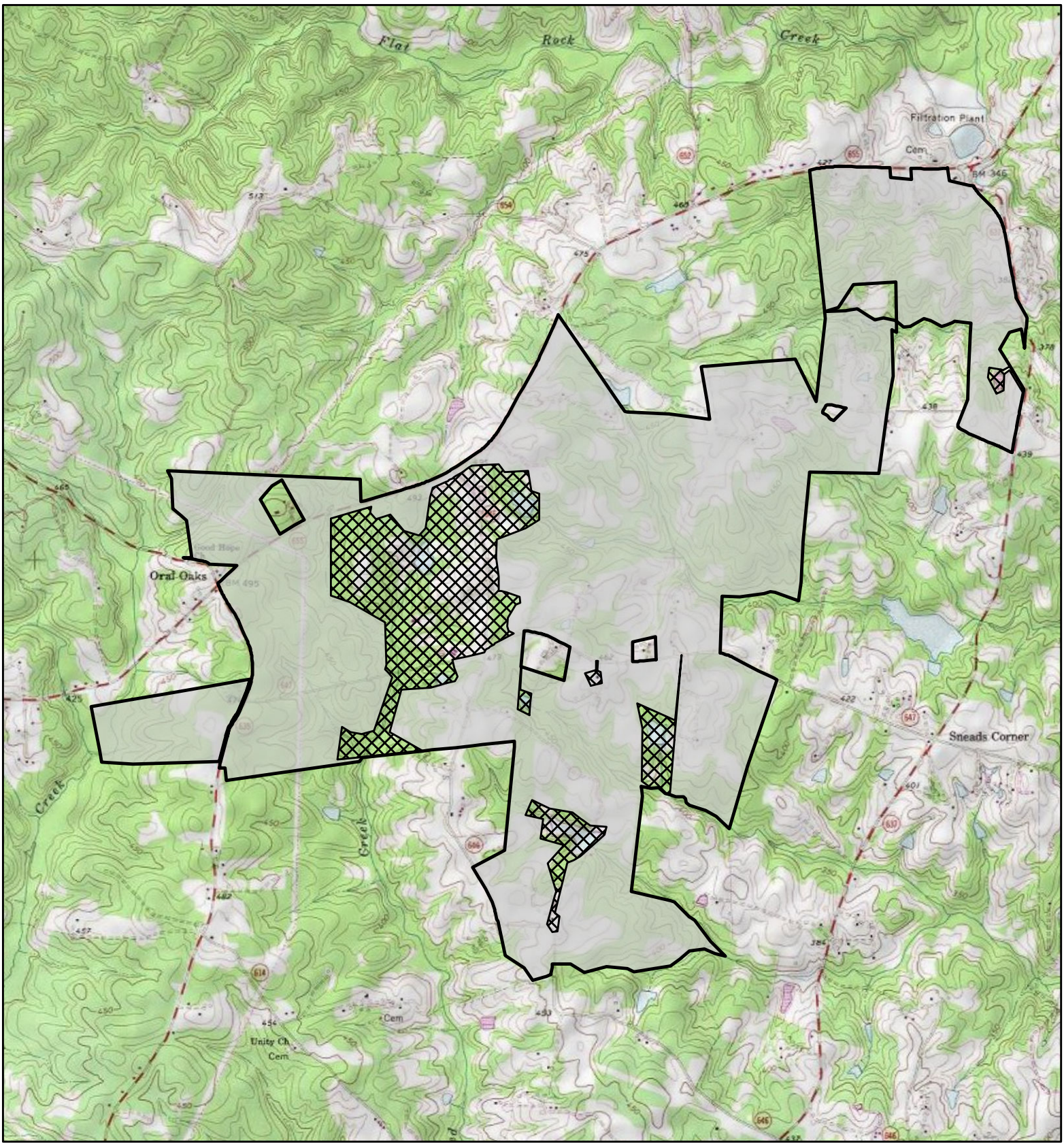


Project Study Area

Anticipated Parcel Carve Out

N

0 1,000 2,000

Feet

Source: USGS (2020)

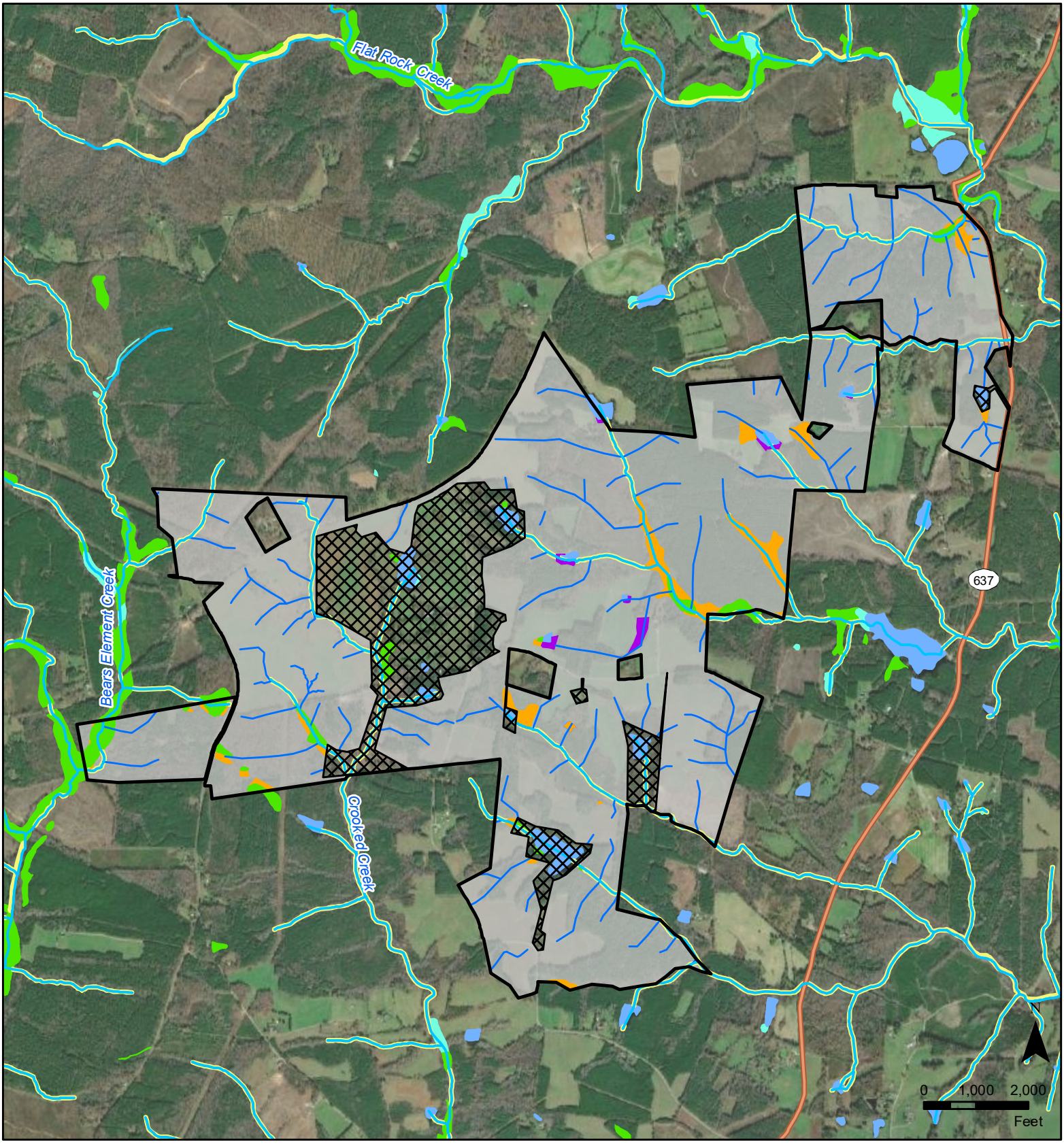
TETRA TECH

Figure 2
Topographic
Project Location Map

Laurel Branch Solar Project

Lunenburg County, Virginia

R:\PROJECTS\LAUREL_BRANCH_1058-0025\SITE\MAPS\LB_Option_A_Figure_2_Location_Topo.mxd



Project Study Area

Anticipated Parcel Carve Out

TT Mapped Streams (93,576 feet)

TT Mapped Wetlands (44.7 acres)

TT Mapped Waterbodies (5.7 acres)

NHD Stream (34,248 feet)

NWI Wetland (55 acres)

Freshwater Emergent Wetland

Freshwater Forested/ Shrub Wetland

Freshwater Pond

Riverine

Source: NHD (2020), NWI (2020)

TETRA TECH

Figure 3 Wetlands and Other Waters Map

Laurel Branch Solar Project

Lunenburg County, Virginia

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ATTACHMENT A: USFWS IPAC AND FEDERALLY LISTED SPECIES INFORMAL REVIEW

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To:
Project Code: 2022-0043762
Project Name: Laurel Branch

May 17, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Project Code in the header of this

letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

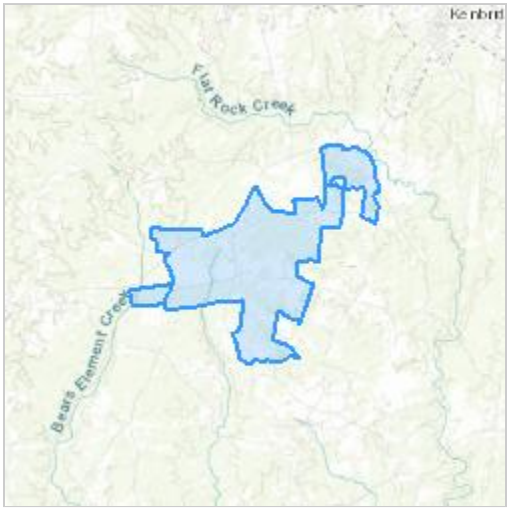
This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Project Summary

Project Code: 2022-0043762
Event Code: None
Project Name: Laurel Branch
Project Type: Power Gen - Solar
Project Description: Laurel Branch
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.91603325,-78.17663331220729,14z



Counties: Lunenburg County, Virginia

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. 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.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

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 OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

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.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

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
Bald Eagle *Haliaeetus leucocephalus* 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. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20

NAME	BREEDING SEASON
Kentucky Warbler *Oporornis formosus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prairie Warbler *Dendroica discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	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.

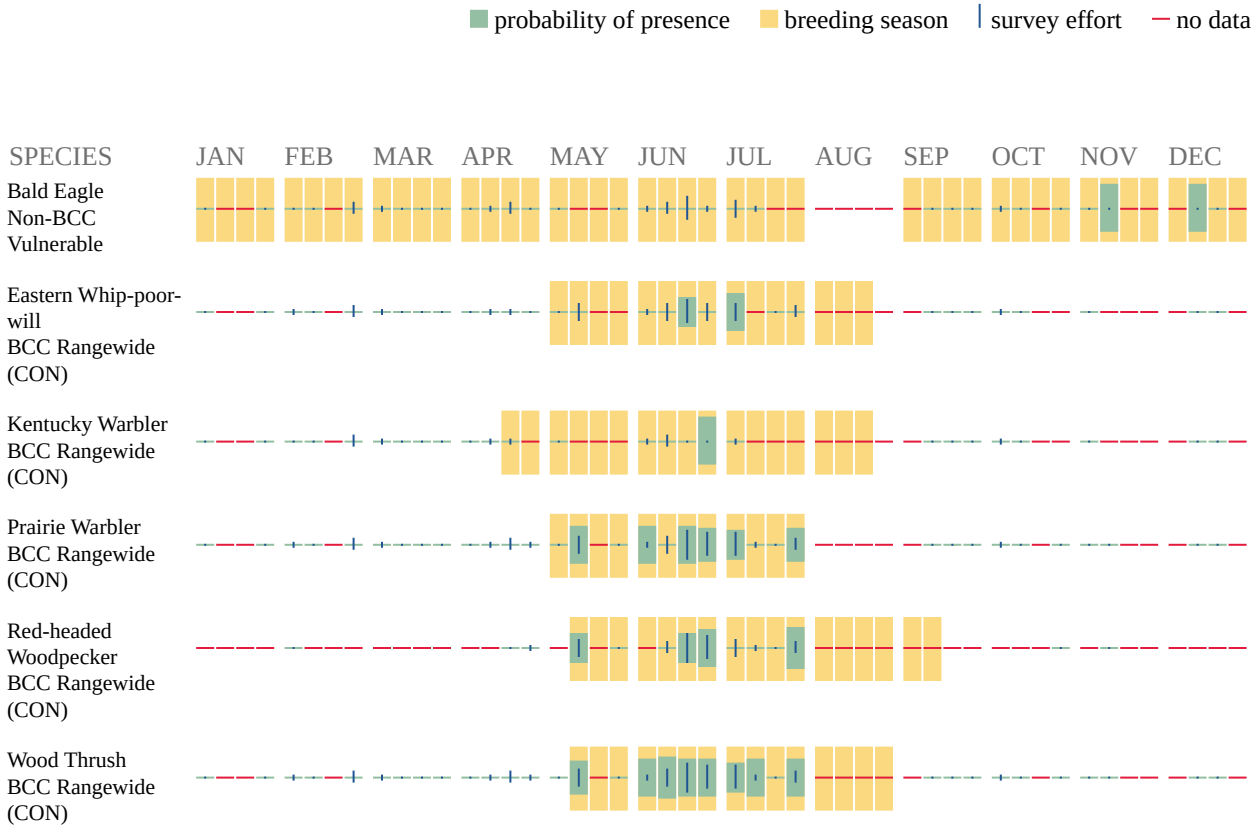
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

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.

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.



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-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

Migratory Birds FAQ

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 migratory birds potentially occurring 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 AKN Phenology 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, migrating or present year-round in my project 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 refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. 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

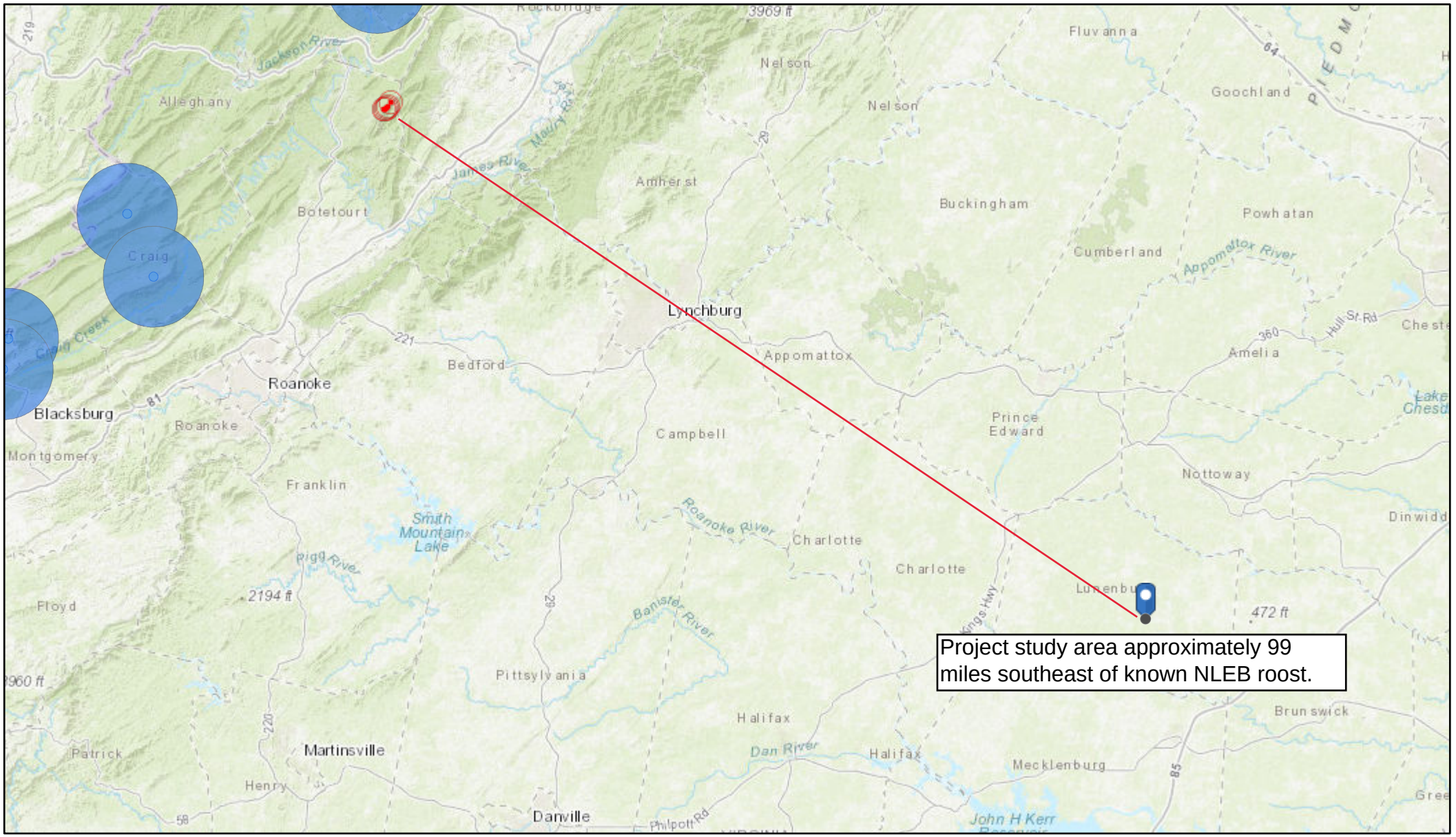
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate 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.

IPaC User Contact Information

Agency:	Tetra Tech
Name:	Justin Ahn
Address:	4101 Cox Road
Address Line 2:	Suite 120
City:	Glen Allen
State:	VA
Zip:	23060
Email	justin.ahn@tetratech.com
Phone:	6105730764

ATTACHMENT B: STATE LISTED SPECIES INFORMAL REVIEW

NLEB Locations and Roost Trees



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NLEB Known Occupied Maternity Roost (Summer Habitat)

NLEB Hibernaculum 5.5 Mile Buffer

NLEB Hibernaculum Half Mile Buffer

1:1,155,581

0 5 10 20 mi

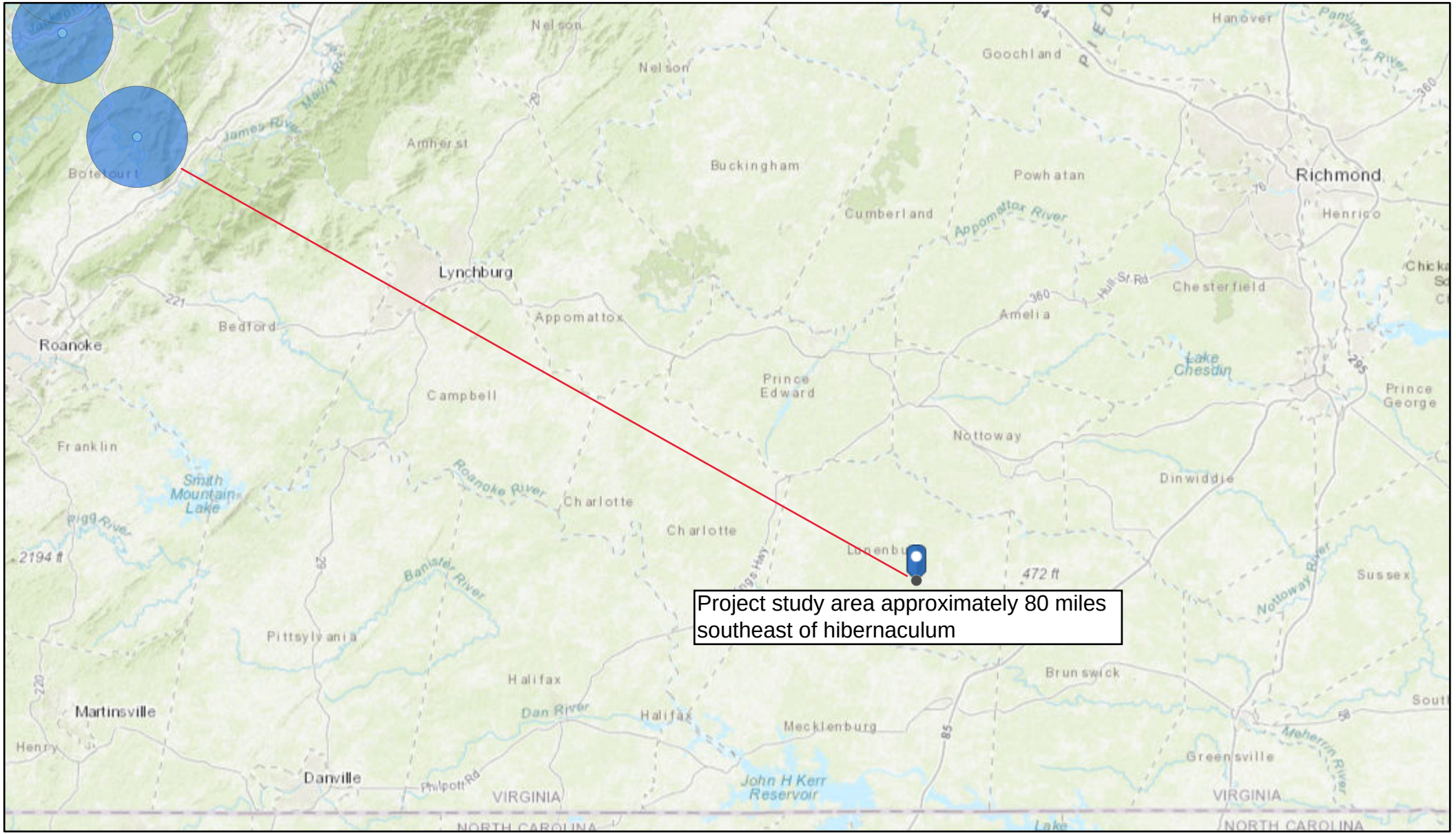
0 12.5 25 50 km

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS

VA Dept. Game & Inland Fisheries

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS |

Tri-colored and Little Brown Bat



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Tri-colored and Little Brown Hibernaculum Half Mile Buffer

Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

1:1,155,581

0 5 10 20 mi

0 12.5 25 50 km

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS

Dept. Game and Inland Fisheries

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS |

VaFWIS Initial Project Assessment Report Compiled on 1/5/2022, 11:27:33 PM

Help

Known or likely to occur within a **2 mile buffer around polygon; center 36,54,56.0 -78,10,26.0** in **111 Lunenburg County, VA**

View Map of Site Location

395 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 21) (21 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon		BOVA
010214	FESE	IIa	Logperch, Roanoke	Percina rex		BOVA
050022	FTST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA
060173	FTST	Ia	Pigtoe, Atlantic	Fusconaia masoni		BOVA,Habitat
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata		BOVA
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050027	SE	Ia	Bat, tri-colored	Perimyotis subflavus		BOVA
060006	SE	Ib	Floater, brook	Alasmidonta varicosa		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA
040385	ST	Ia	Sparrow, Bachman's	Peucaea aestivalis		BOVA
060081	ST	IIa	Floater, green	Lasmigona subviridis		BOVA
010070	ST	IIc	Shiner, whitemouth	Notropis alborus		BOVA
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
030063	CC	IIIa	Turtle, spotted	Clemmys guttata		BOVA
010174		Ia	Bass, Roanoke	Ambloplites cavifrons		BOVA,Habitat
020002		IIa	Treefrog, barking	Hyla gratiosa		BOVA
040052		IIa	Duck, American black	Anas rubripes		BOVA
040320		IIa	Warbler, cerulean	Setophaga cerulea		BOVA
040140		IIa	Woodcock, American	Scolopax minor		BOVA
060071		IIa	Lampmussel, yellow	Lampsilis cariosa		BOVA
040105		IIb	Rail, king	Rallus elegans		BOVA

To view **All 395 species** View 395

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need
Virginia Widlife Action Plan Conservation Opportunity Ranking:
a - On the ground management strategies/actions exist and can be feasibly implemented.; b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.; c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Habitat Predicted for Aquatic WAP Tier I & II Species (3 Reaches) View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

Stream Name	Tier Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Crooked Creek (03010204)	FTST	060173	FTST	Ia	Pigtoe, Atlantic	Fusconaia masoni	Yes
Flat Rock Creek (03010204)	FTST	010174		Ia	Bass, Roanoke	Ambloplites cavifrons	Yes
		060173	FTST	Ia	Pigtoe, Atlantic	Fusconaia masoni	
tributary (03010204)		010174		Ia	Bass, Roanoke	Ambloplites cavifrons	Yes
tributary (03010204)		010174		Ia	Bass, Roanoke	Ambloplites cavifrons	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Public Holdings:

N/A

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Site Location

36,54,56.0 -78,10,26.0
is **the Search Point**

Show Position Rings
(•) Yes ( ) No
1 mile and 1/4 mile at the **Search Point**

Show Search Area
(•) Yes ( ) No
2 Search distance miles buffer

Search Point is at map center

Base Map Choices
Topography

Map Overlay Choices
Current List: Position, Search, BECAR, BAEANests, TEWaters, TierII, Habitat, Trout, Anadromous

Map Overlay Legend

T & E Waters
Federal
State

Predicted Habitat WAP Tier I & II
Aquatic
Terrestrial

Trout Waters
Class I - IV
Class V - VI

Anadromous Fish Reach
Confirmed
Potential

Impediment

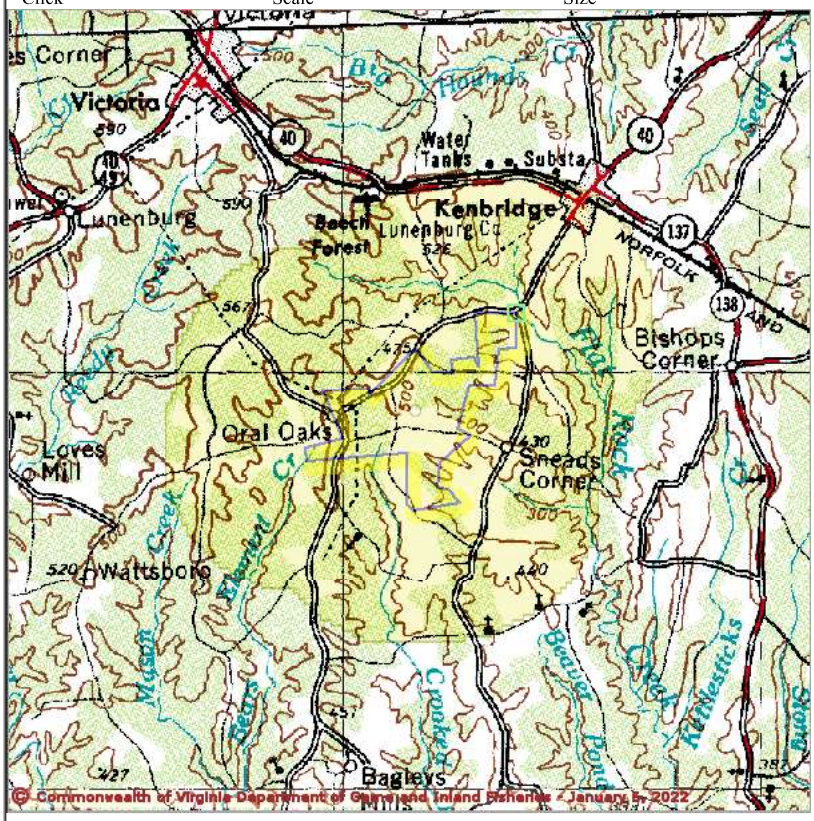
Position Rings 1 mile and 1/4 mile at the Search Point

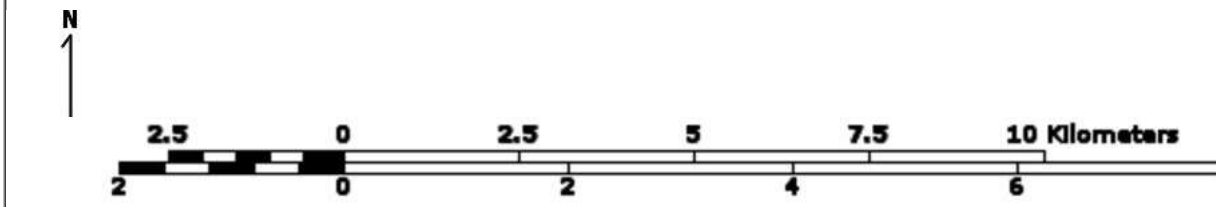
2 mile radius Search Area

Bald Eagle Concentration Areas and Roosts

Refresh Browser Page

Map Click Pan Id M Map Scale In Zoom Out Screen Size Small Size Big Help





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Map Location 36,54,56.6 -78,10,32.0

Select **Coordinate System:**
(•) Degrees,Minutes,Seconds Latitude - Longitude
( ) Decimal Degrees Latitude - Longitude
( ) Meters UTM NAD83 East North Zone
( ) Meters UTM NAD27 East North Zone

Base Map source: USGS 1:250,000 topographic maps (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 17 NAD 1983 with left 742013 and top 4098852. Pixel size is 19. . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 19200 meters east to west by 19200 meters north to south for a total of 368.6 square kilometers. The map display represents 63002 feet east to west by 63002 feet north to south for a total of 142.3 square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic http://www.national.geographic.com/topo
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2022-01-05 23:27:40 (qa/qc March 21, 2016 12:20 - tn=1156083.0 dist=3218 I)
$poi=36.9155556 -78.1738889

Natural Heritage Resources

Your Criteria

Taxonomic Group: Select All

Global Conservation Status Rank: Select All

State Conservation Status Rank: Select All

Federal Legal Status: Select All

State Legal Status: Select All

County: Lunenburg

Watershed (8 digit HUC): 03010204 - Meherrin River

Subwatershed (12 digit HUC): CM08 - Meherrin River-Mason Creek,CM09 - Meherrin River-Crooked Creek,CM10 - Flat Rock Creek

Search Run: 12/5/2021 9:00:46 AM

Result Summary

Total Species returned: 2

Total Communities returned: 0

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

Common Name/Natural Community	Scientific Name	Scientific Name Linked	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences	Virginia Coastal Zone
Lunenburg								
Meherrin								
Flat Rock Creek								
BIRDS								
Loggerhead Shrike	Lanius ludovicianus	Lanius ludovicianus	G4	S1B,S2N	None	LT	40	N
Meherrin River-Mason Creek								
BIVALVIA (MUSSELS)								
Atlantic Pigtoe	Fusconaia masoni	Fusconaia masoni	G1	S2	PT	LT	29	N

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

For Additional Information on locations of Natural Heritage Resources please submit an information request.

To Contribute information on locations of natural heritage resources, please fill out and submit a rare species sighting form.

ATTACHMENT C: CULTURAL RESOURCES DESKTOP REVIEW MEMO

Cultural Resources Desktop Review

Laurel Branch Solar Project

May 20, 2022

Prepared for

Dominion Energy®

600 E Canal Street
Richmond, VA 23219

Prepared by

TETRA TECH

4101 Cox Road, Suite 120
Glen Allen, VA 23060

Table of Contents

1.0 INTRODUCTION 1

2.0 PREVIOUS SURVEYS RELEVANT TO THE PROJECT AREA 1

3.0 PREVIOUSLY IDENTIFIED ARCHAEOLOGICAL SITES WITHIN 0.5 MILE OF THE PROJECT AREA 2

4.0 PREVIOUSLY IDENTIFIED ARCHITECTURAL RESOURCES WITHIN 0.5 MILE OF THE PROJECT AREA..... 2

5.0 RECOMMENDED NEXT STEPS 6

List of Tables

Table 1. Previously identified architectural resources located within 0.5 mile of the project area.[1] 3

List of Figures

Figure 1. Previous surveys (gray) conducted in relation to the 0.5-mile buffer (yellow) around the project area (orange)..... 1

Figure 2. Archaeological resources (red) in relation to the 0.5-mile buffer (yellow) around the project area (orange)..... 2

Figure 3. Map detailing all architectural resources (blue hatched) within 0.5 mile (yellow) of the project area (orange)..... 4

Figure 4. Detail of architectural resources (blue hatched) which are partially within the project area (orange). 5

Figure 5. Detail of the proposed carved out area in which VDHR #055-0117 is located. The orange outlined proposed carved out area is not included within the project area. 6

1.0 INTRODUCTION

This report provides a summary of the cultural resource management events registered at the Virginia Department of Historic Resources (VDHR) through May 2022 that have taken place to date within the proposed Laurel Branch Solar Project area. Additionally, all previously identified architectural resources and archaeological sites located within the project area, as well as within 0.5 mile of the project area, are provided. Information on previously conducted surveys and previously identified resources and sites were accessed through VDHR's Virginia Cultural Resources Information System (VCRIS) on May 17, 2022. The memo was drafted based off the current Laurel Branch Solar Project boundary.

2.0 PREVIOUS SURVEYS RELEVANT TO THE PROJECT AREA

Research undertaken through VDHR's VCRIS demonstrated that no surveys have been conducted within 0.5 mile of the project area (Figure 1).

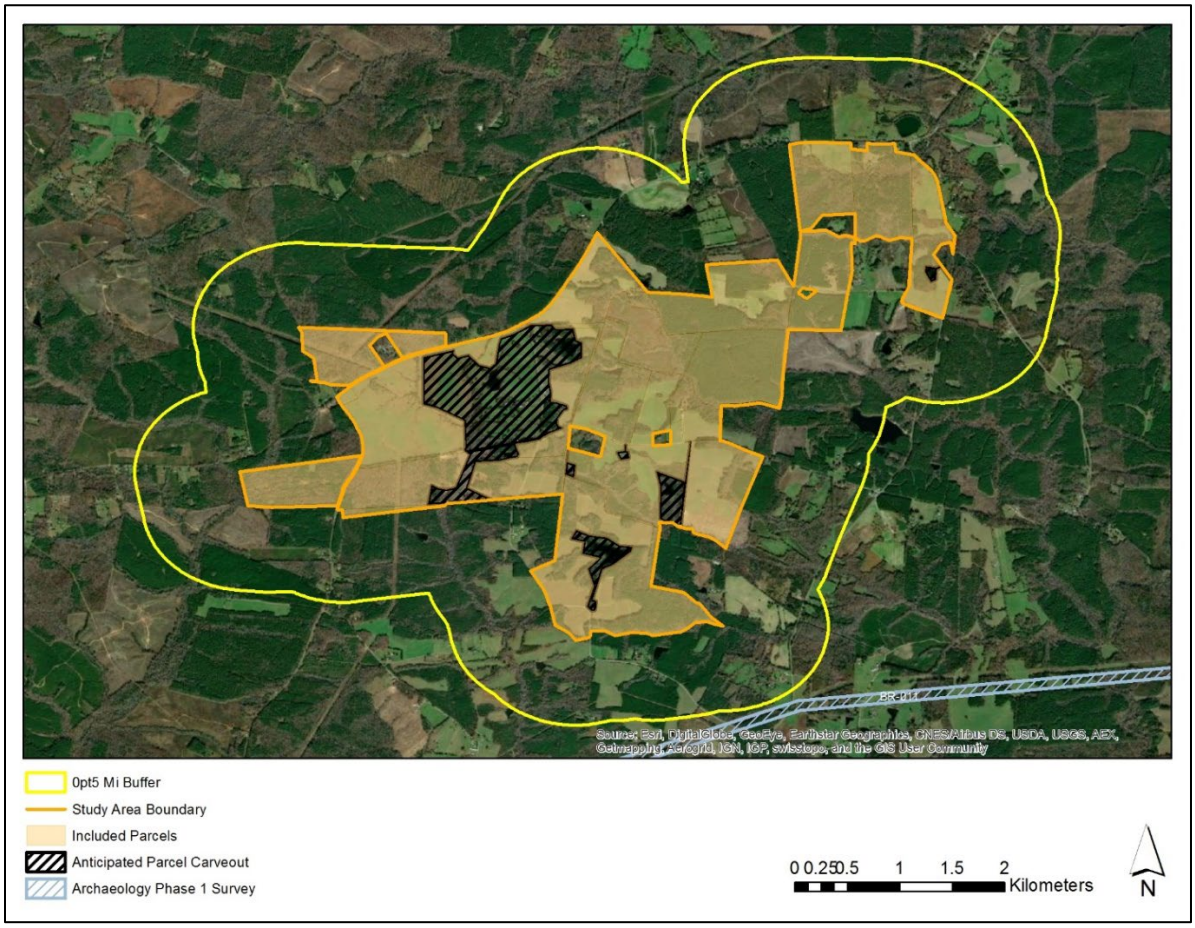


Figure 1. Previous surveys (gray) conducted in relation to the 0.5-mile buffer (yellow) around the project area (orange).
Source: VCRIS 2022

3.0 PREVIOUSLY IDENTIFIED ARCHAEOLOGICAL SITES WITHIN 0.5 MILE OF THE PROJECT AREA

There are no previously recorded archaeological sites located within 0.5 mile of the project area (Figure 2). No archaeological sites are located within the project area.

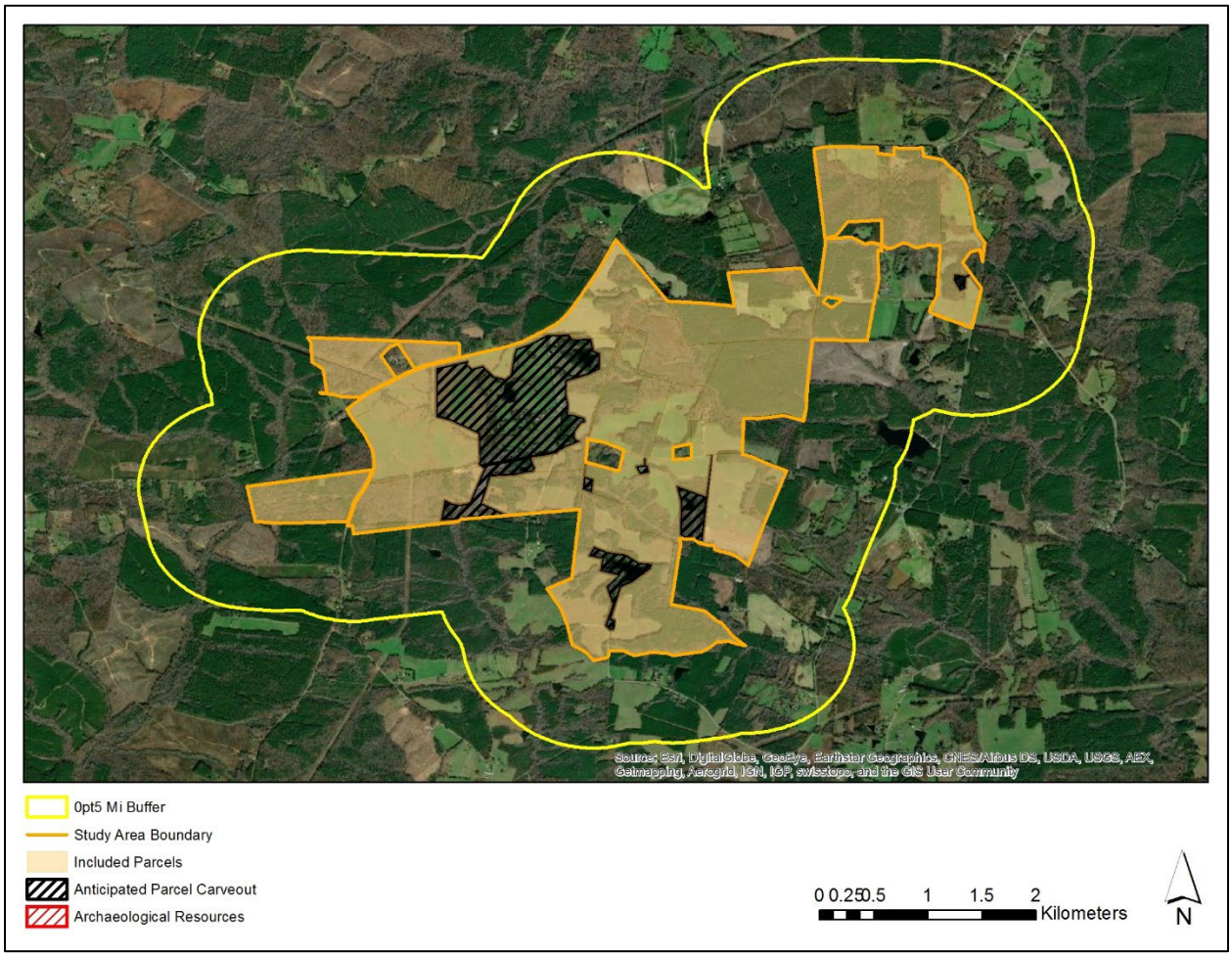


Figure 2. Archaeological resources (red) in relation to the 0.5-mile buffer (yellow) around the project area (orange). Source: VCRIS 2022.

4.0 PREVIOUSLY IDENTIFIED ARCHITECTURAL RESOURCES WITHIN 0.5 MILE OF THE PROJECT AREA

Review of VDHR VCRIS records identified 13 previously recorded architectural resources within 0.5 mile of the project area (Figure 3, Table 1). Among the resources are 10 dwellings, a wagon shed, a church/chapel, and a school. The resources range in date from the late-eighteenth century to the mid-twentieth century. VDHR #055-0003, Flat Rock, a circa 1780 farmhouse, is additionally listed in the National Register of Historic Places (NRHP) (NRHP; reference number 79003051) and the Virginia Landmarks Register (VLR). VDHR #055-5132 (Good Hope Christadelphian Chapel) has been determined to be eligible for inclusion in the NRHP.

Two resources are located partially within the project area. These resources include: VDHR #055-5132 (Good Hope Christadelphian Chapel) and VDHR #055-5138 (Samuel A. Wallace, Jr. House). As mentioned above, VDHR #055-5132 (Good Hope Christadelphian Chapel) has been determined to be eligible for inclusion in the NRHP and VDHR #055-5138 has been determined to not be eligible for inclusion in the NRHP.

As demonstrated in Figure 4, the project area excludes the majority of VDHR #055-5132 and VDHR #055-5138 (Figure 4). Likewise, VDHR #055-0117 is located within a parcel which is excluded from the project area, as shown in Figure 5 (Figure 5).

Table 1. Previously identified architectural resources located within 0.5 mile of the project area.[1]

VDHR ID#	Property Name	NRHP Eligibility Status	Type	Year
055-5139	Charles E. Wallace House (Current)	DHR Staff: Not Eligible	Single Dwelling	1955a
055-5138	**Samuel A. Wallace, Jr., House (Current)**	**DHR Staff: Not Eligible**	**Single Dwelling**	**1953**
055-5140	Wagon shed (Descriptive)	DHR Staff: Not Eligible	Wagon Shed	1925Ca
055-0028	Bell House (Historic/Current), Colonial Oaks (Historic), Eddie Bell Place (Descriptive)	<Null>	Single Dwelling	1825Ca
055-5133	House on Route 655 (Function/Location), Wathall House (Historic)	DHR Staff: Not Eligible	Single Dwelling	1860Ca
055-5132	**Good Hope Christadelphian Chapel (Historic)**	**DHR Staff: Eligible**	**Church/Chapel**	**1825Ca**
055-0117	Oral Oaks (Historic/Current)	<Null>	Single Dwelling	1840
055-0011	Laurel Branches (Historic)	<Null>	Single Dwelling	1790Ca
055-0155	House, Route 637 (Function/Location)	DHR Staff: Not Eligible	Single Dwelling	1870Ca
055-5105	Unity School (Historic)	<Null>	School	1873
055-5131	Lone Oak (Historic)	<Null>	Single Dwelling	1810Ca
055-0003	Flat Rock (Historic/Current), Kenrock (Historic/Current), Old Bagley House (Historic), Prospect Hill (Historic)	NRHP Listing, VLR Listing	Single Dwelling	1780Ca
055-5130	Bridgforth, Washington Maddux House (Historic), Oak Forest (Historic/Current)	<Null>	Single Dwelling	1936

1 Resources highlighted in orange are eligible for listing in the NRHP or have a NRHP and VLR listing. Bolded resources are partially within the project area boundary.

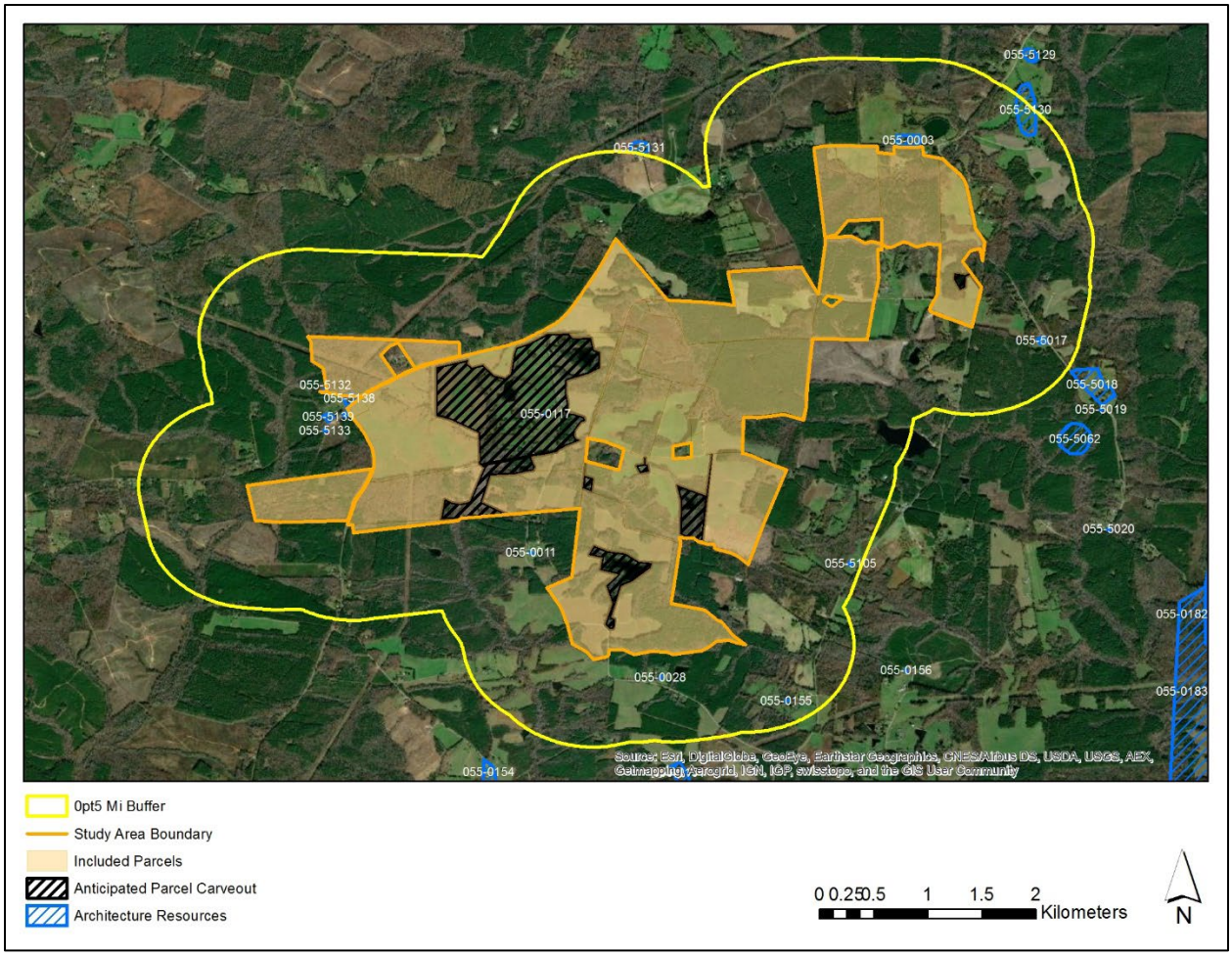


Figure 3. Map detailing all architectural resources (blue hatched) within 0.5 mile (yellow) of the project area (orange). Source: VCRIS 2022.

Figure 4. Detail of architectural resources (blue hatched) which are partially within the project area (orange). Source: VCRIS 2022.

Figure 5. Detail of the proposed carved out area in which VDHR #055-0117 is located. The anticipated parcel carveout area is not included within the project area. Source: VCRIS 2022.

5.0 RECOMMENDED NEXT STEPS

Preparation of a Phase IA cultural resources assessment (Phase IA), including a research design to guide a subsequent Phase I identification survey, is recommended for the Laurel Branch project area. The Phase IA should include further consideration of site soils, historic maps, and existing field conditions and result in the development of a stratified testing strategy for identifying archaeological resources within the project area. The completed Phase IA should be submitted to the VDEQ and VDHR for review and comment prior to initiation of Phase I identification survey of the site in accordance with the recommended testing strategy.

ATTACHMENT D: VISUAL IMPACT ASSESSMENT

Visual Impact Assessment

Laurel Branch Solar Project

May 20, 2022

Prepared for

Dominion Energy®

600 E Canal Street
Richmond, VA 23219

Prepared by

TETRA TECH

4101 Cox Road, Suite 120
Glen Allen, VA 23060

Table of Contents

1.0 OVERVIEW 1

2.0 METHODOLOGY 1

2.1 Evaluation of Solar Facilities Within the 2-Mile Buffer 2

2.2 Viewer Groups 2

2.3 Residents 3

2.4 Commuters/Travelers 3

2.5 Tourists and Recreational Users 3

2.6 Key Observation Points and Photo Simulations 4

2.6.1 KOP 1– Oral Oaks Road/VA 635/U.S. Bicycle Route 1 4

2.6.2 KOP 2 – Plank Road near Flat Rock Historic Site 6

2.6.3 KOP 3 – Laurel Branch Road, South 7

2.6.4 KOP 12 – Laurel Branch Road, South 7

2.6.5 KOP 13 – Laurel Branch Road, South 7

3.0 CONCLUSIONS 8

4.0 REFERENCES 9

List of Tables

Table 1. Key Observation Points 4

List of Figures

Figure 1: Orthoimagery Project Location Map
Figure 2: Topographic Project Location Map
Figure 3: Project Key Observation Point Map

List of Appendices

Appendix A: Photo Simulations
Appendix B: Project Photolog

Acronyms and Abbreviations

AC	alternating current
CUP	Conditional Use Permit
DC	direct current
KOP	key observation point
Project Area	the 2,189± acres of privately-owned land where the proposed Project is located
Project	Laurel Branch Solar Project
Tetra Tech	Tetra Tech, Inc.
USGS	U.S. Geological Survey

1.0 OVERVIEW

Dominion Energy Virginia (Dominion) is proposing to develop a commercial solar energy project, Laurel Branch Solar Project (Project), on private land encompassing approximately 2,189 acres. The Project will be located along Sneads Store and Laurel Branch Roads in Lunenburg County, Virginia (Project). The Project Area consists of predominantly rural undeveloped and agricultural or timber production land. The Project Area is shown on the orthoimagery and U.S. Geological Survey (USGS Project location maps (Figures 1 and 2).

The Project is located in a rural setting, southwest of Kenbridge, Virginia, (pop. 1,188 in 2021 [World Population Review 2022]) between VA 655 (Plank Road) and VA 637 (Craig Mill Road). The Project extends to the north and south of VA 647 (Sneads Store Road).

The predominant landcover of the Project Area is agricultural fields (forage/hay and pine timber production dominate) interspersed with large patches of mixed pine and deciduous forest and populated by isolated rural residences. Crooked Creek and numerous small ponds are also present in the Project Area.

The Project will consist of solar arrays and associated infrastructure, consisting of the following components:

- A solar field of photovoltaic panels producing direct current (DC) electricity mounted on solar module racking systems and foundations;
- Inverters within boxes on concrete pads situated amongst the solar arrays to convert DC electricity to alternating current (AC) electricity;
- A voltage cable collection system that will extend underground to aggregate the AC output from the inverters;
- A small internal substation that will feed the collected power to the existing electric grid; and
- Internal infrastructure including permanent paved and gravel access roads and security fencing.

Tetra Tech, Inc. (Tetra Tech), on behalf of Dominion, prepared this Visual Assessment to support the Laurel Branch Solar Project Conditional Use Permit (CUP) application.

2.0 METHODOLOGY

The Project Visual Study Area was defined as the area within 2 miles of the Project. Refer to Figures 1 to 3. No visual study area distance is prescribed by Lunenburg County ordinances or CUP documentation; therefore, the 2-mile radius was deemed appropriate by the authors to identify locations from which the Project components (i.e., solar arrays) could potentially be visible and noticeable to the casual observer, categorized according to their activity. The “casual observer” is considered an observer who is not actively looking or searching for the Project facilities, but who is engaged in activities at locations with potential views of the Project, such as walking or hiking along a trail or driving along a road. If the Project components are not noticeable to the casual observer, or if

resources in the Visual Study Area are not managed for visual quality, visual impacts can be considered minor to negligible.

A preliminary viewshed analysis was completed to identify Project visibility. A viewshed analysis is a graphic representation of the theoretical seen and unseen areas adjacent to the Project based on topography within the Visual Study Area. The viewshed analysis was conducted using the Google Earth Viewshed tool with a height of the solar arrays above ground surface (10 feet with the panels of the solar array standing vertically). The viewshed assumed "bare earth" conditions and was run from multiple points around the edges and in the middle of the Project to roughly determine areas with potential visibility. Given the limited views with the bare-earth analysis, it was determined that a viewshed accounting for vegetation was not required because it would not identify many more areas other than what is visible on aerials and the photography, and that the field visit would best determine actual areas of visibility.

A review of potential visual resources within the Visual Study Area was also conducted and included, but was not limited to, travel routes, recreation areas, local community resources (e.g., schools, parks, places of worship), and other scenic resources. No specific locations or resources within the Visual Study Area were identified as specifically managed for scenic quality. After review of potentially sensitive visual resources in the Visual Study Area, 13 key observation points (KOPs) were identified from which to potentially develop photographic simulations. The inventory considered 1) the most critical viewpoints (i.e., views from communities, residential areas, travel routes, and recreational areas), and 2) views that best represent the general area or landscape setting including anticipated views of the Project. KOPs were selected to represent typical views of residents, travelers, and recreationalists, primarily from public roads through and adjacent to the Project Area, because these routes would provide the most typical opportunities for views. Following KOP selection, fieldwork was conducted in January 2022 to collect site photography from each identified KOP location. Technical photographs from the field visit are included in Appendix A.

2.1 Evaluation of Solar Facilities Within the 2-Mile Buffer

Desktop research was conducted on existing and proposed solar facilities within the Visual Study Area No proposed or existing solar collection projects were identified within the Visual Study Area, based on an evaluation within the Virginia Department of Environmental Quality records (Virginia Department of Environmental Quality 2022).

2.2 Viewer Groups

Following KOP identification, viewer groups were identified to understand the types of receptors in this area. Viewer groups are specific users associated with various land uses who have unique expectations based on their activity and who could notice and could be impacted by landscape change, and therefore could be adversely affected by the construction and operation of the Project.

As described above, viewing locations are selected based on the results of the viewshed analysis, land uses, and viewer groups associated with key travel routes, recreation areas, and residential areas. KOPs represent critical or typical viewpoints within a land use and associated view group used to assess the visual effect of a proposed project. The visual impact to viewers at each KOP is based on

the type of use and expected concern for aesthetics. Identifying groups of individuals who would likely be perceptive to visual changes is an important part of the visual assessment process and helps to define specific locations from which to assess changes to the visual character of the landscape.

2.3 Residents

The residential viewer group consists of people who live within the 2-mile buffer area of the Project. Many local residents are present on a year-round basis. Generally, they view the landscape from their homes, yards properties, and from places of employment while engaged in daily activities. Residents of primary interest for this analysis are located near the Project that may have views of the Project components. KOPs 2, 12, and 13 were selected, in part, to represent views from residences within proximity to the Project.

Regardless of their proximity to the Project, residents may have similar reactions to views of the Project facilities. Residents' threshold for visual quality can be variable and may be tempered by the visual character and setting of their area. It is assumed that residents are generally familiar with the local landscape and may not be tolerant of changes to views that are important to them.

2.4 Commuters/Travelers

Travelers passing through an area typically view the landscape from motor vehicles on their way to work, errands, or other destinations. Travelers include daily commuters and people engaged in various types of business or personal travel. Commuters traveling within the 2-mile buffer view the landscape from motor vehicles on their way to work or other business and service destinations. Commuters do not tend to stop along their travel routes, have a relatively narrow field of view because they are focused on road and traffic conditions, and are destination oriented.

Commuters may be more likely to notice visual change because they view this environment regularly. Passengers in commuter vehicles would have greater opportunities for prolonged off-road views toward landscape features and, accordingly, may have greater perception of changes in the visual environment. Roads in and around the Project are primarily rural, narrow, and unpainted roads. All KOPs selected for this analysis are located along public roads traversing through or adjacent to the Project Area.

2.5 Tourists and Recreational Users

This viewer group includes local and potentially seasonal residents engaged in recreational activities, and tourists and recreational users visiting from outside the local area. Viewers in this group can also be tied to both traveler and residential, depending on the type of recreation.

Relevant recreation activities in Lunenburg County include hunting, fishing, canoeing, and cycling, among others. Hunting of deer, turkey, and bear is popular in forested areas surrounding the Project Area. Cycling is also available: VA 635 (Oral Oaks Road) is part of U.S. Bicycle Route 1, which is a designated route connecting public roads from Maine to Florida.

Recreational users' perception of visual quality and landscape character is variable, depending on their reason for visiting the area and expectations for their experience. For some recreational viewers,

scenery is a very important part of their recreational experience, and recreational users often have continuous views of landscape features over relatively long periods of time. Recreators are generally considered to be highly perceptive to changes in scenic quality and landscape character.

2.6 Key Observation Points and Photo Simulations

13 KOPs were identified to evaluate potential effects from which to conduct fieldwork and capture site photography. Fieldwork was conducted in January 2022. Following the fieldwork and an analysis of Project visibility, five simulation locations were selected to illustrate views of the landscape following the Project installation. KOPs selected for simulations were evaluated to determine if the Project would be visible and the context that view would be in. Table 1 shows a summary of the 13 identified KOPs, and the KOPs are mapped on Figure 3. Of the 13 identified KOPs, five were found to have no views of the Project due to distance to Project elements, intervening forest or topography, or a combination of these factors.

Appendix A includes photos of existing conditions and photo simulations from KOPs 1, 2, 3, 12, and 13. KOP location 11 was determined to be inaccessible during the field reconnaissance and therefore, no photographs are included for this KOP. Appendix B shows the photography captured at each of the remaining 12 viewing locations visited in the field.

Table 1. Key Observation Points

KOP No.	Name	Viewing Direction	Distance to Nearest Project Element	Primary Viewer Group(s)	Visibility[1/]
01 [2/]	Oral Oaks Road/VA 635/U.S. Bicycle Route 1	East	350 ft.	Commuters/Travelers; Tourists/Recreationalists	+
02 [2/]	Plank Road near Flat Rock Historic Site	Southwest	1,140 ft.	Residents; Commuters/Travelers	+/-
03 [2/]	Laurel Branch Road, South	Northwest	320 ft.	Commuters/Travelers	+
04	Plank Road, South	Northeast	500 ft.	Commuters/Travelers	-
05	Sneads Store Road, East A	West, Southwest	595 ft.	Commuters/Travelers	-
06	Laurel Branch Road, North	East	450 ft.	Commuters/Travelers	+
07	Sneads Store Road, West	North, Northeast	450 ft.	Commuters/Travelers	+/-
08	Craig Mill Road/VA 637	West	1,050 ft.	Commuters/Travelers	-
09	Plank Road, Central	Southeast	690 ft.	Commuters/Travelers	+/-
10	Sneads Store Road, East B	South	260 ft.	Commuters/Travelers	-
11[3/]	Hilltop Road	North, South	565 ft.	Commuters/Travelers	-
12 [2/]	Oral Oaks Road at Plank Road	East	495 ft.	Residents; Commuters/Travelers	+
13 [2/]	Sneads Store Road	North	490 ft.	Residents; Commuters/Travelers	+/-

1 + Visible; - Not Visible; +/- Partially Visible
2 Indicates a photo simulation was prepared for this KOP
3 No photographs are included from this KOP location

2.6.1 KOP 1– Oral Oaks Road/VA 635/U.S. Bicycle Route 1

This viewpoint faces east and is located along Oral Oaks Road/VA 635. It is representative of the commuter/traveler viewer group having foreground views. The existing landscape is characterized by

fairly flat to gently rolling terrain in the immediate foreground (zero to 0.5 mile) and middleground (0.5 to 3 miles). Background views (beyond 3 miles) are screened by dense mixed woods and a low hillside. While most outward-looking views from VA 635 are limited by dense woods on either side of the road, KOP 1 has open views to the east across an agricultural field covered by coarse dry grass. Oral Oaks Road is a narrow, unstriped road, and an existing overhead utility line follows the roadway corridor to the west. A wire fence with rustic wood fenceposts can be seen in the foreground, and another transmission line is seen in the distance.

This portion of VA 635 is also a designated segment of U.S. Bicycle Route 1, which was established by the American Association of State Highway and Transportation Officials in 1982 (VDOT 2019). Currently, the U.S. Bicycle Route 1 route through Virginia is managed by Virginia Department of Transportation in partnership with local governments and cycling advocates. In addition to low traffic volumes, low posted speeds and access to services, unique natural and cultural scenery is a common feature for route designation (U.S. Task Force on Numbered Bicycle Routes 2006). The existing condition and a photo simulation illustrating with-Project conditions from KOP 1 are included in Appendix A.

Despite the open view seen from the KOP 1 location, where the Project would be briefly visible to passersby, most of the Project along Oral Oaks Road would be screened by evergreen vegetation, as demonstrated by Inset 1, from Google Maps, captured just south of the KOP location along Oral Oaks Road. In addition, the Project will maintain a 50-foot vegetation offset from the roadway intended to allow volunteer vegetation to grow to further screen views of the Project from the roadway.

Inset 1. Image Source: Google Maps

2.6.2 KOP 2 – Plank Road Near Flat Rock Historic Site

This viewpoint faces southwest and is located along the northern Project boundary, off Plank Road/VA 655, west of the intersection with Craig Mill Road. It primarily represents views seen by commuters/travelers. This KOP was selected to consider visual effects in proximity of a listed site on the National Register of Historic Places: Flat Rock (NRHP Ref. Number 79003051), a home constructed in the late eighteenth century (Virginia Department of Historic Resources 2020). However, this analysis does not intend to specifically evaluate impacts to historic or cultural resources, including Flat Rock. Fieldwork conducted for this analysis confirmed that existing dense pine woodlands south of Plank Road screens views of the Project from the historic site.

The landscape surrounding KOP 2 is characterized by undulating topography and a mosaic of open agricultural fields and dark, dense mixed woodlands and hedgerows. Like Oral Oaks Road, Plank Road is a narrow, unstriped roadway, and an overhead utility transmission line parallels the roadway to the south. A small residence and an outbuilding can be seen from KOP 2. The existing condition and a photo simulation illustrating with-Project conditions from KOP 2 are included in Appendix A.

Along Plank Road, the same 50-foot vegetation offset as described for KOP 1 will be applied, allowing for vegetation to grow naturally between the roadway and the Project. As shown by Inset 2, captured near the KOP 2 location, a rise in topography naturally screens views from Plank Road into the field where the panels will be installed, and vegetation will be allowed to establish in the offset beyond the existing slope, further screening views from the roadway.

Inset 2. Image Source: Google Maps

2.6.3 KOP 3 – Laurel Branch Road, South

This viewpoint faces northwest and is located along Laurel Branch Road, in the southern portion of the Project Area. It primarily represents views seen by commuters/travelers with foreground views, although more forest can be seen in the distance.

The landscape surrounding KOP 3 is characterized by flat topography and open pastures, with a backdrop of dense mixed woodlands and cultivated stands of pine trees. Laurel Branch Road is a narrow, unstriped roadway, passing between open fields to the north and south at this location. An existing overhead utility line is partially visible to the north. The existing condition and a photo simulation illustrating with-Project conditions from KOP 3 are included in Appendix A.

No vegetation offset within the Project is proposed at KOP 3, due to existing utilities present next to Laurel Branch Road. However, no residences or visually sensitive resources were identified nearby which would have this view; it would be seen briefly by travelers using the roadway.

2.6.4 KOP 12 – Oral Oaks Road at Plank Road

This viewpoint faces northeast and is located off Plank Road, just east of the intersection with Oral Oaks Road at the western edge of the Project Area. It primarily represents views seen by residents (several residences are clustered nearby) and commuters/travelers of Plank Road.

The landscape surrounding KOP 12 is also characterized by level topography in the foreground and a mosaic of open agricultural fields and dark, dense mixed woodlands on the low hills in the distance. Like other roads in the Project Area, Plank Road is a narrow, unstriped roadway, and an overhead utility transmission line passes within view from this location. A wire fence with round wood posts and some young evergreen trees can be seen paralleling the road to the north. The existing condition and photo simulation illustrating with-Project conditions from KOP 12 are included in Appendix A.

Similarly, to viewing conditions at KOP 1, much of the Project along Plank Road would be screened from view by existing roadside vegetation, and existing young evergreen trees are seen in the KOP photos. In addition, the 50-foot vegetation offset would be applied for the entirety of the Project in this area along Plank Road to allow for natural attenuation for vegetative screening.

2.6.5 KOP 13 – Sneads Store Road

KOP 13 faces north and is located along Sneads Store Road, centrally positioned within the Project Area. It primarily represents views seen by residents with middleground views (two rural residences are located south of Sneads Store Road) and commuters/travelers with foreground views. Like other roads in the Project Area, Sneads Store Road is a narrow, unstriped roadway, and is primarily used for local access.

The landscape shown in KOP 13 is characterized by gently rolling topography in the foreground comprised of an open field and a small pond, and dark, dense mixed woods beyond. A dirt vehicle track and utility pole can be seen to the east. The existing condition and photo simulation illustrating with-Project conditions from KOP 13 are included in Appendix A.

As described for the other KOP locations above, the Project area near KOP 13 would also have the 50-foot vegetation offset applied to allow vegetation to naturally establish between Sneads Store Road

and the Project. Over time, the open views shown in the simulation would be partially to fully screened by vegetation.

3.0 CONCLUSIONS

As illustrated by the photo simulations, the Project would introduce a series of low vertical, geometric elements that are gray in color (e.g., solar panel arrays, fencing) into a rolling terrain landscape dominated by green or golden agricultural fields and large patches of dense trees. The solar arrays would vary in size across the Project Area: from less than 10 acres to more than 80 acres. In most cases, large swathes of mixed forest would surround the arrays, screening many viewing opportunities. However, as represented by the photo simulations, some arrays situated in open fields would be briefly visible to passing motorists (or cyclists, pedestrians) from roadways. Refer to photo simulations created for KOPs 1, 2, 3, 12, and 13 in Appendix A.

Visual impacts would vary depending on several factors, such as the distance of the viewer from the Project, whether the viewer is stationary or in motion, and whether views toward the Project are unobstructed or screened by vegetation, topography, or existing structures. Project views can be very different from one location to another, including in proximity, because of the rolling terrain and dense vegetation. In all cases, the Project would be located 200 feet or more from public roadways, limiting viewing opportunities. In very limited instances where arrays are positioned at a slightly higher elevation than the viewer, such as a driver on a roadway, the panels are seen protruding above the background forest. In such instances, the panels could be perceived as more visually impactful compared to when they are viewed below background vegetation, because the panels would become more dominant in the landscape from such viewpoints.

Public roadways adjacent to the Project would offer the most common opportunities for views. Viewers in proximity to the Project may have brief unobstructed or partially screened views (primarily along Plank, Sneads Store, and Laurel Branch roads). Most panels and fencing would be placed in existing open agricultural fields; however, some patches of forest would be cut and converted to solar arrays. While removal of woodlands would create new viewsheds within the Project Area, this is consistent with the existing practice in this area of cultivated pine forests removed for timber.

Commuters and travelers moving along roadways adjacent to or passing through the Project would have limited intermittent views of arrays. For example, a motorist or cyclist traveling south on Plank Road may briefly see a solar array surrounded by fencing to the south, but the view would quickly pass again to a forested roadside or open pasture. No views of the Project were found from Craig Mill Road/VA 637, the primary north-south route to or from Kenbridge, because of dense forest present between the highway and the Project.

Few residences would have views of the Project because of dense vegetation surrounding most of the arrays. It is anticipated that views of the Project from surrounding communities (e.g., Kenbridge, located more than 2 miles to the northwest) would be screened by vegetation, topography, and existing development.

Tourists and recreationalists would most commonly experience views from the same locations as travelers—from roadways adjacent to and traversing through the Project Area. Cyclists following U.S. Bicycle Route 1 along Oral Oaks Road/VA 635 would observe solar arrays, partially to well-screened by roadside vegetation, to the east near the intersection with Plank Road. Refer to the photo simulation for KOP 1 in Appendix A. From locations along Oral Oaks Road where the Project could be seen, it would present an opportunity for cyclists to view a unique type of working landscape and does not conflict with the stated goals or objectives of the cycling route.

4.0 REFERENCES

U.S. Task Force on Numbered Bicycle Routes. 2006. Corridor and Route Criteria for U.S. Bike Route System. Accessible at: https://www.adventurecycling.org/sites/default/assets/File/USBRS/USBRSCorridorCriteria.pdf. Accessed January 25, 2022.

Virginia Department of Environmental Quality. 2022. Renewable Energy Project Status. Accessible at: https://www.deq.virginia.gov/permits-regulations/permits/renewable-energy/renewable-energy-project-statusewable Energy Project Status | Virginia DEQ. Accessed January 25, 2022.

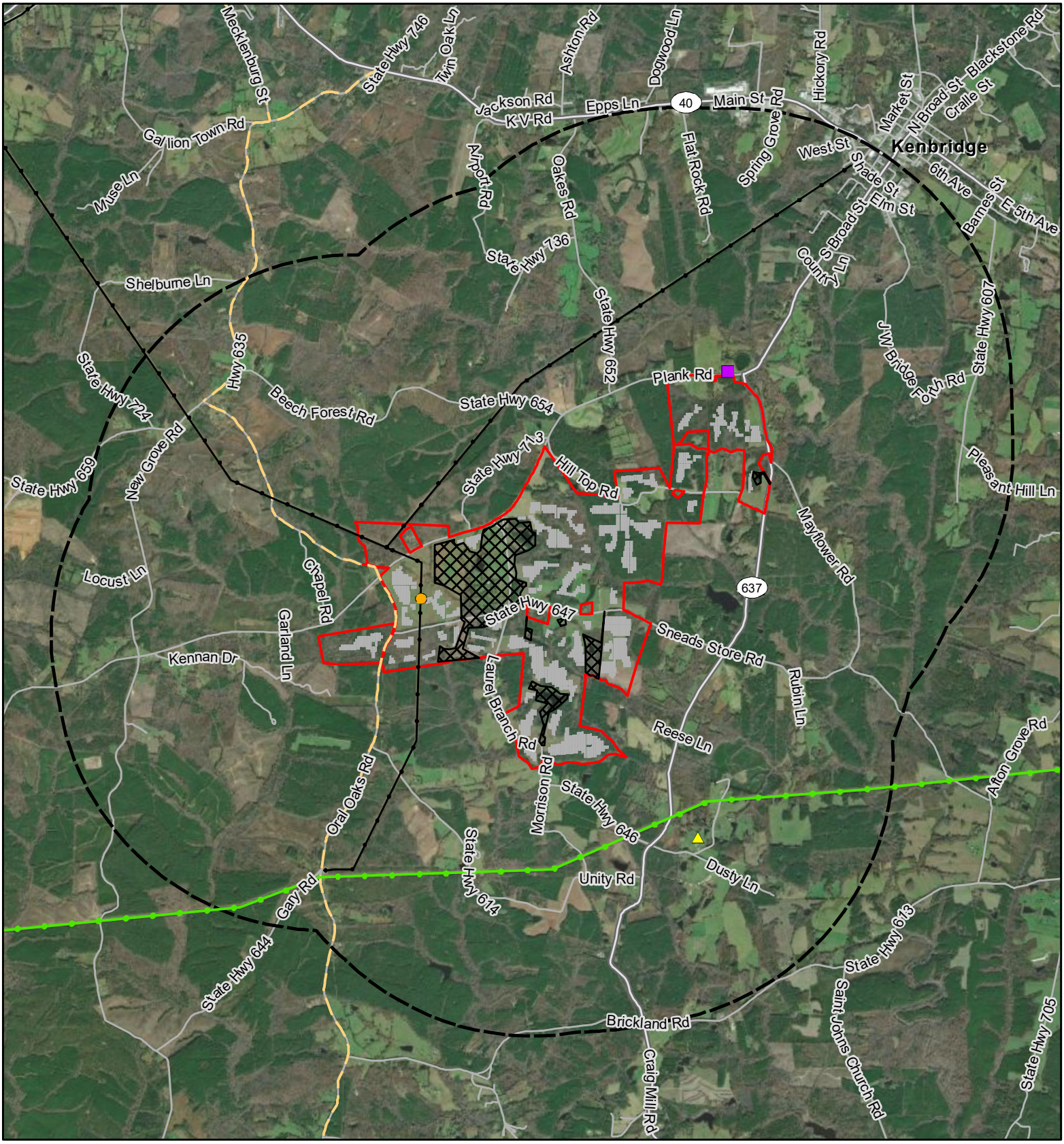
Virginia Department of Historic Resources. 2020. VLR Online and National Register Listings. Accessible at: DHR – Virginia Department of Historic Resources » 055-0003 Flat Rock. Accessed February 3, 2022.

VDOT (Virginia Department of Transportation). 2019. Bicycling and Walking in Virginia. Accessible at: Bicycling and Walking in Virginia – Programs | Virginia Department of Transportation (virginiadot.org). Accessed January 25, 2022.

World Population Review. 2022. Kenbridge, Virginia Population 2022. Accessible at: Kenbridge, Virginia Population 2022 (Demographics, Maps, Graphs) | worldpopulationreview.com. Accessed: February 3, 2022.

FIGURES

Figure 1: Orthoimagery Project Location Map
Figure 2: Topographic Project Location Map
Figure 3: Project Key Observation Point Map



Site Boundary
Anticipated Parcel Carve Out
2-mile Visual Study Area
Solar Arrays
Proposed Substation

Existing Transmission Infrastructure
115 kV Transmission Line
500 kV Transmission Line

Transportation Infrastructure
State Route
State Highway/Local Road

Visual Resources
National Register of Historic Places
Place of Worship
US Bicycle Route

N

0 2,000 4,000
Feet

Source: ESRI/Vivid Imagery (2020), EIA, NRHP

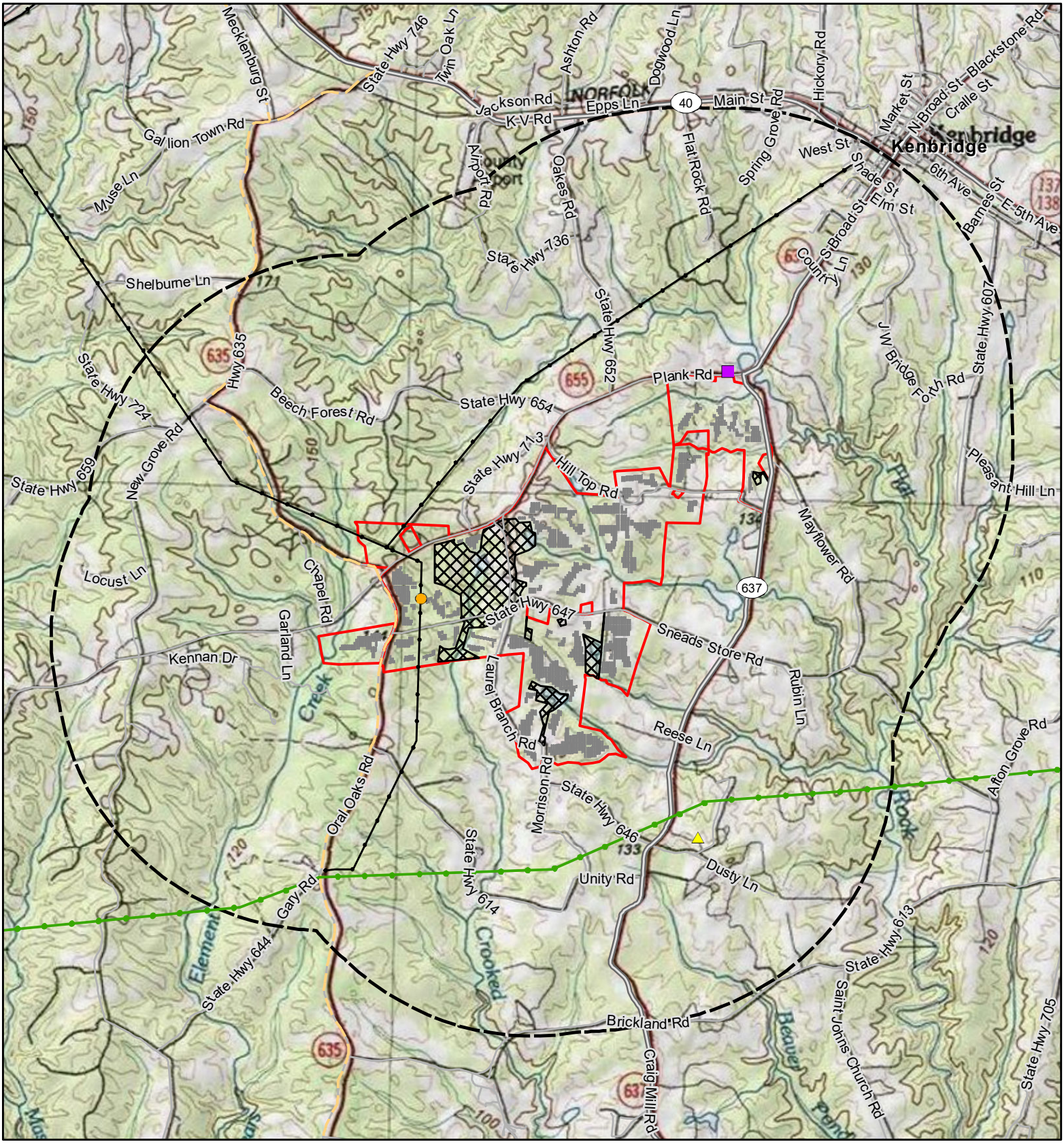
NOT FOR CONSTRUCTION

TETRA TECH

Figure 1
Orthoimagery
Project Location Map

Laurel Branch Solar Project
Lunenburg County, Virginia

R:\PROJECTS\LAUREL_BRANCH_1058-0025\VISUALS\MAPS\LB_Option_A_Figure_1_Location_Aerial.mxd



Source: USGS (2020), EIA, NRHP

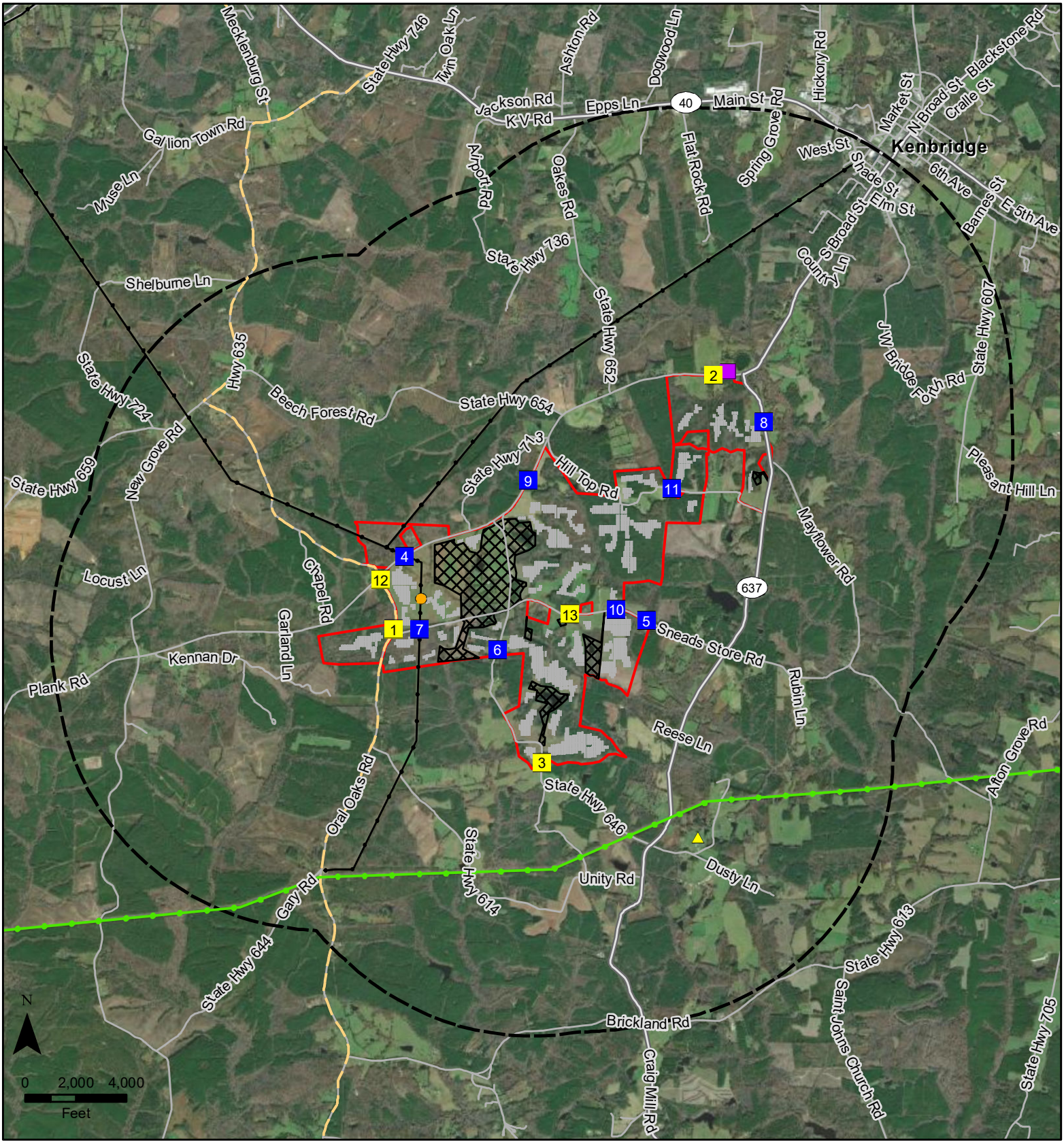
NOT FOR CONSTRUCTION

TETRA TECH

Figure 2
Topographic
Project Location Map

Laurel Branch Solar Project
Lunenburg County, Virginia

R:\PROJECTS\LAUREL_BRANCH_1058-0025\VISUALS\MAPS\LB_Option_A_Figure_2_Location_Topo.mxd



Site Boundary
Anticipated Parcel Carve Out
2-mile Visual Study Area
Solar Arrays
Proposed Substation

Existing Transmission Infrastructure
115 kV Transmission Line
500 kV Transmission Line

Transportation Infrastructure
State Route
State Highway/Local Road

Visual Resources
National Register of Historic Places
Place of Worship
US Bicycle Route

Key Observation Point
Key Observation Point with Photo Simulation

Source: ESRI/Vivid Imagery (2020)

NOT FOR CONSTRUCTION

TETRA TECH

Figure 3
Project Key Observation Point Map

Laurel Branch Solar Project
Lunenburg County, Virginia

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APPENDIX A: PHOTO SIMULATIONS

LAUREL BRANCH SOLAR PROJECT

Lunenburg County, VA

PHOTO SIMULATIONS
Option A

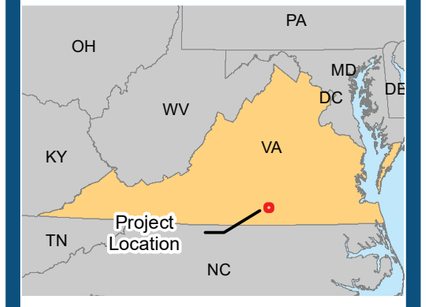
Key Observation Point (KOP) Location Map

Legend

Project Area

Array Area

KOP 0

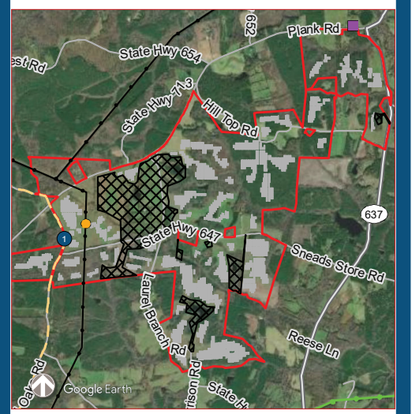


LAUREL BRANCH SOLAR PROJECT

Lunenburg County, VA

PHOTO SIMULATIONS
Option A

Key Observation Point 1
Oral Oaks Road



Photograph Information

Time of photograph:	11:00am
Date of photograph:	1/27/2022
Weather condition:	Clear
Viewing direction:	Northeast
Latitude:	36.912426°
Longtitude:	-78.194235°

Disclaimer: visualizations and plans are for reference only; Not for construction

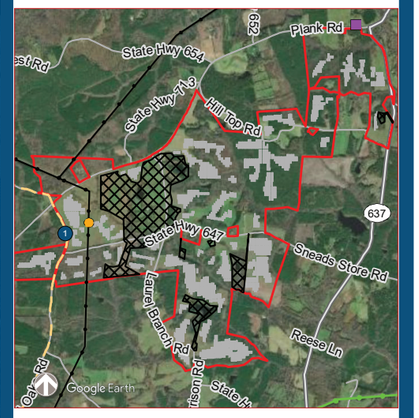
EXISTING CONDITIONS

LAUREL BRANCH SOLAR PROJECT

Lunenburg County, VA

PHOTO SIMULATIONS
Option A

Key Observation Point 1
Oral Oaks Road



Photograph Information

Time of photograph:	11:00am
Date of photograph:	1/27/2022
Weather condition:	Clear
Viewing direction:	Northeast
Latitude:	36.912426°
Longtitude:	-78.194235°

Disclaimer: visualizations and plans are for reference only; Not for construction

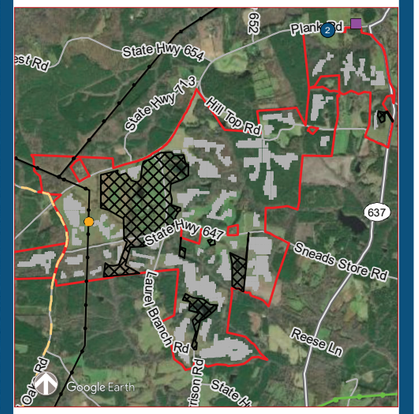
SIMULATED CONDITIONS

LAUREL BRANCH SOLAR PROJECT

Lunenburg County, VA

PHOTO SIMULATIONS
Option A

Key Observation Point 2
Plank Rd



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Weather condition:	Clear
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Longtitude:	-78.153391°

Disclaimer: visualizations and plans are for reference only; Not for construction

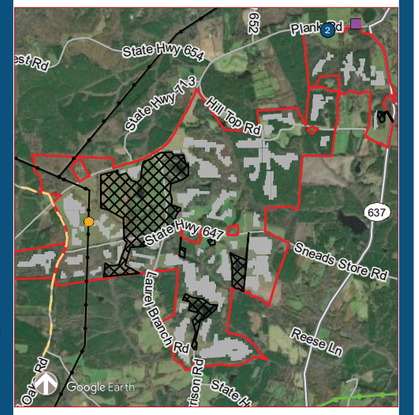
EXISTING CONDITIONS

LAUREL BRANCH SOLAR PROJECT

Lunenburg County, VA

PHOTO SIMULATIONS
Option A

Key Observation Point 2
Plank Rd



SIMULATED CONDITIONS

Photograph Information

Time of photograph:	4:15pm
Date of photograph:	1/27/2022
Weather condition:	Clear
Viewing direction:	Southwest
Latitude:	36.937113°
Longtitude:	-78.153391°

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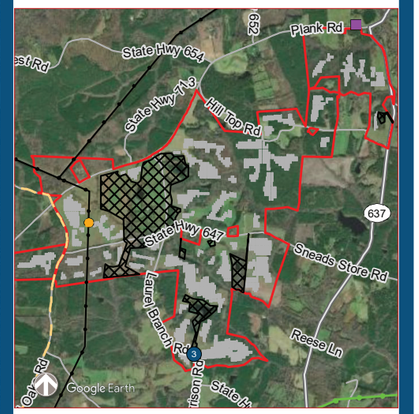
LAUREL BRANCH SOLAR PROJECT

Lunenburg County, VA

PHOTO SIMULATIONS
Option A

Key Observation Point 3
Laurel Branch Rd



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Date of photograph:	1/27/2022
Weather condition:	Clear
Viewing direction:	Northwest
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Longtitude:	-78.175162°

Disclaimer: visualizations and plans are for reference only; Not for construction

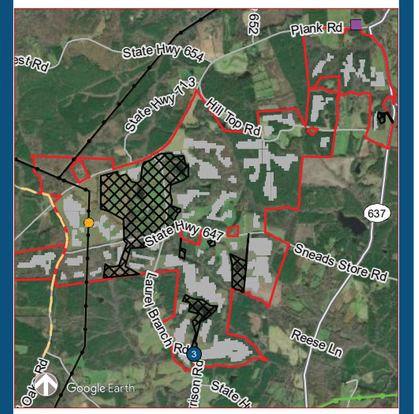
EXISTING CONDITIONS

LAUREL BRANCH SOLAR PROJECT

Lunenburg County, VA

PHOTO SIMULATIONS
Option A

Key Observation Point 3
Laurel Branch Rd



Photograph Information

Time of photograph:	2:30pm
Date of photograph:	1/27/2022
Weather condition:	Clear
Viewing direction:	Northwest
Latitude:	36.897475°
Longtitude:	-78.175162°

Disclaimer: visualizations and plans are for reference only; Not for construction

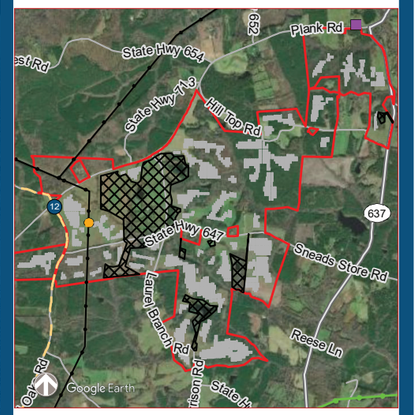
SIMULATED CONDITIONS

LAUREL BRANCH SOLAR PROJECT

Lunenburg County, VA

PHOTO SIMULATIONS
Option A

Key Observation Point 12
Plank Rd & Oral Oaks Rd



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Date of photograph:	1/27/2022
Weather condition:	Clear
Viewing direction:	Northeast
Latitude:	36.915383°
Longtitude:	-78.196065°

Disclaimer: visualizations and plans are for reference only; Not for construction

EXISTING CONDITIONS

LAUREL BRANCH SOLAR PROJECT

Lunenburg

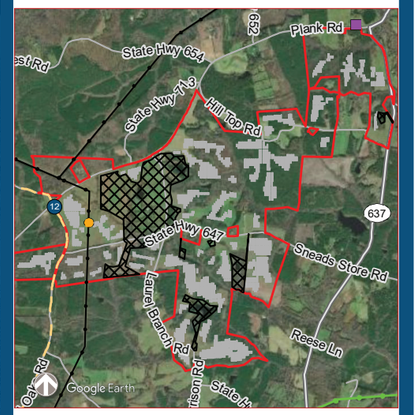
County, VA

PHOTO SIMULATIONS

Option A

Key Observation Point 12

Plank Rd & Oral Oaks Rd



Photograph Information

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Date of photograph:	1/27/2022
Weather condition:	Clear
Viewing direction:	Northeast
Latitude:	36.915383°
Longtitude:	-78.196065°

Disclaimer: visualizations and plans are for reference only; Not for construction

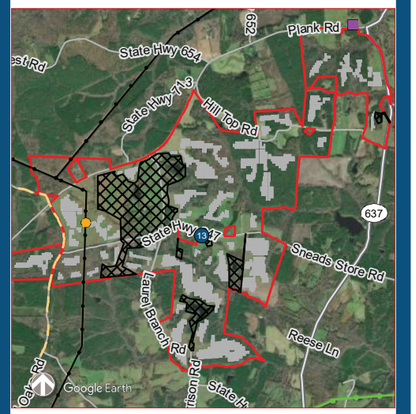
SIMULATED CONDITIONS

LAUREL BRANCH SOLAR PROJECT

Lunenburg County, VA

PHOTO SIMULATIONS
Option A

Key Observation Point 13
Sneads Store Rd



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Date of photograph:	1/27/2022
Weather condition:	Clear
Viewing direction:	North
Latitude:	36.912195°
Longtitude:	-78.173477°

Disclaimer: visualizations and plans are for reference only; Not for construction

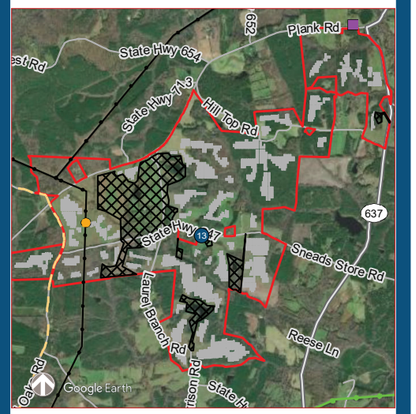
EXISTING CONDITIONS

LAUREL BRANCH SOLAR PROJECT

Lunenburg County, VA

PHOTO SIMULATIONS
Option A

Key Observation Point 13
Sneads Store Rd



Photograph Information

Time of photograph:	3:30pm
Date of photograph:	1/27/2022
Weather condition:	Clear
Viewing direction:	North
Latitude:	36.912195°
Longtitude:	-78.173477°

Disclaimer: visualizations and plans are for reference only; Not for construction

SIMULATED CONDITIONS

APPENDIX B: PROJECT PHOTOLOG

KOP 1: ORAL OAKS ROAD/VA 635/ US BICYCLE ROUTE 1

PHOTO INFORMATION

Date Taken:	1/27/2022
Time:	11:00am
Latitude:	36.9124°
Longitude:	-78.1942°
View Direction:	East

KOP 2: PLANK ROAD NEAR FLAT ROCK HISTORIC SITE

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	4:15pm
Latitude:	36.7051°
Longitude:	-78.0038°
View Direction:	Southwest

KOP 3: LAUREL BRANCH ROAD, SOUTH

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	2:30pm
Latitude:	36.8975°
Longitude:	-78.1752°
View Direction:	Northwest

KOP 4: PLANK ROAD, SOUTH

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	10:45am
Latitude:	36.9177°
Longitude:	-78.193°
View Direction:	Northeast

KOP 5: SNEADS STORE ROAD, EAST A

PHOTO INFORMATION

Date Taken:	01/27/2022
Time:	3:00pm
Latitude:	36.9115°
Longitude:	-78.1665°
View Direction:	West, Southwest