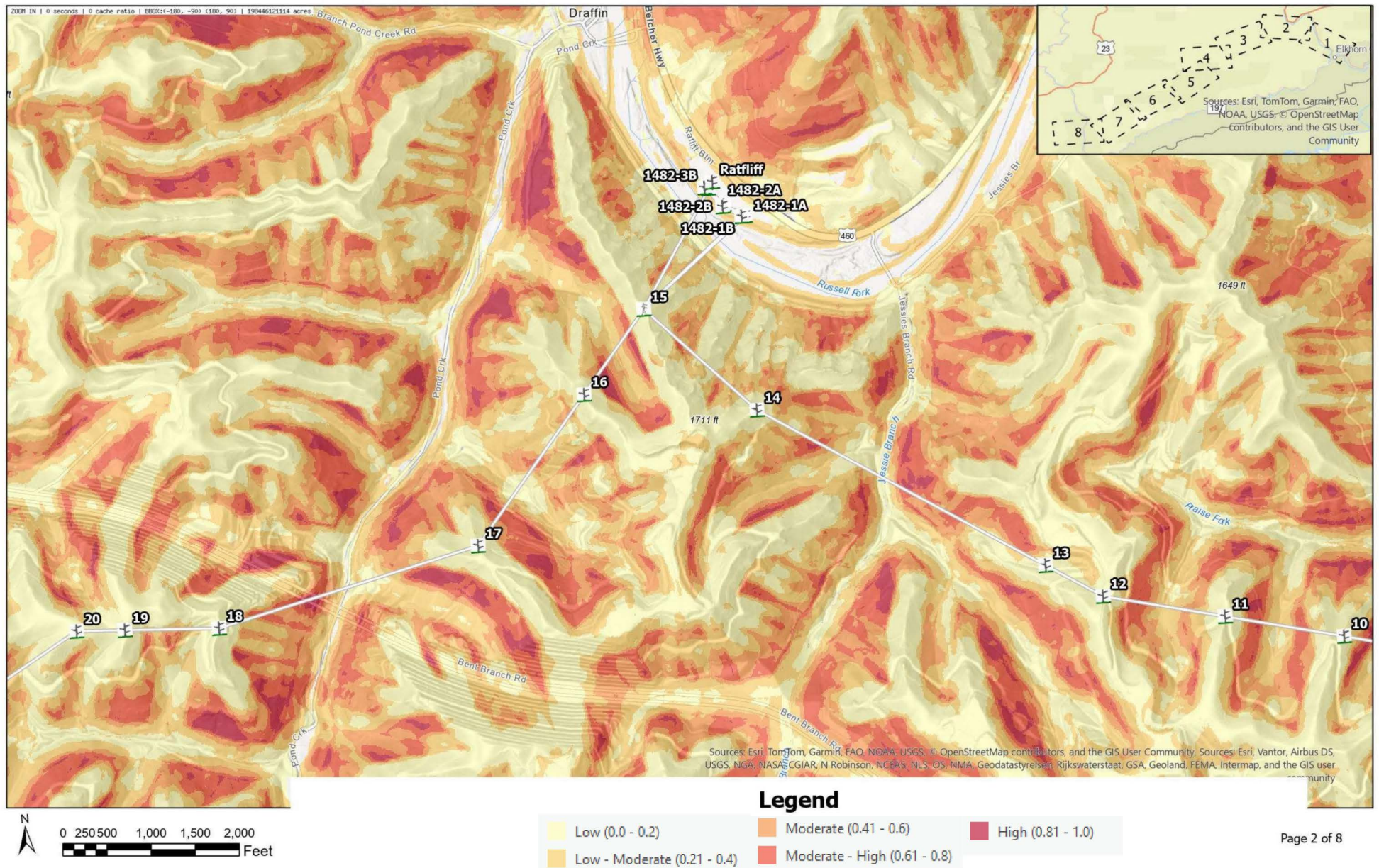


Attachment 3 – Landslide Susceptibility

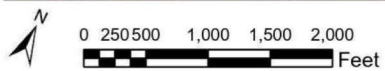
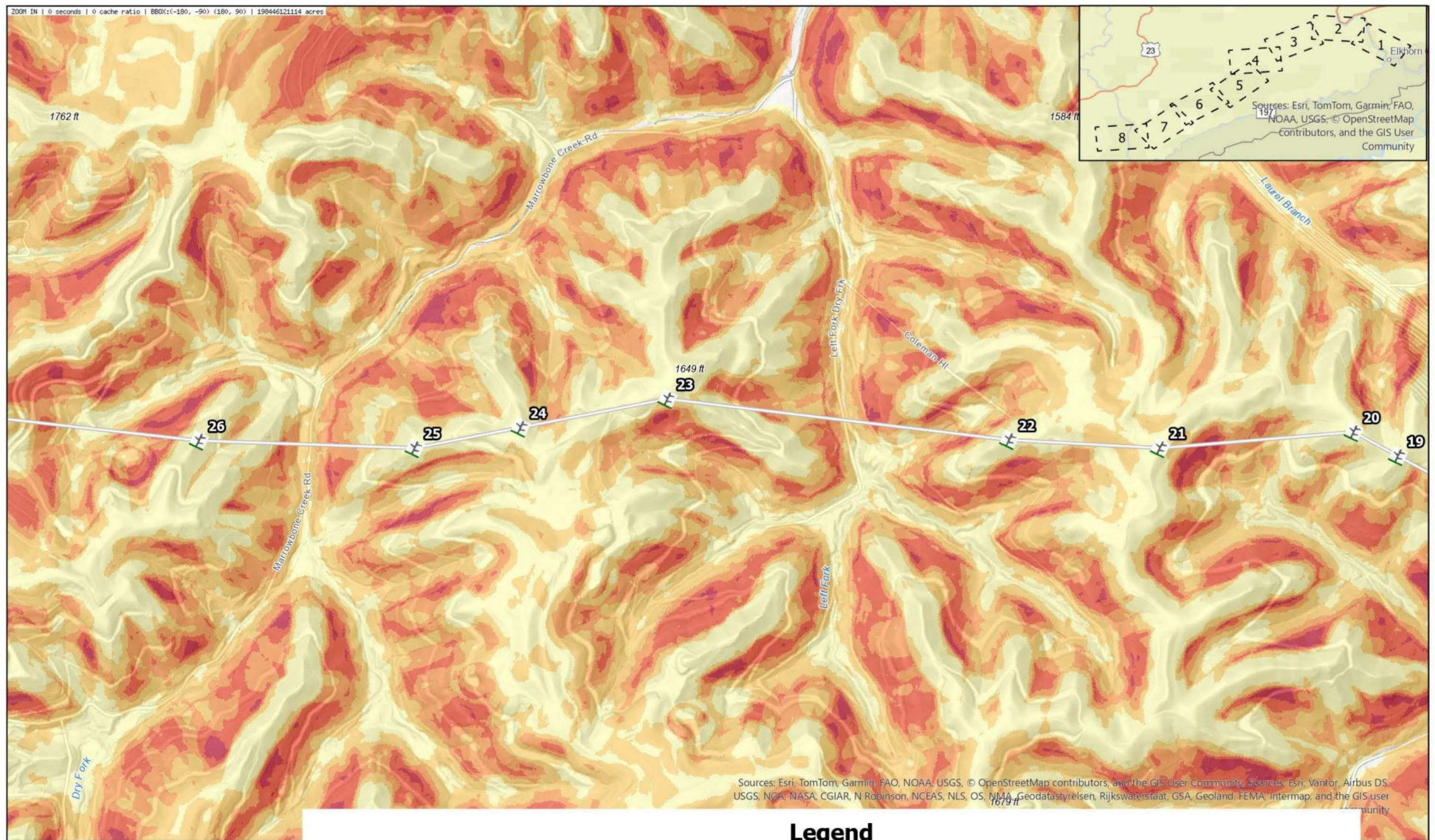
KGS Landslide Susceptibility



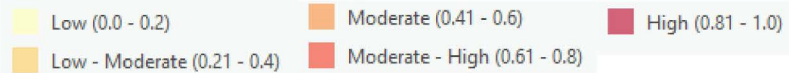
KGS Landslide Susceptibility



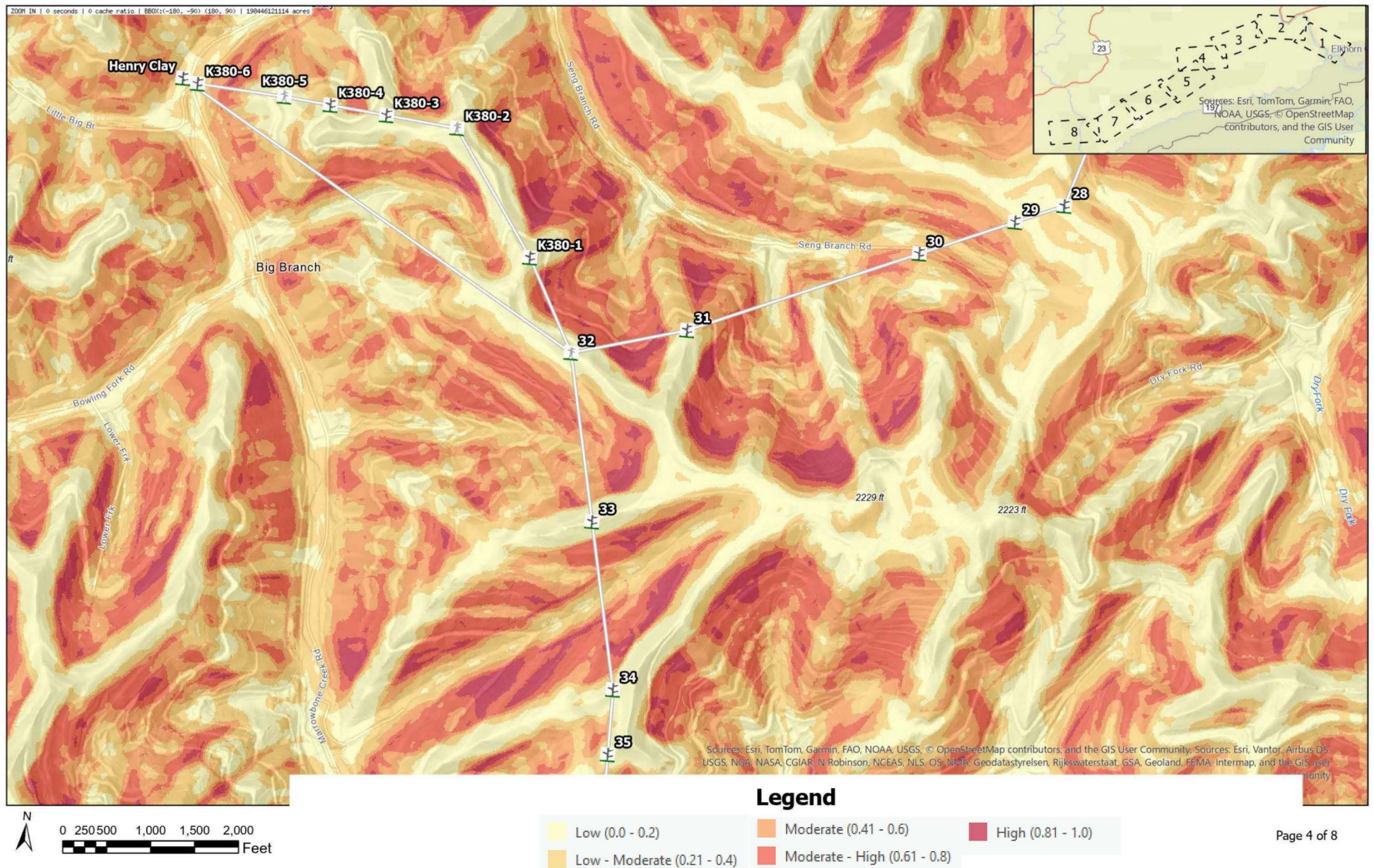
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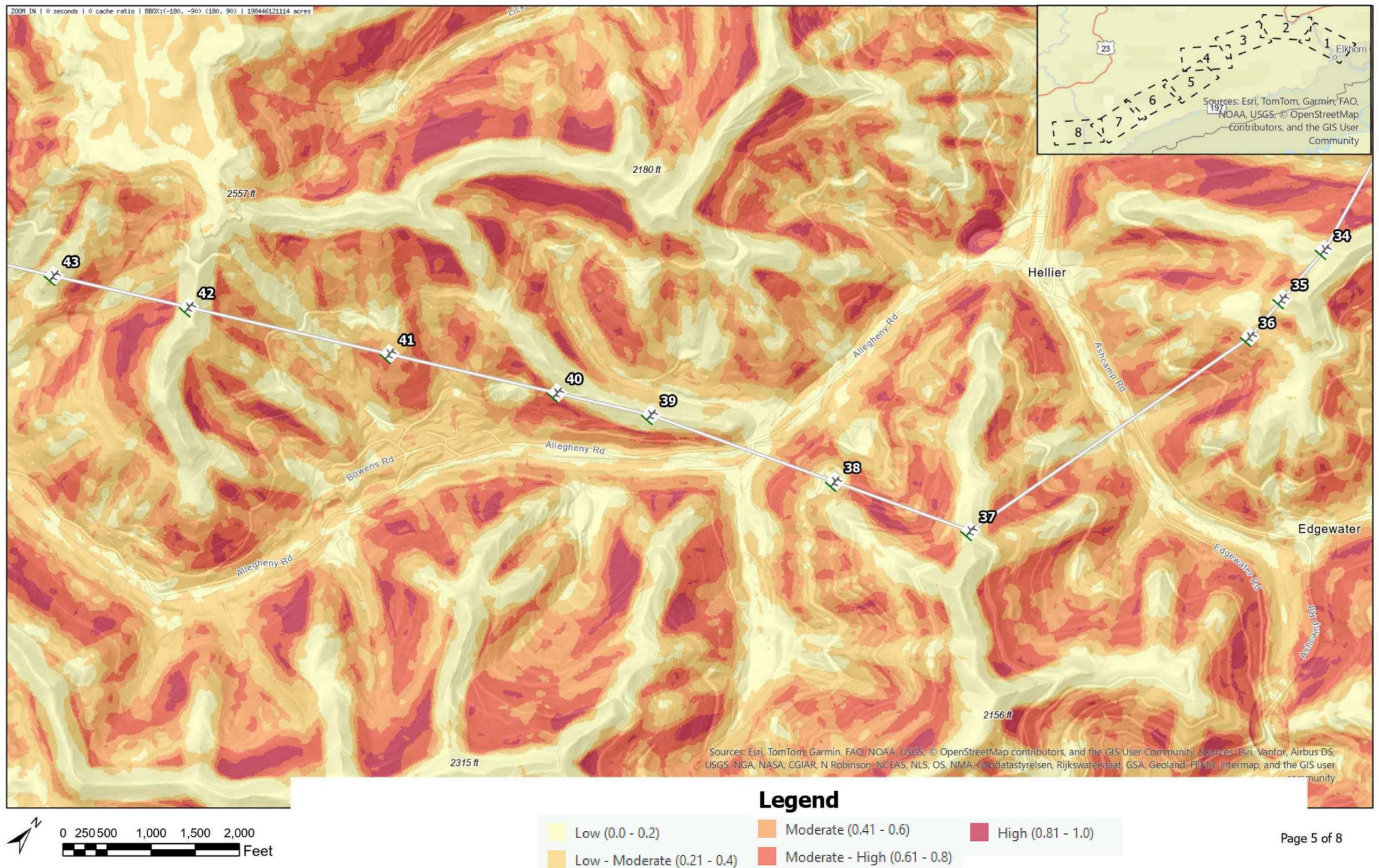
Legend



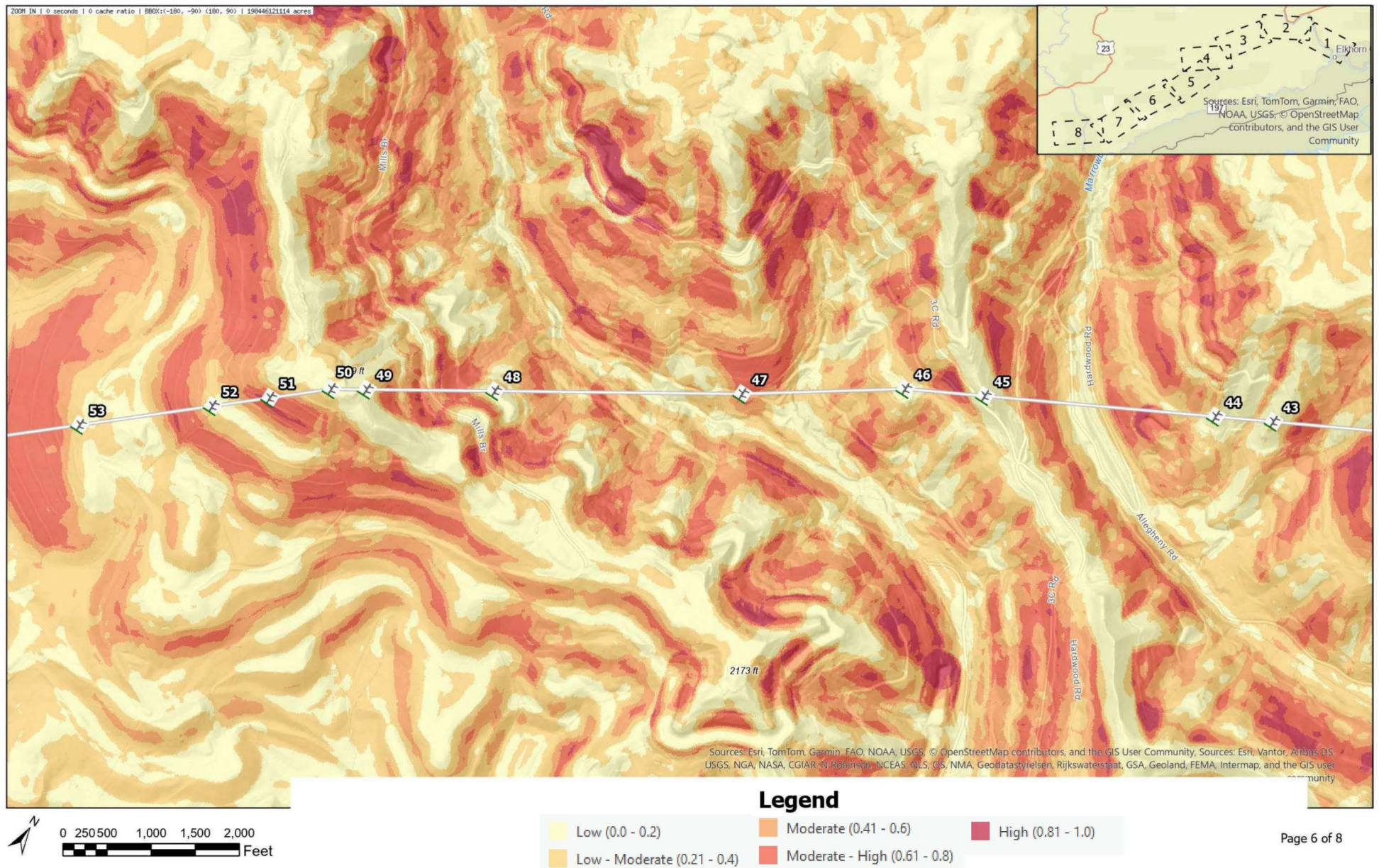
KGS Landslide Susceptibility



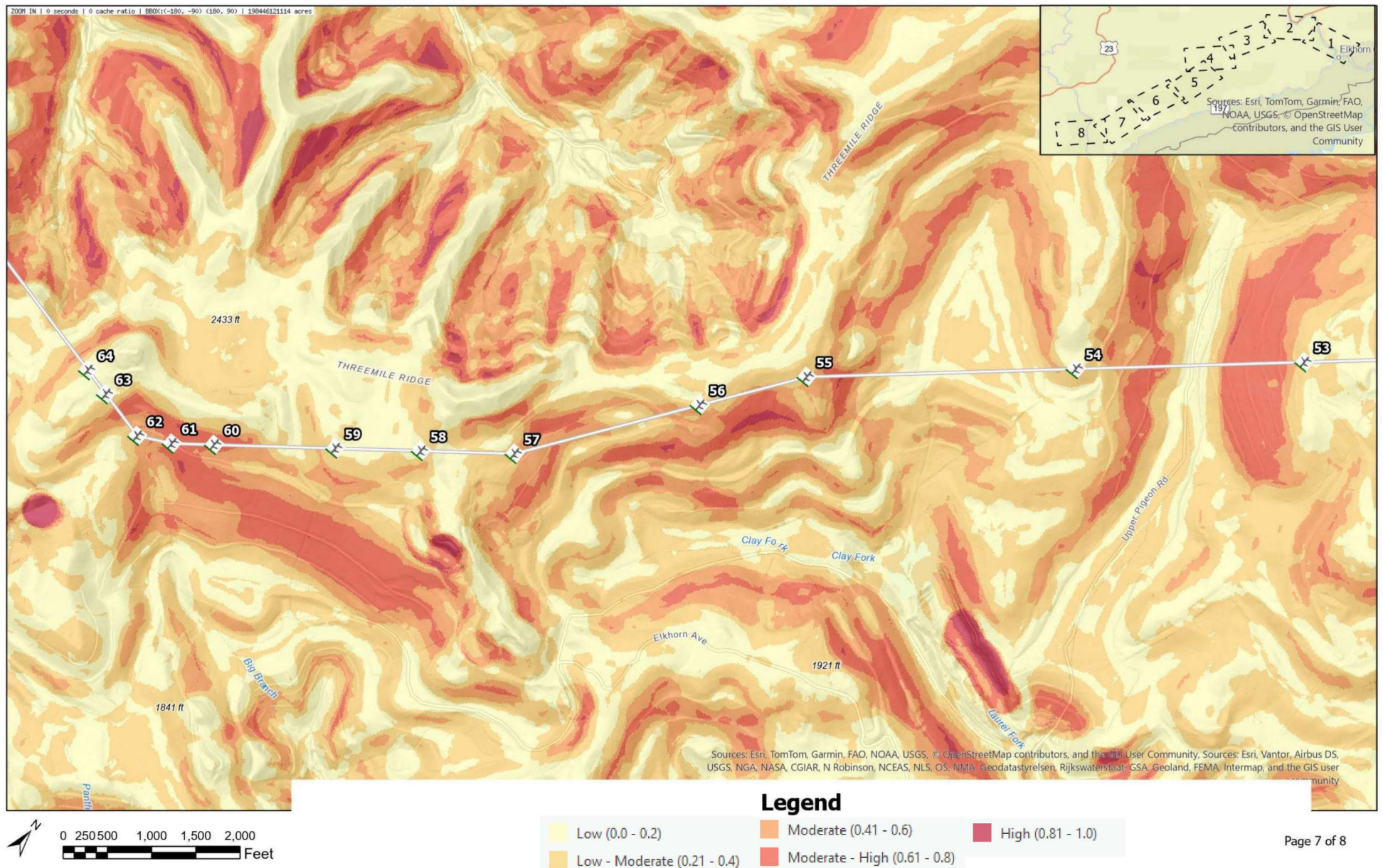
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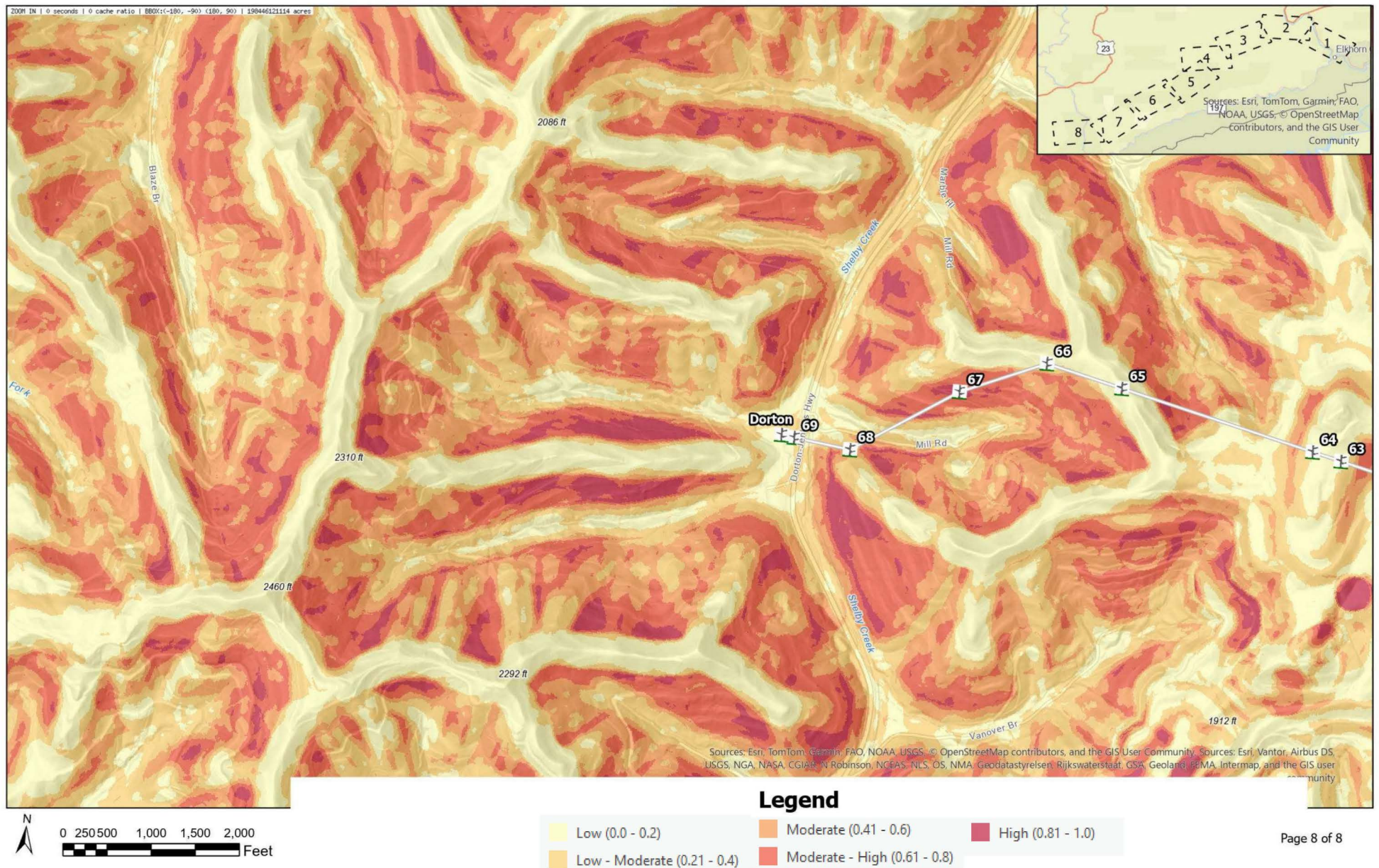
KGS Landslide Susceptibility



KGS Landslide Susceptibility

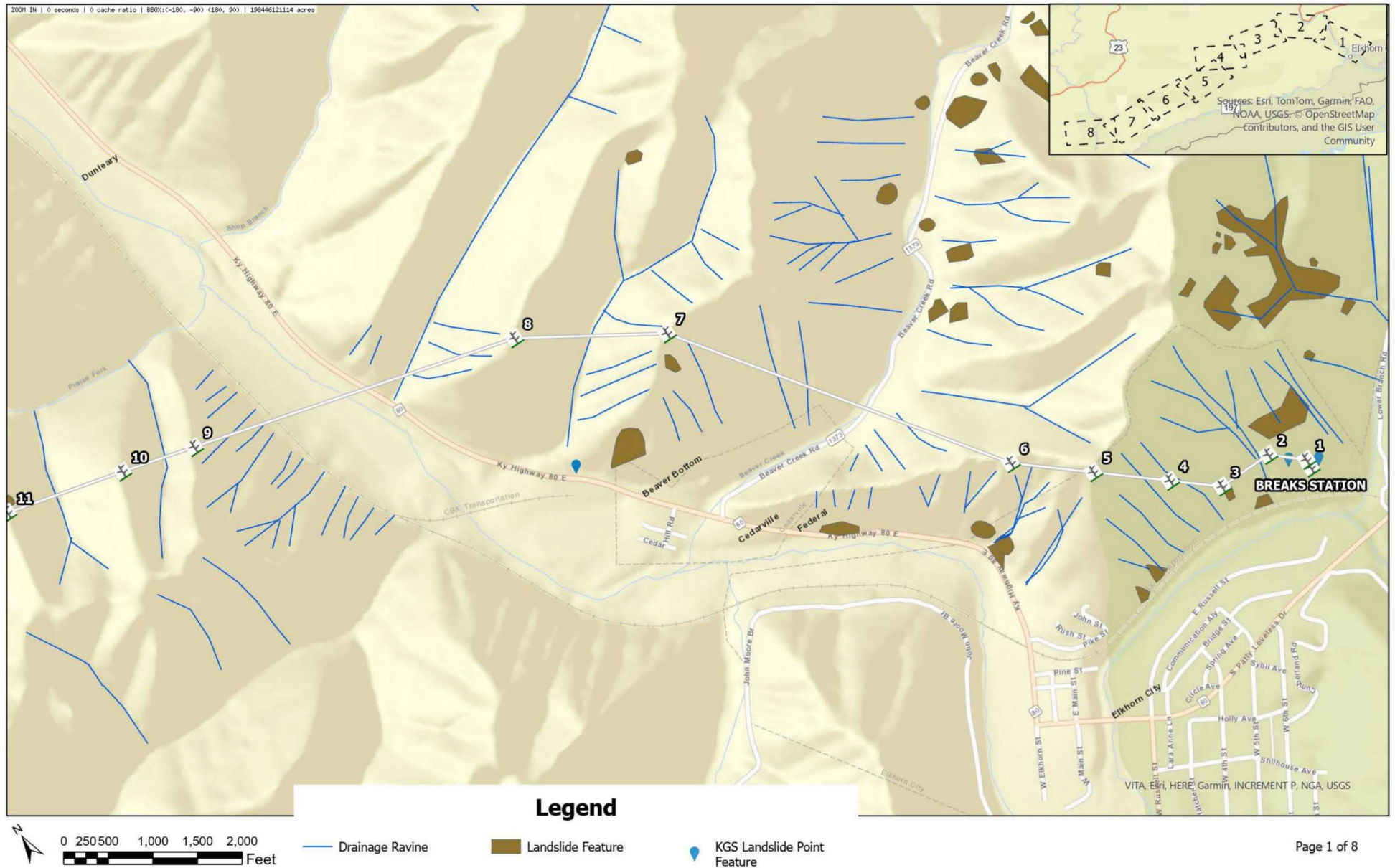


KGS Landslide Susceptibility

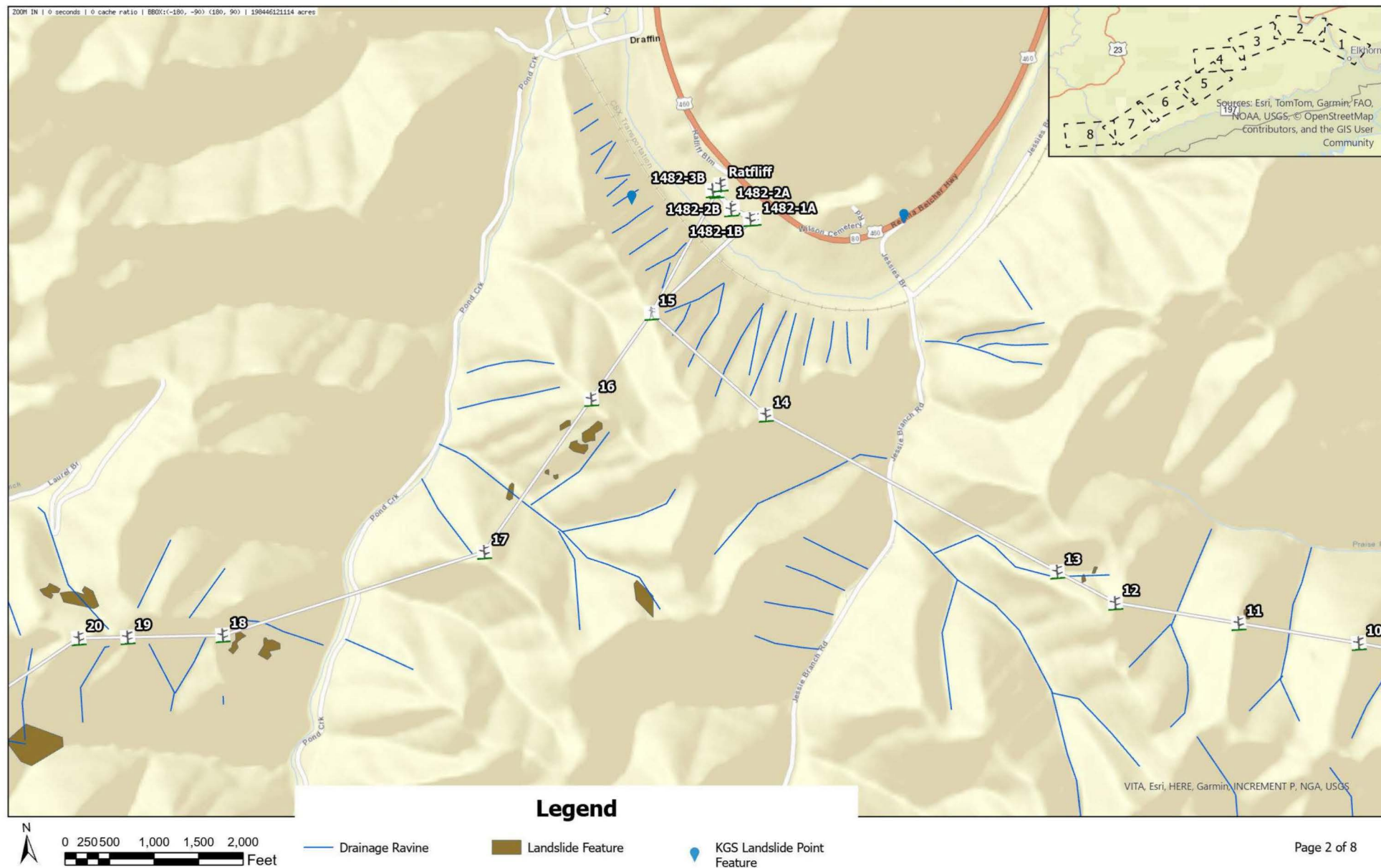


Attachment 4 – Landslide Features

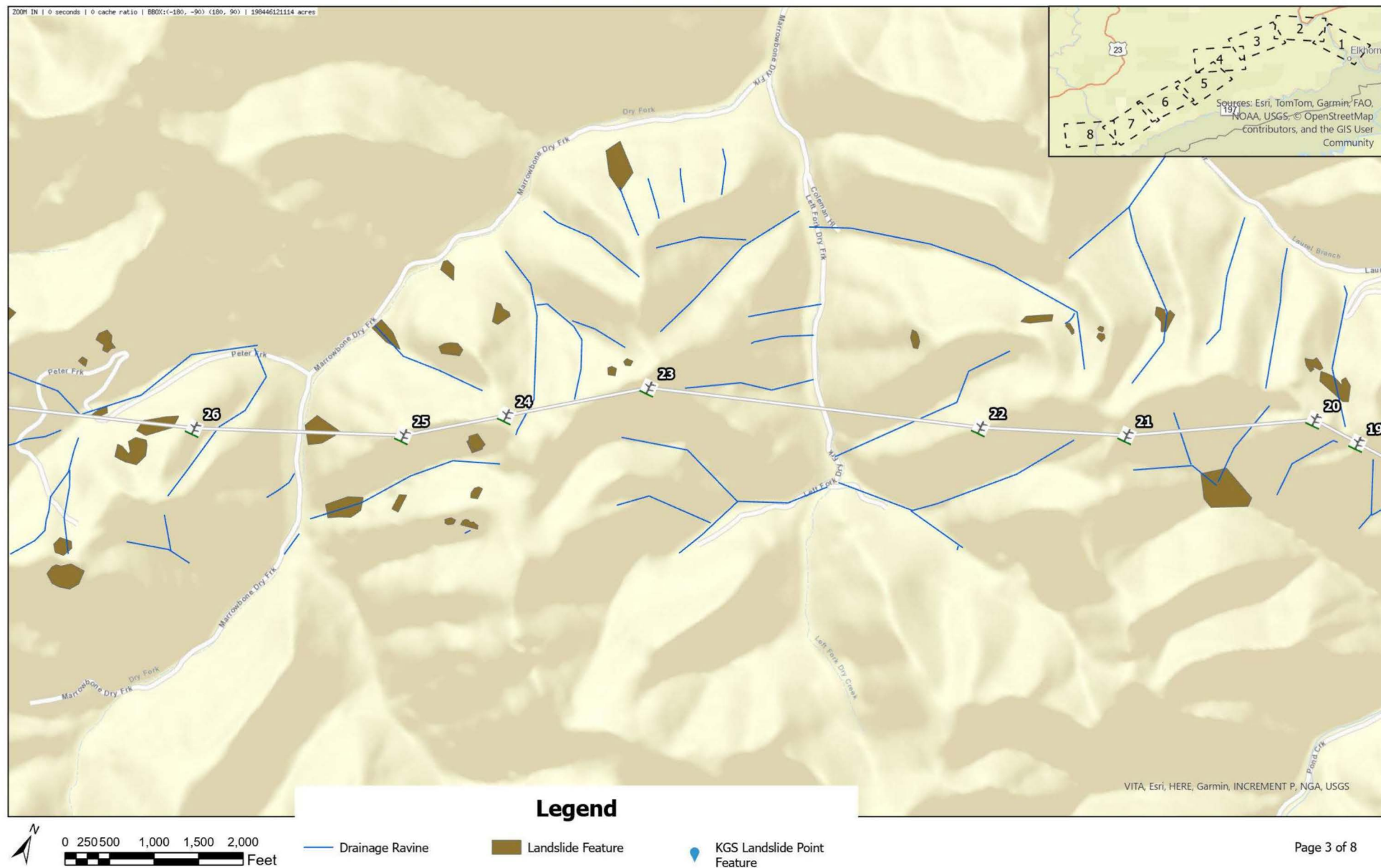
Landslides and Drainage Ravines



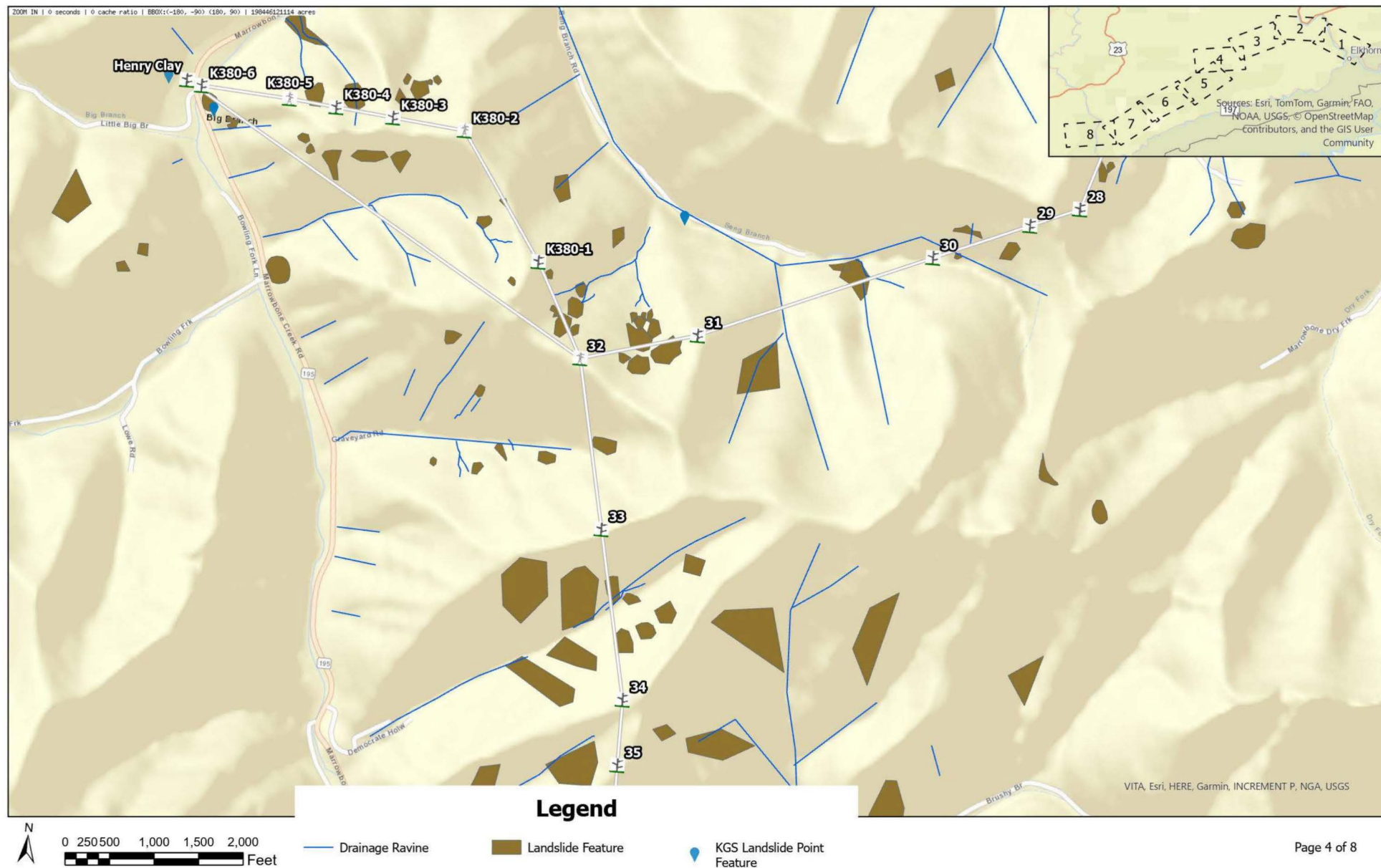
Landslides and Drainage Ravines



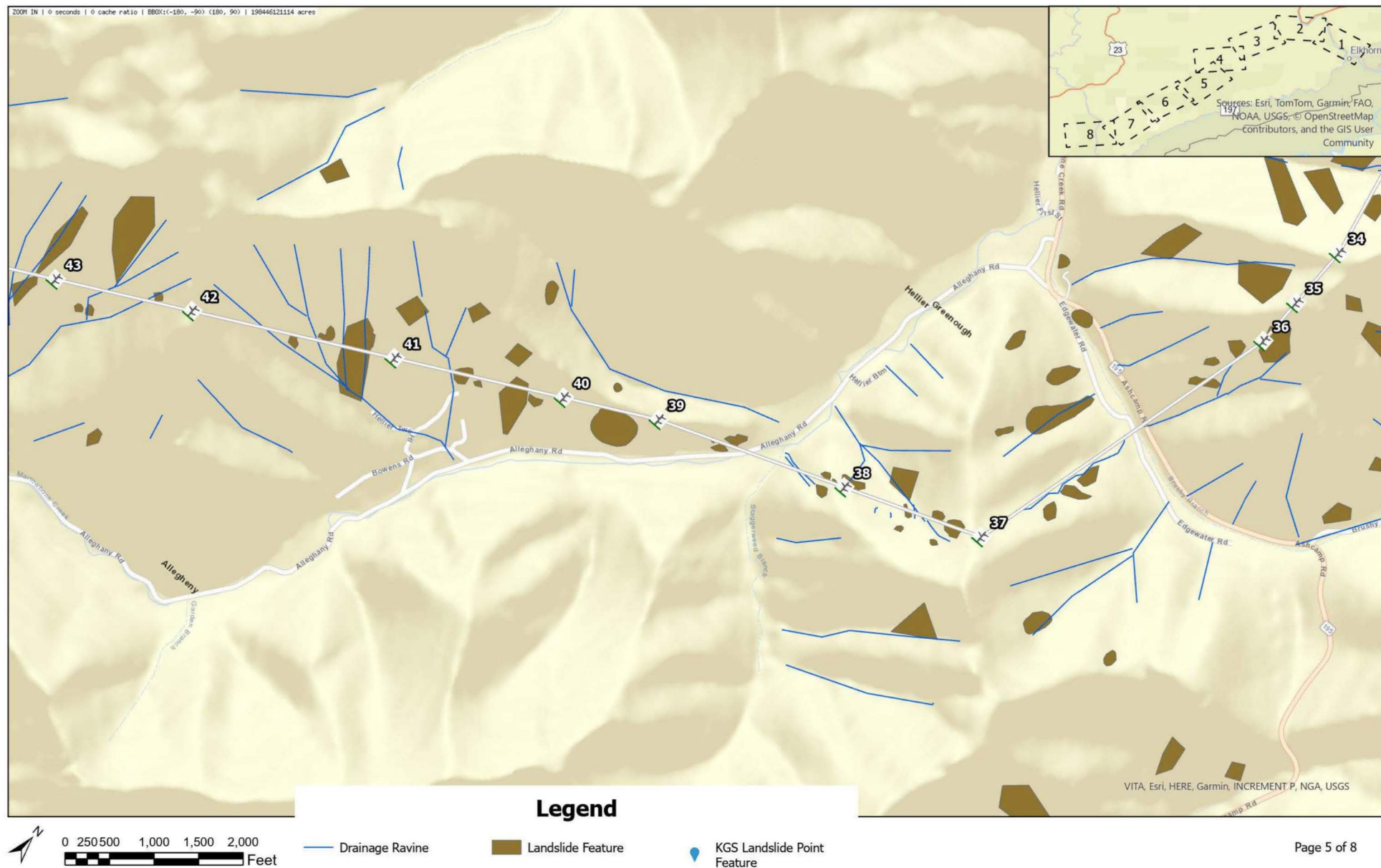
Landslides and Drainage Ravines



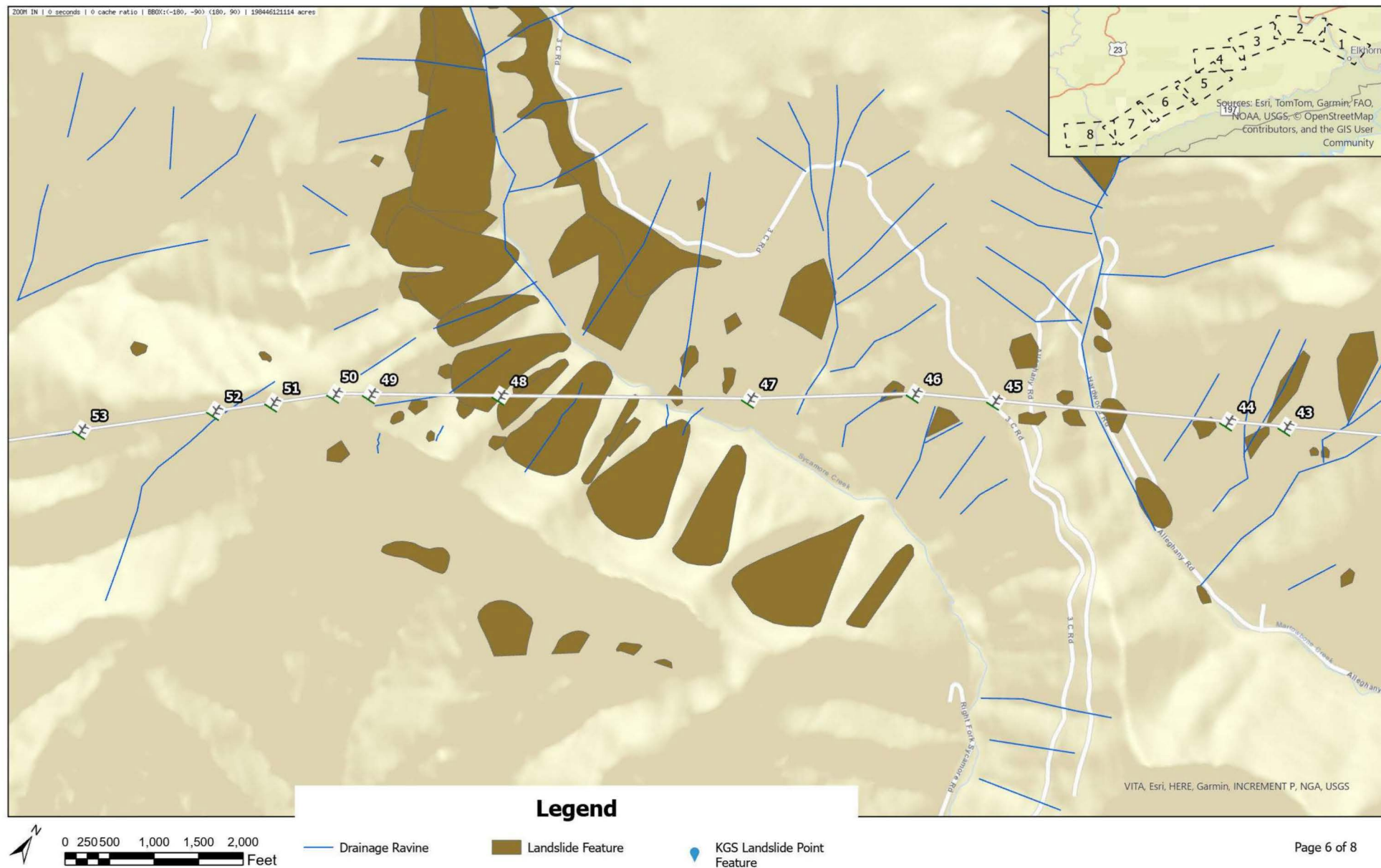
Landslides and Drainage Ravines



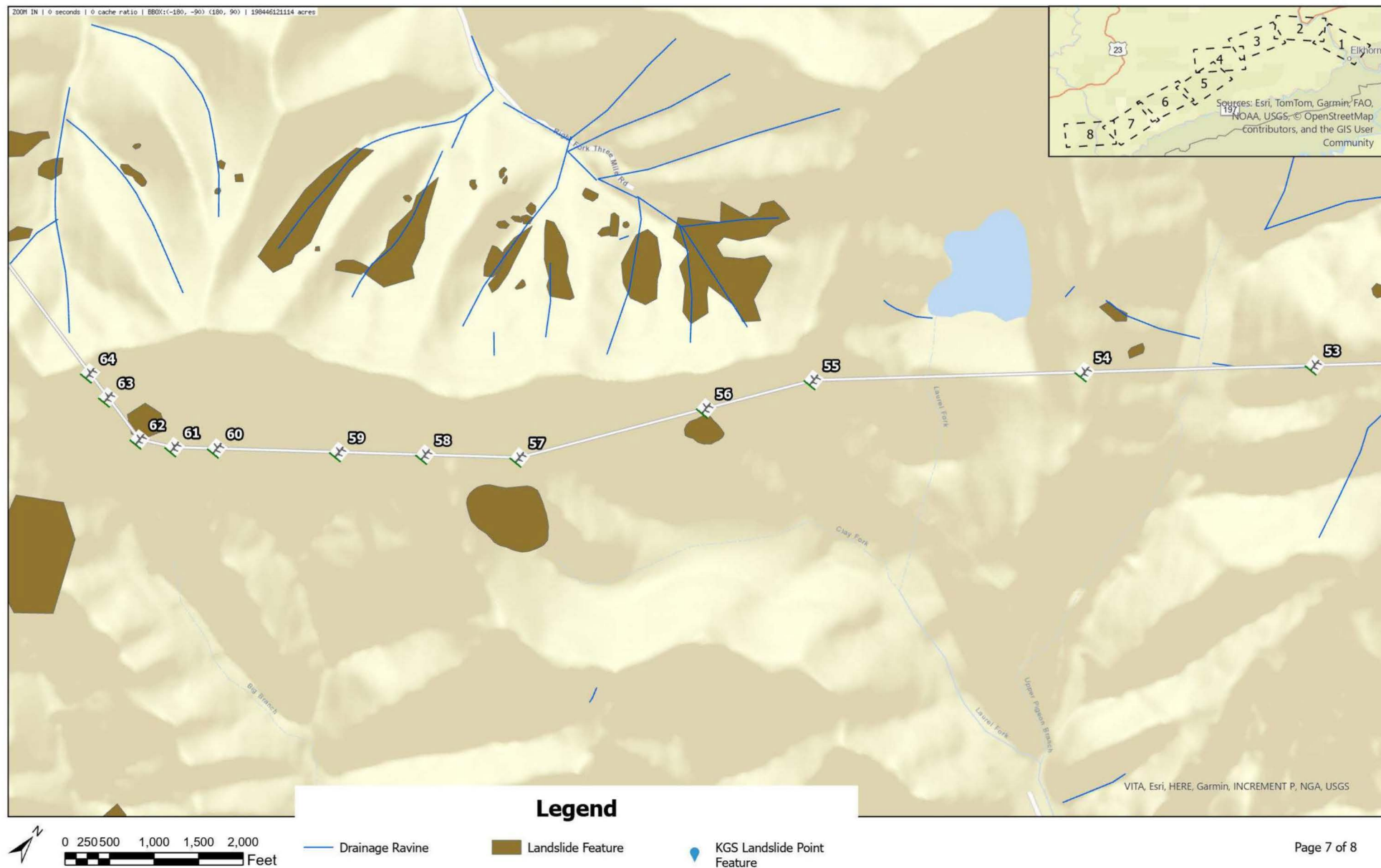
Landslides and Drainage Ravines



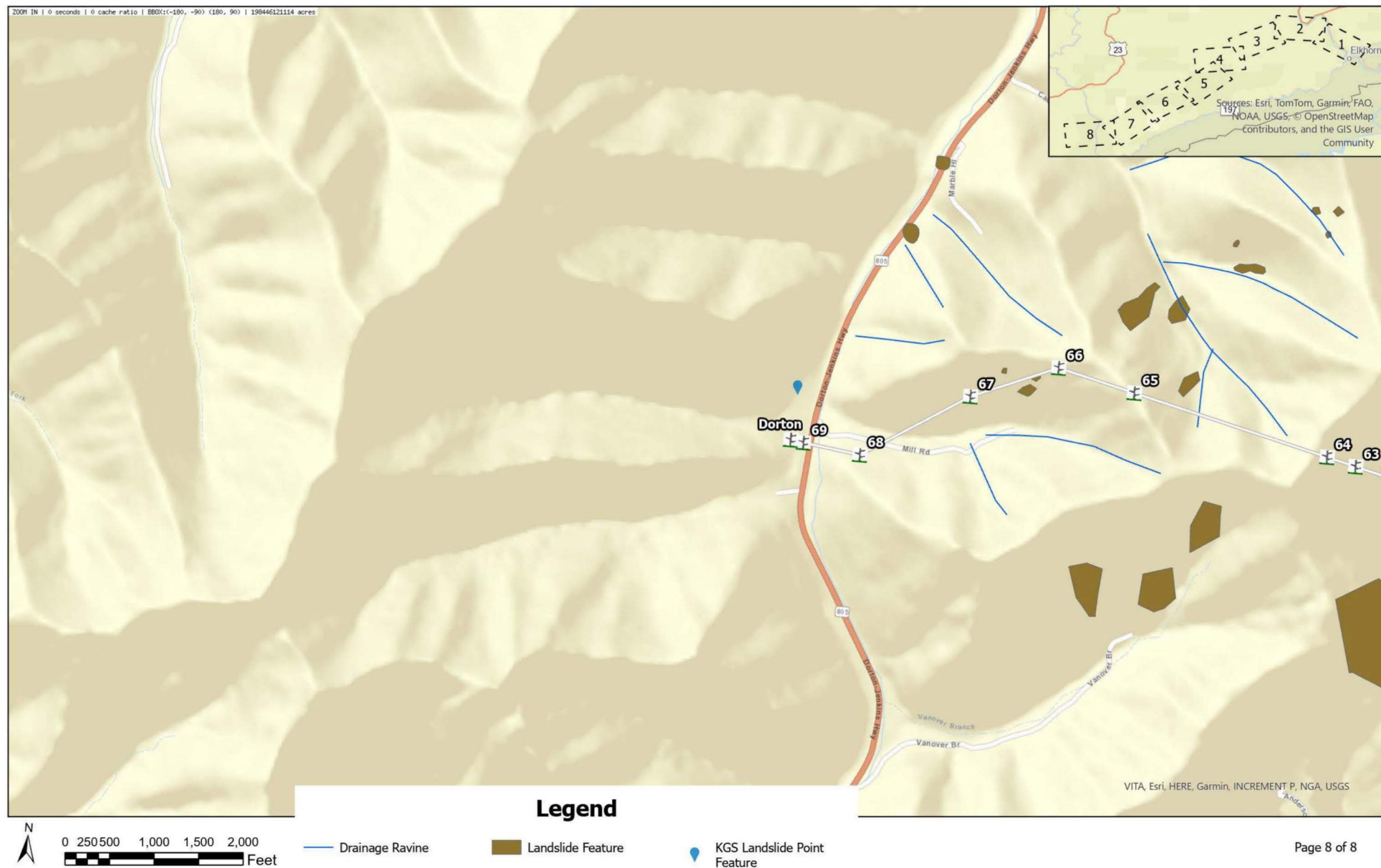
Landslides and Drainage Ravines



Landslides and Drainage Ravines



Landslides and Drainage Ravines



Attachment 5 – Terracon Geotechnical Report

Henry Clay - Breaks

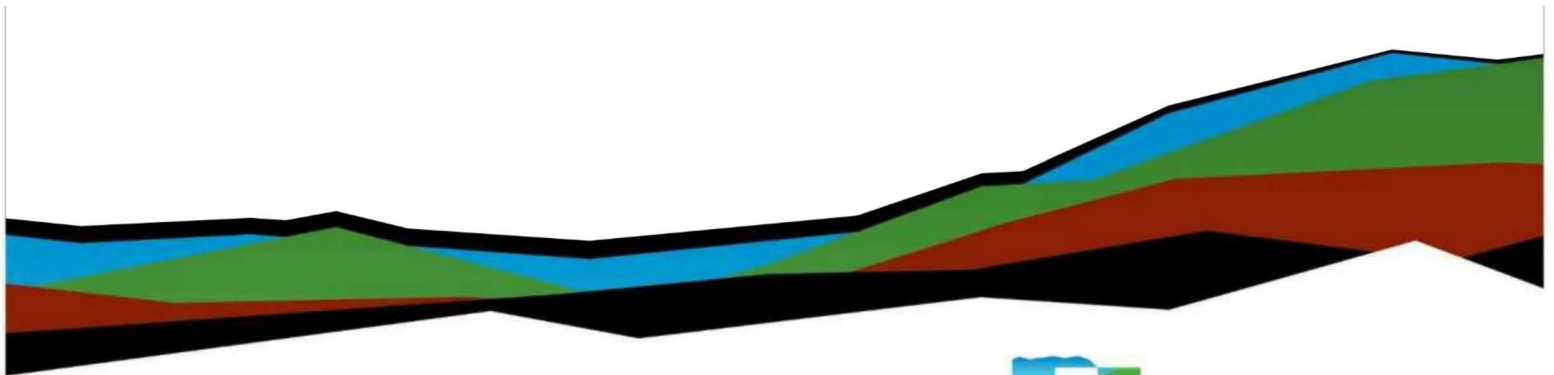
Geotechnical Engineering Report

Pike County, Kentucky

March 10, 2026 | Terracon Project No. N2255181

Prepared for:

American Electric Power
40 Franklin Rd SW
Roanoke, VA 24011





912 Morris Street
Charleston, WV 25301
P (304) 344-0821
Terracon.com

March 10, 2026

American Electric Power
40 Franklin Rd SW
Roanoke, VA 24011

Attn: Ms. Kolleen Backlund
P: (484) 401-6490
E: klbacklund@aep.com

Re: Geotechnical Engineering Report
Henry Clay - Breaks
Various Locations
Pike County, Kentucky
Terracon Project No. N2255181

Dear Ms. Backlund:

We have partially completed the scope of Geotechnical Engineering services for the above referenced project in general accordance with Terracon Proposal No. PN2255181 dated December 19, 2025. The AEP Work Order number for this project is T10358858002 and the BPID number is P19037005.

The subsurface exploration phase for the project was completed on February 11, 2026. This report presents the findings of the subsurface exploration conducted for five (5) test borings designated 15B, 15D, 15E, 32F, and 69, laboratory testing on selected samples, engineering analysis, and preparation of this report. Three A-B resistivity tests are scheduled to be performed at boring locations 15D, 32F, and 69 in accordance with ASTM G57 using the Werner Four-Electrode Method and AEP Specification TLES-032. Due to recent weather, resistivity testing has not yet been completed. Resistivity testing results will be submitted as an addendum to this report at a later date.

Exhibits showing the site and boring locations are presented in the **Site Location and Exploration Plans** section of this report. The boring logs, and results of the laboratory testing performed on selected soil samples obtained during the field exploration are included in the **Exploration Results** section of this report.

The recommended soil parameters for the design of drilled shafts using the computer program MFAD™ have been developed for the test borings and are included in the

Geotechnical Engineering Report

Henry Clay - Breaks | Pike County, Kentucky
March 10, 2026 | Terracon Project No. N2255181



MFAD™ Design Parameters section, with additional construction considerations provided in the **Deep Foundations** section of this report.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

A handwritten signature in black ink that reads 'Alex Sovine'.

Alex B. Sovine, P.E.
Project Engineer

A handwritten signature in black ink that reads 'Yogesh S. Rege'.

Yogesh S. Rege, P.E.
Senior Engineering Consultant



03/10/2026



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Project Description..... 1
Site Conditions 2
Geotechnical Characterization 3
Geologic Hazards..... 4
Seismic Site Class..... 6
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 Drilled Shaft Foundation Design and Construction Recommendations 7
General Comments 8

Figures

- GeoModel
- MFAD™ Soil Parameters – Design Data Sheets

Attachments

- Exploration and Testing Procedures**
- Photography Log**
- Site Location and Exploration Plans**
- Exploration and Laboratory Results**
- MFAD™ Design Parameters**
- Supporting Information**

Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the  Terracon logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

Refer to each individual Attachment for a listing of contents.

Introduction

This data report presents the results of our subsurface exploration and the partially completed Geotechnical Engineering services performed for the proposed transmission line structures to be located along the existing Henry Clay – Breaks T-Line in Pike County, Kentucky. The purpose of these services was to provide information and geotechnical engineering recommendations related to:

- Subsurface soil and rock conditions
- Groundwater conditions
- Seismic site classification per IBC
- Geohazards
- MFAD™ Design Parameters

The geotechnical engineering Scope of Services for this project included the advancement of test borings, laboratory testing, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are shown on the [Site Location and Exploration Plans](#) section. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs and/or as separate graphs in the [Exploration Results](#) section.

Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	An e-mail request for proposal (RFP) was provided by Ms. Kolleen Backlund on December 5, 2025. The email included a general geotechnical scope, boring locations, and the following attachment: ■ Breaks – Dorton TLE Borings.kmz
Project Description	The project involves the construction of five (5) total transmission structures to be located outside existing and proposed substations.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project spans across three separate sites with approximate coordinates as follows: ■ Dorton Substation (existing): 37.2392°, -82.5691° ■ Henry Clay Substation (existing): 37.3100°, -82.3918° ■ Ratliff Substation (proposed): 37.3346°, -82.3918° See Site Location
Existing Improvements	The Dorton site is currently occupied by an existing substation to the west of the proposed structure, as well as two residential trailers located on the northern and southern sides of the proposed structure. We understand these trailers are in the process of being removed. The Henry Clay site is currently occupied by a residential home just north of the proposed structure, with the associated electric substation located to the west. The Ratliff site is currently occupied by an empty residential structure on the northwestern side of the proposed structures. We understand this house will be demolished prior to the construction of a new substation and these structures.
Current Ground Cover	Grass and light vegetation at all three sites
Existing Topography	All three sites are relatively flat in valley areas located near creeks and tributaries. Approximate elevations for each site are as follows: ■ Dorton: ± 1,246 feet ■ Henry Clay: ± 1,030 feet ■ Ratliff: ± 743 feet

We also collected photographs at the time of our field exploration program. Representative photos are provided in our [Photography Log](#).

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs can be found in the [Exploration Results](#) and the GeoModel can be found in the [Figures](#) attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	Existing Fill	Predominantly lean clay with varying content of sand and gravel, as well as sand with clay and silt
2	Native Cohesive Material	Lean clay with varying content of sand, gravel, and silt, medium stiff to hard
3	Native Granular Material	Loose to medium dense sand with varying content of silt, clay, and gravel
4	Bedrock	Moderately to highly weathered siltstone, some coal noted

The borings were advanced using hollow stem augers that allow short term groundwater observations to be made while drilling. Groundwater levels at each of the boring locations are summarized in the table below:

Site	Boring	Groundwater Encountered while Drilling (ft, bgs)	Groundwater Observed at Completion (ft, bgs)
Ratliff	15B	20	NR ^{1,2}
	15D	50	NR ^{1,2}
	15E	NE ¹	NR ^{1,2}
Henry Clay	32F	13.5	46.3 ²
Dorton	69	33	26.7

1. NE = Not encountered, NR = Not recorded

2. Water was added to boring for purposes of sand heaving (Ratliff borings) or rock coring (Henry Clay), and therefore, completion readings may be skewed by the addition of water.

Groundwater conditions may be different at the time of construction due to seasonal variations in rainfall, runoff, elevations of nearby water features such as the Russel Fork (Ratliff site) and Marrowbone Creek (Henry Clay), and other conditions not apparent at the time of drilling. Long-term groundwater monitoring was outside the scope of services for this project.

Geologic Hazards

A geological hazard, or geohazard, is a potential natural or manmade geological, geotechnical, or other subsurface feature or process that may adversely impact property, the environment, or pose a threat to human life. These hazards include but are not limited to landslides, sinkholes, erosion, and mining subsidence. Each of the structure locations were reviewed for such geohazards to make the design team aware of any potential construction challenges.

Ratliff

Structures 15B, 15D, and 15E are all located within 20 to 70 feet of a streambank for the Russel Fork tributary. As such, two structures (15D and 15E) fall within a shaded Flood Zone X (orange in Figure 1), which corresponds to a FEMA Flood Risk of Moderate.



Figure 1: Ratliff Site Boring Locations with FEMA Flood Mapping

A review of hillshade imagery indicates this streambank may be highly susceptible to erosion during flooding events. A small concave feature (circled in blue in Figure 2) can

be seen just southwest of structure 15B that may indicate slope failure from past erosion.



Figure 2: Ratliff Site Boring Locations with FEMA Flood Mapping

Henry Clay

Similar to structures at the Ratliff site, Structure 32F at the Henry Clay site is located within 10 feet of the streambank of Marrowbone Creek. However, this structure does fall within the FEMA 100-year Flood Plain (red in Figure 3 below). Flooding and erosion are the primary geohazards at this site.

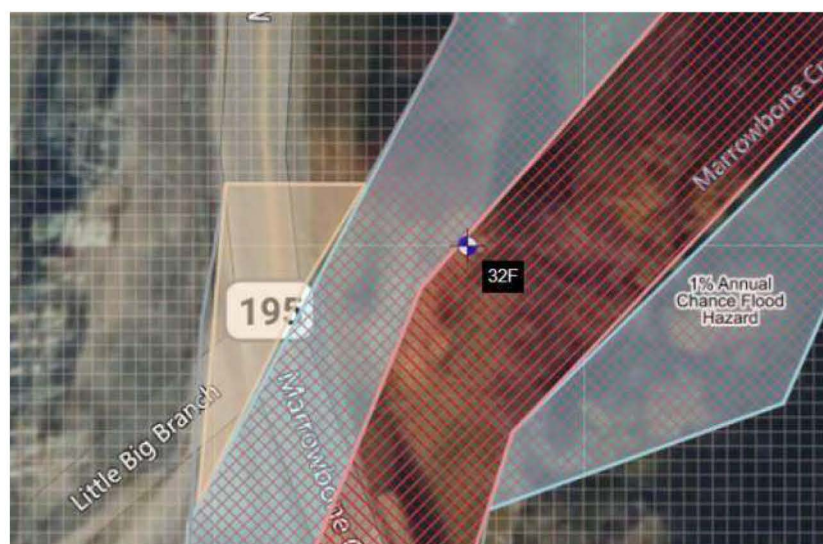


Figure 3: Henry Clay Site Boring Location with FEMA Flood Hazard Mapping

Dorton

Structure 69 is located approximately 140 feet west of the Shelby Creek. While the structure does not appear to have a high erosion-related risk given its distance from the streambank, it is located at the edge of an A Flood Zone (blue in below figure), which is considered by FEMA to be a high-risk flood area due to its proximity to the Shelby Creek.

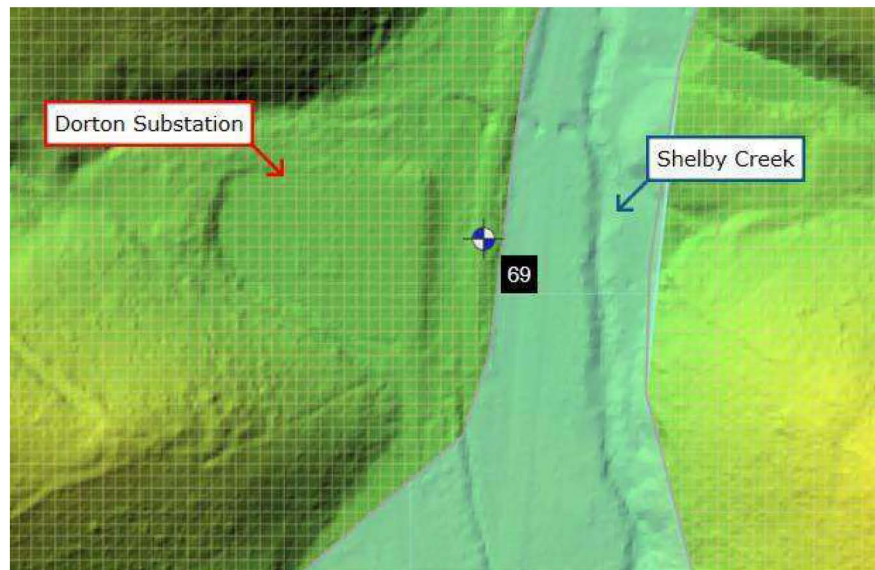


Figure 4: Henry Clay Site Boring Location with FEMA Flood Hazard Mapping

Seismic Site Class

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the soil/bedrock properties observed at the site and as described on the exploration logs and results, our professional opinion is for that a **Seismic Site Classification of D** be considered for the project. Subsurface explorations at this site were extended to a maximum depth of 60.6 feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

Deep Foundations

Drilled Shaft Foundation Design and Construction Recommendations

Parameters for use in MFAD™ software have been developed and are included in the **MFAD™ Design Parameters** section of this report. The values provided for each boring are ultimate values and the designer should apply an adequate applicable factor of safety aligned with its use.

It is recommended that each drilled shaft element be at least 1.5 feet in diameter. Based on our subsurface findings at this project site, it is recommended that drilled shaft lengths should be at least 3 times the shaft diameter with a minimum recommended lengths as follows:

- Ratliff: 30 feet
- Henry Clay: 25 feet (to extend past the coal layer and bear on hard native clay soil)
- Dorton: 20 feet (to bear on at least medium dense native sand)

It is recommended that the drilled shaft design should incorporate a factor of safety of 3.0 for end bearing and 2.5 for side resistance, when subjected to axial compression loading situation. A factor of safety of 3.0 is recommended for side resistance against uplift loading situation.

Drilled shaft length may need to be adjusted (increased) to resist the lateral loads and moments acting at or near the ground surface elevation (structural loads).

The following additional construction considerations, during the drilled shaft installations, should be followed:

- If temporary casing is used to prevent caving during drilling, the casing should be removed as the concrete is placed in the hole, assuring that enough head is maintained.
- The actual bearing elevation at each drilled shaft location should be determined in the field during construction through inspection by an authorized representative of the Geotechnical Engineer.
- If effective dewatering is not practical, concrete should be placed at the bottom of the excavation by pumping or by using a tremie pipe.
- To facilitate shaft construction, concrete should be on-site and ready for placement as shaft excavations are completed.
- It is recommended that no completed drilled shaft holes be left open overnight without being filled with concrete.
- If casing is used during construction of the shaft, the casing should be removed after concrete is poured. Casing should not be left in place permanently as during

the shaft construction process, voids/gaps could get created between the casing and the surrounding soils. If the casing cannot be removed for some reason, jet grouting should be performed to completely fill the gaps/voids between the casing and the surrounding soils. In that case there may still be a reduction in the skin friction capacity of the shaft, which will have to be evaluated by the project geotechnical and structural engineers.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly affect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others.

Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Geotechnical Engineering Report

Henry Clay - Breaks | Pike County, Kentucky

March 10, 2026 | Terracon Project No. N2255181

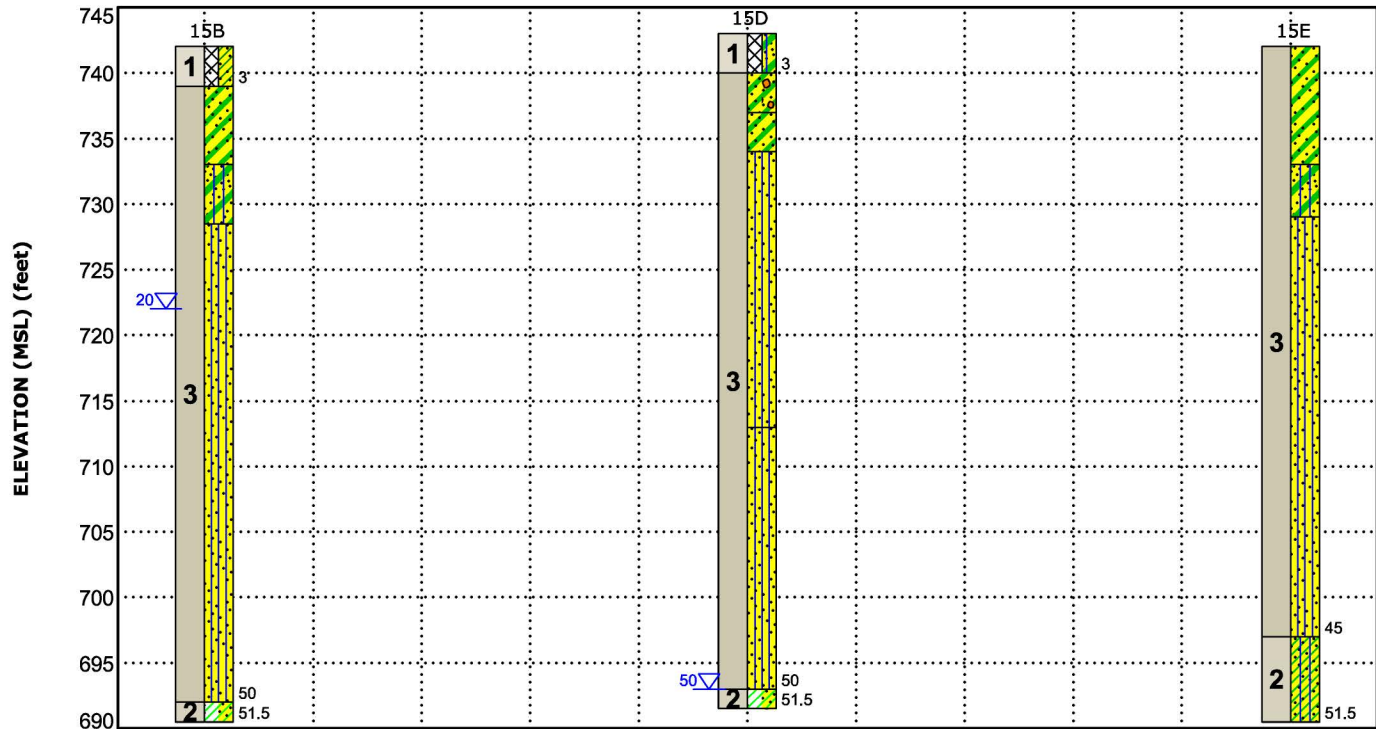


Figures

Contents:

GeoModel (3 pages)

GeoModel - Ratliff Site



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description	Legend	
1	Existing Fill	Predominantly lean clay with varying content of sand and gravel, as well as sand with clay and silt	Sandy Lean Clay	Clayey Sand
2	Native Cohesive Material	Lean clay with varying content of sand, gravel, and silt. Medium stiff to hard	Silty Clayey Sand	Silty Sand
3	Native Granular Material	Sand with varying content of silt, clay, and gravel. Loose to medium dense	Lean Clay with Sand	Clayey Sand with Gravel
4	Bedrock	Moderately to highly weathered siltstone and some coal	Sandy Silty Clay	

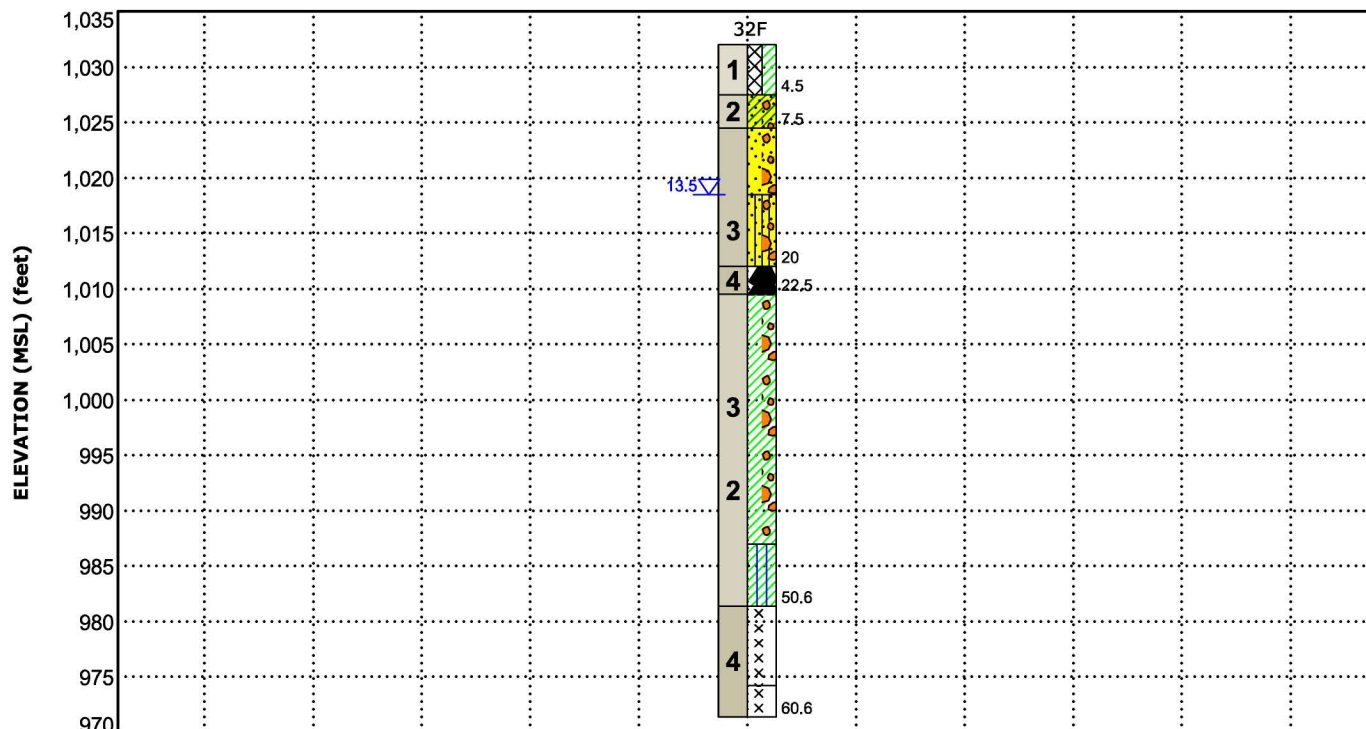
First Water Observation
 Second Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
 Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
 Numbers adjacent to soil column indicate depth below ground surface.

GeoModel - Henry Clay Site



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description	Legend	
1	Existing Fill	Predominantly lean clay with varying content of sand and gravel, as well as sand with clay and silt	Lean Clay	Sandy Lean Clay with Gravel
2	Native Cohesive Material	Lean clay with varying content of sand, gravel, and silt. Medium stiff to hard	Poorly-graded Sand with Gravel	Silty Sand with Gravel
3	Native Granular Material	Sand with varying content of silt, clay, and gravel. Loose to medium dense	Coal	Lean Clay with Gravel
4	Bedrock	Moderately to highly weathered siltstone and some coal	Silty Clay	Siltstone

First Water Observation
 Second Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.

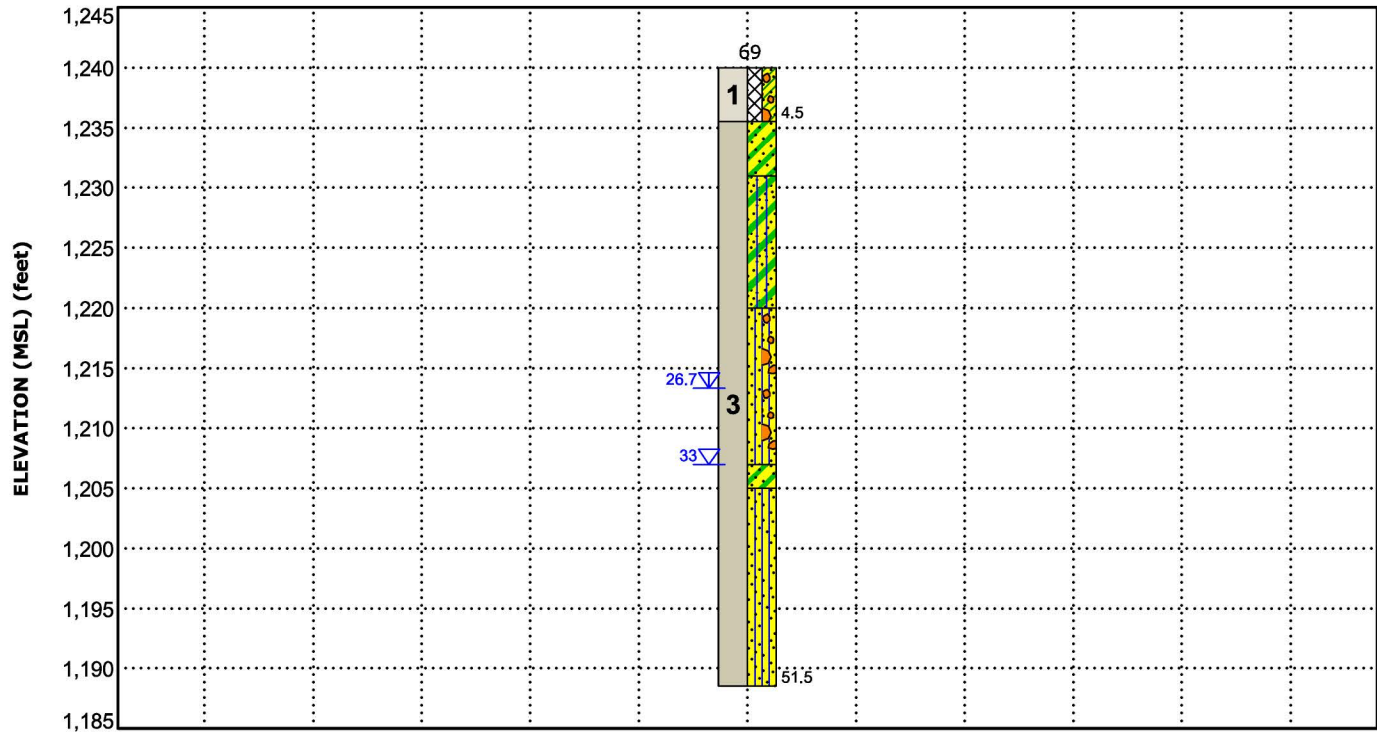
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.

Numbers adjacent to soil column indicate depth below ground surface.

GeoModel - Dorton Site



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description	Legend	
1	Existing Fill	Predominantly lean clay with varying content of sand and gravel, as well as sand with clay and silt	Sandy Lean Clay with Gravel	Clayey Sand
2	Native Cohesive Material	Lean clay with varying content of sand, gravel, and silt. Medium stiff to hard	Silty Clayey Sand	Silty Sand with Gravel
3	Native Granular Material	Sand with varying content of silt, clay, and gravel. Loose to medium dense	Silty Sand	
4	Bedrock	Moderately to highly weathered siltstone and some coal		

First Water Observation
 Second Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

Geotechnical Engineering Report

Henry Clay - Breaks | Pike County, Kentucky

March 10, 2026 | Terracon Project No. N2255181



Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
3 (Str. 15B, 15D, 15E)	51.5	Ratliff
1 (Str. 32F)	60.6	Henry Clay
1 (Str. 69)	51.5	Dorton

Boring Layout and Elevations: AEP provided the boring layout and boring coordinates. Approximate ground surface elevation was estimated using Google Earth™. If elevations and a more precise boring layout are desired, we recommend the boring be surveyed.

Subsurface Exploration Procedures: We advanced the boring with a track-mounted, rotary drill rig using continuous flight hollow stem augers. Sampling was conducted continuously to a depth of 10.5 feet then at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring log at the test depths. We observed and recorded groundwater levels during drilling and sampling. Groundwater encountered at the time of drilling at depths ranging from 13.5 to 50 feet. For safety purposes and in accordance with AEP specifications, the boring was backfilled with auger cuttings and bentonite chips upon completion.

Upon encountering refusal conditions on bedrock, borings were advanced into the refusal materials using a diamond bit attached to the outer barrel of a double core barrel. The inner barrel collected the cored material as the outer barrel was rotated at high speeds to cut the rock. The barrel was retrieved to the surface upon completion of the drill run. Once the core samples were retrieved, they were placed in a box and logged. The rock was later classified by an engineer, and the recovery and rock quality designation (RQD) were determined.

The recovery is the length of the sample retrieved expressed in inches. An indication of the actual in-situ rock quality is provided by calculating the sample’s RQD, which is the ratio of the cumulative length of 4-inch or longer cores (discounting mechanical breaks) to the drilled length.

We also observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. The groundwater levels are shown on the attached boring logs.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials observed during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

- Moisture Content
- Atterberg Limits
- Grain Size Analysis
- Unconfined Compression

The laboratory testing program often included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Rock classification was conducted using locally accepted practices for engineering purposes; petrographic analysis may reveal other rock types. Rock core samples typically provide an improved specimen for this classification. Boring log rock classification was determined using the Description of Rock Properties.

Photography Log



32F Rock Core – Box 1 of 1

Site Location and Exploration Plans

Contents:

Site Location Plan

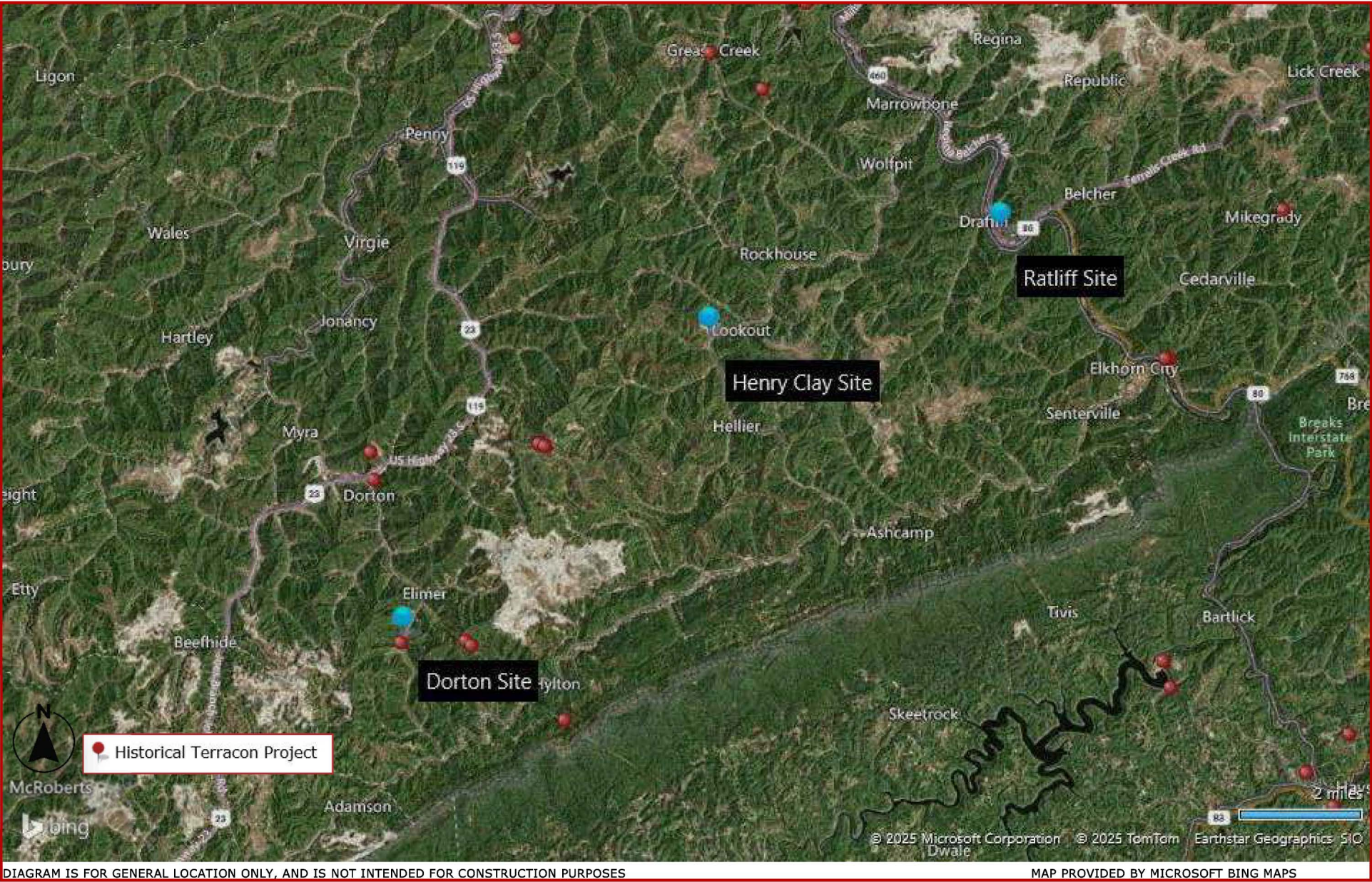
Exploration Plan – Ratliff Site

Exploration Plan – Henry Clay Site

Exploration Plan – Dorton Site

Note: All attachments are one page unless noted above.

Site Location



Exploration Plan – Ratliff Site



Exploration Plan – Henry Clay Site



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan – Dorton Site

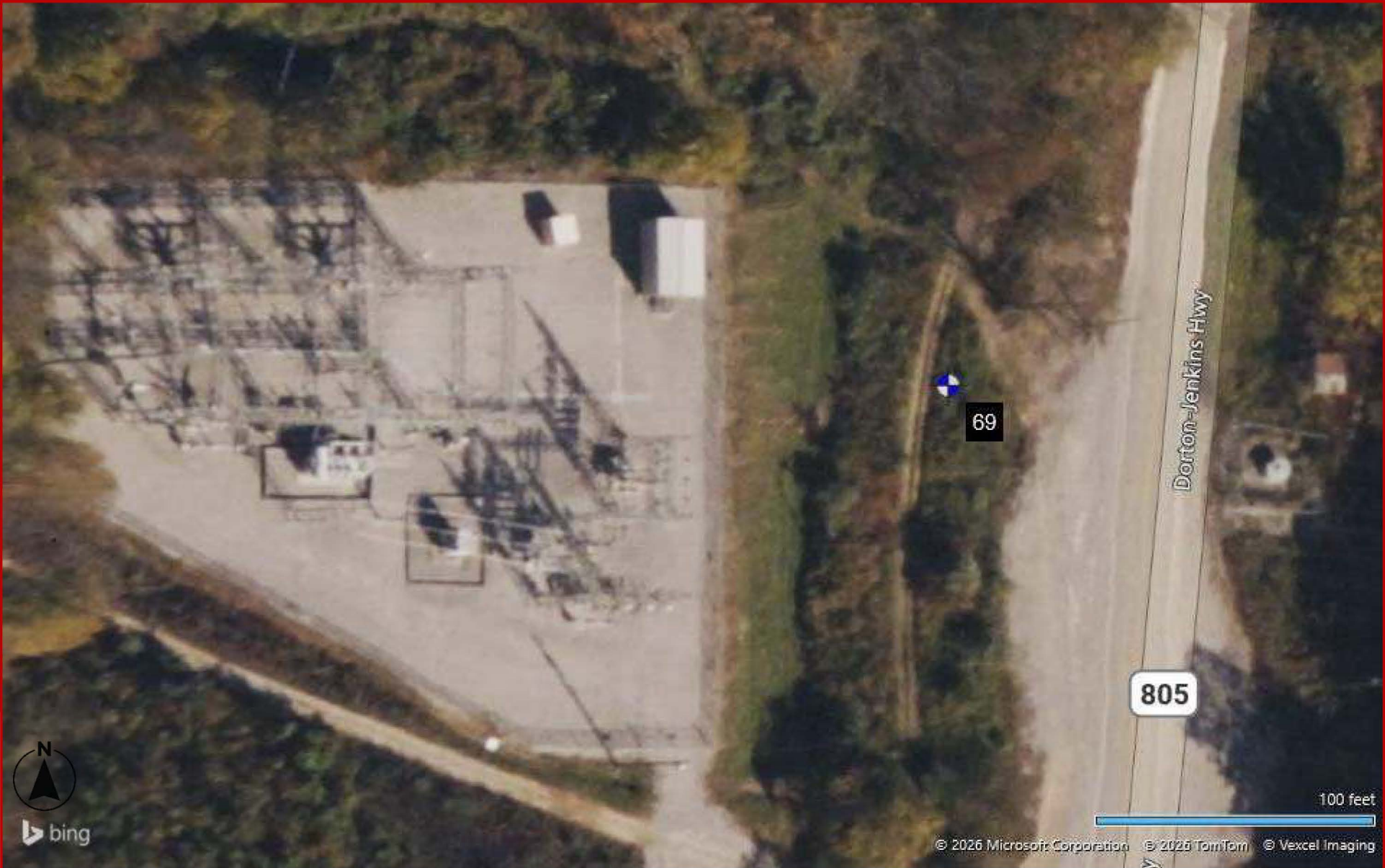


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Boring Logs (15B, 15D, 15E, 32F, 69) (11 pages)
Moisture Content
Atterberg Limits
Grain Size Distribution (3 pages)
Unconfined Compressive Strength (2 pages)

Note: All attachments are one page unless noted above.

Boring Log No. 15B

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 37.3342° Longitude: -82.3913° Depth (Ft.) Approximate Elevation: 742 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	RQD (%)
											LL-PL-PI	
1		FILL - SANDY LEAN CLAY , trace gravel, trace organics (fine roots), brown	3.0			18	3-3-4 N=7					
						18	3-4-3 N=7					
3		CLAYEY SAND (SC) , micaceous, fine to medium grained, brown, loose	5			12	3-4-4 N=8	13.4				
						18	3-3-3 N=6					
						16	3-4-4 N=8					
						18	4-3-4 N=7					
		SILTY CLAYEY SAND (SC-SM) , trace gravel, trace organics (roots), trace carbonaceous shale fragments, light brown, loose	10			18	4-4-4 N=8	19.9			20-16-4	
		SILTY SAND (SM) , micaceous, fine to medium grained, brown, loose to medium dense	15			14	4-3-3 N=6	20.3			NP	
			20			18	3-3-3 N=6					
			25			17	4-3-3 N=6					

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation Reference: Elevation estimated from Google Earth

Water Level Observations

20 ft: Groundwater encountered while drilling
Groundwater observation not recorded upon completion

Drill Rig
CME 55 / DR622

Hammer Type
Automatic

Driller
J. Tower

Logged by
J. Wright

Boring Started
02-11-2026

Boring Completed
02-11-2026

Notes

Advancement Method
3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite.

Boring Log No. 15B

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 37.3342° Longitude: -82.3913° Depth (Ft.) Approximate Elevation: 742 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	RQD (%)
											LL-PL-PI	
3		SILTY SAND (SM) , micaceous, fine to medium grained, brown, loose to medium dense (<i>continued</i>)	30		18		3-4-3 N=7		23.9		NP	
2		LEAN CLAY WITH SAND (CL) , orangish brown to light brown, stiff	50		18		4-5-4 N=9		23.8			
		Boring Terminated at 51.5 Feet										

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation Reference: Elevation estimated from Google Earth

Water Level Observations

20 ft: Groundwater encountered while drilling
 Groundwater observation not recorded upon completion

Drill Rig
CME 55 / DR622

Hammer Type
Automatic

Driller
J. Tower

Logged by
J. Wright

Boring Started
02-11-2026

Boring Completed
02-11-2026

Notes

Advancement Method
3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite.

Boring Log No. 15D

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 37.3345° Longitude: -82.3918° Depth (Ft.) Approximate Elevation: 743 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	RQD (%)
											LL-PL-PI	
1		FILL - SILTY CLAYEY SAND , micaceous, trace gravel, light brown and brown	3.0			16	4-5-5 N=10					
			740			12	5-5-5 N=10					
3		CLAYEY SAND WITH GRAVEL (SC) , sandstone gravels, medium grained, brown to dark brown, loose 4.5 to 6 ft: trace carbonaceous shale and coal fragments	5			18	4-3-3 N=6					
			6.0			18	4-4-3 N=7					
		CLAYEY SAND (SC) , micaceous, fine to medium grained, brown, loose	737			18	4-4-4 N=8	10.6				
			9.0			18	3-2-3 N=5					
		SILTY SAND (SM) , micaceous, fine to medium grained, brown, loose	734			18	3-2-2 N=4					
			10									
3			15			18	3-3-3 N=6	19.9			NP	
			20			16	2-3-3 N=6					
			25			12	3-2-3 N=5	21.8				

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation Reference: Elevation estimated from Google Earth

Water Level Observations

50 ft: Groundwater encountered while drilling
Groundwater observation not recorded upon completion

Drill Rig
CME 55 / DR622

Hammer Type
Automatic

Driller
J. Tower

Logged by
J. Wright

Boring Started
02-10-2026

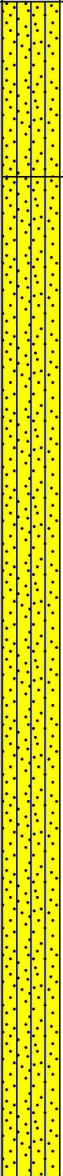
Boring Completed
02-10-2026

Notes

Advancement Method
3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite.

Boring Log No. 15D

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 37.3345° Longitude: -82.3918° Depth (Ft.) Approximate Elevation: 743 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	RQD (%)
											LL-PL-PI	
3		SILTY SAND (SM) , micaceous, fine to medium grained, brown, loose (<i>continued</i>)										
		30.0 713	30									
		SILTY SAND (SM) , micaceous, medium grained, brown, loose		X	18		3-3-3 N=6					
			35	X	18		3-3-4 N=7					
			40	X	16		3-4-4 N=8					
2		50.0 693	50	▽								
		LEAN CLAY WITH SAND (CL) , trace sand, medium plasticity, gray to brown, stiff		X	18		4-5-6 N=11		39.1		41-19-22	
		51.5 691.5										
		Boring Terminated at 51.5 Feet										

See **Exploration and Testing Procedures** for a description of field and laboratory procedures used and additional data (If any).

See **Supporting Information** for explanation of symbols and abbreviations.

Elevation Reference: Elevation estimated from Google Earth

Water Level Observations

▽ 50 ft: Groundwater encountered while drilling
 Groundwater observation not recorded upon completion

Drill Rig
 CME 55 / DR622

Hammer Type
 Automatic

Driller
 J. Tower

Logged by
 J. Wright

Boring Started
 02-10-2026

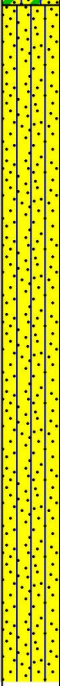
Boring Completed
 02-10-2026

Notes

Advancement Method
 3.25" Hollow Stem Auger

Abandonment Method
 Boring backfilled with auger cuttings and bentonite.

Boring Log No. 15E

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 37.3349° Longitude: -82.3923° Depth (Ft.) Approximate Elevation: 742 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	RQD (%)
											LL-PL-PI	
3		CLAYEY SAND (SC) , trace organics (fine roots) to 4.5 feet, fine to medium grained, brown, loose			X	18	3-2-3 N=5					
					X	18	3-3-3 N=6					
					X	16	3-3-2 N=5		22.3			
			5		X	18	3-2-2 N=4					
					X	16	2-3-3 N=6					
		7.5 to 9 ft: trace clay			X	18	3-3-3 N=6					
		9.0 733			X	18	3-3-4 N=7		21.8			
		SILTY CLAYEY SAND (SC-SM) , micaceous, fine grained, brown, moist, loose to medium dense	10									
		13.0 729										
		SILTY SAND (SM) , micaceous, fine to medium grained, brown, loose			X	9	3-3-3 N=6					
			15									
					X	16	3-3-4 N=7		24.7		NP	
			25		X	18	4-4-4 N=8					

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation Reference: Elevation estimated from Google Earth

Water Level Observations

Water not encountered while drilling

Drill Rig

CME 55 / DR622

Hammer Type

Automatic

Driller

J. Tower

Logged by

J. Wright

Boring Started

02-11-2026

Boring Completed

02-11-2026

Notes

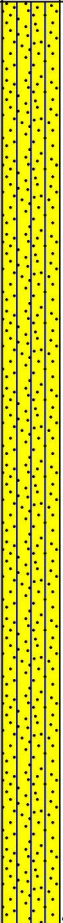
Advancement Method

3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite.

Boring Log No. 15E

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 37.3349° Longitude: -82.3923° Depth (Ft.) Approximate Elevation: 742 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	RQD (%)
											LL-PL-PI	
3		SILTY SAND (SM) , micaceous, fine to medium grained, brown, loose (<i>continued</i>)	30									
				X	18		3-4-4 N=8					
			35									
				X	18		3-3-3 N=6					
2		SANDY SILTY CLAY (CL-ML) , brown, medium stiff to stiff	40						25.2			
				X	18		3-3-4 N=7					
			45									
				X	16		4-4-6 N=10		23.0		22-17-5	
		SILTY SAND (SM) , micaceous, fine to medium grained, brown, loose (<i>continued</i>)	50									
				X	18		4-9-5 N=14					
		Boring Terminated at 51.5 Feet										

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation Reference: Elevation estimated from Google Earth

Water Level Observations

Water not encountered while drilling

Drill Rig

CME 55 / DR622

Hammer Type

Automatic

Driller

J. Tower

Notes

Advancement Method

3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite.

Logged by

J. Wright

Boring Started

02-11-2026

Boring Completed

02-11-2026

Boring Log No. 32F

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 37.3101° Longitude: -82.4779° Depth (Ft.) Approximate Elevation: 1032 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	RQD (%)
											LL-PL-PI	
1		FILL - LEAN CLAY , black, coal fragments and carbonaceous shale fragments noted	4.5			18	3-3-3 N=6					
						18	3-4-4 N=8					
						10	2-2-2 N=4					
2		SANDY LEAN CLAY WITH GRAVEL (CL) , dark brown, medium stiff, sandstone gravel	7.5			13	2-3-4 N=7		10.5			
						18	3-4-5 N=9					
3		POORLY GRADED SAND WITH GRAVEL (SP) , fine to coarse grained, brown with tan and orange, medium dense to dense, gravel consists of sandstone fragments	13.5			16	4-8-13 N=21		6.5			
						9	10-14-18 N=32					
4		SILTY SAND WITH GRAVEL (SM) , brown, medium dense to dense	13.5			10	13-12-11 N=23		20.6		NP	
2		COAL , black, completely weathered	20.0			8	18-29-50/2"					
2		LEAN CLAY WITH GRAVEL (CL) , gray with brown and black, hard, gravel consists of highly weathered shale fragments	22.5			6	21-32-45 N=77					
						7	20-36-40 N=76					

See **Exploration and Testing Procedures** for a description of field and laboratory procedures used and additional data (If any).

See **Supporting Information** for explanation of symbols and abbreviations.

Elevation Reference: Elevation estimated from Google Earth

Water Level Observations

13.5 ft: Groundwater encountered while drilling
50.6 ft: Water introduced for rock coring
46.3 ft: Water observed upon completion

Drill Rig

CME 55 / DR622

Hammer Type

Automatic

Driller

J. Tower

Logged by

J. Wright

Boring Started

02-05-2026

Boring Completed

02-05-2026

Advancement Method

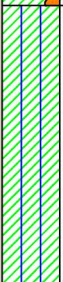
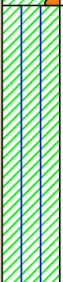
3.25" Hollow Stem Auger / NQ2 Diamond Bit Core Barrel

Abandonment Method

Boring backfilled with auger cuttings and bentonite.

Notes

Boring Log No. 32F

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 37.3101° Longitude: -82.4779° Depth (Ft.) Approximate Elevation: 1032 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	RQD (%)
											LL-PL-PI	
2		LEAN CLAY WITH GRAVEL (CL) , gray with brown and black, hard, gravel consists of highly weathered shale fragments (<i>continued</i>)	30		X	6	16-20-28 N=48		12.4		24-16-8	
			35		X	4	20-32-34 N=66					
			40		X	7	25-32-39 N=71					
			45		X	6	28-38-41 N=79					
			50		X	0	50					
		SILTY CLAY (CL-ML) , gray, hard, moderately fractured, laminated bedding, slightly weathered, medium strong, rock-like (claystone) structure	45.0									
		SILTSTONE , light gray, laminated to very thin bedding, moderately to highly weathered, weak rock, fracture spacing of 0.3 to 1.1 ft along smooth low angle joints 50.6 to 50.9 ft: claystone seam	50.6									

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation Reference: Elevation estimated from Google Earth

Water Level Observations

 13.5 ft: Groundwater encountered while drilling
50.6 ft: Water introduced for rock coring
46.3 ft: Water observed upon completion

Drill Rig
CME 55 / DR622

Hammer Type
Automatic

Driller
J. Tower

Logged by
J. Wright

Boring Started
02-05-2026

Boring Completed
02-05-2026

Notes

Advancement Method

3.25" Hollow Stem Auger / NQ2 Diamond Bit Core Barrel

Abandonment Method

Boring backfilled with auger cuttings and bentonite.

[illegible]

Boring Completed
02-05-2026

Boring Log No. 69

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 37.2393° Longitude: -82.5688° Depth (Ft.) Approximate Elevation: 1240 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	RQD (%)
											LL-PL-PI	
1		FILL - SANDY LEAN CLAY WITH GRAVEL , sandstone gravel, micaceous, trace coal fragments to 5 ft, brown to gray with orange and black				18	3-4-4 N=8					
						16	4-4-4 N=8					
		3 to 4.5 ft: trace organics (roots)				18	4-3-4 N=7					
		4.5 1235.5										
3		CLAYEY SAND (SC) , micaceous, trace gravels, medium to coarse grained, dark brown, loose	5			18	3-4-5 N=9		12.3			
						14	4-5-5 N=10					
						18	4-5-4 N=9					
		9.0 1231										
		SILTY CLAYEY SAND (SC-SM) , grayish brown, loose to medium dense	10			18	5-5-5 N=10		15.7		20-15-5	
						16	5-4-4 N=8					
			15									
		20.0 1220										
		SILTY SAND WITH GRAVEL (SM) , medium grained, brown with orange, medium dense	20			18	6-5-6 N=11		11.7		NP	
		22 ft: pyritic limestone gravels										
		25 to 33 ft: sandstone gravels	25			14	5-6-6 N=12					

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation Reference: Elevation estimated from Google Earth

Water Level Observations

- 33 ft: Groundwater encountered while drilling
- 26.7 ft: Groundwater observed upon completion

Drill Rig
CME 55 / DR622

Hammer Type
Automatic

Driller
J. Tower

Logged by
J. Wright

Boring Started
02-10-2026

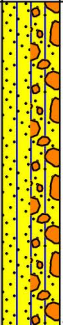
Boring Completed
02-10-2026

Advancement Method
3.25" Hollow Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite.

Notes

Boring Log No. 69

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 37.2393° Longitude: -82.5688° Depth (Ft.) Approximate Elevation: 1240 (Ft.)	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	HP (tsf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits	RQD (%)
											LL-PL-PI	
3		SILTY SAND WITH GRAVEL (SM) , medium grained, brown with orange, medium dense (<i>continued</i>)										
			30			0	50/1"					
		CLAYEY SAND (SC) , fine to medium grained, grayish brown, medium dense	33.0 1207									
					X	13	6-9-11 N=20					
		SILTY SAND (SM) , trace gravel, coarse grained, brownish gray, medium dense	35.0 1205		X	18	8-7-9 N=16		18.8			
					X	10	6-7-5 N=12					
			40									
			45		X	14	6-6-6 N=12					
			50		X	18	6-5-9 N=14					
		Boring Terminated at 51.5 Feet	51.5 1188.5									

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation Reference: Elevation estimated from Google Earth

Water Level Observations

-  33 ft: Groundwater encountered while drilling
-  26.7 ft: Groundwater observed upon completion

Drill Rig
CME 55 / DR622

Hammer Type
Automatic

Driller
J. Tower

Logged by
J. Wright

Boring Started
02-10-2026

Boring Completed
02-10-2026

Notes

Advancement Method
3.25" Hollow Stem Auger

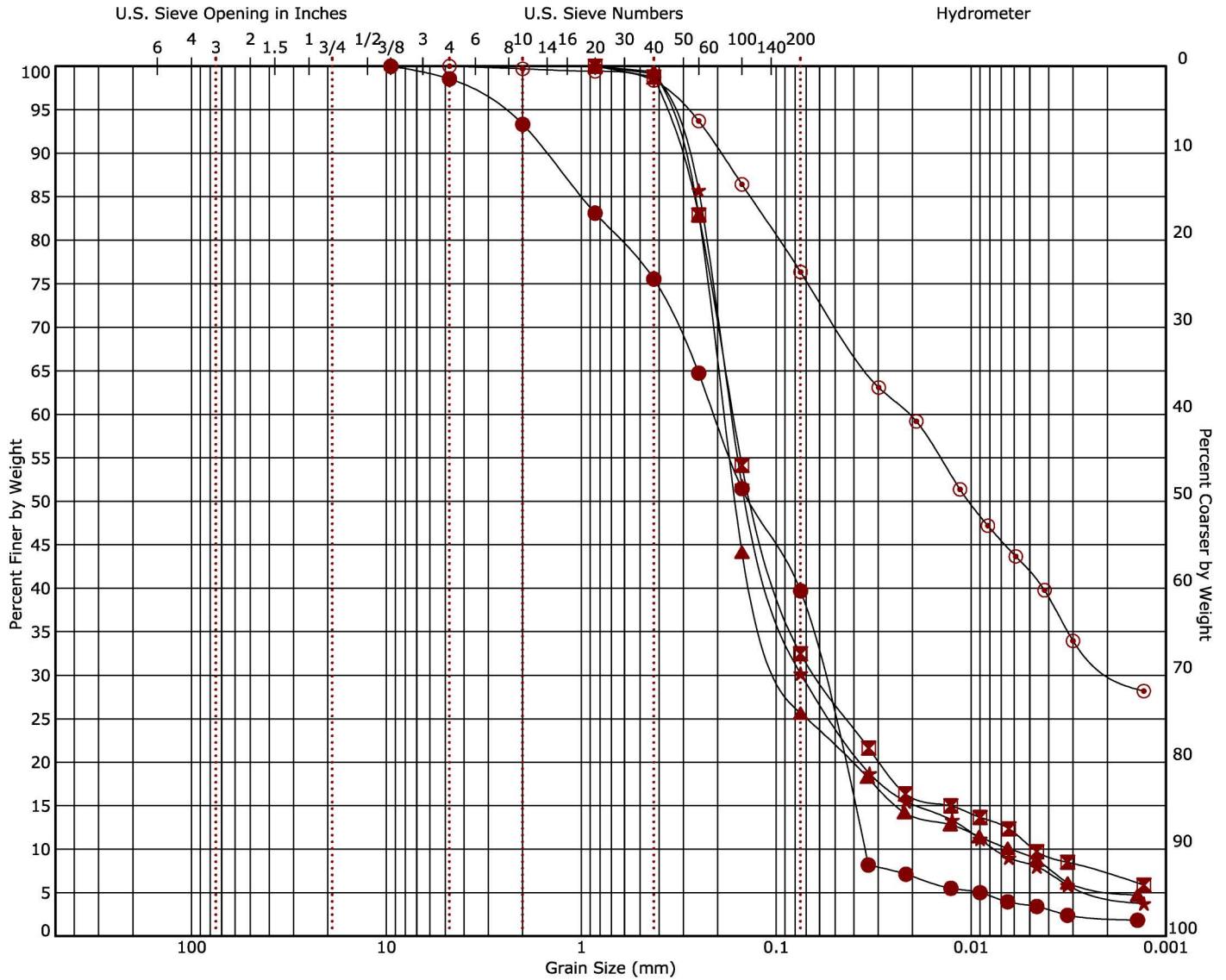
Abandonment Method
Boring backfilled with auger cuttings and bentonite.

Summary of Laboratory Results

[illegible]

Grain Size Distribution

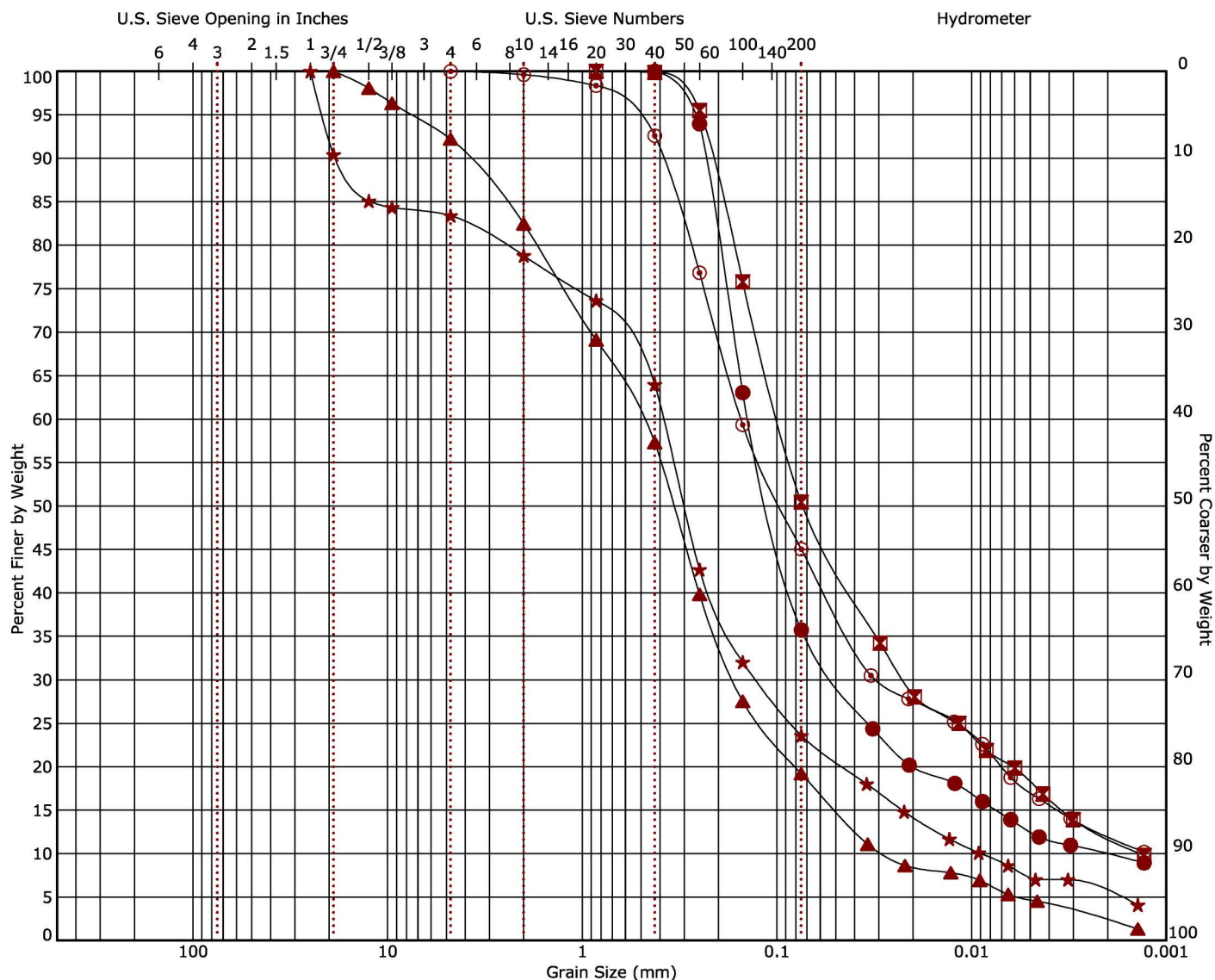
ASTM D422 / ASTM C136 / AASHTO T27



Cobbles		Gravel		Sand			Silt or Clay						
		coarse	fine	coarse	medium	fine							
Boring ID	Depth (Ft)	Description						USCS	LL	PL	PI	Cc	Cu
● 15B	9 - 10.5	SILTY, CLAYEY SAND						SC-SM	20	16	4	0.47	5.90
⊠ 15B	13.5 - 15	SILTY SAND						SM	NP	NP	NP	4.92	34.98
▲ 15B	30 - 31.5	SILTY SAND						SM	NP	NP	NP	6.67	29.21
★ 15D	13.5 - 15	SILTY SAND						SM	NP	NP	NP	4.30	22.64
⊙ 15D	50 - 51.5	LEAN CLAY with SAND						CL	41	19	22		
Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay		
● 15B	9 - 10.5	9.5	0.208	0.059	0.035	0.0	1.5	58.9		36.2	3.5		
⊠ 15B	13.5 - 15	0.85	0.167	0.062	0.005	0.0	0.0	67.5		22.1	10.4		
▲ 15B	30 - 31.5	0.85	0.185	0.088	0.006	0.0	0.0	74.4		16.6	9.1		
★ 15D	13.5 - 15	0.85	0.17	0.074	0.007	0.0	0.0	69.8		21.9	8.2		
⊙ 15D	50 - 51.5	4.75	0.021	0.002		0.0	0.0	23.6		34.6	41.8		

Grain Size Distribution

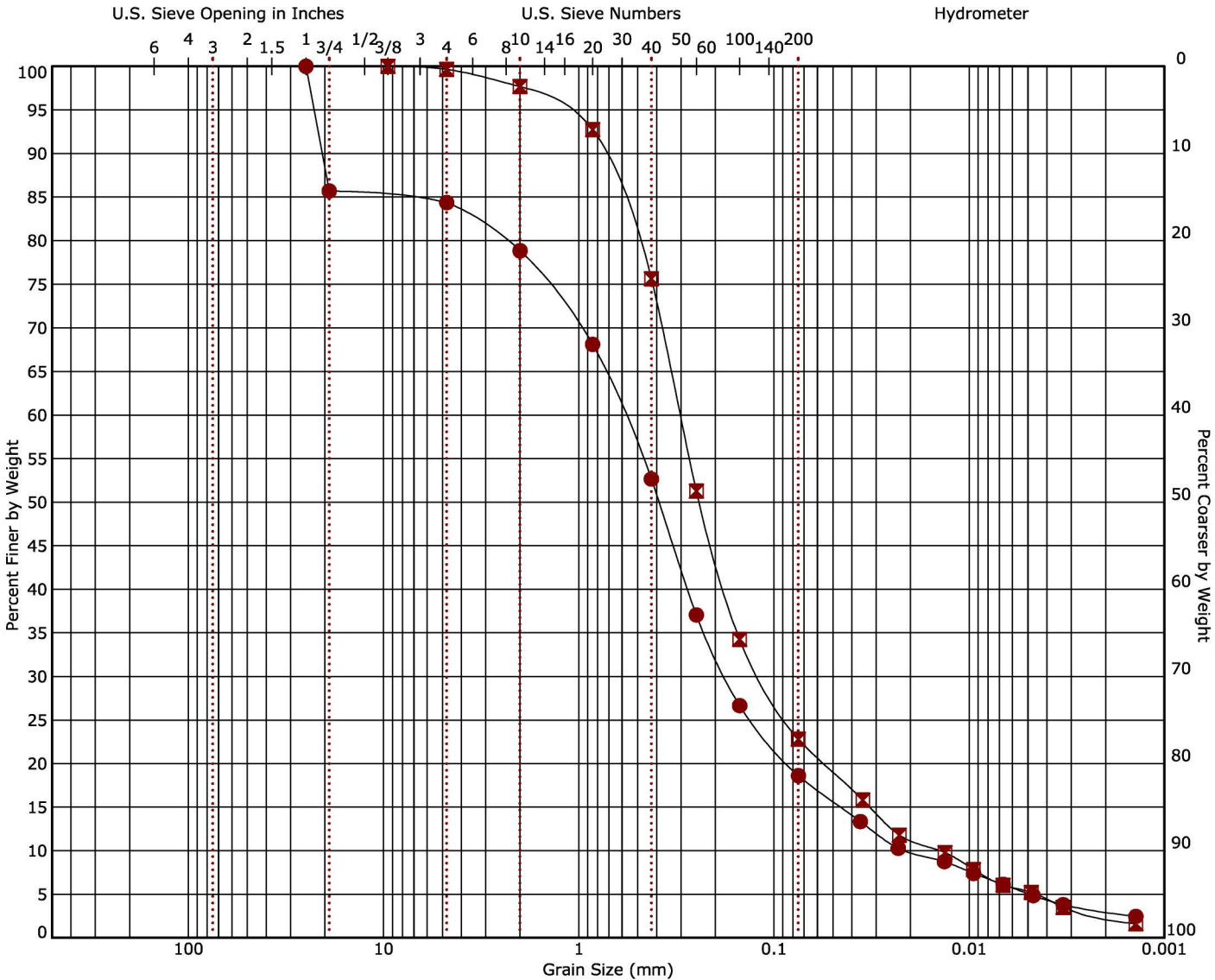
ASTM D422 / ASTM C136 / AASHTO T27



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Boring ID		Depth (Ft)	Description					USCS	LL	PL	PI	Cc	Cu
●	15E	20 - 21.5	SILTY SAND					SM	NP	NP	NP	8.40	67.44
☒	15E	45 - 46.5	SANDY SILTY CLAY					CL-ML	22	17	5	3.78	72.04
▲	32F	7.5 - 9										1.97	17.67
★	32F	13.5 - 15	SILTY SAND with GRAVEL					SM	NP	NP	NP	4.67	42.86
◎	69	9 - 10.5	SILTY, CLAYEY SAND					SC-SM	20	15	5		
Boring ID		Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay	
●	15E	20 - 21.5	0.425	0.139	0.049	0.002	0.0	0.0	64.3		23.2	12.5	
☒	15E	45 - 46.5	0.85	0.097	0.022	0.001	0.0	0.0	49.6		32.2	18.2	
▲	32F	7.5 - 9	19	0.498	0.166	0.028	0.0	7.8	73.0		14.5	4.7	
★	32F	13.5 - 15	25	0.385	0.127	0.009	0.0	16.6	59.8		16.3	7.3	
◎	69	9 - 10.5	4.75	0.153	0.03		0.0	0.0	55.0		28.0	17.1	

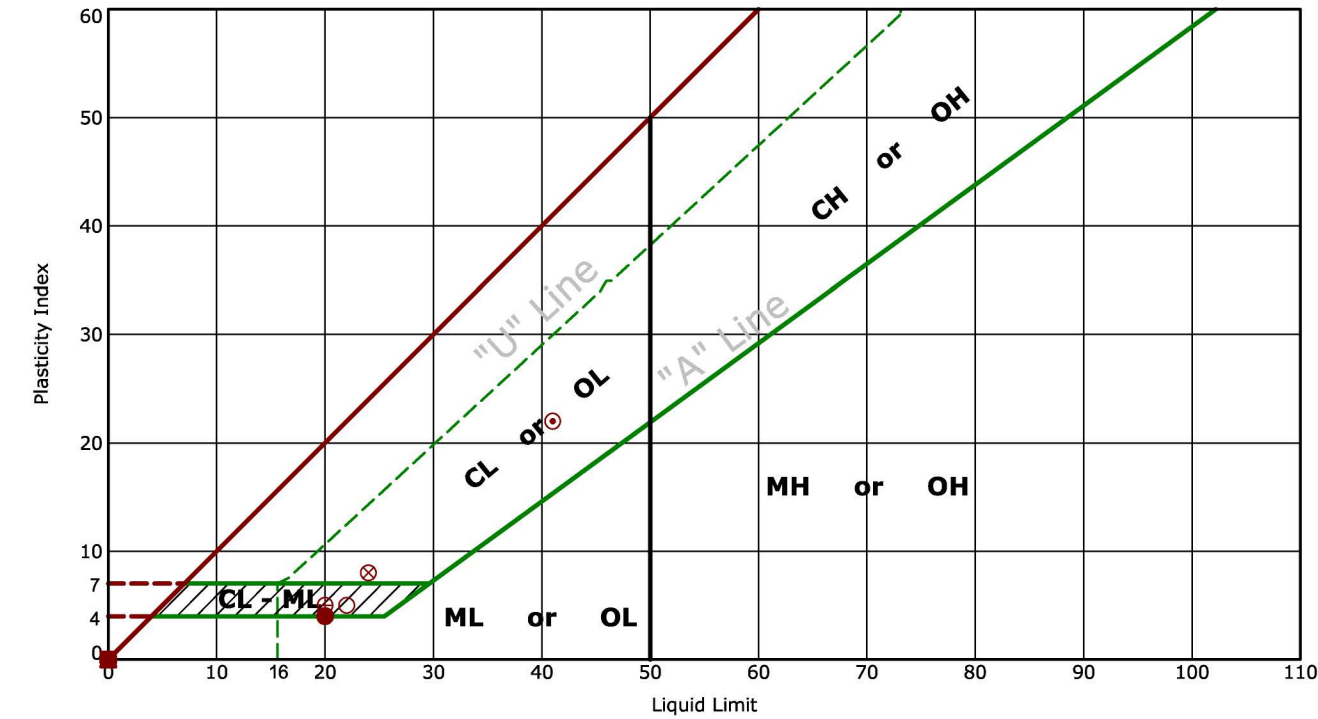
Grain Size Distribution
ASTM D422 / ASTM C136 / AASHTO T27



Boring ID	Depth (Ft)	Description	USCS	LL	PL	PI	Cc	Cu
● 69	20 - 21.5	SILTY SAND with GRAVEL	SM	NP	NP	NP	2.53	28.19
■ 69	35 - 36.5						3.15	21.41

Boring ID	Depth (Ft)	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
● 69	20 - 21.5	25	0.591	0.177	0.021	0.0	15.6	65.7		13.6	5.1
■ 69	35 - 36.5	9.5	0.302	0.116	0.014	0.0	0.3	76.8		17.5	5.3

Atterberg Limit Results
ASTM D4318



	Boring ID	Depth (Ft)	LL	PL	PI	Fines	USCS	Description
●	15B	9 - 10.5	20	16	4	39.7	SC-SM	SILTY, CLAYEY SAND
⊠	15B	13.5 - 15	NP	NP	NP	32.5	SM	SILTY SAND
▲	15B	30 - 31.5	NP	NP	NP	25.6	SM	SILTY SAND
★	15D	13.5 - 15	NP	NP	NP	30.2	SM	SILTY SAND
⊙	15D	50 - 51.5	41	19	22	76.4	CL	LEAN CLAY with SAND
⊕	15E	20 - 21.5	NP	NP	NP	35.7	SM	SILTY SAND
○	15E	45 - 46.5	22	17	5	50.4	CL-ML	SANDY SILTY CLAY
△	32F	13.5 - 15	NP	NP	NP	23.6	SM	SILTY SAND with GRAVEL
⊗	32F	30 - 31.5	24	16	8			
⊕	69	9 - 10.5	20	15	5	45.0	SC-SM	SILTY, CLAYEY SAND
□	69	20 - 21.5	NP	NP	NP	18.6	SM	SILTY SAND with GRAVEL

Unconfined Compression Test of Intact Rock Core Report ASTM D 7012 Method C

Client: American Electric Power Roanoke, VA
Project: Henry Clay - Breaks
Project No: N2255181

Boring No: 32F
Depth (ft): 51.5-52.1

Test Date: 2/25/2026

Avg. Specimen Diameter (in.): 1.970
Area (in.²): 3.05
Avg. Specimen Length (in.): 4.000
L/D Ratio: 2.0
Natural Density, lb/ft³: 168.6
Total Load (lbf.): 7160
Rate of Loading (lbs/sec): 100
Rate of Deformation (in/min): 0.021
Break Time (minutes): 2.10
Compressive Strength (psi): 2348
Compressive Strength (psf): 338046
Compressive Strength (tsf): 169

Moisture Content (%): 0.96

Failure Photograph:

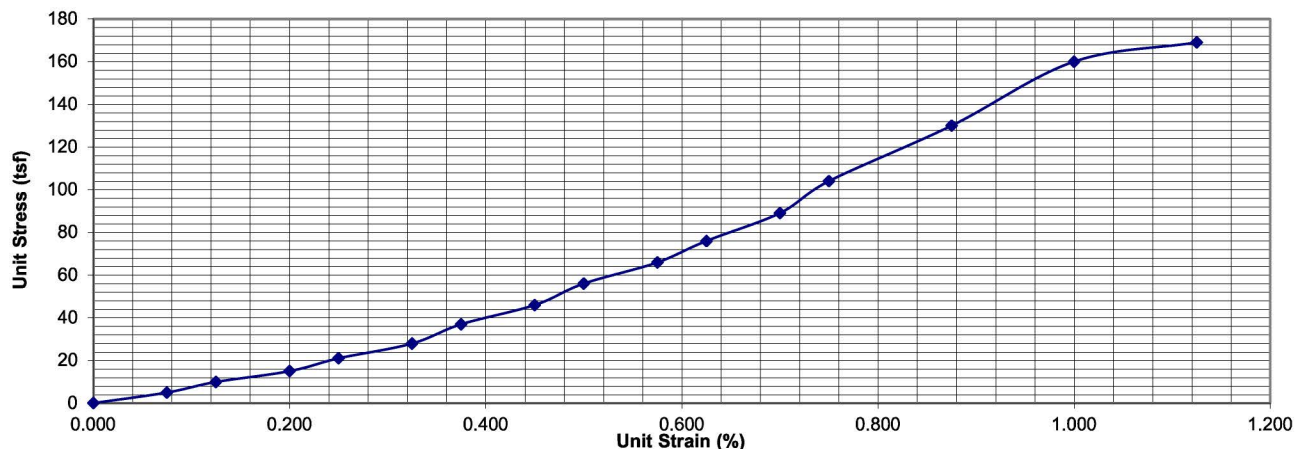


Deformation (in.)	Load (lbs.)	Strain (%)	Stress (psi)	Strength (tsf)
0.000	0	0.000	0	0
0.003	210	0.075	69	5
0.005	410	0.125	134	10
0.008	620	0.200	203	15
0.010	870	0.250	285	21
0.013	1200	0.325	393	28
0.015	1550	0.375	508	37
0.018	1940	0.450	636	46
0.020	2360	0.500	774	56
0.023	2780	0.575	911	66
0.025	3220	0.625	1056	76
0.028	3790	0.700	1243	89
0.030	4390	0.750	1439	104
0.035	5510	0.875	1807	130
0.040	6780	1.000	2223	160
0.045	7160	1.125	2348	169

Test sample prepared in general accordance to ASTM D4543

Straightness: Procedure S1 Parallelism: Procedure FP2

Flatness: Procedure FP2 Perpendicularity: Procedure P2



The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

Unconfined Compression Test of Intact Rock Core Report ASTM D 7012 Method C

Client: American Electric Power Roanoke, VA
Project: Henry Clay - Breaks
Project No: N2255181

Boring No: 32F
Depth (ft): 57.6-58.1

Test Date: 2/25/2026

Avg. Specimen Diameter (in.): 1.970
Area (in.²): 3.05
Avg. Specimen Length (in.): 4.000
L/D Ratio: 2.0
Natural Density, lb/ft³: 168.6
Total Load (lbf.): 3510
Rate of Loading (lbs/sec): 100
Rate of Deformation (in/min): 0.035
Break Time (minutes): 2.57
Compressive Strength (psi): 1151
Compressive Strength (psf): 165718
Compressive Strength (tsf): 83

Moisture Content (%): 2.05

Failure Photograph:

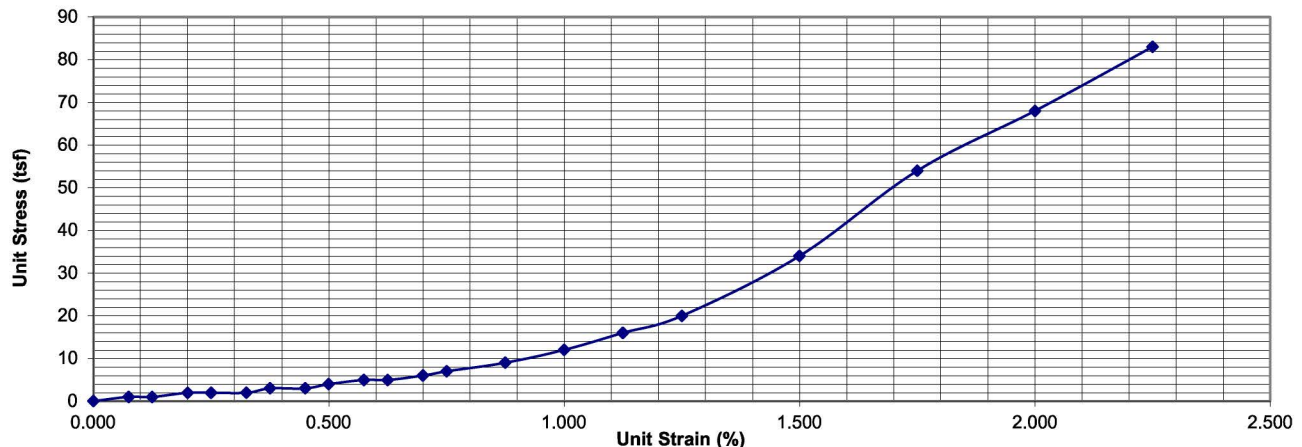


Deformation (in.)	Load (lbs.)	Strain (%)	Stress (psi)	Strength (tsf)
0.000	0	0.000	0	0
0.003	40	0.075	13	1
0.005	40	0.125	13	1
0.008	70	0.200	23	2
0.010	80	0.250	26	2
0.013	90	0.325	30	2
0.015	120	0.375	39	3
0.018	130	0.450	43	3
0.020	160	0.500	52	4
0.023	200	0.575	66	5
0.025	220	0.625	72	5
0.028	250	0.700	82	6
0.030	310	0.750	102	7
0.035	390	0.875	128	9
0.040	520	1.000	170	12
0.045	660	1.125	216	16
0.050	860	1.250	282	20
0.060	1430	1.500	469	34
0.070	2280	1.750	748	54
0.080	2870	2.000	941	68
0.090	3510	2.250	1151	83

Test sample prepared in general accordance to ASTM D4543

Straightness: Procedure S1 **Parallelism:** Procedure FP2

Flatness: Procedure FP2 **Perpendicularity:** Procedure P2



The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

MFAD™ Design Parameters

Contents:

MFAD™ Design Parameters (5 pages)

Note: All attachments are one page unless noted above.

TABLE 15B



MFAD INPUT PARAMETERS FOR UNDRAINED CONDITIONS

Layer Number	Layer Type	Depth to Bottom of Layer [feet]	Total Unit Weight, γ [pcf]	Deformation Modulus, E_p [ksi]	Friction Angle, Φ [degrees]	Undrained Shear Strength, s_u , OR Rock Cohesion, c' [psf]	Rock/ Concrete Bond Strength [ksf]
1	CLAY	3.0	110	0.40	--	600	--
2	SAND	20.0	122	0.55	28	--	--
3	SAND	50.0	122	0.61	29	--	--
4	CLAY	51.5	125	1.56	--	2400	--

Notes:

- 1 - Stratigraphy shown above is based on our interpretation of soil strength and may not correspond with the descriptive classifications shown on the boring logs.
- 2 - Parameters should be considered as nominal (unfactored) values.
- 3 - The resistance of the uppermost 2 feet of the soil should be ignored due to the potential for disturbance caused during drilled shaft construction operations.
- 4 - Groundwater level fluctuations occur due to other factors not evident at the time the borings were performed and therefore may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.
- 5 - The borings encountered variability in soil strength, with higher strength soils overlying lower strength soils. Therefore, we recommend that when calculating the end bearing capacity of the drilled shaft, in order to be able to use the prescribed soils parameters of the subject soil bearing stratum, that soil stratum should extend at least three times the drilled shaft diameter below the bottom of the drilled shaft. If this condition is not met, and the strength parameters of the soil stratum below the bearing soil stratum are less than those of the bearing stratum, then the soil parameters of the lowest strength layer below within the three diameters depth, should be used in calculating the end bearing capacity.

Boring No: 15B
 Design Depth to GW: 20 [feet]

Project Henry Clay - Breaks
 Project Location Pike County, KY
 Project Number N2255181

TABLE 15D



MFAD INPUT PARAMETERS FOR UNDRAINED CONDITIONS

Layer Number	Layer Type	Depth to Bottom of Layer [feet]	Total Unit Weight, γ [pcf]	Deformation Modulus, E_p [ksi]	Friction Angle, Φ [degrees]	Undrained Shear Strength, s_u , OR Rock Cohesion, c' [psf]	Rock/ Concrete Bond Strength [ksf]
1	SAND	3.0	110	0.82	28	--	--
2	SAND	6.0	122	1.16	31	--	--
3	SAND	9.0	122	0.50	30	--	--
4	SAND	50.0	122	0.50	30	--	--
5	CLAY	51.5	122	1.25	--	1920	--

Notes:

- 1 - Stratigraphy shown above is based on our interpretation of soil strength and may not correspond with the descriptive classifications shown on the boring logs.
- 2 - Parameters should be considered as nominal (unfactored) values.
- 3 - The resistance of the uppermost 2 feet of the soil should be ignored due to the potential for disturbance caused during drilled shaft construction operations.
- 4 - Groundwater level fluctuations occur due to other factors not evident at the time the borings were performed and therefore may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.
- 5 - The borings encountered variability in soil strength, with higher strength soils overlying lower strength soils. Therefore, we recommend that when calculating the end bearing capacity of the drilled shaft, in order to be able to use the prescribed soils parameters of the subject soil bearing stratum, that soil stratum should extend at least three times the drilled shaft diameter below the bottom of the drilled shaft. If this condition is not met, and the strength parameters of the soil stratum below the bearing soil stratum are less than those of the bearing stratum, then the soil parameters of the lowest strength layer below within the three diameters depth, should be used in calculating the end bearing capacity.
- 6 - Design depth to groundwater is based on the most shallow encounter at 20 feet in 15B

Boring No: 15D
 Design Depth to GW: 20 [feet]

Project Henry Clay - Breaks
 Project Location Pike County, KY
 Project Number N2255181

TABLE 15E



MFAD INPUT PARAMETERS FOR UNDRAINED CONDITIONS

Layer Number	Layer Type	Depth to Bottom of Layer [feet]	Total Unit Weight, γ [pcf]	Deformation Modulus, E_p [ksi]	Friction Angle, Φ [degrees]	Undrained Shear Strength, s_u , OR Rock Cohesion, c' [psf]	Rock/ Concrete Bond Strength [ksf]
1	SAND	13.0	120	0.77	30	--	--
2	SAND	45.0	122	0.55	28	--	--
3	CLAY	51.5	122	1.33	--	2040	--

Notes:

- 1 - Stratigraphy shown above is based on our interpretation of soil strength and may not correspond with the descriptive classifications shown on the boring logs.
- 2 - Parameters should be considered as nominal (unfactored) values.
- 3 - The resistance of the uppermost 2 feet of the soil should be ignored due to the potential for disturbance caused during drilled shaft construction operations.
- 4 - Groundwater level fluctuations occur due to other factors not evident at the time the borings were performed and therefore may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.
- 5 - The borings encountered variability in soil strength, with higher strength soils overlying lower strength soils. Therefore, we recommend that when calculating the end bearing capacity of the drilled shaft, in order to be able to use the prescribed soils parameters of the subject soil bearing stratum, that soil stratum should extend at least three times the drilled shaft diameter below the bottom of the drilled shaft. If this condition is not met, and the strength parameters of the soil stratum below the bearing soil stratum are less than those of the bearing stratum, then the soil parameters of the lowest strength layer below within the three diameters depth, should be used in calculating the end bearing capacity.
- 6 - Design depth to groundwater is based on the most shallow encounter at 20 feet in 15B

Boring No: 15E
 Design Depth to GW: 20 [feet]

Project Henry Clay - Breaks
 Project Location Pike County, KY
 Project Number N2255181

TABLE 32F



MFAD INPUT PARAMETERS FOR UNDRAINED CONDITIONS

Layer Number	Layer Type	Depth to Bottom of Layer [feet]	Total Unit Weight, γ [pcf]	Deformation Modulus, E_p [ksi]	Friction Angle, Φ [degrees]	Undrained Shear Strength, s_u , OR Rock Cohesion, c' [psf]	Rock/ Concrete Bond Strength [ksf]
1	CLAY	4.5	110	0.40	--	600	--
2	CLAY	7.5	128	2.55	--	3960	--
3	SAND	13.5	130	6.33	39	--	--
4	SAND	20.0	128	1.83	37	--	--
5	SAND	22.5	110	0.48	28	--	--
6	CLAY	50.6	140	5.69	--	9000	--
7	ROCK	57.8	160	200.00	34	2800	15
8	ROCK	60.6	160	100.00	32	2400	15

Notes:

- 1 - Stratigraphy shown above is based on our interpretation of soil strength and may not correspond with the descriptive classifications shown on the boring logs.
- 2 - Parameters should be considered as nominal (unfactored) values.
- 3 - The resistance of the uppermost 2 feet of the soil should be ignored due to the potential for disturbance caused during drilled shaft construction operations.
- 4 - Groundwater level fluctuations occur due to other factors not evident at the time the borings were performed and therefore may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.
- 5 - The borings encountered variability in soil strength, with higher strength soils overlying lower strength soils. Therefore, we recommend that when calculating the end bearing capacity of the drilled shaft, in order to be able to use the prescribed soils parameters of the subject soil bearing stratum, that soil stratum should extend at least three times the drilled shaft diameter below the bottom of the drilled shaft. If this condition is not met, and the strength parameters of the soil stratum below the bearing soil stratum are less than those of the bearing stratum, then the soil parameters of the lowest strength layer below within the three diameters depth, should be used in calculating the end bearing capacity.
- 6 - The unit allowable end bearing should not exceed 100 kips per square foot (ksf)
- 7 - Coal encountered between 20 and 22.5 feet modeled as weak sand

Boring No: 32F
 Design Depth to GW: 13.5 [feet]

Project Henry Clay - Breaks
 Project Location Pike County, KY
 Project Number N2255181

TABLE 69



MFAD INPUT PARAMETERS FOR UNDRAINED CONDITIONS

Layer Number	Layer Type	Depth to Bottom of Layer [feet]	Total Unit Weight, γ [pcf]	Deformation Modulus, E_p [ksi]	Friction Angle, Φ [degrees]	Undrained Shear Strength, s_u , OR Rock Cohesion, c' [psf]	Rock/ Concrete Bond Strength [ksf]
1	CLAY	4.5	110	0.40	--	600	--
2	SAND	20.0	122	1.26	31	--	--
3	SAND	33.0	125	1.00	33	--	--
4	SAND	35.0	128	2.81	36	--	--
5	SAND	51.5	125	1.11	34	--	--

Notes:

- 1 - Stratigraphy shown above is based on our interpretation of soil strength and may not correspond with the descriptive classifications shown on the boring logs.
- 2 - Parameters should be considered as nominal (unfactored) values.
- 3 - The resistance of the uppermost 2 feet of the soil should be ignored due to the potential for disturbance caused during drilled shaft construction operations.
- 4 - Groundwater level fluctuations occur due to other factors not evident at the time the borings were performed and therefore may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.
- 5 - The borings encountered variability in soil strength, with higher strength soils overlying lower strength soils. Therefore, we recommend that when calculating the end bearing capacity of the drilled shaft, in order to be able to use the prescribed soils parameters of the subject soil bearing stratum, that soil stratum should extend at least three times the drilled shaft diameter below the bottom of the drilled shaft. If this condition is not met, and the strength parameters of the soil stratum below the bearing soil stratum are less than those of the bearing stratum, then the soil parameters of the lowest strength layer below within the three diameters depth, should be used in calculating the end bearing capacity.

Boring No: 69
 Design Depth to GW: 33 [feet]

Project Henry Clay - Breaks
 Project Location Pike County, KY
 Project Number N2255181

Supporting Information

Contents:

General Notes

Unified Soil Classification System

Description of Rock Properties

Note: All attachments are one page unless noted above.

General Notes

Sampling	Water Level	Field Tests
 Rock Core  Split Spoon	 Water Level Initially Encountered  Water Level After a Specified Period of Time  Water Level After a Specified Period of Time  Cave In Encountered Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer UC Unconfined Compressive Strength (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		Consistency of Fine-Grained Soils (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Relative Density	Standard Penetration or N-Value (Blows/Ft.)	Consistency	Unconfined Compressive Strength Qu (tsf)	Standard Penetration or N-Value (Blows/Ft.)
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	5 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	9 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	16 - 30
		Hard	> 4.00	> 30

Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A				Soil Classification	
				Group Symbol	Group Name ^B
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines ^C	Cu≥4 and 1≤Cc≤3 ^E	GW	Well-graded gravel ^F
			Cu<4 and/or [Cc<1 or Cc>3.0] ^E	GP	Poorly graded gravel ^F
		Gravels with Fines: More than 12% fines ^C	Fines classify as ML or MH	GM	Silty gravel ^{F, G, H}
			Fines classify as CL or CH	GC	Clayey gravel ^{F, G, H}
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines ^D	Cu≥6 and 1≤Cc≤3 ^E	SW	Well-graded sand ^I
			Cu<6 and/or [Cc<1 or Cc>3.0] ^E	SP	Poorly graded sand ^I
		Sands with Fines: More than 12% fines ^D	Fines classify as ML or MH	SM	Silty sand ^{G, H, I}
			Fines classify as CL or CH	SC	Clayey sand ^{G, H, I}
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots above “A” line ^J	CL	Lean clay ^{K, L, M}
			PI < 4 or plots below “A” line ^J	ML	Silt ^{K, L, M}
		Organic:	$\frac{LL \text{ oven dried}}{LL \text{ not dried}} < 0.75$	OL	Organic clay ^{K, L, M, N}
					Organic silt ^{K, L, M, O}
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above “A” line	CH	Fat clay ^{K, L, M}
			PI plots below “A” line	MH	Elastic silt ^{K, L, M}
		Organic:	$\frac{LL \text{ oven dried}}{LL \text{ not dried}} < 0.75$	OH	Organic clay ^{K, L, M, P}
					Organic silt ^{K, L, M, Q}
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

- ^A Based on the material passing the 3-inch (75-mm) sieve.

^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

^C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

^D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

^E $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

^F If soil contains $\geq 15\%$ sand, add "with sand" to group name.

^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
- ^H If fines are organic, add "with organic fines" to group name.

^I If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.

^J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

^L If soil contains $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.

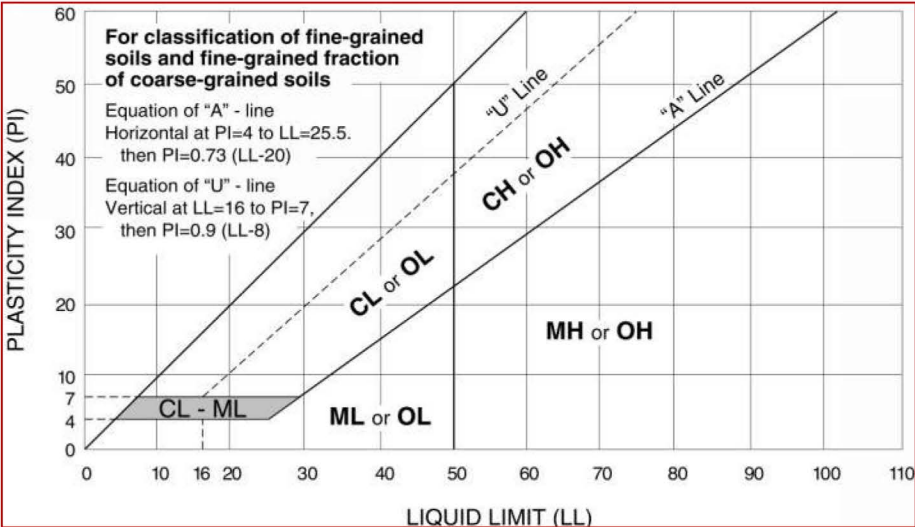
^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.

^N $PI \geq 4$ and plots on or above "A" line.

^O $PI < 4$ or plots below "A" line.

^P PI plots on or above "A" line.

^Q PI plots below "A" line.



Rock Classification Notes

WEATHERING			
Term	Description		
Fresh	Mineral crystals appear bright; show no discoloration. Features show little or now staining on surfaces. Discoloration does not extend into intact rock.		
Slightly weathered	Rock generally fresh except along fractures. Some fractures stained and discoloration may extend <0.5 inches into rock.		
Moderately weathered	Significant portions of rock are dull and discolored. Rock may be significantly weaker than in fresh state near fractures. Soil zones of limited extent may occur along some fractures.		
Highly weathered	Rock dull and discolored throughout. Majority of rock mass is significantly weaker and has decomposed and/or disintegrated; isolated zones of stronger rock and/or soil may occur throughout.		
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The rock mass or fabric is still evident and largely intact. Isolated zones of stronger rock may occur locally.		
STRENGTH OR HARDNESS			
Description	Field Identification	Uniaxial Compressive Strength, psi	
Extremely strong	Can only be chipped with geological hammer. Rock rings on hammer blows. Cannot be scratched with a sharp pick. Hand specimens require several hard hammer blows to break.	>36,000	
Very strong	Several blows of a geological hammer to fracture. Cannot be scratched with a 20d common steel nail. Can be scratched with a geologist’s pick only with difficulty.	15,000-36,000	
Strong	More than one blow of a geological hammer needed to fracture. Can be scratched with a 20d nail or geologist’s pick. Gouges or grooves to ¼ inch deep can be excavated by a hard blow of a geologist’s pick. Hand specimens can be detached by a moderate blow.	7,500-15,000	
Medium strong	One blow of geological hammer needed to fracture. Can be distinctly scratched with 20d nail. Can be grooved or gouged 1/16 in. deep by firm pressure with a geologist's pick point. Can be fractured with single firm blow of geological hammer. Can be excavated in small chips (about 1-in. maximum size) by hard blows of the point of a geologist’s pick;	3,500-7,500	
Weak	Shallow indent by firm blow with geological hammer point. Can be gouged or grooved readily with geologist's pick point. Can be excavated in pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.	700-3,500	
Very weak	Crumbles under firm blow with geological hammer point. Can be excavated readily with the point of a geologist's pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.	150-700	
DISCONTINUITY DESCRIPTION			
Fracture Spacing (Joints, Faults, Other Fractures)		Bedding Spacing (May Include Foliation or Banding)	
Description	Spacing	Description	Spacing
Intensely fractured	< 2.5 inches	Laminated	< ½-inch
Highly fractured	2.5 – 8 inches	Very thin	½ – 2 inches
Moderately fractured	8 inches to 2 feet	Thin	2 inches – 1 foot
Slightly fractured	2 to 6.5 feet	Medium	1 – 3 feet
Very slightly fractured	> 6.5 feet	Thick	3 – 10 feet
		Massive	> 10 feet
ROCK QUALITY DESIGNATION (RQD) ¹			
Description		RQD Value (%)	
Very Poor		0 - 25	
Poor		25 – 50	
Fair		50 – 75	
Good		75 – 90	
Excellent		90 - 100	

1. The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

EXHIBIT 13

Proposed:

- Rebuild ~8.7 miles of 46 kV line between Henry Clay Tap and Breaks Substation to 69 kV.
- Rebuild ~8 miles of 46 kV line between Henry Clay Tap and Dorton Substation to 69 kV.
- Build a double circuit tap from the Breaks – Dorton 69 kV line to the rebuilt Henry Clay Substation (~1 mi).
- Build a double circuit tap from the Breaks – Dorton 69 kV line to the new Ratliff Substation (~0.25 mi).
- Retire Henry Clay – Elwood 46 kV line section.
- Convert the existing Dorton – Burdine 46 kV line to 69 kV.
- Establish 69 kV bus from the 138/69/46 kV autotransformer at Dorton Substation and reuse 72 kV breakers A, H, and D as the new 69 kV line breakers.
- Replace the Distribution transformer at Burdine Substation with a 69/12 kV 10 MVA transformer.
- Rebuild the existing Henry Clay Substation by installing a 69/34.5 kV 30 MVA transformer with high side circuit switcher and four low side breakers. Install two 69 kV SCADA controlled MOABs and a new DICM.
- Replace Draffin Substation with Ratliff. Install 69/12 kV 20 MVA transformer with high side circuit switcher and three low side breakers. Install one SCADA controlled 69 kV MOAB. Install a 69 kV 17 MVAR capacitor bank and circuit switcher.
- Remove the 69/46 kV transformer and circuit switcher at Breaks Substation. Reuse circuit breaker A and connect it to the expanded 69 kV bus and connect it to the rebuild 69 kV line.
- Remove 46 kV circuit breaker at Elwood Station.

Alternative:

- Rebuild the Dorton – Breaks – Elwood 46 kV line in the clear (~26 miles)
- Replace switch structures at Henry Clay SS, Henry Clay, Draffin, and Pike 29
- Install 7.7 MVAR capacitor bank and circuit switcher on the 46 kV bus at Dorton
- Rebuild ~3 miles of the Cedar Creek – Elwood 46 kV line from Elwood – Pike 29 and keep the Pike 29 customer on 46 kV service
- Serve the Pike 29 customer radially from Henry Clay

Cons

- This alternative is not a complete solution and pushes the 69 kV conversion to a later date. Future 69 kV conversion would still incur costs for Henry Clay and Draffin Substations.