

APPALACHIAN POWER COMPANY
BEFORE THE
VIRGINIA STATE CORPORATION COMMISSION
CASE NO. PUR-2023-00024

APPLICATION FOR APPROVAL AND CERTIFICATION OF
ELECTRICAL TRANSMISSION LINE

Stuart Area 138-kV Transmission Improvements Project

VOLUME 3 OF 4
PART 1 OF 2

Components 1 and 2 VDEQ Supplements

July 2023

VOLUME 3, PART 1 OF 2 – Components 1 and 2 VDEQ Supplements

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AGENCY CORRESPONDENCE

May 1, 2023

APPALACHIAN POWER COMPANY

Stuart Area 138-kV Transmission Improvements Project Component 1: Mayo River (Stuart) to Willis Gap Transmission Improvements

**SCC Case No. PUR-2023-00024
Carroll and Patrick Counties, Virginia**

Virginia Department of Environmental Quality (“VDEQ”) Supplement

PROJECT NUMBER:

0158529

PREPARED FOR:

Appalachian Power Company

PREPARED BY:



Based on consultations with the Virginia Department of Environmental Quality (“VDEQ”), POWER Engineers, Inc., on behalf of Appalachian Power Company, has developed this VDEQ Supplement to facilitate review and analysis of the Mayo River (Stuart) to Willis Gap Transmission Improvements Component, which is Component 1 of the larger Stuart Area 138-kV Transmission Improvements Project, by the VDEQ and other relevant agencies.

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ACRONYMS AND ABBREVIATIONS

Appalachian Power	Appalachian Power Company
BMPs	Best management practices
CIR	Color Infrared
Component 1	Mayo River (Stuart) to Willis Gap Transmission Improvements
FAA	Federal Aviation Administration
GIS	Geographic Information System
HUC	Hydrologic Unit Code
IPaC	Information for Planning and Consultation
kV	kilovolt
NHD	National Hydrography Dataset
NPL	National Priority List
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
POWER	POWER Engineers, Inc.
PSS	Palustrine Scrub-Shrub Wetland
RCRA	Resource Conservation and Recovery Act
ROW	Right-of-way
SCC	State Corporation Commission
Stuart Project	Stuart Area 138-kV Transmission Improvements Project
TRI	Toxics Release Inventory
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VDACS	Virginia Department of Agriculture and Consumer Services
VDCCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDHR	Virginia Department of Historic Resources
VDOF	Virginia Department of Forestry
VDOT	Virginia Department of Transportation
VDWR	Virginia Department of Wildlife Resources
VMRC	Virginia Marine Resources Commission
VRP	Voluntary Remediation Program
WERMS	Wildlife Environmental Review Map Service

1. PROJECT DESCRIPTION

With the Stuart Area 138-kV Transmission Improvements Project (“Stuart Project”), Appalachian Power Company (“Appalachian Power”) is planning to upgrade the local electric transmission grid in four Virginia counties: Carroll, Floyd, Henry, and Patrick. The Stuart Project provides a new electrical source for the area, upgrades the voltage of equipment from 69-kilovolt (“kV”) to 138-kV, improves the local distribution system, and addresses deteriorating infrastructure. The Stuart Project will ensure adequate power delivery to the area to support today’s electrical load and provide continued support during an extended outage.

The Stuart Project is organized in three components, which generally follow the Project construction sequence. The Mayo River (Stuart) to Willis Gap Transmission Improvements Component (“Component 1”) is the subject of this Virginia Department of Environmental Quality (“VDEQ”) supplement. Component 1 consists of constructing approximately 24.5 miles of new 138-kV transmission line in Carroll (less than 0.1 mile) and Patrick (approximately 24.4 miles) Counties between the existing Willis Gap Substation and the proposed Claudville and Mayo River Substations. The transmission line will be built to accommodate future electrical needs in Carroll and Patrick Counties. The proposed Mayo River Substation will replace the existing Stuart Substation, which is to be retired. The proposed Claudville Substation serves as a middle point between the existing Willis Gap Substation and proposed Mayo River Substation. A substation site selection process was required for the proposed Claudville and Mayo River Substations. Component 1 will be constructed entirely within new 100-foot right-of-way (“ROW”) to meet design requirements.

A siting effort was undertaken to determine the alignment for Component 1 (the “Proposed Route”). From the existing Willis Gap Substation in Carroll County, the Proposed Route travels southeast, crossing Ararat Highway before heading slightly northwest and entering the proposed Claudville Substation from the west, located north of the Claudville community from the west. The Proposed Route then continues southeast, crossing Dry Pond Highway and continuing east until crossing Salem Highway and turning northeast to enter the proposed Mayo River Substation from the south. See Exhibit 3 within the Company’s Virginia State Corporation Commission (“SCC”) Application for a detailed map of the Stuart Project area.

Transmission line structure types may vary along the line route depending on topography, design, and needs of Component 1. Appalachian Power plans to build the 138-kV transmission line primarily using dulled, galvanized steel single-circuit H-frame structures. The proposed single-circuit structures will range from approximately 55 feet to 110 feet tall, with an average proposed structure height of 80 feet for the H-frames.

Appalachian Power’s application to the SCC, describes the overall need and necessity for the Stuart Area 138-kV Transmission Improvements Project (SCC Case No. PUR-2023-00024).

2. ENVIRONMENTAL ANALYSIS

Appalachian Power and POWER Engineers, Inc. (“POWER”) solicited input from 22 federal, state, and local agencies and/or officials regarding the Stuart Project. Nine responses were received and are included along with the agency letters in Volume 3 of the Application. POWER also obtained relevant environmental data from field reconnaissance, online databases, and other publicly available sources.

A. Air Quality

Component 1 does not involve the construction or expansion of any thermal emission generating sources and therefore no direct operational emissions from the Project are anticipated. During construction, emissions from heavy equipment and dust could occur, but will be kept at a minimum. No permanent impacts on air quality are anticipated, and temporary impacts will only last the duration of the construction phase. Appalachian Power does not expect to burn cleared material but, if burning becomes necessary, Appalachian Power will coordinate with the responsible locality to obtain permits and will comply with conditions imposed by the locality. Appalachian Power’s tree-clearing methods can be found in Section II.A.7 of the Response to Guidelines in Volume 1 of the Application.

B. Water Source

Component 1 is located in eight sub-watersheds: Dan River – Archies Creek (Hydrologic Unit Code [“HUC”] 12 030101030102); Upper South Mayo River (HUC12 030101030401); Dan River – Peters Creek (HUC12 030101030105); Russell Creek (HUC12 030101030402); Little Dan River (HUC12 030101030103); Dan River – Elk Creek (HUC12 030101030104); Johnson Creek (HUC12 030401010802); and Headwaters Ararat River (HUC12 030401010801). Component 1 is located in the Upper Dan sub-basin (HUC8 03010103) and the Upper Yadkin sub-basin (HUC 03040101). No water source is required for the transmission line operation.

Appalachian Power and POWER solicited comments from various environmental agencies in a letter and Project map dated November 23, 2021. In an email received on December 13, 2021, the Virginia Department of Health’s Office of Drinking Water noted receipt of the letter and no concerns related to Component 1 of the Project. The Virginia Department of Health’s Office of Drinking Water also noted public groundwater wells located within one mile of the Project, and wells within a 1,000-foot radius that should be field marked and protected from accidental damage during the construction phase of the Project.

A project review request was completed by the Virginia Department of Conservation and Recreation’s (“VDCR”) Natural Heritage Program on December 17, 2021. Per the VDCR, the Long Branch – Peters Creek is located within a 100-foot buffer of Component 1 and has been given a biodiversity ranking of “very high significance” (B2). Additionally, the Dan River has been designated by the Virginia Department of Wildlife Resources (“VDWR”) as a “Threatened and Endangered Species Water” and is downstream of Component 1. Other conservation sites including the Sandy Creek – Patrick County Conservation Site, Gilbert Mill Conservation Site, Elk Creek Northwest Tributary Conservation Site, Rich Creek Conservation Site, and Simmons Mountain Creek Conservation Site were identified. No response was received from the VDEQ’s Office of Wetland and Stream Protection, VDEQ Blue Ridge Regional Office, United State Army Corps of Engineers

(“USACE”), or the Virginia Marine Resources Commission (“VMRC”) regarding Component 1 or the larger Stuart Project.

Responses from the Virginia Department of Health’s Office of Drinking Water and VDCR in regard to water sources are included in the Agency Correspondence attachment within Volume 3 of the Application. Coordination and review with the VDEQ, USACE, and VMRC will be conducted during the Project’s environmental studies.

C. Discharge of Cooling Waters

No discharge of cooling waters is associated with Component 1.

D. Tidal and Non-tidal Wetlands

No tidal wetlands are associated with Component 1. A desktop wetland and stream delineation report was prepared in March 2023 and identified potential non-tidal wetlands and streams for Component 1 (Attachment 2.D.1). The desktop features were identified within the typical 100-foot-wide ROW for the approximately 24.5-mile portion of the Mayo River – Willis Gap 138-kV transmission line to be built and the Alternative Routes considered. Six alternative routes were identified (Alternative Routes A, B and C between the Willis Gap and Claudville substations and Alternative Routes D, E and F between the Claudville and Mayo River substations for Component 1. The results of the desktop wetland and stream delineation report are briefly summarized below.

Table 1 below shows the criteria used to determine the wetland and stream probability within the typical 100-foot-wide ROW for the Project. The current potential streams and wetlands were assigned a probability of low potential, moderate potential, or high potential of being a regulated resource.

Table 1 Wetland Evaluation Criteria

PROBABILITY	WETLAND ASSESSMENT CRITERIA	STREAM ASSESSMENT CRITERIA
High	Aerial imagery (color and color infrared [“CIR”]) and/or topography combined with two other indicators such as National Wetland Inventory (“NWI”) wetlands, National Hydrography Dataset (“NHD”) streams, hydric soils, or a regulated floodplain.	Streams identified with NHD and aerial imagery (color and CIR).
Moderate	Aerial imagery (color and CIR) and/or topography combined with one other indicator such as NWI wetlands, NHD streams, hydric soils, or a regulated floodplain.	Either (1) streams identified with aerial imagery (color and CIR) and topography; or (2) aerial imagery or topography combined with one other indicator, such as NWI riverine features or county or city stream data.
Low	Areas identified as wetland with topography and aerial photography only.	Areas identified as streams with topography or aerial photography only.

Willis Gap – Claudville Alternative Routes

Alternative Route A

Alternative Route A (11.6 miles) is located south of the Blue Ridge Parkway in Patrick County. Generally, Alternative Route A is east of the existing Willis Gap Substation and crosses multiple named streams and headwater valleys north of the community of Ararat. Alternative A then continues southeast until it crosses the Dan River and then follows the same path as Alternative Routes B and C to enter the proposed Claudville Substation from the west. Alternative Route A is 11.6 miles and is located in Patrick (11.54 miles) and Carroll (0.06 mile) counties. Within a 100-foot-wide ROW, the desktop wetland and stream delineation identified 60 wetlands (totaling 11.14 acres) and 82 streams (totaling 10,378 linear feet). The results of the desktop wetland and stream delineations for Alternative Route A are summarized in Table 2 below.

Table 2 Alternative Route A: Desktop Wetland and Stream Delineation Results

PROBABILITY	POTENTIAL WETLAND/STREAM CLASSIFICATION*	ESTIMATED NUMBER OF OCCURRENCES	ESTIMATED ACREAGE/LINEAR FEET WITHIN ROW
High			
	PSS, PEM/PFO	8	1.90 acres
	Streams	26	3,938 linear feet
Moderate			
	PFO, PSS, PEM	47	8.48 acres
	Streams	12	1,517 linear feet
Low			
	PFO, PSS, PEM	5	0.76 acre
	Streams	44	4,923 linear feet
Wetland Total		60	11.14 acres
Stream Total		82	10,378 linear feet

Note: PSS = Palustrine Scrub-Shrub; PEM = Palustrine Emergent; PFO = Palustrine Forested.

Alternative Route B

Alternative Route B (12.4 miles) is located south of the Blue Ridge Parkway in Patrick County. Generally, Alternative Route B is southeast of the existing Willis Gap Substation and crosses multiple named streams and headwater valleys. Alternative Route B crosses the community of Ararat and continues east until it crosses the Dan River and then follows the same path as Alternative Routes A and C to enter the proposed Claudville Substation from the west. Alternative Route B is 12.4 miles long and is located in Patrick (12.34 miles) and Carroll (0.06 mile) counties. Within a 100-foot-wide ROW, the desktop wetland and stream delineation identified 61 wetlands (totaling 14.38 acres) and 90 streams (totaling 12,993 linear feet). The results of the desktop wetland and stream delineations for Alternative Route B are summarized in Table 3 below.

Table 3 Alternative Route B: Desktop Wetland and Stream Delineation Results

PROBABILITY	POTENTIAL WETLAND/STREAM CLASSIFICATION*	ESTIMATED NUMBER OF OCCURRENCES	ESTIMATED ACREAGE/LINEAR FEET WITHIN ROW
High			
	PSS, PEM/PFO	13	3.29 acres
	Streams	29	4,138 linear feet
Moderate			
	PFO, PSS, PEM	45	10.53 acres
	Streams	13	2,310 linear feet
Low			
	PFO, PSS, PEM	3	0.56 acre
	Streams	48	6,545 linear feet
Wetland Total		61	14.38 acres
Stream Total		90	12,993 linear feet

Note: PSS = Palustrine Scrub-Shrub; PEM = Palustrine Emergent; PFO = Palustrine Forested.

Alternative Route C (Proposed Route)

Alternative Route C (12.5 miles) is located south of the Blue Ridge Mountains in Patrick County. Generally, Alternative Route C is southeast of the existing Willis Gap Substation and crosses multiple named streams and headwater valleys south of the community of Ararat. Alternative C then continues east until it crosses the Dan River and then follows the same path as Alternative Routes A and B to enter the proposed Claudville Substation from the west. Alternative Route C is 12.5 miles long and is located in Patrick (12.44 miles) and Carroll (0.06 mile) counties. Within a 100-foot-wide ROW, the desktop wetland and stream delineation identified 41 wetlands (totaling 6.86 acres) and 97 streams (totaling 13,112 linear feet). The results of the desktop wetland and stream delineations for Alternative Route C are summarized in Table 4 below.

Table 4 Alternative Route C (Proposed Route): Desktop Wetland and Stream Delineation Results

PROBABILITY	POTENTIAL WETLAND/STREAM CLASSIFICATION*	ESTIMATED NUMBER OF OCCURRENCES	ESTIMATED ACREAGE/LINEAR FEET WITHIN ROW
High			
	PSS, PEM/PFO	12	2.39 acres
	Streams	23	2,731 linear feet
Moderate			
	PFO, PSS, PEM	27	4.29 acres
	Streams	15	2,602 linear feet
Low			
	PFO, PSS, PEM	2	0.18 acre
	Streams	59	7,779 linear feet
Wetland Total		41	6.86 acres
Stream Total		97	13,112 linear feet

Note: PSS = Palustrine Scrub-Shrub; PEM = Palustrine Emergent; PFO = Palustrine Forested.

Claudville – Mayo River Alternative Routes

Alternative Route D

Alternative Route D (10.4 miles) is located immediately north of Virginia State Route 103 (VA-103) and eventually crosses the Virginia State Route 8 (VA-8) in Patrick County. Generally, Alternative Route D is east of the proposed Claudville Substation and crosses multiple named streams and headwater valleys. Alternative Route D crosses Witt Creek, which parallels Salem Highway, and continues northeast toward the South Mayo River. Alternative Route D is 10.4 miles long and is located in Patrick County. Within a 100-foot-wide ROW, the desktop wetland and stream delineation identified 23 wetlands (totaling 3.35 acres) and 49 streams (totaling 6,680 linear feet). The results of the desktop wetland and stream delineations for Alternative Route D are summarized in Table 5 below.

Table 5 Alternative Route D: Desktop Wetland and Stream Delineation Results

PROBABILITY	POTENTIAL WETLAND/STREAM CLASSIFICATION*	ESTIMATED NUMBER OF OCCURRENCES	ESTIMATED ACREAGE/LINEAR FEET WITHIN ROW
High			
	PSS, PEM/PFO	4	0.95 acre
	Streams	19	2,404 linear feet
Moderate			
	PFO, PSS, PEM	12	1.85 acres
	Streams	9	1,590 linear feet
Low			
	PFO, PSS, PEM	7	0.55 acre
	Streams	21	2,686 linear feet
Wetland Total		23	3.35 acres
Stream Total		49	6,680 linear feet

Note: PSS = Palustrine Scrub-Shrub; PEM = Palustrine Emergent; PFO = Palustrine Forested.

Alternative Route E (Proposed Route)

Alternative Route E (12 miles) is located along VA-103 in Patrick County and follows the same path as Alternative Route F until the VA-8 crossing. Initially, Alternative Route E runs southeast of the proposed Claudville Substation until it crosses VA-103. Alternative E then parallels VA-103, where it crosses multiple named streams and headwater valleys, until it crosses VA-8 and Witt Creek and continues northeast toward the South Mayo River. Alternative Route E is 12.0 miles long and is located in Patrick County. Within a 100-foot-wide ROW, the desktop wetland and stream delineation identified 52 wetlands (totaling 10.80 acres) and 63 streams (totaling 8,038 linear feet). The results of the desktop wetland and stream delineations for Alternative Route E are summarized in Table 6 below.

Table 6 Alternative Route E (Proposed Route): Desktop Wetland and Stream Delineation Results

PROBABILITY	POTENTIAL WETLAND/STREAM CLASSIFICATION*	ESTIMATED NUMBER OF OCCURRENCES	ESTIMATED ACREAGE/LINEAR FEET WITHIN ROW
High			
	PSS, PEM/PFO	13	4.97 acres
	Streams	23	3,267 linear feet
Moderate			
	PFO, PSS, PEM	30	5.12 acres
	Streams	7	1,115 linear feet
Low			
	PFO, PSS, PEM	9	0.71 acre
	Streams	33	3,656 linear feet
Wetland Total		52	10.80 acres
Stream Total		63	8,038 linear feet

Note: PSS = Palustrine Scrub-Shrub; PEM = Palustrine Emergent; PFO = Palustrine Forested.

Alternative Route F

Alternative Route F (11.6 miles) is located along VA-103 in Patrick County. Initially, Alternative Route F runs southeast of the proposed Claudville Substation and follows the same path as Alternative Route E until it crosses Route 8. After this crossing, Alternative F then travels northeast, where it crosses multiple named streams and headwater valleys, until it crosses Wayside Road and continues northeast toward the South Mayo River. Alternative Route F is 11.6 miles long and is located in Patrick County. Within a 100-foot-wide ROW, the desktop wetland and stream delineation identified 42 wetlands (totaling 9.42 acres) and 52 streams (totaling 6,901 linear feet). The results of the desktop wetland and stream delineations for Alternative Route F are summarized in Table 7 below.

Table 7 Alternative Route F: Desktop Wetland and Stream Delineation Results

PROBABILITY	POTENTIAL WETLAND/STREAM CLASSIFICATION*	ESTIMATED NUMBER OF OCCURRENCES	ESTIMATED ACREAGE/LINEAR FEET WITHIN ROW
High			
	PSS, PEM/PFO	13	4.97 acres
	Streams	23	3,103 linear feet
Moderate			
	PFO, PSS, PEM	23	4.02 acres
	Streams	4	922 linear feet
Low			
	PFO, PSS, PEM	6	0.43 acre
	Streams	25	2,876 linear feet
Wetland Total		42	9.42 acres
Stream Total		52	6,901 linear feet

Note: PSS = Palustrine Scrub-Shrub; PEM = Palustrine Emergent; PFO = Palustrine Forested.

The Proposed Route (Alternative Route C and Alternative Route E) is approximately 24.5 miles long and requires new transmission line ROW and, in some locations, will parallel ROW of an existing transmission line. Within an assumed 100-foot-wide ROW, the desktop wetland and stream delineation identified 93 potential wetlands (17.66 acres total) and 160 potential streams (21,150 linear feet total). Alternative Route C crosses fewer wetlands and total acres than Alternative Routes A or B. Conversely, Alternative Route C crosses more linear feet and total streams than Alternative A or B; however, this is due to the high number of low probability streams compared to other alternatives. Alternative Route C crosses fewer high probability streams than either Alternative Routes A or B. Similarly, Alternative Route E crosses more wetlands, total acres, streams, and linear feet than Alternative Routes D and F; however, this is mostly due to the high number of moderate probability wetlands and low probability streams along Alternative Route E.

Overall, Alternative Route C has comparable or less wetland and stream impacts than Alternative Routes A and B. Furthermore, Alternative Route C minimizes overall impact to the surrounding community and takes landowner feedback into consideration to the extent practical. Public stakeholder input strongly favored Alternative Route C since it was located away from the residential and more visually open areas, as well as provided the best option to minimize existing and future land use conflicts. Additionally, while Alternative Route E crosses more wetlands and streams than Alternative Routes D and F, it parallels an existing transmission line, which was preferred by the public and follows federal and state guidelines.

The Component 1 Proposed Route will be built within newly constructed ROW; however approximately 6.7 miles will parallel an existing 100-foot-wide ROW, as shown in the Desktop Wetland and Stream Delineation Report (Attachment 2.D.1). A field delineation will be required to locate jurisdictional features along the Proposed Route.

Strategic siting of transmission structures/foundations and construction access roads should minimize impacts to regulated resources. In most cases, wetlands and streams can be spanned entirely by a transmission line, however ROW clearing may still result in permanent conversion of forested wetlands. Impacts to wetlands from access roads and clearing equipment can be minimized through the use of temporary timber matting. In some cases, timber mat bridges can also be used to span stream channels.

E. Solid and Hazardous Waste

A Geographic Information System (“GIS”) database search was conducted to identify solid and hazardous waste sites near Component 1. The database search included the United States Environmental Protection Agency’s (“USEPA’s”) National Priority List (“NPL”); the USEPA’s Superfund Enterprise Management System; the USEPA’s Resource Conservation and Recovery Act Information System (“RCRA”); the USEPA’s Toxics Release Inventory (“TRI”); USEPA’s Underground Storage Tank Finder; the VDEQ’s Solid Waste Management Facilities; and the VDEQ’s Voluntary Remediation Program. Results from the solid and hazardous waste database search are shown in Table 8 below.

Table 8 Solid and Hazardous Waste Sites

CRITERIA	UNIT	VALUE
Number of National Priority List sites within 1.0 mile of centerline	Count	0
Number of Superfund sites within 1.0 mile of centerline	Count	0
Number of Resource Conservation and Recovery Act (“RCRA”) sites within Carroll County	Count	18
Number of RCRA sites within Patrick County	Count	20
Number of RCRA sites within 1.0 mile of centerline	Count	0
Distance of closest RCRA facility	Miles	1.0
Number of leaking underground storage tanks within 1.0 mile of centerline	Count	1
Number of Volunteer Remediation Program (“VRP”) sites within 1.0 mile of centerline	Count	0
Distance of closest VRP site	Miles	11.5

The USEPA’s Superfund NPL online mapper and Superfund Enterprise Management System database (database last updated September 2022) identified no NPL sites within one mile of Component 1. The RCRA database (database last updated September 2022) includes information on facilities that generate, transport, store, treat, and/or dispose of hazardous waste as defined by RCRA. Facilities are classified as large quantity generators, small quantity generators, or conditionally exempt small quantity generators depending on the amount of waste they handle. The USEPA’s RCRA database identified 20 active RCRA facilities in Patrick County and 18 active RCRA sites in Carroll County. There are no RCRA sites within one mile of the Proposed Route for Component 1. The TRI database (database last updated in 2021) includes information about toxic chemical releases and pollution prevention activities reported by industrial and federal facilities. The TRI database identified five TRI facilities in Patrick County and five in Carroll County. The closest TRI facility is located 0.84 miles from the Proposed Route and will not be impacted or crossed by Component 1. USEPA’s Underground Storage Tank finder identified one leaking underground storage tank with an open release status¹ within one mile of the Proposed Route centerline.

Carroll County has one transfer station that accepts waste from the public to ship out to area landfills. The transfer station is located approximately 12.0 miles from the Proposed Route and will not be impacted by Component 1. Patrick County has one transfer station that is located approximately 1.2-miles from the Proposed Route and will not be impacted by Component 1. There are no Voluntary Remediation Program (“VRP”) sites in proximity to the Component area according to VDEQ’s VRP database (last updated in May 2022). The closest VRP site is located approximately 11.5 miles from the Proposed Route and will not be crossed or impacted by Component 1.

Care will be taken to operate and maintain construction equipment to prevent any fuel or oil spills. Any waste created by the construction crews will be disposed of in a proper manner and recycled where appropriate and will be further detailed in Appalachian Power’s stormwater pollution prevention plan. The Proposed Route predominantly crosses forested, agricultural, recreational,

¹ An open release status generally means the leaking underground storage tank site has not been remediated and is undergoing assessment, treatment, and/or further monitoring.

residential, and commercial land uses within or parallel to the existing ROW. Appalachian Power will comply with the stormwater pollution prevention plan.

F. Natural Heritage, Threatened and Endangered Species

A United States Fish and Wildlife Service (“USFWS”) Information for Planning and Consultation (“IPaC”) report was generated to verify potential habitat occurrences of threatened and endangered species in April 2023. Six USFWS-listed species were identified to potentially occur within the Study Area of Component 1: the Indiana bat (endangered), northern long-eared bat (endangered), gray bat (endangered), Roanoke logperch (endangered), James spiny mussel (endangered), and the small-anthered bittercress (endangered). In addition, the Monarch Butterfly is shown as a candidate species and the Tricolored bat is shown as a proposed endangered species. The USFWS IPaC report is included as Attachment 2.F.1 to this supplement. Five of these species were identified to potentially occur within the Proposed Route ROW: the Indiana bat, northern long-eared bat, tricolored bat, small-anthered bittercress, and monarch butterfly.

In a letter received from the VDCR’s Division of Natural Heritage on December 17, 2021, ecological core areas were identified throughout the Component area. VDCR defines ecological cores as areas of unfragmented natural cover with at least 100 acres of interior that provide habitat for a wide range of species and are numerically ranked based on their ecological integrity and relative contribution to the ecosystem and natural heritage systems in the area. Highly categorized cores with significant integrity, C1 and C2 core areas as determined by the VDCR, were identified within the Component 1 area along with multiple “Moderate and General” C4 and C5 core areas (Virginia Natural Heritage Data Explorer 2017). Component 1 will be constructed entirely in new ROW and will align with the VDCR’s recommendations to undertake efforts to minimize fragmentation of ecological core areas and retain natural corridors to allow movement between fragments. The VDCR recommends the following maintenance practices for the ROW as preventative measures to protect potential habitats of state-listed species and minimize impacts to ecological cores:

- Invasive species plan including invasive species inventory for the Project based on the current VDCR Invasive Species List from VDCR’s website; methods for treating the invasive species.
- ROW restoration and revegetation including native species in a mix of grasses and forbs; monitoring and adaptive management plan for unsuccessful restoration efforts.

There were no State Natural Area Preserves noted under VDCR’s jurisdiction within five miles of Component 1. Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (“VDACS”) and the VDCR, the VDCR represents the VDACS in comments regarding potential impacts on state-listed, threatened, and endangered plant and insect species.

VDWR’s spatial dataset, Wildlife Environmental Review Map Service (“WERMS”), was used to identify sensitive species potentially located within a five-mile buffer along the Proposed Route for Component 1. Three species were identified by the VDWR WERMS dataset and are shown in Table 9 below. There are no bald eagle nests documented by the Center for Conservation Biology’s Bald

Eagle Nest Locator within close proximity of Component 1. The closest documented nest is more than 20 miles from Component 1.

Table 9 VDWR-Listed Species within five miles of Component 1

SPECIES NAME	STATE STATUS
Bog turtle	Endangered
Orangefin madtom	Threatened
Timber rattlesnake	Collected Concern

Appalachian Power will coordinate with the VDWR, the USFWS, and the VDCR as appropriate to minimize impacts on these resources during the environmental permitting phase of the Project.

G. Erosion and Sediment Control

Appalachian Power submits their erosion and sediment control specifications for construction and maintenance of electric utility lines annually to the VDEQ for all upcoming projects. The approved erosion and sediment control specifications will be implemented for all transmission facility construction related to the larger Stuart Project, which includes, but is not limited to, transmission line construction, structure erection, substation construction and upgrades, and construction of new or upgrade of existing access roads, when practicable. In addition, a site-specific erosion and sediment control plan will be prepared for Component 1 as required by the VDEQ.

H. Archaeological, Historic, Scenic, Cultural or Architectural Resources

In September 2022, POWER conducted a Pre-Application Analysis of cultural resources for the Project in support of the Virginia SCC application. The background research conducted as part of this analysis was designed to identify all previously recorded cultural resources using the tiered study areas outlined within the Virginia Department of Historic Resources’ (“VDHR”) *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (2008). Archival research of previously recorded historic resources and field reconnaissance was part of the analysis and is summarized in Table 10 below.

Table 10 Previously Recorded Historic Resources

RADIAL BUFFER (MILES)	CONSIDERED RESOURCES	RESOURCE NAME (VDHR ID / NRHP NUMBER)
0.0 to 1.5	National Historic Landmarks	None
0.0 to 1.0	Above resources, and; NRHP-listed, Battlefields, Historic Landscapes (e.g., Rural Historic District)	None
0.0 to 0.5	Above resources, and; NRHP-eligible or potentially eligible (determined by VDHR)	None
0.0 (within ROW)	Above resources, and; Archaeological sites	None

Note: NRHP = National Register of Historic Places; VDHR = Virginia Department of Historic Resources.

There are no previously recorded resources within the tiered study area of any of the six alternatives

for Component 1, including the proposed and unselected routes. As such, Component 1 will have no impact on any known resources within the tiered study areas of the proposed ROW. There are no National Historic Landmarks within 1.5-mile of the Component 1 Proposed Route and its alternative routes; no above-ground resources, National Register of Historic Places (“NRHP”)-listed properties, battlefields or Historic Landscapes within 1.0 mile of Component 1 and its alternative routes, no above-ground resources or determined NRHP eligible properties within 0.5 mile of Component 1 and its alternative routes; and no previously recorded archaeological sites within the tiered study areas of the proposed ROW and its alternative routes. As such, Component 1 will have no impact on any known resources within the tiered study areas of the proposed ROW. Refer to Attachment 2.H.1 for the Pre-Application Analysis for historical resources.

I. Chesapeake Bay Preservation Areas

Construction, installation, operation, and maintenance of electric transmission lines are conditionally exempt from the Chesapeake Bay Preservation Act as stated in the exemption for public utilities, railroads, public roads, and facilities in 9 VAC 25-830-150. Appalachian Power will meet applicable conditions as needed.

J. Wildlife Resources

USFWS-listed and VDWR-listed species are discussed in Section 2.F. Consultation with the USFWS, the VDWR, and the VDCR will be on-going as the Project progresses. Appalachian Power will coordinate with the appropriate agencies to determine whether surveys are necessary and to minimize impacts to wildlife resources.

K. Recreation, Agricultural, and Forest Resources

The general character of the Component area is characterized predominantly by forested, agricultural, recreational, residential, and commercial land uses. Component 1 will be constructed entirely within new ROW and parallels the City of Danville’s existing Pinnacles – Hydro 69-kV Transmission Line for 6.7 miles. Mitigation strategies recommended by VDCR, VDWR, and Virginia Department of Forestry (“VDOP”) should be considered throughout the construction process.

The Proposed Route for Component 1 crosses the Blue Ridge Highlands Loop, a designated wildlife viewing driving route that is part of the Virginia Bird and Wildlife Trail system, approximately 5.0 miles east of the existing Willis Gap Substation. The closest site on the Blue Ridge Highlands Loop is located approximately 2.4 miles from the Proposed Route for Component 1. No state parks are crossed by Component 1.

Under the Virginia Open-Space Land Act, any public body can acquire title or rights to real property to provide means of preservation of open-space land as conservation easements. The Project Team solicited input from the Virginia Outdoors Foundation and determined there are no conservation easements crossed by Component 1 according to a letter received on January 20, 2022. The Proposed Route crosses the northern panhandle of a parcel on which a USFWS conservation easement is located. The easement is along the Ararat River and Doe Run Creek which make up the southern and southeastern boundaries of the parcel and furthest away from the Proposed Route. The USFWS easement is not crossed by the Proposed Route or Filing Corridor and no impact is anticipated (See Exhibit 7 Component 1 GIS Constraints Map in the Company’s Application).

The Proposed Route has approximately 186 acres of either prime and unique farmland or farmland of statewide importance located within the ROW based on United States Department of Agriculture Natural Resources Conservation Service (“NRCS”) Soil Survey Geographic Database. Based on NRCS data, approximately 41 acres of pasture/rangeland or cropland is within the Proposed Route ROW. The Proposed Route parallels existing transmission line where available to minimize impacts on farmland.

Component 1 will be entirely constructed within new ROW and parallel existing transmission lines where applicable to minimize habitat fragmentation to the extent possible. In a letter received from the VDOF on January 7, 2022, it stated that Component 1 contains nearly 9,000 acres of forest considered very high or outstanding conservation value. Appalachian Power’s tree clearing methods use the VDOF’s best management practices (“BMPs”) for water quality. Specific sections of the BMPs that are pertinent to transmission line clearing operations include:

- Equipment Maintenance and Litter
- Harvest Closure (rehabilitation of the ROW after construction)
- Revegetation of Disturbed Areas

Appalachian Power will utilize the above BMPs for the Project. Further discussion of ROW clearing, rehabilitation and maintenance can be found in Section II.A.7 of the Response to Guidelines in Volume 1 of the Application.

L. Use of Pesticides and Herbicides

When herbicides are used to maintain the Appalachian Power’s transmission ROW, they are registered with the USEPA and with the VDACS. All herbicides will be used in accordance with label and manufacturer directions. Regarding herbicide applications (additionally, see Section II.A.7 of the SCC Response to Guidelines in Volume 1 of the Application):

- Herbicides will not be applied when rainfall is imminent, during rainfall, or within one day of large rain events (usually greater than one centimeter) that result in soil moisture capacity occurring above field capacity.
- Buffer zones will be maintained and used in accordance with herbicide label and manufacturer directions around streams, ponds, springs, wetlands, water supply wells, channelized drainage ways (perennial or intermittent), and karst features.

M. Geology and Mineral Resources

According to the Division of Geology and Mineral Resources Interactive Geologic Map, Component 1 is located in the Piedmont physiographic province of Virginia and consists primarily of gravel, sand, granite, and metamorphic rock. Appalachian Power requested comments on the Project and Component 1 from the Virginia Departments of Mines, Minerals, and Energy in November of 2021, but no response was received regarding karst, geology, and mineral resources. According to their interactive map, no sinkholes, active mines or stone quarries are crossed by Component 1. Appalachian Power does not anticipate that Component 1 will result in negative impacts on geology or mineral resources.

N. Transportation Infrastructure

The width of the Component 1 Proposed Route ROW is approximately 100 feet and will require all new ROW. Between the existing Willis Gap Substation and the proposed Claudville Substation, Component 1 crosses Ararat Highway twice. Between the proposed Claudville and Mayo River Substations, Component 1 crosses State Route 103 (Claudville Highway) three times and State Route 8 (Salem Highway) once, and a total of 39 local/county road crossings.

POWER contacted the Virginia Department of Transportation (“VDOT”) and reviewed the Proposed Routes for all components of the Project. A letter received from VDOT on January 3, 2022, did not indicate any major concerns regarding the Proposed Route for Component 1. Accordingly, Appalachian Power will coordinate with VDOT during the permitting phase of the Project to determine the extent of land use permits, construction entrances, and traffic control plans needed for the Project.

POWER utilized the Federal Aviation Administration’s (“FAA”) Obstruction Evaluation/Airport Airspace Analysis tool to review the proposed structure locations. Based on preliminary engineering, Appalachian Power does not expect to file Form 7460 for any Component 1 structures. Preliminary desktop reviews indicated that there are no airports within 10 miles of Component 1. A letter received from the Virginia Department of Aviation on December 7, 2021, indicated that no portion of Component 1 is located within 20,000 linear feet of a public use airport. Appalachian Power will continue to coordinate with the Virginia Department of Aviation and FAA as necessary to obtain all appropriate approvals.

ATTACHMENT 2.D.1: DESKTOP WETLAND AND STREAM DELINEATION REPORT

May 2023

APPALACHIAN POWER COMPANY

Stuart Area 138-kV Transmission Improvements Project
Component 1: Mayo River (Stuart) to Willis Gap Transmission Improvements
SCC Case No. PUR-2023-00024
Carroll and Patrick Counties, Virginia

Virginia Department of Environmental Quality
Desktop Wetland and Stream Delineation Report

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0158529

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ACRONYMS AND ABBREVIATIONS

Appalachian Power	Appalachian Power Company
CIR	Color Infrared
Component 1	Mayo River (Stuart) to Willis Gap Transmission Improvements
Component 1 Proposed Route	Alignments for the Mayo River – Willis Gap 138-kV Transmission Line
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
kV	kilovolt
NFHL	National Flood Hazard Layer
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
POWER	POWER Engineers, Inc.
PSS	Palustrine Scrub-Shrub Wetland
PUB	Palustrine Unconsolidated Bottom Wetland
ROW	Right-of-way
SCC	State Corporation Commission
Stuart Project	Stuart Area Transmission Improvements Project
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VBMP	Virginia Base Mapping Program
VGIN	Virginia Geographic Information Network

1.0 INTRODUCTION

With the Stuart Area 138-kV Transmission Improvements Project (“Stuart Project”), Appalachian Power Company (“Appalachian Power”) is planning to upgrade the local electric transmission grid in four Virginia counties: Carroll, Floyd, Henry, and Patrick. The Stuart Project provides a new electrical source for the area, upgrades the voltage of equipment from 69-kilovolt (kV) to 138-kV, improves the local distribution system, and addresses aging infrastructure. The Stuart Project will ensure adequate power delivery to the area to support today’s electrical load and provide continued support during an extended outage.

The Stuart Project is organized in three components which are generally the construction sequence. The Mayo River (Stuart) to Willis Gap Transmission Improvements Component (“Component 1”) is the subject of this report and is depicted on Attachments A and B. Appalachian Power is planning to construct a 138-kilovolt (“kV”) transmission line to accommodate future electrical needs in Carroll and Patrick counties, Virginia. Component 1 consists of constructing approximately 24.5 miles of new 138-kV Transmission Line between the existing Willis Gap Substation and the proposed Claudville and Mayo River Substations.

The transmission line will be built primarily using single-circuit H-frame structures and single-circuit steel monopole structures; however, final structure types will be dependent on final engineering and additional studies. The proposed structures are anticipated to be approximately 85 feet tall on average to meet current design standards. Component 1 will be built within a newly constructed right-of-way (“ROW”) that is typically 100 feet wide; however approximately 6.4 miles of the ROW will primarily be built parallel to existing ROW associated with non-Appalachian Power owned transmission line.

Appalachian Power contracted POWER Engineers, Inc. (“POWER”) to prepare this Desktop Wetland and Stream Delineation Report for inclusion in the Stuart Area 138-kV Transmission Improvements Project’s Application for a Certificate of Public Convenience and Necessity to be filed with the Virginia State Corporation Commission (“SCC”), which approves or denies such applications. This report is included as Attachment 2.D.1 in the Virginia Department of Environmental Quality Supplement, located in Volume 3 of the Application (SCC Case No. PUR-2023-00024).

The purpose of the Desktop Wetland and Stream Delineation Report is to identify potential federally regulated waters of the United States within the proposed 100-foot-wide ROW. A siting effort was undertaken to determine the alignments for the Mayo River – Willis Gap 138-kV Transmission Line (“Component 1 Proposed Route”). Six alternative routes were identified for Component 1, as further detailed in the Component 1 Siting Study in Volume 2 of the Company’s Application. This report includes a description of the methodologies POWER used to determine the location and size of potential regulated waters within the Component 1 ROW and guidance regarding probability of encountering the identified features during a field verification.

2.0 METHODS

2.1 Data Sources and Background Information

POWER reviewed various mapping sources and Geographic Information System (“GIS”) data in order to identify areas where wetlands or streams could potentially be located within the proposed ROW of Component 1. The GIS data and mapping sources reviewed include the following:

- United States Geological Survey (“USGS”), United States Elevation Data (USGS 2021)
- Virginia Geographic Information Network (“VGIN”) Virginia Base Mapping Program (“VBMP”) color orthoimagery (VGIN 2015, 2018, 2019 and 2021).
- Color Infrared (“CIR”) aerial imagery and orthophotography (VBMP 2018 and 2019).
- Google Earth color aerial photography, including historical aerial data (Google Earth 2002, 2003, 2005-2008, 2011, 2013-2017, 2020, 2021).
- National Hydrography Dataset (“NHD”) stream and river data (USGS 2022).
- United States Fish and Wildlife Service (“USFWS”) National Wetland Inventory (NWI) mapping (USFWS 2022).
- United States Department of Agriculture (“USDA”) Natural Resources Conservation Service (“NRCS”) Soil Surveys of Carroll and Patrick Counties, Virginia (USDA NRCS 1967 and 2009).
- USDA NRCS Web Soil Survey (USDA NRCS 2022).
- Federal Emergency Management Agency (“FEMA”) National Flood Hazard Layer (“NFHL”) data (FEMA 2022).
- Esri. Terrain with Labels Basemap. (Esri 2016).

2.2 Wetland Definitions

Federal regulations define wetlands as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation, typically adapted for life in saturated soil conditions” (United States Environmental Protection Agency [“USEPA”] 2023).

Under normal circumstances, three parameters must be present for an area to be considered a wetland: hydrophytic vegetation, wetland hydrology, and hydric soils. Applicable technical guidance that defines these parameters and provides criteria for the evaluation of associated data and field indicators is provided in the *1987 Wetland Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the United States Army Corps of Engineers (“USACE”) Wetland Delineation Manual, Eastern Mountains and Piedmont Region* (USACE 2012).

Using the data sources outlined above, POWER identified areas that could potentially satisfy the three parameters required to meet the definition of a wetland provided by the USACE.

Aerial imagery and NWI mapping for Component 1 were used to determine potential habitat type of the desktop delineated wetlands. NWI maps use the Classification of Wetlands and Deepwater Habitats of the United States to classify wetland habitat types (Cowardin et al. 1979). This classification system is hierarchical and defines five major systems: Marine, Estuarine, Riverine, Lacustrine, and Palustrine. The Palustrine system is the only type of wetland system likely to be present within the study area and is defined as including all nontidal wetlands dominated by trees, shrubs, persistent emergent herbaceous plants, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean driven-derived salts is below 0.5 percent (Cowardin et al. 1979). Cowardin wetland types likely to be encountered along the proposed ROW fall into the following four classifications:

- **Palustrine Emergent (PEM) Wetlands.** Emergent wetlands are typically characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is usually present for most of the growing season in most years.
- **Palustrine Scrub-Shrub (PSS) Wetlands.** Scrub-shrub wetlands are typically characterized by woody vegetation less than 20 feet tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions.
- **Palustrine Forested (PFO) Wetlands.** Forested wetlands are usually characterized by woody vegetation that is 20 feet tall or taller. These wetlands typically possess an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer.
- **Palustrine Unconsolidated Bottom (PUB) Wetlands.** Unconsolidated bottom wetlands include all wetland and deepwater habitats with at least 25 percent cover of particles smaller than stones and a vegetative cover less than 30 percent.

2.3 Stream Definitions

Streams are described by the USEPA as channels that are natural or artificial open areas that connect two bodies of water and may have water flowing in them continuously or periodically. They are further placed into three general stream habitat types:

- **Perennial Streams.** These channels typically have water throughout the year except during extreme drought. Most of the water comes from smaller upstream waters or groundwater while runoff from rainfall or other precipitation is supplemental.
- **Intermittent Streams.** These channels flow a considerable portion of the time but cease to flow occasionally or seasonally.
- **Ephemeral Streams.** These channels have flowing water only during and for a short duration after precipitation events in a typical year. Ephemeral streambeds are located above the ground water table year-round and are often described as headwater streams

POWER used aerial imagery, orthophotography, topographic mapping, and NHD datasets to determine the location of potential streams. Stream habitat types were not identified during this desktop delineation.

2.4 Wetland and Stream Data Interpretation

In order to assess the probability for streams and wetlands to occur along the proposed ROW of the transmission line route, POWER biologists utilized available desktop data for this report.

2.4.1 Aerial Imagery and Topographic Mapping

The CIR aerial imagery (VBMP 2018 and 2019), current and historical aerial photography (Google Earth 2002, 2003, 2005-2008, 2011, 2013-2017, 2020, 2021; VGIN 2015, 2018, 2019, and 2021), USGS topographic data (USGS 2021), and ESRI world terrain base mapping (Esri 2016) were used to help determine the location and size of potential wetland and stream resources within the Component 1 ROW. The USGS topographic contour lines were used to identify potential drainage areas ranging from small headwater streams to larger perennial streams. The contour lines were also used to determine areas of flat or depressed terrain where water is more likely to pool for a sufficient duration that allows development of the three required wetland parameters.

Several years of aerial imagery were reviewed for signs of potential wetland and stream resources such as apparent drainage lines, areas with changes in vegetation, and areas with apparent water ponding. CIR aerial imagery was also reviewed, which provides a higher level of contrast compared to traditional aerial photography since it renders the scene in colors not normally seen by the human eye. Open water and saturated areas are typically depicted as black or dark blue since they do not reflect much light in the infrared spectrum (Minnesota IT Services n.d.). Areas with a shift in vegetation (as observed between wetland and upland boundaries) are more apparent on CIR aerial imagery as areas with dead or stressed vegetation appear in lighter shades of red and pink, and areas with actively photosynthesizing vegetation appear bright red.

Aerial imagery was also used to estimate the desktop delineated wetland's Cowardin classification. The CIR aerial imagery is used on the Desktop Wetland and Stream Delineation maps included in Attachments A and B.

2.4.2 National Wetland Inventory Dataset

POWER reviewed NWI mapping to help identify potential wetland areas. NWI maps were published by the USFWS and depict probable wetland areas based on stereoscopic analysis of high-altitude aerial photographs and analysis of infrared bands from remotely sensed imagery. Therefore, NWI mapping reflects conditions during the specific year and season the data was acquired and should not be considered precise, field-verified wetlands (USFWS 2022). NWI mapping was also used to estimate the desktop delineated wetland's Cowardin classification. NWI mapping is included on the Desktop Wetland and Stream Delineation maps included in Attachments A and B.

2.4.3 National Hydrography Dataset

The NHD (USGS 2022) was used to identify potential and known streams within the Component 1 ROW. The NHD is a comprehensive set of digital spatial data representing surface waters, including common features such as lakes, ponds, streams, rivers, canals, and oceans (Simley and Carswell 2009). Although not field verified, the NHD shows the general locations of streams, rivers, and open waters, and provides insight into the general location of waters (USGS 2022). NHD mapping is included on the Desktop Wetland and Stream Delineation maps included in Attachments A and B.

2.4.4 National Flood Hazard Layer Floodplain Dataset

The FEMA NFHL dataset was reviewed to identify floodplains within the Component 1 ROW. The FEMA NFHL dataset (FEMA 2022) provides digital spatial data representing floodplains associated with recorded streams (see Section 2.4.3, USGS NHD streams) as well as riverine mapping. Floodplain boundaries are divided into flood insurance rate zones that are rated between 100-year and 500-year floodplains. Both 100-year and 500-year are considered areas of moderate flood hazard. All remaining areas fall under the terms of minimal flood hazard (FEMA 2022). Floodplain mapping is included on the Desktop Wetland and Stream Delineation maps included in Attachments A and B.

2.4.5 Soil Survey Mapping

USDA NRCS digital soil survey data for Carroll and Patrick Counties, Virginia were used to locate areas of hydric soils, which are typically found in wetlands (USDA NRCS 1967 and 2012). The NRCS soil survey groups soil map units into three categories; non-hydric soil units, soil units with hydric soil inclusions, and units that contained all hydric soils. Areas that contain hydric or hydric inclusion map units have a greater probability of supporting wetlands relative to those mapped as non-hydric soil units. Hydric inclusion soils are identified on the map sheets included in

Attachments A and B. There are three hydric soil areas mapped within the Component 1 ROW, which are shown in Attachments A and B.

2.5 Wetland and Stream Data Evaluation

Potential streams and wetlands were assigned a probability of low, moderate, or high potential of being a regulated resource if a field verification were to be done. Tables 1 and 2 show the criteria used to assign the probability of an identified feature within the proposed ROW.

TABLE 1 WETLAND EVALUATION CRITERIA

WETLAND PROBABILITY	ASSESSMENT CRITERIA
High	Aerial imagery (color and CIR) and/or topography combined with two other indicators such as NWI wetlands, NHD streams, hydric soils, or a regulated floodplain.
Moderate	Aerial imagery (color and CIR) and/or topography combined with one other indicator such as NWI wetlands, NHD streams, hydric soils, or a regulated floodplain.
Low	Areas identified as wetland with topography and aerial photography only.

TABLE 2 STREAM EVALUATION CRITERIA

STREAM PROBABILITY	ASSESSMENT CRITERIA
High	Streams identified with NHD and aerial imagery (color and CIR) or topography.
Moderate	Either (1) streams identified with aerial imagery (color and CIR) and topography; or (2) aerial imagery or topography combined with one other indicator, such as NWI riverine features or county or city stream data.
Low	Areas identified as streams with topography or aerial photography only.

3.0 RESULTS AND DISCUSSION

The results of the desktop wetland and stream delineation are presented for potential wetlands and streams in Tables 3 and 4, respectively. Figures showing the location of desktop delineated wetlands and streams along the Willis Gap – Claudville and Claudville – Mayo River Alternative Routes are included as Attachments A and B, respectively.

The desktop delineation assumed a 100-foot-wide ROW on the Component 1 Proposed Route to assess potential acreage and linear feet of wetlands and streams, respectively for Alternative Routes A through C between the Willis Gap and Claudville substations and Alternative Routes D through F between the Claudville and Mayo River substations. Due to limitations in aerial photography and available data, the probability and estimated number of occurrences provided

below are for planning purposes and likely do not represent the full extent of potentially jurisdictional aquatic resources that may be identified later during a field study.

TABLE 3 DESKTOP WETLAND DELINEATION RESULTS

WETLAND TYPES	WILLIS GAP - CLAUDVILLE				CLAUDVILLE - MAYO RIVER							
	ALTERNATIVE ROUTE A		ALTERNATIVE ROUTE B		ALTERNATIVE ROUTE C (PROPOSED ROUTE)		ALTERNATIVE ROUTE D		ALTERNATIVE ROUTE E (PROPOSED ROUTE)		ALTERNATIVE ROUTE F	
	NUMBER OF WETLAND OCCURRENCES	ACREAGE WITHIN ROW	NUMBER OF WETLAND OCCURRENCES	ACREAGE WITHIN ROW	NUMBER OF WETLAND OCCURRENCES	ACREAGE WITHIN ROW	NUMBER OF WETLAND OCCURRENCES	ACREAGE WITHIN ROW	NUMBER OF WETLAND OCCURRENCES	ACREAGE WITHIN ROW	NUMBER OF WETLAND OCCURRENCES	ACREAGE WITHIN ROW
HIGH	8	1.90	13	3.29	12	2.39	4	0.95	13	4.97	13	4.97
MODERATE	47	8.48	45	10.53	27	4.29	12	1.85	30	5.12	23	4.02
LOW	5	0.76	3	0.56	2	0.18	7	0.55	9	0.71	6	0.43
TOTAL	60	11.14	61	14.38	41	6.86	23	3.35	52	10.80	42	9.42

TABLE 4 DESKTOP STREAM DELINEATION RESULTS

STREAM TYPES	WILLIS GAP - CLAUDVILLE						CLAUDVILLE - MAYO RIVER					
	ALTERNATIVE ROUTE A		ALTERNATIVE ROUTE B		ALTERNATIVE ROUTE C (PROPOSED ROUTE)		ALTERNATIVE ROUTE D		ALTERNATIVE ROUTE E (PROPOSED ROUTE)		ALTERNATIVE ROUTE F	
	NUMBER OF STREAM OCCURRENCES	LINEAR FOOTAGE WITHIN ROW	NUMBER OF STREAM OCCURRENCES	LINEAR FOOTAGE WITHIN ROW	NUMBER OF STREAM OCCURRENCES	LINEAR FOOTAGE WITHIN ROW	NUMBER OF STREAM OCCURRENCES	LINEAR FOOTAGE WITHIN ROW	NUMBER OF STREAM OCCURRENCES	LINEAR FOOTAGE WITHIN ROW	NUMBER OF STREAM OCCURRENCES	LINEAR FOOTAGE WITHIN ROW
High	26	3,938	29	4,138	23	2,731	19	2,404	23	3,267	23	3,103
Moderate	12	1,517	13	2,310	15	2,602	9	1,590	7	1,115	4	922
Low	44	4,923	48	6,545	59	7,779	21	2,686	33	3,656	25	2,876
TOTALS	82	10,378	90	12,993	97	13,112	49	6,680	63	8,038	52	6,901

3.1 Willis Gap - Claudville

3.1.1 Alternative Route A

Alternative Route A is located south of the Blue Ridge Parkway in Patrick County. Generally, Alternative Route A is east of the Willis Gap Substation and crosses multiple named streams and headwater valleys north of the community of Ararat. Alternative A then continues southeast until it crosses the Dan River and then follows the same path as Alternative Routes B and C to enter the proposed Claudville Substation from the west. Alternative Route A is 11.6 miles and is located in Patrick (11.54 miles) and Carroll (0.06 mile) counties (Attachment A, Map Tiles 1-18, and 48-51). The Alternative Route A ROW contains a total of 60 wetlands (totaling 11.14 acres) and 82 streams (totaling 10,378 linear feet). Additional details on the probability of the identified features are included below.

High Probability

Eight high probability wetlands (totaling 1.90 acres) were identified within the ROW of Alternative Route A (Attachment A, Map Tiles 1, 4, 12, 18, and 48). In addition, a total of 26 high probability streams, including multiple named streams, are within the ROW and approximately 3,938 linear feet in length (Attachment A, Map Tiles 1-4, 7-12, 16, 48, 49, and 51).

Moderate Probability

Forty-seven moderate probability wetlands (totaling 8.48 acres) were identified within the ROW of Alternative Route A (Attachment A, Map Tiles 1-4, 7-12, 15-17, 49, and 51). In addition, a total of 12 moderate probability streams are within the ROW and approximately 1,517 linear feet in length (Attachment A, Map Tiles 1, 3, 6, 9, 10, 12, 13, 15, 16, 48, and 49).

Low Probability

Five low probability wetlands (totaling 0.76 acre) were identified within the ROW of Alternative Route A (Attachment A, Map Tiles 6, 7, and 51). In addition, a total of 44 low probability streams are within the ROW and approximately 4,923 linear feet in length (Attachment A, Map Tiles 1-3, 5-9, 13-18, and 48-51).

3.1.2 Alternative Route B

Alternative Route B is located south of the Blue Ridge Parkway in Patrick County. Generally, Alternative Route B is southeast of the Willis Gap Substation and crosses multiple named streams and headwater valleys. Alternative Route B crosses the community of Ararat and continues east until it crosses the Dan River and then follows the same path as Alternative Routes A and C to enter the proposed Claudville Substation from the west. Alternative Route B is 12.4 miles and is located in Patrick (12.34 miles) and Carroll (0.06 mile) counties (Attachment A, Map Tiles 1, 19-

32, and 43-51). The Alternative Route B ROW contains a total of 61 wetlands (totaling 14.38 acres) and 90 streams (totaling 12,993 linear feet). Additional details on the probability of the identified features are included below.

High Probability

Thirteen high probability wetlands (totaling 3.29 acres) were identified within the ROW of Alternative Route B (Attachment A, Map Tiles 1, 22, 23, 28, 29, 44, and 48). In addition, a total of 29 high probability streams, including multiple named streams, are within the ROW and approximately 4,138 linear feet in length (Attachment A, Map Tiles 1, 21, 22, 24-32, 43, 44-49, and 51).

Moderate Probability

Forty-five moderate probability wetlands (totaling 10.53 acres) were identified within the ROW of Alternative Route B (Attachment A, Map Tiles 1, 21-32, 43-47, 49, and 51). In addition, a total of 13 moderate probability streams are within the ROW and approximately 2,310 linear feet in length (Attachment A, Map Tiles 1, 19-22, 29, 44, 45, and 47-49).

Low Probability

Three low probability wetlands (totaling 0.56 acre) were identified within the ROW of Alternative Route B (Map Tiles 24 and 51, Attachment A). In addition, a total of 48 low probability streams are within the ROW and approximately 6,545 linear feet in length (Attachment A, Map Tiles 1, 20-32, 43, 45-47, and 49-51).

3.1.3 Alternative Route C (Proposed Route)

Alternative Route C is located south of the Blue Ridge Parkway in Patrick County. Generally, Alternative Route C is southeast of the Willis Gap Substation and crosses multiple named streams and headwater valleys south of the community of Ararat. Alternative Route C then continues east until it crosses the Dan River and then follows the same path as Alternative Routes A and B to enter the proposed Claudville Substation from the west. Alternative Route C is 12.5 miles and is located in Patrick (12.44 miles) and Carroll (0.06 mile) counties (Attachment A, Map Tiles 1, 19-22, and 33-51). The Alternative Route C ROW contains a total of 41 wetlands (totaling 6.86 acres) and 97 streams (totaling 13,112 linear feet). Additional details on the probability of the identified features are included below.

High Probability

Twelve high probability wetlands (totaling 2.39 acres) were identified within the ROW of Alternative Route C (Attachment A, Map Tiles 33, 38, 39, 44, and 48). In addition, a total of 23 high probability streams, including multiple named streams, are within the ROW and

approximately 2,731 linear feet in length (Attachment A, Map Tiles 1, 33-36, 38, 39, 42-49, and 51).

Moderate Probability

Twenty-seven moderate probability wetlands (totaling 4.29 acres) were identified within the ROW of Alternative Route C (Attachment A, Map Tiles 33, 36, 39, 42-47, 49, and 51). In addition, a total of 15 moderate probability streams are within the ROW and approximately 2,602 linear feet in length (Attachment A, Map Tiles 1, 19-21, 33, 34, 39, 40, 44, 45, 47-49).

Low Probability

Two low probability wetlands (totaling 0.18 acre) were identified within the ROW of Alternative Route C (Attachment A, Map Tile 51). In addition, a total of 59 low probability streams are within the ROW and approximately 7,779 linear feet in length (Attachment A, Map Tiles 1, 20, 21, 33-43, 45-47, 49-51).

3.2 Claudville - Mayo River

3.2.1 Alternative Route D

Alternative Route D is located immediately north of Virginia State Route 103 (VA-103) and eventually crosses the Virginia State Route 8 (VA-8) in Patrick County. Generally, Alternative Route D is east of the proposed Claudville Substation and crosses multiple named streams and headwater valleys. Alternative Route D crosses Witt Creek, which parallels Salem Highway, and continues northeast toward the South Mayo River. Alternative Route D is 10.4 miles and is located in Patrick County (Attachment B, Map Tiles 1-19, and 45-47). The Alternative Route D ROW contains a total of 23 wetlands (totaling 3.35 acres) and 49 streams (totaling 6,680 linear feet). Additional details on the probability of the identified features are included below.

High Probability

Four high probability wetlands (totaling 0.95 acre) were identified within the ROW of Alternative Route D (Attachment B, Map Tiles 2 and 4). In addition, a total of 19 high probability streams, including multiple named streams, are within the ROW and approximately 2,404 linear feet in length (Attachment B, Map Tiles 2, 4-6, 8-16, 18, 19, 46, and 47).

Moderate Probability

Twelve moderate probability wetlands (totaling 1.85 acres) were identified within the ROW of Alternative Route D (Attachment B, Map Tiles 4-6, 8-10, 46, and 47). In addition, a total of nine moderate probability streams are within the ROW and approximately 1,590 linear feet in length (Attachment B, Map Tiles 8-10, 12, 14, 16, 18, 19, and 45).

Low Probability

Seven low probability wetlands (totaling 0.55 acre) were identified within the ROW of Alternative Route D (Attachment B, Map Tiles 3, 11, 13, 15, and 16). In addition, a total of 21 low probability streams are within the ROW and approximately 2,686 linear feet in length (Attachment B, Map Tiles 1-9, 11, and 17).

3.2.2 Alternative Route E (Proposed Route)

Alternative Route E is located along VA-103 in Patrick County and follows the same path as Alternative Route F until the VA-8 crossing. Initially, Alternative Route E runs southeast of the proposed Claudville Substation until it crosses VA-103. Alternative E then parallels VA-103, where it crosses multiple named streams and headwater valleys, until it crosses VA-8 and Witt Creek and continues northeast toward the South Mayo River. Alternative Route E is 12.0 miles and is located in Patrick County (Attachment B, Map Tiles 1, 20-33, and 37-47). The Alternative Route E ROW contains a total of 52 wetlands (totaling 10.80 acres) and 63 streams (totaling 8,038 linear feet). Additional details on the probability of the identified features are included below.

High Probability

Thirteen high probability wetlands (totaling 4.97 acres) were identified within the ROW of Alternative Route E (Attachment B, Map Tiles 1, 21-23, 28, and 30-33). In addition, a total of 23 high probability streams, including multiple named streams, are within the ROW and approximately 3,267 linear feet in length (Attachment B, Map Tiles 1, 20-24, 26-31, 33, 38, 41, and 44-47).

Moderate Probability

Thirty moderate probability wetlands (totaling 5.12 acres) were identified within the ROW of Alternative Route E (Attachment B, Map Tiles 20, 22-24, 26, 27, 29-32, 38, 41, and 44-47). In addition, a total of seven moderate probability streams are within the ROW and approximately 1,115 linear feet in length (Attachment B, Map Tiles 21, 22, 37, and 42-44).

Low Probability

Nine low probability wetlands (totaling 0.71 acre) were identified within the ROW of Alternative Route E (Attachment B, Map Tiles 1, 21, 24, 32, and 42-44). In addition, a total of 33 low probability streams are within the ROW and approximately 3,656 linear feet in length (Attachment B, Map Tiles 1, 20-27, 29, 30, 32, 33, 37-42, 45, and 46).

3.2.3 Alternative Route F

Alternative Route F is located along VA-103 in Patrick County. Initially, Alternative Route F runs southeast of the proposed Claudville Substation and follows the same path as Alternative Route

E until it crosses Route 8. After this crossing, Alternative Route F then travels northeast, where it crosses multiple named streams and headwater valleys, until it crosses Wayside Road and continues northeast toward the South Mayo River. Alternative Route F is 11.6 miles and is located in Patrick County (Attachment B, Map Tiles 1, 18, 20-37, and 41-47). The Alternative Route F ROW contains a total of 42 wetlands (totaling 9.42 acres) and 52 streams (totaling 6,901 linear feet). Additional details on the probability of the identified features are included below.

High Probability

Thirteen high probability wetlands (totaling 4.97 acres) were identified within the ROW of Alternative Route F (Attachment B, Map Tiles 1, 21-23, 28, and 30-33). In addition, a total of 23 high probability streams, including multiple named streams, are within the ROW and approximately 3,103 linear feet in length (Attachment B, Map Tiles 1, 20-24, 26-31, 33, 34, 36, 42, and 45-47).

Moderate Probability

Twenty-three moderate probability wetlands (totaling 4.02 acres) were identified within the ROW of Alternative Route F (Attachment B, Map Tiles 20, 22-24, 26, 27, 29-32, 42 and 45-47). In addition, a total of four moderate probability streams are within the ROW and approximately 922 linear feet in length (Attachment B, Map Tiles 21, 22, 34, and 41).

Low Probability

Six low probability wetlands (totaling 0.43 acre) were identified within the ROW of Alternative Route F (Attachment B, Map Tiles 1, 21, 24 and 32). A total of 25 low probability streams are within the ROW and approximately 2,876 linear feet in length (Attachment B, Map Tiles 1, 20-27, 29, 30, 32-34, and 44-46).

4.0 CONCLUSION

A summary of the desktop wetland and stream resources identified for Component 1 is provided in Table 5.

4.1 Willis Gap - Claudville

There are three alternative routes for the Willis Gap - Claudville 138-kV Transmission Line. Alternative Route A includes 60 wetlands with a total combined area of 11.14 acres and crosses 82 streams with a total combined linear footage of 10,378 feet. Alternative Route B includes 61 wetlands with a total combined of 14.38 acres and crosses 90 streams with a total combined linear footage of 12,993 feet. Alternative Route C (Proposed Route) includes 41 wetlands with a total combined of 6.86 acres and crosses 97 streams with a total combined linear footage of 13,112 feet.

Alternative Route C, south of the community of Ararat, crosses more high probability wetlands than Alternative Route A and one less than Alternative Route B; however, Alternative Route C crosses fewer moderate probability wetlands than Alternative Routes A or B. Despite being longer than other alternative routes, Alternative Route C (12.5 miles) crosses fewer wetlands and total acres of wetlands than Alternative Route A (11.6 miles) or B (12.4 miles). Conversely, Alternative Route C crosses more linear feet and total streams than Alternative A or B; however, this is due to the high number of low probability streams compared to other alternatives. Alternative Route C crosses fewer high probability streams than either Alternative Routes A or B.

Overall, Alternative Route C has comparable or less wetland and stream impacts than Alternative Routes A and B. Furthermore, Alternative Route C minimizes overall impact to the surrounding community and takes landowner feedback into consideration to the extent practical. Public stakeholder input strongly favored Alternative Route C since it was located away from the residential and more visually open areas, as well as provided the best option to minimize existing and future land use conflicts.

4.2 Claudville – Mayo River

There are three alternative routes for the Claudville – Mayo River 138-kV Transmission Line. Alternative Route D includes 23 wetlands with a total combined area of 3.35 acres and crosses 49 streams with a total combined linear footage of 6,680 feet. Alternative Route E (Proposed Route) includes 52 wetlands with a combined total of 10.80 acres and crosses 63 streams with a total combined linear footage of 8,038 feet. Alternative Route F includes 42 wetlands with a total combined of 9.42 acres and crosses 52 streams with a total combined linear footage of 6,901 feet.

Alternative Route E crosses more wetlands and total acres than Alternative Routes D or F, which is mostly due to the high number of moderate probability wetlands along Alternative Route E. The amount of high probability wetlands for Alternative Routes E and F are the same. Similarly,

Alternative Route E crosses more linear feet and total streams than Alternative Routes D or F; however, this is due to a higher amount of low probability streams compared to other alternatives. The total number and linear feet of high and moderate probability streams among all three alternative routes are comparable. Overall, Alternative Route E (12.0 miles) is longer than Alternative Route D (10.4 miles) and Alternative Route F (11.6 miles), which partially explains the increased amounts of wetland and stream crossings. While **Alternative Route E crosses more wetlands and streams than Alternative Routes D and F, it parallels an existing transmission line, which was preferred by the public and follows federal and state guidelines.**

Strategic siting of transmission structures/foundations and construction access roads should minimize impacts to regulated resources. In most cases, wetlands and streams can be spanned entirely by a transmission line, however ROW clearing may still result in permanent conversion of forested wetlands. Impacts to wetlands from access roads and clearing equipment can be minimized through the use of temporary timber matting. In some cases, timber mat bridges can also be used to span stream channels.

The results of this desktop wetland and stream delineation are intended solely for use as an indication of probable wetlands and streams within the ROWs associated with the Mayo River (Stuart) to Willis Gap Transmission Improvements Component 1 of the Stuart Project. This analysis is designed for planning purposes only and does not represent the results of an on-the-ground, wetland and stream field delineation. Accurate determination of regulated resource boundaries is only possible through field delineations of wetlands and streams utilizing the USACE wetland delineation manual (Environmental Laboratory 1987), the applicable regional supplement (USACE 2012), and other appropriate regulatory guidance.

TABLE 5 SUMMARY OF DESKTOP WETLAND AND STREAM DELINEATIONS

TYPES	WILLIS GAP - CLAUDVILLE				CLAUDVILLE - MAYO RIVER							
	ALTERNATIVE ROUTE A		ALTERNATIVE ROUTE B		ALTERNATIVE ROUTE C (PROPOSED ROUTE)		ALTERNATIVE ROUTE D		ALTERNATIVE ROUTE E (PROPOSED ROUTE)		ALTERNATIVE ROUTE F	
	NUMBER OF OCCURRENCES	ACREAGE/ LINEAR FOOTAGE WITHIN ROW WITHIN ROW	NUMBER OF OCCURRENCES	ACREAGE/ LINEAR FOOTAGE WITHIN ROW WITHIN ROW	NUMBER OF OCCURRENCES	ACREAGE/ LINEAR FOOTAGE WITHIN ROW WITHIN ROW	NUMBER OF OCCURRENCES	ACREAGE/ LINEAR FOOTAGE WITHIN ROW WITHIN ROW	NUMBER OF OCCURRENCES	ACREAGE/ LINEAR FOOTAGE WITHIN ROW WITHIN ROW	NUMBER OF OCCURRENCES	ACREAGE/ LINEAR FOOTAGE WITHIN ROW WITHIN ROW
Wetland Total	60	11.14	61	14.38	41	6.86	23	3.35	52	10.80	42	9.42
Stream Total	82	10,378	90	12,993	97	13,112	49	6,680	63	8,038	52	6,901

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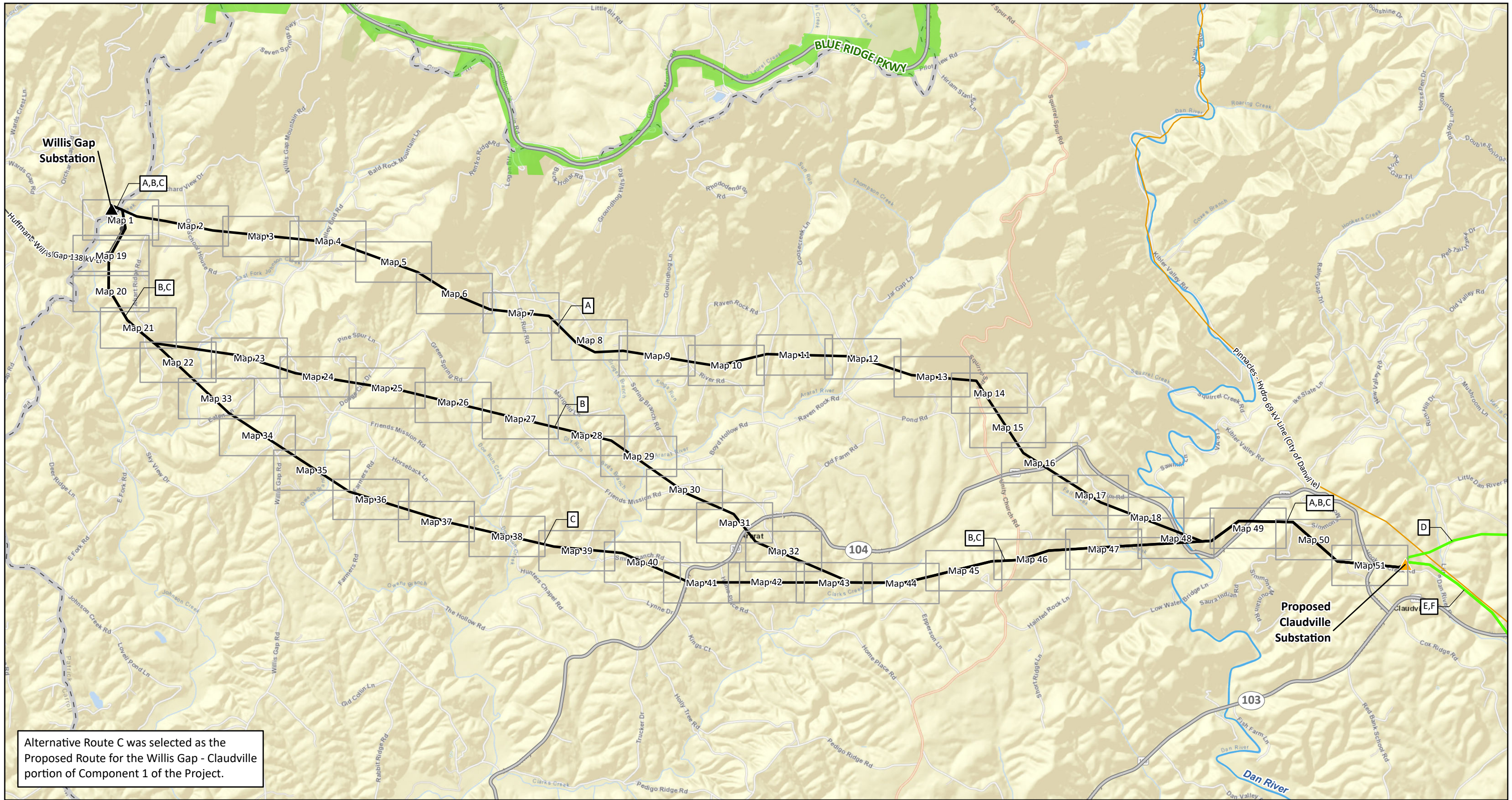
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**ATTACHMENT A: DESKTOP DELINEATED FEATURES AND ROUTE MAP FOR
WILLIS GAP – CLAUDVILLE ALTERNATIVE ROUTES**



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



	Map Tile		Existing APCo Substation		Stream (NHD)
	Proposed APCo Substation		Existing APCo Transmission Line (115 kV - 230 kV)		River (NHD)
	Willis Gap - Claudville Alternative Routes		Existing Non-APCo Transmission Line		Blue Ridge Parkway National Parkway
	Claudville - Mayo River Alternative Routes		Highway		State Boundary
					County Boundary

Carroll & Patrick Counties,
Virginia

Date: 3/27/2023; Author: ckunde; Project: 159298

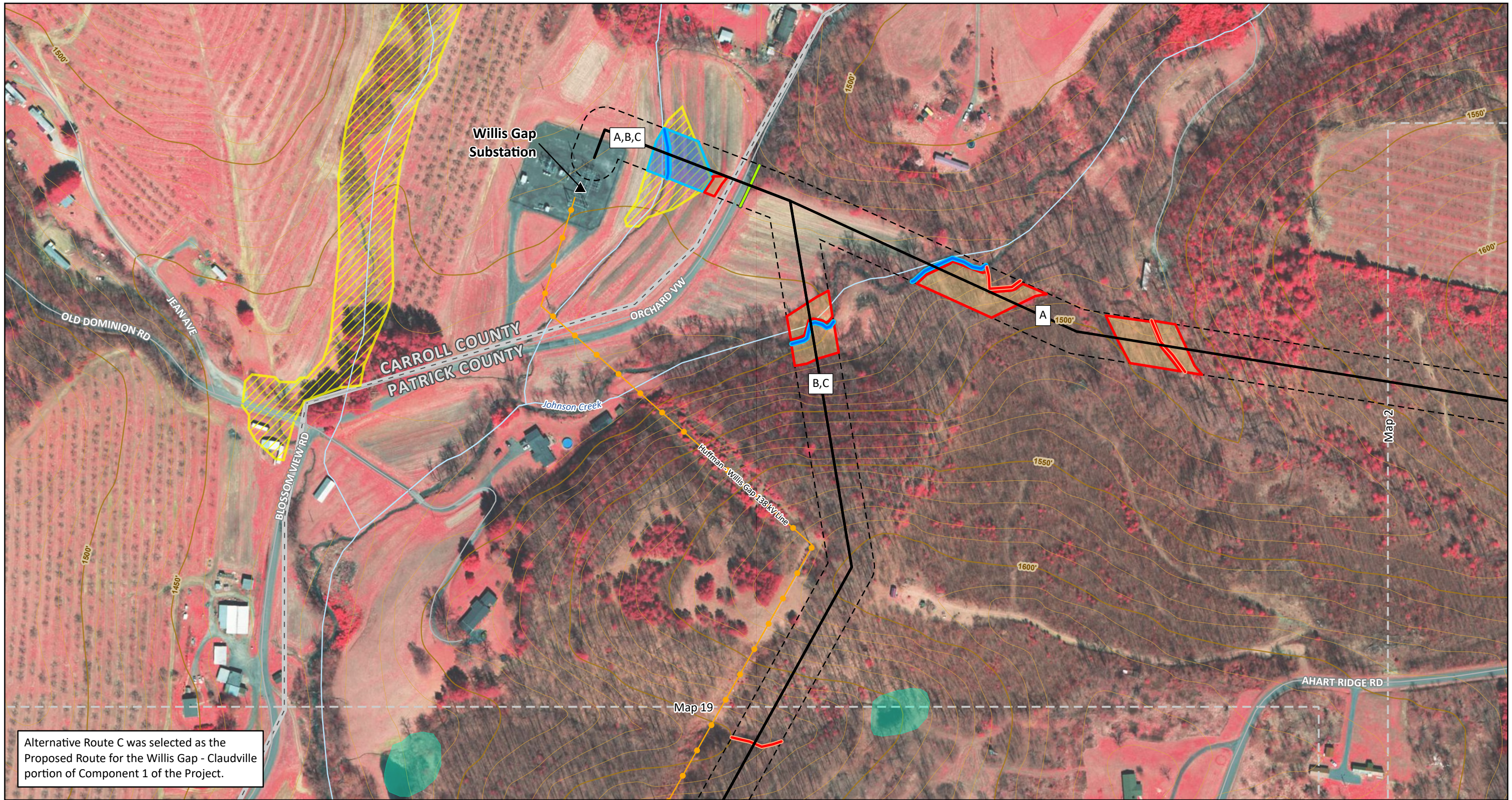
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Miles

1" = 0.75 miles

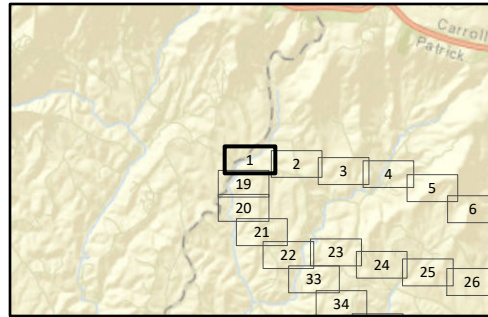
Attachment A:
**Desktop Stream and Wetland
Delineation Index**

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Hydric Soils
Low Probability Stream	Existing APCo Substation	County Boundary
Moderate Probability Stream	Huffman - Willis Gap 138 kV Line	Map Tile
High Probability Wetland	Road	Index Contour (50')
Moderate Probability Wetland	Stream (NHD)	Intermediate Contour (10')
Willis Gap - Claudville Alternative Routes	Wetland (NWI)	

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

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Feet

1" = 200'

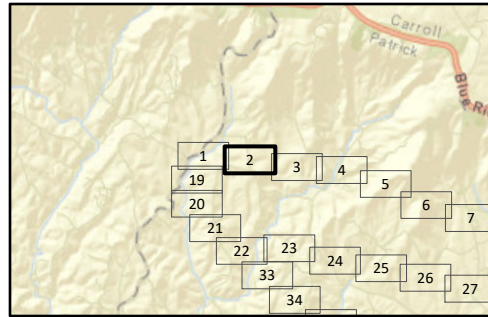
Attachment A:
Desktop Stream and Wetland Delineation
Map 1 of 51

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Map Tile
Low Probability Stream	Road	Index Contour (50')
Moderate Probability Wetland	Stream (NHD)	Intermediate Contour (10')
Willis Gap - Claudville Alternative Routes	County Boundary	

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

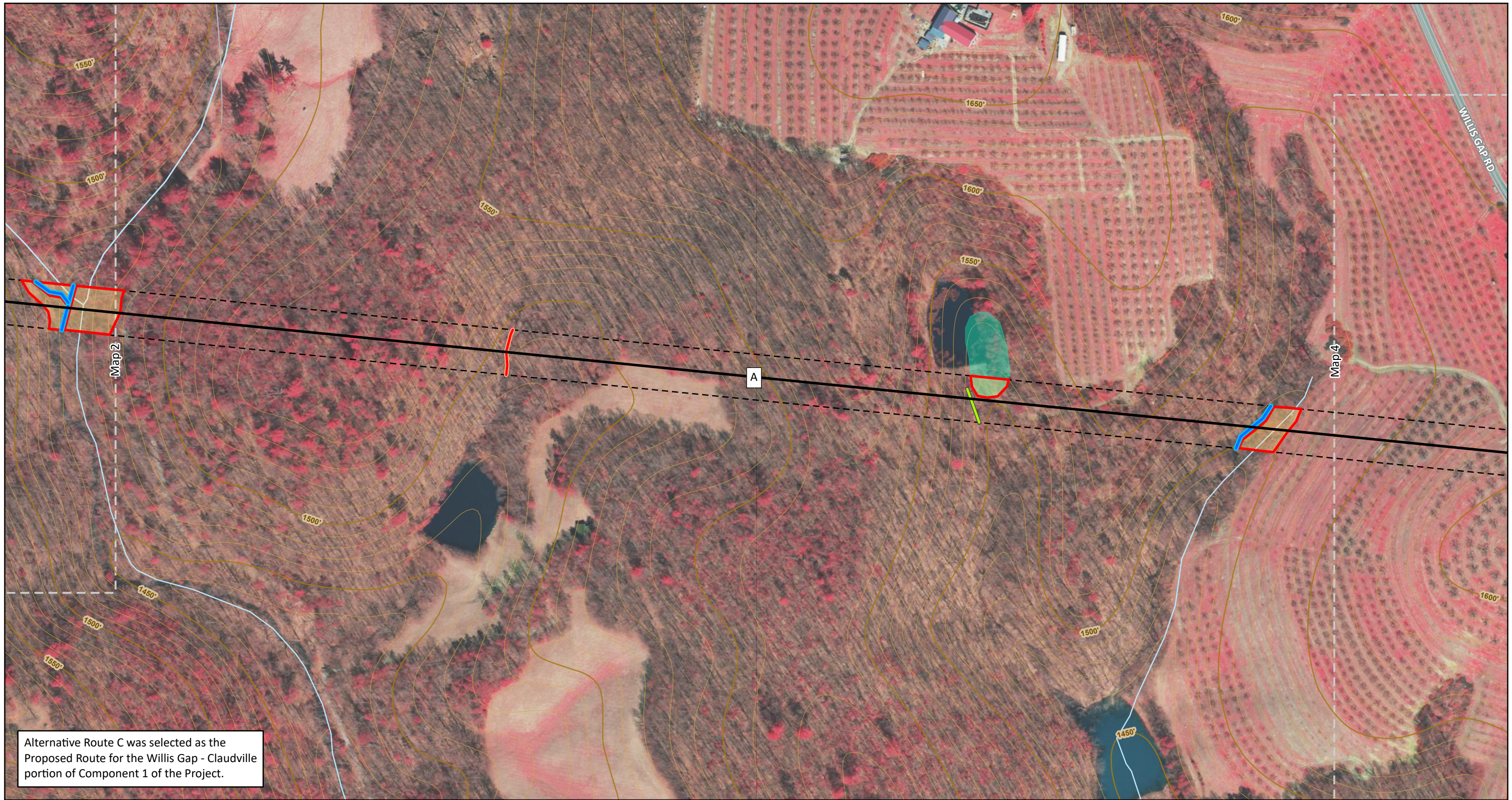
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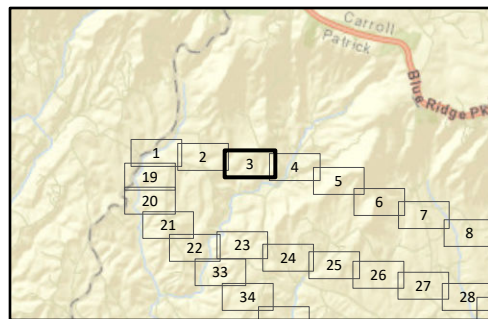
Attachment A:
Desktop Stream and Wetland Delineation
Map 2 of 51





Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes





An AEP Company








Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



-  High Probability Stream
-  Low Probability Stream
-  Moderate Probability Stream
-  Moderate Probability Wetland

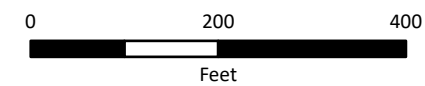
-  Willis Gap - Claudville Alternative Routes
-  Right-of-Way (100')
-  Road
-  Stream (NHD)

-  Wetland (NWI)
-  County Boundary
-  Map Tile
-  Index Contour (50')
-  Intermediate Contour (10')



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

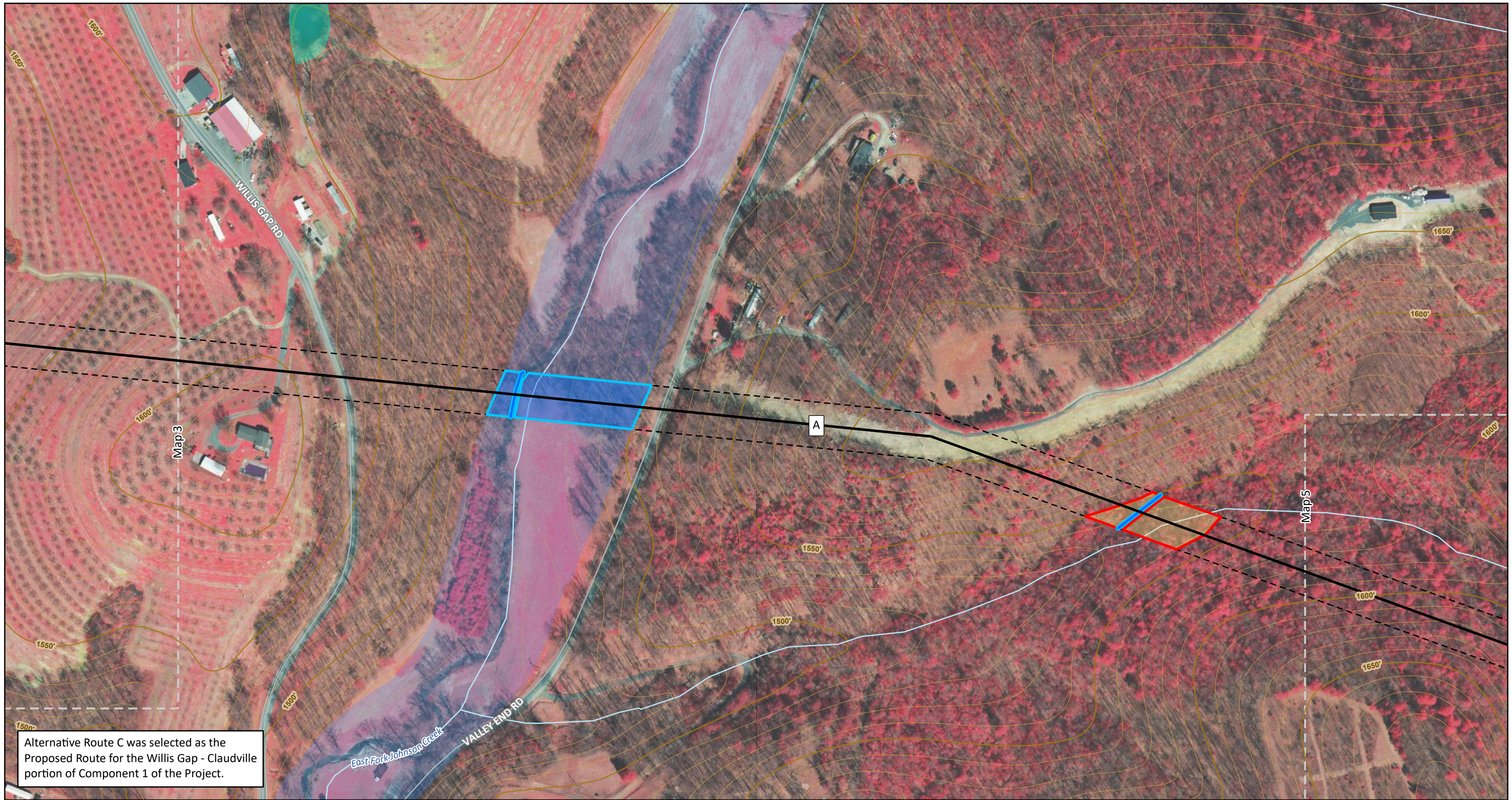


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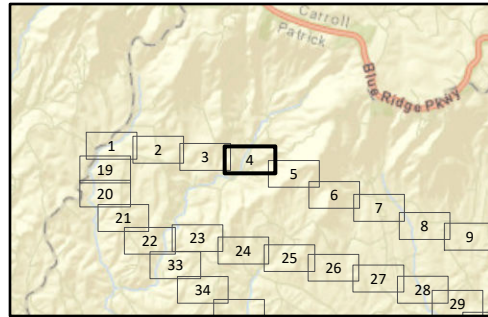
Attachment A:
Desktop Stream and Wetland Delineation
Map 3 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	County Boundary
High Probability Wetland	Road	Map Tile
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
Willis Gap - Claudville Alternative Routes	Wetland (NWI)	Intermediate Contour (10')
	Floodplain	

Carroll & Patrick Counties, Virginia

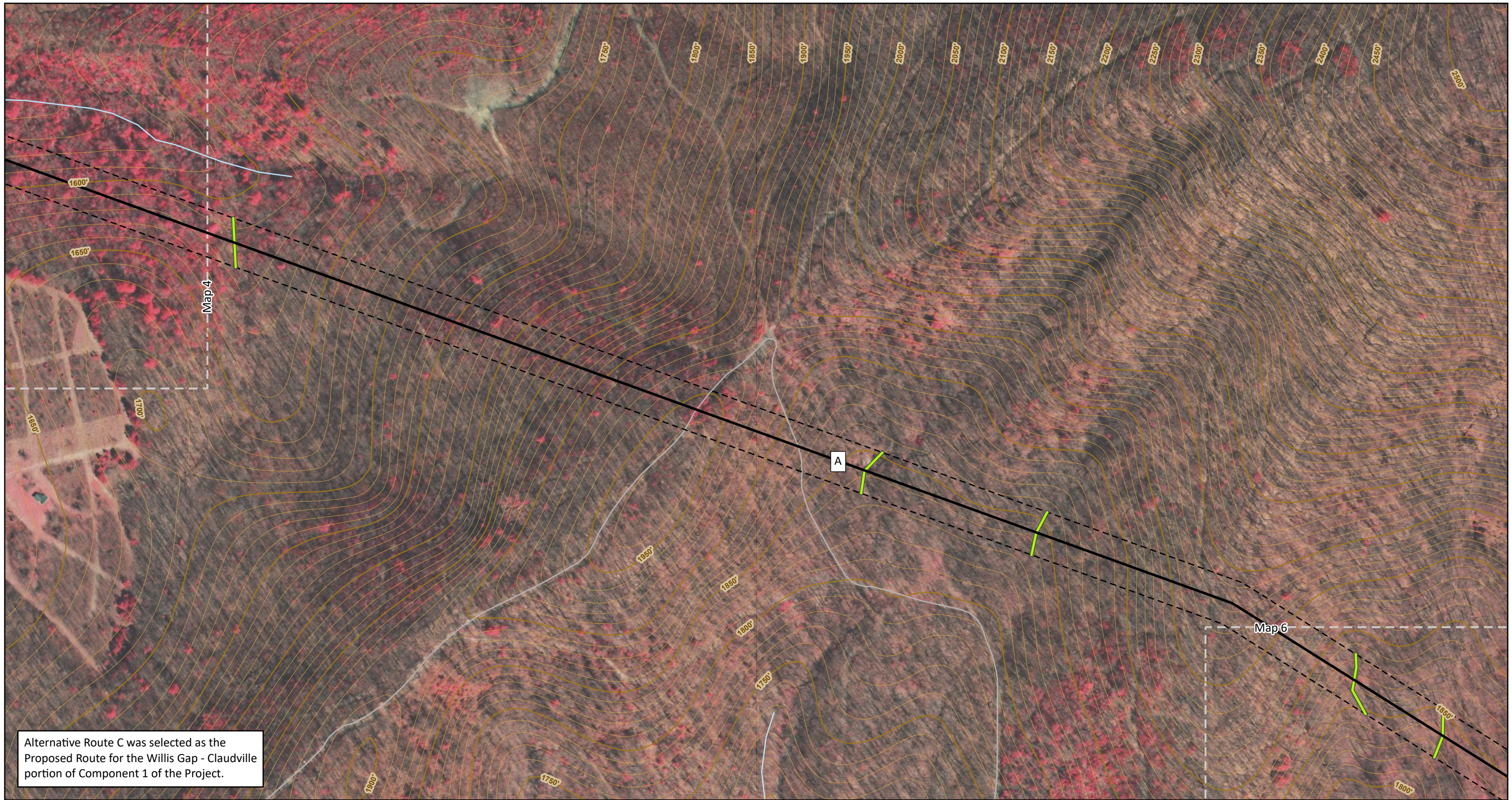
Date: 3/17/2023; Author: ckunde; Project: 159298

1" = 200'

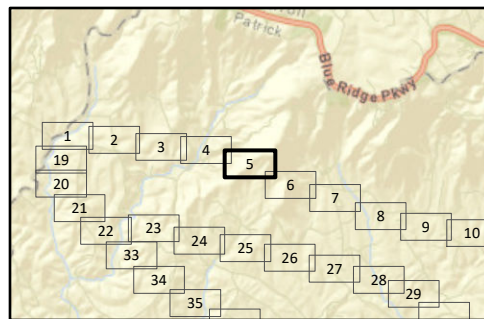
Attachment A:
Desktop Stream and Wetland Delineation
Map 4 of 51

Stuart Area Transmission Improvements Project:
Component 1:
Willis Gap - Claudville Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.

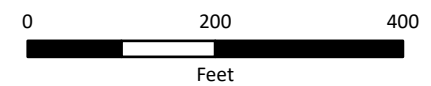


- | | |
|--|----------------------------|
| Low Probability Stream | Stream (NHD) |
| Willis Gap - Claudville Alternative Routes | County Boundary |
| Right-of-Way (100') | Map Tile |
| Road | Index Contour (50') |
| | Intermediate Contour (10') |



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

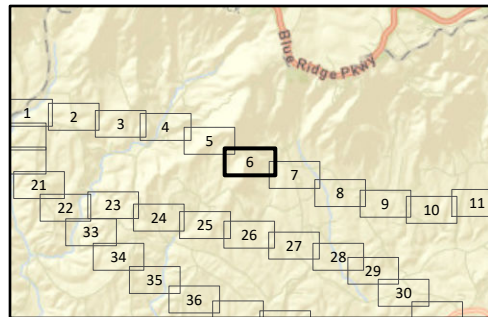
Attachment A:
Desktop Stream and Wetland Delineation
Map 5 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



Low Probability Stream	Willis Gap - Claudville Alternative Routes	County Boundary
Moderate Probability Stream	Right-of-Way (100')	Map Tile
Low Probability Wetland	Stream (NHD)	Index Contour (50')
		Intermediate Contour (10')

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

1" = 200'

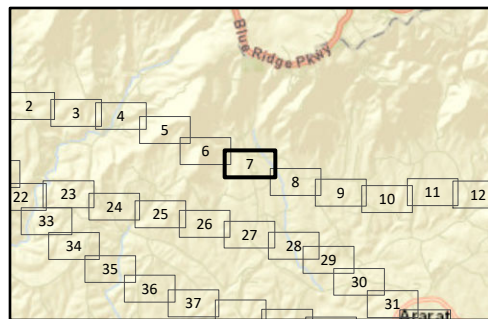
Attachment A:
Desktop Stream and Wetland Delineation
Map 6 of 51




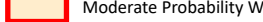
An AEP Company





Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes








Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



-  High Probability Stream
-  Low Probability Stream
-  Low Probability Wetland
-  Moderate Probability Wetland

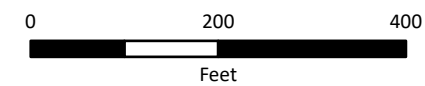
-  Willis Gap - Claudville Alternative Routes
-  Right-of-Way (100')
-  Road
-  Stream (NHD)

-  Wetland (NWI)
-  County Boundary
-  Map Tile
-  Index Contour (50')
-  Intermediate Contour (10')



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

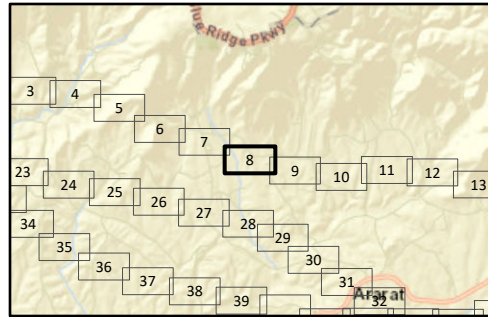
Attachment A:
Desktop Stream and Wetland Delineation
Map 7 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Stream	Road	Map Tile
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
Willis Gap - Claudville Alternative Routes	Floodplain	Intermediate Contour (10')

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

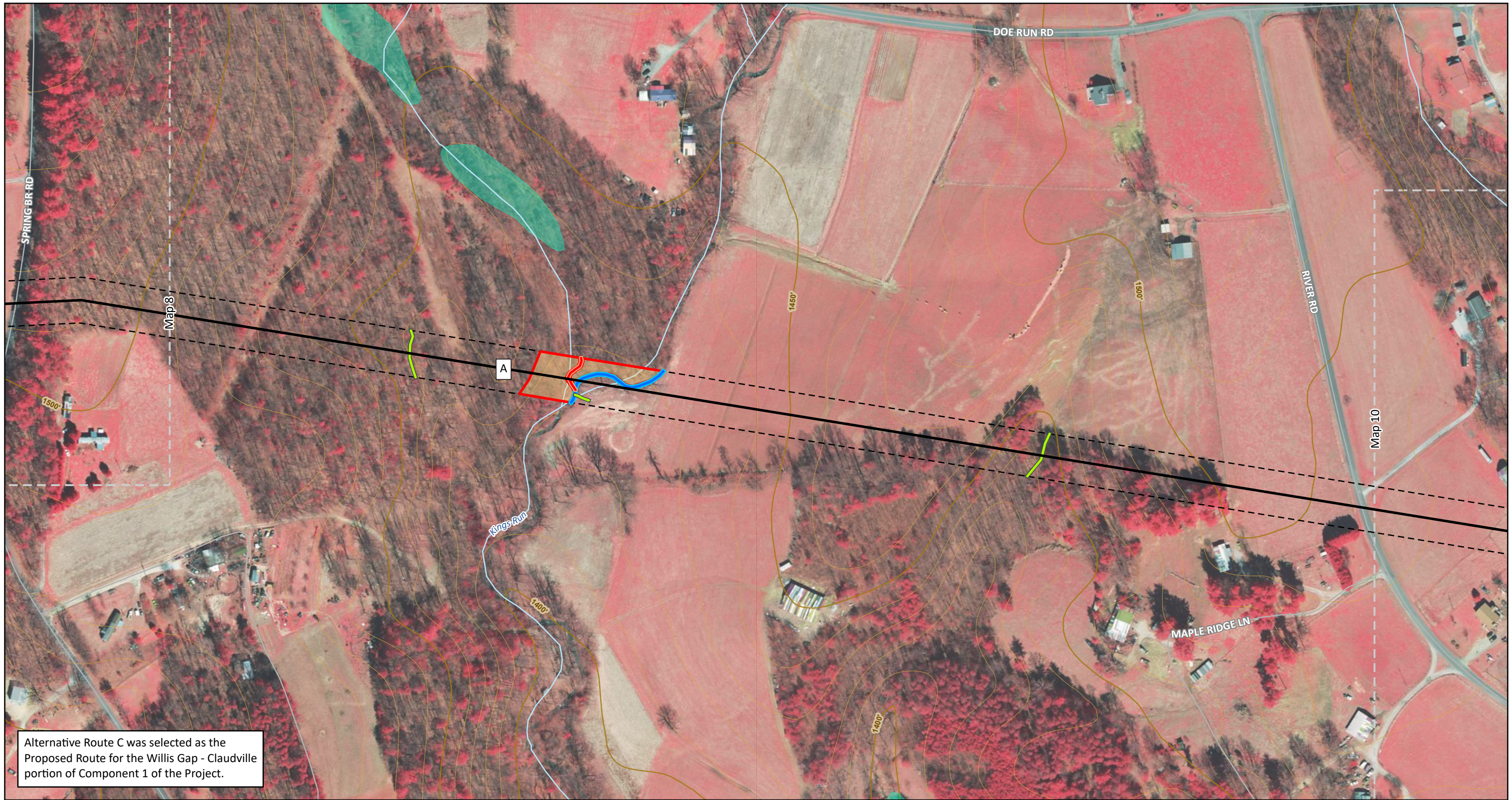
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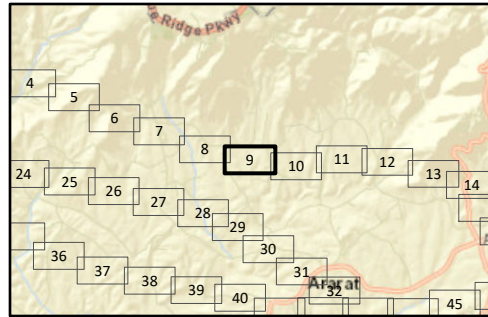
Attachment A:
Desktop Stream and Wetland Delineation
Map 8 of 51

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Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Willis Gap - Claudville Alternative Routes	Wetland (NWI)
Low Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Stream	Road	Map Tile
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
		Intermediate Contour (10')

Carroll & Patrick Counties, Virginia

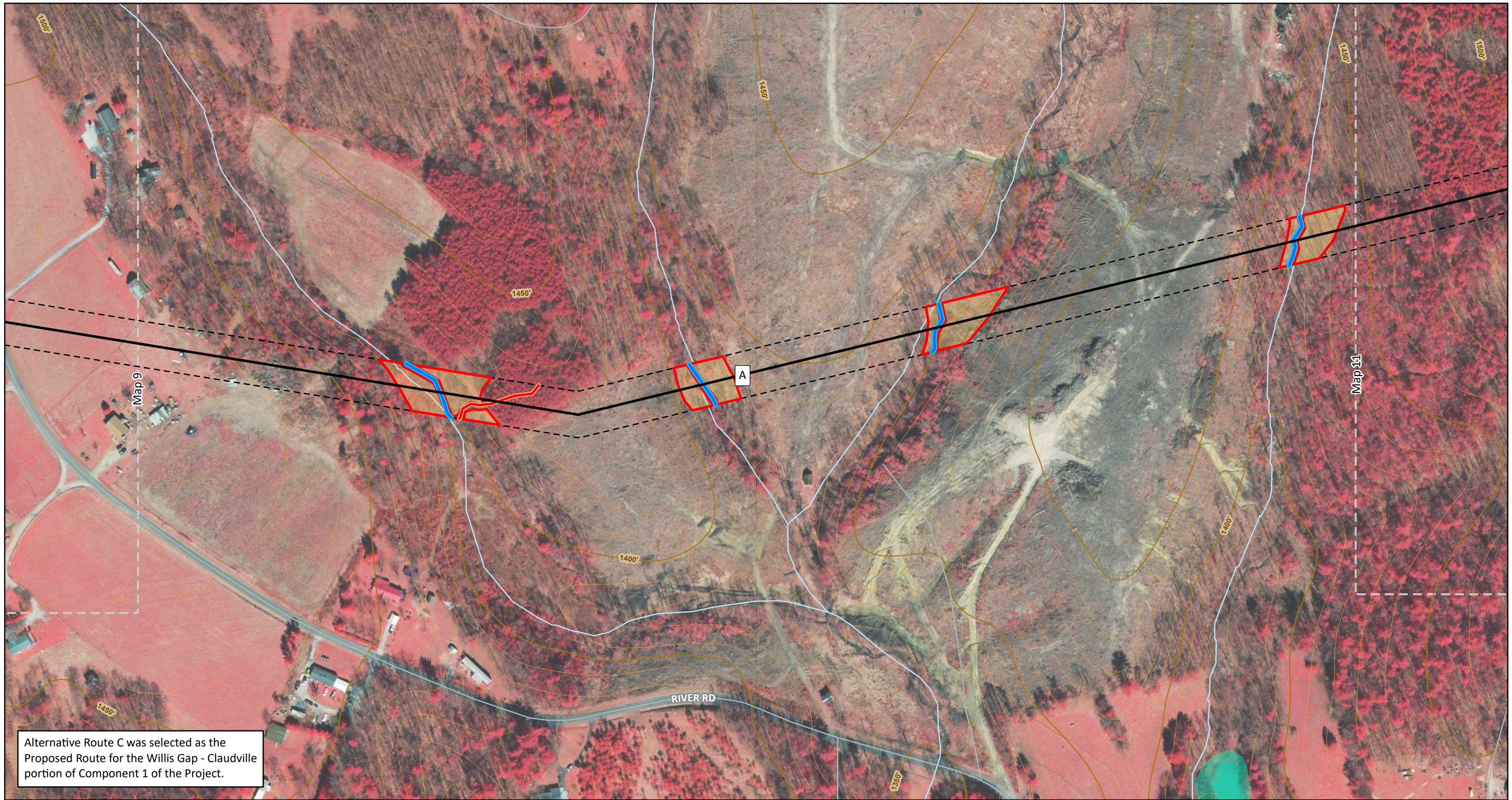
Date: 3/17/2023; Author: ckunde; Project: 159298

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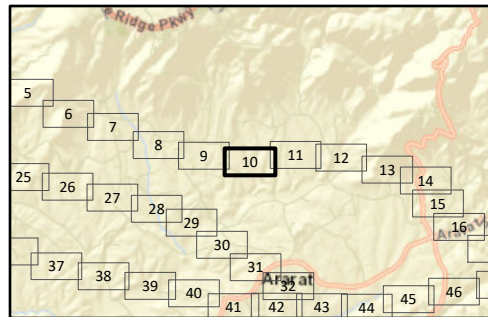
Attachment A:
Desktop Stream and Wetland Delineation
Map 9 of 51

Stuart Area Transmission Improvements Project:
Component 1:
Willis Gap - Claudville Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.

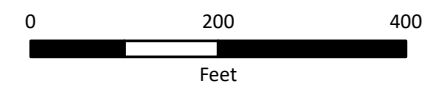


- | | | |
|--|---------------------|----------------------------|
| High Probability Stream | Right-of-Way (100') | County Boundary |
| Moderate Probability Stream | Road | Map Tile |
| Moderate Probability Wetland | Stream (NHD) | Index Contour (50') |
| Willis Gap - Claudville Alternative Routes | Wetland (NWI) | Intermediate Contour (10') |



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

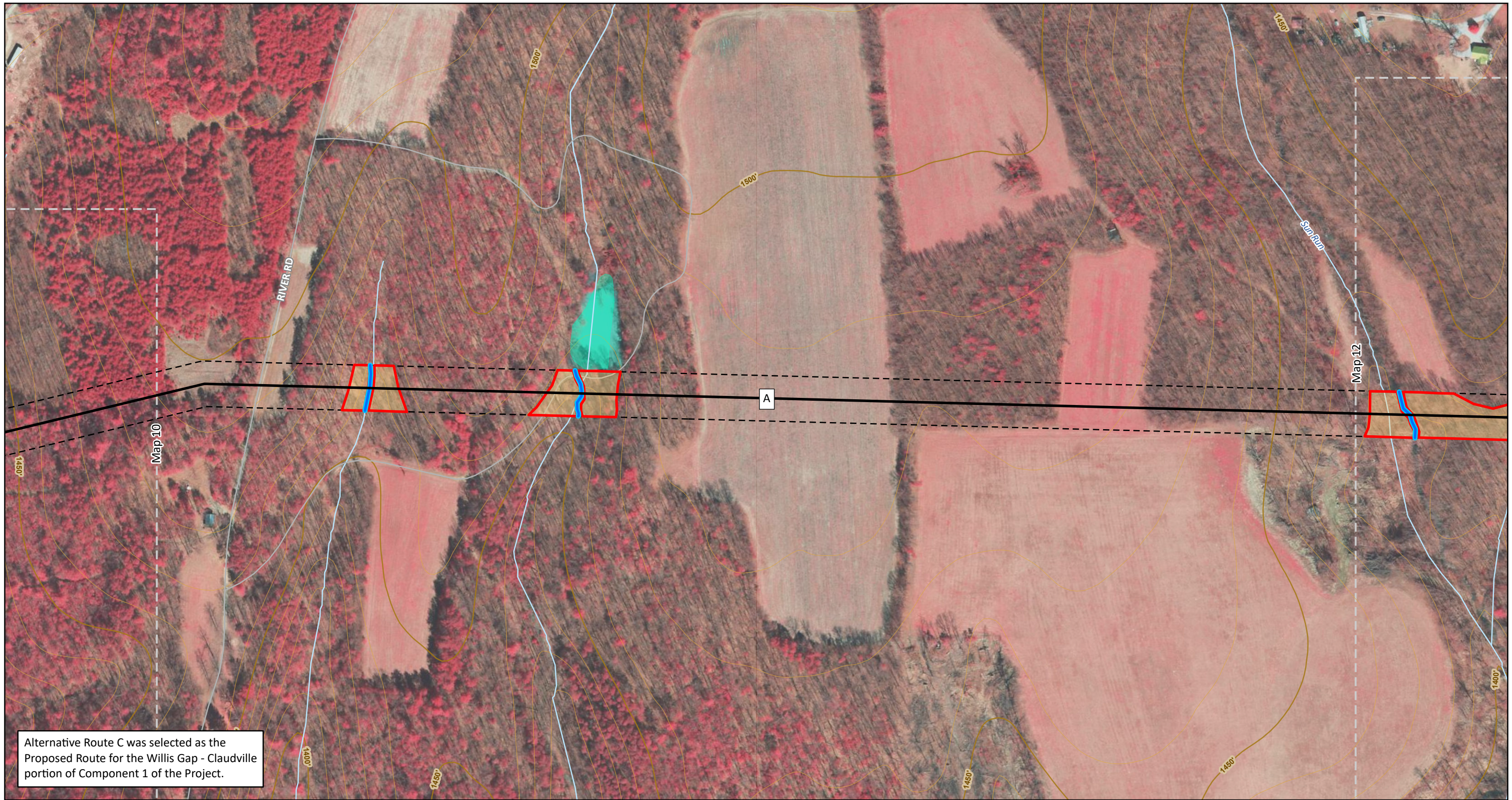


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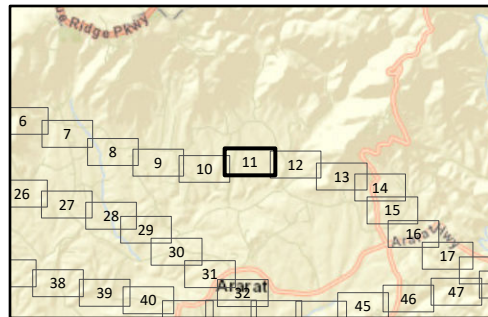
Attachment A:
Desktop Stream and Wetland Delineation
Map 10 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.

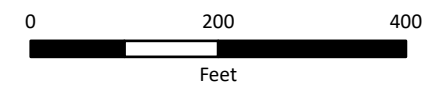


- | | | |
|--|----------------------------|---------------------|
| High Probability Stream | Right-of-Way (100') | County Boundary |
| Moderate Probability Wetland | Road | Map Tile |
| Willis Gap - Claudville Alternative Routes | Stream (NHD) | Index Contour (50') |
| Wetland (NWI) | Intermediate Contour (10') | |



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

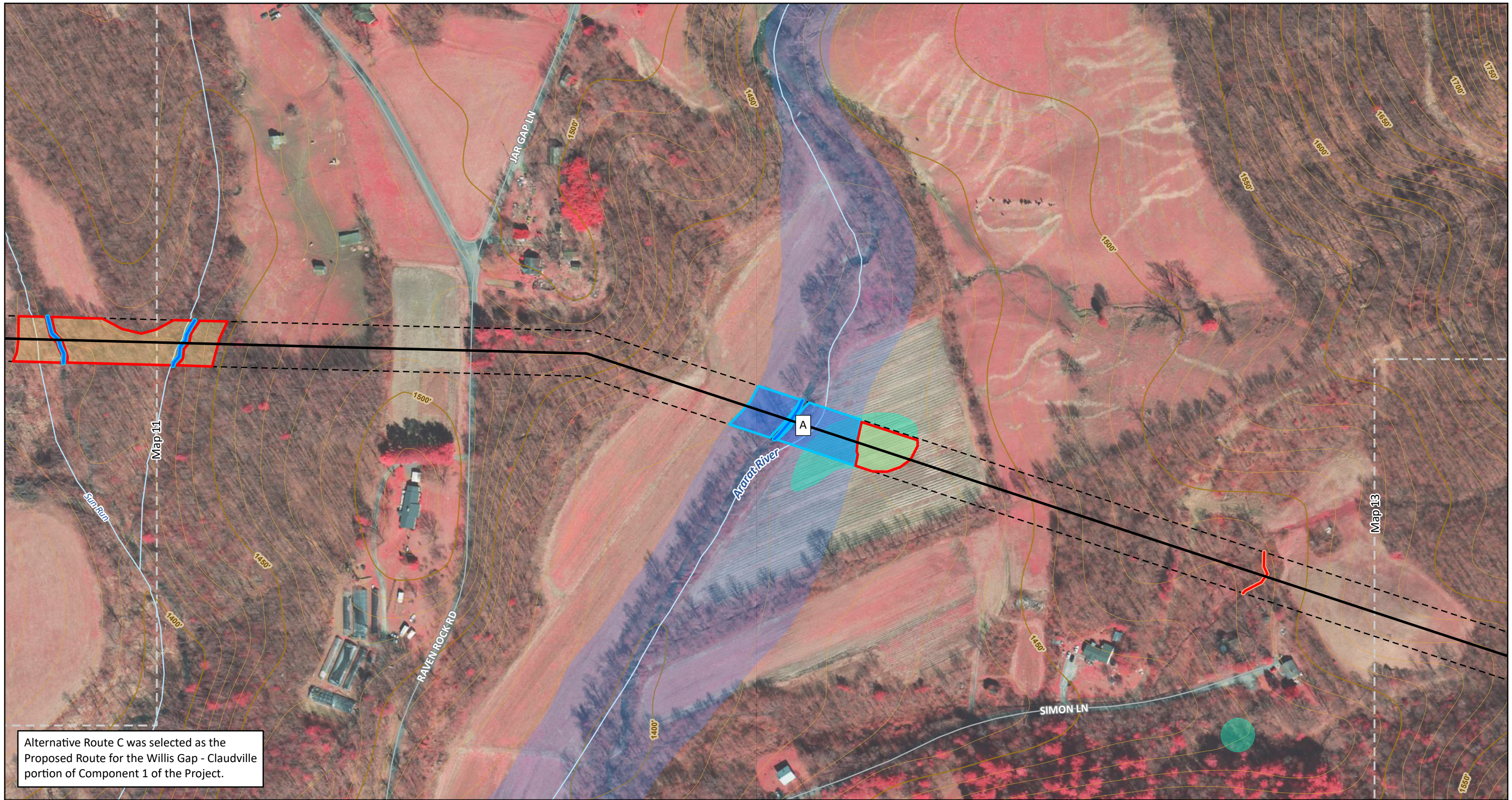


1" = 200'

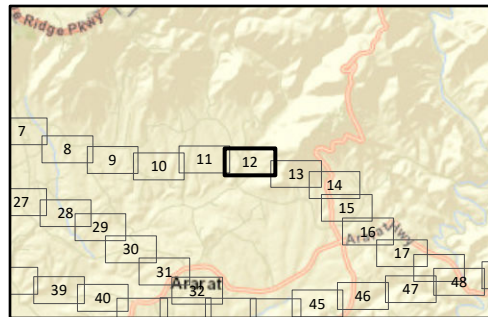
Attachment A:
Desktop Stream and Wetland Delineation
Map 11 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Stream	Road	Map Tile
High Probability Wetland	Stream (NHD)	Index Contour (50')
Moderate Probability Wetland	Wetland (NWI)	Intermediate Contour (10')
Willis Gap - Claudville Alternative Routes	Floodplain	

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

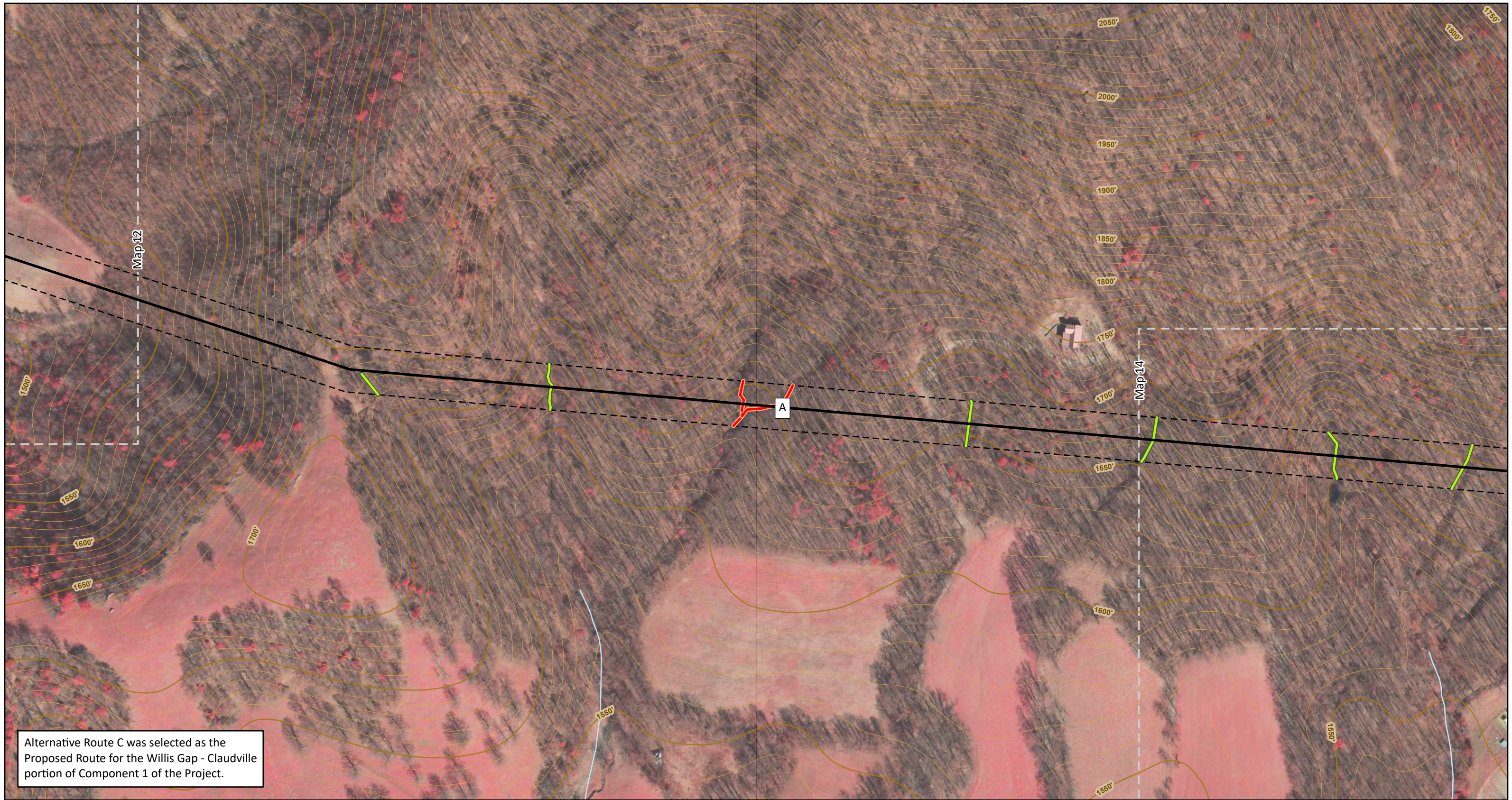
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Feet

1" = 200'

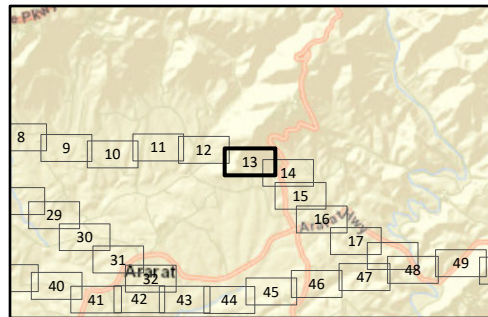
Attachment A:
Desktop Stream and Wetland Delineation
Map 12 of 51

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Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.

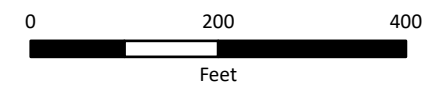


- Low Probability Stream
- Moderate Probability Stream
- Willis Gap - Claudville Alternative Routes
- Right-of-Way (100')
- Stream (NHD)
- County Boundary
- Map Tile
- Index Contour (50')
- Intermediate Contour (10')



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

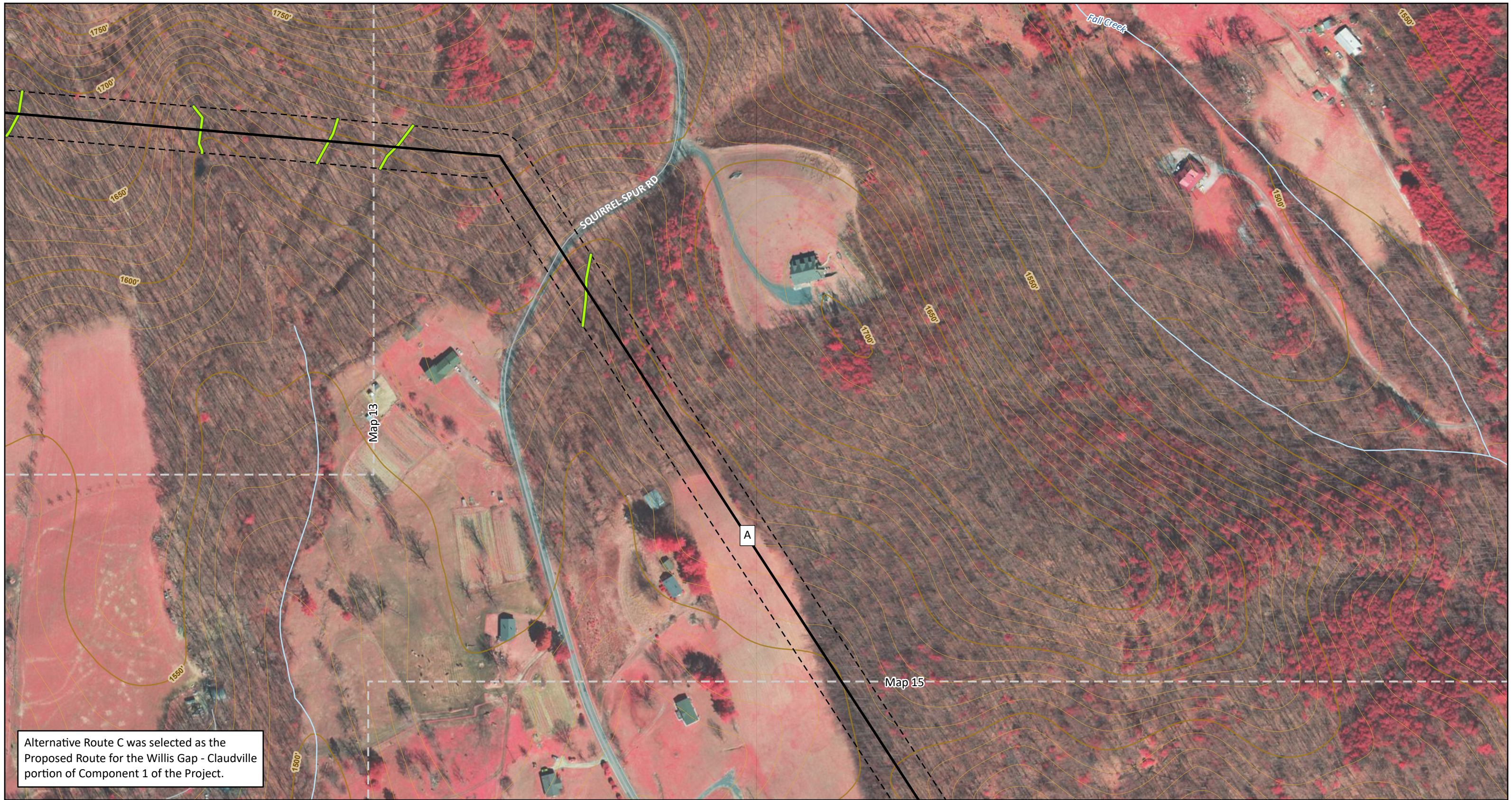


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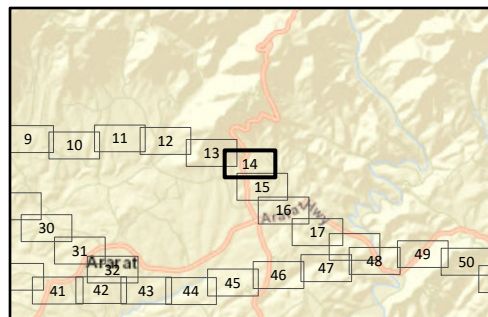
Attachment A:
Desktop Stream and Wetland Delineation
Map 13 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.

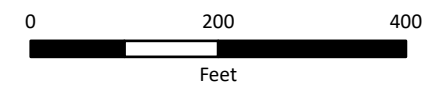


- Low Probability Stream
- Stream (NHD)
- Willis Gap - Claudville Alternative Routes
- County Boundary
- Right-of-Way (100')
- Map Tile
- Road
- Index Contour (50')
- Intermediate Contour (10')



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Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

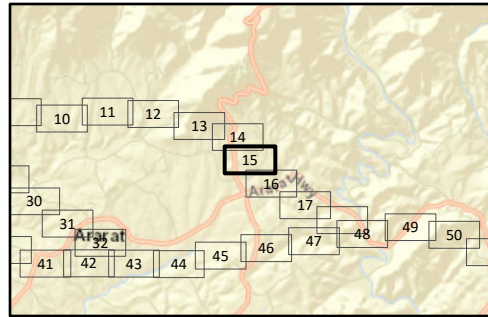
Attachment A:
Desktop Stream and Wetland Delineation
Map 14 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



- | | | |
|--|---------------------|----------------------------|
| Low Probability Stream | Right-of-Way (100') | County Boundary |
| Moderate Probability Stream | Road | Map Tile |
| Moderate Probability Wetland | Stream (NHD) | Index Contour (50') |
| Willis Gap - Claudville Alternative Routes | Wetland (NWI) | Intermediate Contour (10') |

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

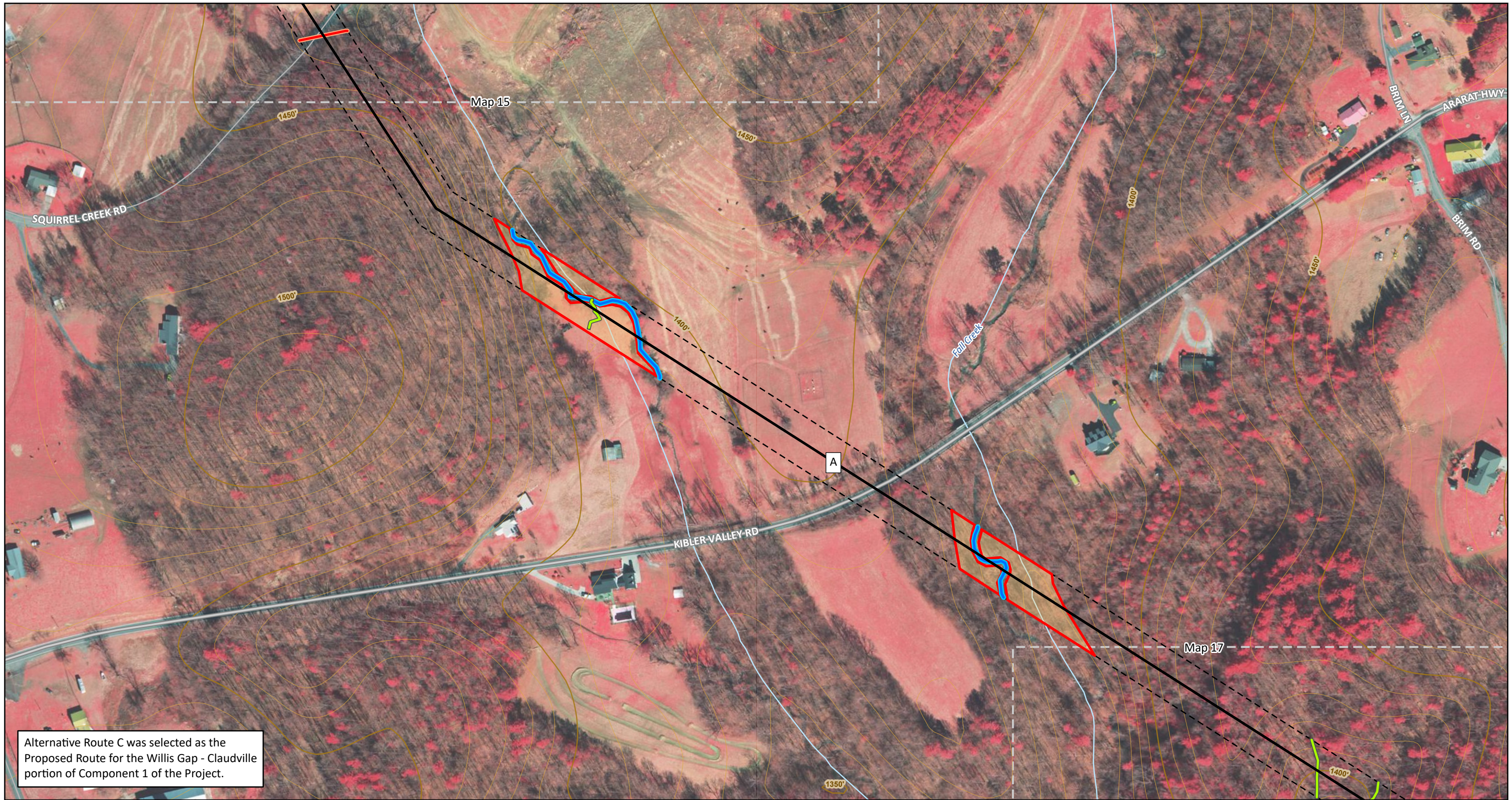
0 200 400
Feet

1" = 200'

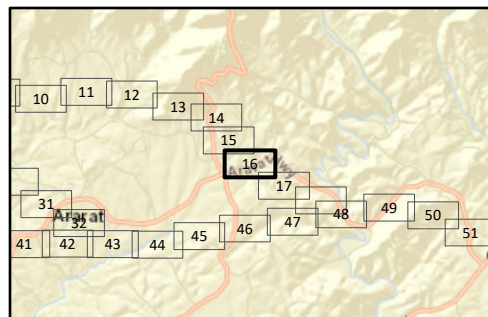
Attachment A:
Desktop Stream and Wetland Delineation
Map 15 of 51

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



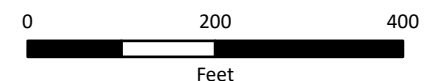
- High Probability Stream
- Low Probability Stream
- Moderate Probability Stream
- Moderate Probability Wetland

- Willis Gap - Claudville Alternative Routes
- Right-of-Way (100')
- Highway
- Road
- Stream (NHD)
- County Boundary
- Map Tile
- Index Contour (50')
- Intermediate Contour (10')



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

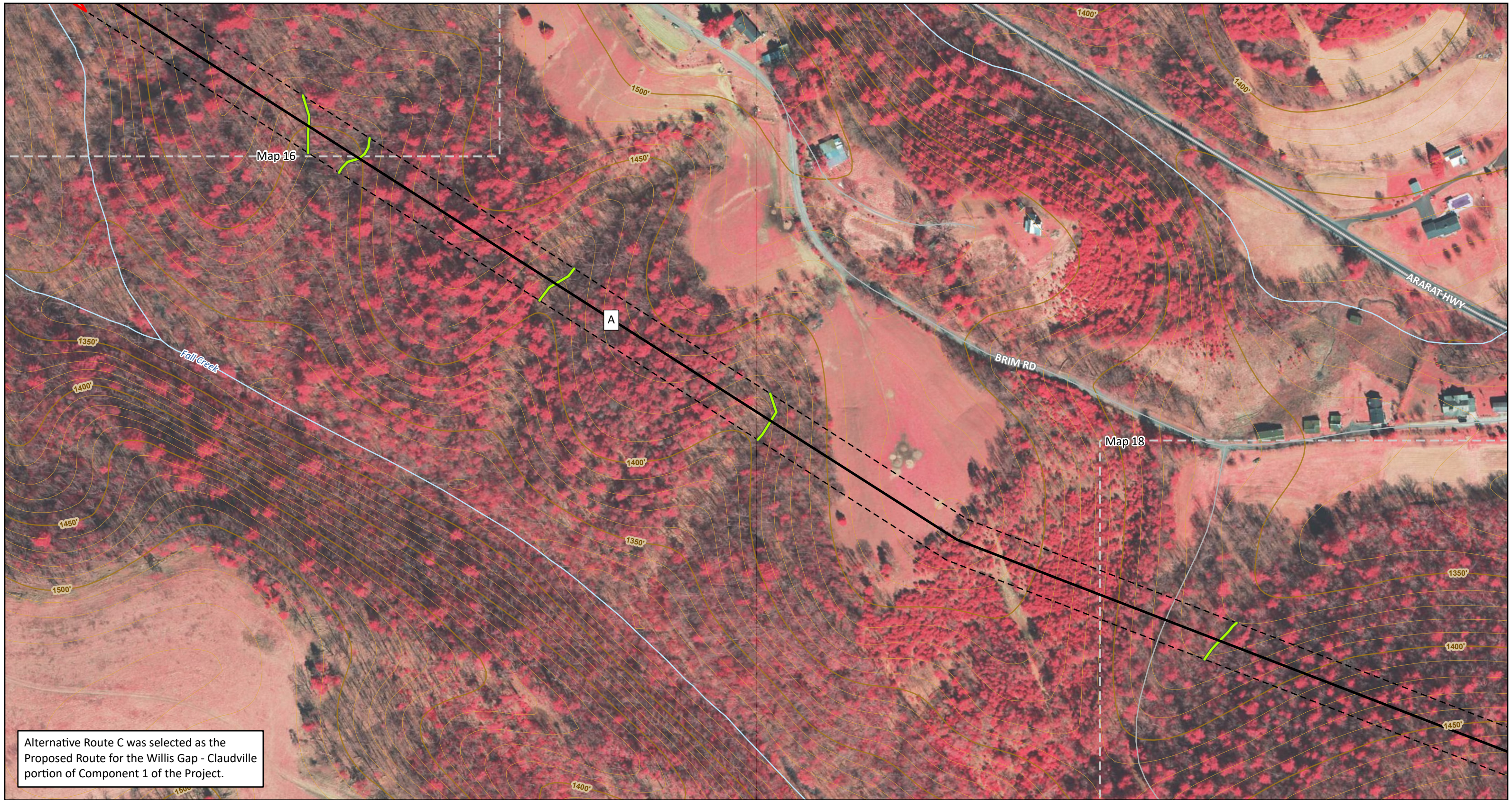


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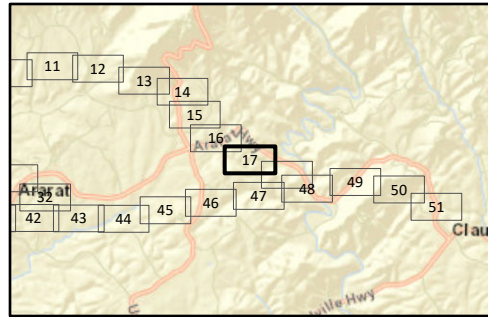
Attachment A:
Desktop Stream and Wetland Delineation
Map 16 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



Low Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Wetland	Highway	Map Tile
Willis Gap - Claudville Alternative Routes	Road	Index Contour (50')
	Stream (NHD)	Intermediate Contour (10')

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Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

1" = 200'

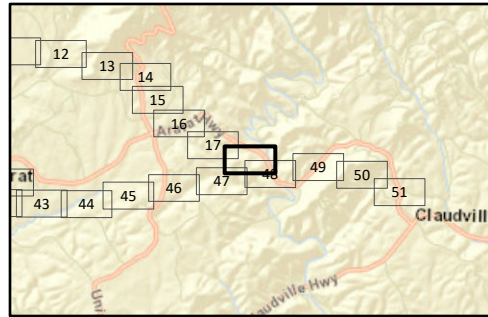
Attachment A:
Desktop Stream and Wetland Delineation
Map 17 of 51

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



Low Probability Stream	Highway	County Boundary
High Probability Wetland	Road	Map Tile
Willis Gap - Claudville Alternative Routes	Stream (NHD)	Index Contour (50')
Right-of-Way (100')	Floodplain	Intermediate Contour (10')

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

1" = 200'

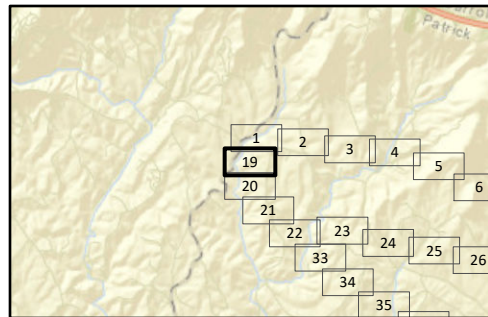
Attachment A:
Desktop Stream and Wetland Delineation
Map 18 of 51

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



Low Probability Stream	Huffman - Willis Gap 138 kV Line	County Boundary
Moderate Probability Stream	Road	Map Tile
Willis Gap - Claudville Alternative Routes	Stream (NHD)	Index Contour (50')
Right-of-Way (100')	Wetland (NWI)	Intermediate Contour (10')
	Hydric Soils	

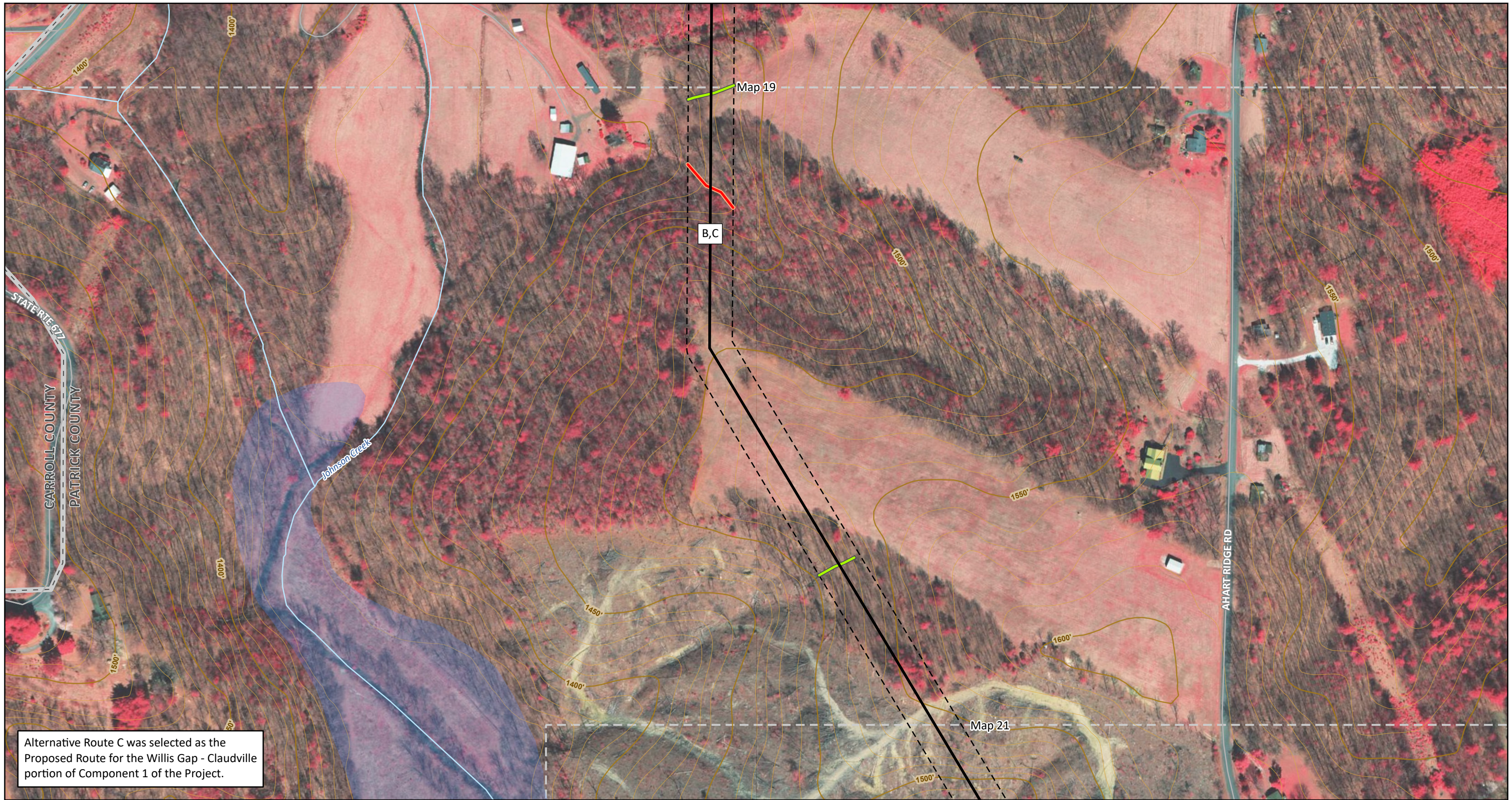
Carroll & Patrick Counties,
Virginia
Date: 3/17/2023; Author: ckunde; Project: 159298

1" = 200'

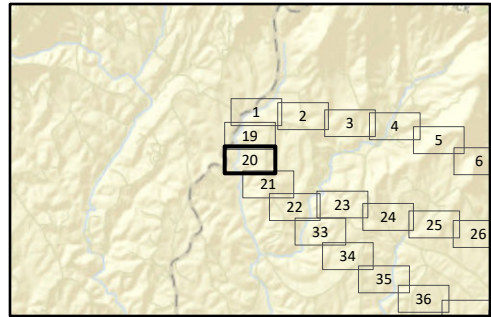
Attachment A:
Desktop Stream and Wetland Delineation
Map 19 of 51

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



Low Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Stream	Road	Map Tile
Willis Gap - Claudville Alternative Routes	Stream (NHD)	Index Contour (50')
	Floodplain	Intermediate Contour (10')


Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

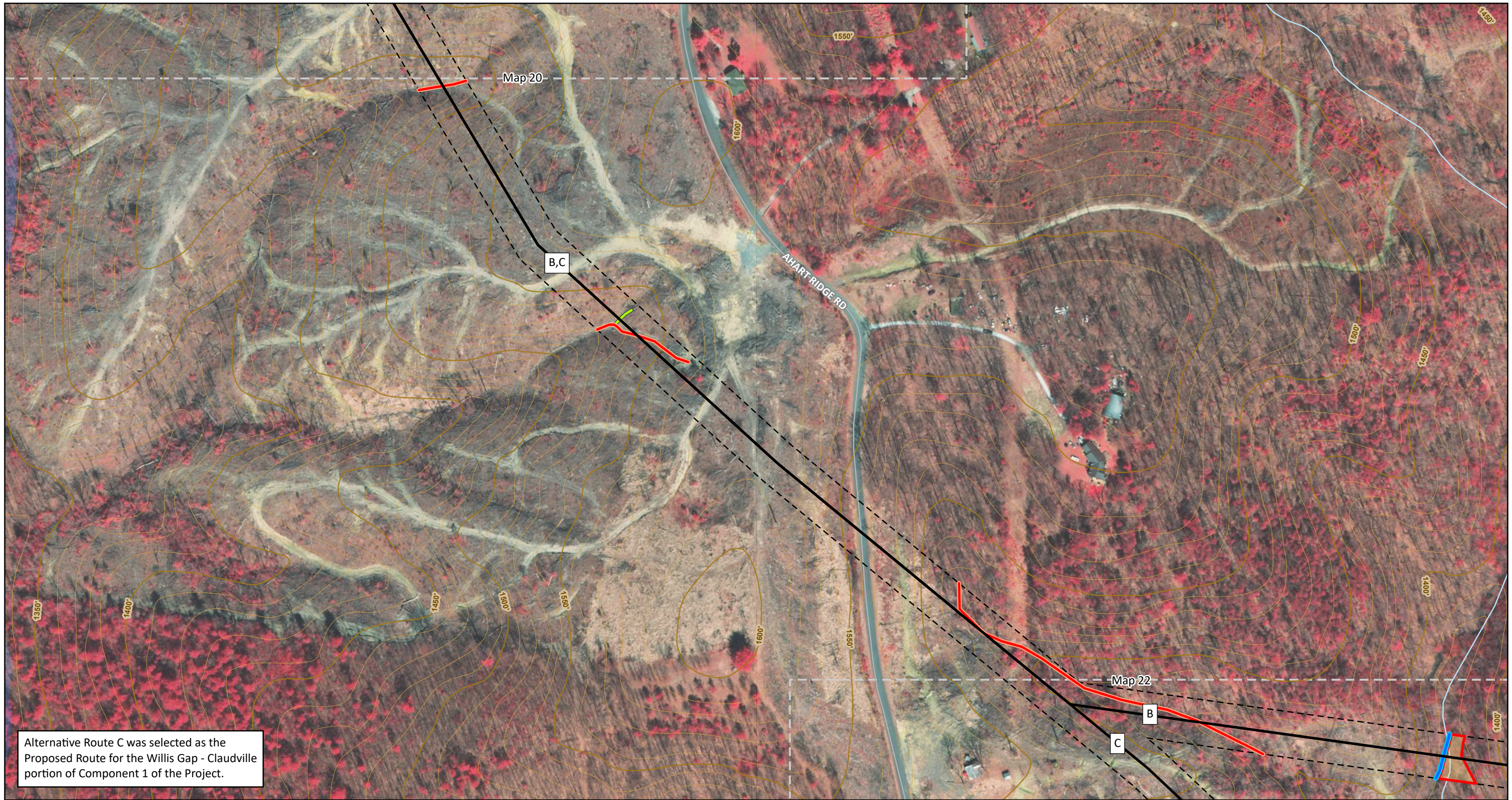
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Attachment A:
Desktop Stream and Wetland Delineation
Map 20 of 51

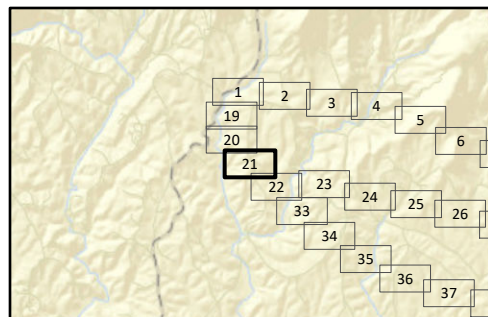


Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



- High Probability Stream
- Low Probability Stream
- Moderate Probability Stream
- Moderate Probability Wetland

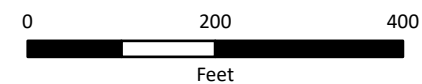
- Willis Gap - Claudville Alternative Routes
- Right-of-Way (100')
- Road
- Stream (NHD)

- Floodplain
- County Boundary
- Map Tile
- Index Contour (50')
- Intermediate Contour (10')



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

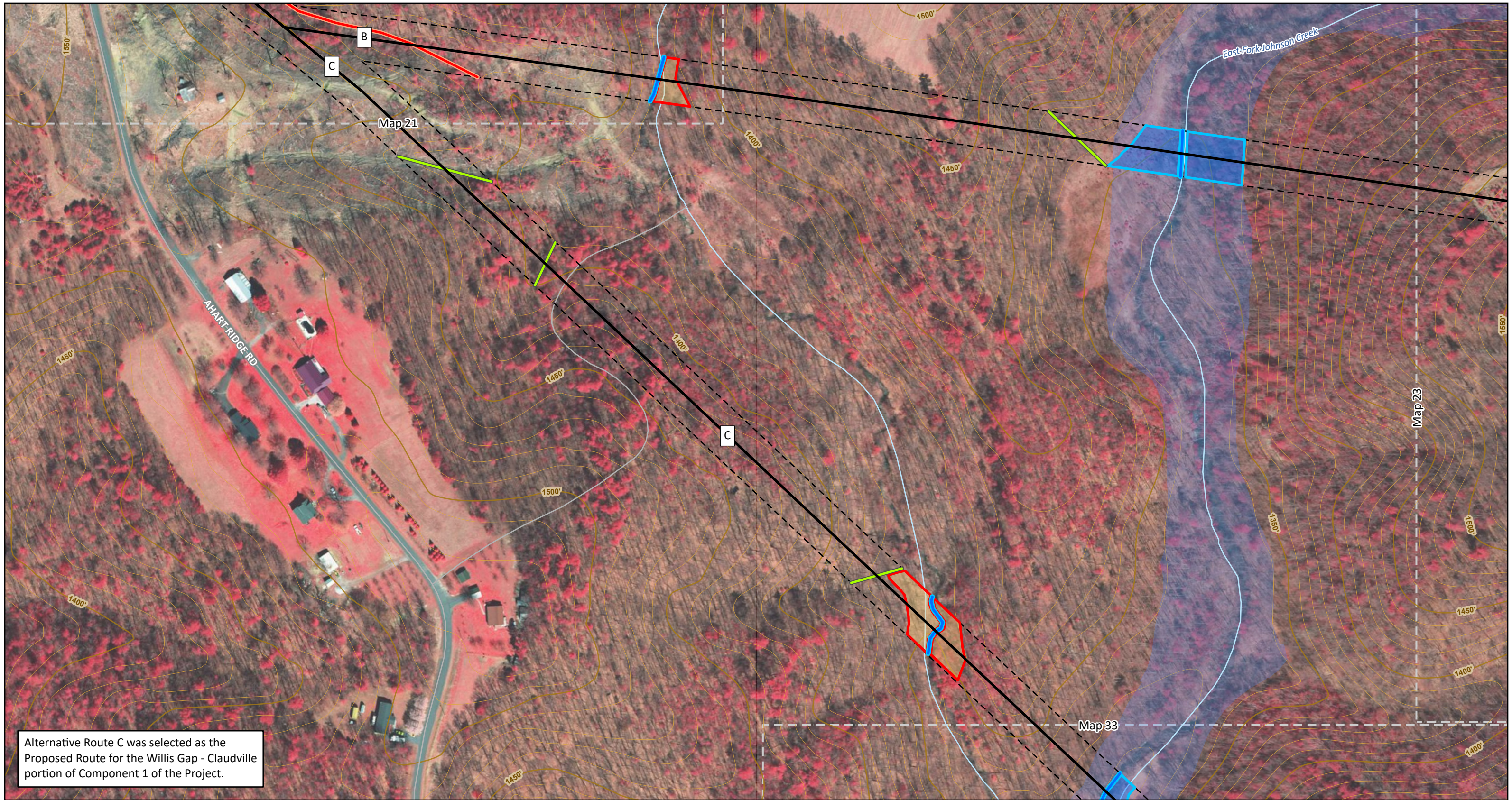


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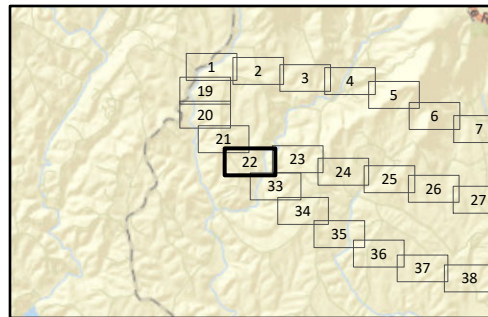
Attachment A:
Desktop Stream and Wetland Delineation
Map 21 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Willis Gap - Claudville Alternative Routes	Floodplain
Low Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Stream	Road	Map Tile
High Probability Wetland	Stream (NHD)	Index Contour (50')
Moderate Probability Wetland		Intermediate Contour (10')

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

1" = 200'

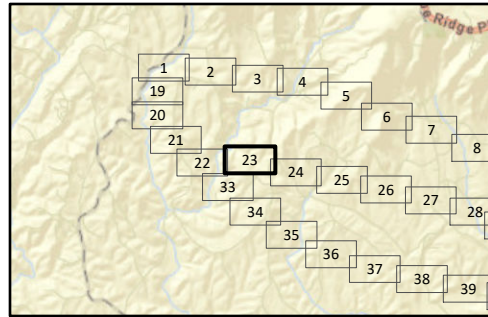
Attachment A:
Desktop Stream and Wetland Delineation
Map 22 of 51

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Stream	Road	Map Tile
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
Willis Gap - Claudville Alternative Routes	Wetland (NWI)	Intermediate Contour (10')
	Floodplain	

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

1" = 200'

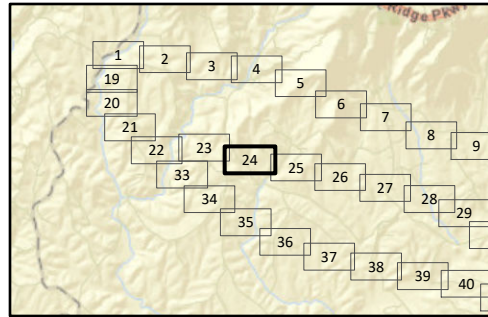
Attachment A:
Desktop Stream and Wetland Delineation
Map 23 of 51

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Willis Gap - Claudville Alternative Routes	Wetland (NWI)
Low Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Wetland	Road	Map Tile
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
		Intermediate Contour (10')

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

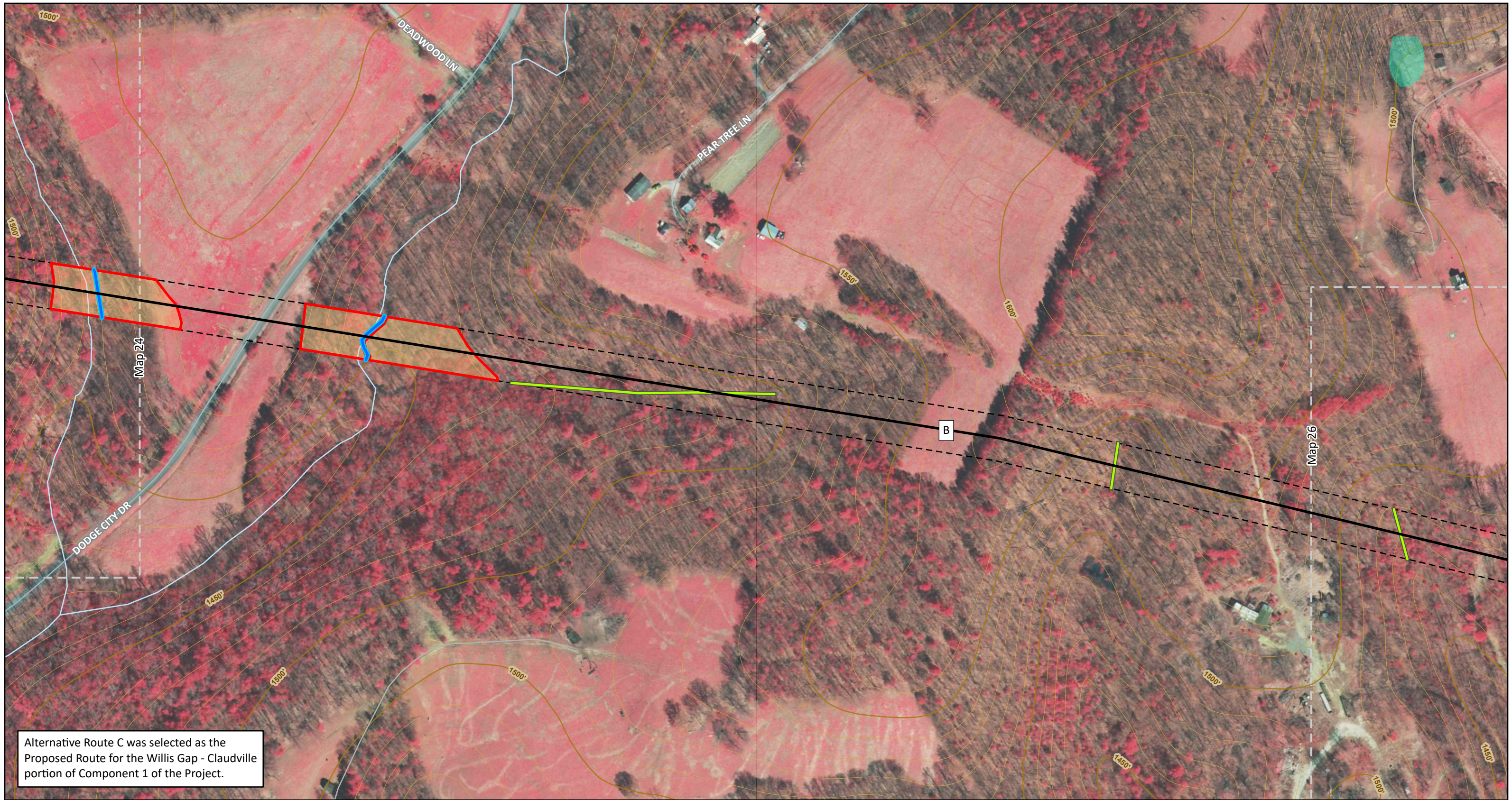
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Feet

1" = 200'

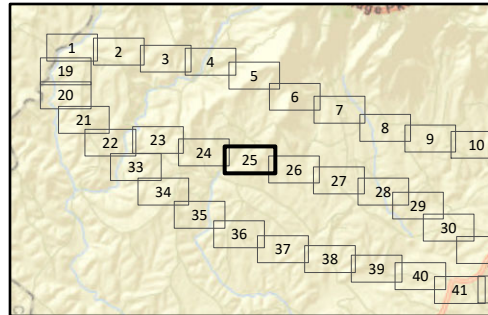
Attachment A:
Desktop Stream and Wetland Delineation
Map 24 of 51

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



- High Probability Stream
- Low Probability Stream
- Moderate Probability Wetland
- Willis Gap - Claudville Alternative Routes
- Right-of-Way (100')
- Road
- Stream (NHD)
- Wetland (NWI)
- County Boundary
- Map Tile
- Index Contour (50')
- Intermediate Contour (10')

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

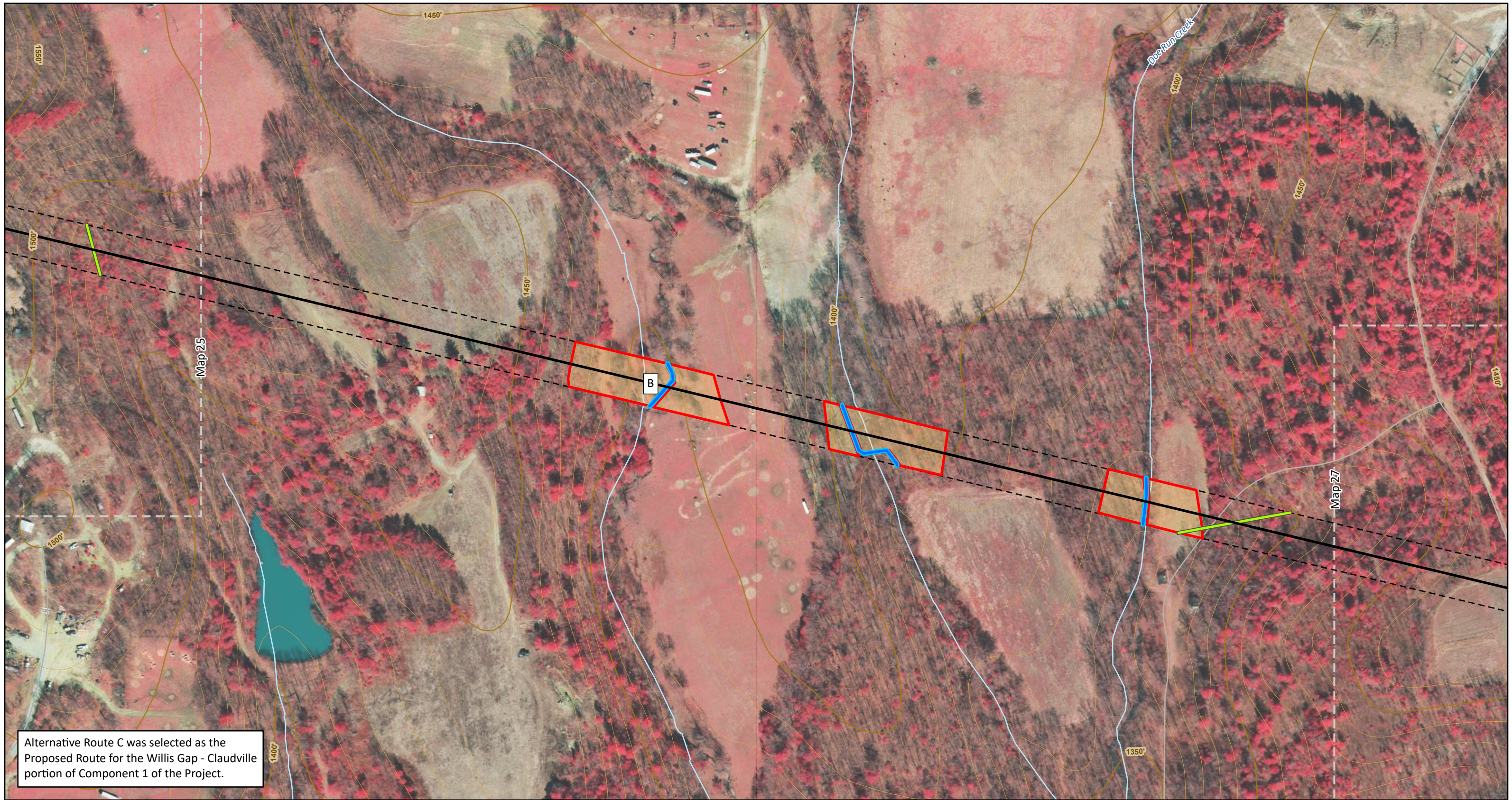
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Feet

1" = 200'

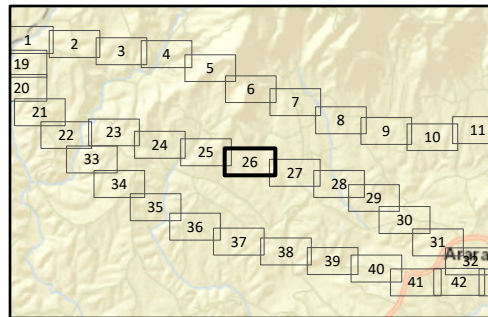
Attachment A:
Desktop Stream and Wetland Delineation
Map 25 of 51

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



- High Probability Stream
- Low Probability Stream
- Moderate Probability Wetland
- Willis Gap - Claudville Alternative Routes

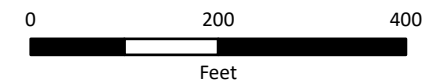
- Right-of-Way (100')
- Road
- Stream (NHD)
- County Boundary

- Map Tile
- Index Contour (50')
- Intermediate Contour (10')



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Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

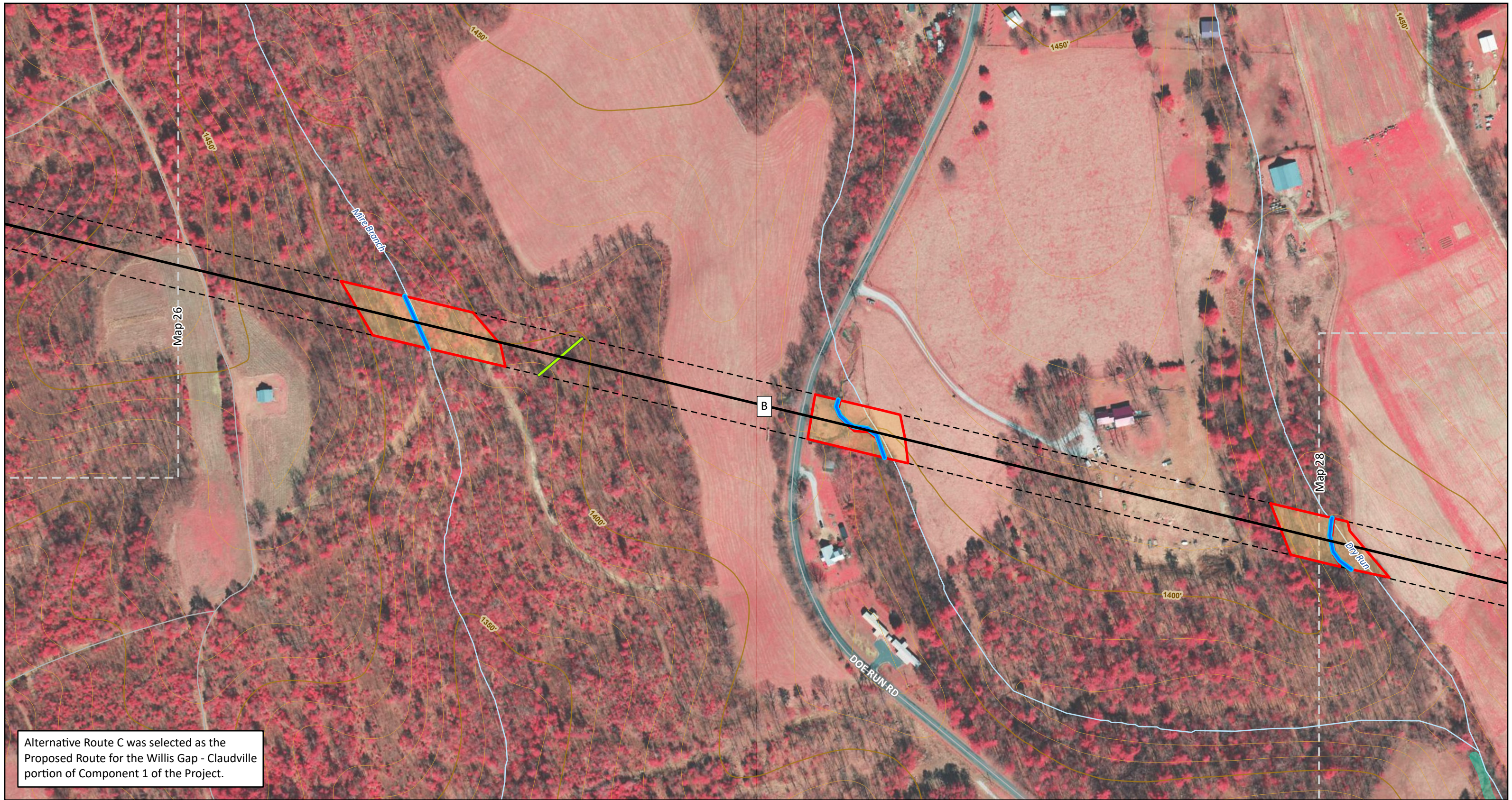


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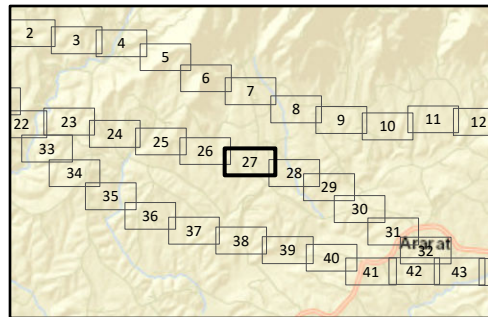
Attachment A:
Desktop Stream and Wetland Delineation
Map 26 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.

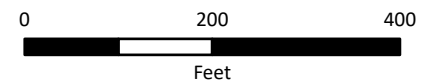


- | | | |
|--|---------------------|----------------------------|
| High Probability Stream | Right-of-Way (100') | County Boundary |
| Low Probability Stream | Road | Map Tile |
| Moderate Probability Wetland | Stream (NHD) | Index Contour (50') |
| Willis Gap - Claudville Alternative Routes | Wetland (NWI) | Intermediate Contour (10') |



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

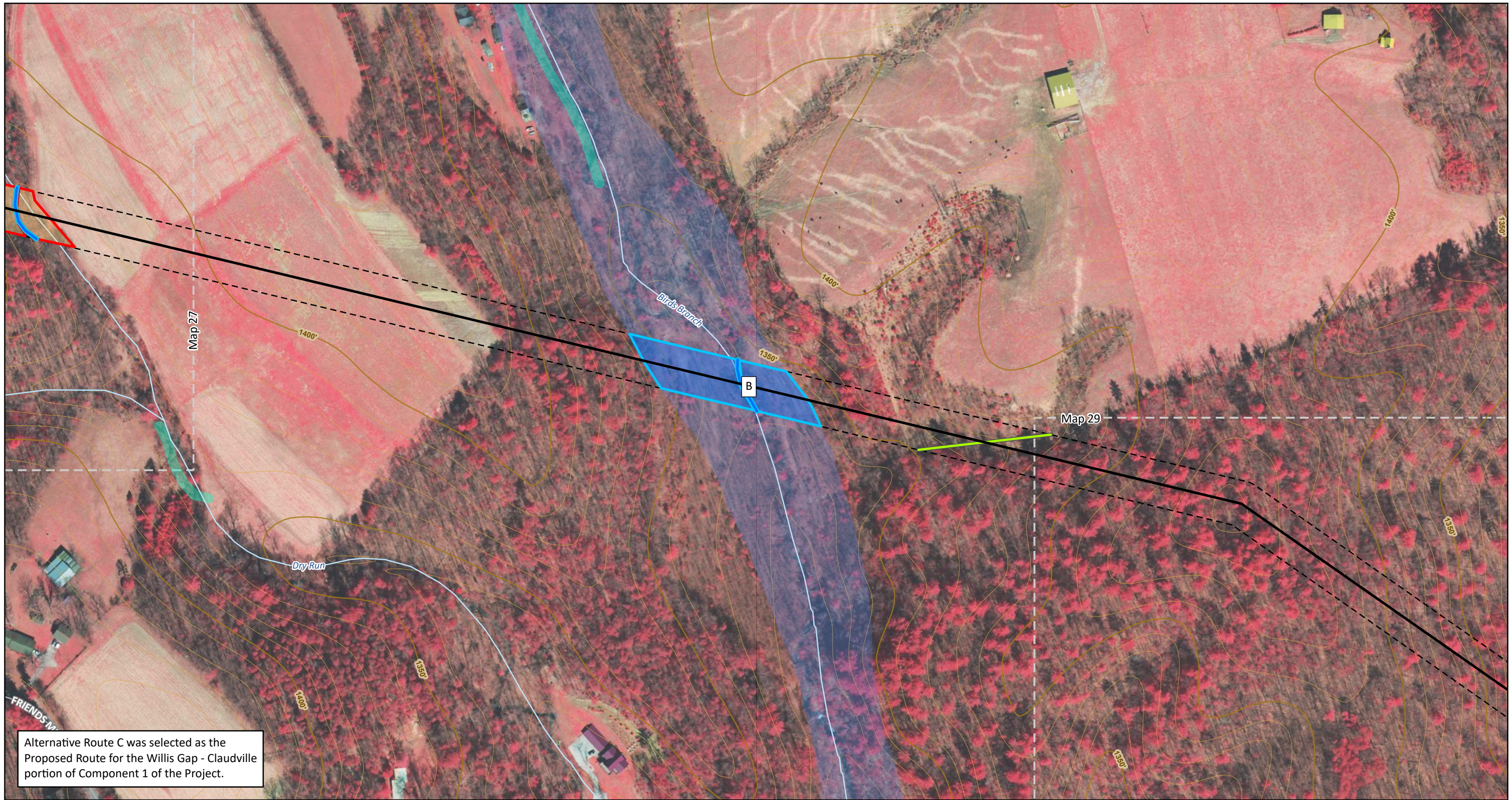


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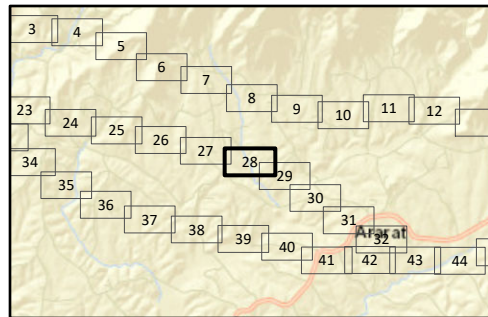
Attachment A:
Desktop Stream and Wetland Delineation
Map 27 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.

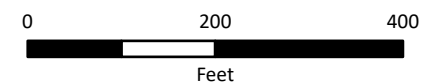


- | | | |
|--|---------------------|----------------------------|
| High Probability Stream | Right-of-Way (100') | County Boundary |
| Low Probability Stream | Road | Map Tile |
| High Probability Wetland | Stream (NHD) | Index Contour (50') |
| Moderate Probability Wetland | Wetland (NWI) | Intermediate Contour (10') |
| Willis Gap - Claudville Alternative Routes | Floodplain | |



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

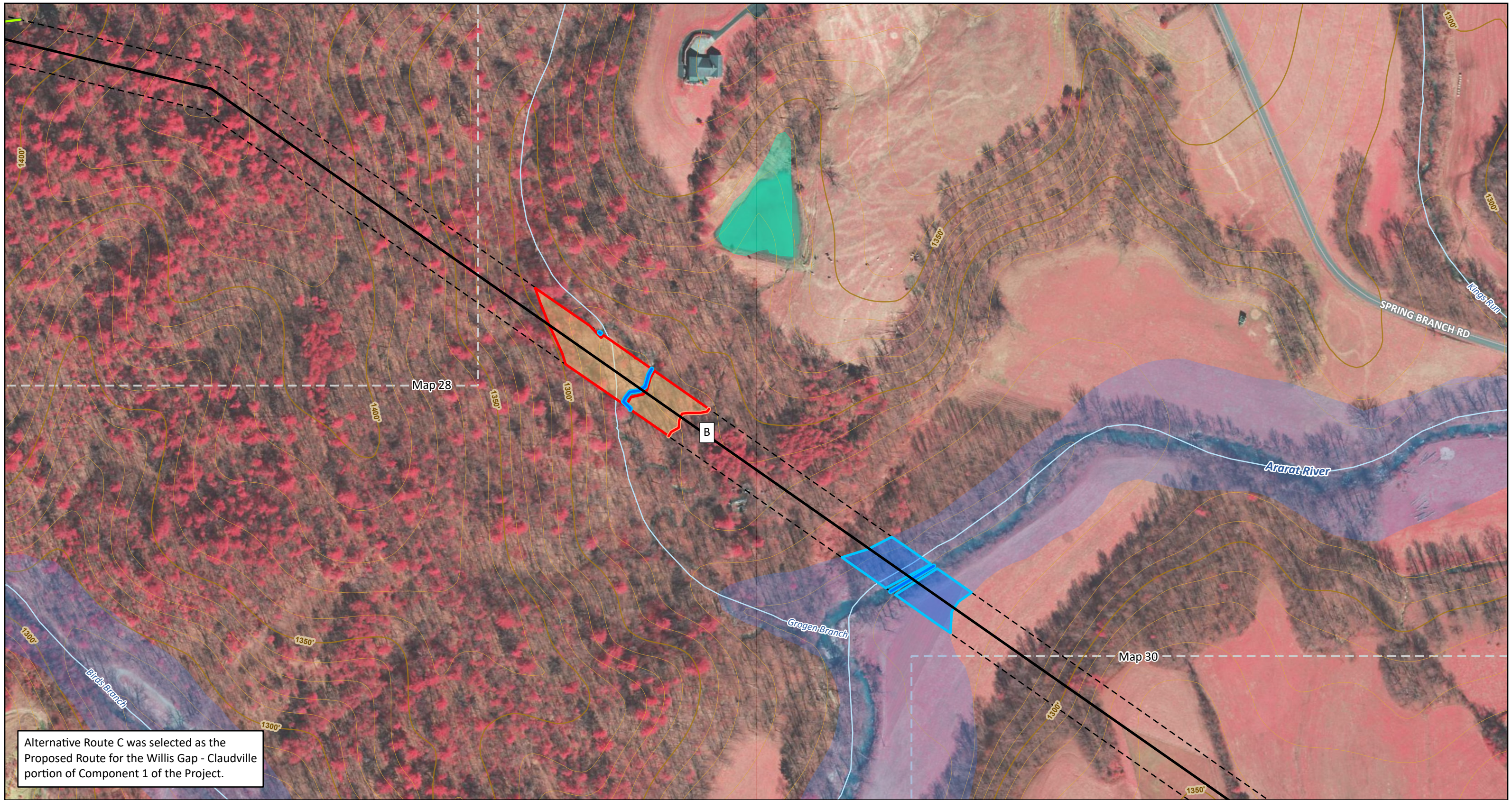


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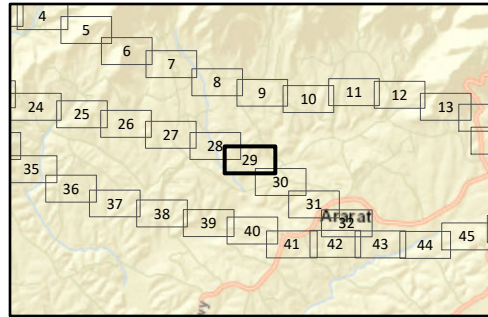
Attachment A:
Desktop Stream and Wetland Delineation
Map 28 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Willis Gap - Claudville Alternative Routes	Floodplain
Low Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Stream	Road	Map Tile
High Probability Wetland	Stream (NHD)	Index Contour (50')
Moderate Probability Wetland	Wetland (NWI)	Intermediate Contour (10')

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Virginia

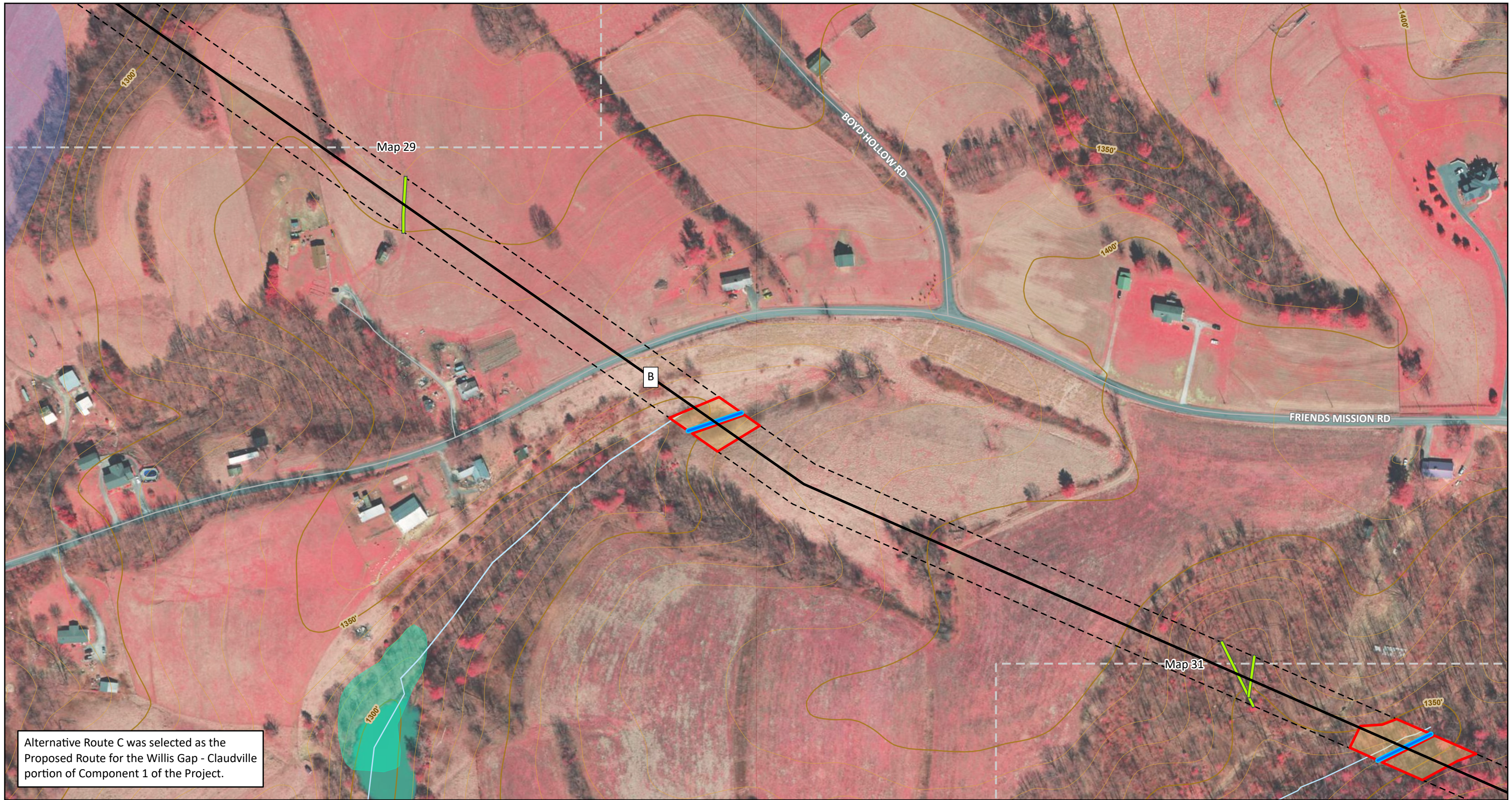
Date: 3/17/2023; Author: ckunde; Project: 159298

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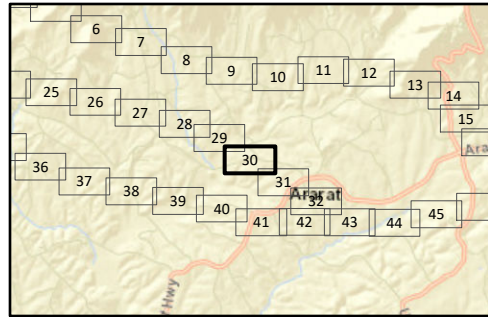
Attachment A:
Desktop Stream and Wetland Delineation
Map 29 of 51

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Stream	Road	Map Tile
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
Willis Gap - Claudville Alternative Routes	Wetland (NWI)	Intermediate Contour (10')
	Floodplain	

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

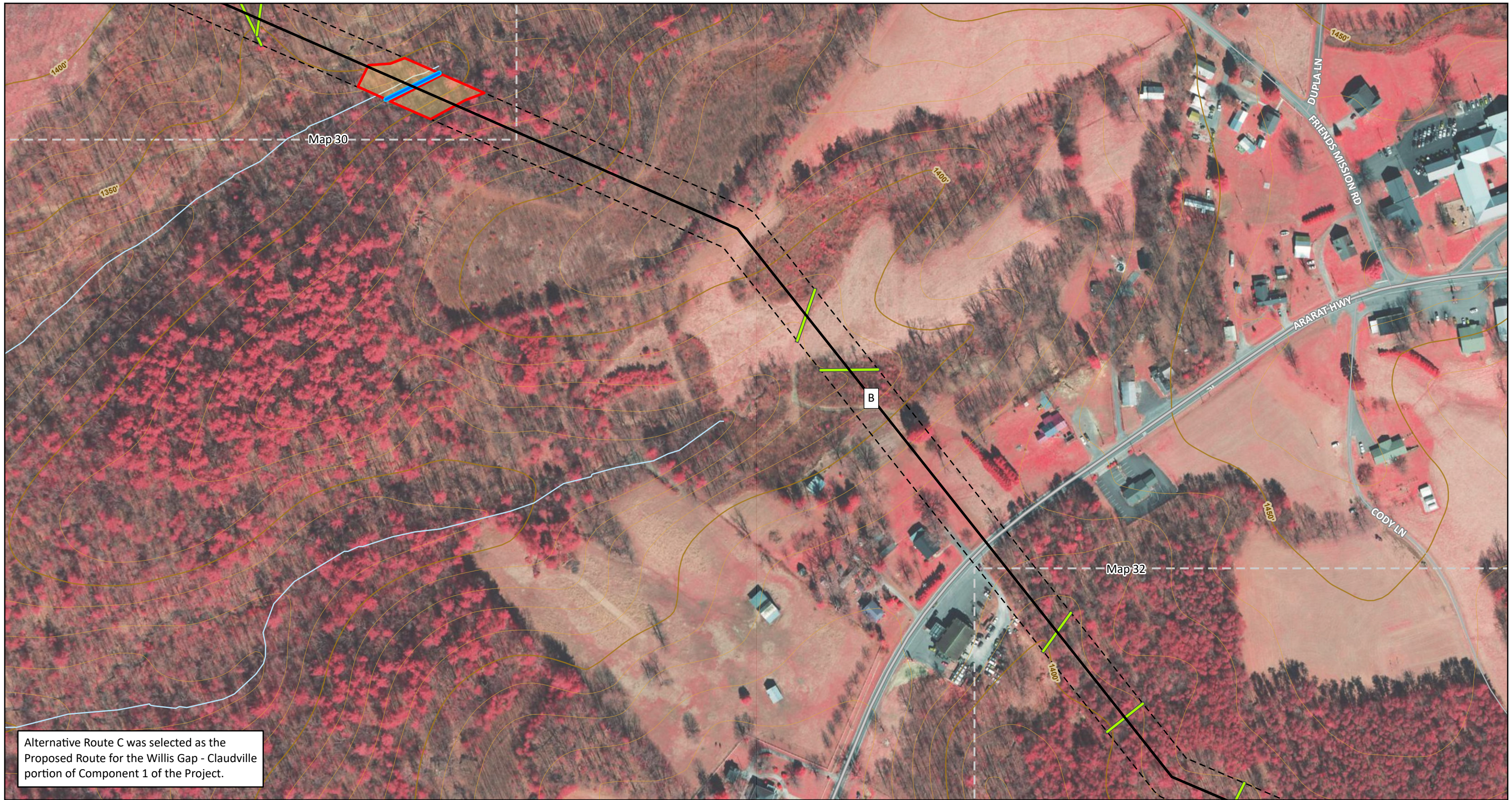
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Feet

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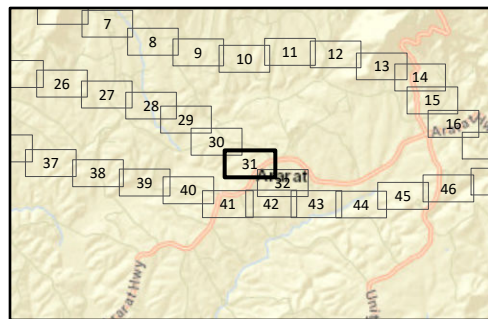
Attachment A:
Desktop Stream and Wetland Delineation
Map 30 of 51

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.

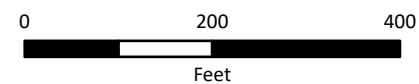


- | | | |
|--|---------------------|----------------------------|
| High Probability Stream | Right-of-Way (100') | County Boundary |
| Low Probability Stream | Highway | Map Tile |
| Moderate Probability Wetland | Road | Index Contour (50') |
| Willis Gap - Claudville Alternative Routes | Stream (NHD) | Intermediate Contour (10') |



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Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

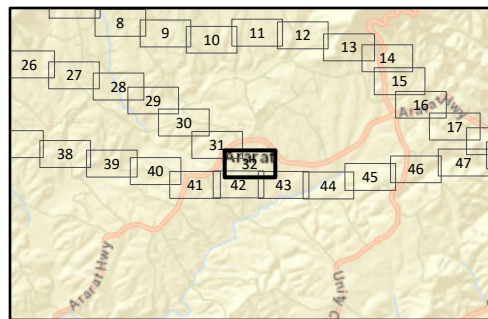
Attachment A:
Desktop Stream and Wetland Delineation
Map 31 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Map Tile
Low Probability Stream	Road	Index Contour (50')
Moderate Probability Wetland	Stream (NHD)	Intermediate Contour (10')
Willis Gap - Claudville Alternative Routes	County Boundary	

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Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

1" = 200'

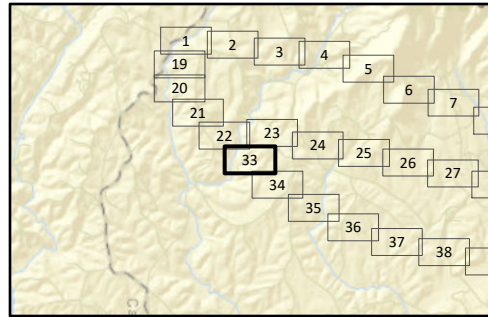
Attachment A:
Desktop Stream and Wetland Delineation
Map 32 of 51

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

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Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Willis Gap - Claudville Alternative Routes	Floodplain
Low Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Stream	Road	Map Tile
High Probability Wetland	Stream (NHD)	Index Contour (50')
Moderate Probability Wetland	Wetland (NWI)	Intermediate Contour (10')

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

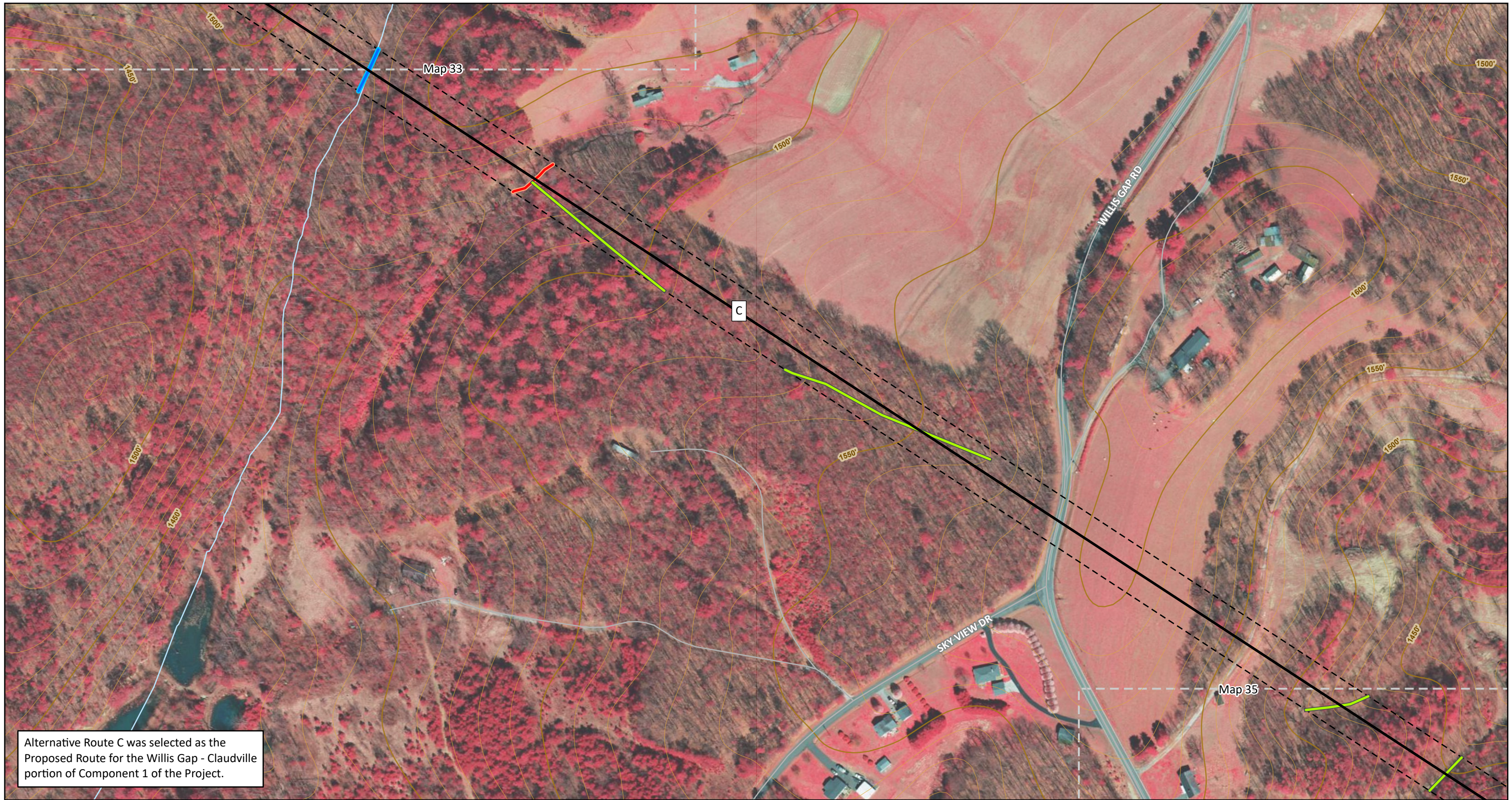
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Feet

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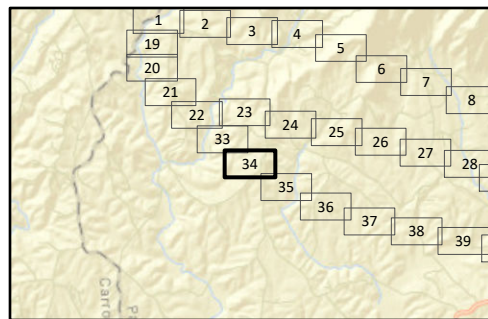
Attachment A:
Desktop Stream and Wetland Delineation
Map 33 of 51

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Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Map Tile
Low Probability Stream	Road	Index Contour (50')
Moderate Probability Stream	Stream (NHD)	Intermediate Contour (10')
Willis Gap - Claudville Alternative Routes	County Boundary	

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

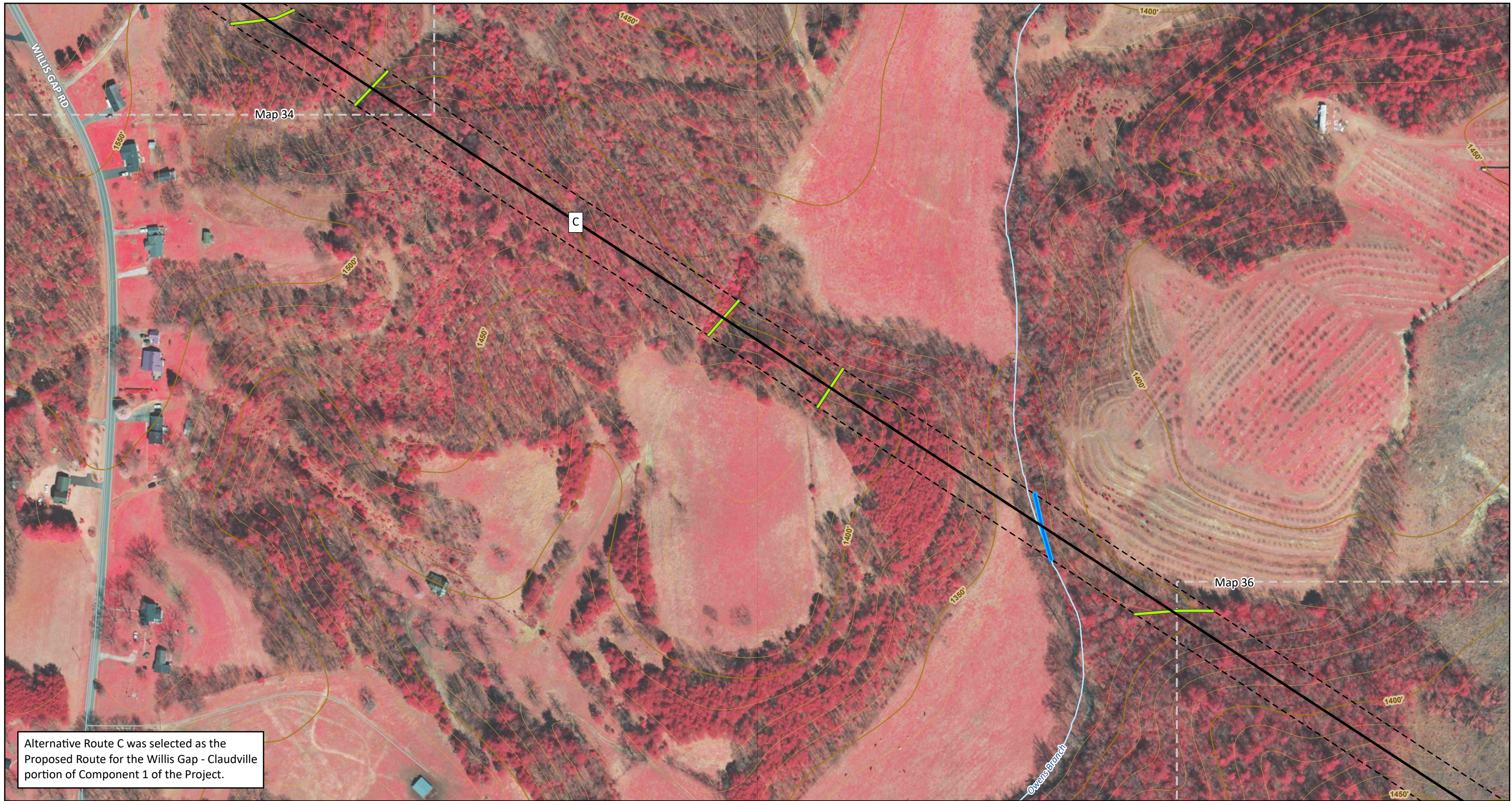
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Feet

1" = 200'

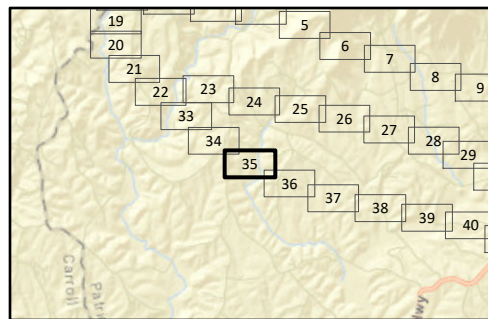
Attachment A:
Desktop Stream and Wetland Delineation
Map 34 of 51



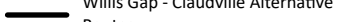
An AEP Company

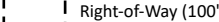



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes






Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



-  High Probability Stream
-  Low Probability Stream
-  Willis Gap - Claudville Alternative Routes

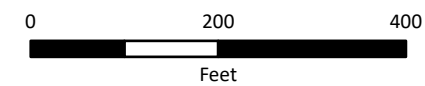
-  Right-of-Way (100')
-  Road
-  Stream (NHD)
-  County Boundary

-  Map Tile
-  Index Contour (50')
-  Intermediate Contour (10')



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Virginia

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1" = 200'

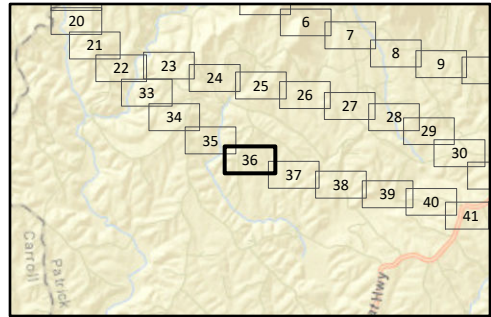
Attachment A:
Desktop Stream and Wetland Delineation
Map 35 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Stream	Road	Map Tile
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
Willis Gap - Claudville Alternative Routes	Wetland (NWI)	Intermediate Contour (10')

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

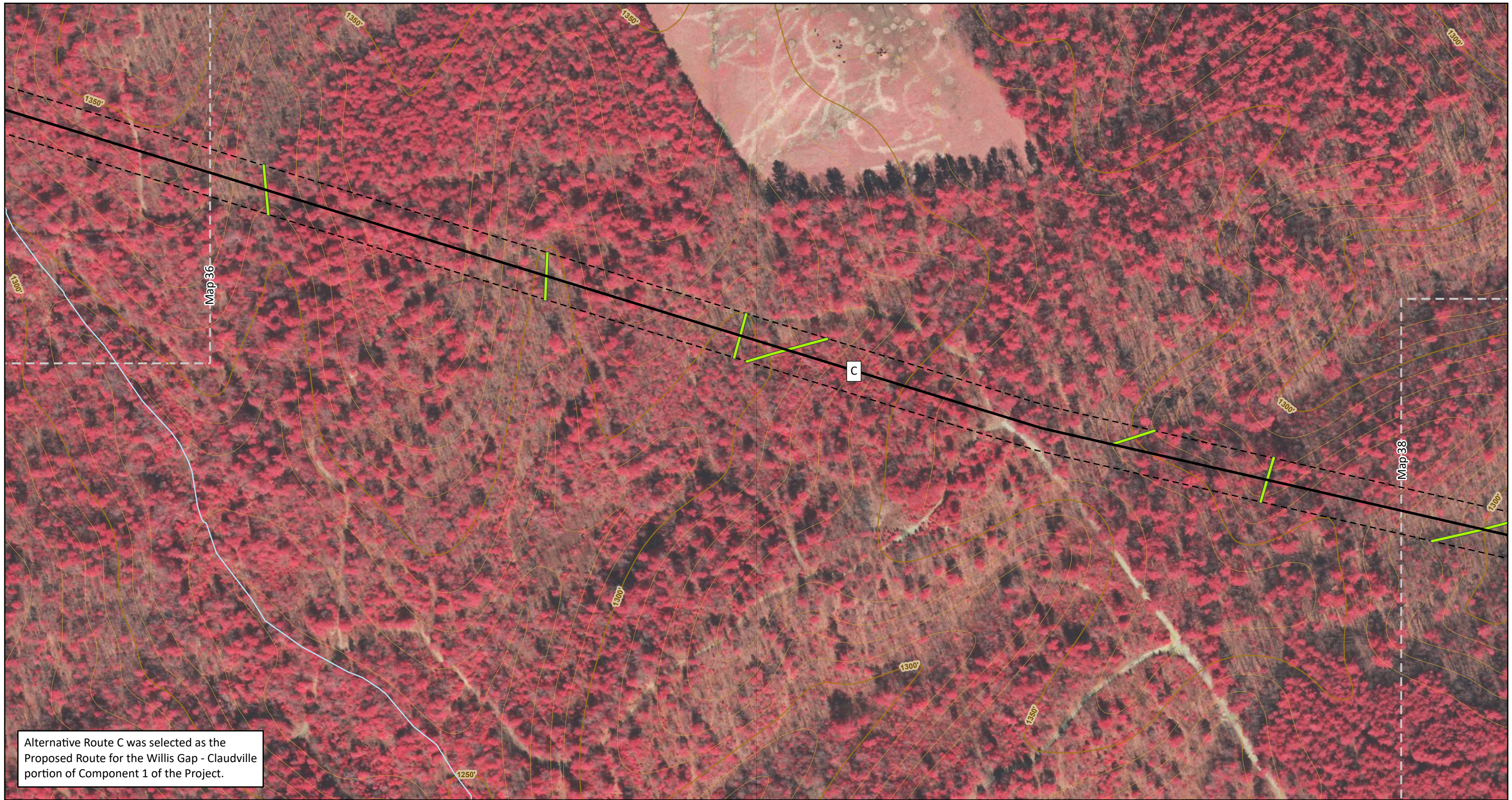
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Feet

1" = 200'

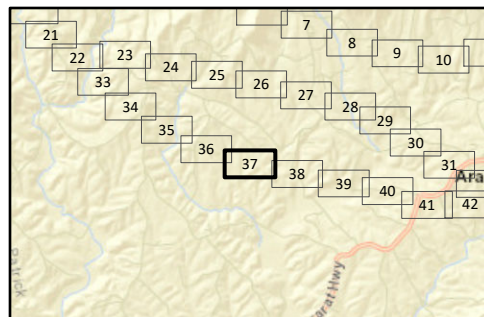
Attachment A:
Desktop Stream and Wetland Delineation
Map 36 of 51

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.

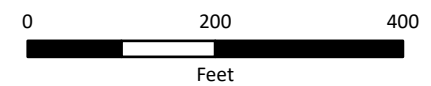


- Low Probability Stream
- Moderate Probability Wetland
- Willis Gap - Claudville Alternative Routes
- Right-of-Way (100')
- Stream (NHD)
- County Boundary
- Map Tile
- Index Contour (50')
- Intermediate Contour (10')



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Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

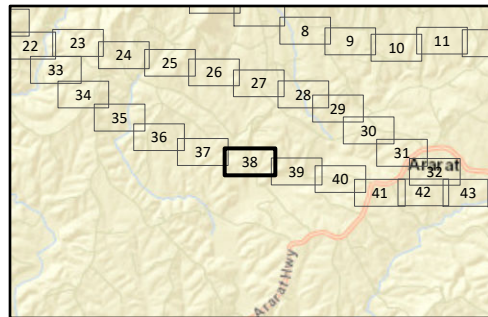
Attachment A:
Desktop Stream and Wetland Delineation
Map 37 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.

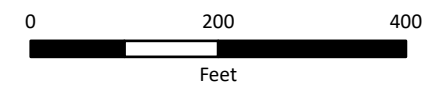


- High Probability Stream
- Low Probability Stream
- High Probability Wetland
- Willis Gap - Claudville Alternative Routes
- Right-of-Way (100')
- Road
- Stream (NHD)
- Floodplain
- County Boundary
- Map Tile
- Index Contour (50')
- Intermediate Contour (10')



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

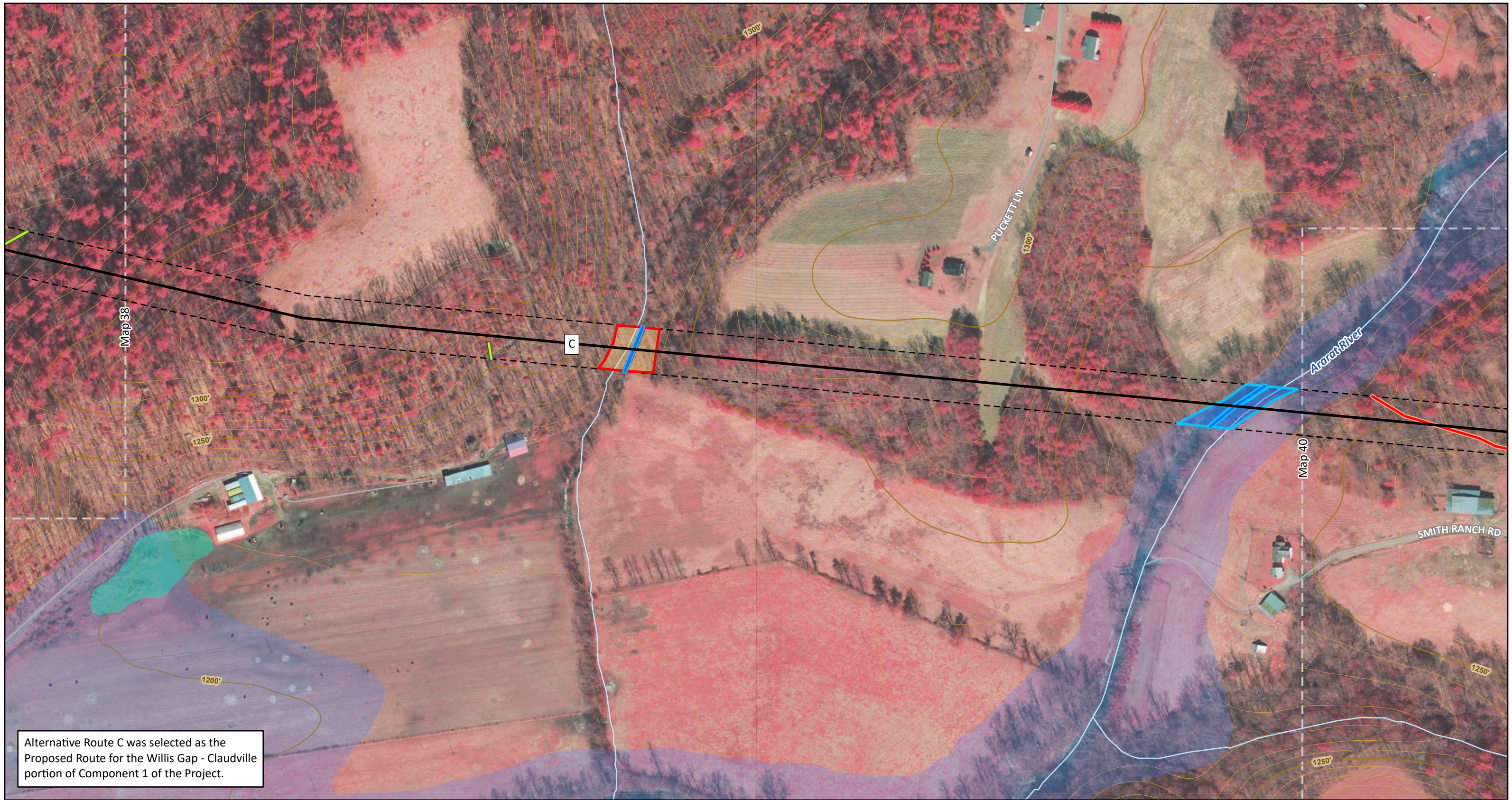


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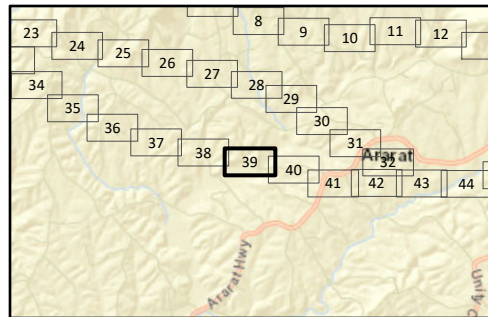
Attachment A:
Desktop Stream and Wetland Delineation
Map 38 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



- High Probability Stream
- Low Probability Stream
- Moderate Probability Stream
- High Probability Wetland
- Moderate Probability Wetland

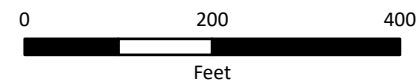
- Willis Gap - Claudville Alternative Routes
- Right-of-Way (100')
- Road
- Stream (NHD)
- Wetland (NWI)

- Floodplain
- County Boundary
- Map Tile
- Index Contour (50')
- Intermediate Contour (10')



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1" = 200'

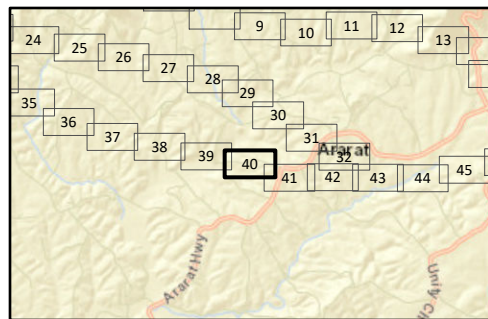
Attachment A: Desktop Stream and Wetland Delineation Map 39 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



Low Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Stream	Road	Map Tile
Willis Gap - Claudville Alternative Routes	Stream (NHD)	Index Contour (50')
	Floodplain	Intermediate Contour (10')

Carroll & Patrick Counties,
Virginia

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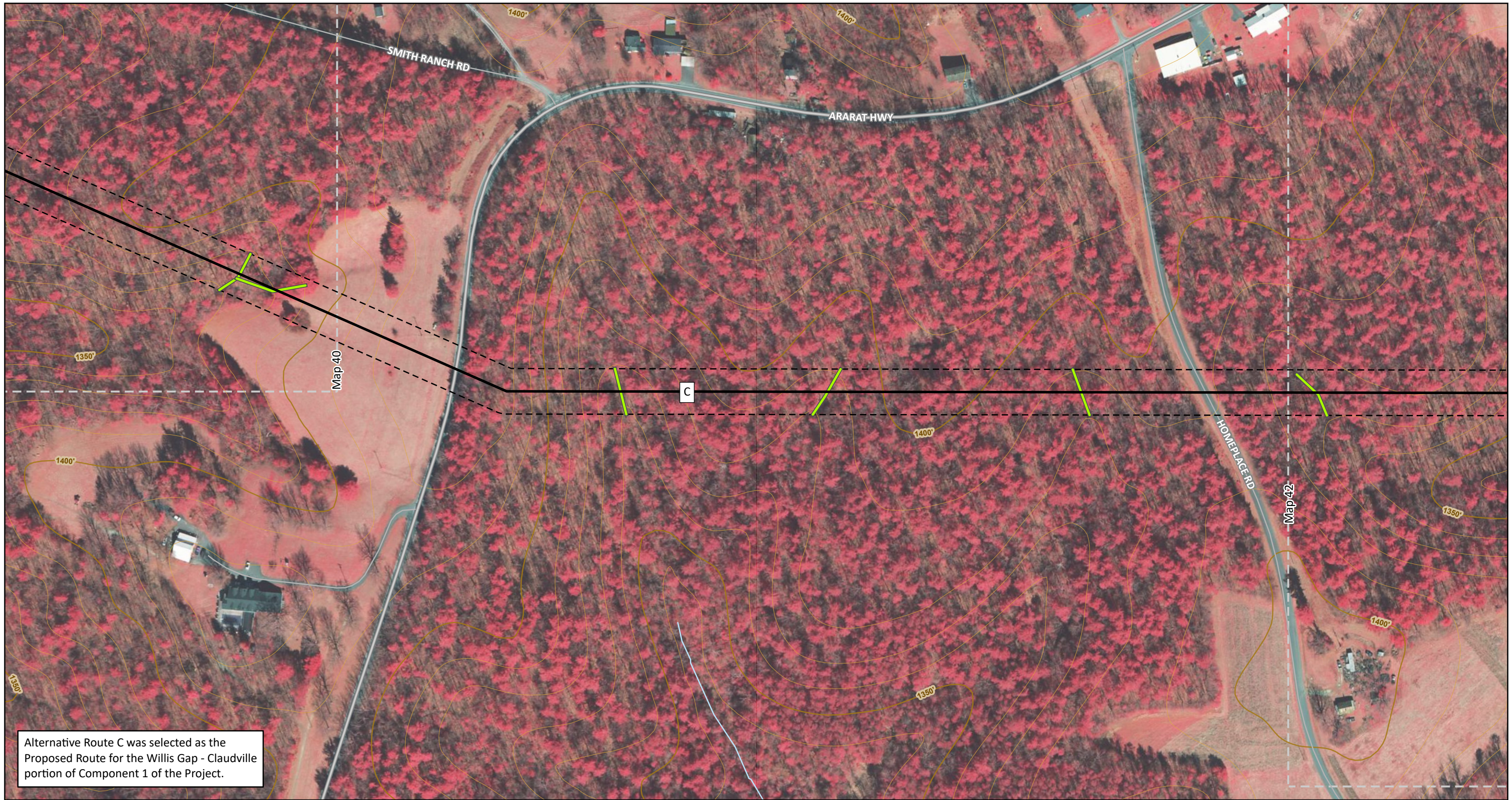
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Feet

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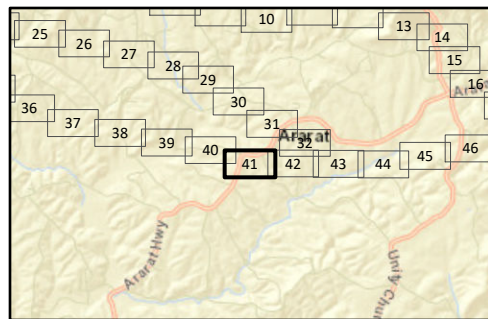
Attachment A:
Desktop Stream and Wetland Delineation
Map 40 of 51

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



Low Probability Stream	Highway	Map Tile
Willis Gap - Claudville Alternative Routes	Road	Index Contour (50')
Right-of-Way (100')	Stream (NHD)	Intermediate Contour (10')
	County Boundary	

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Virginia

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0 200 400
Feet

1" = 200'

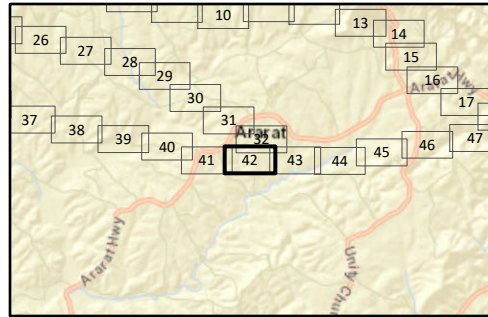
Attachment A:
Desktop Stream and Wetland Delineation
Map 41 of 51

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes


An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.




- ▬ High Probability Stream
- ▬ Low Probability Stream
- Moderate Probability Wetland
- Willis Gap - Claudville Alternative Routes
- Right-of-Way (100')
- Road
- Stream (NHD)
- County Boundary
- Map Tile
- Index Contour (50')
- Intermediate Contour (10')



**Carroll & Patrick Counties,
Virginia**


Date: 3/17/2023; Author: ckunde; Project: 159298



0 200 400
Feet

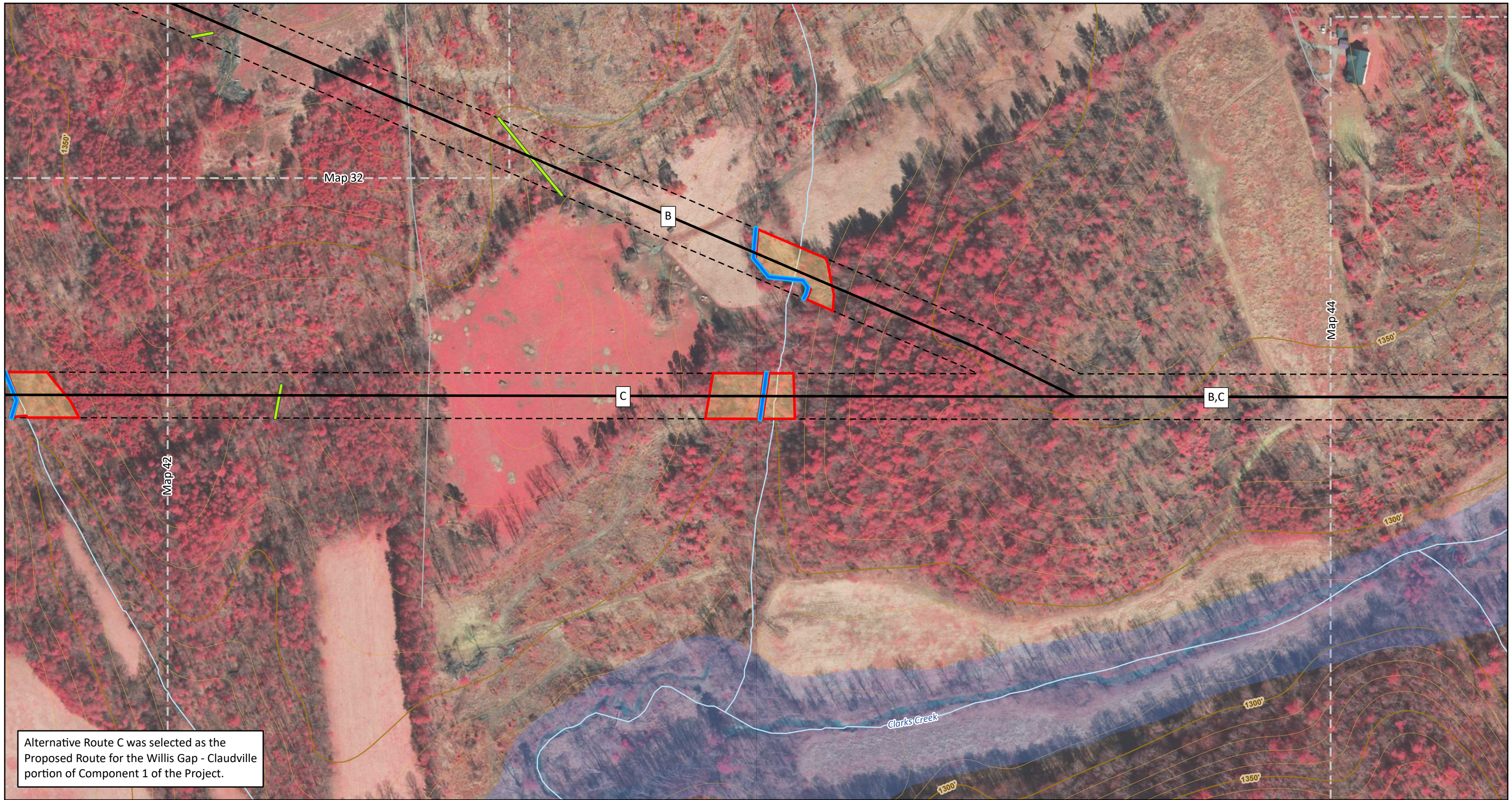
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Attachment A:
Desktop Stream and Wetland Delineation
Map 42 of 51

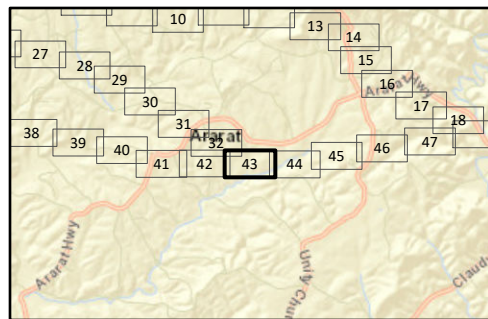


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Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Stream	Road	Map Tile
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
Willis Gap - Claudville Alternative Routes	Floodplain	Intermediate Contour (10')

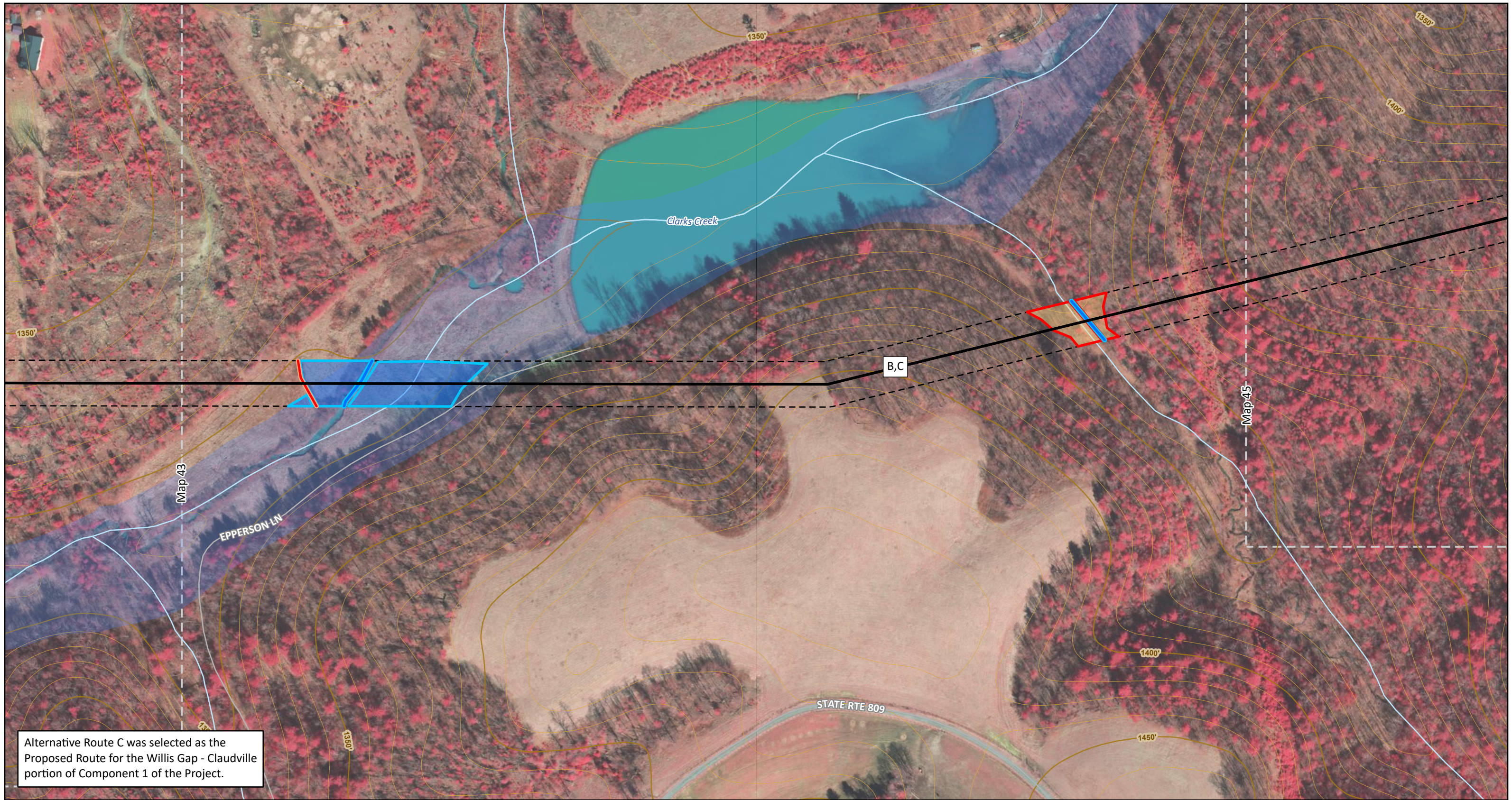
Carroll & Patrick Counties,
Virginia
Date: 3/17/2023; Author: ckunde; Project: 159298

1" = 200'

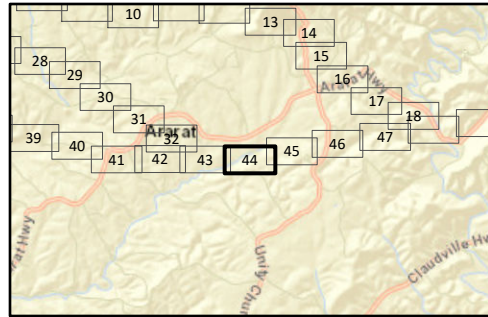
Attachment A:
Desktop Stream and Wetland Delineation
Map 43 of 51

An AEP Company

Stuart Area Transmission
 Improvements Project:
 Component 1:
 Willis Gap - Claudville
 Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Willis Gap - Claudville Alternative Routes	Floodplain
Moderate Probability Stream	Right-of-Way (100')	County Boundary
High Probability Wetland	Road	Map Tile
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
		Intermediate Contour (10')

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

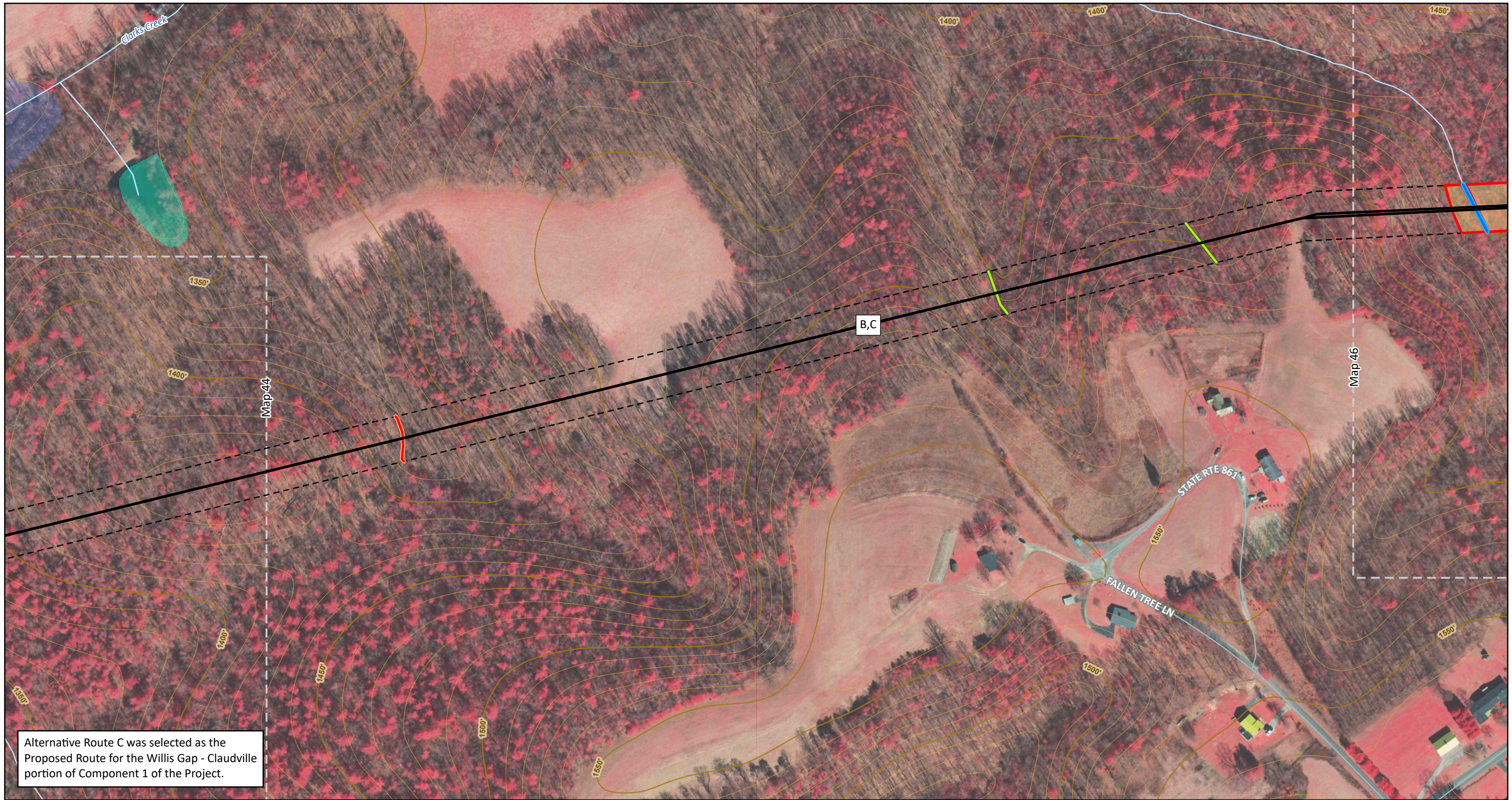
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Feet

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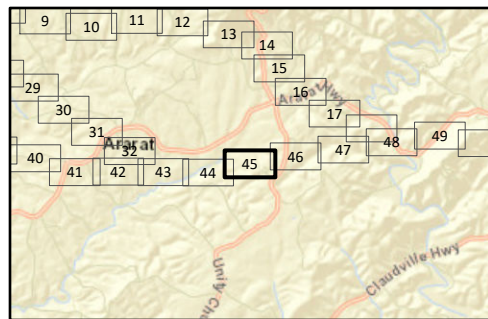
Attachment A:
Desktop Stream and Wetland Delineation
Map 44 of 51

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Stream	Road	Map Tile
Moderate Probability Stream	Stream (NHD)	Index Contour (50')
Moderate Probability Wetland	Wetland (NWI)	Intermediate Contour (10')
Willis Gap - Claudville Alternative Routes	Floodplain	

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

1" = 200'

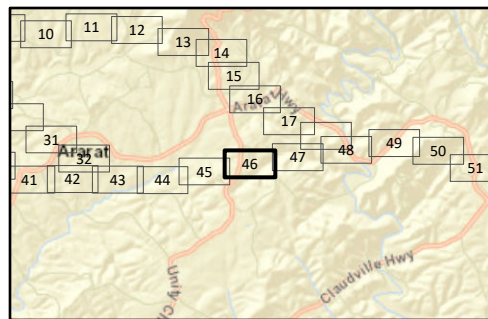
Attachment A:
Desktop Stream and Wetland Delineation
Map 45 of 51

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Map Tile
Low Probability Stream	Road	Index Contour (50')
Moderate Probability Wetland	Stream (NHD)	Intermediate Contour (10')
Willis Gap - Claudville Alternative Routes	County Boundary	

Carroll & Patrick Counties, Virginia
 Date: 3/17/2023; Author: ckunde; Project: 159298

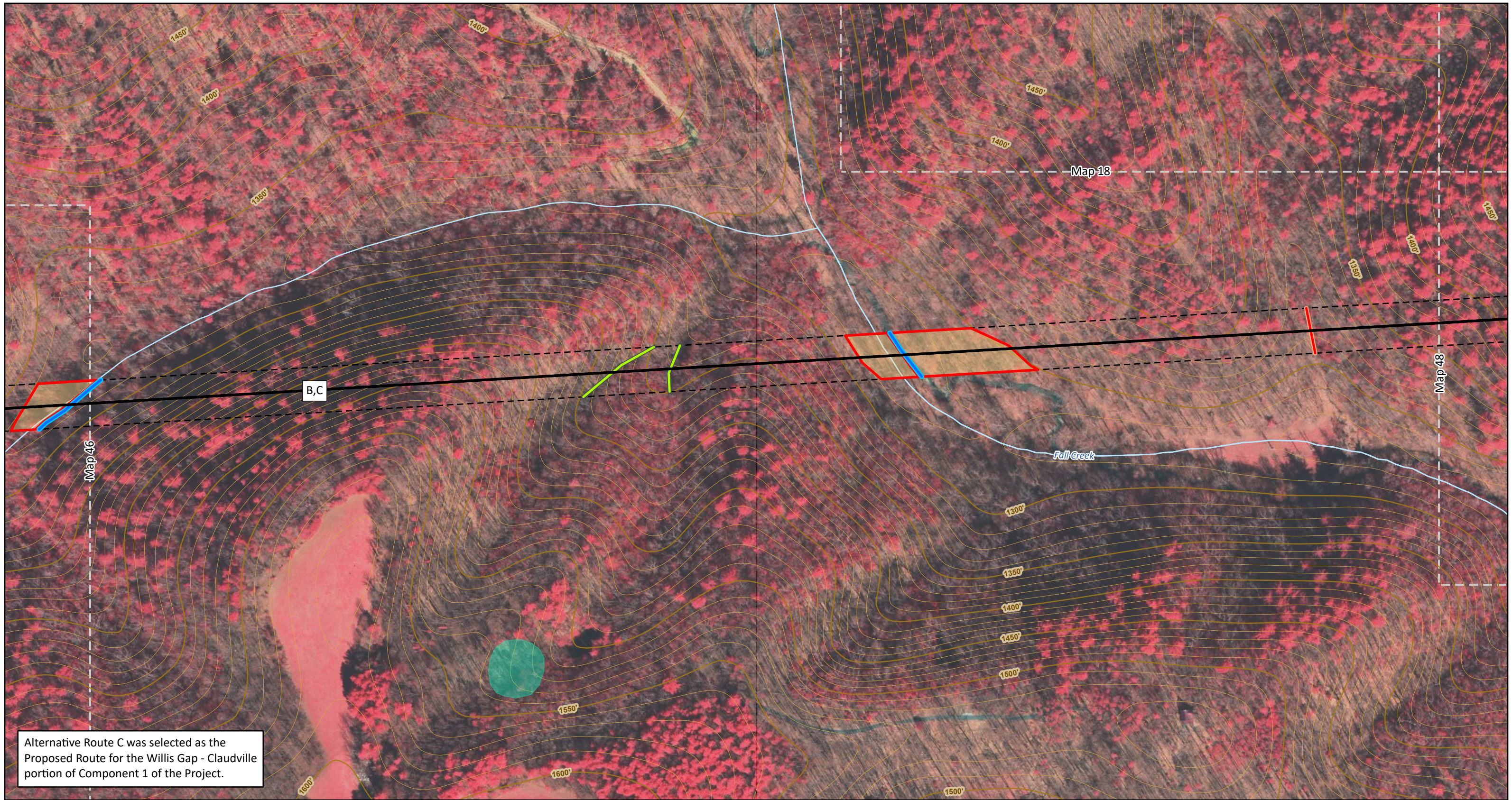
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 Feet

1" = 200'

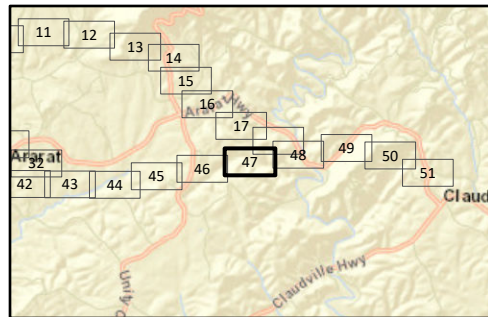
Attachment A:
Desktop Stream and Wetland Delineation
Map 46 of 51

Stuart Area Transmission
 Improvements Project:
 Component 1:
 Willis Gap - Claudville
 Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Willis Gap - Claudville Alternative Routes	County Boundary
Low Probability Stream	Right-of-Way (100')	Map Tile
Moderate Probability Stream	Stream (NHD)	Index Contour (50')
Moderate Probability Wetland	Wetland (NWI)	Intermediate Contour (10')

Carroll & Patrick Counties, Virginia
 Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400

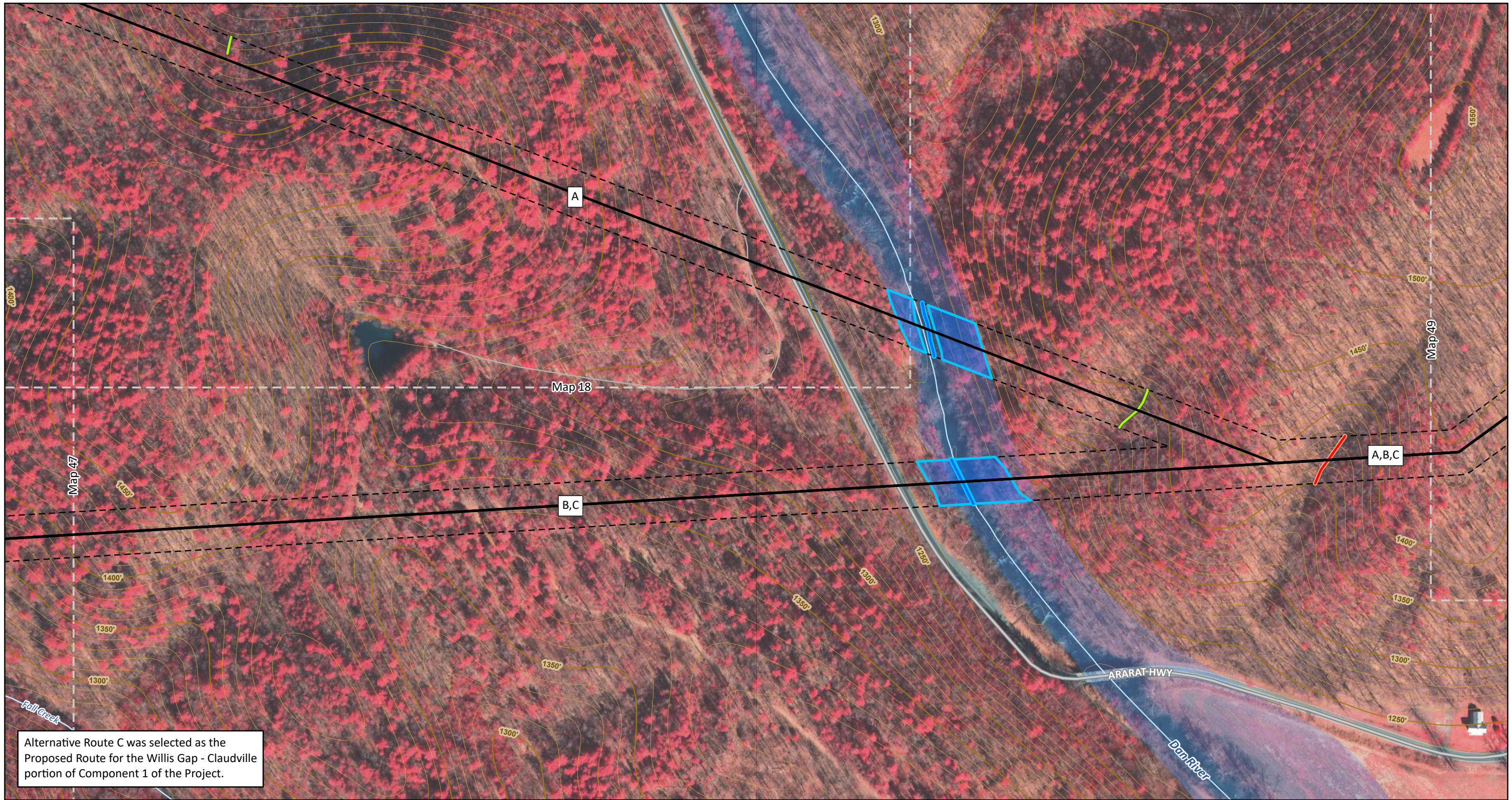
 Feet

1" = 200'

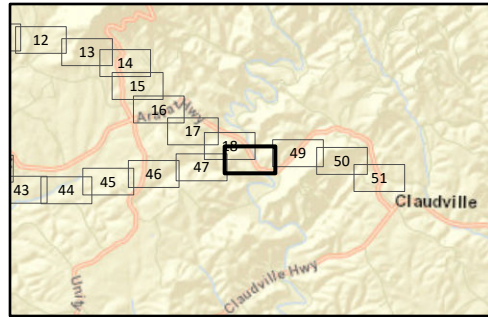
Attachment A:
Desktop Stream and Wetland Delineation
Map 47 of 51

Stuart Area Transmission
 Improvements Project:
 Component 1:
 Willis Gap - Claudville
 Alternative Routes

An AEP Company



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Stream	Highway	Map Tile
Moderate Probability Stream	Road	Index Contour (50')
High Probability Wetland	Stream (NHD)	Intermediate Contour (10')
Willis Gap - Claudville Alternative Routes	Floodplain	

Carroll & Patrick Counties, Virginia

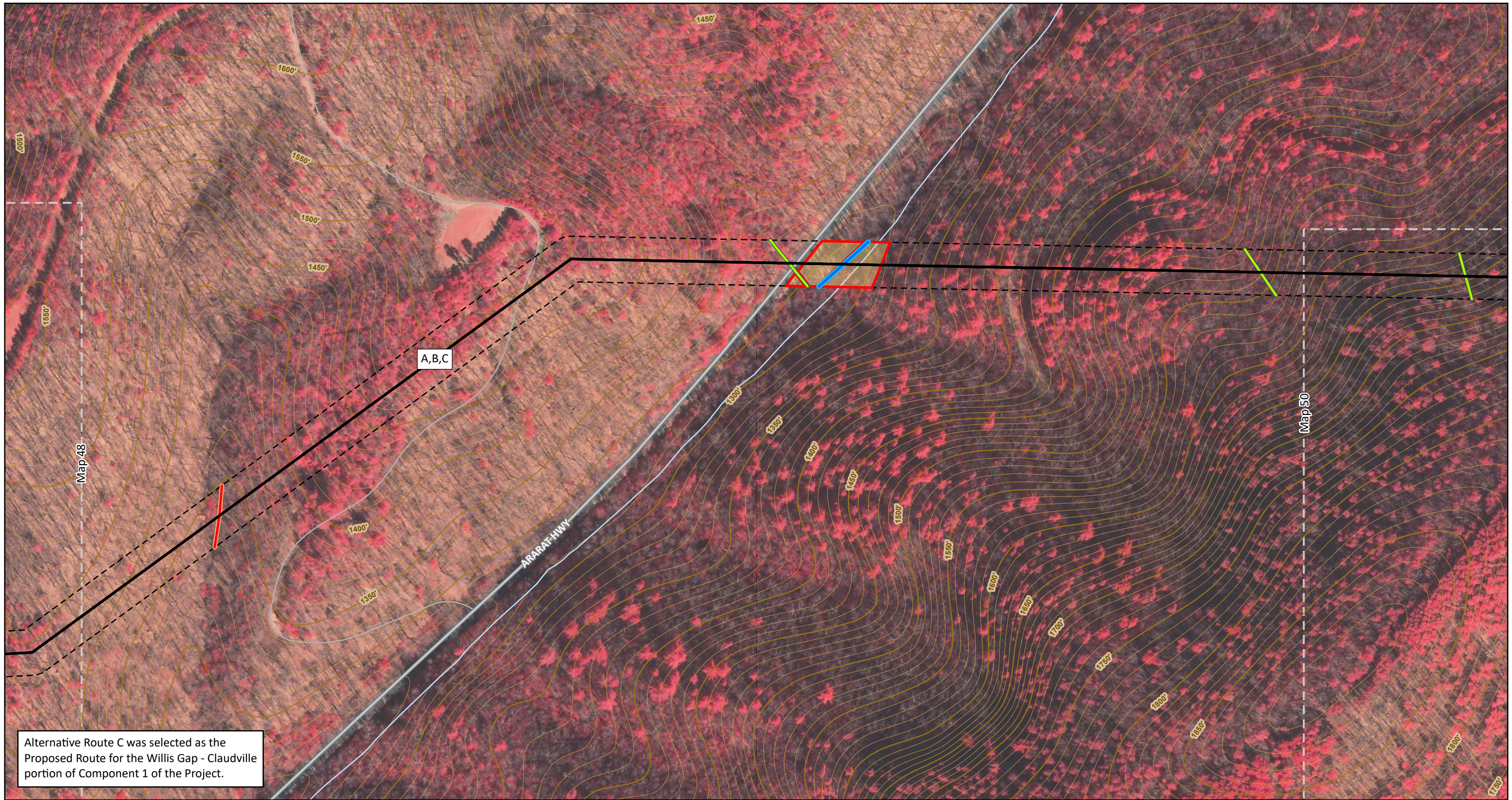
Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

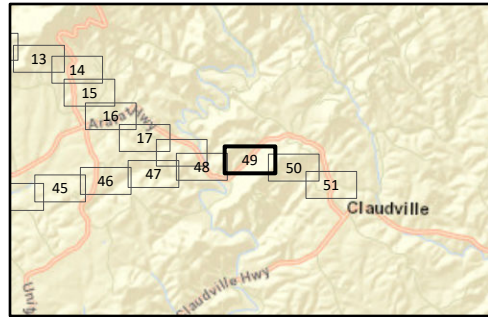
1" = 200'

Attachment A:
Desktop Stream and Wetland Delineation
Map 48 of 51

Stuart Area Transmission Improvements Project:
Component 1:
Willis Gap - Claudville Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



- High Probability Stream
- Low Probability Stream
- Moderate Probability Stream
- Moderate Probability Wetland

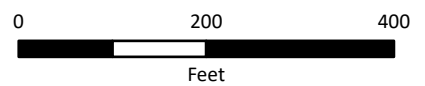
- Willis Gap - Claudville Alternative Routes
- Right-of-Way (100')
- Highway
- Road

- Stream (NHD)
- County Boundary
- Map Tile
- Index Contour (50')
- Intermediate Contour (10')



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

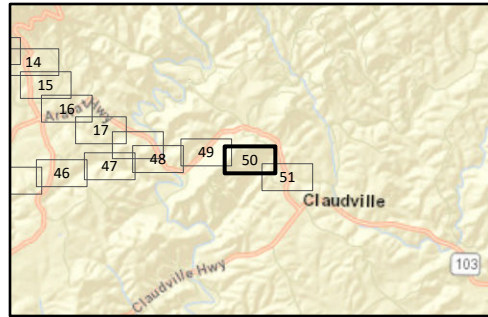


1" = 200'

Attachment A:
Desktop Stream and Wetland Delineation
Map 49 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

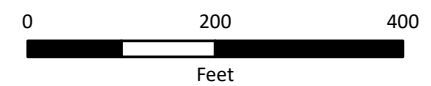


- Low Probability Stream
- Stream (NHD)
- Willis Gap - Claudville Alternative Routes
- County Boundary
- Right-of-Way (100')
- Map Tile
- Road
- Index Contour (50')
- Intermediate Contour (10')



Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

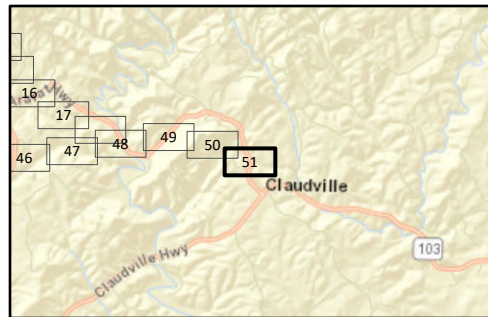
Attachment A:
Desktop Stream and Wetland Delineation
Map 50 of 51



Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes



Alternative Route C was selected as the Proposed Route for the Willis Gap - Claudville portion of Component 1 of the Project.



High Probability Stream	Claudville - Mayo River Alternative Routes	Wetland (NWI)
Low Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Wetland	Highway	Map Tile
Moderate Probability Wetland	Road	Index Contour (50')
Proposed APCo Substation	Stream (NHD)	Intermediate Contour (10')
Willis Gap - Claudville Alternative Routes		

Carroll & Patrick Counties,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

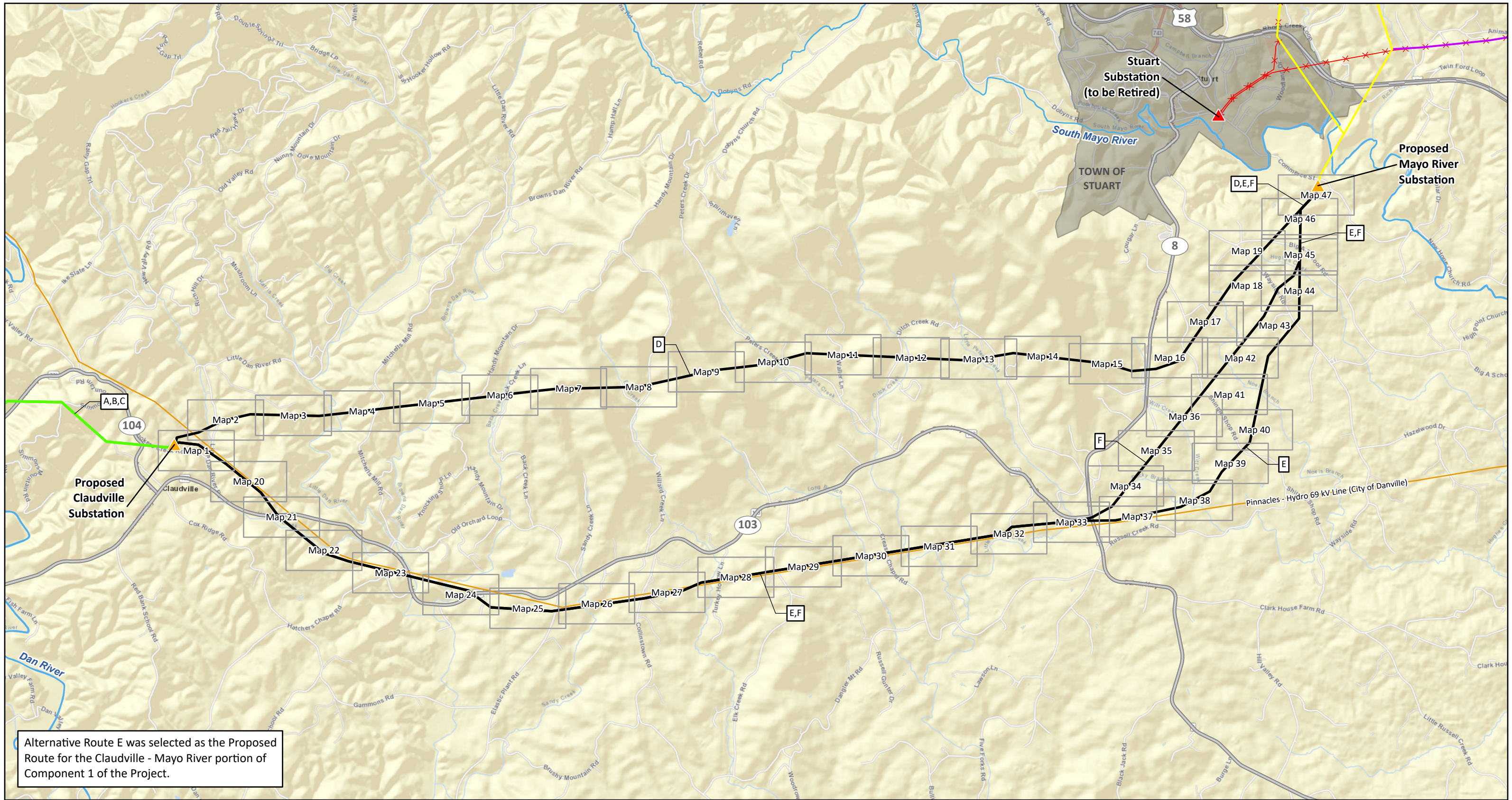
1" = 200'

Attachment A:
Desktop Stream and Wetland Delineation
Map 51 of 51

Stuart Area Transmission
Improvements Project:
Component 1:
Willis Gap - Claudville
Alternative Routes

An AEP Company

**ATTACHMENT B: DESKTOP DELINEATED FEATURES AND ROUTE MAP FOR
CLAUDVILLE – MAYO RIVER ALTERNATIVE ROUTES**



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



- | | | |
|--|--|-----------------|
| Map Tile | Component 3 Proposed Route | Stream (NHD) |
| Proposed APCo Substation | Existing APCo Substation to be Retired | River (NHD) |
| Claudville - Mayo River Alternative Routes | Existing Transmission Line to be Retired | Town Boundary |
| Willis Gap - Claudville Alternative Routes | Existing Non-APCo Transmission Line | State Boundary |
| Component 2 Alternative Routes | Highway | County Boundary |

Patrick County,
Virginia

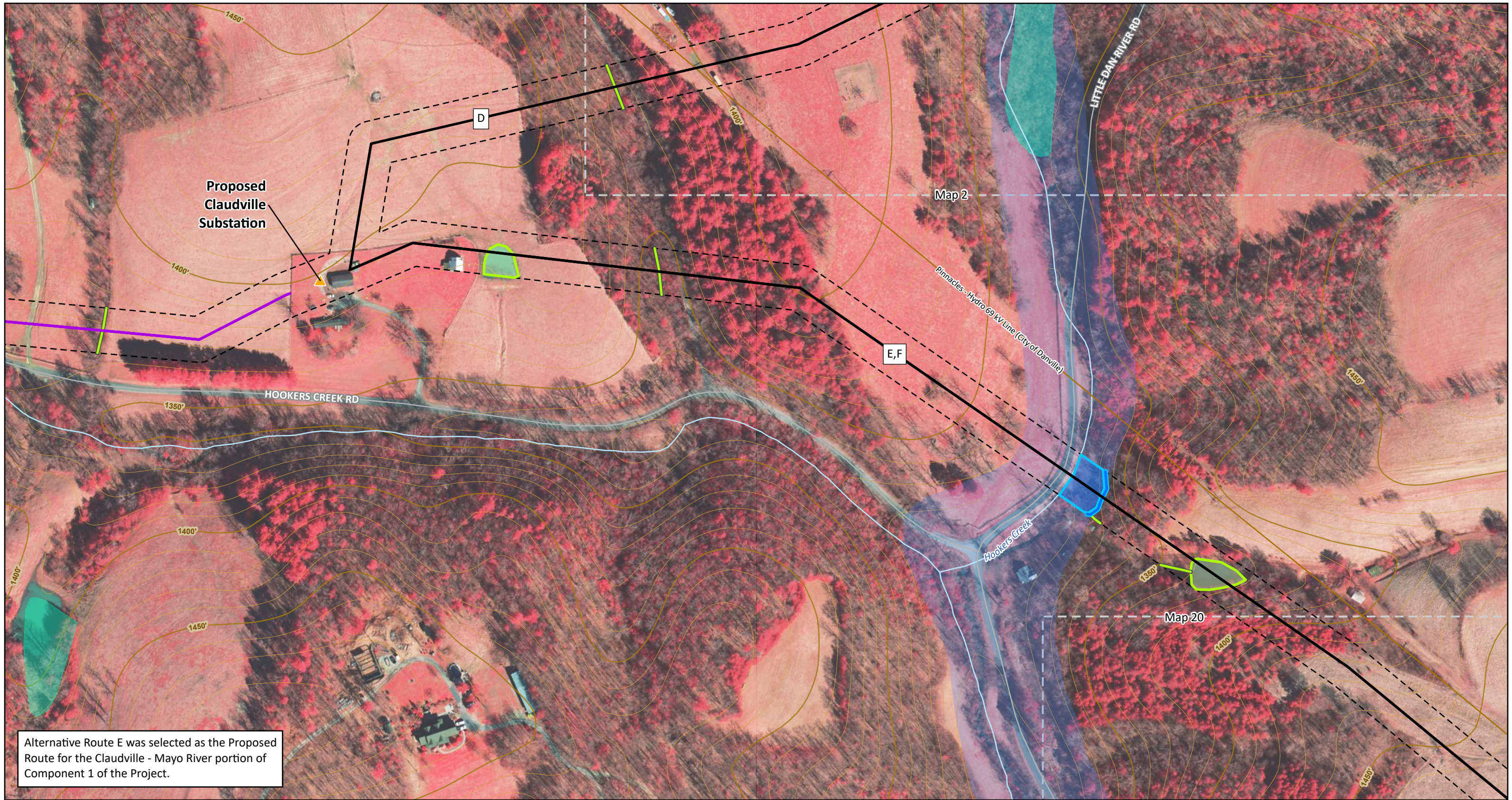
Date: 3/27/2023; Author: ckunde; Project: 159298

1" = 0.75 miles

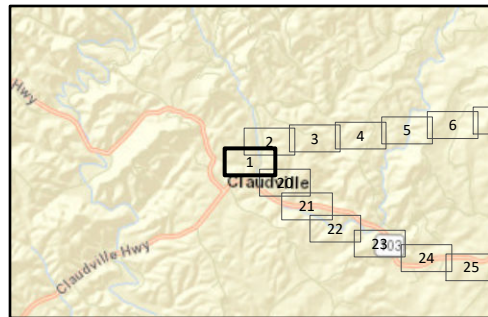
Attachment B:
**Desktop Stream and Wetland
Delineation Index**

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes

An AEP Company



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



- High Probability Stream
- Low Probability Stream
- High Probability Wetland
- Low Probability Wetland
- Proposed APCo Substation
- Willis Gap - Claudville Alternative Routes

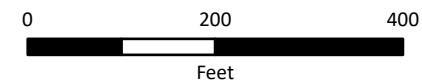
- Claudville - Mayo River Alternative Routes
- Right-of-Way (100')
- Existing Non-APCo Transmission Line
- Road
- Stream (NHD)

- Wetland (NWI)
- Floodplain
- County Boundary
- Index Contour (50')
- Intermediate Contour (10')



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

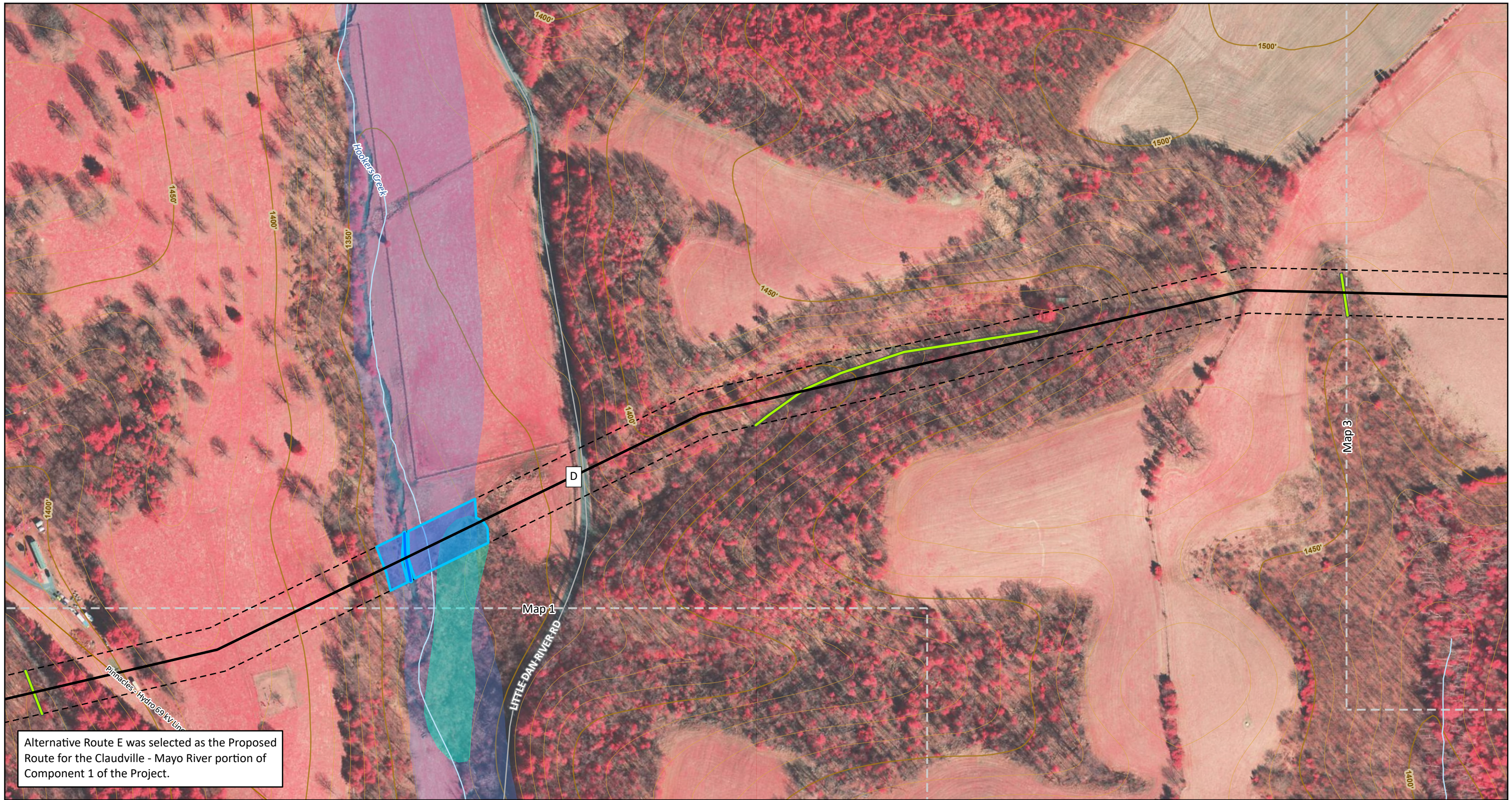


1" = 200'

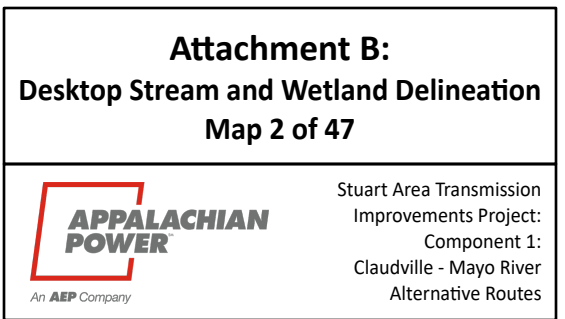
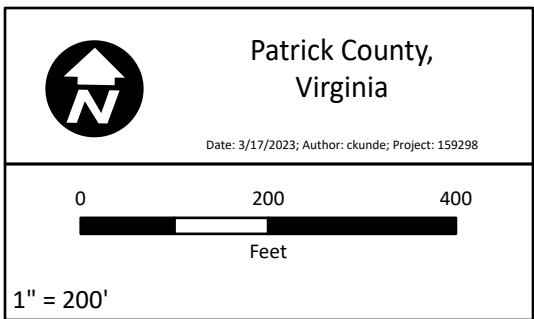
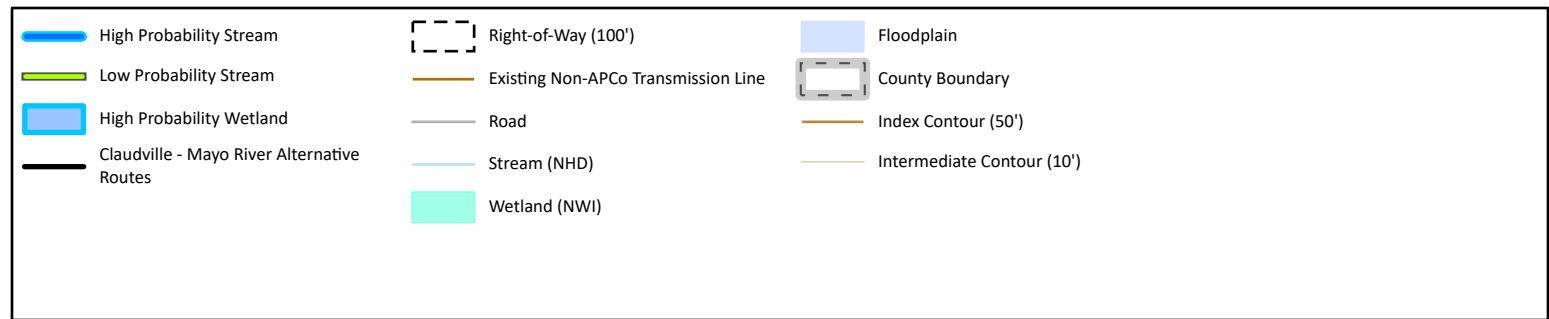
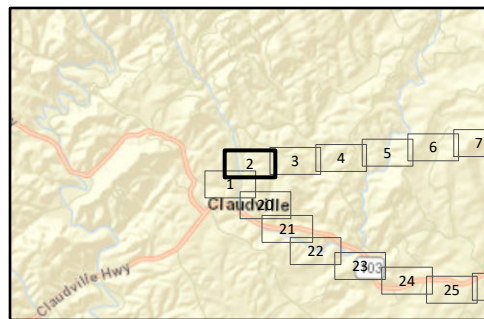
Attachment B:
Desktop Stream and Wetland Delineation
Map 1 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes

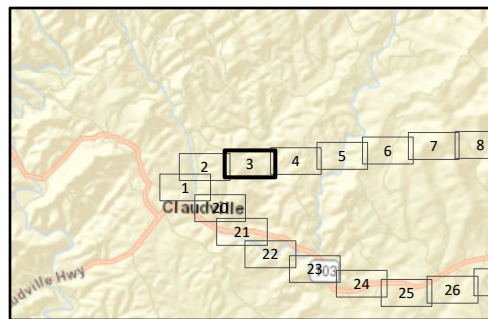


Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.





Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

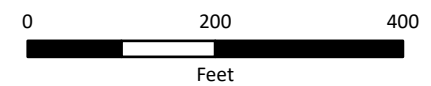


- | | |
|--|----------------------------|
| Low Probability Stream | Stream (NHD) |
| Low Probability Wetland | Floodplain |
| Claudville - Mayo River Alternative Routes | County Boundary |
| Right-of-Way (100') | Index Contour (50') |
| | Intermediate Contour (10') |



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

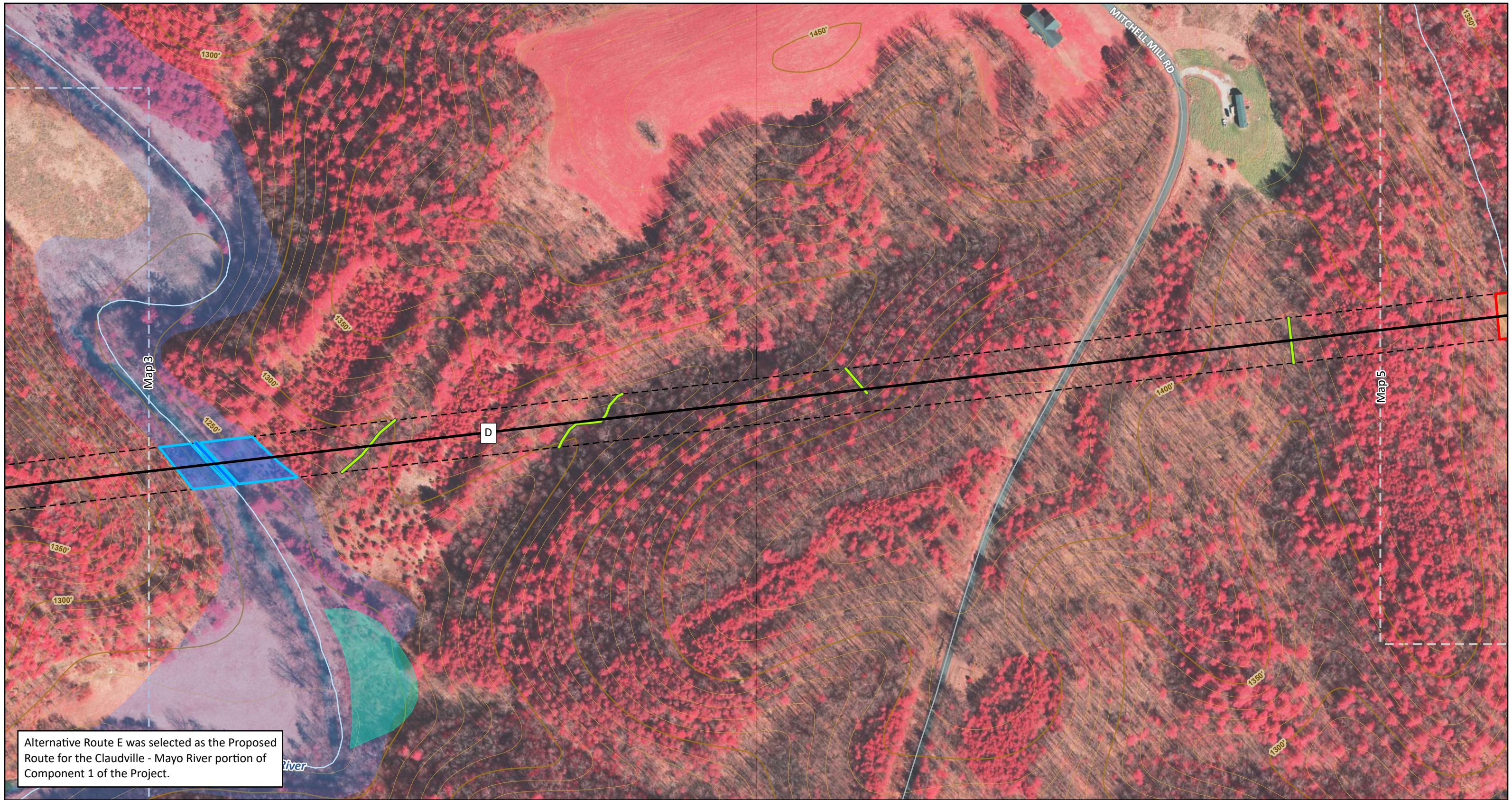


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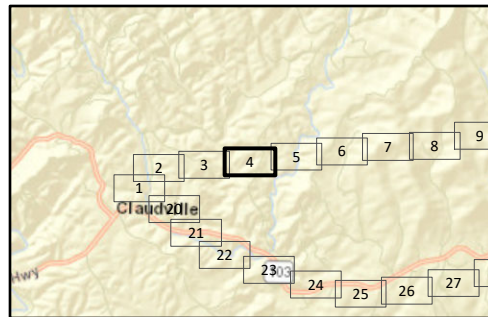
Attachment B:
Desktop Stream and Wetland Delineation
Map 3 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Claudville - Mayo River Alternative Routes	Wetland (NWI)
Low Probability Stream	Right-of-Way (100')	Floodplain
High Probability Wetland	Road	County Boundary
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
		Intermediate Contour (10')

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

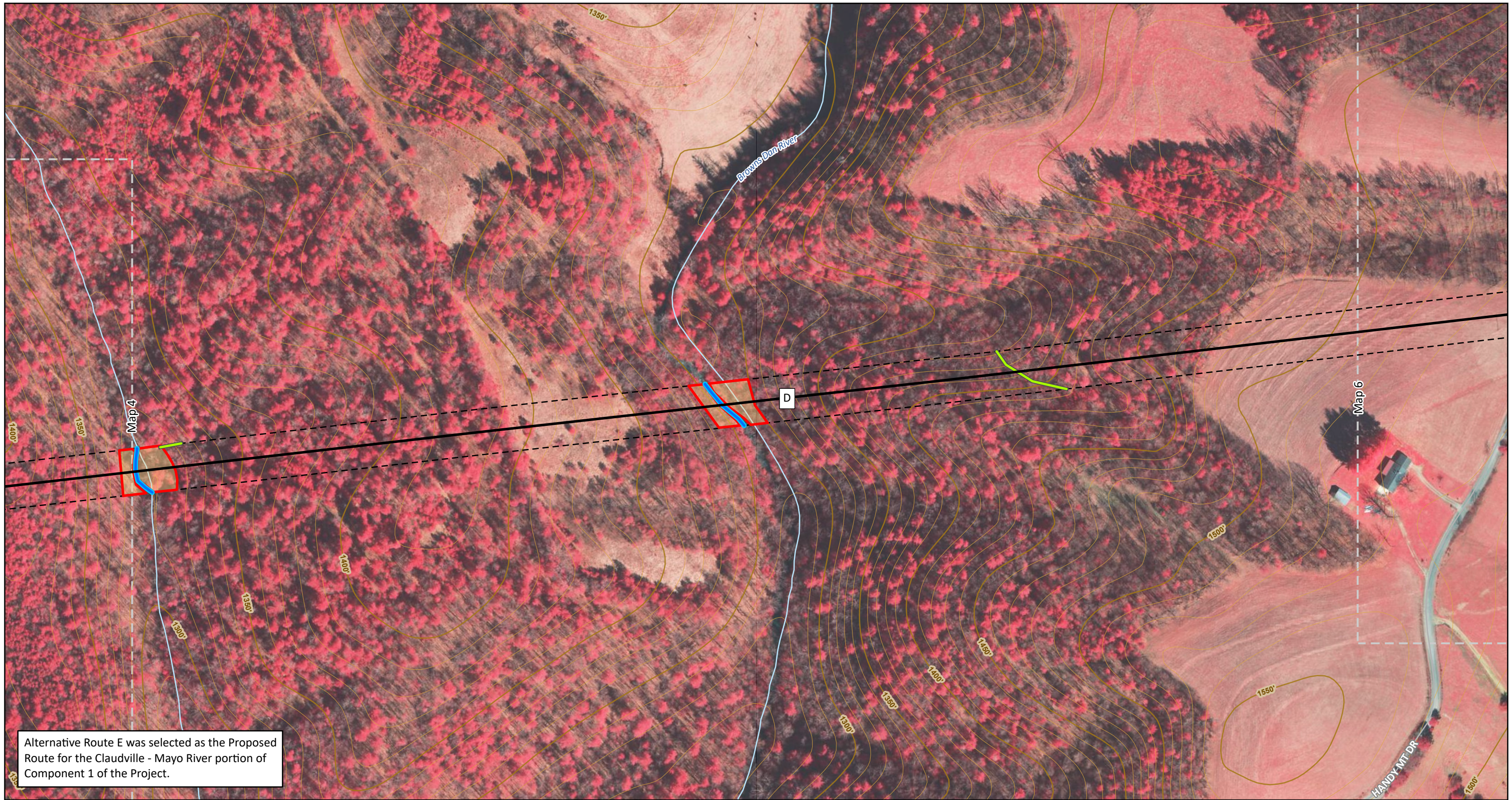
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Feet

1" = 200'

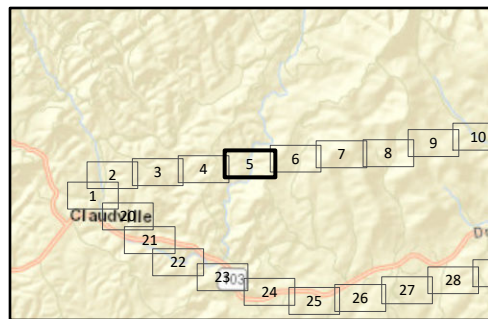
Attachment B:
Desktop Stream and Wetland Delineation
Map 4 of 47

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Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Claudville - Mayo River Alternative Routes	Stream (NHD)
Low Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Wetland	Road	Index Contour (50')
		Intermediate Contour (10')

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

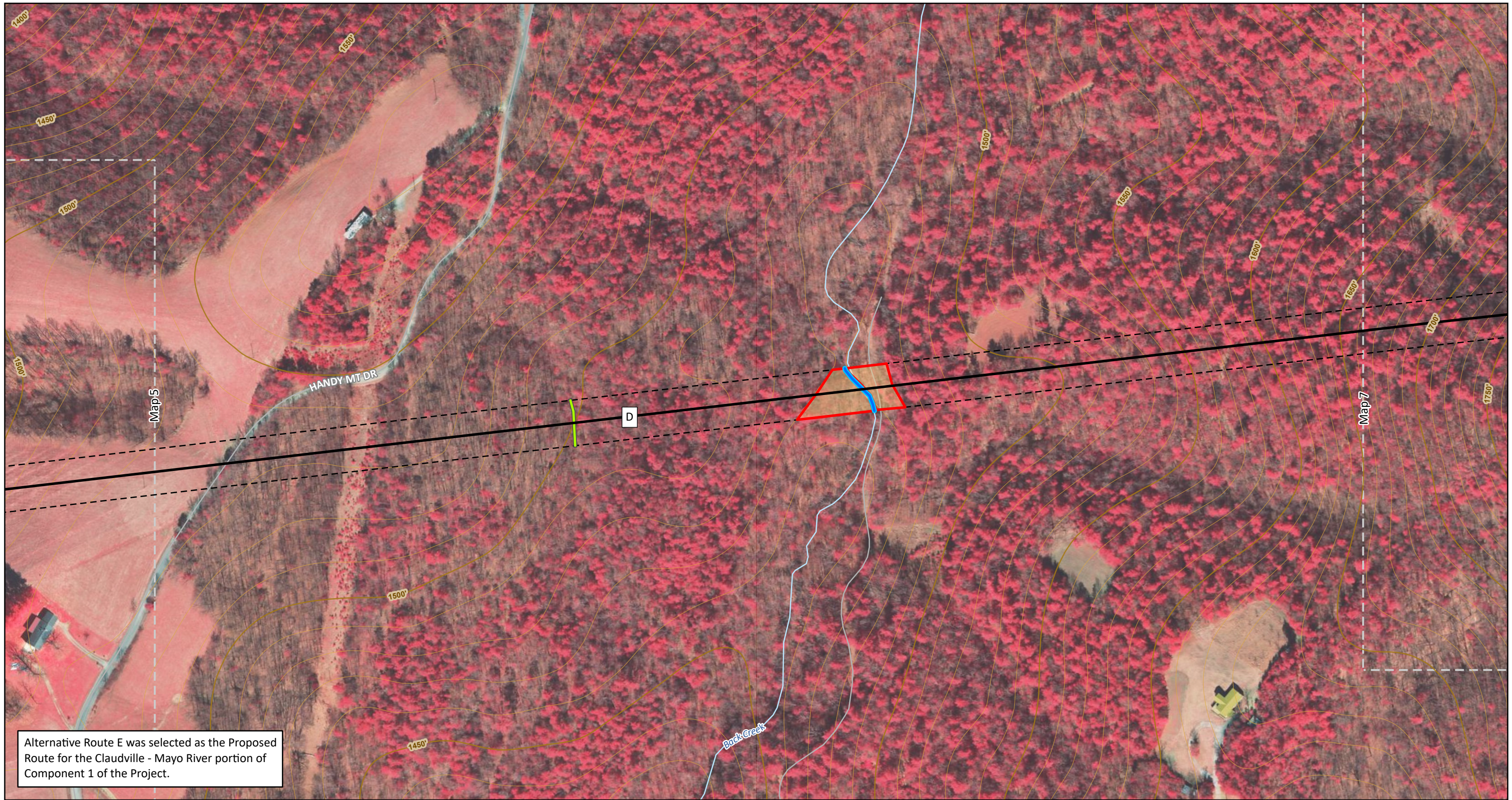
0 200 400
Feet

1" = 200'

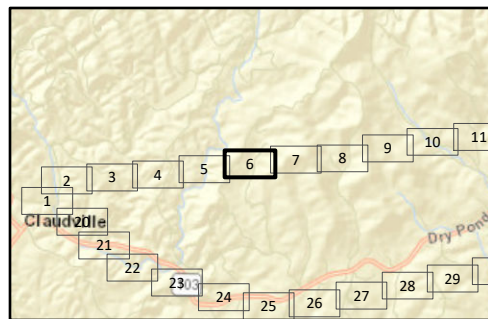
Attachment B:
Desktop Stream and Wetland Delineation
Map 5 of 47



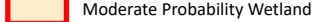
An AEP Company




Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes




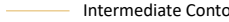


Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



-  High Probability Stream
-  Low Probability Stream
-  Moderate Probability Wetland

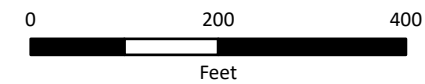
-  Claudville - Mayo River Alternative Routes
-  Right-of-Way (100')
-  Road

-  Stream (NHD)
-  County Boundary
-  Index Contour (50')
-  Intermediate Contour (10')



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

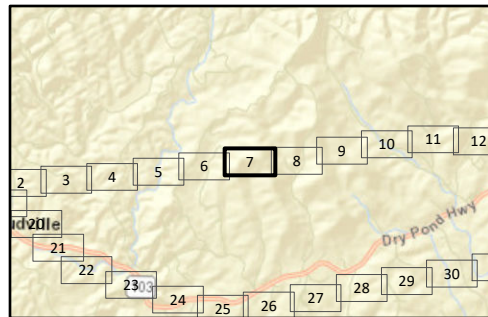
Attachment B: Desktop Stream and Wetland Delineation Map 6 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

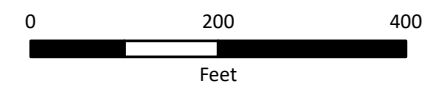


- Low Probability Stream
- Claudville - Mayo River Alternative Routes
- Right-of-Way (100')
- Road
- County Boundary
- Index Contour (50')
- Intermediate Contour (10')



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

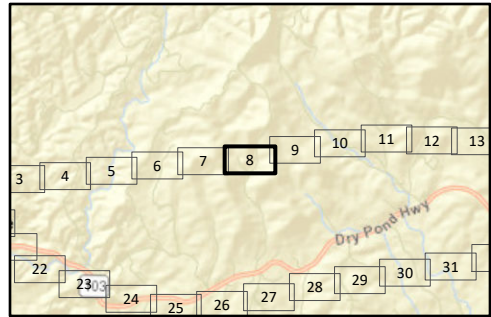
Attachment B:
Desktop Stream and Wetland Delineation
Map 7 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Claudville - Mayo River Alternative Routes	Stream (NHD)
Low Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Stream	Road	Index Contour (50')
Moderate Probability Wetland		Intermediate Contour (10')

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

1" = 200'

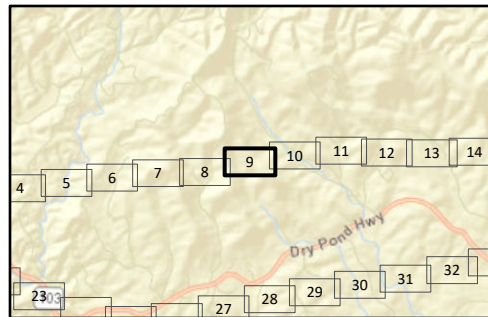
Attachment B:
Desktop Stream and Wetland Delineation
Map 8 of 47

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Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



- High Probability Stream
- Low Probability Stream
- Moderate Probability Stream
- Moderate Probability Wetland

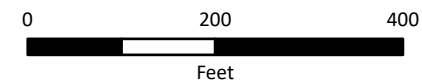
- Claudville - Mayo River Alternative Routes
- Right-of-Way (100')
- Stream (NHD)

- County Boundary
- Index Contour (50')
- Intermediate Contour (10')



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

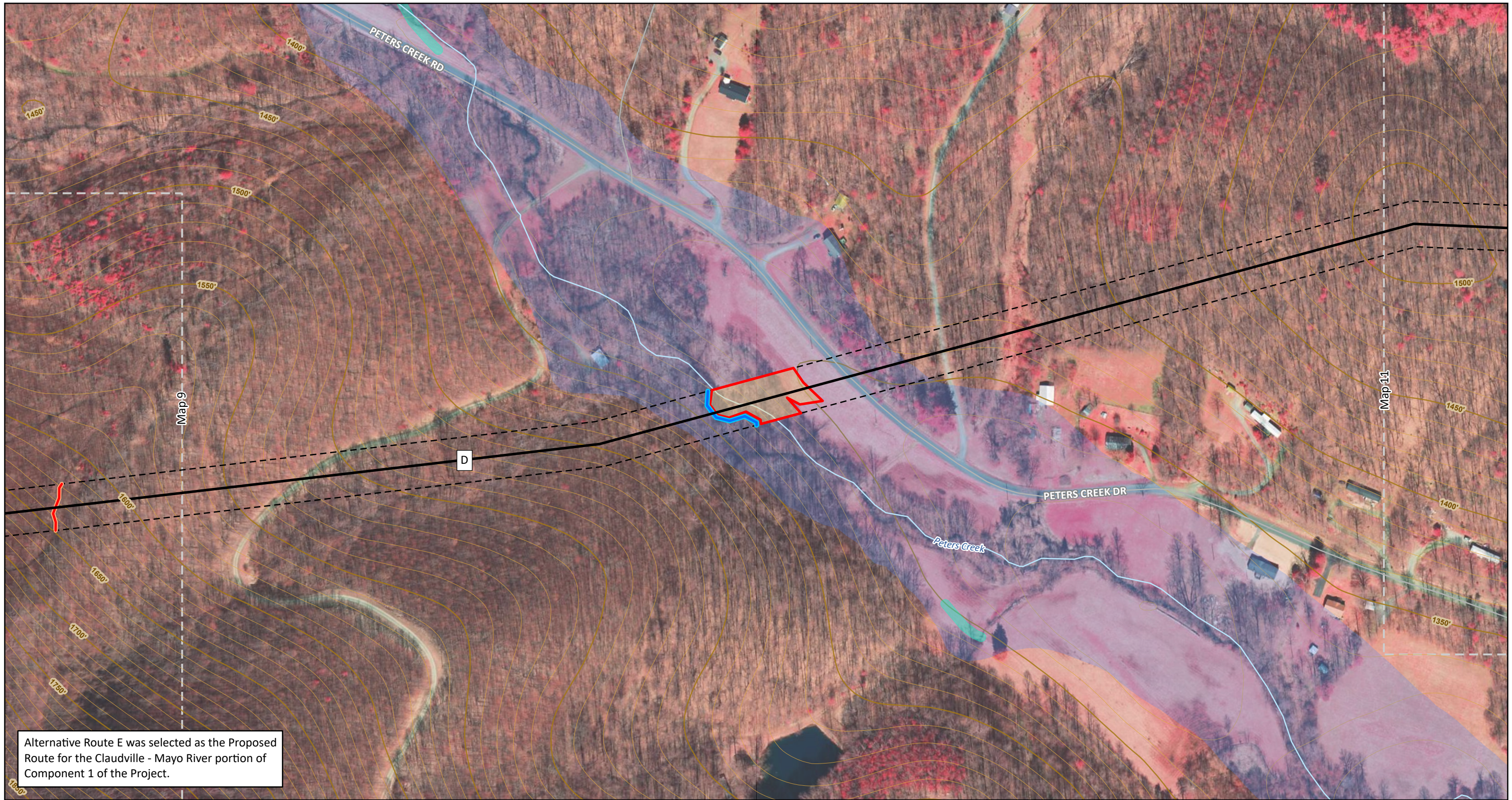


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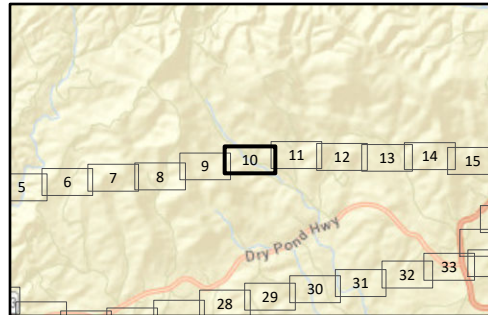
Attachment B:
Desktop Stream and Wetland Delineation
Map 9 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Floodplain
Moderate Probability Stream	Road	County Boundary
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
Claudville - Mayo River Alternative Routes	Wetland (NWI)	Intermediate Contour (10')

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

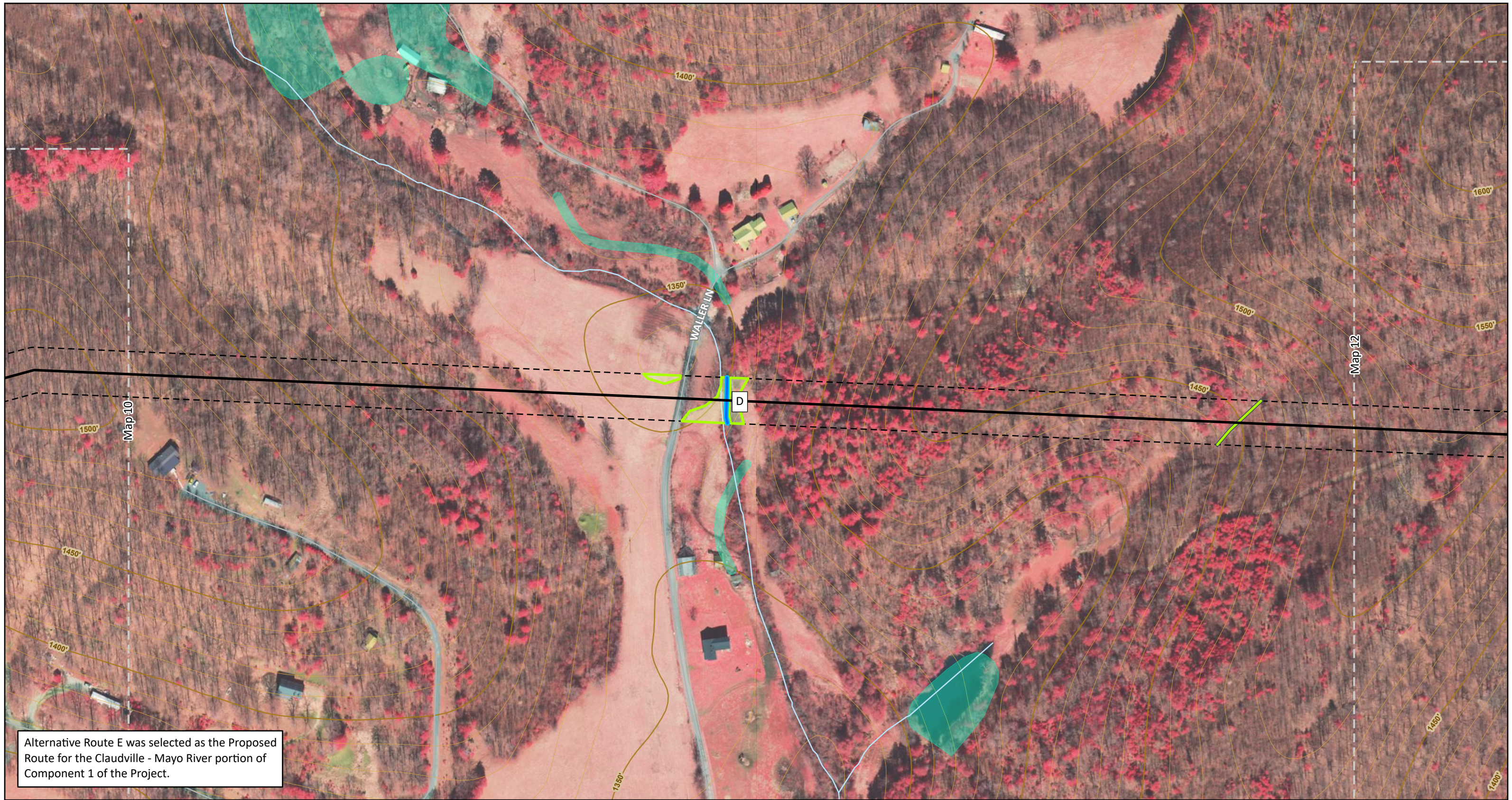
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Feet

1" = 200'

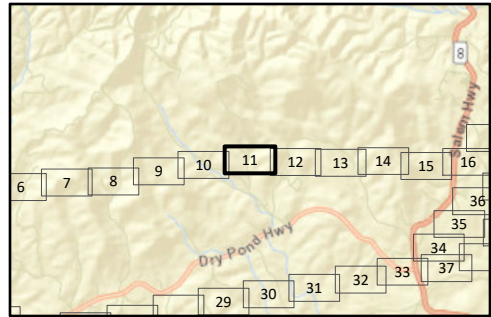
Attachment B:
Desktop Stream and Wetland Delineation
Map 10 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Stream	Road	Index Contour (50')
Low Probability Wetland	Stream (NHD)	Intermediate Contour (10')
Claudville - Mayo River Alternative Routes	Wetland (NWI)	

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

1" = 200'

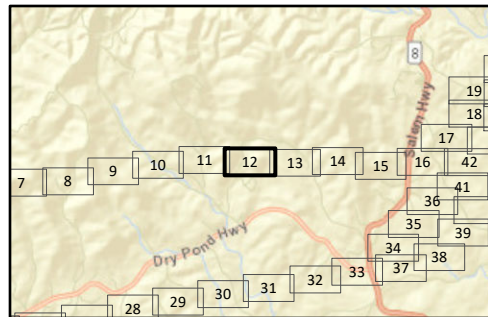
Attachment B:
Desktop Stream and Wetland Delineation
Map 11 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Stream	Road	Index Contour (50')
Claudville - Mayo River Alternative Routes	Stream (NHD)	Intermediate Contour (10')
	Floodplain	

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

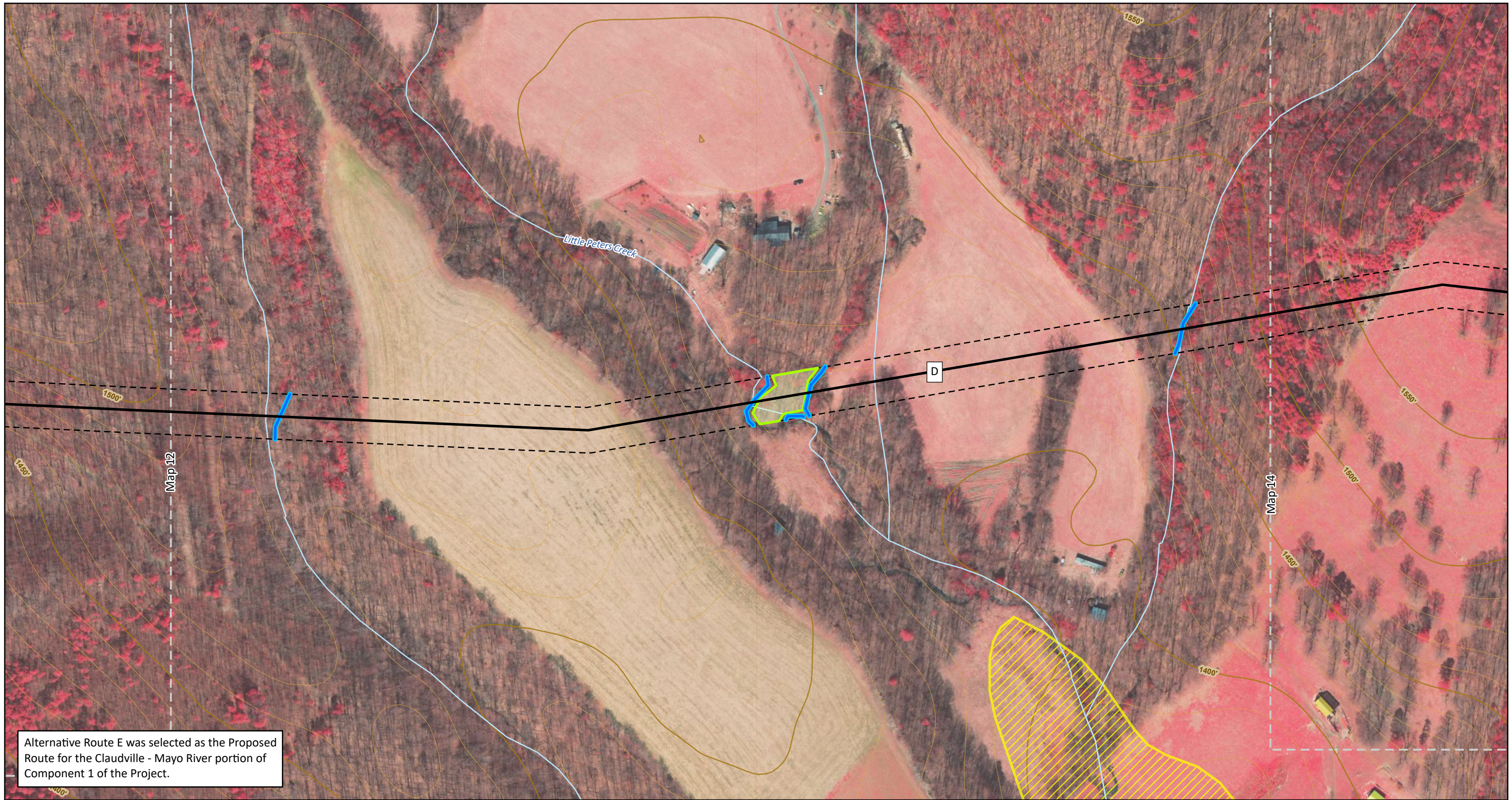
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Feet

1" = 200'

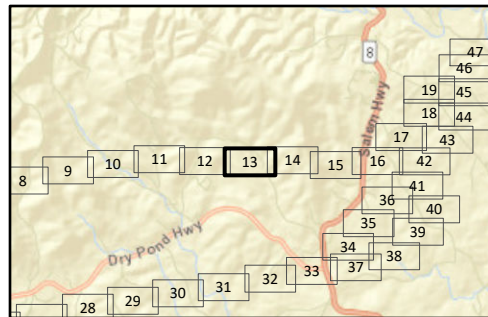
Attachment B:
Desktop Stream and Wetland Delineation
Map 12 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

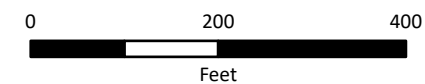


- | | |
|--|----------------------------|
| High Probability Stream | Stream (NHD) |
| Low Probability Wetland | Hydric Soils |
| Claudville - Mayo River Alternative Routes | County Boundary |
| Right-of-Way (100') | Index Contour (50') |
| | Intermediate Contour (10') |



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

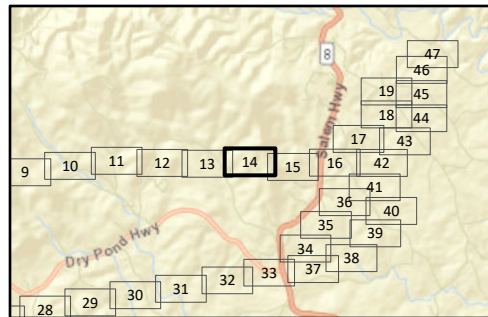
Attachment B:
Desktop Stream and Wetland Delineation
Map 13 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

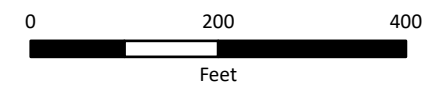


- ▬ High Probability Stream
- ▬ Moderate Probability Stream
- Claudville - Mayo River Alternative Routes
- Right-of-Way (100')
- ▬ Stream (NHD)
- County Boundary
- ▬ Index Contour (50')
- ▬ Intermediate Contour (10')
- ▬ Road



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

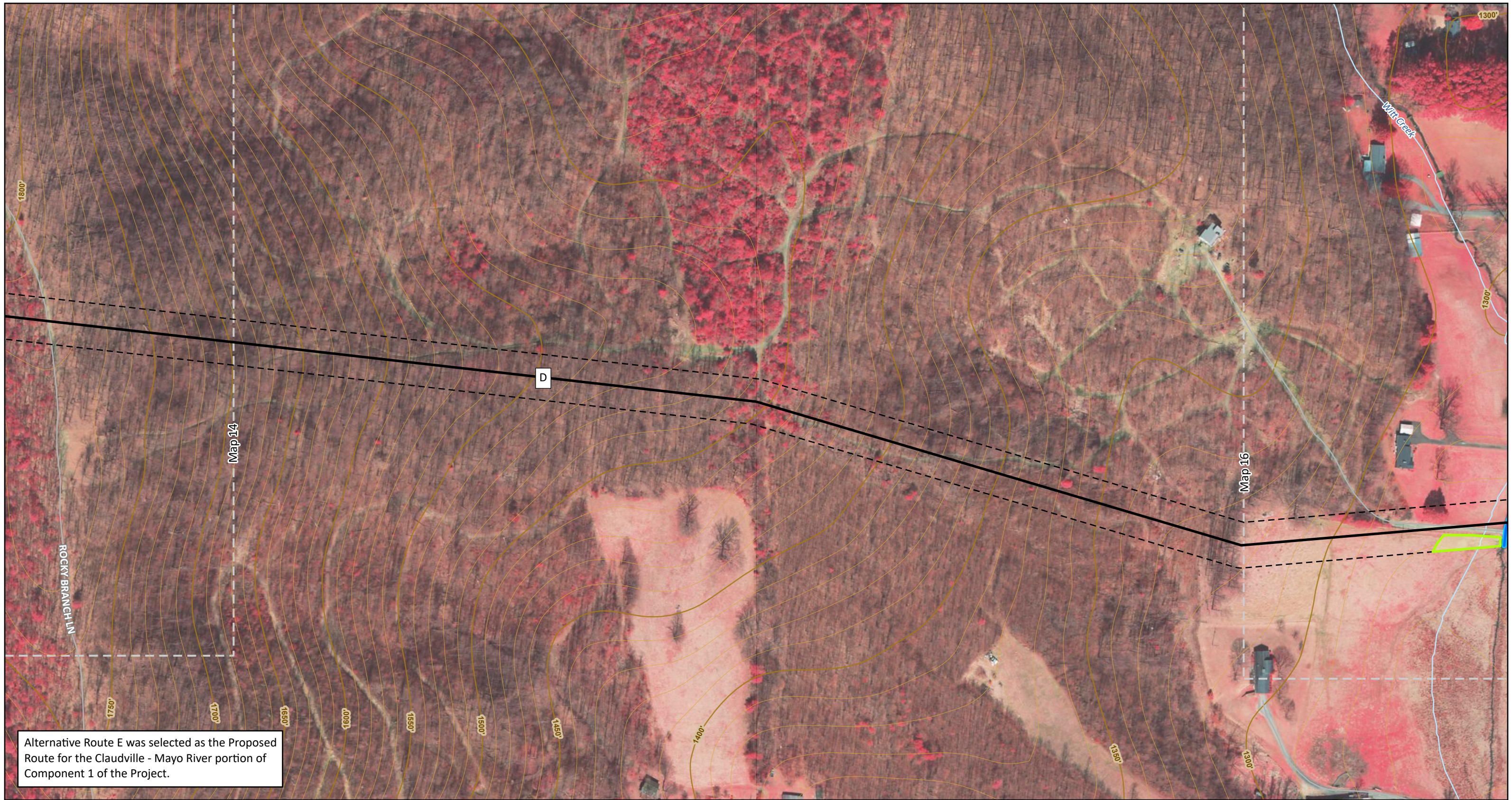


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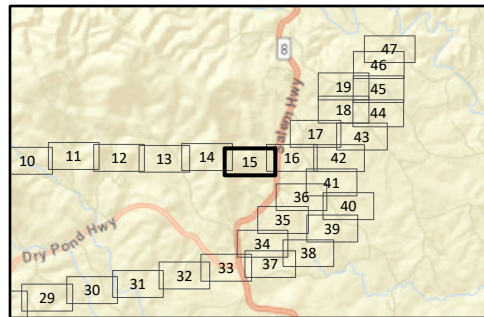
Attachment B:
Desktop Stream and Wetland Delineation
Map 14 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Claudville - Mayo River Alternative Routes	Stream (NHD)
Moderate Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Wetland	Road	Index Contour (50')
		Intermediate Contour (10')

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

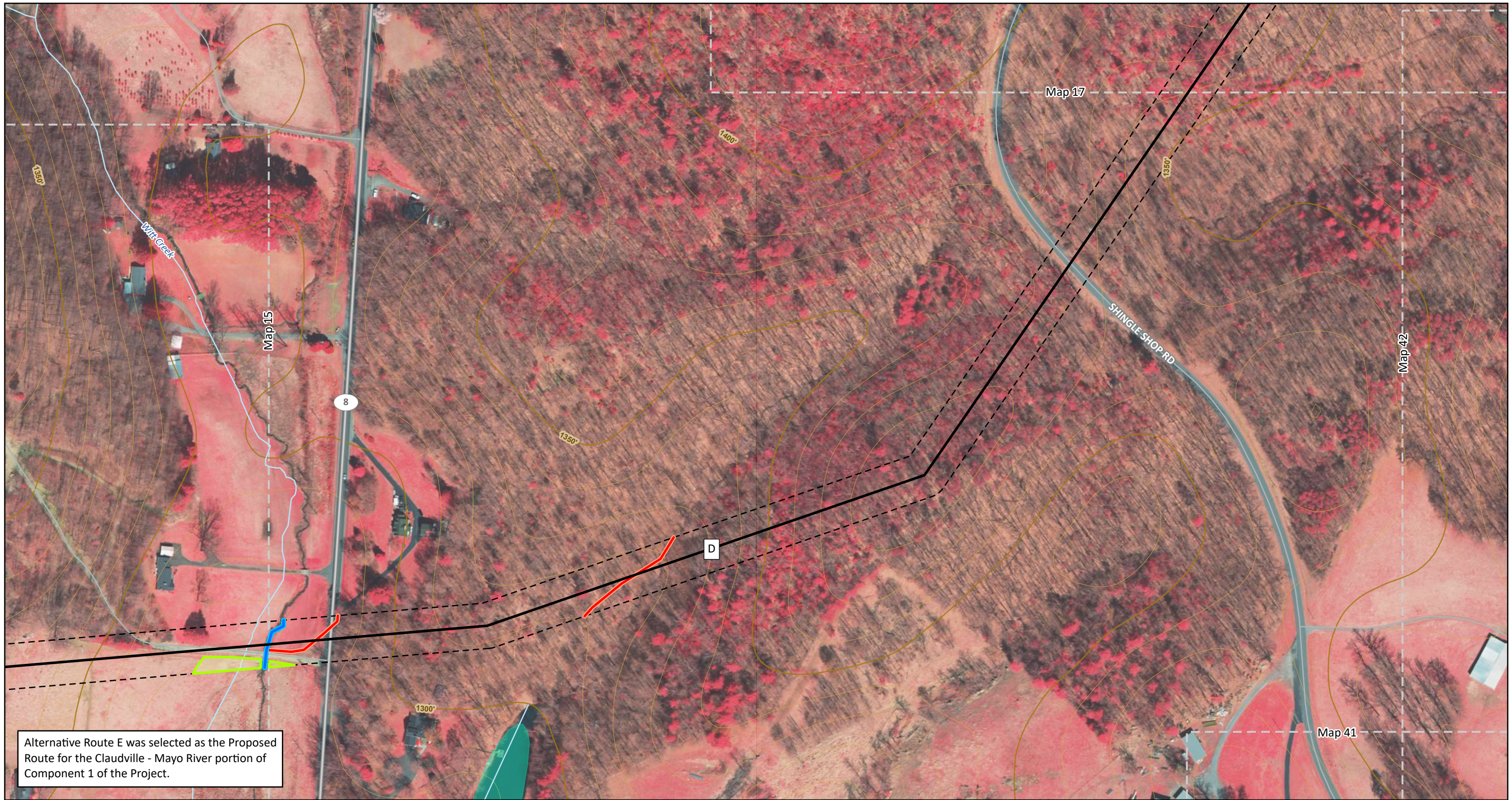
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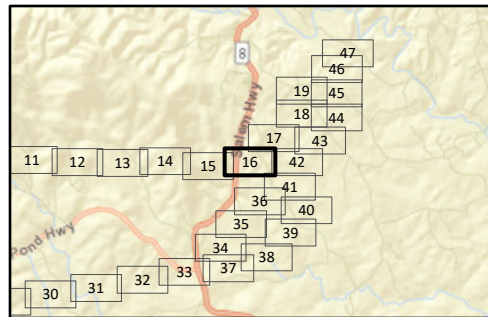
Attachment B:
Desktop Stream and Wetland Delineation
Map 15 of 47

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes

An AEP Company



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

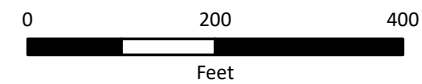


- | | | |
|--|---------------------|----------------------------|
| High Probability Stream | Right-of-Way (100') | Wetland (NWI) |
| Moderate Probability Stream | Highway | County Boundary |
| Low Probability Wetland | Road | Index Contour (50') |
| Claudville - Mayo River Alternative Routes | Stream (NHD) | Intermediate Contour (10') |



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

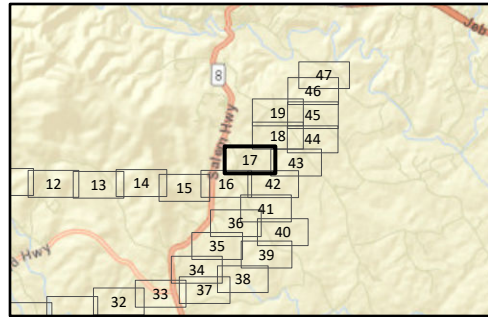
Attachment B:
Desktop Stream and Wetland Delineation
Map 16 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

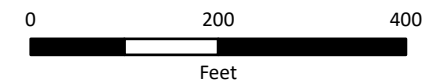


- Low Probability Stream
- Stream (NHD)
- Claudville - Mayo River Alternative Routes
- Wetland (NWI)
- Right-of-Way (100')
- County Boundary
- Road
- Index Contour (50')
- Intermediate Contour (10')



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

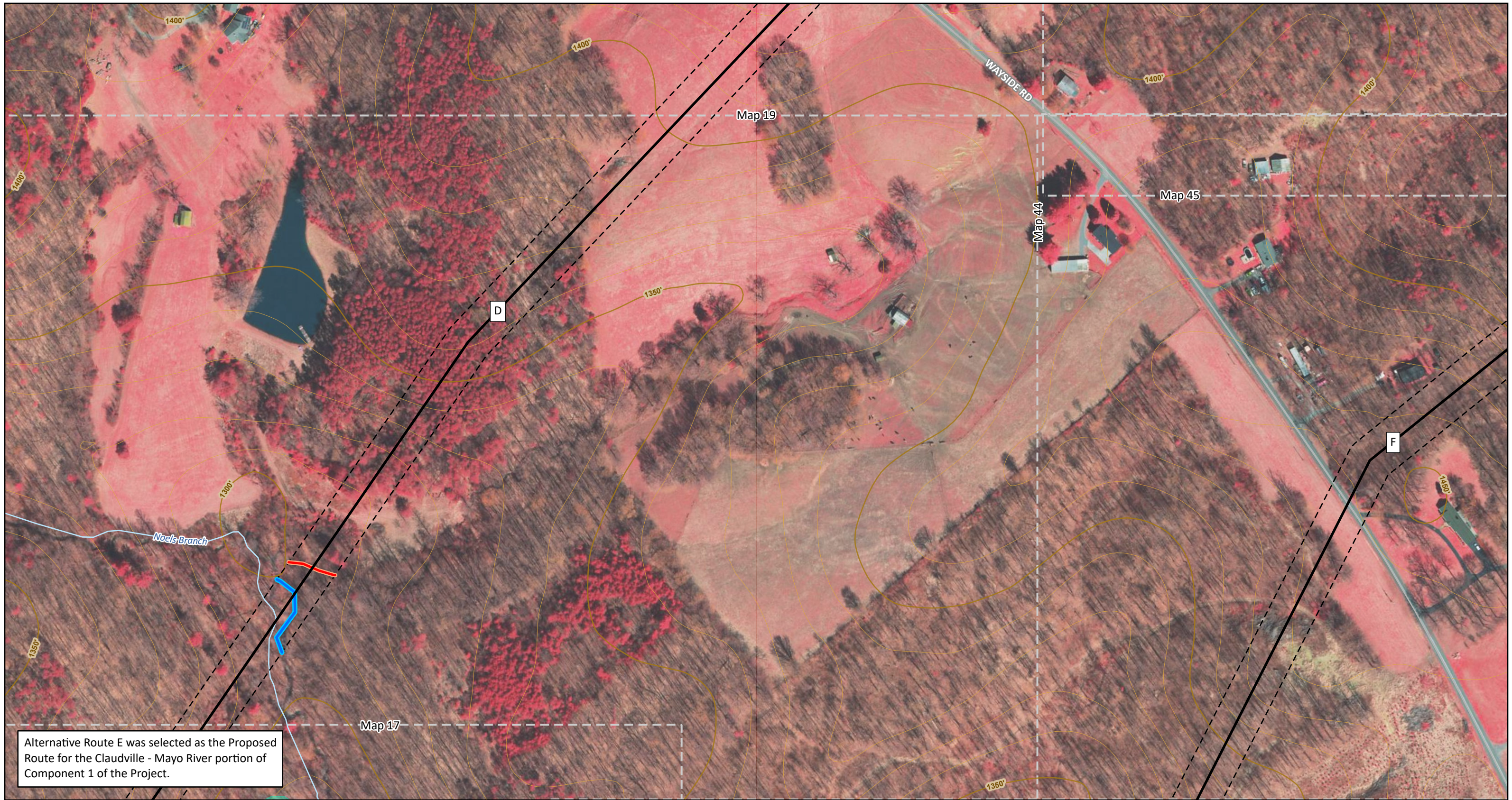


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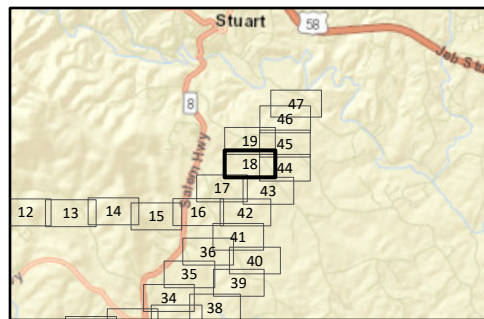
Attachment B:
Desktop Stream and Wetland Delineation
Map 17 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

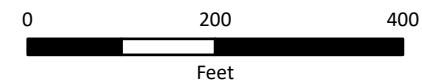


- | | | |
|--|---------------------|----------------------------|
| High Probability Stream | Right-of-Way (100') | County Boundary |
| Moderate Probability Stream | Road | Index Contour (50') |
| Claudville - Mayo River Alternative Routes | Stream (NHD) | Intermediate Contour (10') |
| Wetland (NWI) | | |



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

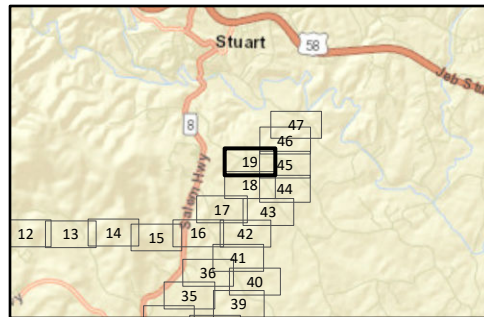
Attachment B:
Desktop Stream and Wetland Delineation
Map 18 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Stream (NHD)
Moderate Probability Stream	County Boundary
Claudville - Mayo River Alternative Routes	Index Contour (50')
Right-of-Way (100')	Intermediate Contour (10')
Road	

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

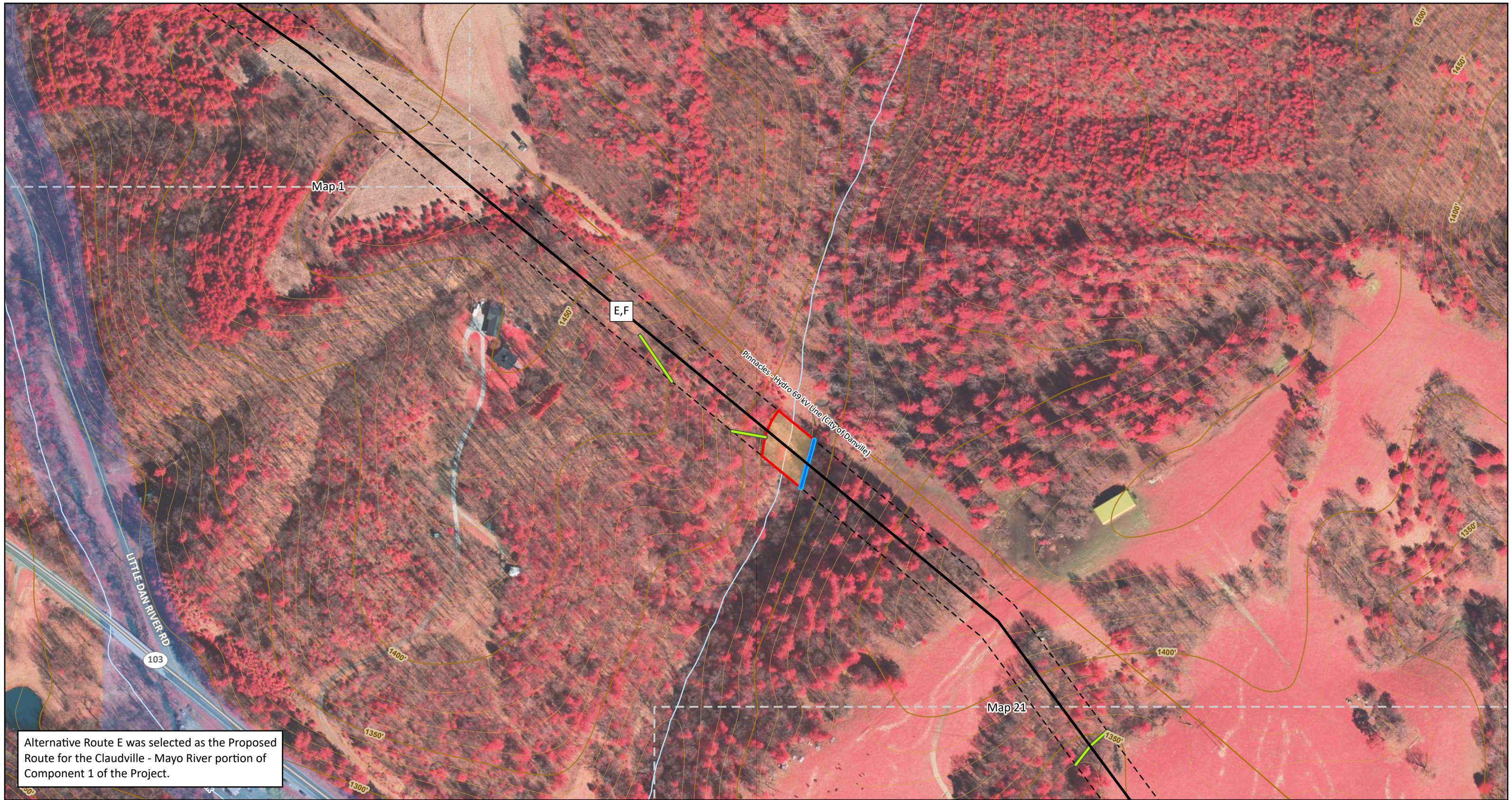
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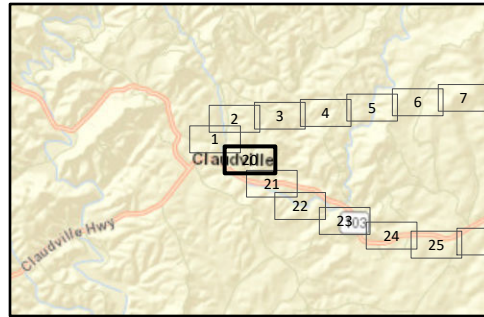
Attachment B:
Desktop Stream and Wetland Delineation
Map 19 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Floodplain
Low Probability Stream	Existing Non-APCo Transmission Line	County Boundary
Moderate Probability Wetland	Highway	Index Contour (50')
Claudville - Mayo River Alternative Routes	Road	Intermediate Contour (10')
	Stream (NHD)	

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

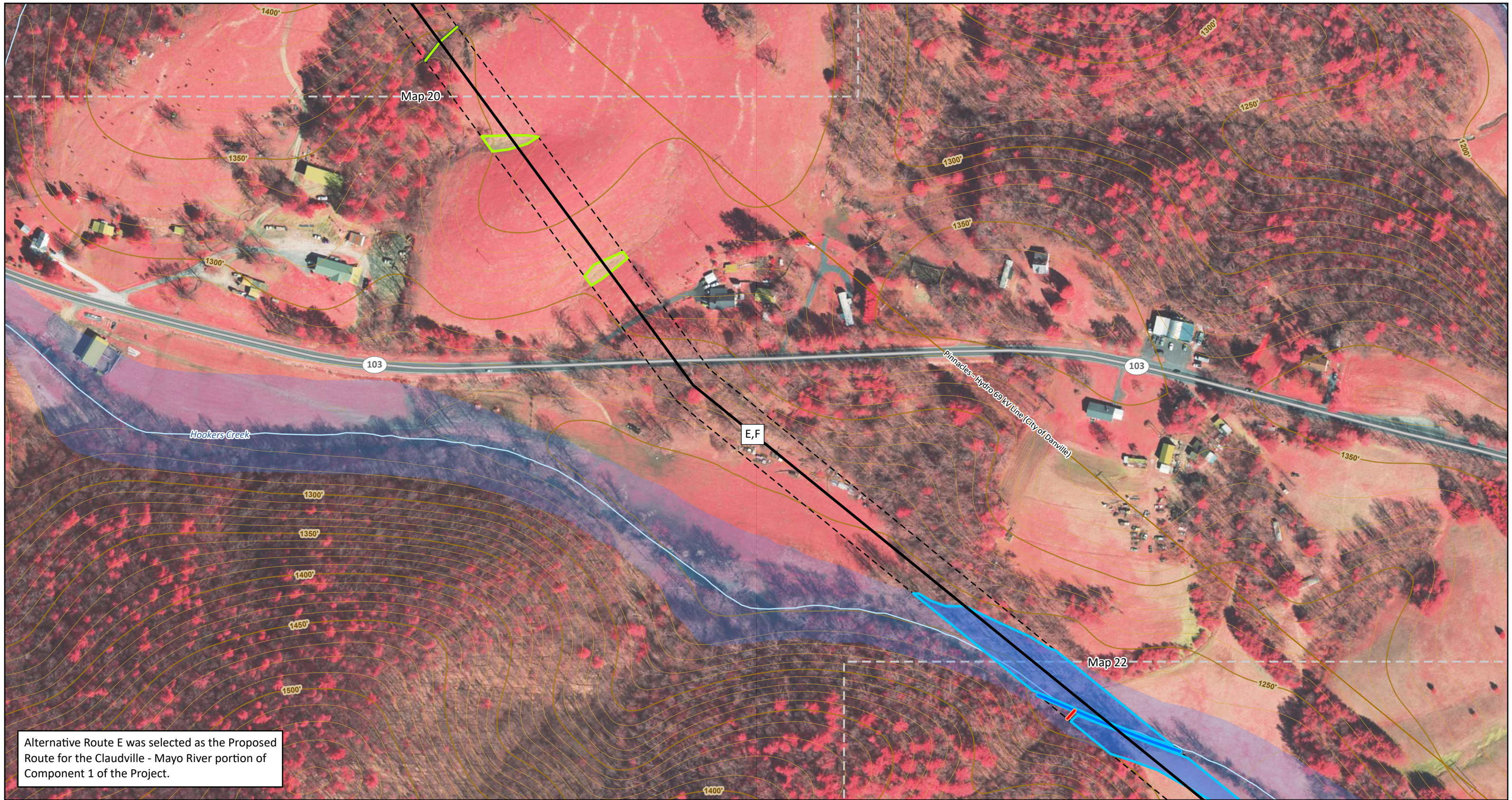
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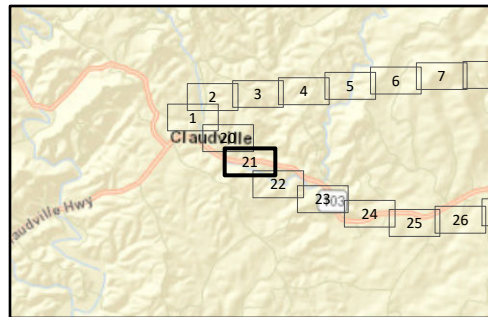
Attachment B:
Desktop Stream and Wetland Delineation
Map 20 of 47

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes

An AEP Company



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



- High Probability Stream
- Low Probability Stream
- Moderate Probability Stream
- High Probability Wetland
- Low Probability Wetland

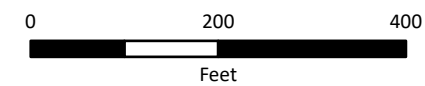
- Claudville - Mayo River Alternative Routes
- Right-of-Way (100')
- Existing Non-APCo Transmission Line
- Highway
- Road

- Stream (NHD)
- Floodplain
- County Boundary
- Index Contour (50')
- Intermediate Contour (10')



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

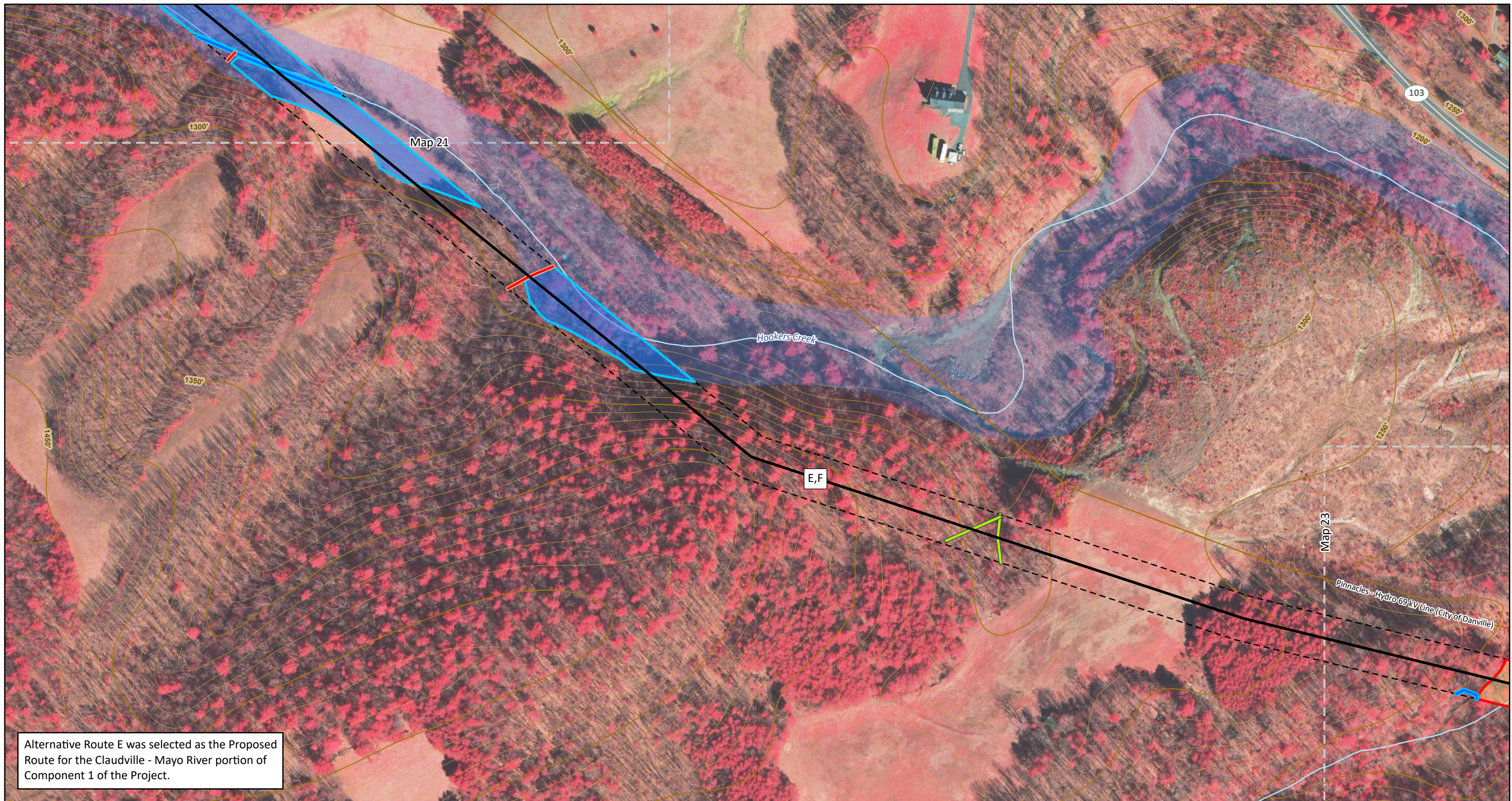


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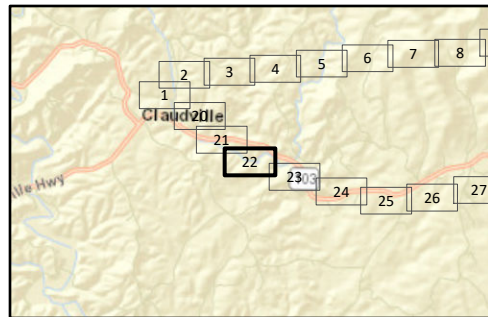
Attachment B:
Desktop Stream and Wetland Delineation
Map 21 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Claudville - Mayo River Alternative Routes	Stream (NHD)
Low Probability Stream	Right-of-Way (100')	Floodplain
Moderate Probability Stream	Existing Non-APCo Transmission Line	County Boundary
High Probability Wetland	Highway	Index Contour (50')
Moderate Probability Wetland	Road	Intermediate Contour (10')

Patrick County,
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Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
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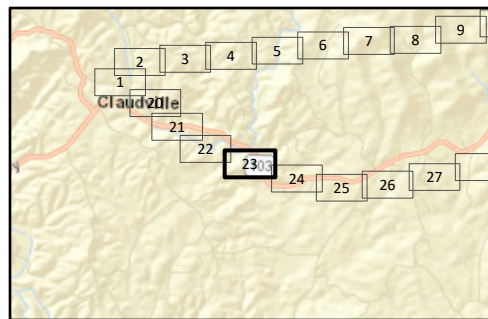
Attachment B:
Desktop Stream and Wetland Delineation
Map 22 of 47

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes

An AEP Company



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Floodplain
Low Probability Stream	Existing Non-APCo Transmission Line	County Boundary
High Probability Wetland	Highway	Index Contour (50')
Moderate Probability Wetland	Road	Intermediate Contour (10')
Claudville - Mayo River Alternative Routes	Stream (NHD)	

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

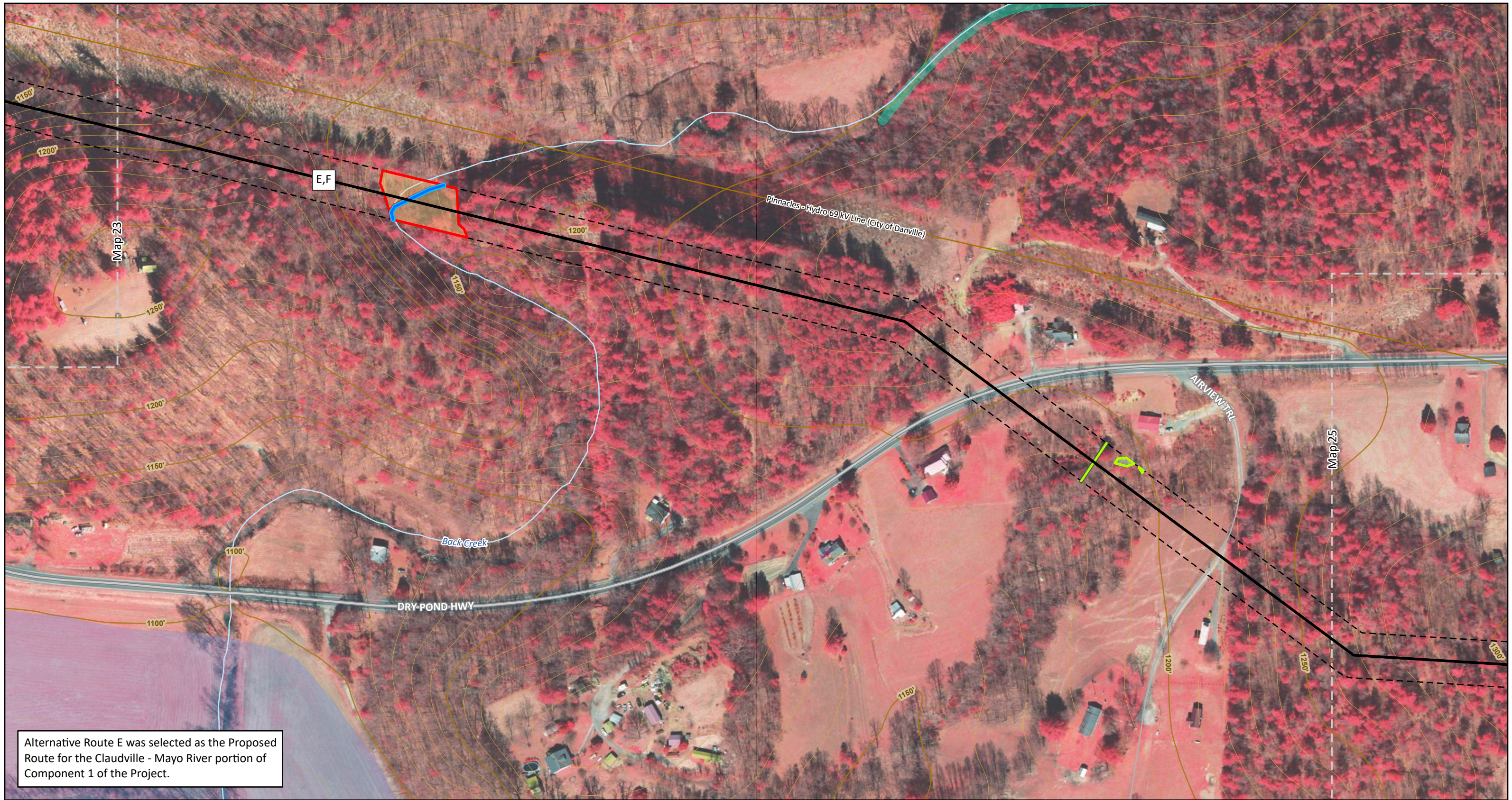
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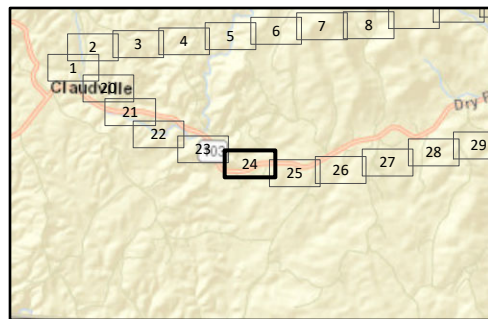
Attachment B:
Desktop Stream and Wetland Delineation
Map 23 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

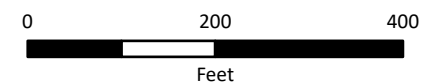


- | | | |
|--|-------------------------------------|----------------------------|
| High Probability Stream | Right-of-Way (100') | Wetland (NWI) |
| Low Probability Stream | Existing Non-APCo Transmission Line | Floodplain |
| Low Probability Wetland | Highway | County Boundary |
| Moderate Probability Wetland | Road | Index Contour (50') |
| Claudville - Mayo River Alternative Routes | Stream (NHD) | Intermediate Contour (10') |



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Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

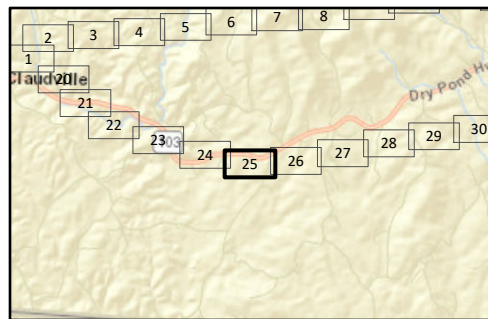
Attachment B:
Desktop Stream and Wetland Delineation
Map 24 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



- | | | |
|--|-------------------------------------|----------------------------|
| Low Probability Stream | Existing Non-APCo Transmission Line | County Boundary |
| Claudville - Mayo River Alternative Routes | Highway | Index Contour (50') |
| Right-of-Way (100') | Road | Intermediate Contour (10') |
| | Stream (NHD) | |

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Date: 3/17/2023; Author: ckunde; Project: 159298

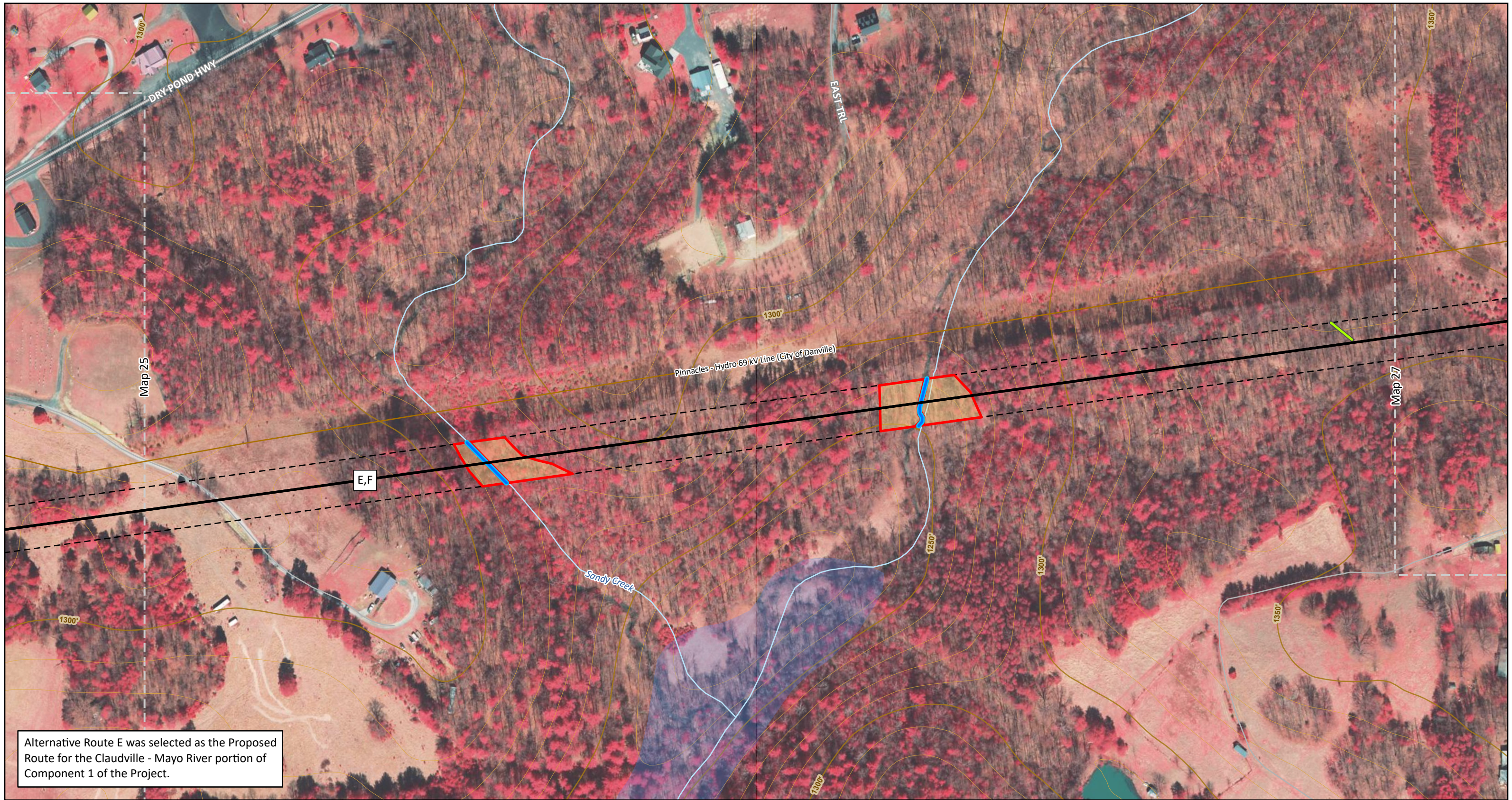
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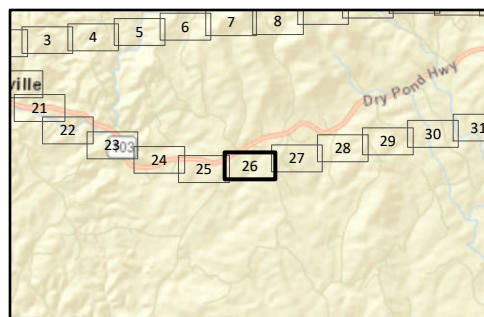
Attachment B:
Desktop Stream and Wetland Delineation
Map 25 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Floodplain
Low Probability Stream	Existing Non-APCo Transmission Line	County Boundary
Moderate Probability Wetland	Highway	Index Contour (50')
Claudville - Mayo River Alternative Routes	Road	Intermediate Contour (10')
	Stream (NHD)	

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

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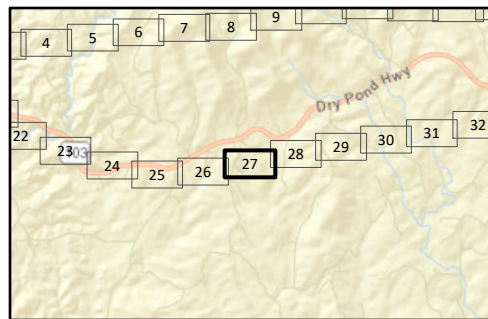
Attachment B:
Desktop Stream and Wetland Delineation
Map 26 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Floodplain
Low Probability Stream	Existing Non-APCo Transmission Line	County Boundary
Moderate Probability Wetland	Road	Index Contour (50')
Claudville - Mayo River Alternative Routes	Stream (NHD)	Intermediate Contour (10')
	Wetland (NWI)	

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

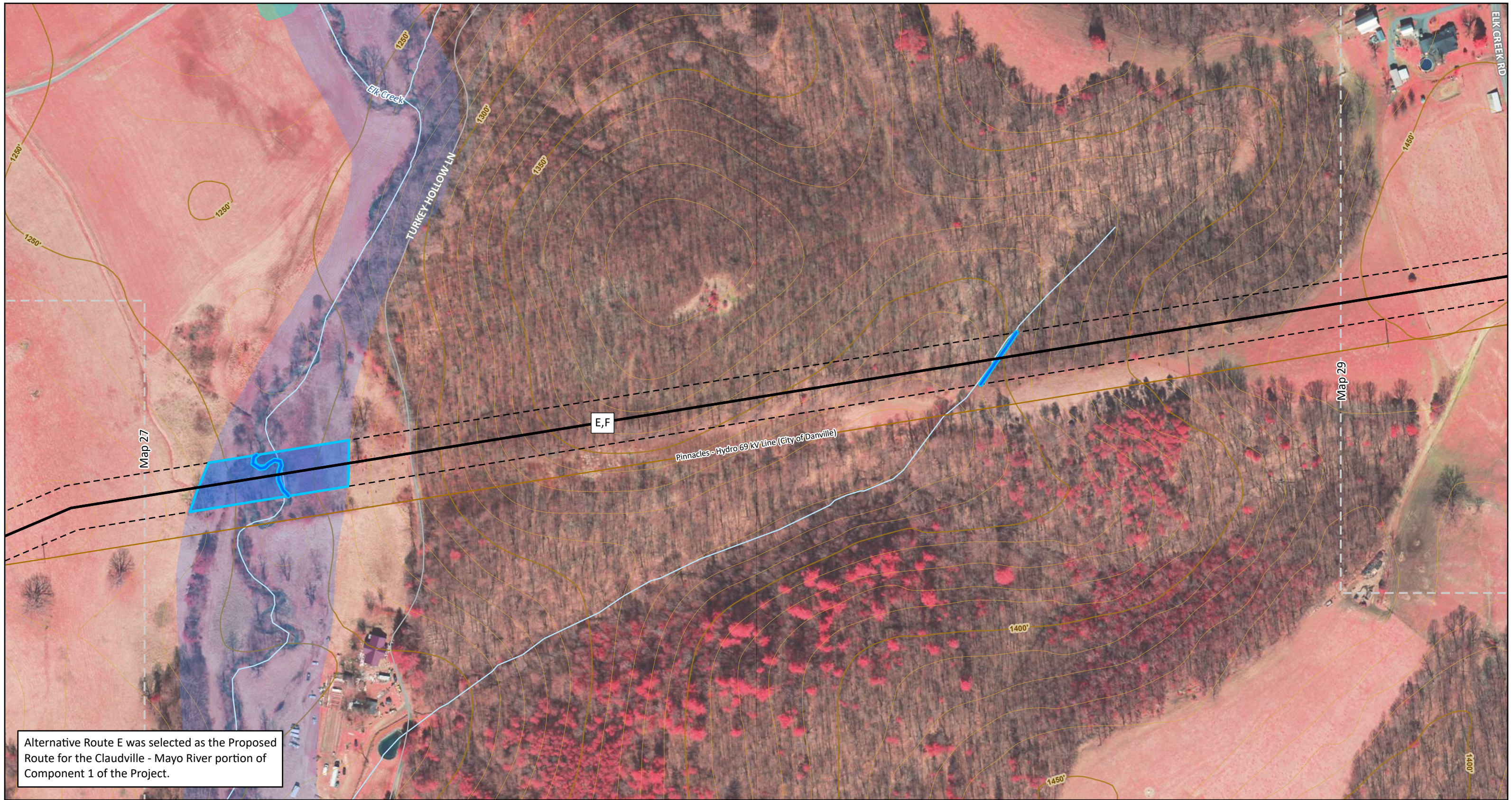
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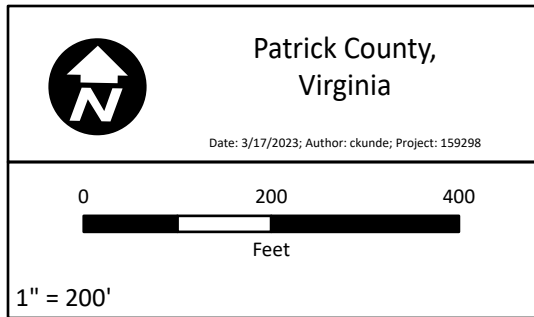
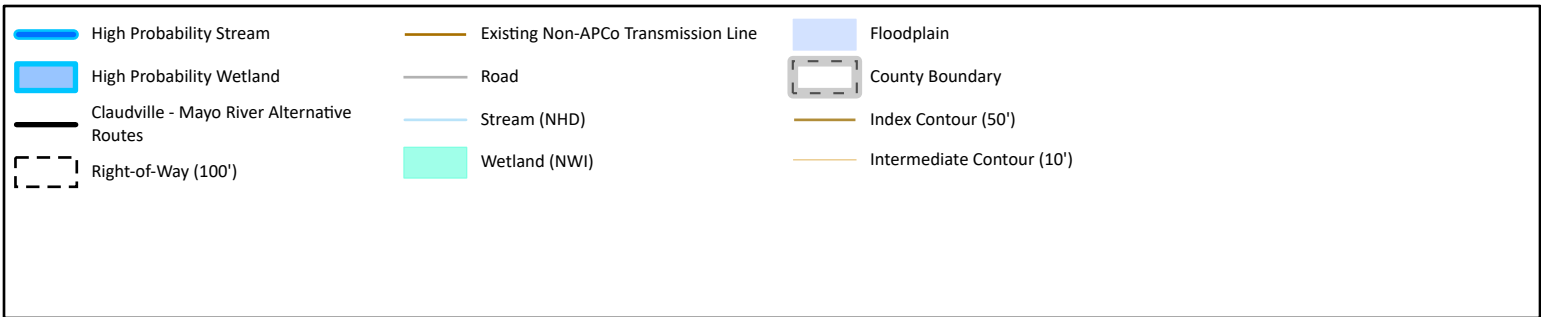
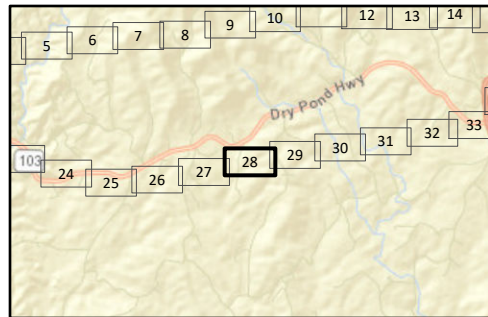
Attachment B:
Desktop Stream and Wetland Delineation
Map 27 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



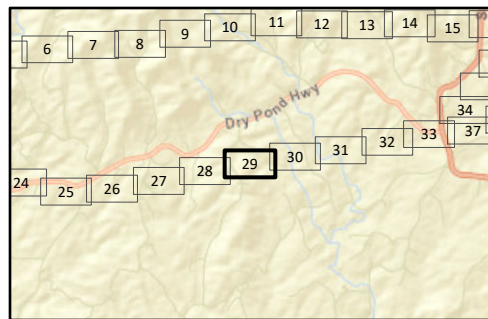
Attachment B:
Desktop Stream and Wetland Delineation
Map 28 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Wetland (NWI)
Low Probability Stream	Existing Non-APCo Transmission Line	County Boundary
Moderate Probability Wetland	Road	Index Contour (50')
Claudville - Mayo River Alternative Routes	Stream (NHD)	Intermediate Contour (10')

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

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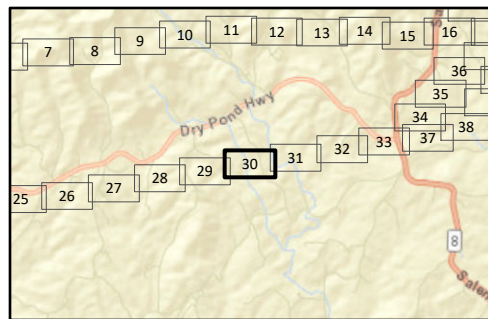
Attachment B:
Desktop Stream and Wetland Delineation
Map 29 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Floodplain
Low Probability Stream	Existing Non-APCo Transmission Line	County Boundary
High Probability Wetland	Road	Index Contour (50')
Moderate Probability Wetland	Stream (NHD)	Intermediate Contour (10')
Claudville - Mayo River Alternative Routes	Wetland (NWI)	

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

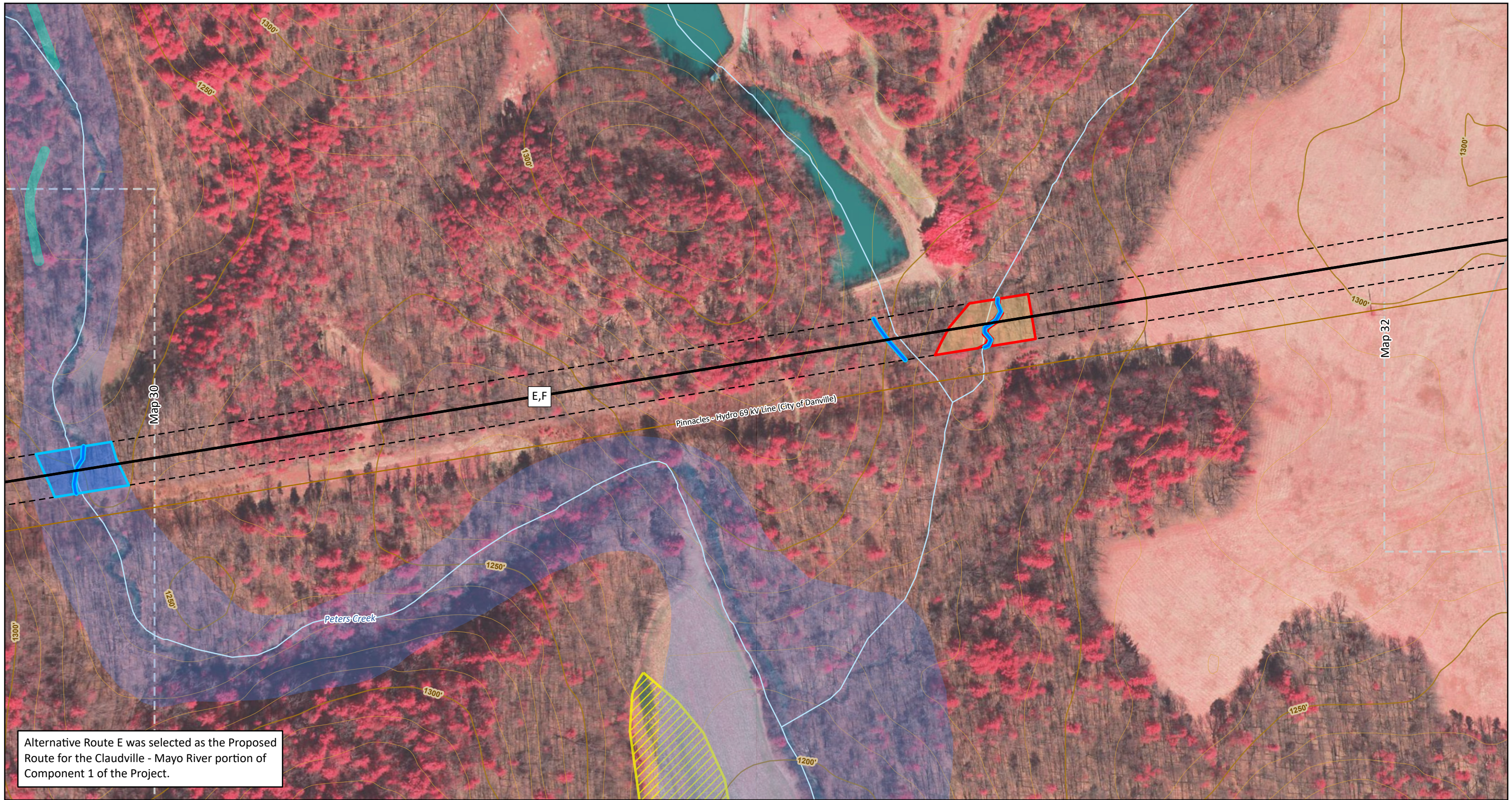
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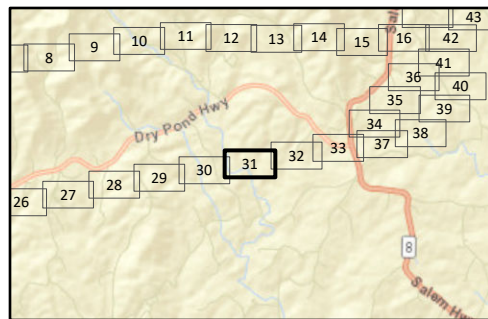
Attachment B:
Desktop Stream and Wetland Delineation
Map 30 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Right-of-Way (100')	Floodplain
High Probability Wetland	Existing Non-APCo Transmission Line	Hydric Soils
Moderate Probability Wetland	Road	County Boundary
Claudville - Mayo River Alternative Routes	Stream (NHD)	Index Contour (50')
	Wetland (NWI)	Intermediate Contour (10')

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

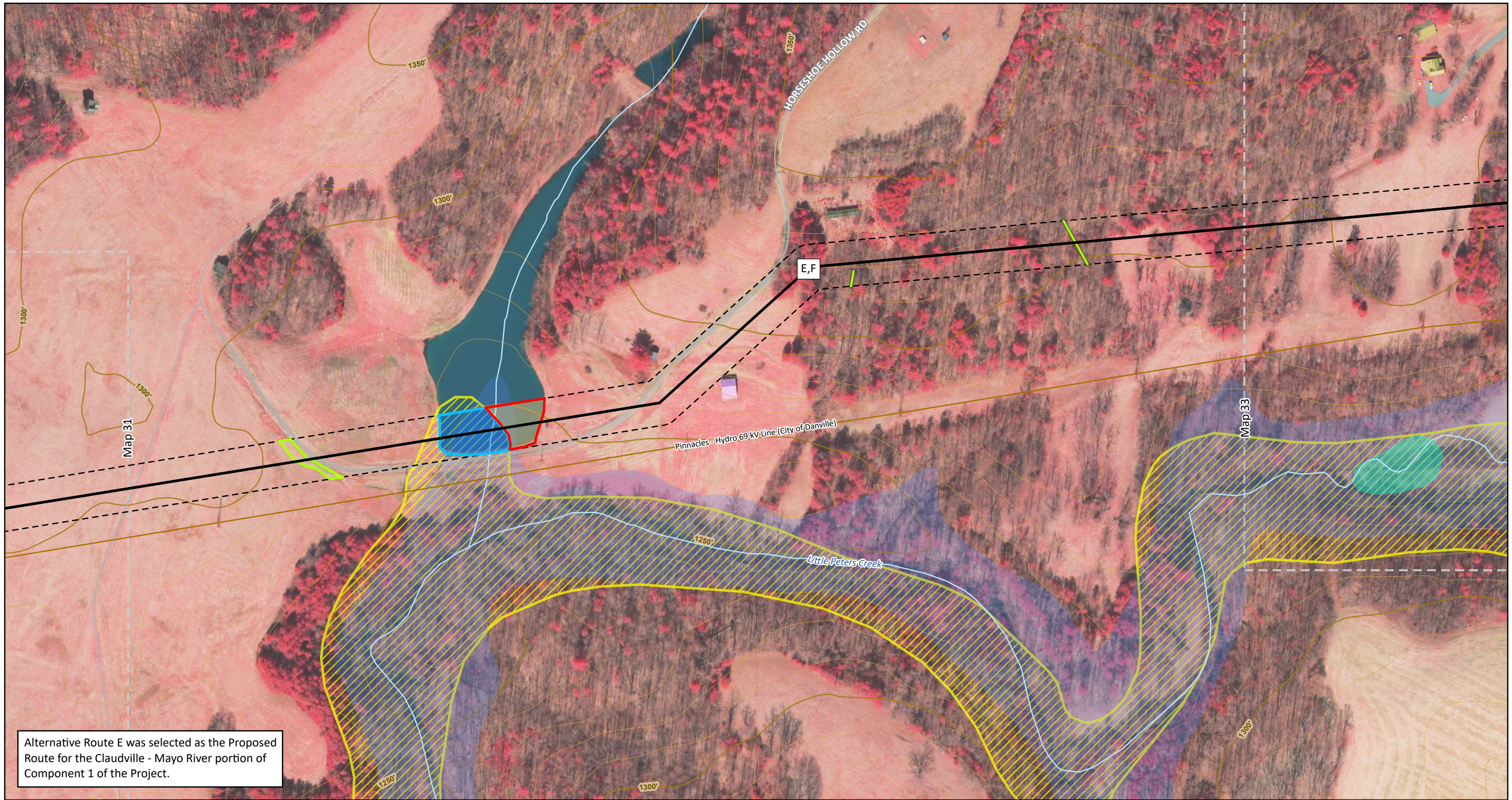
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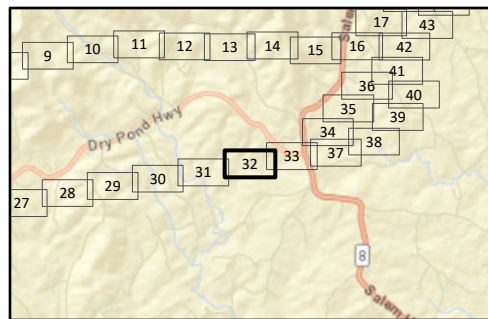
Attachment B:
Desktop Stream and Wetland Delineation
Map 31 of 47

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes

An AEP Company



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



Low Probability Stream	Right-of-Way (100')	Floodplain
High Probability Wetland	Existing Non-APCo Transmission Line	Hydric Soils
Low Probability Wetland	Road	County Boundary
Moderate Probability Wetland	Stream (NHD)	Index Contour (50')
Claudville - Mayo River Alternative Routes	Wetland (NWI)	Intermediate Contour (10')

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

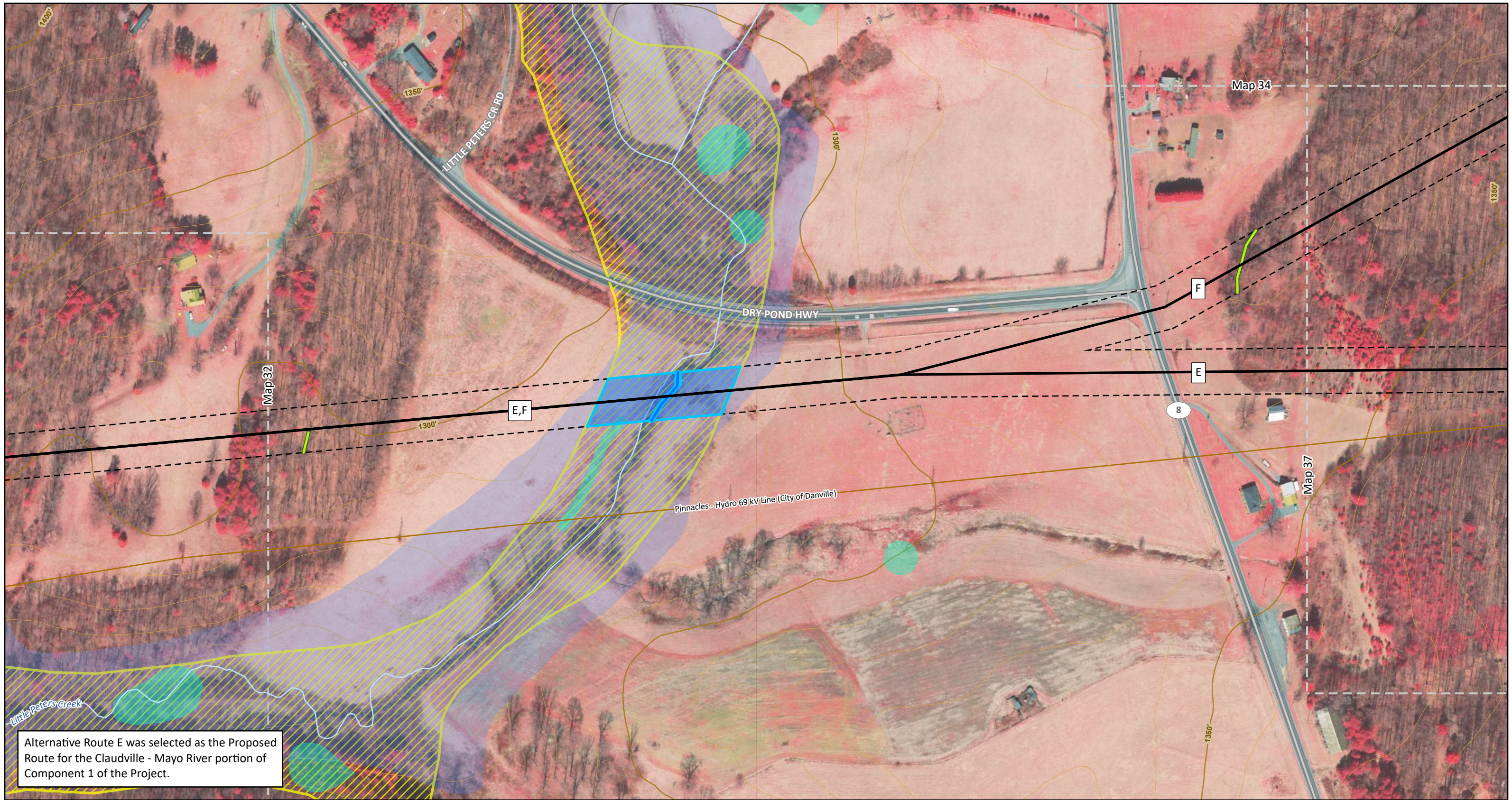
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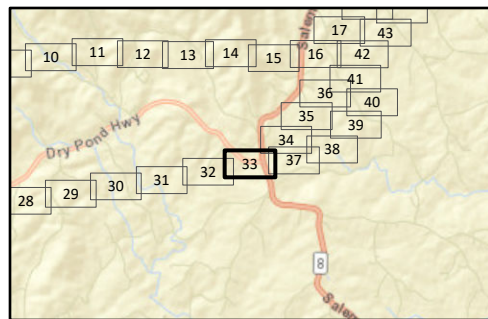
Attachment B:
Desktop Stream and Wetland Delineation
Map 32 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Existing Non-APCo Transmission Line	Floodplain
Low Probability Stream	Highway	Hydric Soils
High Probability Wetland	Road	County Boundary
Claudville - Mayo River Alternative Routes	Stream (NHD)	Index Contour (50')
Right-of-Way (100')	Wetland (NWI)	Intermediate Contour (10')

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

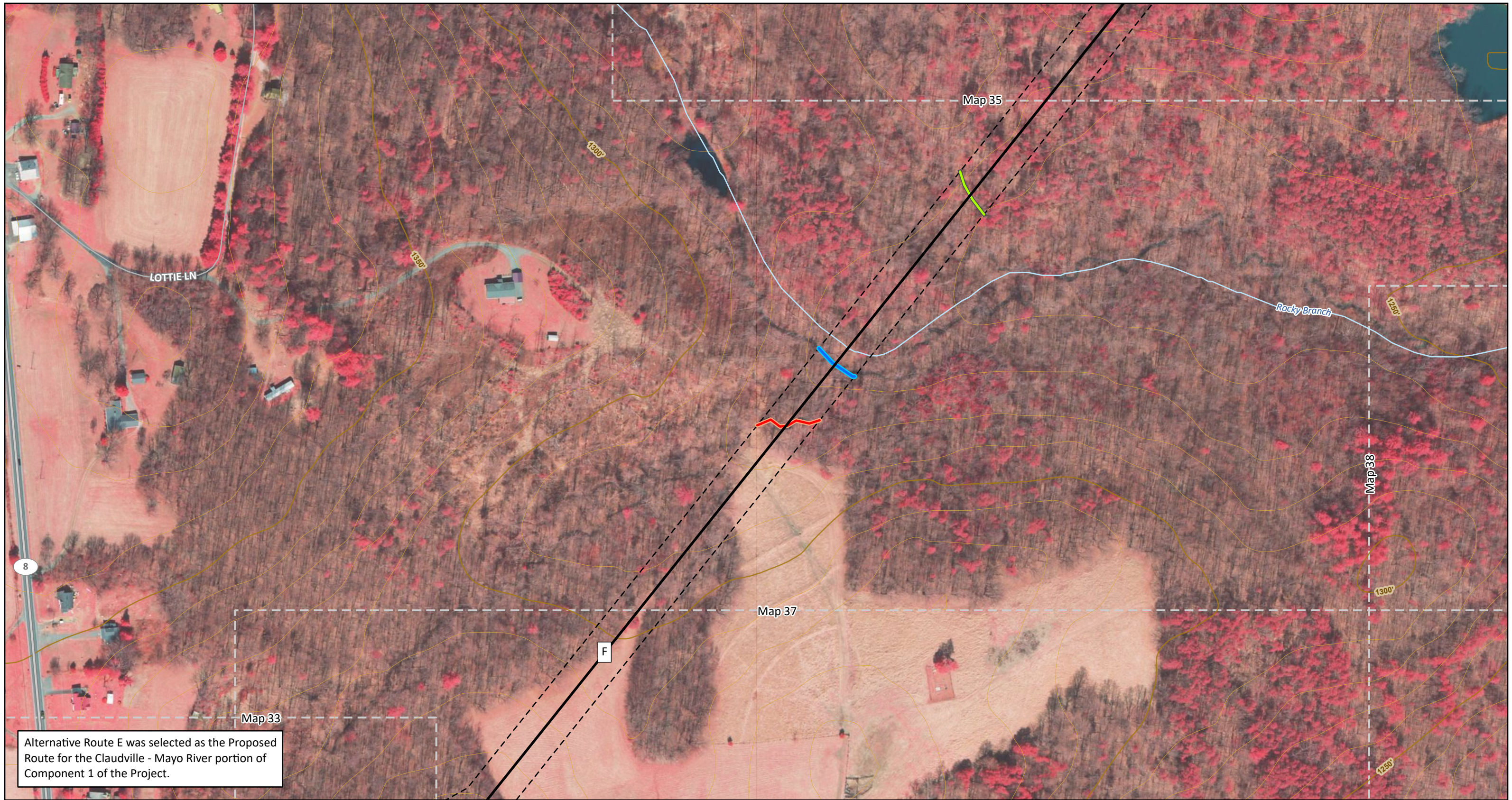
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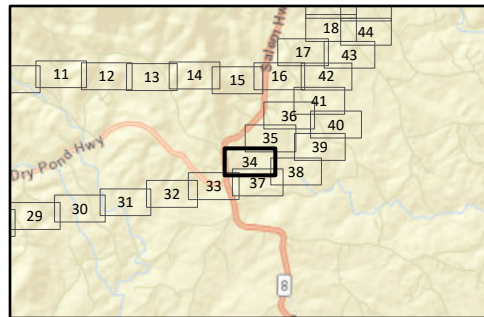
Attachment B:
Desktop Stream and Wetland Delineation
Map 33 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

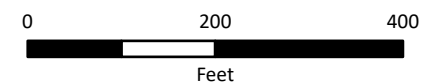


- | | | |
|--|---------------------|----------------------------|
| High Probability Stream | Right-of-Way (100') | County Boundary |
| Low Probability Stream | Highway | Index Contour (50') |
| Moderate Probability Stream | Road | Intermediate Contour (10') |
| Claudville - Mayo River Alternative Routes | Stream (NHD) | |



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

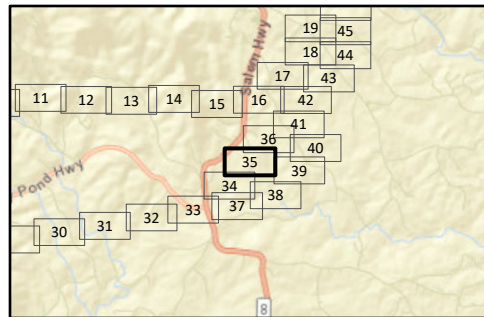
Attachment B:
Desktop Stream and Wetland Delineation
Map 34 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

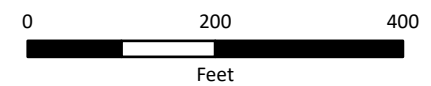


- Claudville - Mayo River Alternative Routes
- Right-of-Way (100')
- Highway
- Road
- Stream (NHD)
- County Boundary
- Index Contour (50')
- Intermediate Contour (10')



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

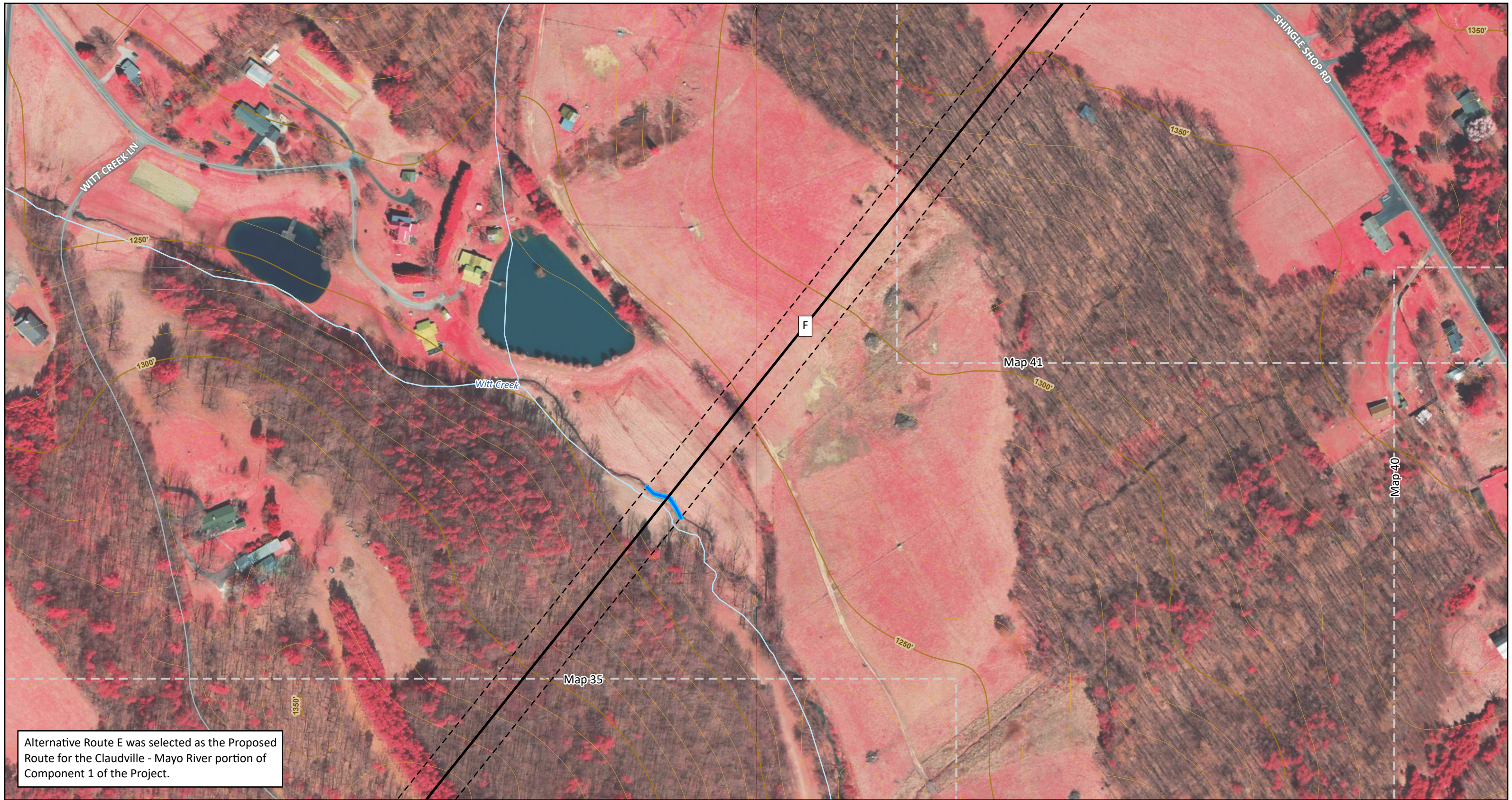


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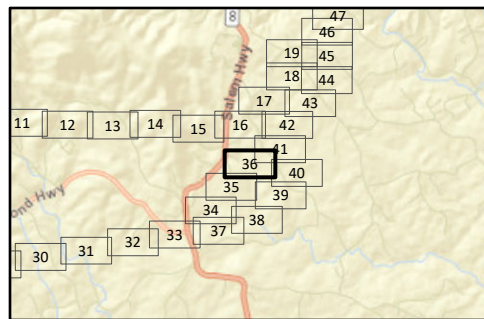
Attachment B:
Desktop Stream and Wetland Delineation
Map 35 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Road
Claudville - Mayo River Alternative Routes	Stream (NHD)
Right-of-Way (100')	County Boundary
Highway	Index Contour (50')
	Intermediate Contour (10')

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

1" = 200'

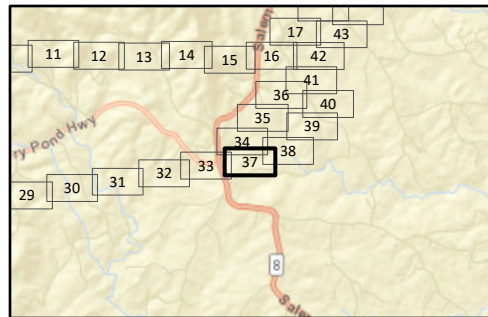
Attachment B:
Desktop Stream and Wetland Delineation
Map 36 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



Low Probability Stream	Right-of-Way (100')	County Boundary
Moderate Probability Stream	Existing Non-APCo Transmission Line	Index Contour (50')
Claudville - Mayo River Alternative Routes	Road	Intermediate Contour (10')
	Stream (NHD)	

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

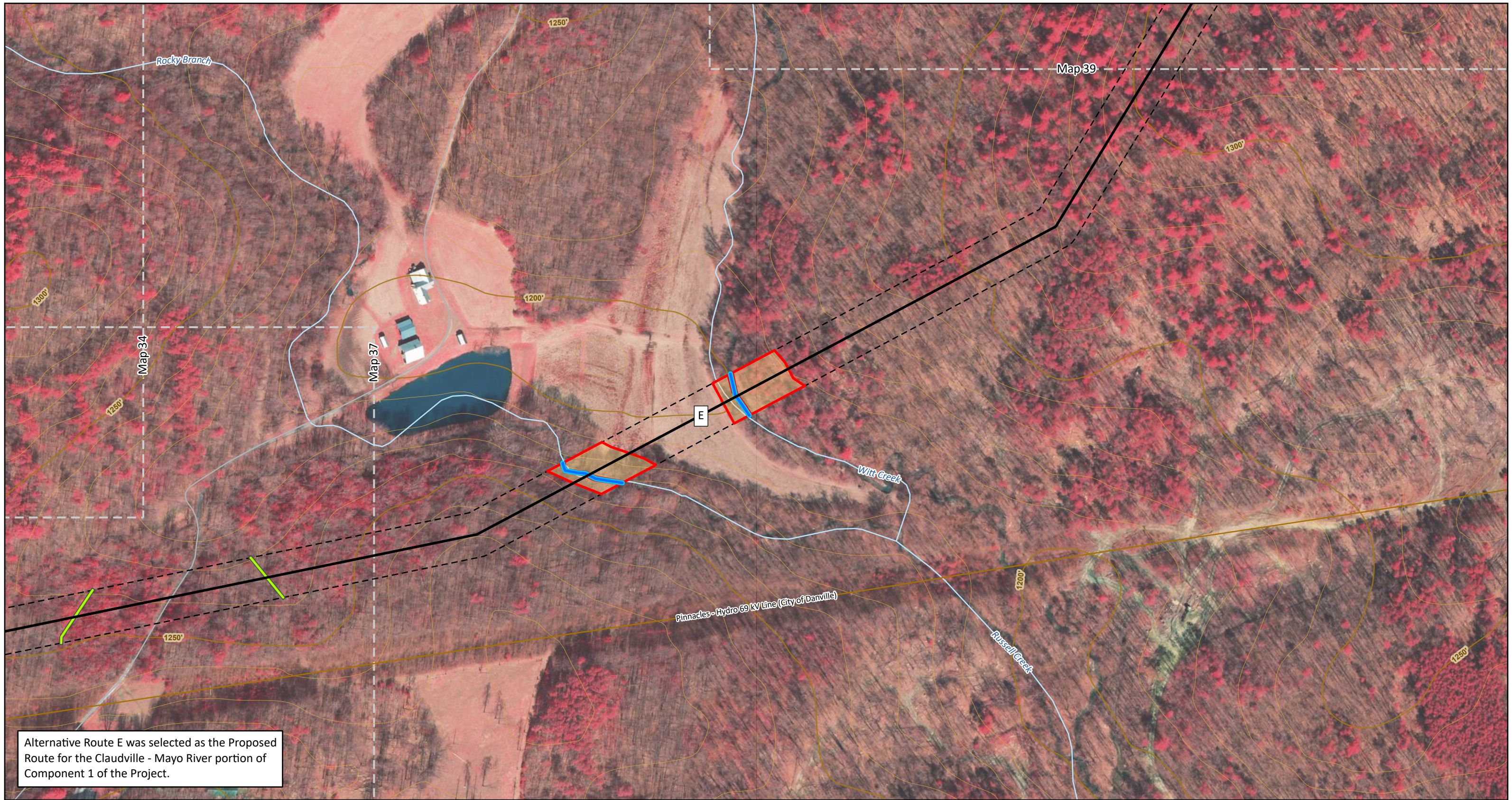
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Feet

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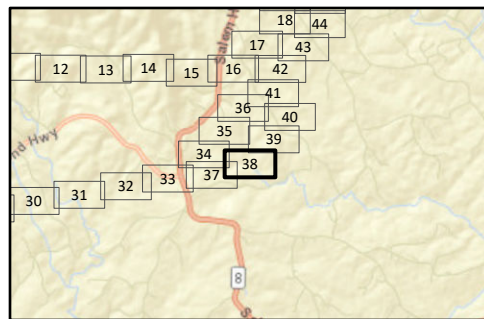
Attachment B:
Desktop Stream and Wetland Delineation
Map 37 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



- | | | |
|--|-------------------------------------|----------------------------|
| High Probability Stream | Right-of-Way (100') | County Boundary |
| Low Probability Stream | Existing Non-APCo Transmission Line | Index Contour (50') |
| Moderate Probability Wetland | Road | Intermediate Contour (10') |
| Claudville - Mayo River Alternative Routes | Stream (NHD) | |

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

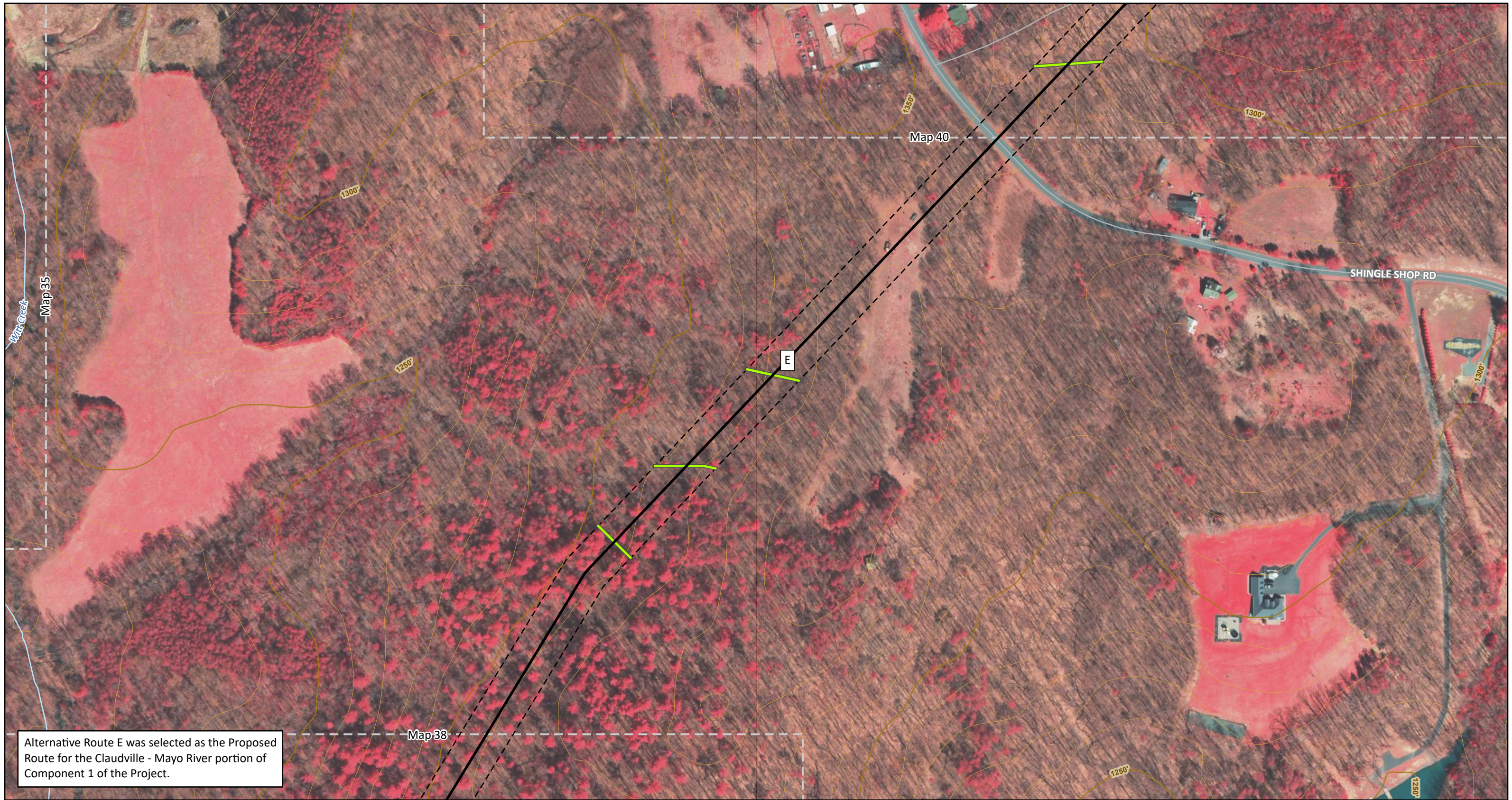
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Feet

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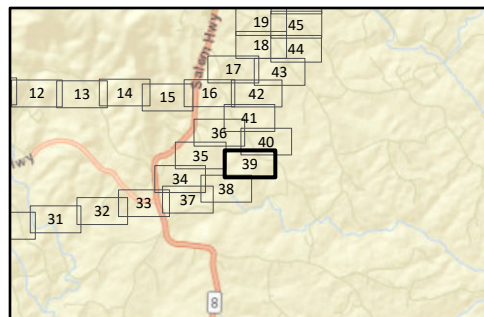
Attachment B:
Desktop Stream and Wetland Delineation
Map 38 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

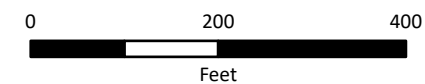


- | | |
|--|----------------------------|
| Low Probability Stream | Stream (NHD) |
| Claudville - Mayo River Alternative Routes | County Boundary |
| Right-of-Way (100') | Index Contour (50') |
| Road | Intermediate Contour (10') |



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

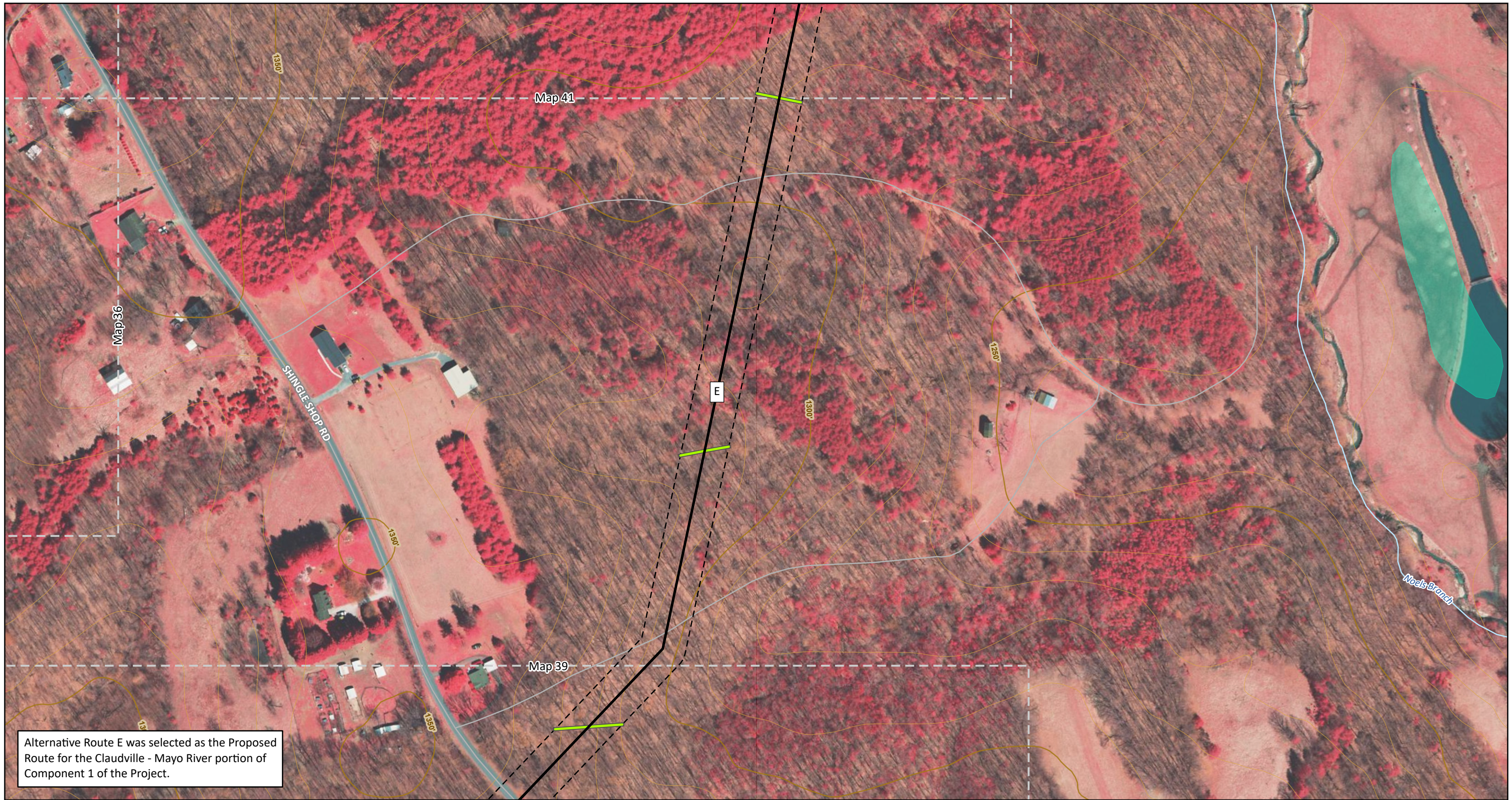


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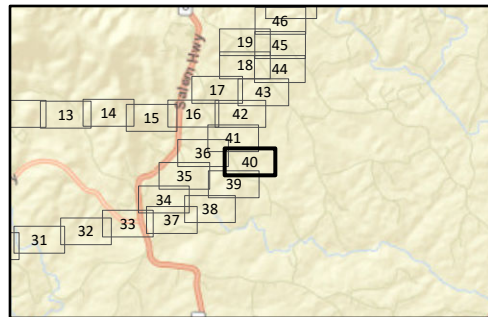
Attachment B:
Desktop Stream and Wetland Delineation
Map 39 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

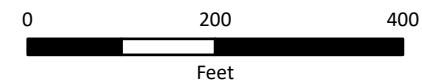


- | | |
|--|----------------------------|
| Low Probability Stream | Stream (NHD) |
| Claudville - Mayo River Alternative Routes | Wetland (NWI) |
| Right-of-Way (100') | County Boundary |
| Road | Index Contour (50') |
| | Intermediate Contour (10') |



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

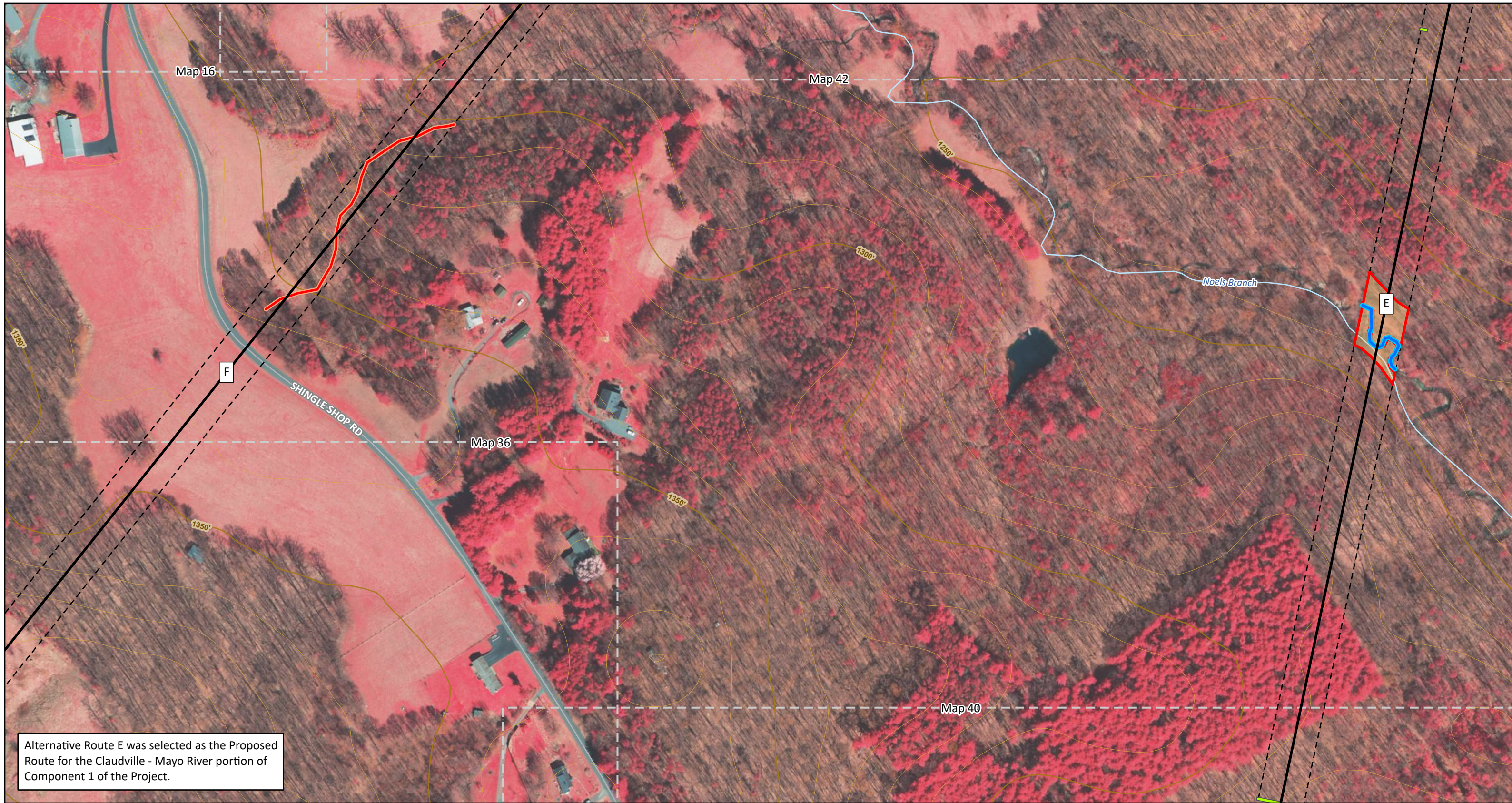


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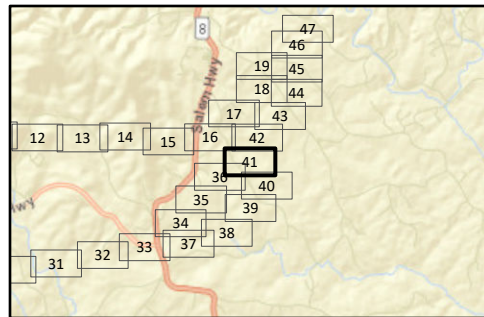
Attachment B:
Desktop Stream and Wetland Delineation
Map 40 of 47



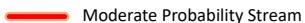




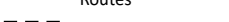
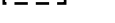
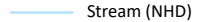



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



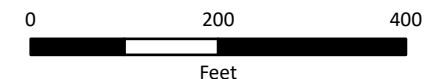
-  High Probability Stream
-  Low Probability Stream
-  Moderate Probability Stream
-  Moderate Probability Wetland

-  Claudville - Mayo River Alternative Routes
-  Right-of-Way (100')
-  Road
-  Stream (NHD)
-  County Boundary
-  Index Contour (50')
-  Intermediate Contour (10')



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298



1" = 200'

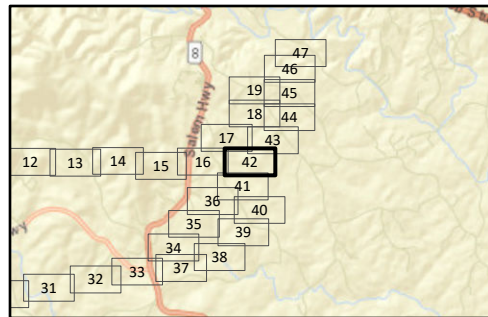
Attachment B:
Desktop Stream and Wetland Delineation
Map 41 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



- High Probability Stream
- Low Probability Stream
- Moderate Probability Stream
- Low Probability Wetland
- Moderate Probability Wetland

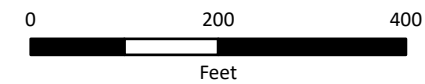
- Claudville - Mayo River Alternative Routes
- Right-of-Way (100')
- Road
- Stream (NHD)

- Wetland (NWI)
- County Boundary
- Index Contour (50')
- Intermediate Contour (10')



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

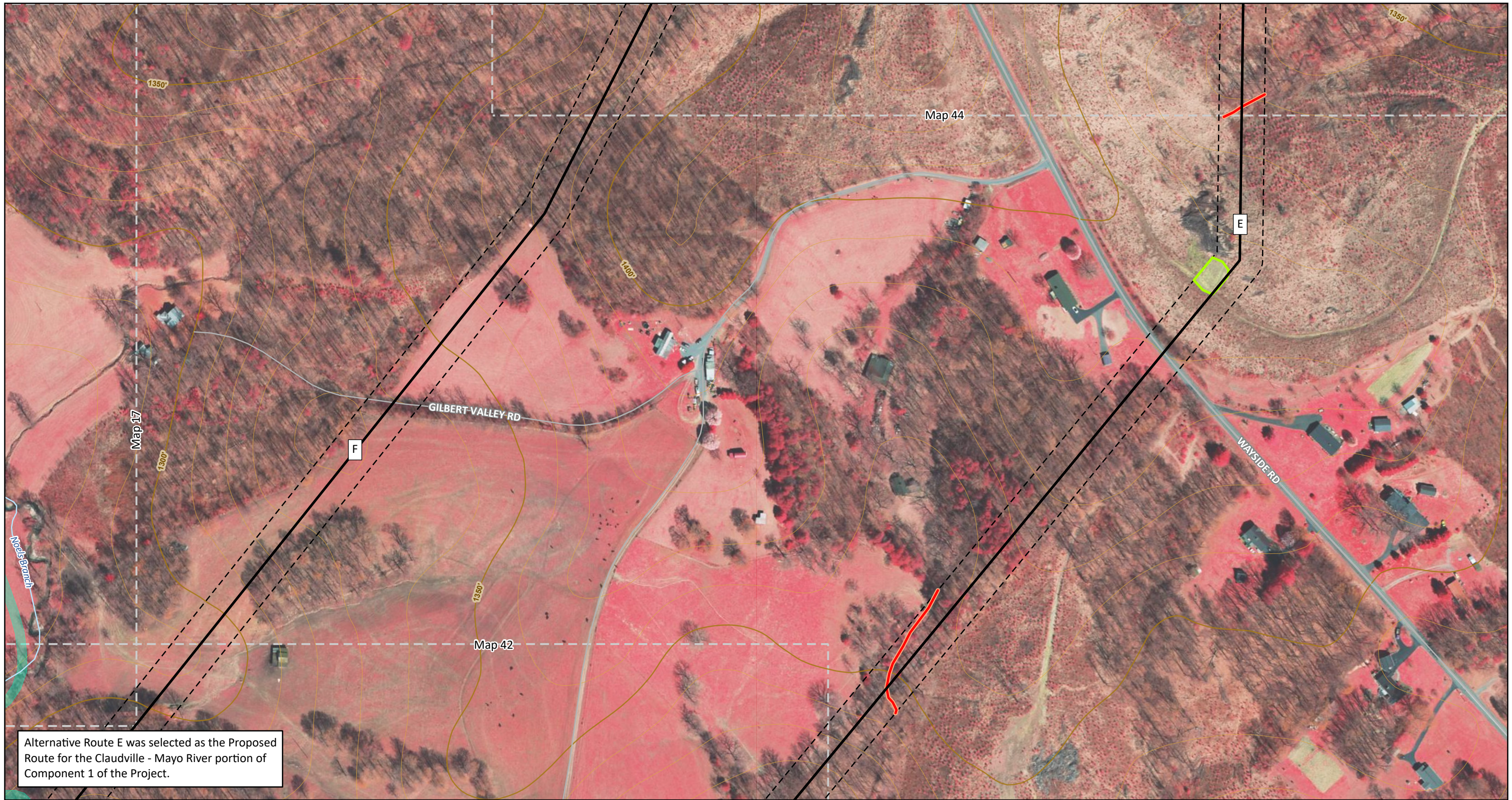


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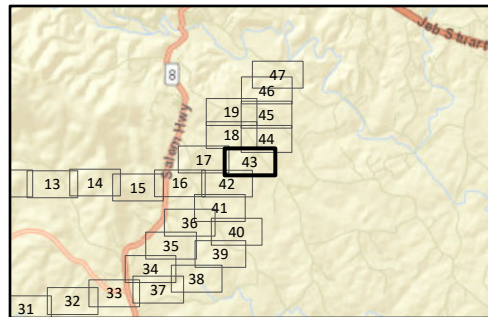
Attachment B:
Desktop Stream and Wetland Delineation
Map 42 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



Moderate Probability Stream	Right-of-Way (100')	County Boundary
Low Probability Wetland	Road	Index Contour (50')
Claudville - Mayo River Alternative Routes	Stream (NHD)	Intermediate Contour (10')
Wetland (NWI)		

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

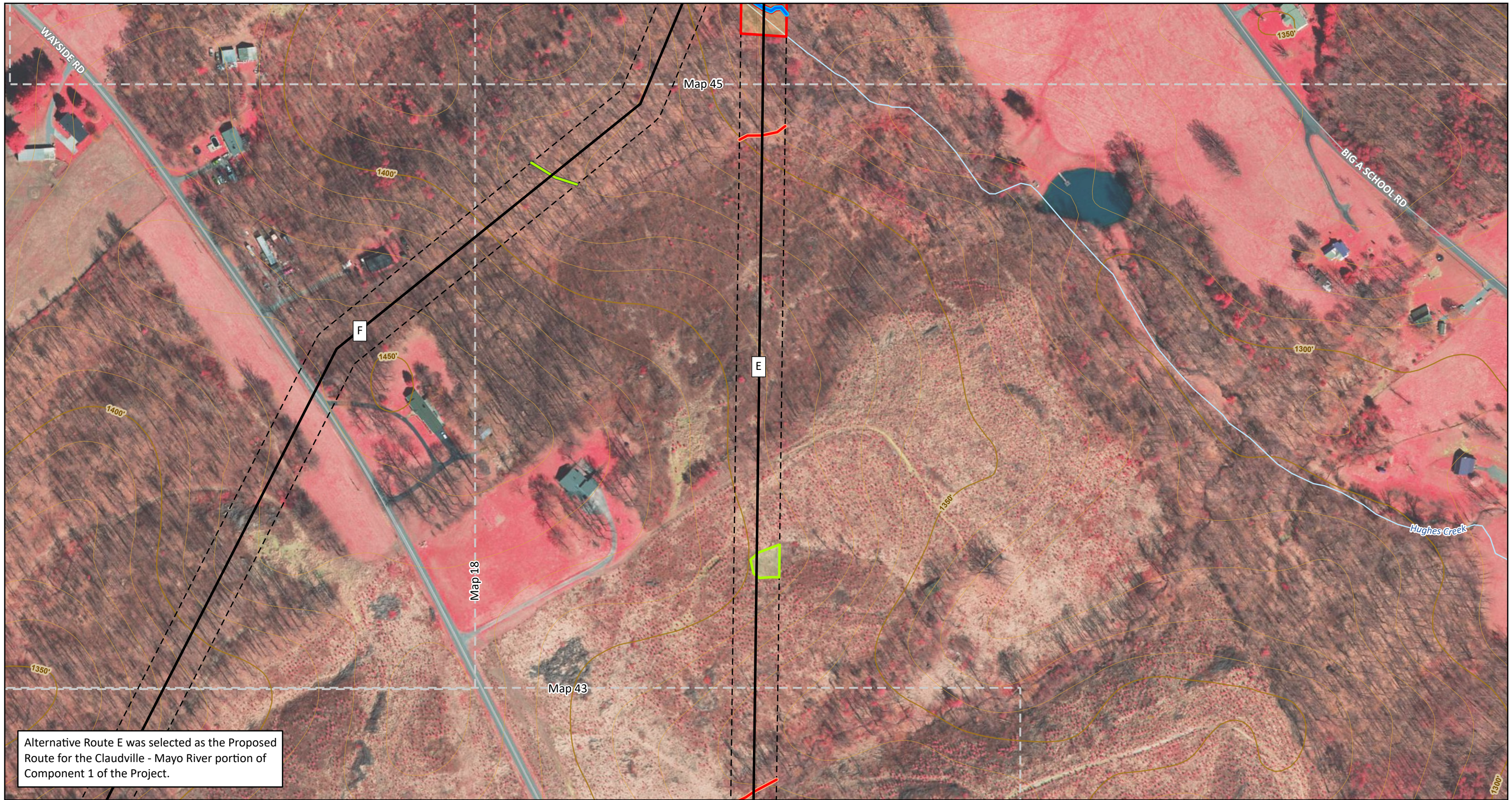
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Feet

1" = 200'

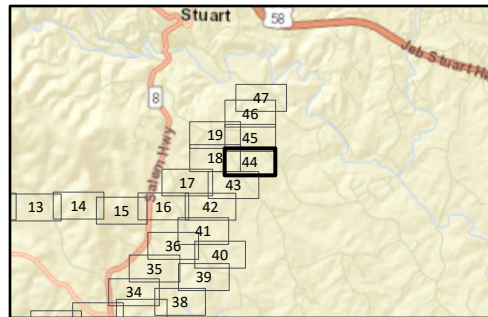
Attachment B:
Desktop Stream and Wetland Delineation
Map 43 of 47

Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes

An AEP Company



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.

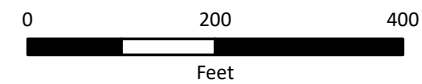


- | | | |
|-----------------------------|--|----------------------------|
| High Probability Stream | Moderate Probability Wetland | Stream (NHD) |
| Low Probability Stream | Claudville - Mayo River Alternative Routes | County Boundary |
| Moderate Probability Stream | Right-of-Way (100') | Index Contour (50') |
| Low Probability Wetland | Road | Intermediate Contour (10') |



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

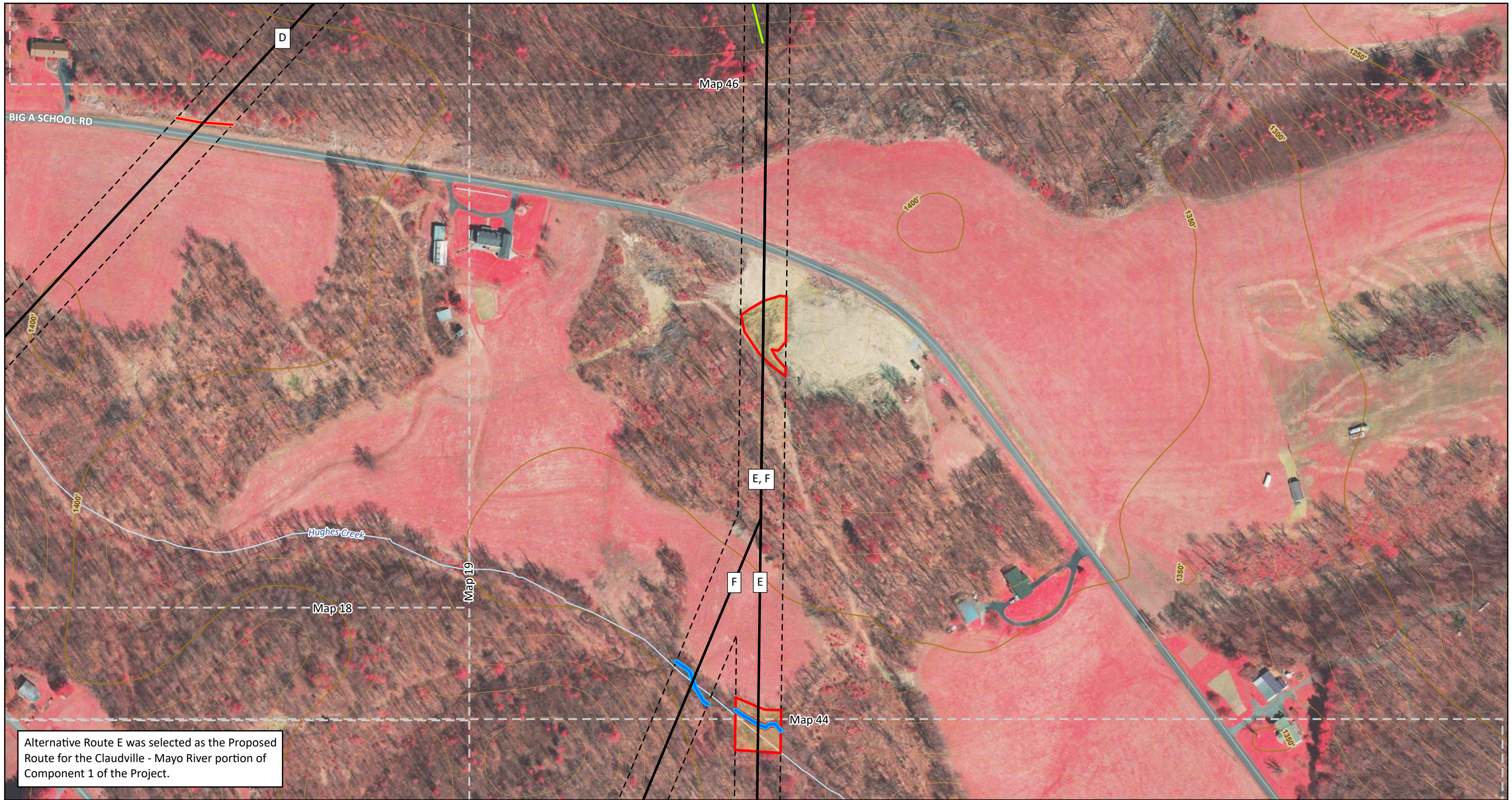


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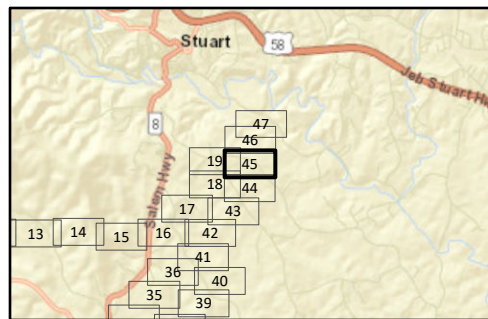
Attachment B:
Desktop Stream and Wetland Delineation
Map 44 of 47



Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



Alternative Route E was selected as the Proposed Route for the Claudville - Mayo River portion of Component 1 of the Project.



- High Probability Stream
- Low Probability Stream
- Moderate Probability Stream
- Moderate Probability Wetland

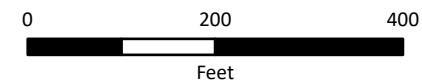
- Claudville - Mayo River Alternative Routes
- Right-of-Way (100')
- Road

- Stream (NHD)
- County Boundary
- Index Contour (50')
- Intermediate Contour (10')



Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

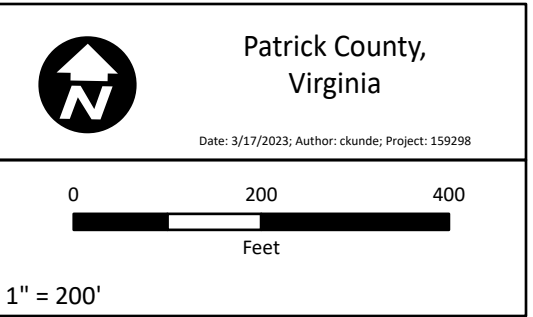
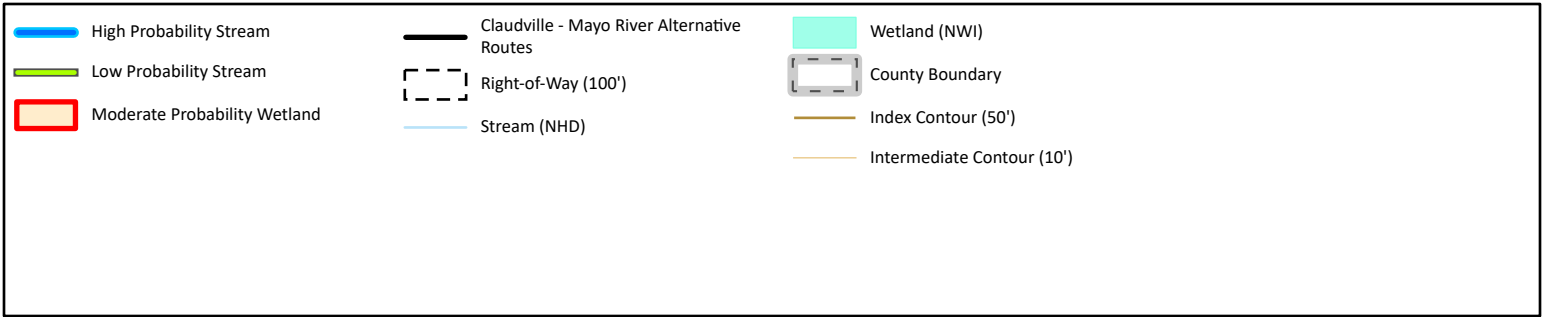
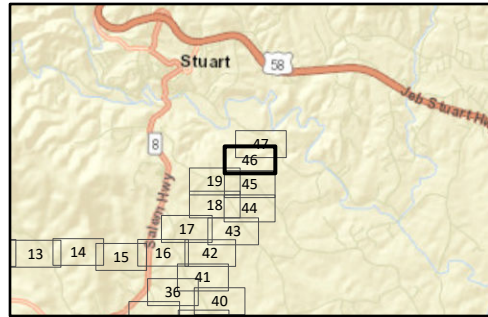
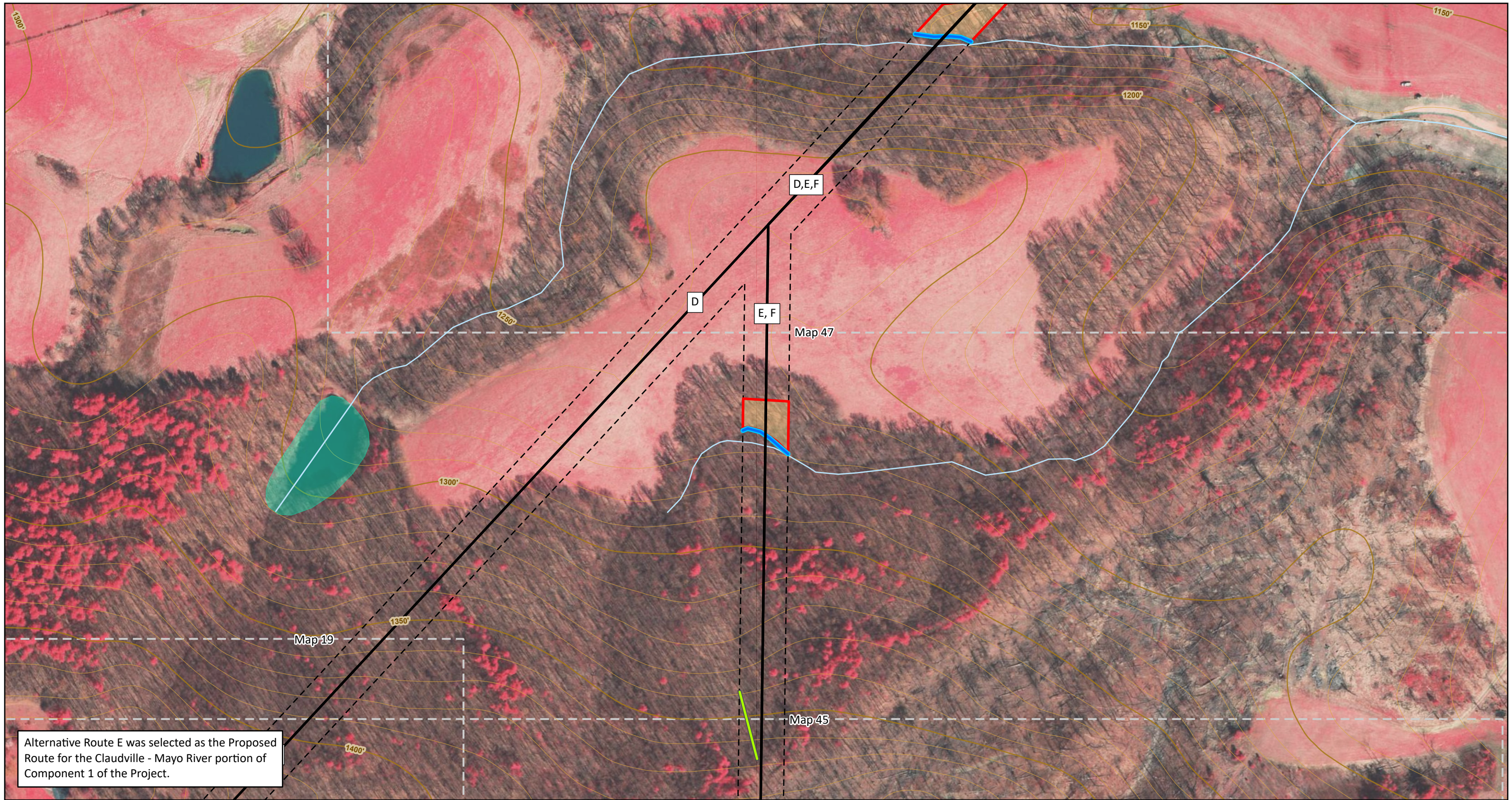


1" = 200'

Attachment B:
Desktop Stream and Wetland Delineation
Map 45 of 47



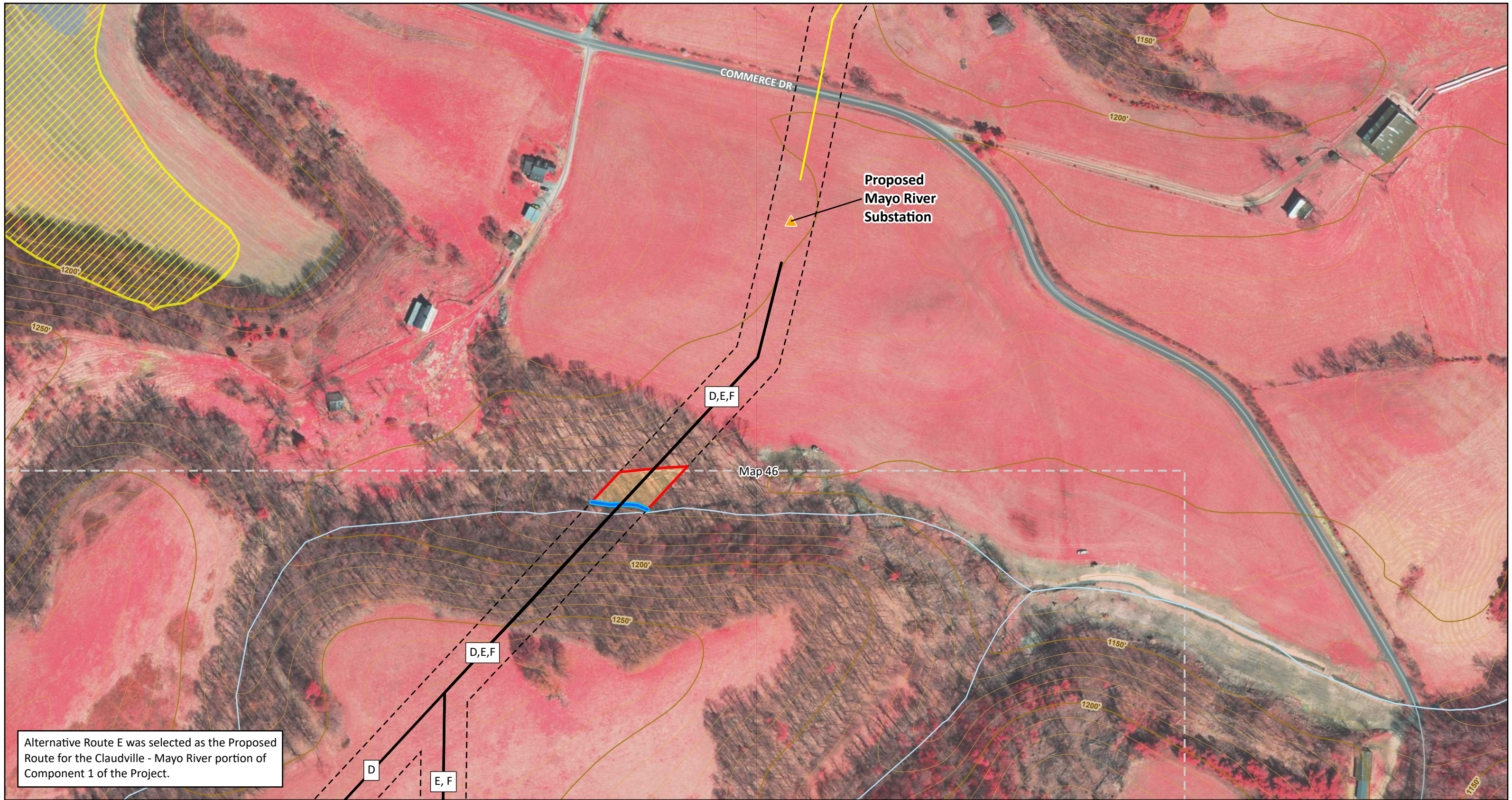
Stuart Area Transmission
Improvements Project:
Component 1:
Claudville - Mayo River
Alternative Routes



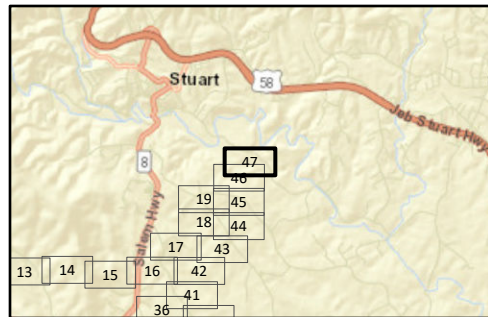
Attachment B:
Desktop Stream and Wetland Delineation
Map 46 of 47

Stuart Area Transmission Improvements Project:
 Component 1:
 Claudville - Mayo River Alternative Routes

An AEP Company



Alternative Route E was selected as the Proposed Route for the Claudeville - Mayo River portion of Component 1 of the Project.



High Probability Stream	Component 2 Alternative Routes	Hydric Soils
Moderate Probability Wetland	Right-of-Way (100')	County Boundary
Proposed APCo Substation	Road	Index Contour (50')
Claudeville - Mayo River Alternative Routes	Stream (NHD)	Intermediate Contour (10')
	Floodplain	

Patrick County,
Virginia

Date: 3/17/2023; Author: ckunde; Project: 159298

0 200 400
Feet

1" = 200'

Attachment B:
Desktop Stream and Wetland Delineation
Map 47 of 47

An AEP Company

Stuart Area Transmission
Improvements Project:
Component 1:
Claudeville - Mayo River
Alternative Routes

ATTACHMENT 2.F.1: USFWS IPAC REPORT

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Carroll and Patrick counties, Virginia



Local office

Virginia Ecological Services Field Office

☎ (804) 693-6694

📅 (804) 693-9032

6669 Short Lane

0000 0101 0000
Gloucester, VA 23061-4410

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

-
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
<p>Indiana Bat <i>Myotis sodalis</i> Wherever found There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5949</p>	Endangered
<p>Northern Long-eared Bat <i>Myotis septentrionalis</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045</p>	Endangered
<p>Tricolored Bat <i>Perimyotis subflavus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515</p>	Proposed Endangered

Fishes

NAME	STATUS
<p>Roanoke Logperch <i>Percina rex</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1134</p>	Endangered

Clams

NAME	STATUS
<p>James Spiny mussel <i>Parvaspina collina</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2212</p>	Endangered

Insects

NAME	STATUS
------	--------

Monarch Butterfly *Danaus plexippus*

Candidate

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/9743>

Flowering Plants

NAME

STATUS

Small-anthered Bittercress *Cardamine micranthera*

Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/3462>

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation->

[measures.pdf](#)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
<p>Bald Eagle <i>Haliaeetus leucocephalus</i></p> <p>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.</p>	Breeds Sep 1 to Aug 31
<p>Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399</p>	Breeds May 15 to Oct 10
<p>Black-capped Chickadee <i>Poecile atricapillus praticus</i></p> <p>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p>	Breeds Apr 10 to Jul 31
<p>Bobolink <i>Dolichonyx oryzivorus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 20 to Jul 31
<p>Canada Warbler <i>Cardellina canadensis</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 20 to Aug 10

<p>Cerulean Warbler <i>Dendroica cerulea</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/2974</p>	Breeds Apr 27 to Jul 20
<p>Chimney Swift <i>Chaetura pelagica</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Mar 15 to Aug 25
<p>Eastern Whip-poor-will <i>Antrostomus vociferus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 1 to Aug 20
<p>Kentucky Warbler <i>Oporornis formosus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Apr 20 to Aug 20
<p>Prairie Warbler <i>Dendroica discolor</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 1 to Jul 31
<p>Prothonotary Warbler <i>Protonotaria citrea</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Apr 1 to Jul 31
<p>Red-headed Woodpecker <i>Melanerpes erythrocephalus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 10 to Sep 10
<p>Wood Thrush <i>Hyllocichla mustelina</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

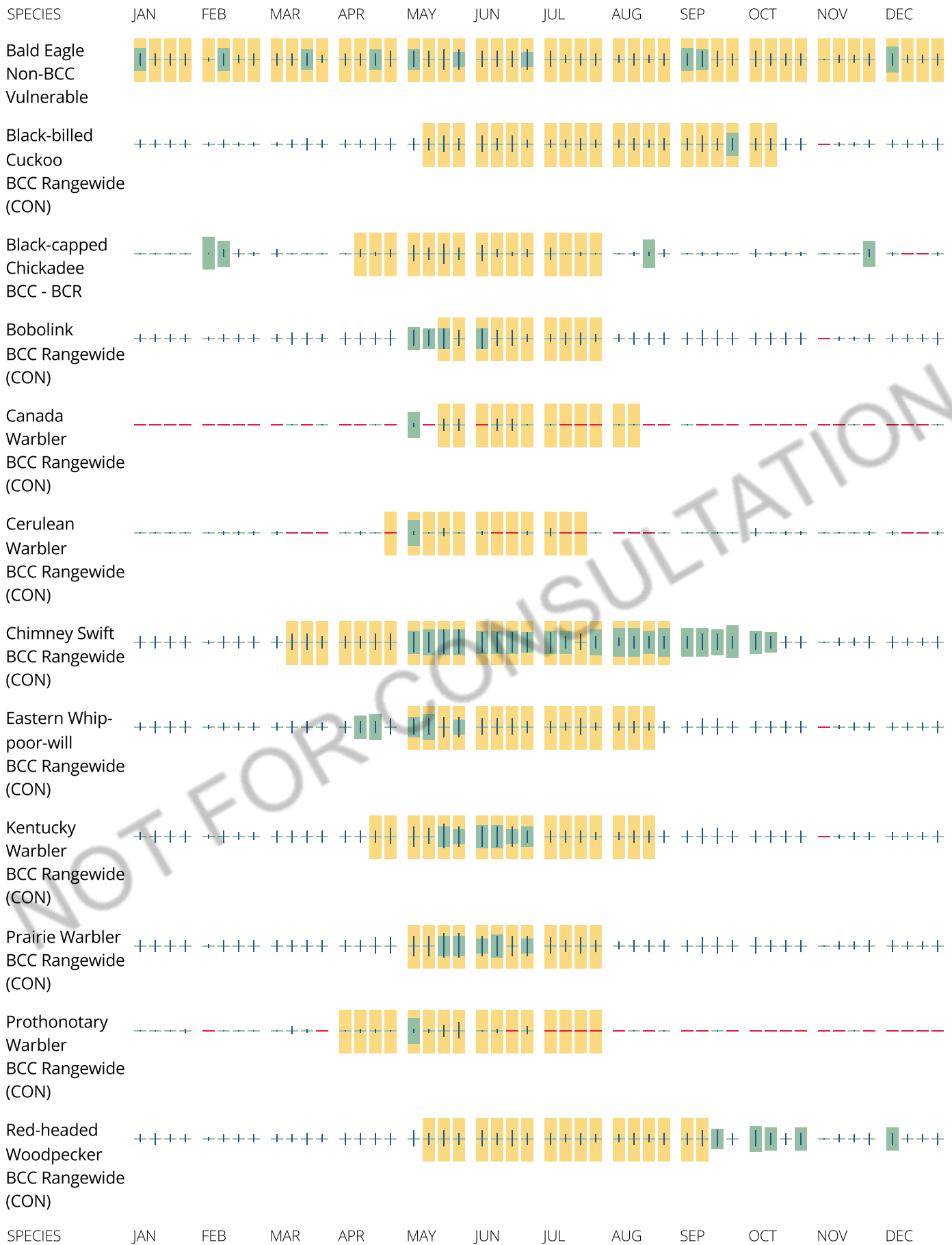
No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort — no data



Wood Thrush
BCC Rangewide
(CON)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird

on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is

the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the [NWI map](#) to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

ATTACHMENT 2.H.1: VDHR PRE-APPLICATION ANALYSIS

April 18, 2023

APPALACHIAN POWER COMPANY

**Stuart Area 138-kV Transmission Improvements Project
Component 1: Mayo River (Stuart) to Willis Gap Transmission Improvements
SCC Case No. PUR-2023-00024
Carroll and Patrick Counties, Virginia**

Virginia Department of Historic Resources Pre-Application Analysis

PROJECT NUMBER:
0158529

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Virginia Department of Historic Resources Pre-Application Analysis

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EXECUTIVE SUMMARY

With the Stuart Area 138-kV Transmission Improvements Project (“Stuart Project” or “Project”), Appalachian Power Company (“Appalachian Power”) is planning to upgrade the local electric transmission grid in four Virginia counties: Carroll, Floyd, Henry, and Patrick. The Stuart Project provides a new electrical source for the area, upgrades the voltage of equipment from 69-kilovolt (“kV”) to 138-kV, improves the local distribution system, and addresses aging infrastructure. The Stuart Project will ensure adequate power delivery to the area to support today’s electrical load and provide continued support during an extended outage.

The Project is organized into three components which are generally the construction sequence. The Mayo River (Stuart) to Willis Gap Transmission Improvements Component (“Component 1”) is the subject of this report and is depicted in **Appendix A: Maps 1 and 2**. Appalachian Power is planning to construct a 138-kV transmission line to accommodate future electrical needs in Carroll and Patrick counties, Virginia. Component 1 consists of constructing approximately 24.5 miles of new 138-kV transmission line between the existing Willis Gap Substation and the proposed Claudville and Mayo River Substations.

In August 2022, POWER Engineers, Inc. conducted a Pre-Application Analysis of cultural resources for Component 1 in Carroll and Patrick, counties, Virginia. The analysis was performed on behalf of Appalachian Power, an affiliated operating company of American Electric Power Company, Inc. in support of a Virginia State Corporation Commission application. The analysis was conducted in accordance with the Virginia Department of Historic Resources’ (“VDHR”) *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (2008), or simply, *Guidelines*.

The transmission line will be built primarily using single-circuit steel H-frame structures and single-circuit monopole structures; however, final structure types will be dependent on engineering and terrain. Based on preliminary engineering, Appalachian Power anticipates primarily using galvanized steel H-frame and monopole structures with a low-reflective finish for the Project. The anticipated heights of the proposed structures on Component 1 range between 55 and 110 feet, with an average proposed structure height of 85 feet. These anticipated heights for the proposed structures are necessary to meet current design standards. Component 1 will be built within a newly constructed right-of-way (“ROW”) that is typically 100 feet wide; however approximately 6.4 miles will primarily be built parallel to the existing ROW of another utility’s transmission line.

The background research conducted for this analysis used the VDHR’s Virginia Cultural Resource Information System, which is a database of all previously recorded cultural resources in Virginia. Resources within the Virginia Cultural Resource Information System were reviewed based on the tiered study areas outlined in the *Guidelines*. Historic resources include architectural and archaeological (terrestrial and underwater) resources, historic and cultural landscapes, and historic districts. Resource documentation and current aerial photography was examined for listed, eligible, or potentially eligible previously recorded historic resources within the different tiered study areas per the *Guidelines*.

There are no National Historic Landmarks, within 1.5 miles of Component 1; no above ground resources, National Register of Historic Places-listed properties, battlefields, or Historic Landscapes within 1.0 mile of Component 1, determined National Register of Historic Places-eligible properties within 0.5 mile of Component 1; and no previously recorded archaeological sites within the tiered study areas of the proposed ROW and the unselected alternatives. As such, Component 1 will have no impact on any known resources within the tiered study areas of the proposed ROW.

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ACRONYMS AND ABBREVIATIONS

Appalachian Power	Appalachian Power Company
Component 1	Mayo River (Stuart) to Willis Gap Transmission Improvements
<i>Guidelines</i>	<i>VDHR's Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia</i>
kV	kilovolt
NRHP	National Register of Historic Places
POWER	POWER Engineers, Inc.
ROW	right-of-way
SCC	State Corporation Commission
Stuart Project or Project	Stuart Area Transmission Improvements Project
VCRIS	Virginia Cultural Resources Information System
VDHR	Virginia Department of Historic Resources

1.0 INTRODUCTION

With the Stuart Area 138-kV Transmission Improvements Project (“Stuart Project” or “Project”), Appalachian Power Company (“Appalachian Power”) is planning to upgrade the local electric transmission grid in four Virginia counties: Carroll, Floyd, Henry, and Patrick. The Stuart Project provides a new electrical source for the area, upgrades the voltage of equipment from 69-kilovolt (“kV”) to 138-kV, improves the local distribution system, and addresses aging infrastructure. The Stuart Project will ensure adequate power delivery to the area to support today’s electrical load and provide continued support during an extended outage.

The Stuart Project includes numerous components; however, the Mayo River (Stuart) to Willis Gap Transmission Improvements Component (“Component 1”) is the subject of this report and is depicted in **Appendix A: Maps 1 and 2**. Appalachian Power is planning to construct a 138-kV transmission line to accommodate future electrical needs in Carroll and Patrick counties, Virginia. Component 1 consists of constructing approximately 24.5 miles of new 138-kV transmission line between the existing Willis Gap Substation and the proposed Claudville and Mayo River Substations.

In August 2022, POWER Engineers, Inc. (“POWER”) conducted a Pre-Application Analysis of cultural resources for the Component 1 in Carroll and Patrick, counties, Virginia. The analysis was performed on behalf of Appalachian Power, an affiliated operating company of American Electric Power Company, Inc. in support of a Virginia State Corporation Commission (“SCC”) application. The analysis was conducted in accordance with the Virginia Department of Historic Resources’ (“VDHR’s”) *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (2008), or simply, *Guidelines*.

The analysis was conducted to provide technical assistance in accordance with VDHR and the SCC’s guidance. The analysis provides information regarding previously recorded cultural resources that are eligible for or listed on the National Register of Historic Places (“NRHP”) or recorded National Historic Landmark within a 0.5-, 1.0- and 1.5-mile study area, and previously recorded archaeological sites located within the proposed right-of-way (“ROW”) for the Project. The analysis does not include assessment of the potential impacts upon unrecorded and/or historic resources that have not been evaluated for listing on the NRHP. If a federal undertaking is identified for the Project, this analysis will not satisfy Section 106 of the National Historic Preservation Act cultural resource identification and evaluation requirements. However, it can serve as a planning tool and assist in determining if further cultural resource identification efforts may be warranted.

This report contains a research design outlining the scope and methodology of the analysis, discussion of previously identified historic properties and an assessment of potential impacts. POWER cultural resources specialists Tanner Haynes, M.A., R.P.A., conducted the analysis and co-authored the report with Travis Corwin, who also served as Field Director. The POWER personnel who conducted this analysis meet the professional qualification standards of the United States Department of the Interior (48 Federal Register 44738-9).

2.0 COMPONENT 1 DESCRIPTION

Component 1 consists of building approximately 24.5 miles of 138-kV transmission line between the existing Willis Gap Substation and the proposed Claudville and Mayo River Substations; the construction of the new Claudville and Mayo River Substations; and upgrades at the existing Willis Gap and Huffman Substations. Component 1 consists of the following:

- Construction of approximately 24.5 miles of new 138-kV transmission line between the existing Willis Gap 138-kV Substation in Carroll County and a new Mayo River 138-kV Substation near Stuart, Virginia (the proposed “Mayo River – Willis Gap 138-kV Transmission Line”).
- Construction of a new Mayo River 138-kV Substation.
- Construction of a new Claudville 138-kV Substation approximately midway (11 miles from Willis Gap) on the new Mayo River – Willis Gap 138-kV Transmission Line.
- Upgrades at the existing Willis Gap 138-kV Substation.
- Upgrades at the existing Huffman 138-kV Substation.

A siting effort was undertaken to determine the proposed route for Component 1. Alternative Routes A, B, and C were evaluated for the Willis Gap to Claudville segment of Component 1. Alternative Route C was selected as the proposed route for this segment.

- The Proposed Route for Willis Gap to Claudville is the longest route and requires more tree clearing; however, it minimizes impact to the surrounding community by taking landowner feedback into consideration to the extent practical and avoiding residential development where feasible. The Proposed Route has the fewest landowners within the ROW compared to Alternative Routes A and B and generally avoids residential development. In addition, the Proposed Route has the fewest residences within 100, 250, and 500 feet of centerline compared to Alternative Routes A and B. The Proposed Route minimizes potential visual impacts to the community due to its proximity to residences. Based on stakeholder input, the Proposed Route also will avoid or minimize impacts to planned future development in the area. Additionally, public stakeholder input generally favored the southern study segments (Proposed Route) since they were located in a forested area and maximized distance from the developed residential and visually open fields. For the reasons listed, the Proposed Route (Alternative Route C) for Willis Gap to Claudville is the most suitable route.

Alternative Routes D, E, and F were evaluated for the Claudville to Mayo River segment of Component 1. Alternative Route E was selected as the proposed route for this segment.

- The Proposed Route (12.0 miles) for Claudville to Mayo River is the longest compared to Alternative Routes D (10.4 miles) and F (11.6 miles); however, it parallels an existing transmission line which was favored by the public and follows federal and state guidelines to use or parallel existing ROWs. While the Proposed Route is closer to residential development and crosses more landowners than Alternative Route D, it minimizes visual impacts by being cohesive with the existing visual character of existing transmission infrastructure. Additionally, Alternative Route D traverses a mountainous and unfragmented forested area, which would require more access roads and have associated visual and environmental impacts. The Proposed Route considers landowner feedback to the extent practical and was preferred by landowners overall. Based on stakeholder input, the Proposed Route attempts to minimize impacts to future development in the area. It also minimizes clearing, visual, and environmental impacts by

paralleling existing ROW. For the reasons listed, the Proposed Route for Claudville to Mayo River is the most suitable route.

3.0 SCOPE AND METHODOLOGY

3.1 Archival Research

POWER conducted background research, using data available online through VDHR’s Virginia Cultural Resource Information System (“VCRIS”) from May to September 2022, with the goal of identifying all previously recorded cultural resources according to the *Guidelines* and within the tiered study areas (Table 1). Archival research also included any additional potential cultural resource locations referred to in historic documents. Details and histories of individual resources were pulled from the information provided by the original surveyors and VDHR within the VCRIS. Background research included review of the following sources:

- VCRIS (VDHR 2022)
 - Architectural Site Forms
 - Archaeological Site Forms
 - NRHP Nomination Forms
- National Park Service’s NRHP Database (2022)

TABLE 1 TIERED STUDY AREA BUFFERS

RADIAL BUFFERS (MILES)	CONSIDERED RESOURCES
1.5	National Historic Landmarks
1.0	Above resources and: NRHP Properties (listed) Battlefields Historic Landscapes (e.g., Rural Historic Districts)
0.5	Above resources and: NRHP-eligible (as determined by VDHR)
0.0 (within ROW)	Above resources and: Archaeological Sites

Source: VDHR 2008

3.2 Field Reconnaissance

Based on the VDHR’s *Guidelines*, a field reconnaissance was conducted for each previously recorded resource that meets the criteria of the tiered study area for Component 1 to assess each resource’s integrity with regard to feeling, setting, and associations. Visual inspection included digital photo documentation of each resource’s existing conditions including its setting and views toward the Project. All photographs were taken from a point of public access and where feasible, photographs were taken of primary elevations, general setting, and existing viewsheds.

3.3 Simulation Methodology

Per the VDHR’s *Guidelines*, simulations are required for transmission line builds when the proposed transmission structures are substantially taller (greater than 10% or 20 feet) than the existing structures

(see **Appendix B**). No resources are within the tiered Study Area buffers. No simulations were produced for Component 1.

3.4 Assessment of Potential Impacts

In accordance with VDHR's *Guidelines*, an assessment of the potential impacts of Component 1 to previously recorded potentially eligible, NRHP-eligible, NRHP-listed historic resources, and National Historic Landmarks within VDHR's tiered study areas was completed. This entails consideration of those qualities and characteristics that qualify a property for listing on the NRHP and whether Component 1 has the potential to alter or diminish the integrity of the property and its associated significance. Effects to historic properties can be direct or indirect. Direct effects refer to the causality, and not the physicality, of the effect to historic properties. Direct effects occur at the same time and place. Indirect effects refer to those caused at a later time or farther removed in the distance but are still reasonably foreseeable (National Trust for Historic Preservation v. Todd Semonite 2019). This analysis was performed at a level that meets the purpose and intent of VDHR and the SCC's guidance, and therefore an assessment of potential impacts to unrecorded and/or historic resources that have not been evaluated for NRHP eligibility is not included. The following terminology was used in reference to the impacts on a given resource:

- **None:** Component 1 is not visible from the property.
- **Minimal:** Occur within viewsheds that have existing, unrelated transmission and distribution lines, locations where there will be a minor change in tower height, and/or views that have been partially obstructed by intervening topography and vegetation.
- **Moderate:** Include viewsheds with expansive views of the transmission line, more dramatic changes in the line and tower height, and/or an overall increase in the visibility of the route from the historic properties.
- **Severe:** Occur within viewsheds that do not have existing transmission lines and where the views are primarily unobstructed, locations where there will be a dramatic increase in tower visibility due to the close proximity of the route to historic properties, and viewsheds where the visual introduction of the transmission line is a significant change in the setting of the historic properties.

4.0 PREVIOUSLY IDENTIFIED HISTORIC PROPERTIES

There are no National Historic Landmarks within 1.5 miles of Component 1; no above-ground resources, NRHP-listed properties, battlefields or Historic Landscapes within 1.0 mile of Component 1; no above ground resources or determined NRHP eligible properties within 0.5 mile of Component 1; and no previously recorded archaeological sites within the tiered study areas of the proposed ROW and the unselected alternative routes. As such, Component 1 will have no impact on any known resources within the tiered study areas of the proposed ROW (**Appendix A: Maps 1 and 2**).

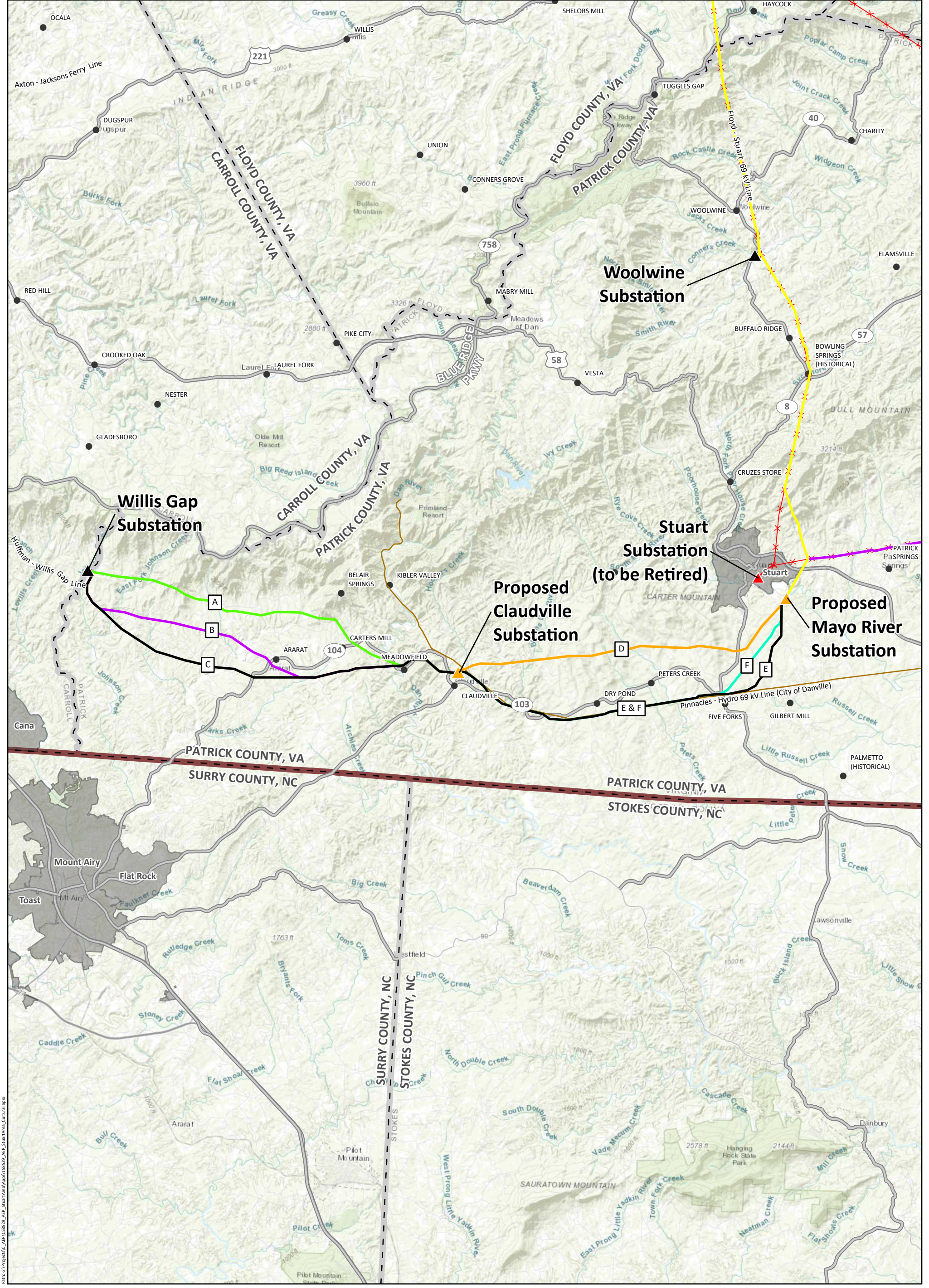
5.0 SUMMARY

This analysis was conducted for the purpose and intent of VDHR and the SCC's guidance using the *Guidelines*. There are no previously recorded resources within the tiered study area of any of the six alternatives, including the proposed and unselected routes. As such, Component 1 will have no impact on any known resources within the tiered study areas of the proposed ROW.

6.0 REFERENCES

- National Park Service (NPS). 2022. National Register of Historic Places. Map. Available online: <https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466>. Accessed May to September 2022.
- National Trust for Historic Preservation v. Todd Semonite. 2019. 1:17-cv-01574, Case #18-5179, United States Court of Appeal for the D.C. Circuit (March 1, 2019).
- Virginia Department of Historic Resources (VDHR). 2008. Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia.
- _____. 2022. Virginia Cultural Resource Information System (VCRIS). Available online at <https://vcris.VDHR.virginia.gov/VCRIS/Account/Login?ReturnUrl=%2fvcris%2f> (restricted access). Accessed May to September 2022.

APPENDIX A MAPS



	Proposed APCo Substation		Component 3 Proposed Route
	Existing APCo Substation		Existing Non-APCo Transmission Line
	Existing APCo Substation to be Retired		Existing Transmission Line to be Retired
	Proposed Route		Populated Place
	Alternative Route A		Highway
	Alternative Route B		Town Boundary
	Alternative Route D		State Boundary
	Alternative Route F		County Boundary
	Component 2 Proposed Route		

1" = 2.5 miles

 Miles



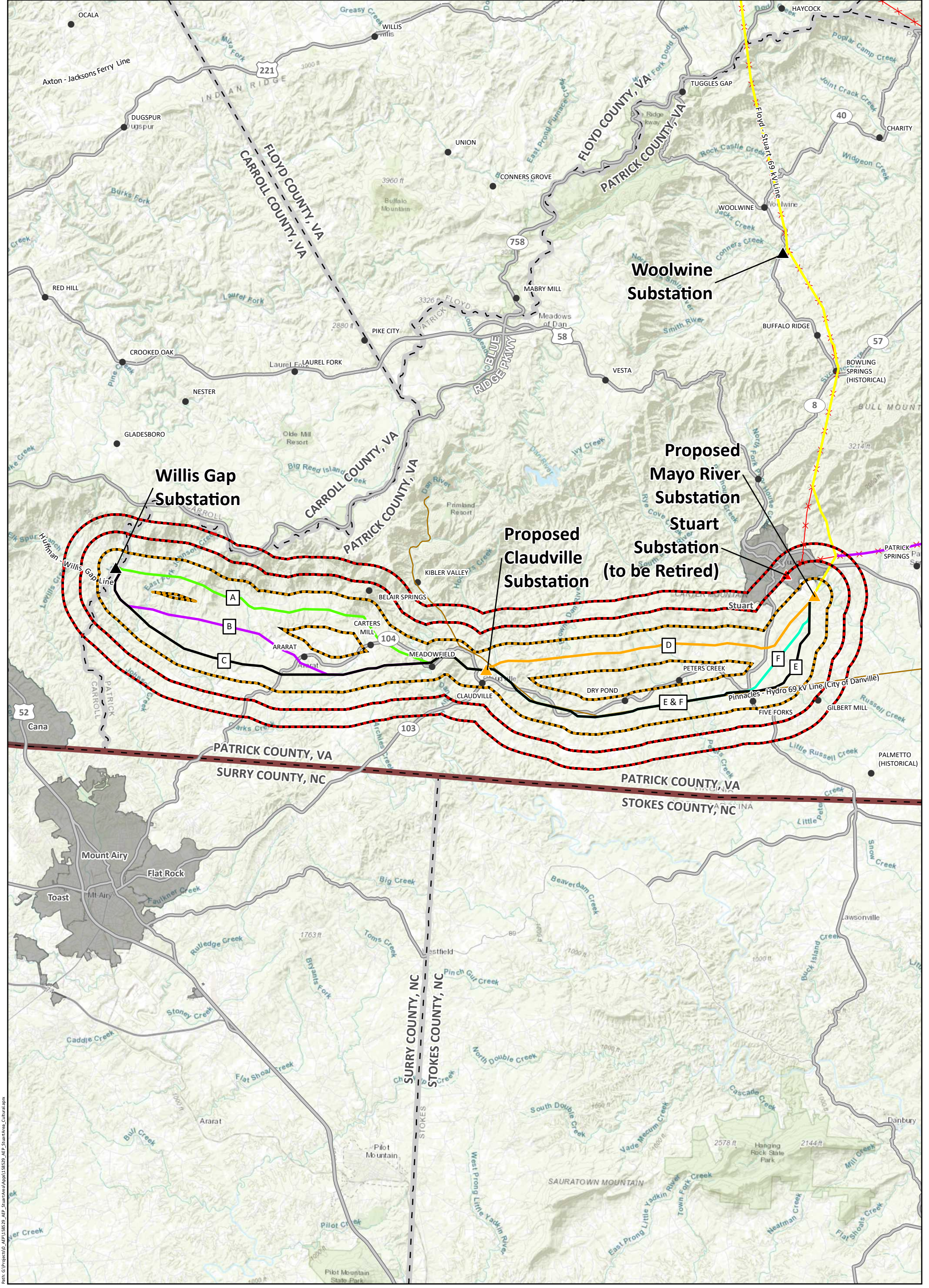
Stuart Area Transmission Improvements Project

 Patrick and Carroll County, Virginia

 Date: 3/21/2023
 Author: ckunde
 Project: 158529

Component 1:
 Mayo River (Stuart) to Willis Gap
 Transmission Improvements Project
 Map 1: DHR Pre-Application Review

An AEP Company
 BOUNDLESS ENERGY™



1" = 2.5 miles



Stuart Area Transmission Improvements Project

 Patrick and Carroll County, Virginia

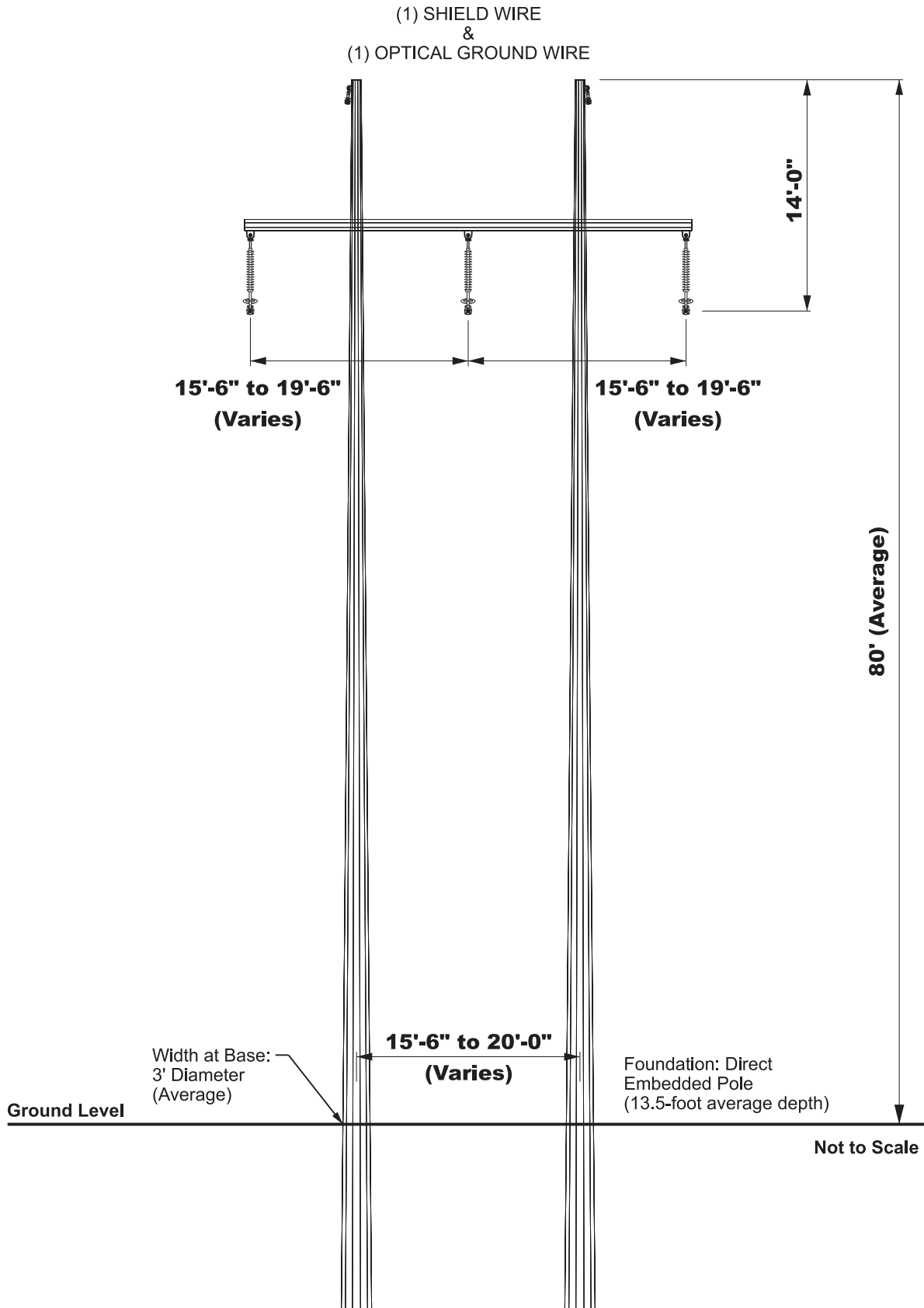
 Date: 3/21/2023
 Author: ckunde
 Project: 158529

Component 1:
 Mayo River (Stuart) to Willis Gap
 Transmission Improvements Project
 Map 2: Previously Recorded Resources

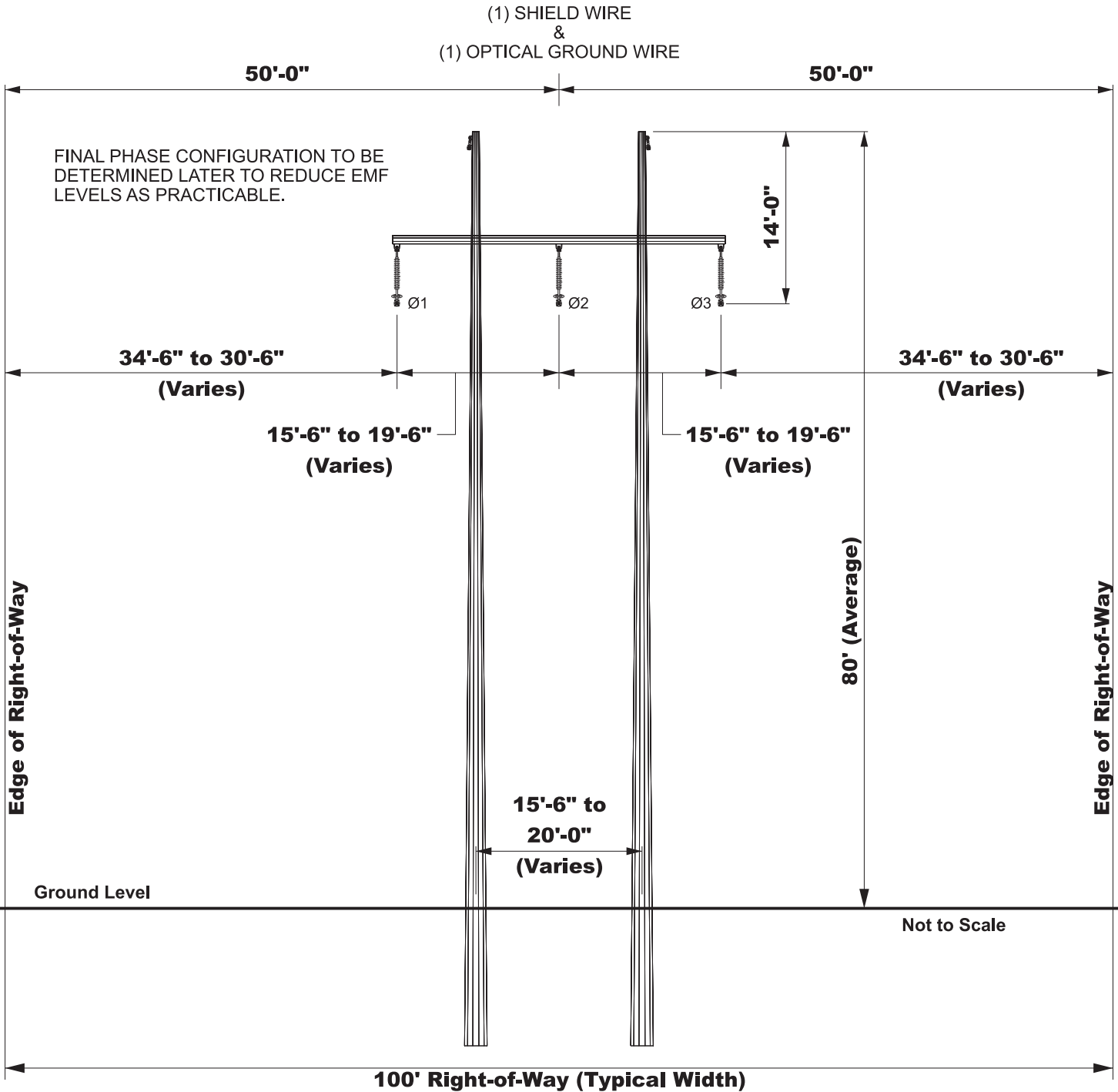
An AEP Company
 BOUNDLESS ENERGY™

APPENDIX B TYPICAL STRUCTURES

STEEL H-FRAME (Single Circuit)



TYPICAL SCHEMATIC



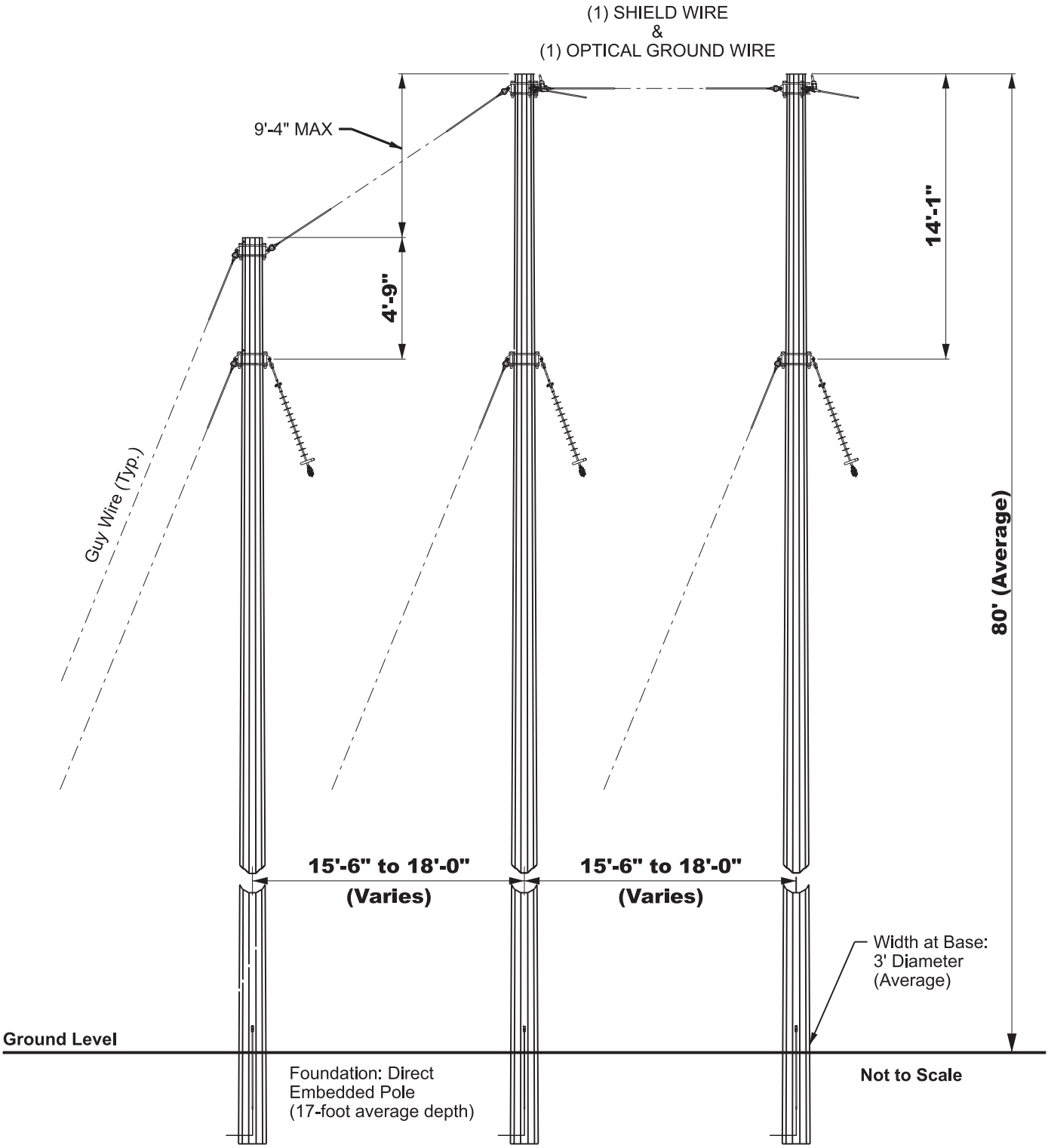
TYPICAL RIGHT-OF-WAY CROSS SECTION



COMPARABLE EXISTING STRUCTURE PHOTOGRAPH

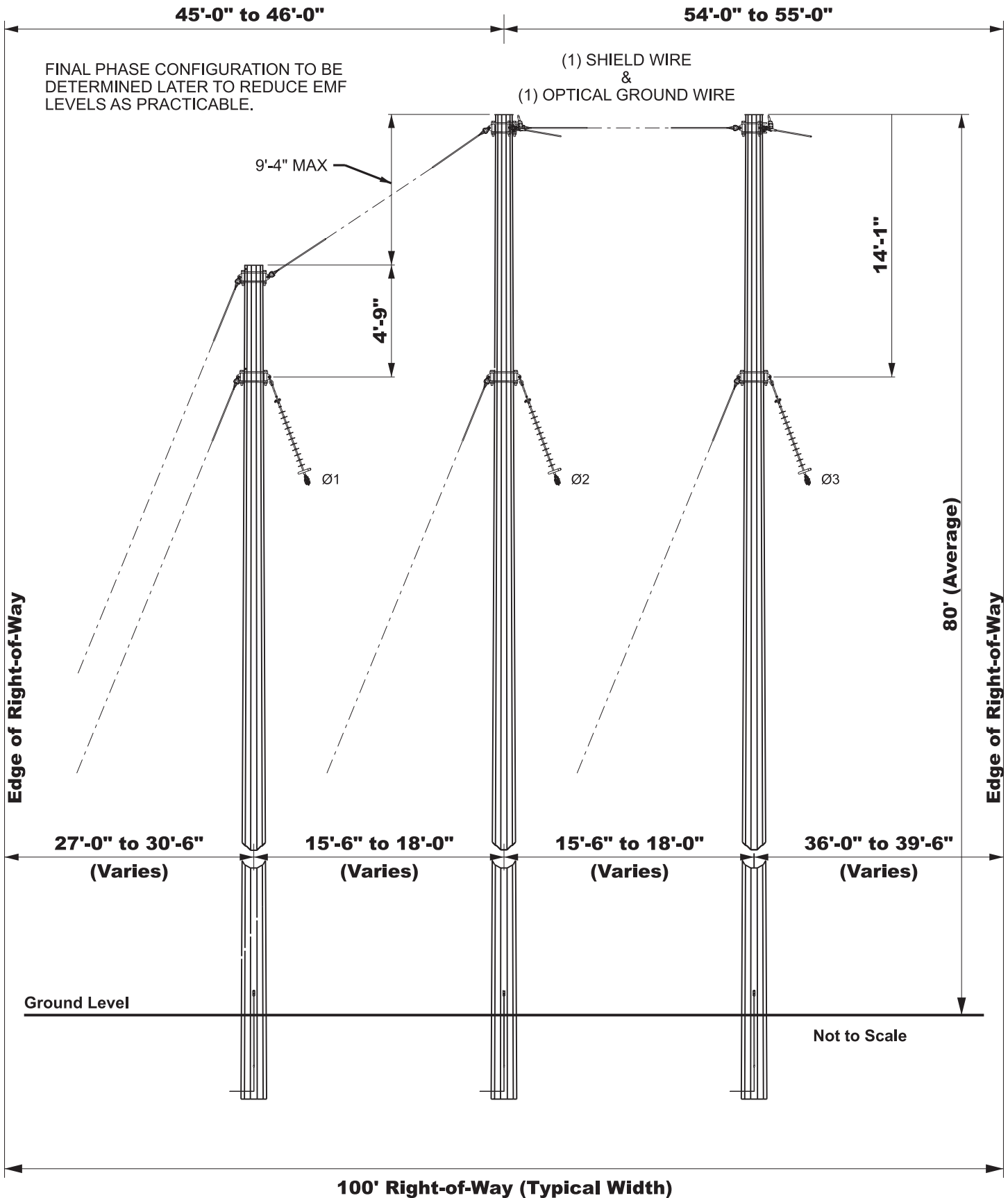
Note: The proposed material for the typical structure will be galvanized steel with a dulled finish (as shown above)

STEEL THREE-POLE RUNNING ANGLE (Single Circuit)



TYPICAL SCHEMATIC

STEEL THREE-POLE RUNNING ANGLE (Single Circuit)



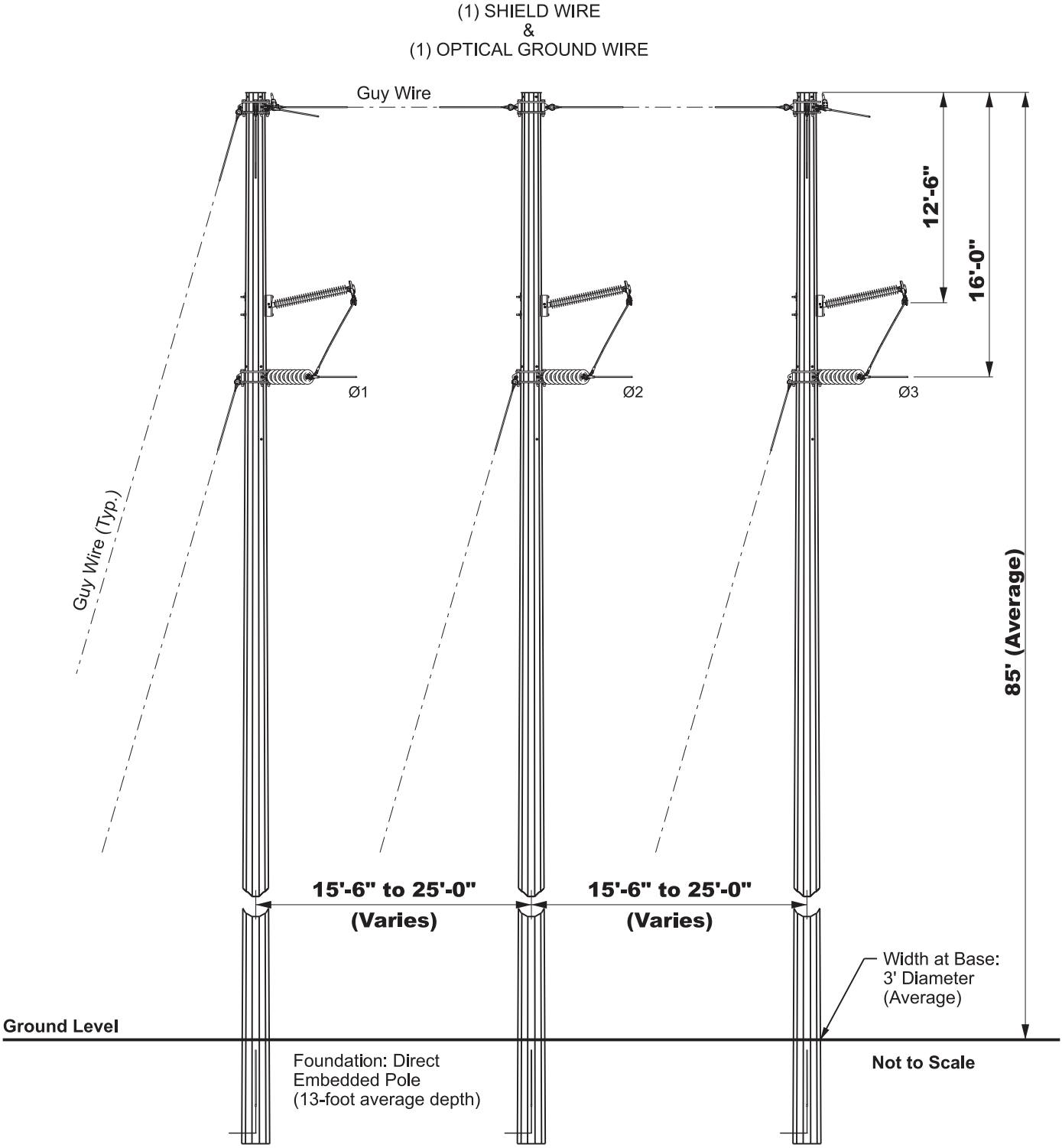
TYPICAL RIGHT-OF-WAY CROSS SECTION



COMPARABLE EXISTING STRUCTURE PHOTOGRAPH

Note: The proposed material for the typical structure will be galvanized steel with a dulled finish (as shown above)

STEEL THREE-POLE DEAD-END (Single Circuit)



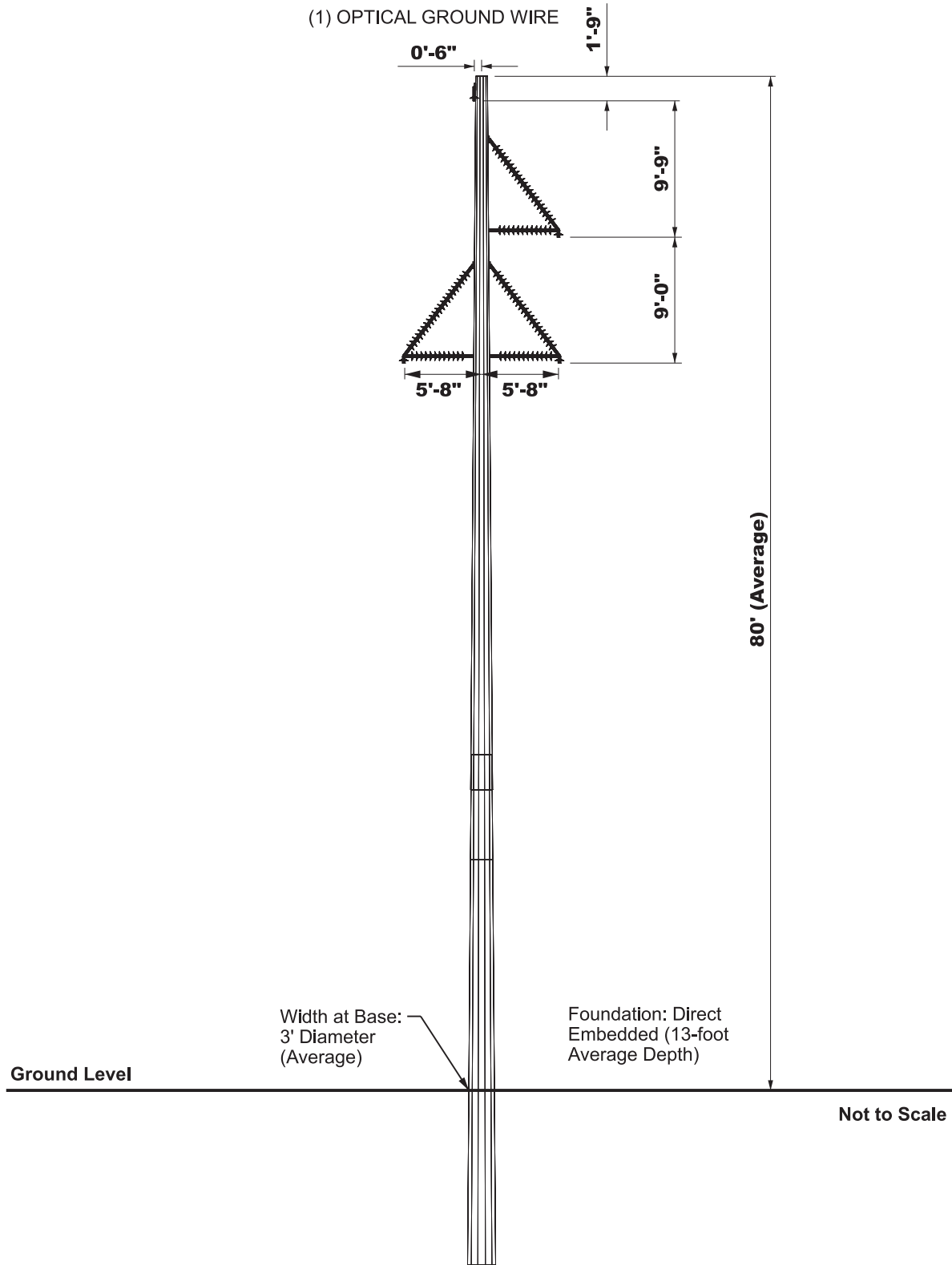
TYPICAL SCHEMATIC



COMPARABLE EXISTING STRUCTURE PHOTOGRAPH

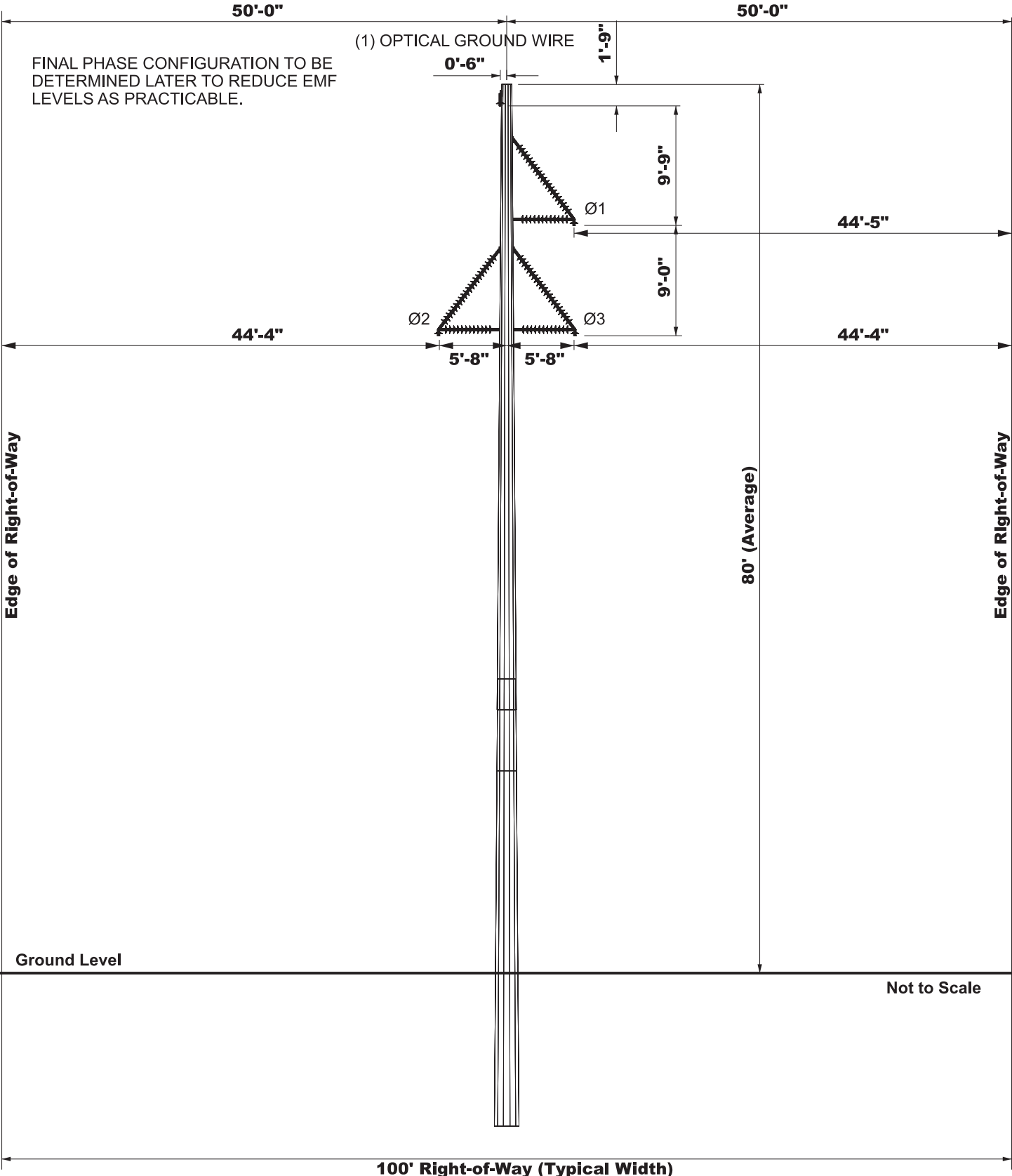
Note: The proposed material for the typical structure will be galvanized steel with a dulled finish (as shown above)

STEEL MONOPOLE WITH BRACED POSTS (Single Circuit)



TYPICAL SCHEMATIC

STEEL MONOPOLE WITH BRACED POSTS (Single Circuit)



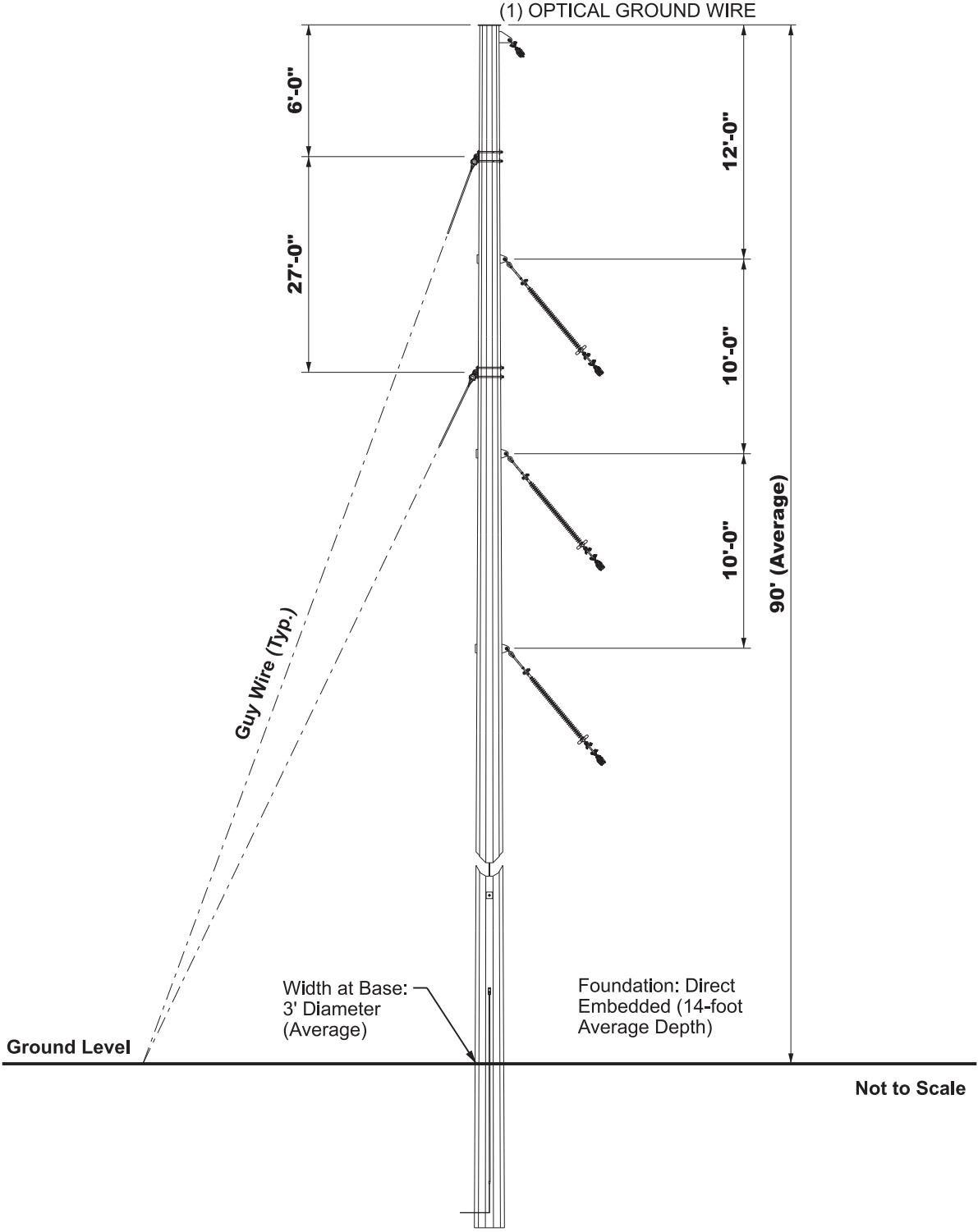
TYPICAL RIGHT-OF-WAY CROSS SECTION



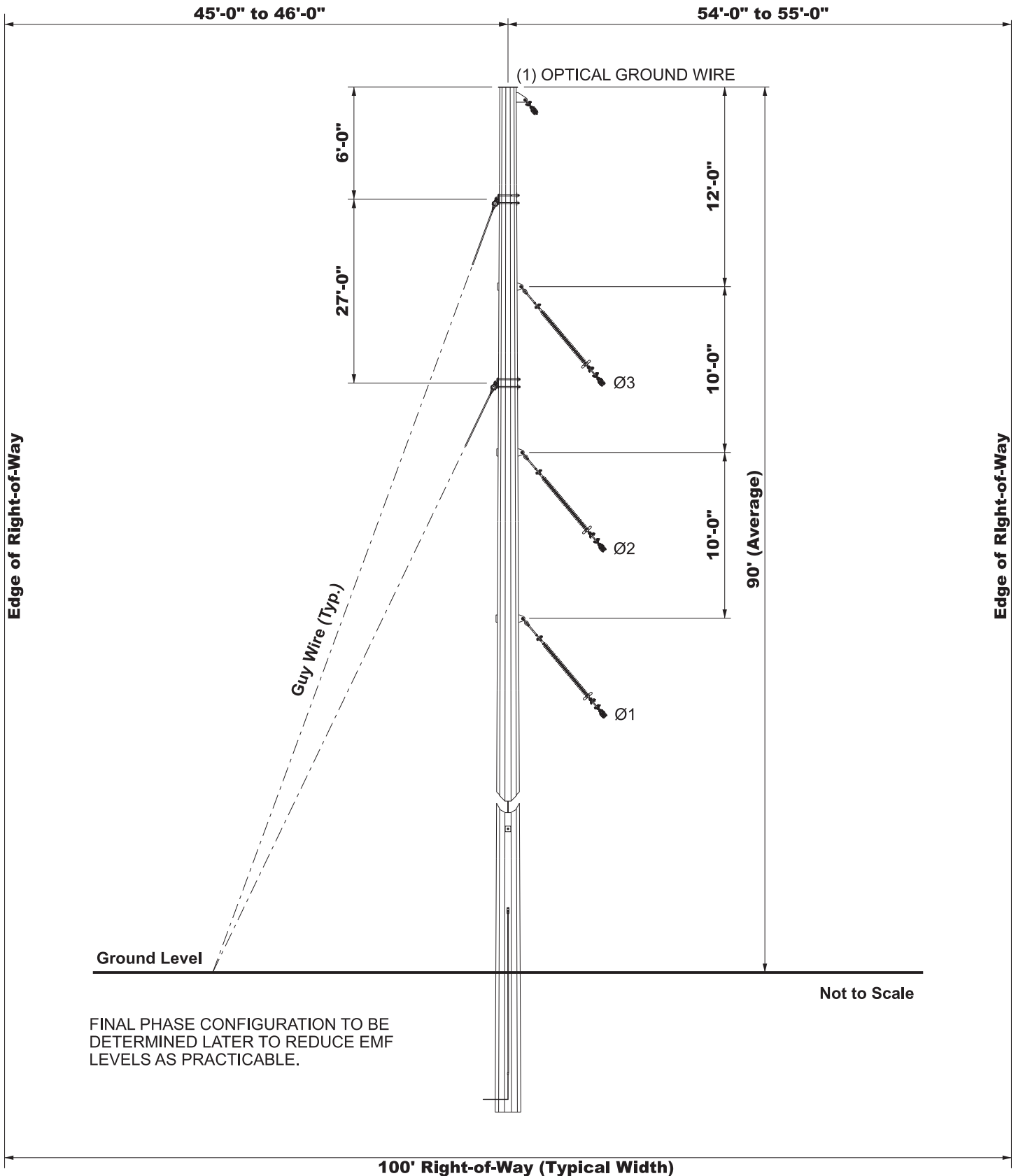
COMPARABLE EXISTING STRUCTURE PHOTOGRAPH

Note: The proposed material for the typical structure will be galvanized steel with a dulled finish (as shown above)

EXHIBIT 14
PROPOSED 138-kV TRANSMISSION LINE STRUCTURES (Page 1 of 3)
STEEL MONOPOLE RUNNING ANGLE (Single Circuit)



TYPICAL SCHEMATIC



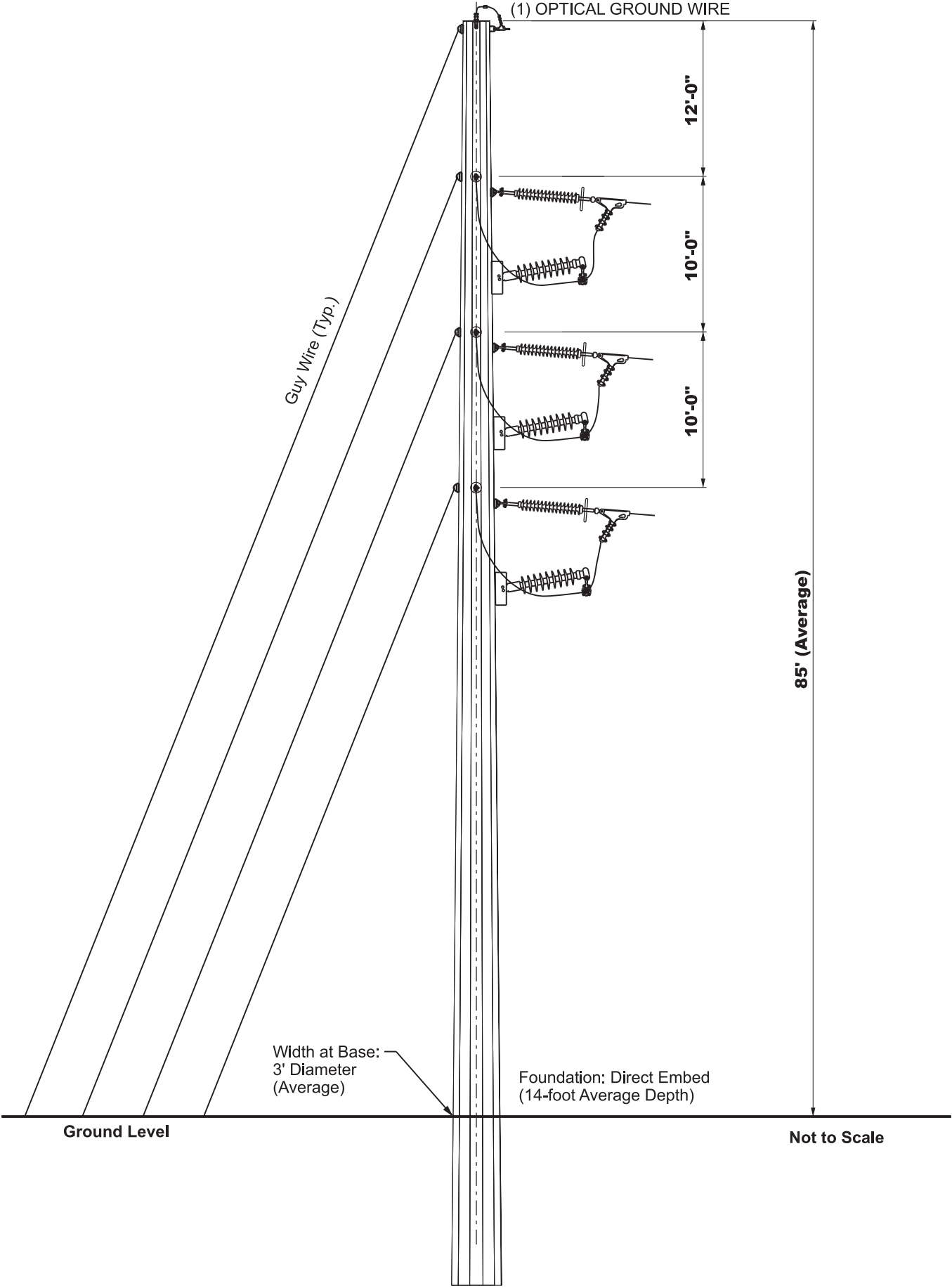
TYPICAL RIGHT-OF-WAY CROSS SECTION



COMPARABLE EXISTING STRUCTURE PHOTOGRAPH

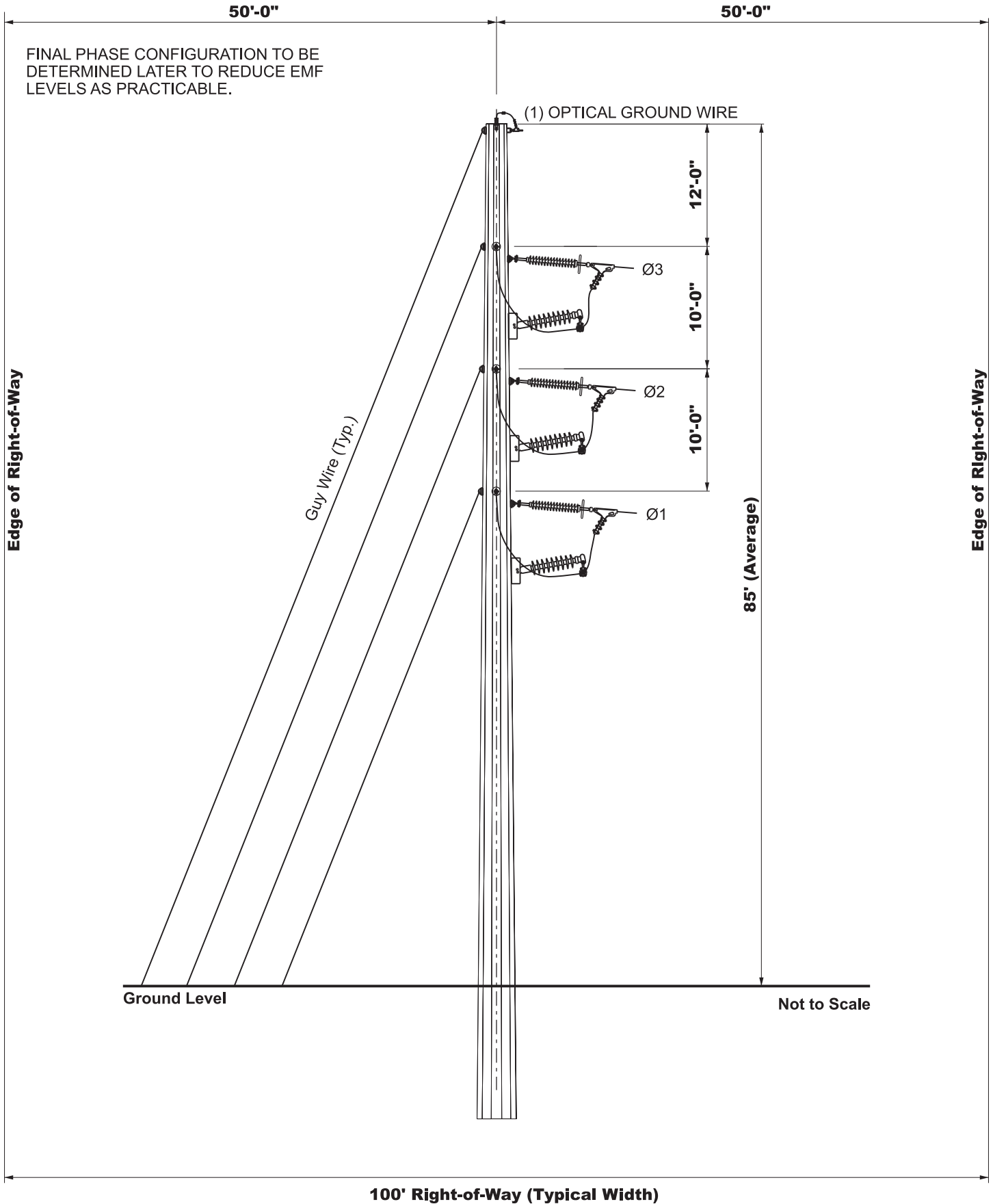
Note: The proposed material for the typical structure will be galvanized steel with a dulled finish (as shown above)

GUYED STEEL MONOPOLE DEAD-END (SINGLE CIRCUIT)



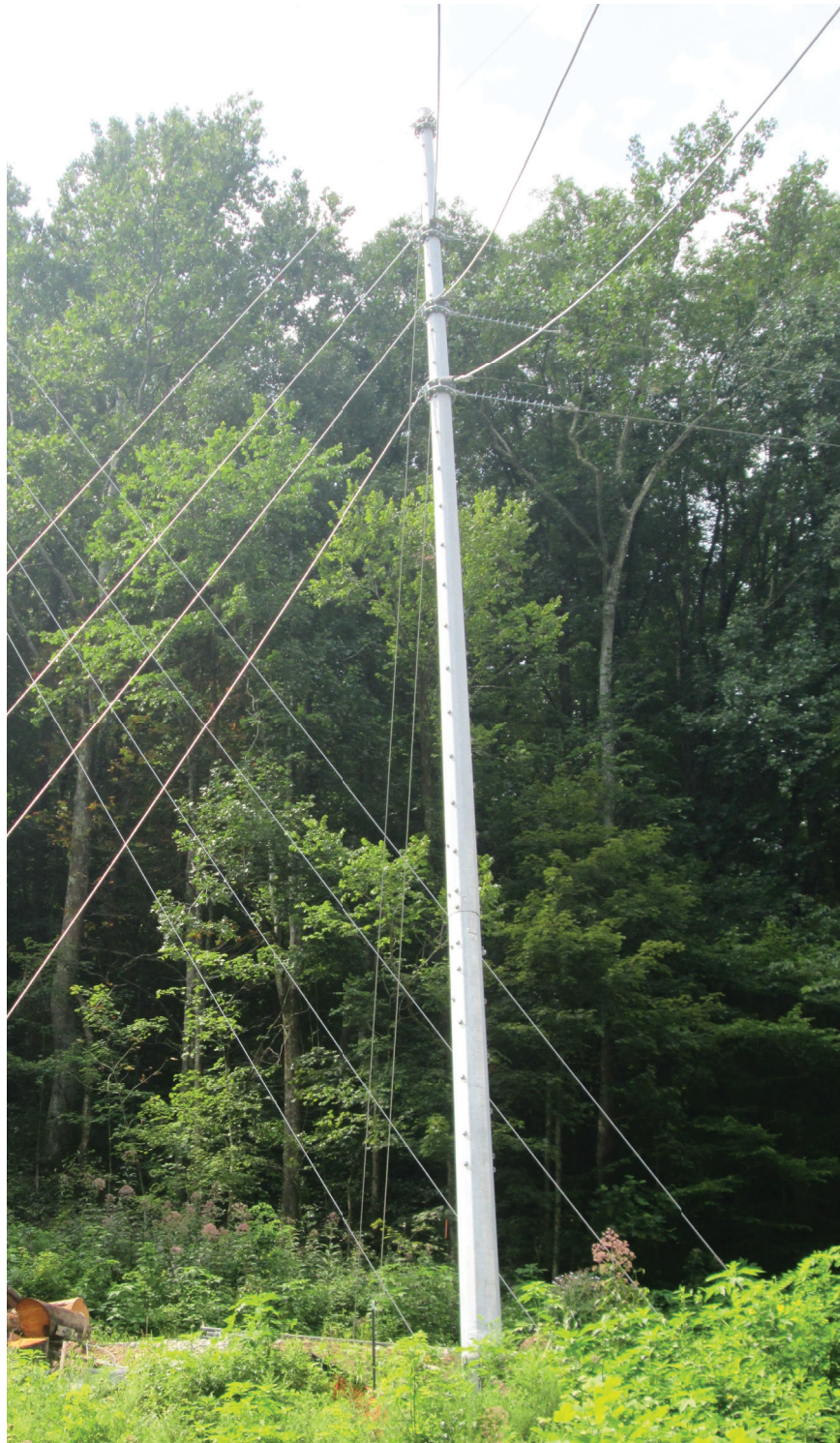
TYPICAL SCHEMATIC

GUYED STEEL MONOPOLE DEAD-END (SINGLE CIRCUIT)



TYPICAL RIGHT-OF-WAY CROSS SECTION

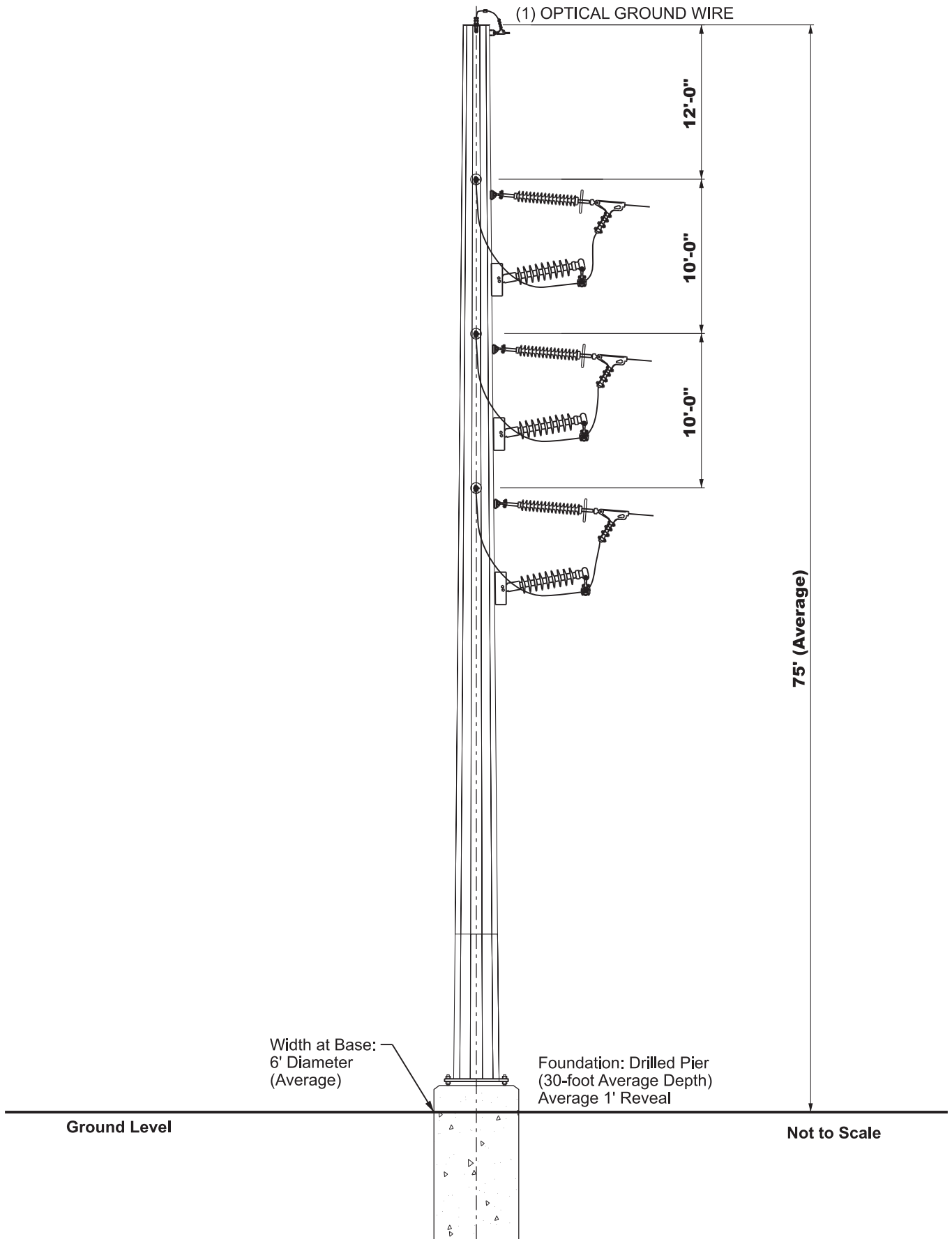
GUYED STEEL MONOPOLE DEAD-END (SINGLE CIRCUIT)



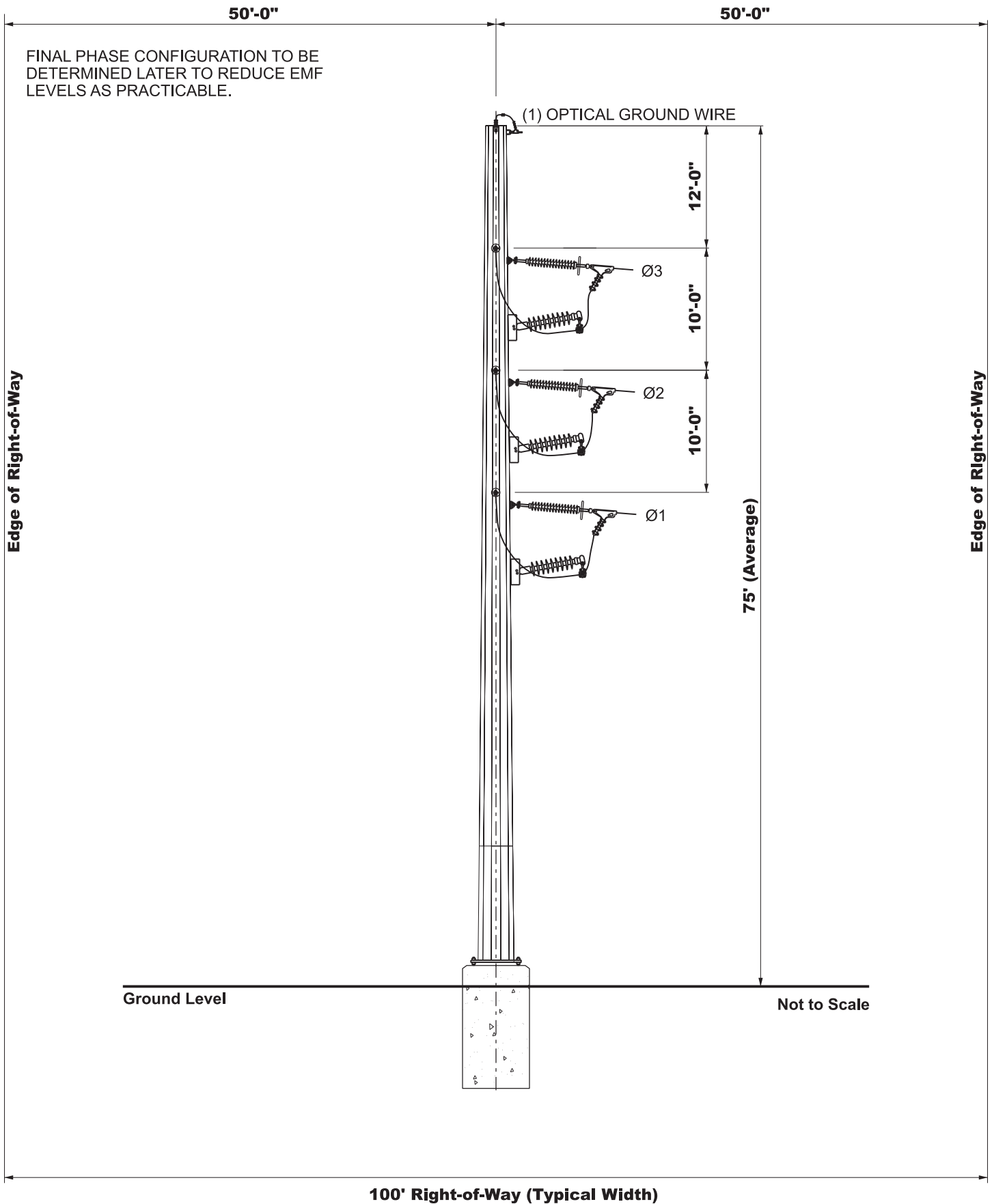
COMPARABLE EXISTING STRUCTURE PHOTOGRAPH

Note: The proposed material for the typical structure will be galvanized steel with a dulled finish (as shown above)

STEEL MONOPOLE DEAD-END (SINGLE CIRCUIT)



TYPICAL SCHEMATIC



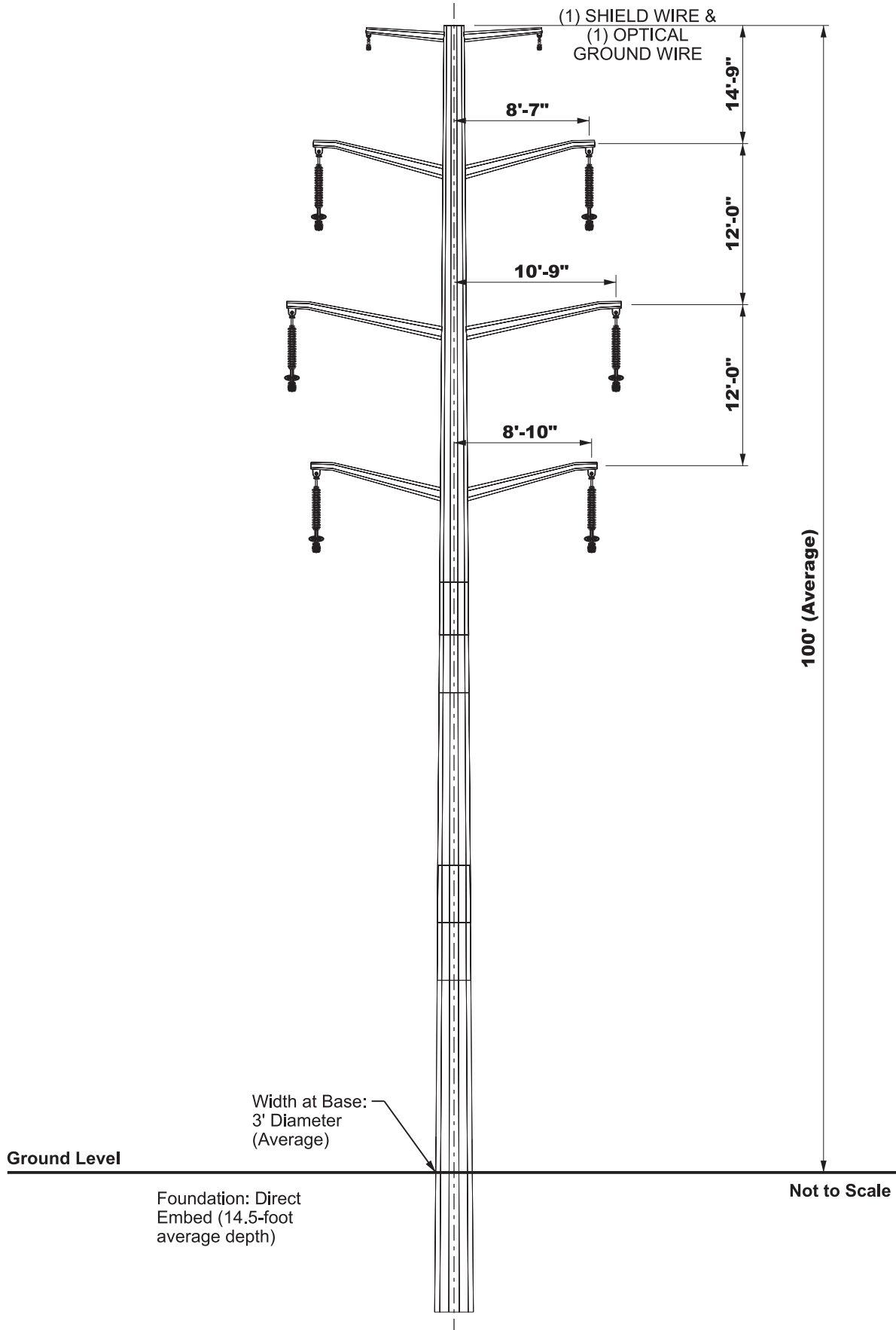
TYPICAL RIGHT-OF-WAY CROSS SECTION



COMPARABLE EXISTING STRUCTURE PHOTOGRAPH

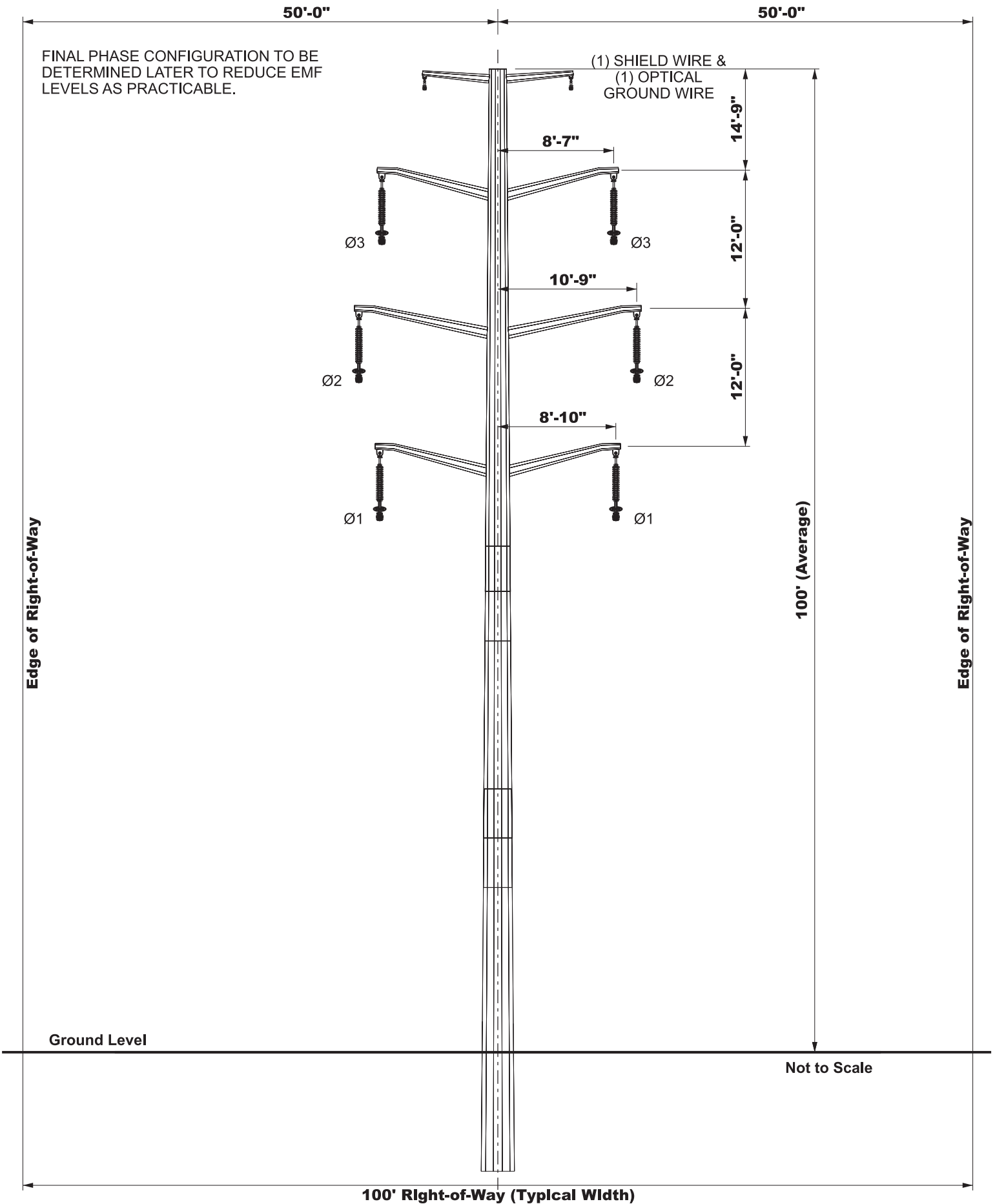
Note: The proposed material for the typical structure will be galvanized steel with a dulled finish (as shown above)

STEEL MONOPOLE TANGENT WITH DAVIT ARMS (Double Circuit)



TYPICAL SCHEMATIC

STEEL MONOPOLE TANGENT WITH DAVIT ARMS (Double Circuit)

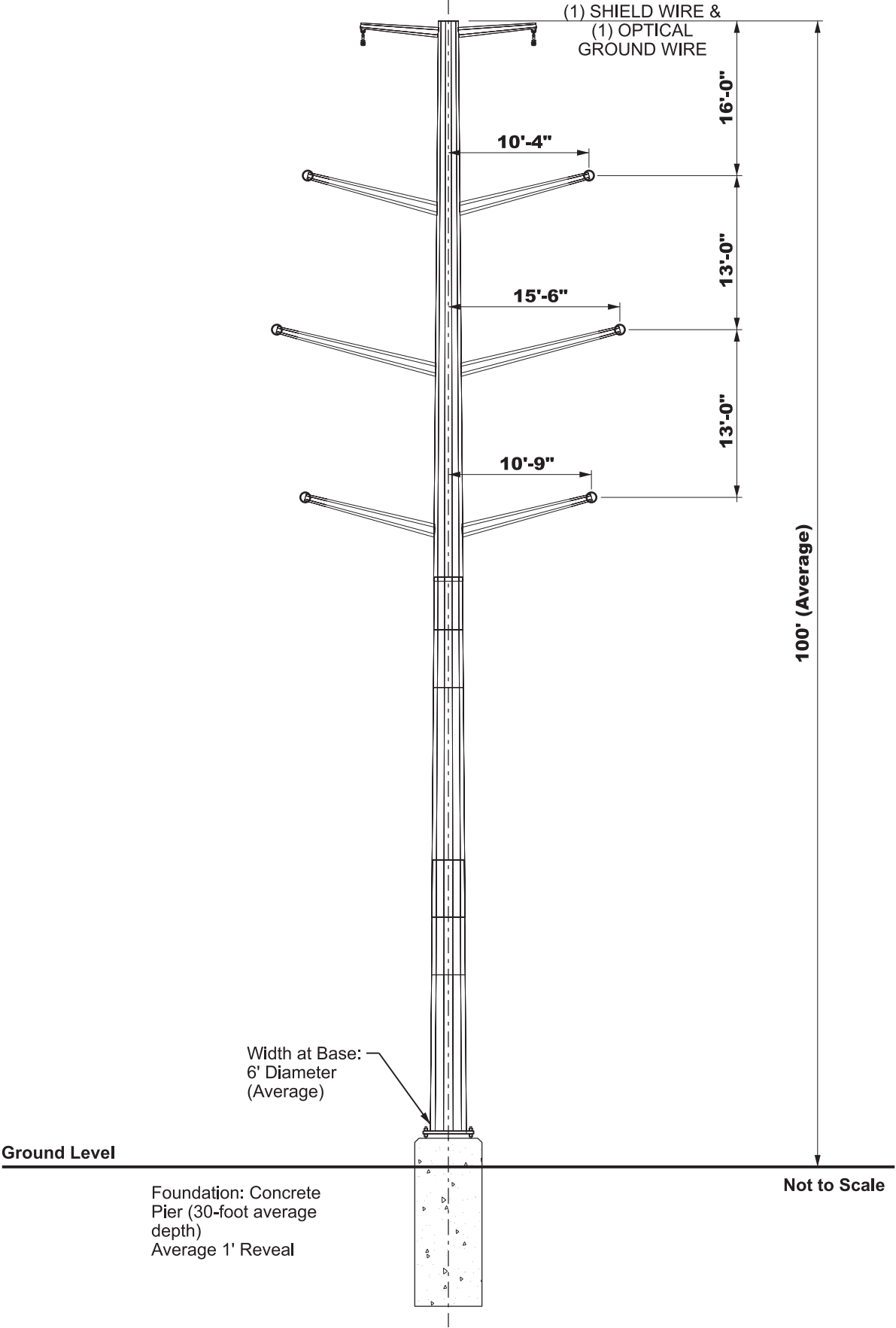


TYPICAL RIGHT-OF-WAY CROSS SECTION

STEEL MONOPOLE TANGENT WITH DAVIT ARMS (Double Circuit)**COMPARABLE EXISTING STRUCTURE PHOTOGRAPH**

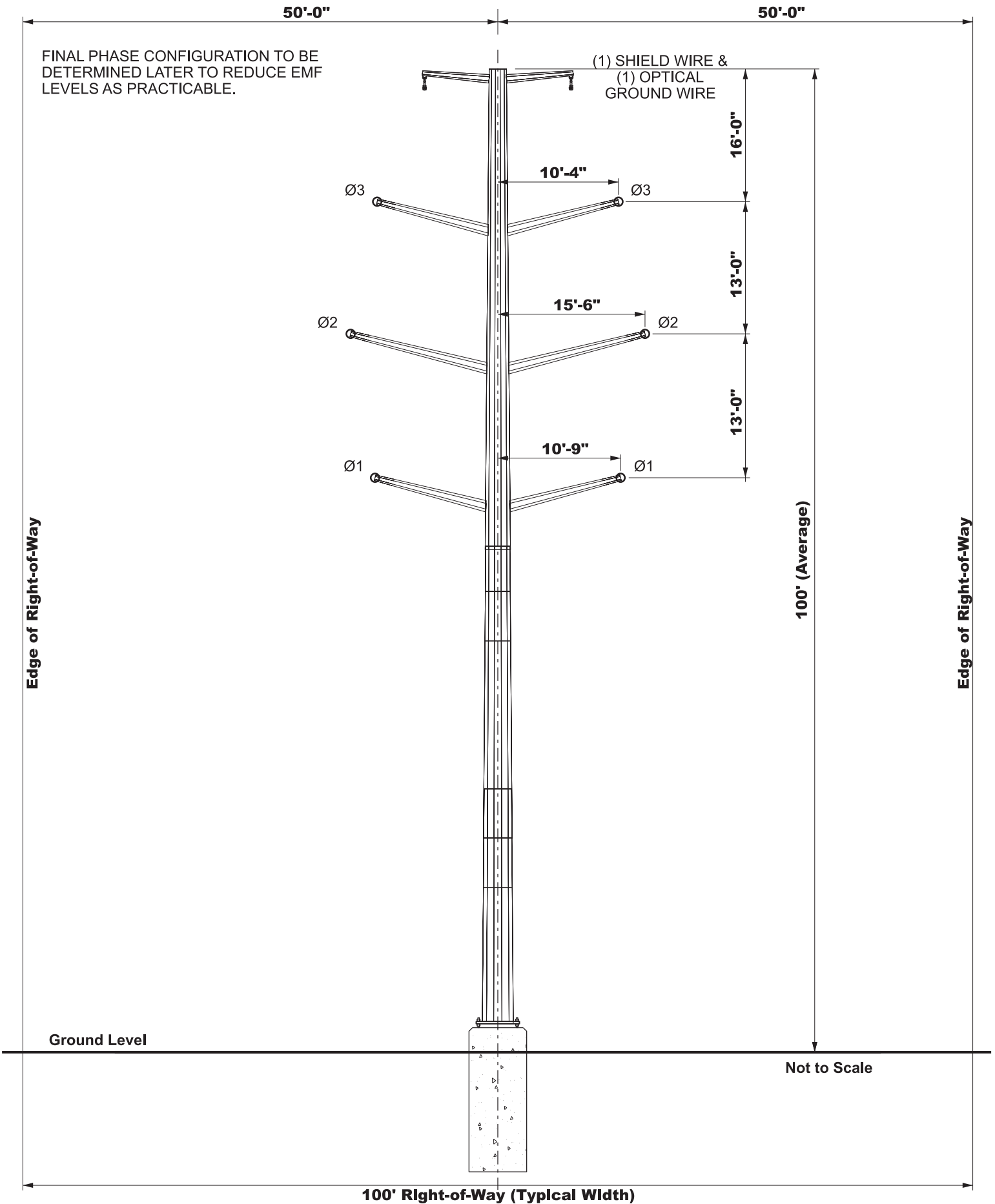
Note: The proposed material for the typical structure will be galvanized steel with a dulled finish (as shown above)

STEEL MONOPOLE DEAD-END WITH DAVIT ARMS (Double Circuit)



TYPICAL SCHEMATIC

STEEL MONOPOLE DEAD-END WITH DAVIT ARMS (Double Circuit)



TYPICAL RIGHT-OF-WAY CROSS SECTION

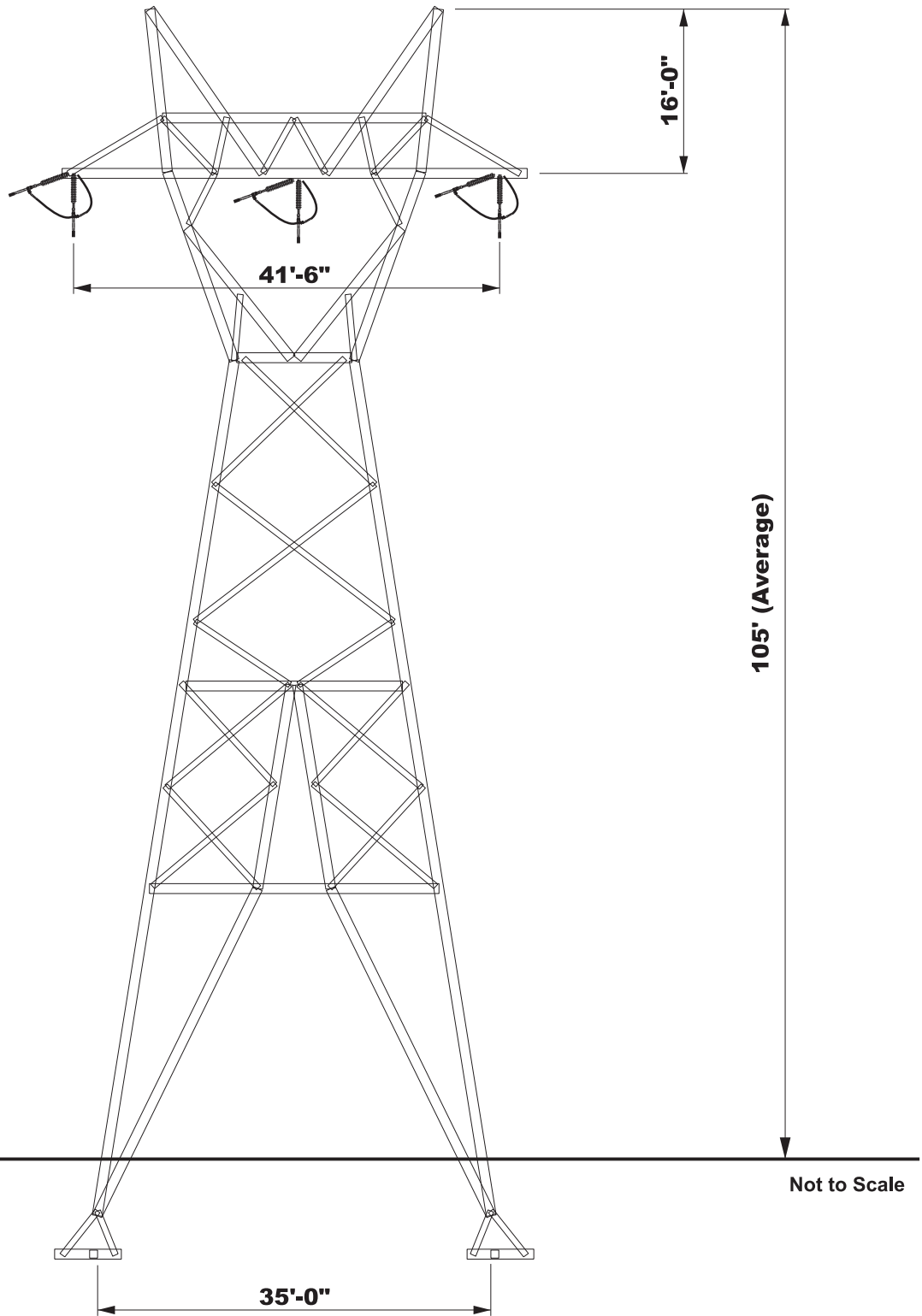


COMPARABLE EXISTING STRUCTURE PHOTOGRAPH

Note: The proposed material for the typical structure will be galvanized steel with a dulled finish (as shown above)

SELF-SUPPORTING STEEL LATTICE TOWER (Single Circuit)

(1) SHIELD WIRE
&
(1) OPTICAL GROUND WIRE



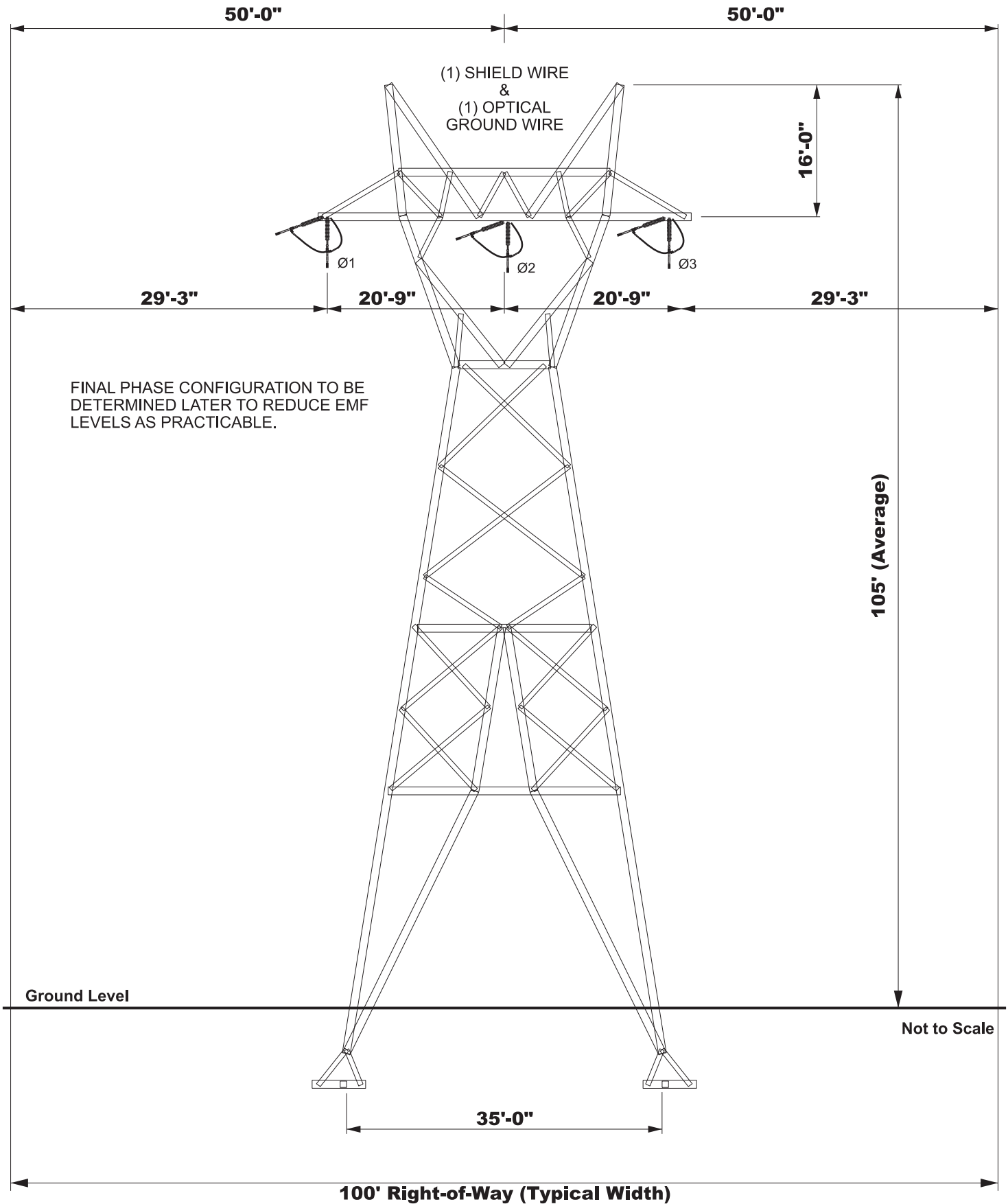
Ground Level

Foundation: (4) Earth grillages
(12-foot average depth)

Not to Scale

TYPICAL SCHEMATIC

SELF-SUPPORTING STEEL LATTICE TOWER (Single Circuit)



TYPICAL RIGHT-OF-WAY CROSS SECTION



COMPARABLE EXISTING STRUCTURE PHOTOGRAPH

Note: The proposed material for the typical structure will be galvanized steel with a dulled finish (as shown above)