NOTICE IS HEREBY GIVEN THAT
THE SURRY COUNTY BOARD OF SUPERVISORS
WILL HOLD A PUBLIC HEARING ON
THURSDAY, SEPTEMBER 11, 2025 AT 6:00 P.M.
IN THE GENERAL DISTRICT COURTROOM LOCATED AT
THE SURRY COUNTY GOVERNMENT CENTER
45 SCHOOL STREET, SURRY, VIRGINIA
TO CONSIDER AND MAY OR MAY NOT TAKE ACTION ON THE FOLLOWING:

Conditional Use Permit No. 2025-01

The Applicant, Bear Island Battery Storage LLC, seeks a Conditional Use Permit for a Battery Energy Storage System, and Utility Service/Major for an associated switchyard and substation, as permitted by Article III, Section 3-302, Permitted Uses, subsection (C) of the Surry County Zoning Ordinance. The subject property, Tax Map Parcel No. 54-1, is a 416 acre parcel zoned A-R, Agricultural-Rural, located in the Bacon's Castle District on White Marsh Road (SR 617), south of Colonial Trail East (SR 10). The proposed conditional use permit will allow the Applicant to build a 89-megawatt battery energy storage system and utility switchyard on 32.5 acres in the interior of this site. The Comprehensive Plan Map indicates that the project parcel is suitable for Rural Preservation.

Facility Siting Agreement

Pursuant to Virginia Code Section § 15.2-2316.6 et seq., consider the terms and conditions of the siting agreement related to the Bear Island Battery Storage LLC Battery Energy Storage System within 32.5 acres on Surry County Parcel 54-1, whereby the Applicant intends to develop, install, build, and operate an energy storage facility and utility switchyard. In accordance with Va. Code § 15.2-2316.7, the siting agreement includes terms and conditions related to mitigation of energy project impacts and financial compensation to Surry County. At the conclusion of the public hearing, if a majority of a quorum of the members of the Board of Supervisors present at such public hearing approve of such siting agreement, the siting agreement shall be executed by the parties.

The public hearing will be held pursuant to § 15.2-2204 and § 15.2-2316.8 of the Code of Virginia (1950, as amended). A copy of the related material may be reviewed or obtained on the County's website at https://www.surrycountyva.gov/413/Public-Notices, or a copy of the related material may be examined at the Department of Planning and Community Development, Surry County Government Center, 45 School Street, Surry, Virginia. Office hours are Monday through Friday from 9:00 am to 5:00 pm.

All interested persons are invited to participate in the public hearing. If assistance or special accommodations are needed to participate in the hearing, please contact the Department of Planning & Community Development Monday – Friday from 9:00 a.m. to 5:00 p.m. at least 72 hours prior to the hearing.

Melissa Rollins, ICMA
County Administrator
(757) 294-5271

Bear Island Battery Storage LLC

Surry County, Virginia

Conditional Use Permit (CUP) Application

Prepared by Clēnera on behalf of Bear Island Battery Storage LLC

First Submission – Monday May 5th, 2025

Cover Letter

Horace H. Wade III, AICP, CZA
Director of Planning & Community Development
Surry County, Virginia
45 School Street
Surry, Virginia 23883
hwade@surrycountyva.gov

RE: Bear Island Battery Storage – Surry County CUP Application

Dear Mr. Wade,

On behalf of Bear Island Battery Storage ("Bear Island", "The Project"), I am pleased to submit our Conditional Use Permit Application for a Battery Energy Storage Facility ("BESS") located in Surry County. The pages that follow include a narrative description of the proposed facility. You will also find enclosed the following supporting documents.

1. Completed CUP Application
2. Concept Development Plans
3. Traffic & Route Evaluation Study
4. Example Design Specs and Visual Renderings
5. Draft Decommissioning Plan
6. Enivronmental and Cultural Impact Assessment
7. Community Meeting Minutes / FAQ
8. Proposed CUP Conditions
9. Notice of Intent to Negotiate a Siting Agreement

On behalf of Bear Island Battery Storage, thank you for your time and consideration. We look forward to bringing a world-class If you ever have questions or comments, please feel free to contact me.

Sincerely,

Ed Rumler
Director of Development
Project Lead – Bear Island Battery Storage
Ed.rumler@clenera.com
517-292-9476

Table of Contents

Introduction

Bear Island Battery Storage LLC is an 89MWac Battery Energy Storage System ("BESS") – referred to throughout this application as the Project, the Facility, or Bear Island. The Project's goal is to support grid stability and improve system-wide economics by buying energy from the transmission system, storing it for a period, then delivering back to the grid as demand dictates.

The Project is located on approximately 32.5 acres of land inside of a 416-acre parcel (Surry Tax ID 54-1) in the Bacon's Castle voting district. The project is sited on the interior of the parcel, over ½ mile from the nearest public road, and it will be visually isolated from all public rights-of-way and neighboring houses. The primary point of access will be off White Marsh Road.

Description of Applicant

Bear Island Battery Storage LLC is a wholly owned subsidiary of Clēnera, LLC ("Clēnera"), a subsidiary of Enlight Renewable Energy, LTD (NASDAQ: ENLT). Founded in 2013, Clēnera is a developer and independent power producer of solar energy and battery storage facilities, based in Boise, Idaho. Clēnera's current portfolio of operational projects is 470 MWdc PV and 1.2 GWh BESS. An additional 821 MWdc PV and 2 GWh BESS are in construction. In its eleven-year history, in addition to its operating portfolio, Clēnera has had a hand in developing, constructing, or managing an additional 3 GW of solar generation and 1.2 GWh of energy storage. Combined, these projects will deliver enough power to supply over 1 million homes each year.

In 2021, Clēnera was acquired by Enlight Renewable Energy LTD ("Enlight"). Enlight was founded in 2008 and is a global renewable energy developer and independent power producer. Specializing in wind, solar, and battery storage, Enlight develops, designs, constructs, finances, owns, and operates power plants across 10 different countries.

Project Narrative

Request for Conditional Use Permit

Bear Island Battery Storage LLC seeks a Conditional Use Permit from Surry County to build and operate an 89MW Utility Scale Energy Storage facility, as defined in Surry County Code Sec. 4-609, Battery Energy Storage Systems, and new utility switchyard as defined in Sec. 4-607, utility service/major. The proposed project adheres to and relies upon the ordinance requirements and is in substantial accordance with the Surry County Comprehensive Plan.

Project Highlights

Grid-scale Battery Energy Storage System (BESS) are designed to enhance grid reliability, provide critical electrical services to the local and regional power grid, and improve the economic performance of the transmission system.

The facility will consist of modular battery enclosures (often housed in containerized or cabinet-style units, akin to a shipping container), associated power conversion systems (inverters and transformers), electrical switchgear, and a control system. The batteries are typically lithium-ion or a similar commercially available chemistry selected for safety, performance, and lifecycle efficiency. The enclosures are designed with robust fire suppression and thermal management systems, and the facility is remotely monitored by trained operators.

Purpose and Function

The primary purpose of the BESS is to store electricity during periods of low demand or excess generation (such as midday) and discharge it during periods of peak demand or when renewable generation is unavailable (such as in the evening). This capability serves several high-level grid functions:

Grid Stability: The BESS can respond rapidly to grid fluctuations, helping to maintain a stable frequency and voltage.

Energy Arbitrage: The project will store lower-cost electricity and deliver it during higher-cost, high-demand periods, improving economic efficiency of the transmission system.

Renewable Integration: The system supports the broader adoption of solar and wind energy by balancing their variable output and reducing curtailment.

Capacity Support: It can reduce strain on the grid during peak periods, deferring or eliminating the need for new fossil fuel power plants or costly transmission upgrades.

Operational Characteristics

The facility will not generate electricity from fuel combustion or create emissions. It operates quietly and without ongoing water use. Traffic to the site will be minimal once construction is complete, limited primarily to periodic maintenance visits. A secure perimeter fence, vegetative screening, and stormwater controls will be included as part of the project's site design to minimize visual and environmental impacts.

Table 1 below highlights key project information.

BEAR ISLAND BATTERY STORAGE LLC	
Project Type	Battery Energy Storage System Utility Switchyard (utility service/major)
Battery Storage	89MW x 4
Operating Life	20 - 25 years
Est. Construction Timeline	9 – 12 months
Est. Construction Start	12/1/2026
Est. Start of Operations	12/1/2027
Parcel Tax ID	54-1
Current Land Use	Commercial Timber
Total Parcel Acreage (appx)	416
Total CUP Acreage (appx)	32.5

Table 1 – Project Information

Project Timeline

Below is an overview of the Project's estimated timeline after the Surry County Conditional Use Permit.

	2025				2026				2027			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Surry County Conditional Use Permit Granted			X									
Virginia Permit By Rule							X					
Commerical Contracts and Advanced Design								X				
Construction										X		
Start of Operations												X

Table 2 – Project Timeline

Project Concept Development Plan

The Project Concept Plan design set is shown in Exhibit B. Most of the Project's infrastructure is located within the BESS Yard, a roughly 10-acre square surface surrounded by a security fence. Inside the BESS yard will be the battery enclosures (often housed in containerized or cabinet-style units, akin to a shipping container), associated power conversion systems (inverters and transformers), electrical switchgear, and a control system. Access roads surround the infrastructure inside of the fence. Electricity will be routed to/from the transmission system via the Project's substation, which will include a high voltage transformer designed to step up/down the Project voltage to be compatible with the transmission system. The Project substation is an accessory use to the BESS, and it will be decommissioned alongside the project at the end of its useful life.

The Project will interconnect with the transmission system by building a new utility switchyard next to the high voltage transmission line that intersects the parcel. Please note this application is a combined permit application for the battery storage facility and the utility switchyard that will be built for the Project's point of interconnection.

Description of Project Infrastructure

A modular battery enclosure used in a utility-scale Battery Energy Storage System (BESS) is composed of several layers of components, each playing a role in energy storage, safety, and control:

Battery Cells: The basic unit of storage, each cell stores a small amount of energy and operates at a low voltage. Cells are designed to be compact, energy-dense, and thermally stable.

Battery Modules: Dozens of individual cells are assembled into a battery module, which includes internal wiring, mechanical housing, and basic sensors for temperature and voltage monitoring.

Battery Racks: Multiple modules are then mounted into vertical racks. Each rack includes busbars for electrical interconnection, rack-level fusing, and additional sensors for thermal and electrical performance.

Battery Enclosure or Container*:* Racks are housed in weatherproof, climate-controlled enclosures (often similar in appearance to shipping containers). Enclosures include HVAC systems, battery management systems (see below), and physical access controls.

Battery Management System ("BMS") is used to monitor the system's temperature, cell voltage, and other parameters necessary to detect early fault conditions. The BMS initiates immediate shut down of strings when monitored values exceed limits. Fans and/or air conditioning equipment are used to maintain the manufacturer's required container temperature. Smoke and flammable gas detectors monitor the system and can force system shut down alongside the BMS.

Exhibit A – Concept Plan includes a design set for the proposed BESS, and design specs for typical

infrastructure. Exhibit C includes design drawings and visual renderings of the assumed equipment used for the concept plans, along with typical signage used for a storage project.

Please note, the project has not chosen an equipment supplier at the time of this application, and we are unlikely to do so prior to CUP issuance. As such, the site design may be altered during advance design and equipment selection. The County's final site plan approval is required before the project can begin construction, which will ensure any changes are fully compliant with the County's ordinance and safety standards in the Emergency Response Plan (see below).

Clenera's Atrisco Battery Storage Project

Project Substation **–** The aggregate output of the facility is collected at the Project Substation, which consists of parallel sets of internal power distribution systems (i.e., 34.5kV busses and circuit breakers, disconnect switches, and step-up transformer) designed to "step up" and "step down" the voltage of the Facility to match the voltage of the transmission line (230kV). Electricity that leaves the Project Substation flows through a Utility Switchyard and onto the grid. Electricity used to charge the battery system takes the opposite route. The final design of the project substation will be determined in consultation with Dominion Energy, the owner of the transmission line, and PJM, the system operator.

Utility Switchyard **–** A new utility substation will be built to "tap" the transmission line. This facility will be within the Project boundary, but it will be designed, built, owned, and operated by Dominion Energy. Once built, it will be considered part of the transmission system.

Roads and Project Access Points - The Project will be accessed from White Marsh Road, as further described under Transportation and Traffic Control and shown in Exhibit B – Traffic & Route Evaluation Study. Inside of the parcel limits, the Project will utilize existing logging roads. Some improvement of those roads may be required to provide for heavy vehicle deliveries and to accommodate first responders as part of the final Emergency Response Plan.

Safety and Emergency Response

Safe design and operation of the Project is our top priority, and we are committed to close coordination with County Fire and Rescue Resources prior to the start of construction. Representatives of the Project have engaged in preliminary discussions with County first responders on multiple occasions prior to submitting this permit application.

As required in the County ordinance Section 4-609.D, the Project will complete an Emergency Response Plan in coordination with the Surry County Chief of Emergency Management and/or the Fire Marshal. As further required by Section 4-609.C.1 and C.3, the system will be designed to comply with the most recent national safety standards including the International Fire Code, The Virginia Statewide Fire Code, and NFPA 855.

This application includes several proposed permit conditions that are in direct response to feedback from Surry County's Chief of Emergency Management. Those conditions can be found attached to this application under Condition 6 – Operations.

Transportation and Route Evaluation Study

See Exhibit B for the Traffic and Route Evaluation Study.

The main access point into the Project will be located off White Marsh Road, approximately 2.25 miles south of the intersection of Route 10 and Route 617. Potential Haul Routes from the north and south of the entrance are highlighted in Exhibit 1.

Traffic for a BESS Project is limited. The total number of heavy vehicle haul routes is expected to be between 100 - 150 trips total. Most of the the heavy vehicle deliveries will occur over a 1-to-2-month period during construction. On average, less than 3 heavy vehicle trips are expected per day during this period, which is less than 2.5% of the Vehicles Per Day traffic currently utilizing the most constrained roadways used for the project (see Figure 3 of Exhibit B).

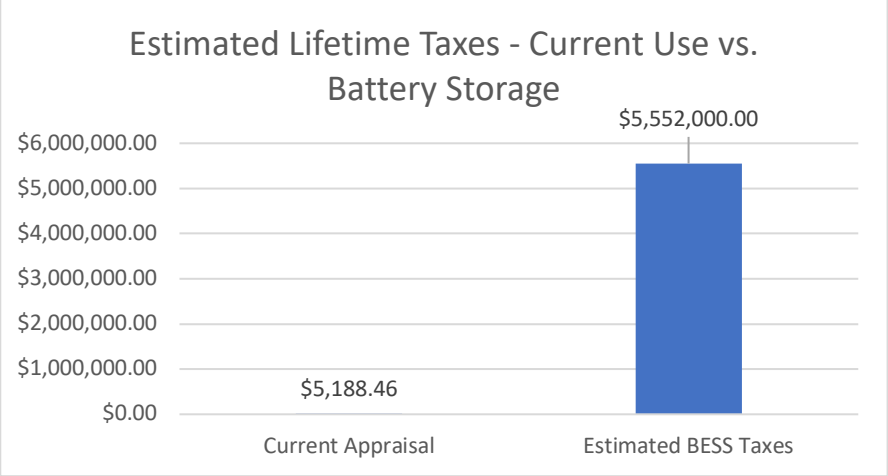
According to the Traffic Study, the existing roads have available capacity to handle the construction traffic, with no expected improvements necessary to accommodate the project.

As required by Surry Ordinance 4-609.E, prior to start of construction, Bear Island will complete a Traffic Management Plan prior to start of construction and coordinate with Surry County and VDOT to determine any necessary transportation management procedures or temporary control measures, to ensure the limited traffic is as minimally disruptive as possible to neighbors and County residents.

Tax Revenue and Siting Agreement

Additional Tax Revenue

The direct fiscal benefit of the Project is expected to generate roughly over $5.5 million in additional revenue from higher real property value assessments, and machine and tool taxes on capital investment in the project. That's over 100x the current taxes that would be paid over 20 years based on the most recent property tax assessment of the property.



County Revenue from Battery Storage vs. Existing Use

Siting Agreement

Virginia Law provides Counties the opportunity to negotiate Siting Agreements with energy storage projects, whereby Counties may negotiate additional voluntary payments to help with local projects. In other Counties, siting agreements have been used to pay for things such as new fire stations and trucks, EMS facilities, public recreation facilities, community centers, and even direct tax rebates to County residents.

Attachment 3 to this application is a formal request to negotiate a siting agreement with the County. We look forward to further discussions about economic development throughout the siting agreement process.

Community Meeting

As required by Section 4-609.B of the County Code, Representatives of Bear Island Battery Storage held a Community Meeting on Wednesday May 30th, 2025 at the Surry County Parks and Recreation Center. Information about the project and pending application was provided on posterboards stationed around the room in a "town hall" format. Roughly 30 individuals attended. A summary of some of the frequently asked questions and comments from community has been provided as an Exhibit to the Permit Application.

Attachments and Exhibits

ATTACHMENT 1 – SIGNED CUP APPLICATION FORM

ATTACHMENT 2 – PROPOSED CUP CONDITIONS

ATTACHMENT 3 – NOTICE OF INTENT TO NEGOTIATE SITING AGREEMENT

EXHIBIT A – CONCEPT PLAN AND PARCEL MAPS

EXHIBIT B – TRAFFIC & ROUTE EVALUATION STUDY

EXHIBIT C – EXAMPLE DRAWINGS AND VISUAL REFERENCE

EXHIBIT D – DECOMMISSIONING PLAN

EXHIBIT E – ENVIRONMENTAL & CULTURAL IMPACT ASSESSMENT

EXHIBIT F – COMMUNITY MEETING MINUTES / FAQ

DEPARTMENT OF PLANNING

P. O. Box 357 - 45 School Street - Surry, VA 23883
(757) 294-5210

REQUEST FOR:

_____Administrative Appeal ($300)	_____Rezoning (Conditional) ($1,000)
_____BHAR Application ($200)	_____Site Plan Review ($300 + $10 acre)
_____Comp. Plan Amendment ($500)	_____Special Exception ($300)
__X__Conditional Use (Res./Ag.) ($350)	_____Variance (including Admin) ($300)
_____Conditional Use (Comm.) ($500)	_____Wetlands Permit ($300)
_____Conditional Use (Ind.) ($1,000)	_____Zoning Text Amendment ($500)
_____Rezoning ($500)	

DATE 4/4/2025 APPLICATION NUMBER_____

APPLICANT Bear Island Battery Storage LLC PHONE 517-292-9476

ADDRESS c/o Clenera, LLC, 999 W Main St., Suite 800, Boise, ID 83702

EMAIL ed.rumler@clenera.com

OWNER (IF DIFFERENT THAN APPLICANT): White Marsh Environmental, LLC

ADDRESS PO Box 727, Colonial Heights, VA 23834

ADDRESS AND LOCATION OF

SUBJECT PROPERTY White Marsh Rd.

Magisterial District 02 Tax Map _____ Parcel 54-1

LOCATION see attached site plan

APPLICATION IS HEREBY BEING MADE FOR THE PREMISES DESIGNATED AS:

Current zoning: A-R Proposed zoning: A-R

REASON FOR APPLICATION: Conditional Use Permit for Battery Energy Storage System and Utility Service/Major.

OWNER'S SIGNATURE

see attached signature page

APPLICANT'S SIGNATURE

ATTACH SUPPORTING MATERIAL SUCH AS SITE PLAN, TOPOGRAPHIC, DRAINAGE, UTILITY EASEMENT, OR BUILDING ELEVATION MAPS.

ADJACENT PROPERTY OWNERS

NAME	MAILING ADDRESS
See scehdule attached to site plan	

APPLICANT:

Bear Island Battery Storage LLC,
a Delaware limited liability company
By: CRE-Bear Island ESS Virginia LLC, its Sole Member
By: Clenera DevCo, LLC, its Sole Member
By: Clenera Holdings, LLC, its Sole Member

By: Signed by: Tom Fitzgerald E56FCE6158814BA...
Name: Tom Fitzgerald
Title: VP of Development

BEAR ISLAND BATTERY ENERGY STORAGE SYSTEM

BEAR ISLAND ENERGY STORAGE LLC

CONDITIONAL USE PERMIT CONDITIONS

Conditional Use Permit No. 2025-01

Approved _____

A Conditional Use Permit ("CUP") has been granted to Bear Island Energy Storage LLC (the "Applicant") to construct, operate, and decommission a Battery Energy Storage System ("BESS") and associated switchyard and substation (the "Project") pursuant to the Surry County Zoning Ordinance (the "Ordinance"). The following CUP conditions (the "Conditions") shall apply to the Project. To the extent the Conditions are inconsistent with or more specific than the Ordinance, the Conditions shall control. All terms and phrases used but not defined in the Conditions shall have the meanings ascribed to them in the Ordinance. The CUP, including approved plans and the Conditions, shall run with the land and shall not be affected by a change in ownership of the Applicant or the Project or any portion thereof, nor by any change in the Ordinance.

List of Included Exhibits:
Exhibit 1 – Conceptual Site Plan

Conditions

1. The Applicant shall develop, construct, operate, and maintain the project site in substantial conformance with the conceptual plans titled "Bear Island BESS ", prepared by Timmons Group, dated March 28, 2025, ("the "Conceptual Site Plan") and these Conditions. The Conceptual Site Plan is based upon current technology. Applicant will have the flexibility to adjust the design of the Project within the Project Limits as depicted on the Conceptual Site plan, subject to applicable ordinance regulations and these conditions at the time of final site plan approval ("Final Site Plan") based on final selected technology and associated spacing and design requirements.

2. Landscaping and Buffering. The landscaping and buffering applicable to the Project and the Property shall generally conform to that depicted in the Conceptual Site Plan attached hereto, as approved by the Zoning Administrator at Final Site Plan approval. If, prior to Final Site Plan approval, expansion of the landscaping and buffer on the north side of the Project Limits are necessary to be in compliance with the noise standards contained in Section 4-609 (C)(9) of the Ordinance, the Zoning Administrator shall have the authority to require those modifications in accordance with Section 4-609(C)(9)(ii).

3. Standards for Design and Operation. The BESS will be designed and operated in compliance with the most recent National Fire Protection Association (NFPA) 855 (Battery Energy Storage Systems) regulations in effect at the time of Final Site Plan approval. In the event of any conflict between NFPA 855 and the Virginia Uniform Statewide Building

Code, NFPA 855 shall control. The BESS will be equipped with a Battery Management system providing for automatic fire detection and prevention.

4. Construction

a. Public Liaison. The Applicant shall designate a person to act as a point of contact between citizens and construction crews. The contact information for the point of contact shall be posted at each construction access and provided to the Zoning Administrator.

b. Construction Hours. All land clearing and grading activities shall be limited to the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday and 7:00 a.m. to 5:00 p.m. on Saturday. All deliveries to the site shall be conducted between 8:30 a.m. and 3:30 p.m. If construction or deliveries are substantially delayed by circumstances beyond the control of the Applicant, the Zoning Administrator may allow the Applicant to conduct these activities on Sundays or modify delivery hours, subject to the approval of the Zoning Administrator.

c. Installation of Erosion and Sediment Control Measures. Erosion and Sediment Control ("ESC") measures shall be installed as a first step in any land-disturbing activity area and shall be made functional before upslope land disturbance takes place.

d. Local Contractor and Employee Recruitment. After Final Site Plan approval but before the start of construction, the Applicant shall host a local recruiting event marketed to local contractors and individuals in the Surry County community. The Applicant will coordinate with the Surry County Department of Economic Development in planning an executing this event.

e. Compliance with Transportation and Traffic Control Plan, Penalties. As required by Sec. 4-609(E) (iii), during the site plan approval process the Applicant shall submit a Transportation and Traffic Control Plan designating routes for deliveries or equipment and materials on secondary roads to the Property (the "Delivery Routes"). During construction of the Project, penalties for material non-compliance with the Delivery Routes detailed shall be as follows:

i. First violation: A written warning shall be issued to the Applicant.

ii. Second violation: A monetary penalty of $1,000.00 shall be imposed.

iii. Third violation: A monetary penalty of $1,500.00 shall be imposed.

iv. Subsequent violations: For each subsequent violation, a monetary penalty of $2,000.00 shall be imposed.

5. Information about Erosion and Sediment Control and Stormwater Management. The final design for erosion and sediment control shall be prepared in accordance with the Virginia Erosion and Sediment Control Handbook and reflected in the Site Plan. Stormwater

management designs shall be approved by DEQ, with the approved designs reflected in the Final Site Plan. For informational purposes, the Applicant shall submit DEQ's approval of the Project's stormwater management plans with the Final Site Plan. The final plans for erosion and sediment control for the Project shall comply with the Chesapeake Bay Preservation Act.

6. Operation

a. County Access. The Applicant shall allow Surry County (the "County) access to the Project at any time for inspection purposes, with twenty-four (24) hours advance notice to the Applicant and adherence to site safety procedures. Access to the Project by the County shall be immediate in the event of a risk to health and life safety or in the event of a malfunction of the BESS. Access to the Project shall be controlled by a "Knox Box" to which Surry County Emergency Services (as defined below) shall have access. EAs necessary, Surry County Office of Emergency Services and the Fire Marshall's Office (collectively "Surry County Emergency Services") may conduct familiarization tours of the Project to ensure all necessary County staff are informed on the appropriate emergency response procedures and general layout and operation of the Project. These tours will be scheduled to coincide with training sessions as provided by Section 6(b) below and shall not exceed twice per year in frequency, except as Applicant may agree. Applicant shall post emergency contact information on the Project gate.

b. Emergency Services Training. In order to implement the Emergency Response Plan required in section 4-609(D) of the Ordinance, prior to the start of operations, the Applicant shall provide materials, education and on-site training regarding safe responses to potential on-site emergencies to emergency services personnel in coordination with Surry County Emergency Services. The content and scope of this training shall be determined through coordination between the Applicant and Surry County Emergency Services prior to conducting the training events and correspond to the Emergency Response Plan submitted prior to Final Site Plan approval. The Applicant shall provide refresher training upon request of Surry County Emergency Services, up to once per calendar year. Additional training shall be provided on an as-needed basis for newly hired Surry County Emergency Services employees at the request of Surry County Emergency Services, up to once per calendar year. Emergency responders will be provided with a list of hazardous substances on site, and this list will be updated periodically to address any change of condition on site.

c. Reimbursement for County Emergency Response Costs: In the event of an emergency event at the Project, Applicant agrees to reimburse the County for overtime wages incurred by Surry County Emergency Services responding to the emergency event at the Project.

d. Testing and Remediation. Stormwater management design at the site shall consider the capability of retaining water associated with a firefighting event at the Project. In the event of a fire at the Project that results in retained firefighting water, the

Applicant shall test the retained surface water for any hazardous chemicals and provide for its disposal as required by state and federal law.

e. Water Access. The Project shall have water accessible at or nearby to the site in a form and volume as deemed acceptable to the County and Surry County Emergency Services. Forms of water may include an on-site well, on-site well and associated water tank, or off-site well and water tank. The specific details on the provision of water will be influenced based on well production and availability of offsite resources. Any water tank should be made accessible to Surry County Emergency Services for fire response throughout the surrounding area.

f. Access Road and Access Road Maintenance. The road into the Project (the "Access Road") shall be a minimum of twenty (20) feet in width, subject to final design and loading requirements being approved by Surry County Emergency Services.

7. Decommissioning.

a. Implementation of Decommissioning Plan. When the requirement to decommission the BESS is triggered, the Applicant shall implement the most recent version of the Decommissioning Plan. If the County determines it is necessary, the Decommissioning Plan shall be updated prior to implementation. The Decommissioning obligation shall not apply to the Project's switchyard, which is part of the regional electric grid.

b. Timely Decommissioning: If the Applicant fails to timely decommission the BESS within twelve (12) months from the cessation of use of the BESS, the County shall have the right, but not the obligation, to commence decommissioning activities and shall have access to the property, access to the full amount of the decommissioning security, and the right to dispose of the equipment and materials on the property, without incurring any financial liability to the owner of the BESS or the property owner, and the County shall use reasonable efforts to secure salvage value (if any) for the property disposed of. Following the completion of decommissioning the BESS arising out of a default by the Applicant, any remaining Decommissioning Surety held by the County shall be released by the County to the designated beneficiary as identified in the Decommissioning Surety. Upon completion of decommissioning and approval by the County, the County shall sign documentation releasing the decommissioning security.

8. Administrative

a. Building Permit Deadline. The deadline for obtaining building permits for the Project is five (5) years after the date of approval of the CUP unless extended by written agreement between the County and the Applicant.

b. Stop Work Orders. During construction of the Project, any situation that either has caused or may cause immediate harm to life or significant damage to property may result in an order that the Applicant pause construction ("Stop Work Order"). Stop

Work Orders may be issued 72 hours after delivery of a written notice of violation ("Pending Stop Work Order Notice") by the Zoning Administrator to the Applicant by email or written notice. Upon issuance of a Stop Work Order or Pending Stop Work Order Notice, the Applicant shall meet and/or communicate with the County and determine a process for resolving the situation. Commencement of the remedial process or agreement on a plan for such remediation to the County's satisfaction shall deem the Pending Stop Work Order Notice or the Stop Work Order, as applicable, to have been withdrawn.

c. Violations, Notice and Remediation. Any material violation of these Conditions or the Ordinance that continues for more than 60 days after the date a written notice of violation ("NOV") is delivered by certified mail, return receipt requested, to the Applicant's designated point of contact as provided in writing to the Zoning Administrator, may result in the initiation of proceedings by the County to revoke the CUP. No such proceeding may be initiated, however, as long as the Applicant has submitted in writing to the Zoning Administrator a plan to remediate the issues raised by the NOV. The NOV may result in revocation of this CUP only if the Applicant has failed to submit in writing a plan to address the violations cited in the NOV within the 60 days following Applicant's receipt of the NOV.

    i. Upon a violation by the Applicant in their decommissioning obligations, the County may enter the site in accordance with Code of Virginia Section §15.2-2241.2. Nothing herein shall limit other rights or remedies that may be available to the County to enforce the obligations of the Applicant, including under the County's zoning powers.

9. Binding Effect. These Conditions are binding on the Applicant and any successors and assigns of the Project, or any component thereof.

10. Effect of Conditions. To the extent these Conditions are inconsistent with or more specific than the Ordinance, the Conditions shall control.

Exhibits follow on subsequent pages

800 W Main St, Suite 900
Boise, ID 83702
USA
208-639-3232

May 5th, 2025

Horace H. Wade III, AICP, CZA
Director of Planning & Community Development
Surry County, Virginia
45 School Street
Surry, Virginia 23883
hwade@surrycountyva.gov

Re: **Notice of Intent to Locate Battery Energy Storage Facility**

Dear Mr. Wade:

Pursuant to Virginia Code § 15.2-2316.7, Bear Island Battery Storage, LLC ("Applicant") submits this letter, in conjunction with the Conditional Use Permit application submitted to via email on May 5th, 2025, as its written notice of intent to locate a battery energy storage project (the "Project") in Surry County, Virginia ("Locality"). Applicant further requests the opportunity to meet, discuss, and negotiate a mutually beneficial siting agreement with the Locality.

Please acknowledge receipt of this letter and provide availability for a meeting by contacting:

Attn: Ed Rumler
Phone: (517) 292-9476
Email: ed.rumler@clenera.com

Bear Island Battery Storage, LLC

We look forward to working with you.

Sincerely,

Ed Rumler
Director of Development
Blackwater Solar LLC

BEAR ISLAND BESS

75 MWac x 4 Hour BATTERY ENERGY STORAGE FACILITY
CONDITIONAL USE PERMIT

SURRY COUNTY, VIRGINIA

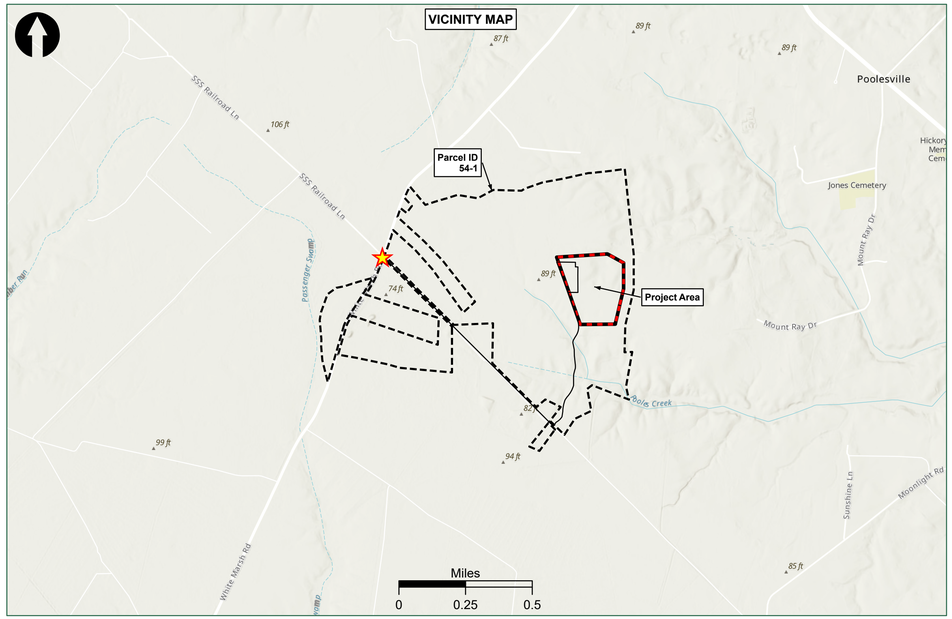


TABLE OF CONTENTS	
SHEET	**DESCRIPTION**
C1.0	COVER SHEET
C2.0	PARCEL AND ZONING MAP
C2.1	PARCEL INFORMATION SHEET
C3.0	PRELIMINARY SITE PLAN
C4.0	PRELIMINARY LANDSCAPING MAP
C4.1	LANDSCAPING NOTES AND DETAILS

CLENERA

DEVELOPER

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TIMMONS GROUP

ENGINEER

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CONCEPTUAL SITE PLANS PREPARED BY TIMMONS GROUP

MARCH 28, 2025

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PROJECT NAME & LOCATION
BEAR ISLAND BESS
SURRY COUNTY, VIRGINIA

DATE 02/28/2025
PROJECT NUMBER 43880.008
PROJECT NAME BEAR ISLAND BESS
DESIGNED BY / DRAWN BY M. HILL

REVISIONS

#	MM/DD/YY	DESCRIPTION

DRAWING DESCRIPTION
COVER SHEET

PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE	SHEET NUMBER
	C1.0

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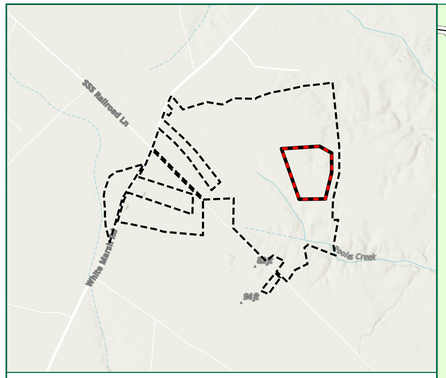

Legend

- Project Limits - 32.5 Acres
- Project Parcel
- Surry County Tax Parcels

Zoning Classification

- A-R: Agricultural-Rural District
- M-1: General Industrial District

NOTES:

1. PARCEL AND ZONING INFORMATION FROM SURRY COUNTY GIS.

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PARCEL AND ZONING MAP

SCALE (FEET)
0 500 1,000
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SCALE	SHEET NUMBER
H: 1" = 500'	C2.0

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PARTICIPATING SURRY COUNTY TAX PARCELS					
MAP IDENTIFIER	**PARCEL IDENTIFIER**	**OWNER**	**ADDRESS**	**CITY, STATE**	**ZIP CODE**
1	54-1	WHITE MARSH ENVIRONMENTAL, LLC	P O BOX 727	COLONIAL HEIGHTS, VA	23834
ADJACENT SURRY COUNTY TAX PARCELS					
MAP IDENTIFIER	**PARCEL IDENTIFIER**	**OWNER**	**ADDRESS**	**CITY, STATE**	**ZIP CODE**
2	42-53	HOGGE ROGER L	4889 CEDAR BUSH ROAD	HAYES, VA	23072
3	42-57	DOGGETT EVERETT H JR	1262 MOONLIGHT ROAD	SMITHFIELD, VA	23430
4	42-58	HEATON DOUGLAS W	17 RUGBY ROAD	NEWPORT NEWS, VA	23606
5	42-59	HUNDLEY JUSTIN R & KIMBERLY N	10253 WRENNS MILL ROAD	SMITHFIELD, VA	23430
6	42-59A	VAUGHAN PEGGIE A	15220 WHITE MARSH RD	SURRY, VA	23883
7	42-60	DOGGETT EVERETT H JR	1262 MOONLIGHT ROAD	SMITHFIELD, VA	23430
8	42-60C	DOGGETT EVERETT H JR	1262 MOONLIGHT ROAD	SMITHFIELD, VA	23430
9	43-26	PETTISS JERRY & JARRID	391 HILLSIDE LANE	SURRY, VA	23883
10	43-35	SLADE CLIFTON A	1111 MOUNT RAY DRIVE	SURRY, VA	23883
11	53-1	HANCOCK TIMBERLAND XII INC	13950 BALLANTYNE CORP PLACE	CHARLOTTE, NC	28277
12	53-10	WHITE MARSH ENVIRONMENTAL, LLC	P O BOX 727	COLONIAL HEIGHTS, VA	23834
13	53-11	WHITE MARSH ENVIRONMENTAL, LLC	P O BOX 727	COLONIAL HEIGHTS, VA	23834
14	53-12	WHITE MARSH ENVIRONMENTAL, LLC	P O BOX 727	COLONIAL HEIGHTS, VA	23834
15	53-14	WHITE MARSH ENVIRONMENTAL, LLC	P O BOX 727	COLONIAL HEIGHTS, VA	23834
16	53-7	WHITE MARSH ENVIRONMENTAL, LLC	P O BOX 727	COLONIAL HEIGHTS, VA	23834
17	53-8	PIERCE THELMA O & SHAWN L	4282 HATTON POINT LANE	PORTSMOUTH, VA	23703
18	53-9	WHITE MARSH ENVIRONMENTAL, LLC	P O BOX 727	COLONIAL HEIGHTS, VA	23834
19	54-2	WHITE MARSH ENVIRONMENTAL, LLC	P O BOX 727	COLONIAL HEIGHTS, VA	23834
20	54-3	WHITE MARSH ENVIRONMENTAL, LLC	P O BOX 727	COLONIAL HEIGHTS, VA	23834
21	54-40	SLADE CLIFTON A	1111 MOUNT RAY ROAD	SURRY, VA	23883

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PARCEL INFORMATION SHEET

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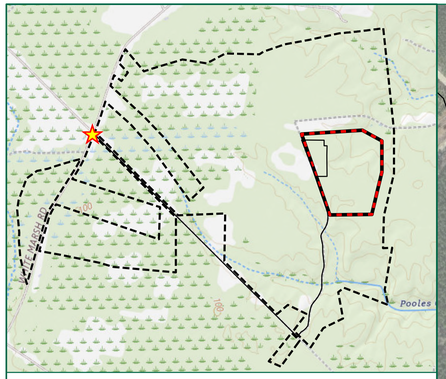
SHEET NUMBER C2.1



Legend

- Overall Project Parcel
- Project Limits - 32.5 Acres
- Property Setbacks - 200'
- Entrance
- Access Road
- Internal BESS Road
- Fence - 9.3 Acres
- Battery Container
- Power Conversion System
- Substation
- Switchyard
- 20' Minimum Fire Protection Buffer (Gravel or Concrete)
- Existing Culvert
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Delineated Wetlands
- Preliminary Perennial Stream Buffer - 100'
- Surry County Resource Protection Areas (RPA)
- Existing Dwellings
- Existing Dwelling Buffer - 500'

NOTES:

1. SITE LAYOUT FOR DESIGN PURPOSES ONLY. NOT FOR CONSTRUCTION. SITE LAYOUT SUBJECT TO CHANGE.
2. SETBACKS ARE FROM SURRY COUNTY DRAFT BESS ORDINANCE.
3. SETBACKS ARE 200' FROM ALL PROPERTY LINES AND 500' FROM ALL RESIDENTIAL AND COMMERCIAL STRUCTURES.
4. WETLANDS AND STREAMS ONSITE HAVE BEEN DELINEATED.
5. FLOOD ZONE DATA FROM FEMA'S NATIONAL FLOOD HAZARD LAYER.
6. TOPOGRAPHY GENERATED FROM USGS LiDAR.
7. RESOURCE PROTECTION AREAS FROM SURRY COUNTY GIS.
8. BATTERY CELLS SHALL BE PLACED IN A BATTERY ENERGY STORAGE SYSTEM OR SIMILAR MODULAR ASSEMBLY WITH A BATTERY MANAGEMENT SYSTEM THAT SHALL PROVIDE A SECONDARY LAYER OF PHYSICAL CONTAINMENT TO THE BATTERIES AND BE EQUIPPED WITH COOLING, VENTILATION, AND FIRE SAFETY SYSTEMS.
9. BESS SHALL BE ENCLOSED BY A SECURITY FENCE AT LEAST 8' IN HEIGHT OF OTHER GREATER HEIGHT AS REQUIRED BY APPLICABLE CODES OR DESIGN REQUIREMENTS OF THE OPERATING ENTITY.
10. BESS SHALL NOT EXCEED A HEIGHT OF 30', EXCEPT FOR STRUCTURES ASSOCIATED WITH INTERCONNECTION TO THE ELECTRICAL GRID.
11. AERIAL IMAGERY FROM VGIN.

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PRELIMINARY SITE PLAN

SCALE (FEET)
0 300 600
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SCALE H: 1" = 300'
SHEET NUMBER C3.0

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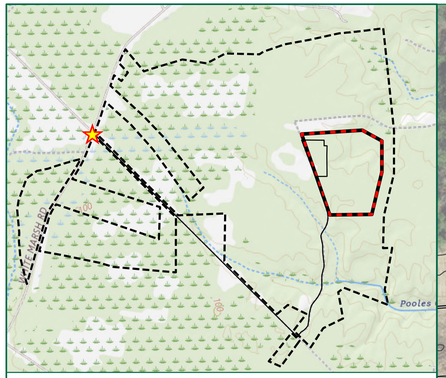

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- Property Setbacks - 200'
- Entrance
- Access Road
- Internal BESS Road
- Fence - 9.3 Acres
- Battery Container
- Power Conversion System
- Substation
- Switchyard
- 20' Minimum Fire Protection Buffer (Gravel or Concrete)
- 2' Topographic Contours
- Ephemeral Stream
- Intermittent Stream
- Delineated Wetlands
- 100' Retained Vegetative Buffer

NOTES:

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11. AERIAL IMAGERY FROM VGIN.

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0 100 200
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SCALE	SHEET NUMBER
H: 1" = 100'	C3.1

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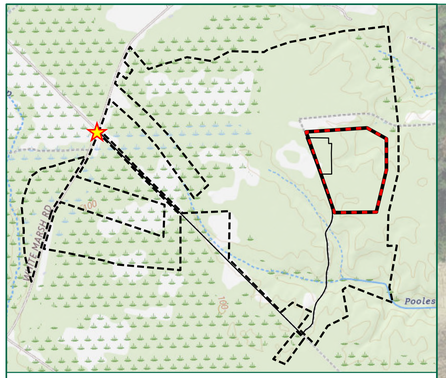

Legend

- Overall Project Parcel
- Project Limits - 32.5 Acres
- Property Setbacks - 200'
- Fence - 9.2 Acres
- Battery Container
- Power Conversion System
- 20' Minimum Fire Protection Buffer (Gravel or Concrete)
- Retained Vegetative Buffer

NOTES:

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2. WETLANDS AND STREAMS ONSITE HAVE BEEN DELINEATED.
3. BESS SHALL BE FULLY SCREENED BY A VEGETATIVE BUFFER OF AT LEAST 100'.
4. A MINIMUM 20' BUFFER SHALL BE ESTABLISHED AROUND THE PERIMIETER OF THE BESS'S OUTERMOST STRUCTURE AND SHALL BE CLEARED OF COMBUSTABLE VEGETATION OR OTHER COMBUSTABLE GROWTH. THIS BUFFER MUST BE COVERED IN GRAVEL, CONCRETE, OR OTHER NON-COMBUSTIBLE MATERIAL TO PROVIDE FOR ADDITIONAL FIRE PROTECTION.
5. SEE SHEET 4.1 FOR MORE DETAILS.
6. AERIAL IMAGERY FROM VGIN.

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PROPOSED LANDSCAPING MAP

SCALE (FEET)
0 100 200
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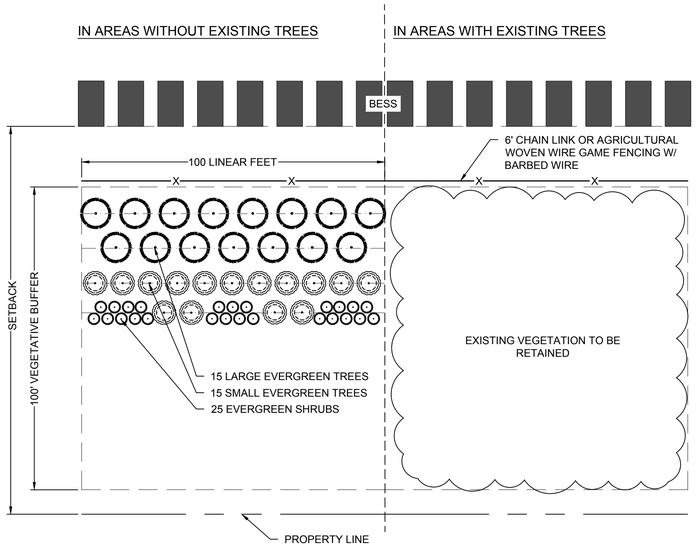
VEGETATIVE BUFFER NOTES

- EXISTING VEGETATION WITHIN BUFFER YARDS SHALL BE CONSIDERED AS A SUBSTITUTE FOR OTHERWISE REQUIRED LANDSCAPING, IF IN THE OPINION OF THE ADMINISTRATOR, THE TYPE, SIZE, AND DENSITY OF THE EXISTING VEGETATION COMPLIES WITH THE FOLLOWING STANDARDS AND THE INTENT OF ARTICLE V, SEC. 5-403, GENERAL DESIGN GUIDELINES AND DEVELOPMENT REVIEW PROCEDURES OF THE SURRY COUNTY, VA ZONING ORDINANCE.
- BATTERY ENERGY STORAGE SYSTEMS LOCATED IN THE A-R DISTRICT SHALL BE FULLY SCREENED ON ALL SIDES FROM GROUND-LEVEL VIEW BY A VEGETATIVE BUFFER OF AT LEAST 100 FEET LOCATED WITHIN THE REQUIRED SETBACKS, EXCEPT FOR FACILITIES LOCATED WITHIN OR ADJACENT TO PARCELS ZONED INDUSTRIAL, OR ADJACENT TO A PARCEL WITH AN ELECTRIC SUBSTATION LOCATED ON THE SAME SIDE OF THE ROAD.
- 100' BUFFER REQUIREMENT TO BE MET WITH EXISTING VEGETATION RETAINED ON SITE.
- ALL SCREENING AND LANDSCAPING SHALL BE IN ACCORDANCE WITH ARTICLE V, GENERAL DESIGN GUIDELINES AND DEVELOPMENT REVIEW PROCEDURES, OF THE SURRY COUNTY, VA ZONING ORDINANCE.
- FENCING MUST BE INSTALLED ON THE INTERIOR OF THE BUFFER.
- BUFFER MUST BE MAINTAINED IN GOOD CONDITION UNTIL THE FACILITY HAS BEEN DECOMMISSIONED AND REMOVED. IMPLEMENT A THREE-YEAR ESTABLISHMENT AND MAINTENANCE PERIOD TO FACILITY OPTIMAL SURVIVABILITY.
- FOR PROPOSED BUFFER, VARY SPECIES EVERY 100 LINEAR FEET.

VEGETATIVE BUFFER PLAN TEMPLATE



RECOMMENDED BUFFER PLANT LIST

BOTANICAL NAME	COMMON NAME	MINIMUM HEIGHT AT PLANTING	CONTAINER OR B&B
LARGE EVERGREEN TREES			
ILEX OPACA	AMERICAN HOLLY	5 FT.	B&B
JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	5 FT.	B&B
PINUS TAEDA	LOBLOLLY PINE	5 FT.	B&B
MAGNOLIA GRANDIFLORA	SOUTHERN MAGNOLIA	5 FT.	B&B
SMALL EVERGREEN TREES			
MAGNOLIA GRANDIFLORA 'LITTLE GEM'	LITTLE GEM SOUTHERN MAGNOLIA	5 FT.	B&B
ILEX OPACA 'NELLIE R. STEVENS'	NELLIE R. STEVENS HOLLY	5 FT.	B&B
MORELLA CERIFERA	SOUTHERN WAX MYRTLE	5 FT.	CONTAINER
EVERGREEN SHRUBS			
ILEX GLABRA	INKBERRY	1.5 FT.	CONTAINER
ILEX OPACA 'MARYLAND DWARF'	MARYLAND DWARF HOLLY	1.5 FT.	CONTAINER
ILEX CORNUTA BUFORDII 'NANA'	DWARF BUFORD HOLLY	1.5 FT.	CONTAINER

GROUNDCOVER PLANTING NOTES

- FOLLOWING INITIAL IMPLEMENTATION OF NOXIOUS WEED AND INVASIVE SPECIES MANAGEMENT PLAN, PREPARE SITE SOIL CONDITIONS FOR SEEDING.
- SEED DISTURBED AREAS WITHIN THE PROJECT AREA, DISTURBED AREAS WITHIN THE SETBACK, AND INSTALLED VEGETATIVE BUFFERS WITH APPROPRIATE POLLINATOR-FRIENDLY NATIVE PLANTS, SHRUBS, GRASSES, FORBES, AND WILDFLOWERS.
- SEED DISTURBED AREAS WITH A TEMPORARY MIXTURE AS NEEDED TO MEET STATE REGULATIONS FOR EROSION AND SEDIMENT CONTROL.
- DURING THE NEXT SUITABLE SEEDING PERIOD (SPRING OR FALL), SOW GROUNDCOVER TO ESTABLISH PERMANENT VEGETATIVE COVER. OPTIMAL SEED GERMINATION OCCURS AFTER OCTOBER 15 AND BEFORE APRIL 15. IF SEEDING IS CONDUCTED OUTSIDE OF OPTIMAL SEED GERMINATION PERIODS, PAIR A SEASONALLY-APPROPRIATE COVER CROP WITH PERMANENT SEED MIXTURE TO SUPPORT SOIL STABILIZATION AND EROSION AND SEDIMENT CONTROL DURING SEED ESTABLISHMENT PERIOD.
- USE RECOMMENDED SEEDING RATES (SPECIFIC TO MIXTURE) AND PROPER SEED PACKING FOR OPTIMAL GERMINATION AND SEED ESTABLISHMENT.

NOXIOUS WEED AND INVASIVE PLANT SPECIES MANAGEMENT PLAN

GENERAL NOTES

- ONGOING MONITORING IS REQUIRED TO MANAGE WEEDS AND INVASIVE SPECIES.
- USE PROPER EQUIPMENT FOR ALL CONTROL MEASURES:
  - TRACTOR MOUNTED BRUSH HOG FOR HEAVY MOWING (MINIMUM PLANT HEIGHT ≥3"-4") AND HIGH MOWING (MINIMUM PLANT HEIGHT ≥6"-8")
  - TRACTOR-MOUNTED, TRUCK-MOUNTED, OR ATV- MOUNTED SPRAYER FOR BROADCAST APPLICATIONS
  - BACKPACK STYLE SPRAYER OR OTHER DEVICE FOR SPOT SPRAYING APPROPRIATE TO THE CLASS OF PESTICIDE
  - AREAS UNDER AND DIRECTLY ADJACENT TO SOLAR ARRAYS MAY REQUIRE USE OF HAND-HELD EQUIPMENT
  - GRAZING BY RUMINANTS (USUALLY GOATS OR SHEEP) WHERE PRACTICAL AND APPROPRIATE TO PLANT SPECIES PRESENT
- REMOVE SHRUBS AND WOODY VINES BY THEIR ROOT SYSTEMS. ALTERNATIVELY, PRUNE THESE PLANTS AT GROUND LEVEL.
- REMOVE PROBLEMATIC PLANTS WITH FLOWERS OR SEEDS MANUALLY, PLACE HEAD FIRST IN HEAVY PLASTIC BAG, AND TRANSPORT TO A DESIGNATED DISPOSAL SITE. DO NOT DISPOSE OF AT LOCAL TRANSFER STATION, UNLESS THERE IS A DESIGNATED AREA FOR INVASIVE PLANT SPECIES DISPOSAL.
- PERFORM ALL CHEMICAL CONTROL TREATMENTS UNDER THE DIRECT SUPERVISION OF A VIRGINIA CERTIFIED PESTICIDE APPLICATOR OR REGISTERED TECHNICIAN.
- DO NOT APPLY HERBICIDE WHEN RAINFALL IS EXPECTED WITHIN 48 HOURS OR WIND SPEEDS EXCEED 10 MPH.

IDENTIFICATION AND CONTROL MEASURES PRE-CONSTRUCTION AND DURING CONSTRUCTION

- COMPLETE SITE INVENTORY OF NOXIOUS WEED SPECIES AND INVASIVE SPECIES.
- DEVELOP A MANAGEMENT PLAN THAT PRIORITIZES CONTROL OBJECTIVES.
- IMPLEMENT REMOVAL AND CONTROL MEASURES ACCORDING TO MANAGEMENT PLAN.
- REMOVAL AND CONTROL STRATEGIES SHOULD BE IMPLEMENTED TO BEGIN MANAGEMENT PRIOR TO SEEDING.

ESTABLISHMENT AND ONGOING MAINTENANCE SCHEDULE

- WINTER
  - REVIEW AND REVISE MANAGEMENT PLANS FOR THE UPCOMING YEAR BASED ON OBSERVATIONS FROM THE PRIOR YEAR.
  - PRUNE AS NECESSARY AND SEASONALLY APPROPRIATE.
  - DURING THE ESTABLISHMENT PERIOD, YEARS 1, 2, AND 3: DURING LATE WINTER OR EARLY SPRING, MOW SEEDED AREAS WHEN VEGETATION GROWS TO 18 INCHES BENEATH THE PANELS OR 2 TO 2.5 FEET ELSEWHERE. MOW TO A HEIGHT OF 12 INCHES. AFTER THE ESTABLISHMENT PERIOD, THIS SHOULD BECOME THE ONCE-A-YEAR MOWING OR AN AS NEEDED MOWING.
- SPRING
  - WEED MANUALLY OR SPOT SPRAY TO TREAT WEEDS, IDEALLY ONCE PER MONTH.
  - DURING THE ESTABLISHMENT PERIOD, YEARS 1, 2, AND 3: IF NOT DONE IN WINTER, MOW SEEDED AREAS WHEN VEGETATION GROWS TO 18 INCHES BENEATH THE PANELS OR 2 TO 2.5 FEET ELSEWHERE. MOW TO A HEIGHT OF 12 INCHES.
  - WATER AS NEEDED, ESPECIALLY DURING PERIODS OF DROUGHT.
  - REMOVE AND DISPOSE OF DISEASED AND DAMAGED PLANT MATERIAL, PARTICULARLY THOSE THAT CONTAIN OR COULD CONTAIN PESTS.
- SUMMER
  - WEED MANUALLY OR SPOT SPRAY TO TREAT WEEDS, IDEALLY ONCE PER MONTH.
  - WATER AS NEEDED, ESPECIALLY DURING PERIODS OF DROUGHT.
  - REMOVE AND DISPOSE OF DISEASED AND DAMAGED PLANT MATERIAL, PARTICULARLY THOSE THAT CONTAIN OR COULD CONTAIN PESTS.
- FALL
  - DURING THE ESTABLISHMENT PERIOD, YEARS 1 AND 3: IF NOT DONE IN WINTER, MOW SEEDED AREAS WHEN VEGETATION GROWS TO 18 INCHES BENEATH THE PANELS OR 2 TO 2.R FEET ELSEWHERE. MOW TO A HEIGHT OF 12 INCHES. THE SECOND OR LAST MOWING SHOULD BE IN OCTOBER.
  - REMOVE AND DISPOSE OF DISEASED AND DAMAGE PLANT MATERIAL, PARTICULARLY THAT WHICH CONTAINS OR COULD CONTAIN PESTS.
  - LEAVE GROUNDCOVER ALONE FOR THE PURPOSE OF CREATING SEASONAL INTEREST IN THE LANDSCAPE AND WINTER HABITAT AND FOOD SOURCES FOR WILDLIFE. DO NOT DEADHEAD OR CUT DOWN STANDING VEGETATION, INCLUDING GRASSES AND FORBS. AN EXCEPTION IS ANY SPECIES THAT SEEDS AGGRESSIVELY; IN THAT CASE, DEADHEAD TO PREVENT THESE PLANTS FROM SELF-SOWING. IF A DECISION IS MADE TO CUT DOWN ANY VEGETATION, LAY THE CLIPPINGS ON THE GROUND TO SERVE AS MULCH (EXCEPT FOR AGGRESSIVE, NOXIOUS, OR INVASIVE PLANTS, WHICH SHOULD BE PROPERLY REMOVED FROM THE SITE).
  - IDENTIFY PROBLEM AREAS AND CHALLENGES FROM THE PRIOR GROWING SEASON TO INCORPORATE INTO MAINTENANCE AND MANAGEMENT PLANS FOR THE UPCOMING SEASON. PLAN OUT AND SCHEDULE SPECIFIC MAINTENANCE TASKS.

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#	MM/DD/YY	DESCRIPTION

DRAWING DESCRIPTION
LANDSCAPING NOTES AND DETAILS

PLANS PRINTED AS 11X17 ARE HALF SCALE

SHEET NUMBER C4.1

Traffic & Route Evaluation Study

Bear Island BESS

Surry County, Virginia

March 2025

Prepared For:

Clenera, LLC

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

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Traffic & Route Evaluation Study

Bear Island BESS

Surry County, Virginia

Prepared For:

Clenara, LLC
999 West Main Street
Suite 800
Boise, Idaho 83702

Prepared By:

Timmons Group
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March 2025

TABLE OF CONTENTS

LIST OF FIGURES

1 PROJECT OVERVIEW

Timmons Group, at the request of Clenara, LLC, completed a transportation assessment for the proposed Bear Island BESS Project, located in Surry County, Virginia. This work has been prepared in conjunction with the site's evaluation to identify any potential transportation issues and recommend solutions. The tasks associated with this assessment included:

- Review of data and documents provided by the Client relative to the project;
- Coordination with the Client on access, schedule, and other parameters that are reflected in the traffic assessment;
- Obtaining available geometric (roadway widths, intersection control, etc.) and speed limit data that is readily available via a review of available aerial imagery through Google Earth, Bing, or County GIS systems;
- Obtaining available VDOT traffic data for those roads adjacent to the site;
- Preparing a crash analysis history for the past five (5) years along the traffic route via available VDOT crash history; and
- Preparing a narrative summarizing existing intersection conditions, traffic along the adjacent roadway network, and anticipated impacts associated with the site-related traffic along with potential mitigation measures.

2 EXISTING CONDITIONS

Timmons Group compiled existing roadway conditions and crash data for facilities adjacent to the proposed Bear Island BESS Project located in Surry County, Virginia. The proposed site is located on Route 617 (White Marsh Road), north of the town of Wakefield and south of Route 10 (Colonial Trail) in Surry County, Virginia. Please note that access to the site is anticipated via Route 10 from the north and US Route 460 (County Drive) from the south.

The project location is shown in Figure 1 (all figures are located at the end of the report) and a preliminary site layout can be found in Figure 2.

For the purposes of this work, it was assumed that all vehicles will utilize the two (2) proposed haul routes as shown in Figure 1. Traffic on the southern haul route will originate from US Route 460, and traffic on the northern haul route will originate from Route 10.

EXISTING ROADWAYS

US Route 460 (County Drive) is a four-lane, undivided principal arterial roadway with a posted speed limit of 35 mph in the vicinity of the town of Wakefield, Virginia. According to 2023 VDOT AADT data, US Route 460 services 11,000 vehicles per day in the vicinity of the town of Wakefield and the intersection of US Route 460 and Route 617.

Route 31 (East/West Main Street) is a two-lane, undivided minor arterial with a posted speed limit of 35 mph. According to 2023 VDOT AADT data, Route 31 services 3,300 vehicles per day between US Route 460 and Route 617.

Route 617 (Rocky Hock Road/White Marsh Road) is a two-lane, undivided minor collector road with a posted speed limit of 55 mph. The ADTs along Route 617 vary from 990 VPD to 260 VPD in Surry County, as shown in Figure 3.

Route 10 (Colonial Trail) is a two-lane, undivided minor arterial roadway with a posted speed limit of 55 mph. According to 2023 VDOT AADT data, Route 10 services 5,800 vehicles per day to the north of the Route 10/Route 617 intersection and Route 10 services 4,600 vehicles per day to the south of the Route 10/Route 617 intersection.

A summary of the ADT, heavy vehicle percentages and typical pavement widths along the haul route can be found in Figure 3.

Existing Structures

The VDOT-maintained *Bridge and Culvert Database* indicated that there are two (2) culverts and two (2) bridges along the proposed southern haul route. The database indicated that there are no existing structures along the proposed northern haul route.

- One (1) culvert is located on Route 617 (White Marsh Road) approximately 2.3 miles to the east of the intersection of Route 617 and Route 31 (Birch Island Road). According to the database, the culvert is classified as fair. There is no signage present indicating a weight restriction. It is not anticipated that this structure will impact/restrict construction-related traffic. The location of the culvert is shown in Figure 1.
- One (1) bridge is located on Route 617 approximately 1.8 miles west of the intersection of Route 617 and Route 622 (Runnymede Road). According to the database, the bridge is classified as fair. There is no signage present indicating a weight restriction. It is not anticipated that this structure will impact/restrict construction-related traffic. The location of the bridge is shown in Figure 1.
- One (1) culvert is located on Route 617 approximately 0.3 miles to the east of the intersection of Route 617 and Route 622. According to the database, the culvert is classified as fair. There is no signage present indicating a weight restriction. It is not anticipated that this structure will impact/restrict construction-related traffic. The location of the culvert is shown in Figure 1.
- One (1) bridge is located on Route 617 approximately 1.5 miles east of the intersection of Route 617 and Route 622. According to the database, the bridge is classified as fair. There is no signage present indicating a weight restriction. It is not anticipated that this structure will impact/restrict construction-related traffic. The location of the bridge is shown in Figure 1.

EXISTING INTERSECTIONS

The following six (6) key intersections were noted along the identified haul routes and are shown in Figure 1:

1. US Route 460 (County Drive) and Route 31 (East/West Main Street) (Signalized);
2. Route 617 (East Main Street/Rocky Hock Road) and Route 31 (Birch Island Road) (Unsignalized);
3. Route 617 (White Marsh Road) and Route 621 (Aberdeen Road) (Unsignalized);
4. Route 617 (White Marsh Road) and Route 622 (Runnymede Road) (Unsignalized);
5. Route 617 (White Marsh Road) and Route 626 (Beechland Road) (Unsignalized); and
6. Route 10 (Colonial Trail) and Route 617 (White Marsh Road/Bacons Castle Trail) (Unsignalized).

US Route 460 (County Drive) and Route 31 (East/West Main Street)

At the signalized four-legged intersection of US Route 460 and Route 617, US Route 460 (eastbound and westbound) is the mainline approach. The pavement on US Route 460 is 55', consisting of four (4) 11' through lanes (two (2) lanes in each direction) and one (1) 11' wide left turn lane for both approaches. Both left turn lanes consist of 100' of storage and 100' of taper. The southbound approach of Route 617 is 26' wide and consists of one (1) 13' wide approach lane and one (1) 13' wide departure lane. The northbound approach of Route 617 is 26' wide and consists of one (1) 13' wide approach lane and one (1) 13' wide departure lane. Photos of the intersection can be found in Figure 4.

Route 617 (Rocky Hock Road) and Route 31 (East Main Street/Birch Island Road)

At the unsignalized three-legged intersection of Route 617 and Route 31, the southbound approach of Route 617 is the stop-controlled approach. The eastern leg of Route 31 and the southern leg of Route 617 are each approximately 24' wide and accommodate two (2) 12' travel lanes. The southbound approach of Route 31 is 22' wide and accommodates two (2) 11' travel lanes. Photos of the intersection of can be found in Figure 5.

Route 617 (White Marsh Road) and Route 621 (Aberdeen Road)

At the unsignalized three-legged intersection of Route 617 and Route 621, Route 621 is the stop-controlled approach. The northern and southern legs of Route 617 are each approximately 22' wide and accommodate two (2) 12' travel lanes. The westbound approach of Route 621 is 16' wide with no pavement striping and accommodates a single ingress lane and a single egress lane. Photos of the intersection of can be found in Figure 6.

Route 617 (White Marsh Road) and Route 622 (Runnymede Road)

At the unsignalized three-legged intersection of Route 617 and Route 622, Route 622 is the stop-controlled approach. The northern leg of Route 617 is approximately 22' wide and accommodates two (2) 11' travel lanes and the southern leg of Route 617 is approximately 22' wide and accommodates two (2) 11' travel lanes. The eastbound approach of Route 622 is 20' wide and accommodates two (2) 10' travel lanes. Photos of the intersection of can be found in Figure 7.

Route 617 (White Marsh Road) and Route 626 (Beechland Road)

At the unsignalized four-legged intersection of Route 617 and Route 626, Route 626 is the stop-controlled approach. The southern leg of Route 617 is approximately 20' wide and accommodates two (2) 10' travel lanes and the northern leg of Route 617 is approximately 20' wide with no pavement striping. The east- and westbound approaches of Route 626 are approximately 20' wide with no pavement markings and each accommodate a single ingress lane and a single egress lane. Photos of the intersection of can be found in Figure 8.

Route 10 (Colonial Trail) and Route 617 (White Marsh Road/Bacons Castle Trail)

At the unsignalized four-legged intersection of Route 10 and Route 617, Route 617 is the stop-controlled approach. The southern leg of Route 617 is approximately 24' wide and accommodates two (2) 12' travel lanes and the northern leg of Route 617 is approximately 36' wide and accommodates two (2) 12' travel lanes and one (1) 12' right turn lane with 100' of storage and 50' of taper. The westbound approach of Route 10 is approximately 36' wide and accommodates two (2) 12' travel lanes and one (1) 12' left turn lane with 100' of storage and 100' of taper. The eastbound approach of Route 10 is approximately 36' wide and accommodates two (2) 12' travel lanes and one (1) 12' left turn lane with 100' of storage and 100' of taper. Photos of the intersection can be found in Figure 9. Note that the intersection was reconstructed in the summer of 2024 and aerial imagery of the intersection is not yet available.

CRASH ANALYSIS

There have been 68 crashes within the past five (5) years (January 1, 2020 – December 31, 2024) along the proposed haul route. A map of the location of these crashes can be found in Figure 10.

Of the 68 reported crashes, 48 crashes (71%) resulted in property damage only, 17 crashes (21%) resulted in visible injury, two (2) crashes (3%) resulted in severe injury, and one (1) crash resulted in a fatality.

The fatal crash was an angle collision at the intersection of Route 617 and Route 626. The crash occurred during the day under clear weather conditions.

Of the two (2) severe injury crashes, one (1) was with a fixed object off the road and one (1) crash was a rear end collision. Both crashes occurred during rain. Both crashes occurred during the day. Speeding was cited as a contributing factor to the fixed object off road crash.

The crash types for all 68 crashes were as follows:

- 25 Fixed Object Off Road (37%)
- 11 Non-Collision (16%)
- 10 Angle (15%)
- 7 Rear End (10%)
- 5 Other (7%)
- 3 Head On (4%)
- 3 Sideswipe – Opposite Direction (4%)
- 2 Deer (3%)
- 1 Backed Into (1%)
- 1 Sideswipe – Same Direction (1%)

The weather conditions for all 68 crashes were as follows:

- 50 No Adverse Condition (Clear/Cloudy) (74%)
- 13 Rain (19%)
- 2 Mist (3%)
- 2 Fog (3%)
- 1 Other (1%)

Overall, the crash history in this area is typical for the roadway types and surrounding areas.

Aerials depicting the locations of the recorded crashes as well as the type and severity can be found in 10 and 11, respectively.

3 SITE ACCESS

SITE ENTRANCES

Access to the site will be provided via one (1) driveway on Route 617 (White Marsh Road). The site access is located 2.25 miles south of the Route 10 (Colonial Trail) and Route 617 (White Marsh Road/Bacons Castle Trail) intersection. Site access will utilize abandoned railroad right-of-way.

The site entrance is not yet constructed and there is an existing unpaved road at the proposed entrance. The pavement on Route 617 is 20' wide in the vicinity of the proposed access. Photos of the access point can be found in Figure 12.

TRAFFIC MITIGATION

Throughout construction of the site, Clenara, LLC will coordinate with the representatives from Surry County and VDOT to determine appropriate transportation management procedures.

Please note that the traffic associated with the proposed battery storage facility is significantly less than what is witnessed with a solar facility. Construction is estimated to take place over a 12-month period. During this period, it is anticipated that 100 heavy vehicles (total) will be required to deliver materials to the site; this will occur within a one (1) to two (2) month window. With respect to employees, only 50-75 are anticipated during the peak period.

Based on the existing roadway conditions, the location of the proposed access points, and the available average daily traffic numbers for the agreed upon access roads, the anticipated construction traffic volumes should not significantly impact traffic operations. During operations and maintenance, the facility will not generate a significant volume of traffic with the anticipation of only a few pickup trucks monthly.

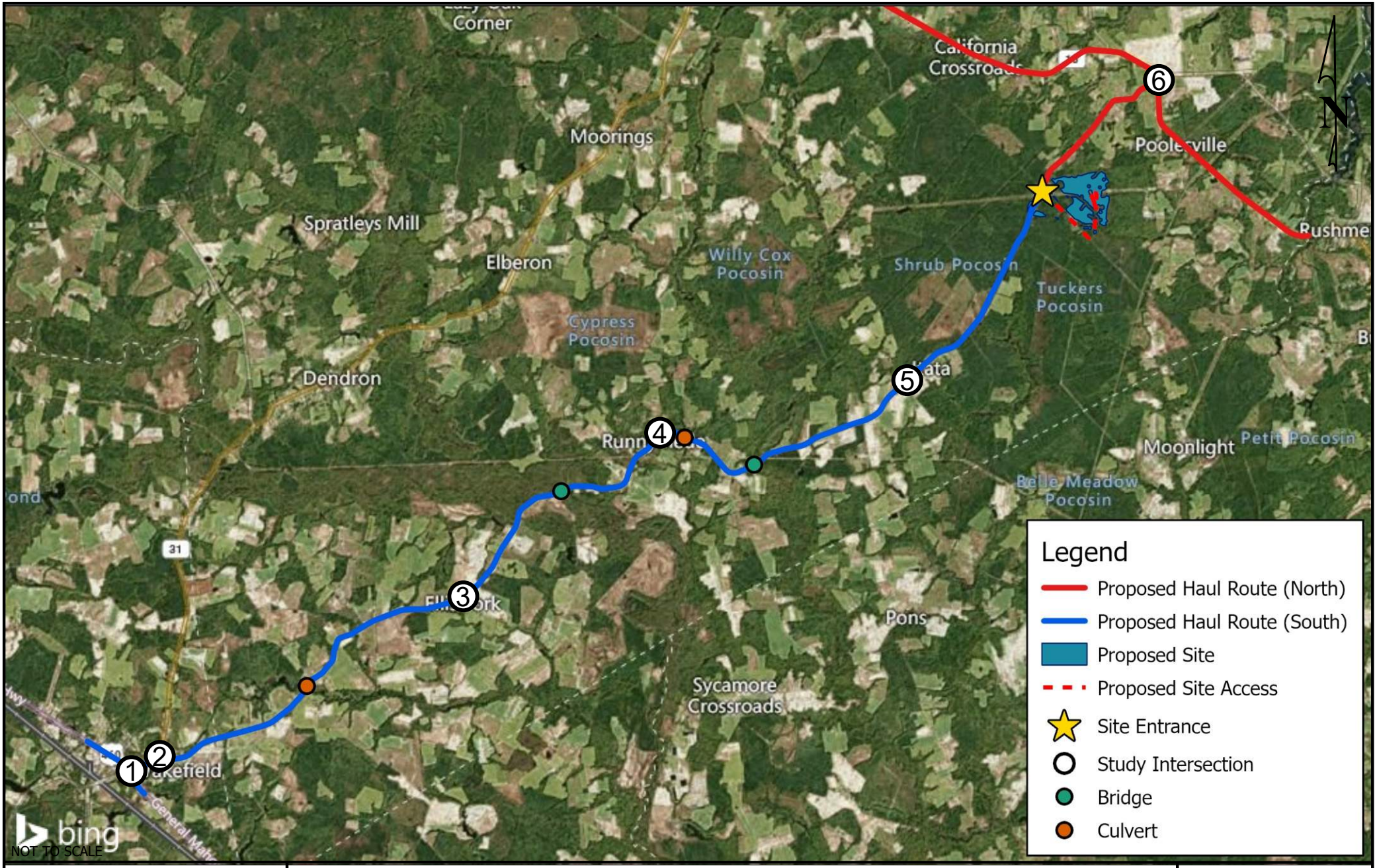
Construction-related traffic will access the Bear Island BESS Project via state-maintained roadways. Given the existing posted speeds and anticipated slower entering/exiting traffic, temporary traffic control (TTC) measures may be necessary. Pertinent signage should be installed as necessary to accommodate the ingress and egress of heavy vehicles and materials. It is not anticipated that daily vehicular traffic following construction will disrupt local traffic flows during normal peak hours.

Outside of the previously noted mitigation efforts, should a traffic issue arise during construction, Clenara, LLC will work the County and VDOT to appropriately address the specific concern.

4 CONCLUSIONS

Based on our review of the available data relating to the site, existing conditions, and estimated traffic, the following is offered:

- The proposed Bear Island BESS site is located north of the Town of Wakefield in Surry County, Virginia (see Figure 1).
- Access to the site will be provided via US Route 460, Route 31 (East Main Street), Route 617 (Rocky Hock Road/White Marsh Road), and Route 10 (Colonial Trail).
- The previously mentioned roadway facilities have the available capacity to accommodate site-generated traffic, both during construction and operations/maintenance activities based on existing ADTs.
- A review of available crash data indicated crashes are spread throughout the network with a majority (71%) being property damage only. No "hot spots" or patterns were readily identified by the available crash data.
- Assuming site-traffic is focused on US Route 460, Route 31 (East Main Street), Route 617 (Rocky Hock Road/White Marsh Road), and Route 10 (Colonial Trail), no improvements are anticipated to accommodate site-generated traffic. However, the potential exists for temporary traffic control measures to be implemented as necessary to accommodate the delivery of materials.



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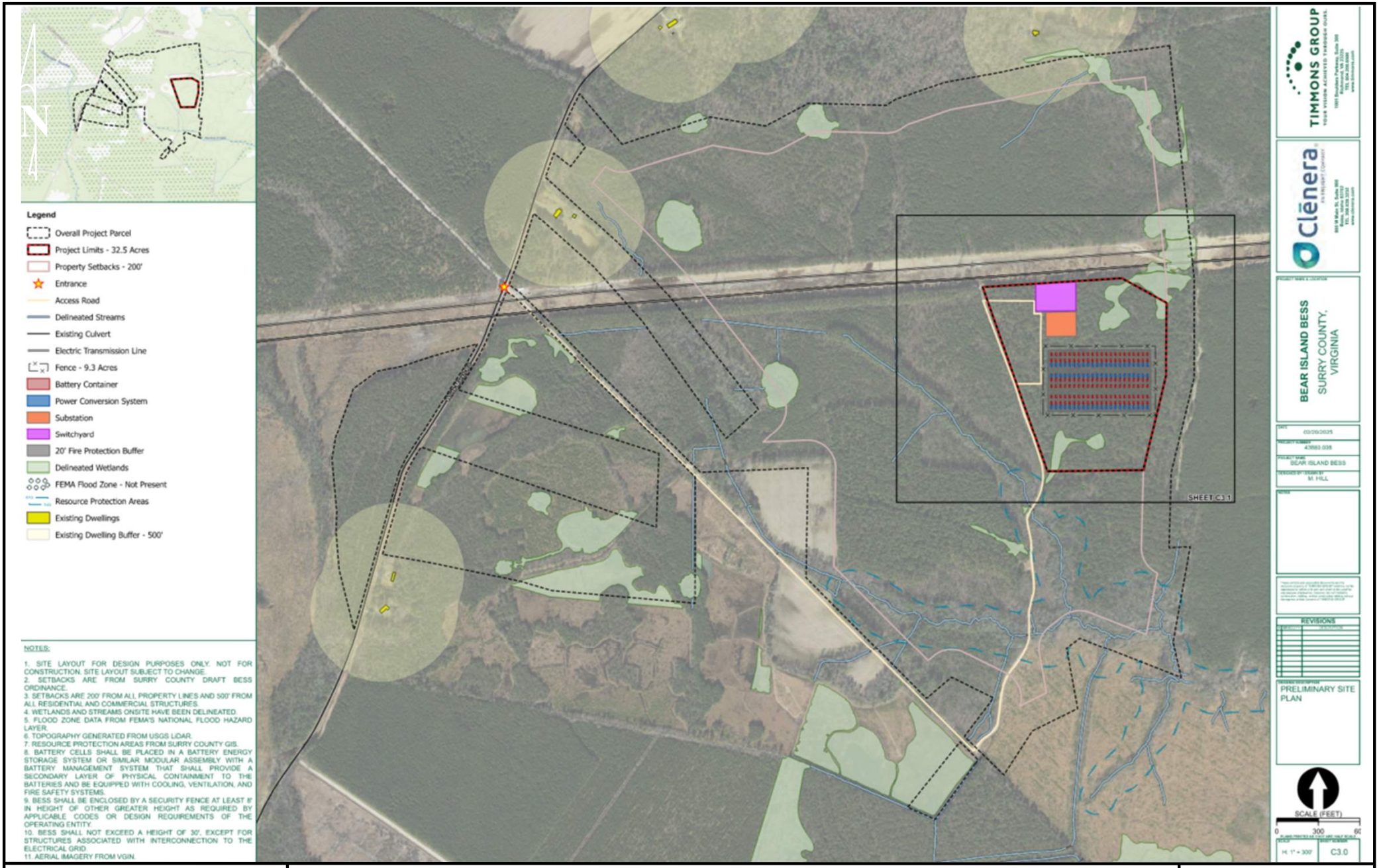
Surrounding Roadway Network and Site Location
Bear Island BESS
Surry County, Virginia

Figure 1



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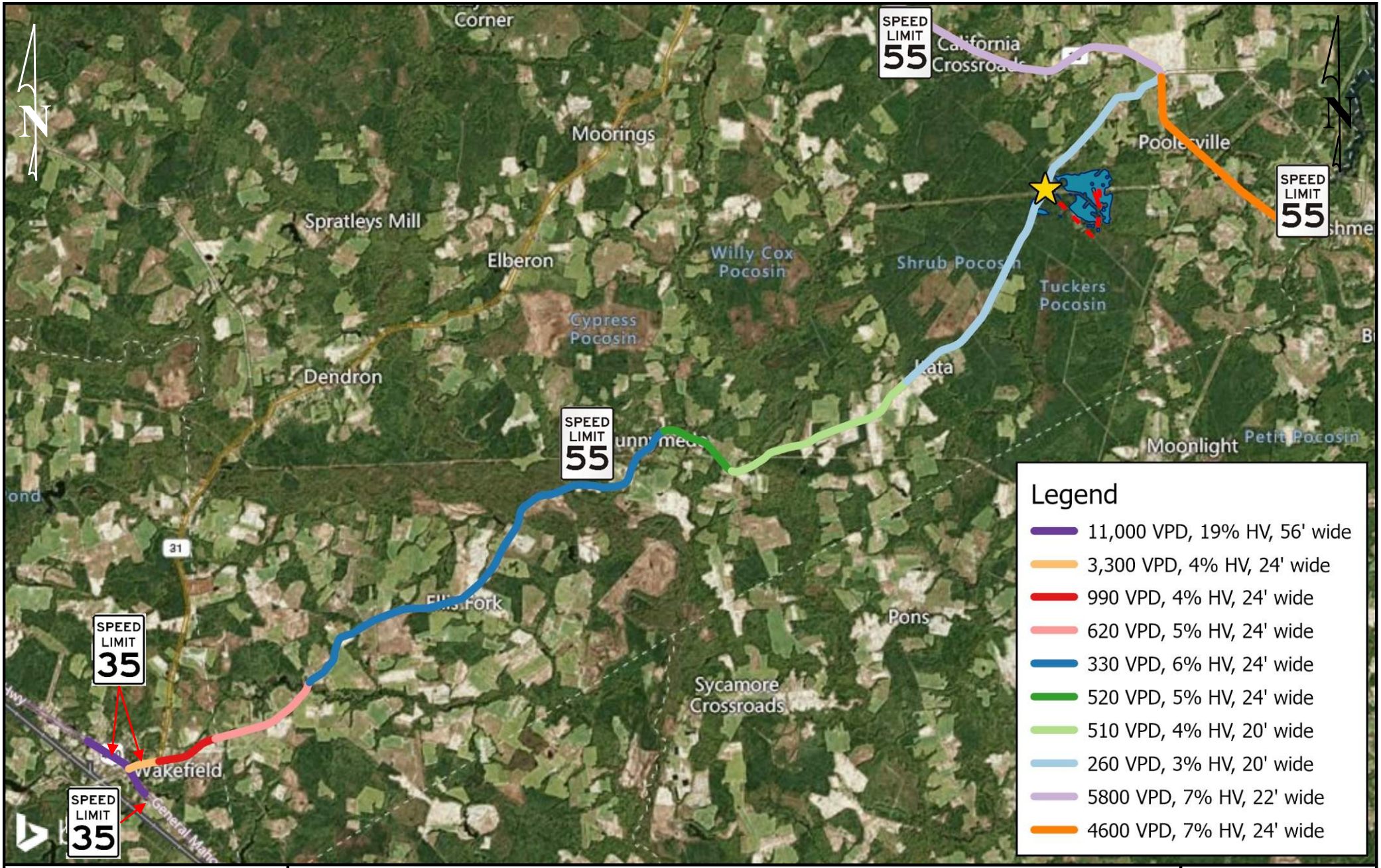
Preliminary Site Layout
Bear Island BESS
Surry County, Virginia

Figure
2



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ADTs on Route 617
Bear Island BESS
Surry County, Virginia

Figure
3

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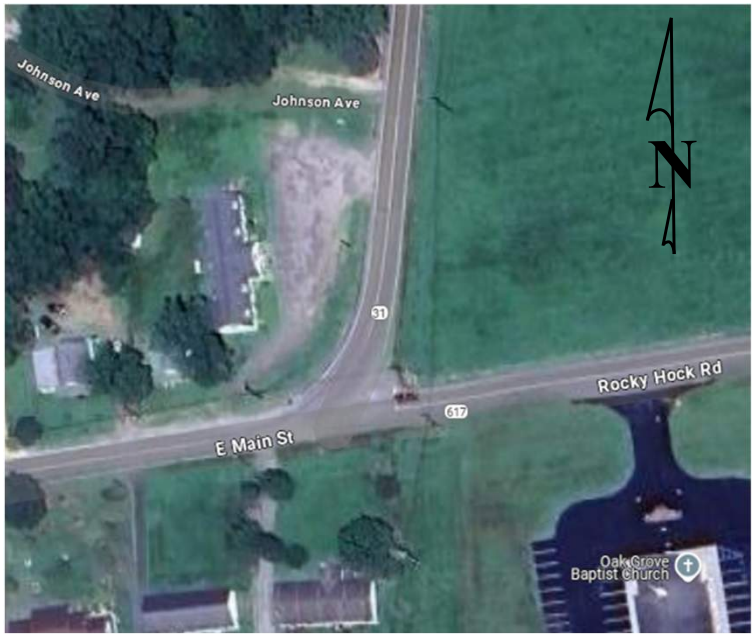
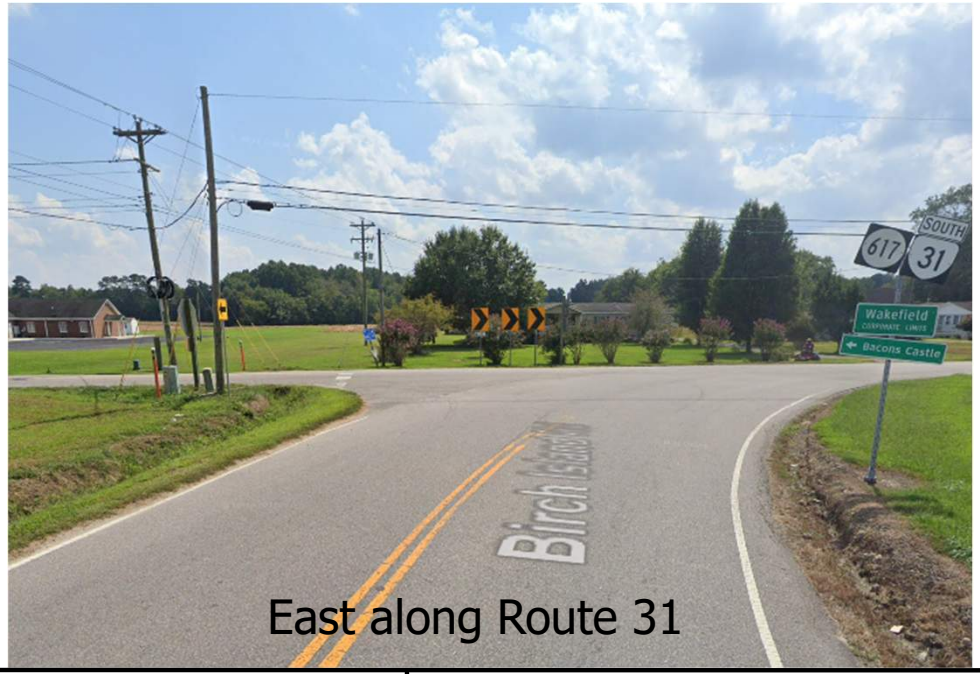
Intersection of US Route 460 and Route 31
Bear Island BESS
Surry County, Virginia

Figure
4

North along Route 31





East along Route 31

South along Route 617

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Intersection of Route 617 and Route 31
Bear Island BESS
Surry County, Virginia

Figure
5

North along Route 617

West along Route 621

South along Route 617

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Intersection of Route 617 and Route 621
Bear Island BESS
Surry County, Virginia

Figure
6

North along Route 617

South along Route 617

East along Route 622

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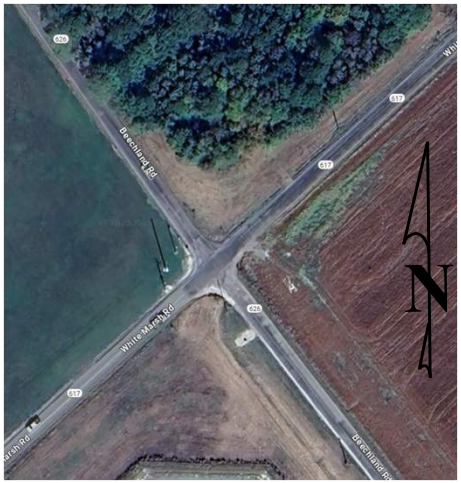
Intersection of Route 617 and Route 622
Bear Island BESS
Surry County, Virginia

Figure
7

North along Route 617

East along Route 626



South along Route 617

West along Route 626

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Intersection of Route 617 and Route 626
Bear Island BESS
Surry County, Virginia

Figure
8

North along Route 617

West along Route 10

South along Route 617

East along Route 10

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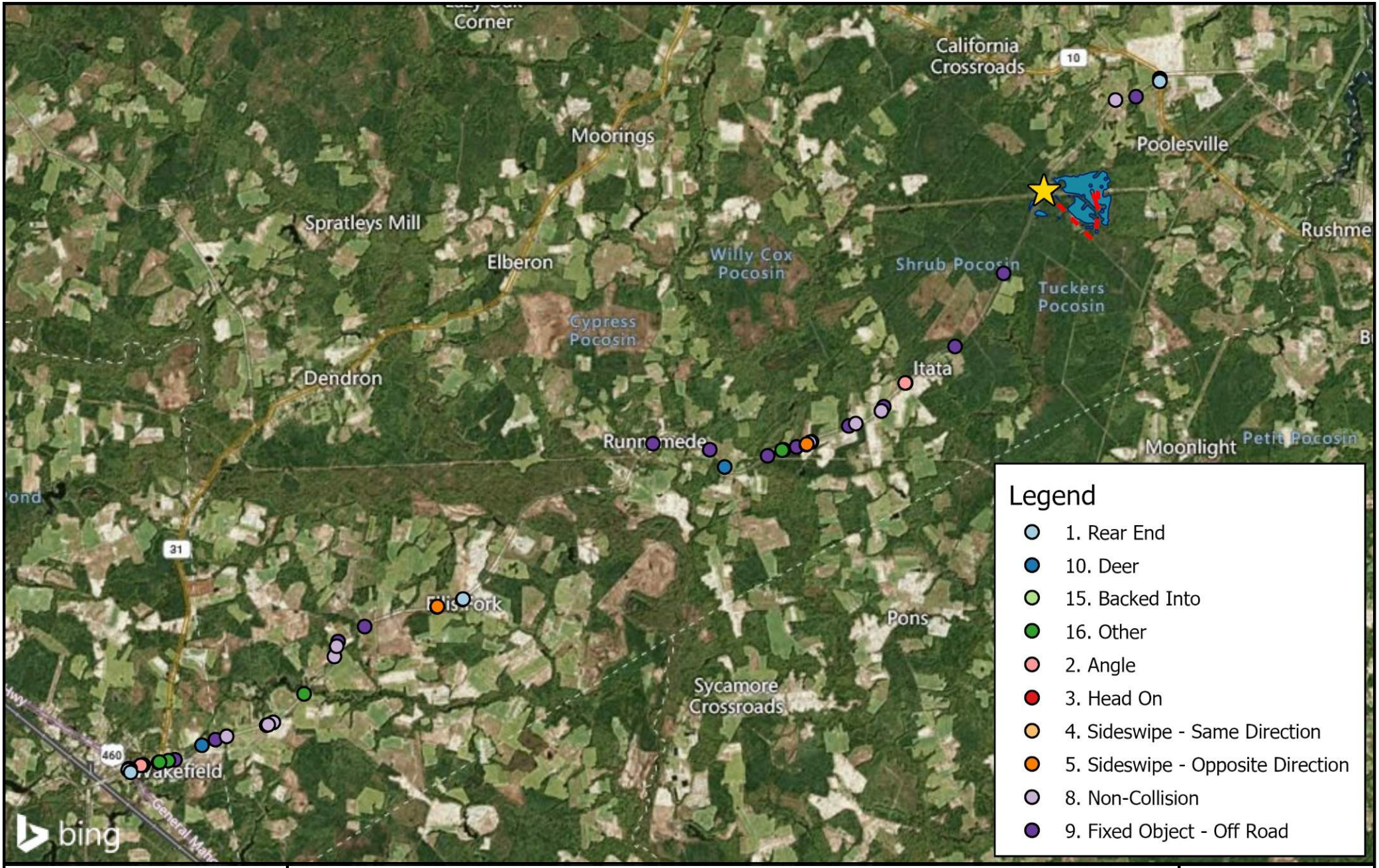
Intersection of Route 617 and Route 10
Bear Island BESS
Surry County, Virginia

Figure
9



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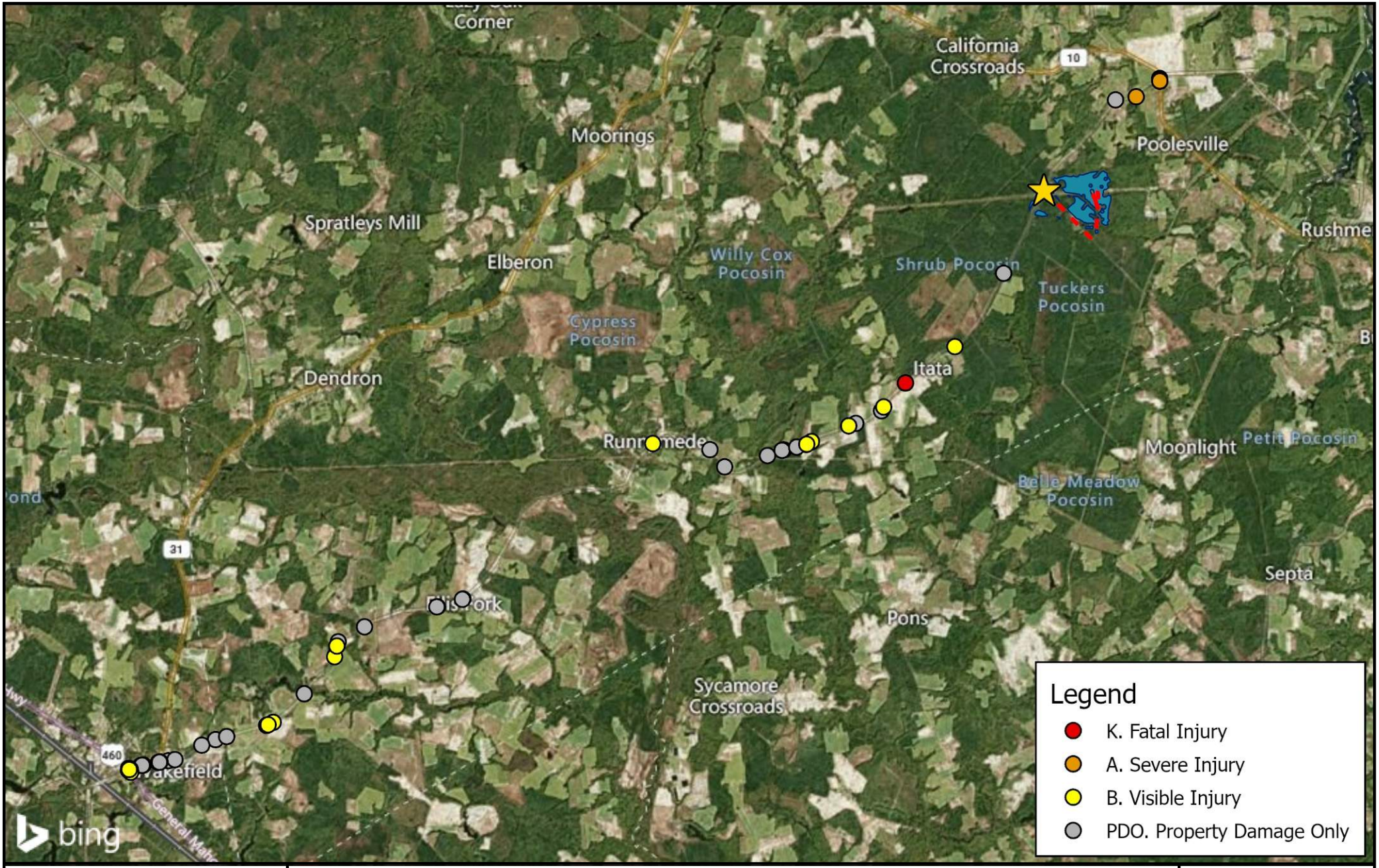
Crashes by Type along Proposed Haul Route
Bear Island BESS
Surry County, Virginia

Figure
10



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Crashes by Severity along Proposed Haul Route
Bear Island BESS
Surry County, Virginia

Figure
11

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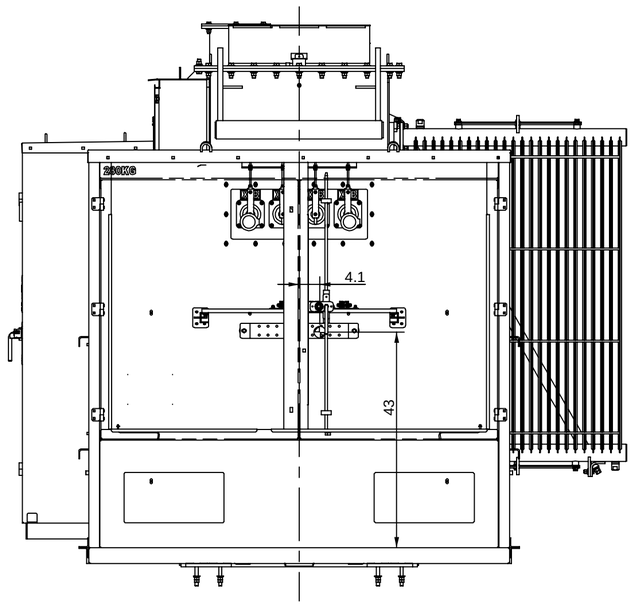
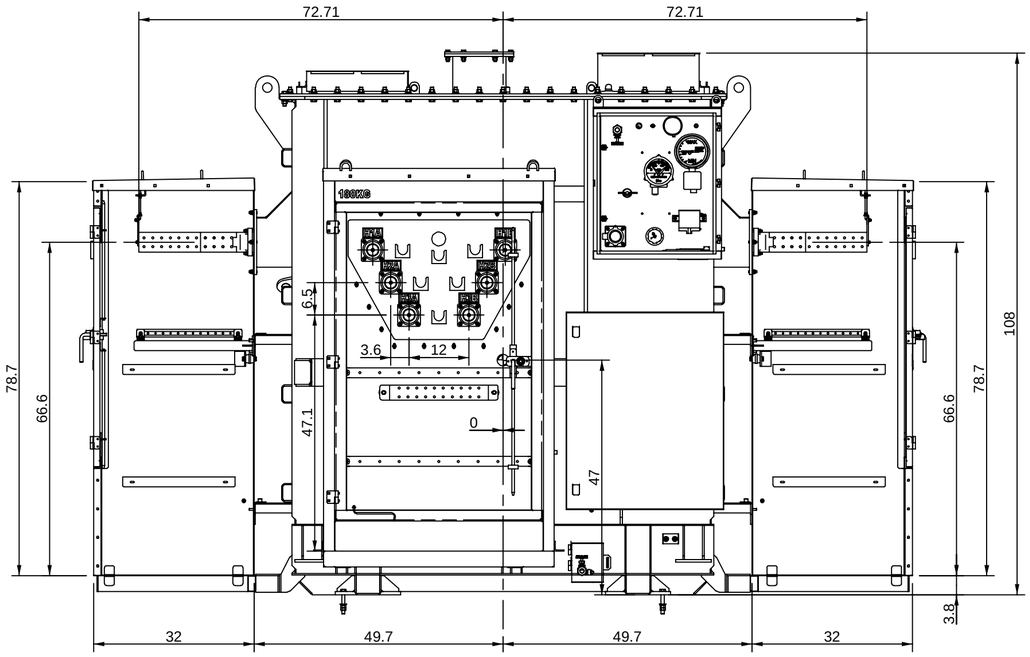
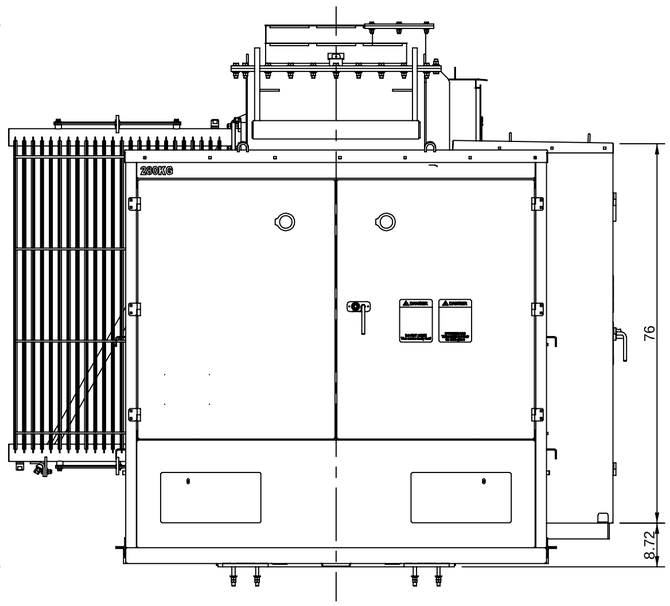
Site Access and Route 617
Bear Island BESS
Surry County, Virginia

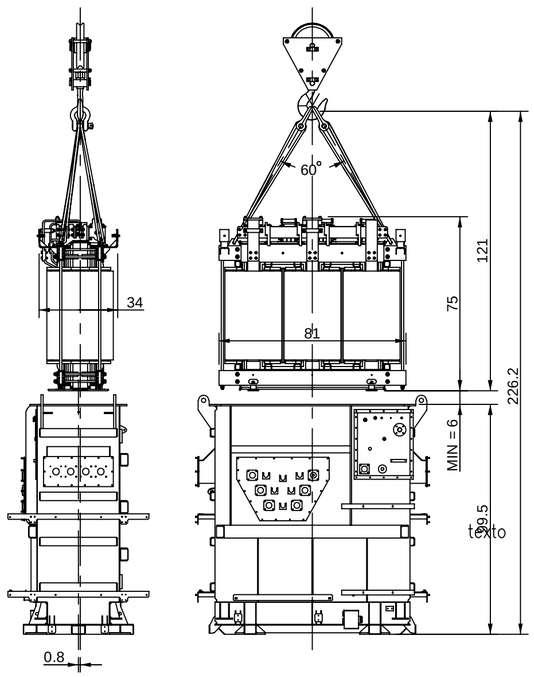
Figure
12

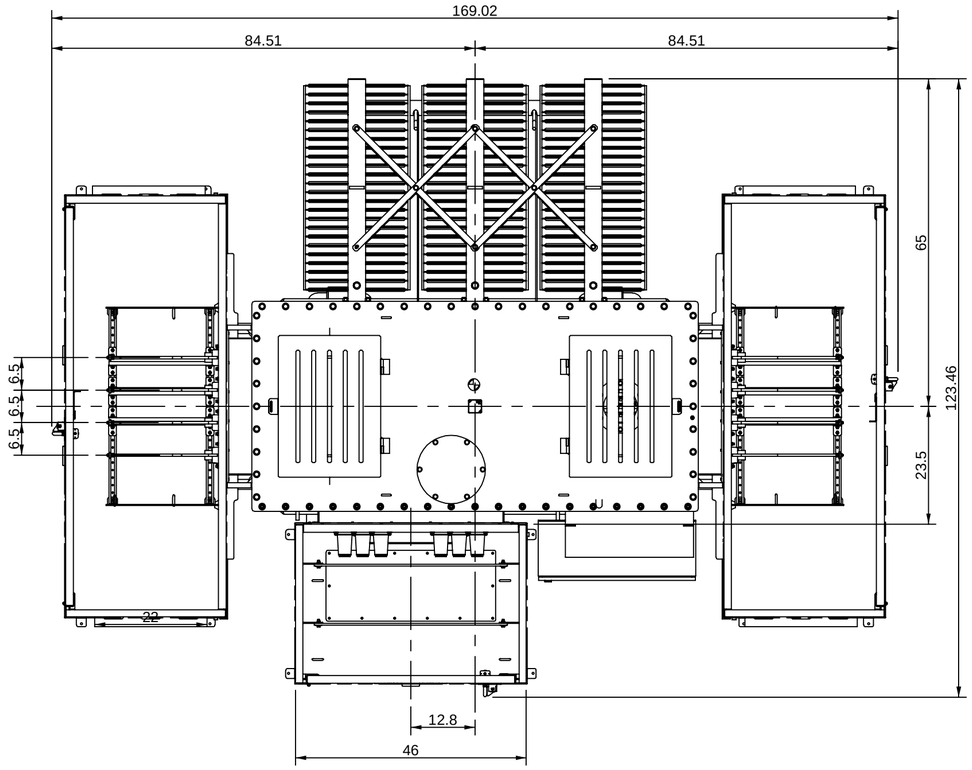






DETAILS OF LIFTING THE ACTIVE PART HEIGHT





EXTERNAL PAINTING

COLOR	RAL 9016
DEGREE OF PROTECTION	C4H

APPROXIMATE MASSES

ACTIVE PART		6000 kg
TANK AND FITTINGS W/o RADIATORS		2800 kg
TANK OIL W/o RADIATORS	2450 l	2350 kg
RADIATORS (4 units)		1100 kg
TOTAL RADIATORS OIL (4 units)	390 l	380 kg
TOTAL OIL W/ RADIATORS		2840 l
TOTAL (kg)		12650 kg

CABLE BOX MASS (kg)

HIGH VOLTAGE	180
1x LOW VOLTAGE	280

NITROGEN BLANKET

PRESSURE (kpa)	50
VOLUME (m3)	20
WEIGHT (kg)	25

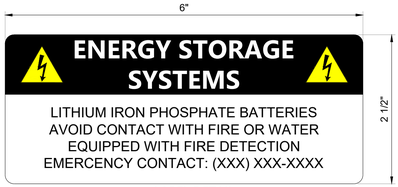
NOTES:

** PAINTED RAL 9016
** LESS-FLAMMABLE BIODEGRADABLE FLUID
** NITROGEN BLANKET
** CUL APPROVED
** CORE GROUND ACCESSIBLE
** IMPACT RECORD
** ALL FIXINGS ARE INCH
** STAINLESS STEEL HARDWARE

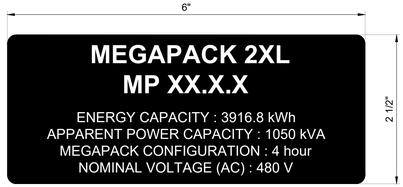
Zone	Rev.	Description	Date	Approved
-	-	-	-	-
-	-	-	-	-
-	2	CHANGED HIGH FROM GROUND OF MV AND LV CABLE BOX	06/11/2024	MP
-	1	INCLUDED FIXING BOLT	08/10/24	MP

PREPARED 2024-09-05 M.PEREIRA	DOCUMENT KIND Standard	PROJECT 1LBR601563	MASS (kg) 12650	SCALE 1:22
APPROVED 2024-09-05 E.AGOSTINI	SECURITY LEVEL Internal	TITLE GENERAL DIMENSION		LANG. EN
RESPONSIBLE DEPT. Engineering	STATUS Approved			PAGE 1/1
OWNING ORGANIZATION Hitachi Energy Brasil Ltda	Hitachi Energy HITACHI	DOCUMENT ID 1LBR408032A		REVISION 2

BESS CONTAINER LABELS



LABEL DETAIL
TO BE PLACED ON EACH TESLA
MEGAPACK 2XL ENCLOSURE
PER NFPA 855 4.3.5.1.



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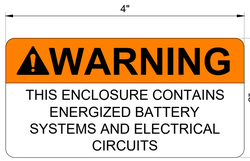
XX.X.X TO BE REPLACED WITH TESLA PACK (TP) NUMBER



WARNING LABEL
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ENCLOSURE PER IFC 1206.2.8.6

HAZARD LABEL
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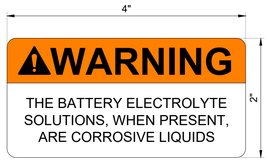
2XL ENCLOSURE PER NEC 706.3



WARNING LABEL
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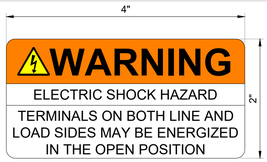
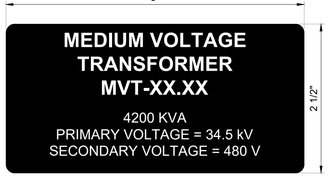
MEGAPACK 2XL ENCLOSURE

BESS XFMR LABELS



HAZARD LABEL
TO BE PLACED ON EACH MV TRANSFORMER



LABEL DETAIL
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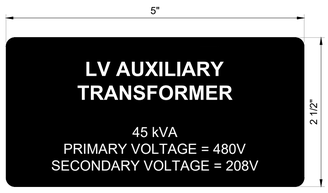
HAZARD LABEL
TO BE PLACED ON AUXILIARY TRANSFORMER



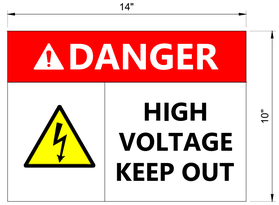
LABEL DETAIL
TO BE PLACED ON AUXILIARY TRANSFORMER

COMMUNICATION EQUIPMENT LABEL

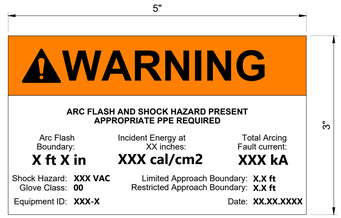
LABEL DETAIL
TO BE PLACED ON EACH FIELD NETWORK ENCLOSURE
"XX" TO BE REPLACED WITH FNE NUMBER

SAFETY SIGNS LABELS

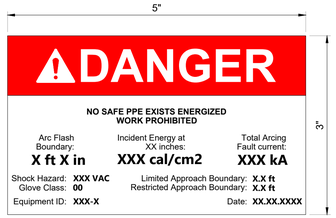
FENCE SIGNS
TO BE PLACED AT ALL FENCE GATES AND AT
INTERVALS OF 200FT ALONG FENCE, NEXT TO
HIGH VOLTAGE SIGNS.



FENCE SIGNS
TO BE PLACED AT ALL FENCE GATES AND AT
INTERVALS OF 200 FT ALONG FENCE,
NEXT TO NO TRESPASSING SIGNS.



ARC FLASH HAZARD LABEL DETAIL
TO BE PLACED AT ACCESS DOORS TO
ELECTRICAL EQUIPMENT



ARC FLASH HAZARD LABEL DETAIL
TO BE PLACED AT ACCESS DOORS TO
ELECTRICAL EQUIPMENT

REV	DATE	DESCRIPTION	DRN	DSN	CKD	APD

PROJECT:

LOCATION:

TITLE:
LABEL DETAILS

PROJECT NO.:

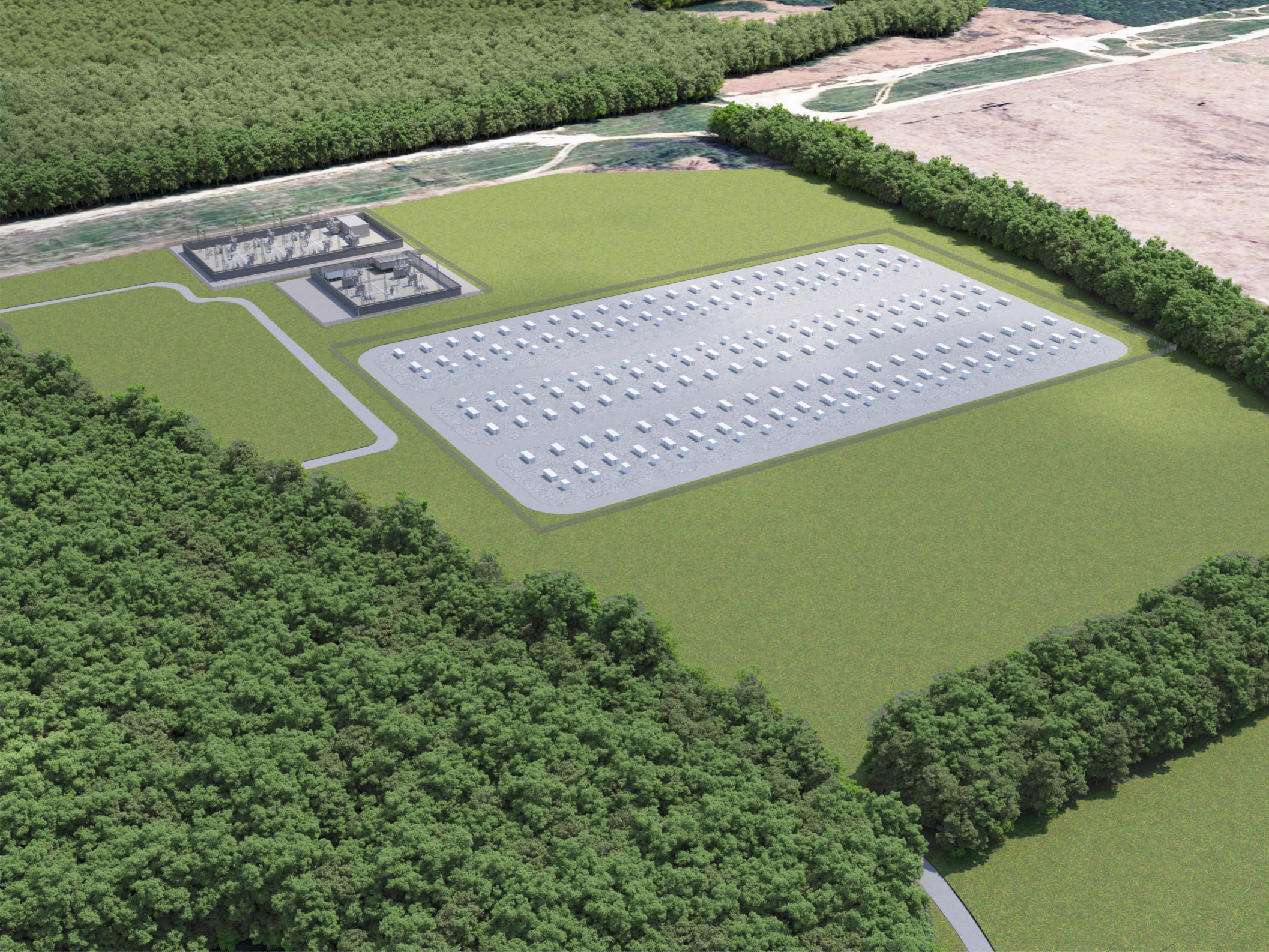
DRAWING NO.:

DATE:

SHEET NO.:
01 OF 01

SCALE:
AS NOTED

PAPER SIZE:
ARCH-D



TIMMONS GROUP
ENGINEERING | DESIGN | TECHNOLOGY

Bear Island BESS

Decommissioning Plan

Surry County, VA

Date: 3/13/2025

This cost estimate was not based on detailed construction drawings but is typical for a project of this size and type. The listed equipment quantities are subject to change based on the actual installed facilities. An updated decommissioning plan and decommissioning cost estimate will be provided prior to start of construction.

Prepared For:

Clēnera
AN ENLIGHT COMPANY

Bear Island BESS
Decommissioning Plan

CLIENT NAME	**Clenera**
PROJECT NAME	**Bear Island BESS**
LOCATION	**Surry, VA 23883** **Surry County, Virginia**
PROJECT	**Battery Storage Facility**

Rev.	Date	Description	Prepared	Checked	Approved
0	3/13/2025	Released for Client Use	NBF	KJ	AC

Table of Contents

1 Introduction

Clenera (Applicant) is proposing to construct an up to 75 MW x 4-hour Battery Energy Storage (BESS) facility called Bear Island BESS (Project) in Surry County, Virginia. The overall project site will span approximately 32.5 aces, of which approximately 10 acres will be fenced. The project will connect to the electric grid transmission system at a planned 230 kV switchyard to be located on site, which will be constructed, owned, and operated by the utility. A new collector substation is planned across from the switchyard, which will be constructed, owned, and operated by the Project. The gen-tie transmission line and switchyard infrastructure serving as the Point of Interconnection (POI) owned and operated by the utility/grid operator is not covered by this Project's decommissioning plan.

The operational life of the Project is anticipated to be approximately 20 years. This Decommissioning Methodology (Plan) describes the procedures associated with decommissioning the Project and has been created to support the Project's Conditional Use Permit application.

This Plan lays out the procedures for restoring the site to its original use at the end of the Project's operational life. The Plan describes procedures for the removal of Project components. The components of the Project are described below and are shown in the preliminary layout in Appendix A.

2 Project Components

Appendix A provides detailed information regarding the anticipated location and description of the Facility components. The Facility generally consists of the equipment and infrastructure listed below:

- Invertor Steel Piers
- BESS Modules/Enclosures
- Transformers and electrical Auxiliary System Foundations
- Inverters/GSU Transformers
- Medium and Low Voltage Collector System
- Overhead Electrical T- Lines Jumbler
- Access Roads
- Fencing, Gating, and Safety Features
- Collector Substation
- Data Acquisition System (DAS) System
- Operations and Maintenance (O&M) Building (if necessary); and
- Weather Stations.

3 Regulatory Compliance

Prior to the commencement of decommissioning, Bear Island will perform the appropriate due diligence requirements and obtain the necessary county, state, and federal approvals to complete decommissioning activities. To mitigate any environmental impact from decommissioning, Bear Island will assess the necessary permits and approvals in the future regulatory environment to maintain regulatory compliance and may include the following:

- Review of on-site jurisdictional status and potential impacts to wetlands and waterbodies to comply with the Clean Water Act
- Consultation with the United States Fish and Wildlife Service to evaluate compliance with the Endangered Species Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and any other relevant regulations at the time of decommissioning
- Consultation with the Virginia Department of Energy and Virginia Department of Environmental Quality for compliance with any pertinent state regulatory requirements
- Completion of a Phase I Environmental Site Assessment in support of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) protection
- Development and implementation of a Stormwater Pollution Prevention Plan (SWPPP)
- Surry County building, road, discharge, or erosion control permits (as necessary); and
- Special state or local hauling permits (as necessary).

4 Decommissioning

The Project will be decommissioned at the end of its useful life. The Project is presumed to be at the end of its useful life if the facility generates no electricity for a continuous period of 12 months. The Project will notify the Zoning Administrator by certified mail of the proposed date of discontinued operations and plans for removal. The following general decommissioning activities will occur:

Decommissioning Sequence:

1. Obtain required site permits from Authority Having Jurisdiction (AHJ)
2. Disconnect all utility grid power
3. Move all disconnects to the off position
4. Disconnect all above ground wirings, cables, and electrical connections
5. Remove all BESS systems and related facilities
6. Remove Inverters/Step up Transformer (GSU), mounting equipment, pads and posts
7. Remove all electrical equipment, and their foundations
8. Remove DAS equipment, feeders, and conduit
9. Remove all above ground mounting equipment components and posts
10. Excavate and remove Underground feeders and conduit
11. Remove all MV feeders and conductors

12. Removal of Collector Substation
13. Removal of Gen-tie Transmission line
14. Remove access road
15. O&M Facility (if one exists)
16. Fire Suppression and safety systems
17. Remove all fencing
18. Fill/Grade/Seed as needed

Once the BESS facility has been removed, it is expected that the site will be returned to as close to its original condition as possible. Some minor grading may be required; topsoil (if removed) will be reapplied to allow for reseeding and growth.

The plan is to remove all BESS and Collector Substation related system. However, some components may be left in place under certain circumstances. Electrical lines that will not impact future use of the Project Area or Substation foundation (at least 3 feet in depth) may be left in place per renewable industry practices. Steel piles, where full removal is unattainable, may be cut and left in place at a depth of 3 feet or greater below the ground surface. Additionally, the Project Collector Substation could remain in place should another agreement or future use necessitate its continued operation by the utility or another third party. Additionally, landowners may desire that private access roads remain in place for their use. The Project will obtain a written request from the landowner for a road or structure (such as a potential O&M building) to remain in place.

5 Materials, Recycling, and Disposal

Many components of the facility, such as battery modules/enclosures, wiring, piles, inverters and transformer, electrical poles, retain value over time. Panels, while slightly less efficient, may be reused elsewhere, or components may be broken down and recycled. Recycling of BESS battery modules and equipment is rapidly evolving and can be handled through a combination of sources such as certain manufacturers, an international waste program founded by and for the BESS industry), or waste management companies. More than 90% of the semiconductor material and glass can be reused in new modules and products. Other waste materials that hold no value will be recycled or disposed of via a licensed solid waste disposal facility

6 Site Restoration

Following the completion of decommissioning activities, it is anticipated that the site will primarily be converted back to the pre-construction land uses. Decommissioning of the Project, including the removal of materials followed by site restoration, should be completed in approximately 6 months.

7 BESS Decommissioning

As with any other asset within the power sector, the decommissioning process involves dismantling the BESS and removing it from the site in compliance with applicable federal and local rules that govern the safe transport and disposition of used equipment or waste. A primary issue in end-of-life planning is who bears the legal and financial liability for the equipment once a facility shuts down and components are moved offsite. Even if an engineering, procurement, and construction (EPC) or an operating contract assigns decommissioning cost responsibilities to another party, the used lithium-ion batteries will be classified as hazardous waste and thus the owner will be considered a hazardous waste generator liable for proper disposal under the Environmental Protection Agency (EPA) rules under the Resource Conservation and Recovery Act (RCRA).

Decommissioning obligations, processes, and costs for stationary storage are rapidly evolving with the industry, and the Project will adapt it's Decommissioning Plan throughout the life of the Project as standards change.

The actual scope of decommissioning depends on project-specific conditions, the type of system, and the disposition pathway chosen, such as whether some or all of the BESS will be reused or recycled. In some cases, the battery modules are removed, while the balance of the system (controls, enclosures, etc.) remain and are re-used with new battery modules. In other cases, the full systems are replaced as integrated packages. The battery modules have a limited expected life span, of approximately 12 to 15 years and will be replaced during the life of the Project, The replacement of the batteries is governed by contractual agreements with the supplier. When the site itself is being entirely decommissioned (no future energy storage or similar infrastructure will occupy it), contractual agreements govern the final state of the site (e.g. resulting in remediated land, residual foundations, gravel, etc.).

Once a used battery is removed from service and diverted toward end-of-life management, it is designated as "Universal Waste," a special category of hazardous waste under EPA regulations. These rules generally require recordkeeping, labeling, and storage methods that keep material out of the environment, and they outline approved recycling or disposal pathways. Damaged cells, e.g., where the cell casing has been breached, may face additional requirements than those imposed under Universal Waste rules. A battery intended for refurbishment and reuse is not considered "waste" under RCRA, because it is not discarded.

Beside the end-of-life management of batteries, the balance of plant as previously described in this decommissioning plan, can represent a significant quantity of materials, including concrete pads, steel piles/enclosures, cabling, and an array of electronics that are part of the entire energy storage system package. Concrete and steel are readily recyclable, and many enclosures can be reused, particularly if a site is being repowered with new batteries at the end of old equipment's lifespan. Inverters, control systems, and other electronic equipment share many of the challenges of e-waste more broadly, but useful materials can often be recovered. Some of the dismantled equipment from the BESS can be reused with minimal processing. For example, rack systems can be reused in new or existing BESS facilities or returned to original equipment manufacturers (OEMs) for spare parts inventory.

8 Decommissioning Cost Estimate

The facility will be decommissioned at the end of life. Below is the estimated decommissioning cost of the Project in Surry County, Virgina, (76°44'40.39W, 37°4'54.91"N).

75 MW x4 hr. BESS Decommissioning Cost: Table 8-1:

Foundations Structural Removal	QUANTITY	UNITS	Unit Cost	Total	Comment
# Transformers Support Steel Helical piers 4	e	EA	$150	$9,900	Disassembly, Haul Off-Site
# Invertors Support Steel Helical piers	66	EA	$150	$9,900	Disassembly, Haul Off-Site
Concrete Pads	132	Lot	$300	$39,600	Disassembly, Haul Off-Site
SUBTOTAL				$59,400	
Electrical Equipment Removal	**QUANTITY**	**UNITS**	**Unit Cost**	**Total**	**Comment**
Inverters 1,140 KW	66	EA	$1,500	$99,000	Disassembly, Haul Off-Site
BYD Battery Modules Enclosures/Containers (Battery Removal by Manufacturer)	132	EA	$1,500	$198,000	Disassembly, Haul Off-Site
MV Transformers, 1,250 KVA	66	EA	$2,500	$165,000	Disassembly, Haul Off-Site
Electrical Auxiliary System	3	LOT	$2,500	$7,500	Disassembly, Haul Off-Site
SUBTOTAL				$469,500	
Electrical Wires Removal	**QUANTITY**	**UNITS**	**Unit Cost**	**Total**	**Comment**
MV Conductor	6,000	FT	10	$60,000	Disassembly, Haul Off-Site
DC/AC Conductor	60,000	FT	$0.5	$30,000	Disassembly, Haul Off-Site
SUBTOTAL				$90,000	
Collector Substation Removal	**QUANTITY**	**UNITS**	**Unit Cost**	**Total**	**Comment**
Circuit Breakers 34.5 kV	3	EA	$7,500	$22,500	Disassembly, Haul Off-site
HV Circuit Breakers 230 kV	1	EA	$12,500	$12,500	Disassembly, Haul Off-site
Substation Steel	1	LOT	$175,000	$175,000	Disassembly, Haul Off-site
Foundation/Fence	1	LOT	$195,000	$195,000	Disassembly, Haul Off-site
Main Power Transformers 230- 34.5 kV 51/68/85 MVA	1	EA	$85,000	$85,000	Disassembly, Haul Off-site
Substation Control House	1	EA	$55,000	$55,000	Disassembly, Haul Off-site
Capacitor Bank (final TBD)	N/A	EA		$0	Disassembly, Haul Off-site
SUBTOTAL				$545,000	
Fence/land, Removal/Restoration	**QUANTITY**	**UNITS**	**Unit Cost**	**Total**	**Comment**
Fence Perimeter	2,800	FT	$2	$5,600	Disassembly, Haul Off-Site
Site Remediation/roads (disturbed area)	14	Acre	$5,000	$70,000	Decompaction/Seeding
Storm Water Management Ponds	2	EA	$2,500	$5,000	Restoration
Engineering & permitting	1	LOT	$50,000	$50,000	Budgeted Allowance
SUBTOTAL				$130,600	

Summary of BESS Removal Estimate	
Foundations Structural Removal	$59,400
Electrical Equipment Removal	$469,500
Electrical Wires Removal	$90,000
Collector Substation Removal	$545,000
Fence/land, Removal/Restoration	$130,600
ESTIMATED GRAND TOTAL	**$1,294,500**

Data Sources:
1. Material List and Quantities: Based on schematic design.
2. Unit Price Values: Based on R.S. Means and typical quantities for various components.
3. Battery Modules Packaging/Transportation covered by Supplies' contractual Agreements.

8.1 NET DECOMMISSIONING COST

The cost estimate shall not include credits for the resale or salvage of the equipment and materials.

8.2 DECOMMISSIONING ASSUMPTIONS

To develop a cost estimate for the decommissioning of the Project, Timmons Group made the following assumptions. Costs were estimated based on current pricing, technology, and regulatory requirements. The assumptions are listed in order from top to bottom of the estimate spreadsheet. We developed time and materials-based estimates considering composition of work crews

1. Decommissioning cost is based on a 5-year initial period for the financial security. The projected life of the project is 20 years.
2. This cost estimate is based on the Timmons Group data request forwarded February 2025.
3. Common labor will be used for many of the tasks except for heavy equipment operation. Pricing is based on local Southeast US labor rates.
4. Permit applications required include the preparation of a Stormwater Pollution Protection Plan (SWPPP) and a Spill Prevention Control and Countermeasure (SPCC) Plan.
5. Road gravel removal was estimated on a time and material basis using a 16 feet width and an 8-inch thickness for the access roads. Substation aggregate is included in the substation quantities. Since the material will not remain on site, a hauling cost is added to the removal cost. Road aggregate can often be disposed of by giving to landowners for use on driveways and parking areas. Many landfills will accept clean aggregate for use as "daily cover" and do not charge for the disposal.
6. Sie remediation reflects the cost of mobilizing and operating light equipment to spread and smooth the topsoil stockpiled on site to replace the aggregate removed from the road.

7. Erosion and sediment control reflects the cost of silt fence on the downhill side of the road and surrounding all on-site wetlands.
8. Topsoil is required to be stockpiled on site during construction, therefore this topsoil is available on site to replace the road aggregate, once removed. Subsoiling cost to decompact roadway areas is estimated as $750 per acre (based on previous bid prices), and revegetation on removed road area, which includes seed, fertilizer, lime, and care until vegetation is established is $2,750 per acre. The majority of the project area is "over-seeded" since the decommissioning activities are not expected to eliminate the existing grasses and vegetation or heavily compact the soils. Over-seeding does not include fertilizer and lime and is estimated at $5,000 per acre.
9. Battery Racks pads, invertor/GS foundations and Auxiliary power transformers are included as lump sum.
10. A metal recycling facility (FEA Salvage and Recycling) in Virginia and is located relatively close to the project site. Steel scrap pricing was acquired from www.scrapmonster.com.
11. No topsoil is planned to be removed from the site during decommissioning and most of the site will not have been compacted by heavy truck or equipment traffic, so the site turf establishment cost is based on RS Means unit prices for applying lime, fertilizer, and seed at the price of per acre plus an allowance for some areas to be decompacted.
12. There is an active market for reselling and recycling electrical transformers and inverters with several national companies specializing in recycling. We have assumed a 20% recovery of these units based on field experience with used transformers as opposed to trying to break them down into raw material components.
13. The underground collection lines are assumed to be aluminum conductor.
14. Care to prevent damage and breakage of equipment, BESS modules, inverters, capacitors, and SCADA must be exercised, but removal assumes unskilled common labor under supervision.

If required an estimated salvage values could be provided and will be derived from years of experience decommissioning and uprating electric substations, overhead transmission, and distribution hardware/underground distribution hardware that would include but not limited to substation and pad mounted transformers, overhead and underground conductors, poles, fencing, ground grid conductors, control housings, circuit breakers (high and medium voltage), protective relaying, and other hardware items. These individual items have high salvage value either as stand-alone components to be reused or recycled and sold as used items. These items also have a relatively high salvage value as pure scrap for steel, copper and other commodities.

For all medium voltage transformers, breakers and other items, Southeastern Transformer Company in Dunn, NC provides complete repair, upgrading and recycling and resale for all items mentioned above. Their website is: https://www.setransformer.com. They have a national presence.

For any and all recycling and upgrading, Solomon Corporation offers the same set of services for transformer repair and recycling and complete substation decommissioning services. With seven different locations, Solomon is one of several vendors that can decommission and recycle the components as noted above. Their website is: https://www.solomoncorp.com/. Solomon Corporation is only one of many transmission and distribution recycle and decommissioning shops that do this mainly to harvest the components.

For recycling conductor, General Cable and Southwire both utilize extensive scrap procurement programs to reuse copper and aluminum conductor harvested from projects such as this one to supplement and reduce their raw material costs.

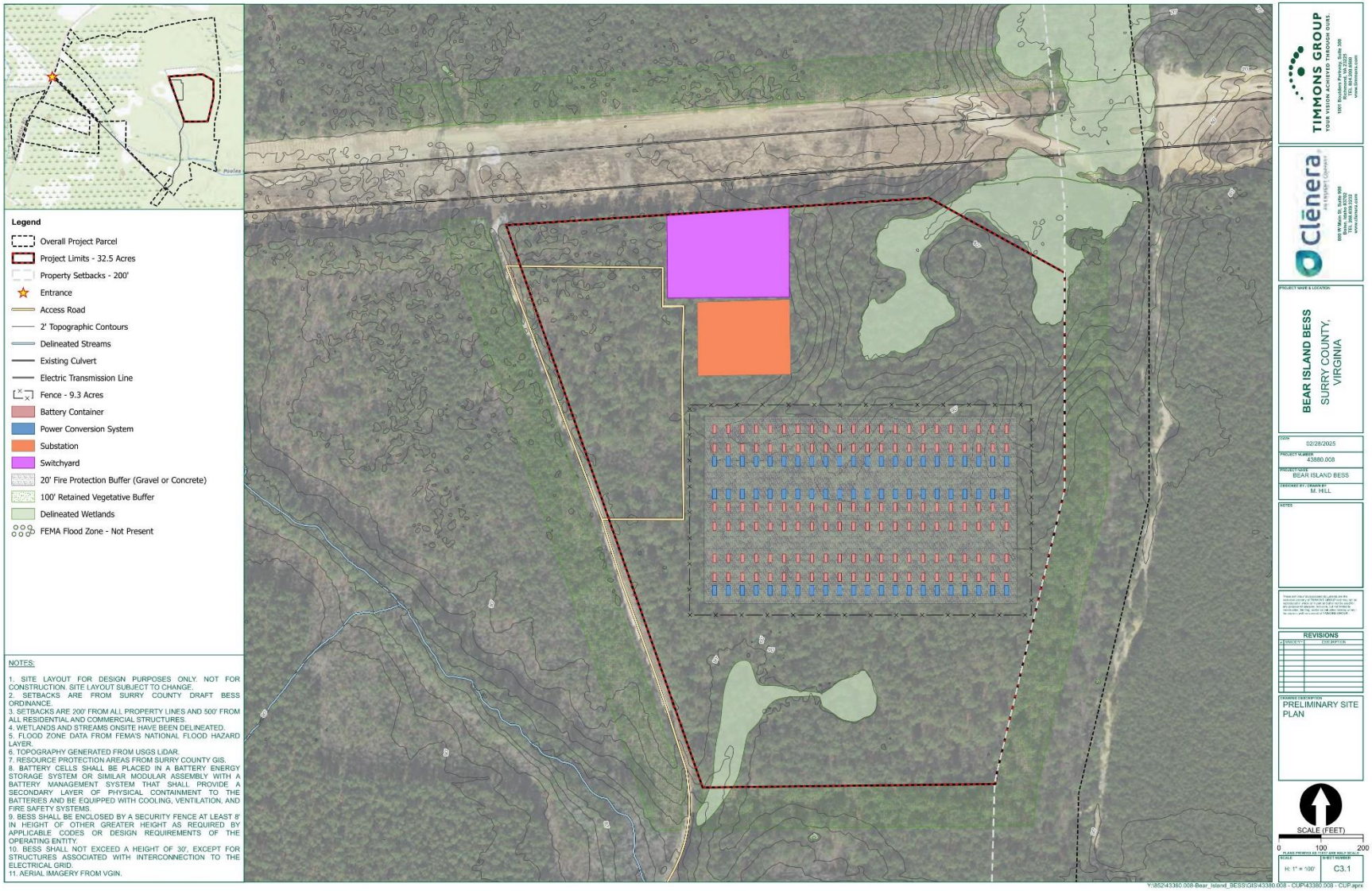
Here is the link to the General Cable program which only increases the salvage values found in this Plan: General Cable Recycling

https://es.generalcable.com/na/us-can/socialresponsibility/sustainability/recycling

9 Financial Assurance

The full decommissioning cost, without salvage value, will be guaranteed by escrow at a federally insured financial institution, irrevocable letter of credit, or surety bond before a building permit is issued to the project. The decommissioning cost guarantee will remain valid until the battery energy system has been fully decommissioned. If the Project Owner fails to remove the installation in accordance with the requirements of the Conditional Use Permit or within the proposed date of decommissioning, the County may collect the bond or other surety and the County or hired third-party may enter the property to physically remove the installation. Based on industry trends, the projected and actual costs of decommissioning are expected to go down over time based on improvements both to best practices in calculating these costs and the decommissioning process itself. Project Owner will reevaluate decommissioning costs with a qualified engineering consultant every five years during the life of the Project. If the recalculated estimate exceeds the original estimated decommissioning cost by 10 percent or more, the Project Owner will increase the guarantee to meet the new cost estimate. If the recalculated estimate is less than 90 percent of the original estimated cost of decommissioning, the County may approve reducing the guarantee.

Appendix A – Site Plan


Legend
Overall Project Parcel
Project Limits - 32.5 Acres
Property Setbacks - 200'
Entrance
Access Road
2' Topographic Contours
Delineated Streams
Existing Culvert
Electric Transmission Line
Fence - 9.3 Acres
Battery Container
Power Conversion System
Substation
Switchyard
20' Fire Protection Buffer (Gravel or Concrete)
100' Retained Vegetative Buffer
Delineated Wetlands
FEMA Flood Zone - Not Present
NOTES:
1. SITE LAYOUT FOR DESIGN PURPOSES ONLY. NOT FOR CONSTRUCTION. SITE LAYOUT SUBJECT TO CHANGE.
2. SETBACKS ARE FROM SURRY COUNTY DRAFT BESS ORDINANCE.
3. SETBACKS ARE 200' FROM ALL PROPERTY LINES AND 500' FROM ALL RESIDENTIAL AND COMMERCIAL STRUCTURES.
4. WETLANDS AND STREAMS ONSITE HAVE BEEN DELINEATED.
5. FLOOD ZONE DATA FROM FEMA'S NATIONAL FLOOD HAZARD LAYER.
6. TOPOGRAPHY GENERATED FROM USGS LIDAR.
7. RESOURCE PROTECTION AREAS FROM SURRY COUNTY GIS.
8. BATTERY CELLS SHALL BE PLACED IN A BATTERY ENERGY STORAGE SYSTEM OR SIMILAR MODULAR ASSEMBLY WITH A BATTERY MANAGEMENT SYSTEM THAT SHALL PROVIDE A SECONDARY LAYER OF PHYSICAL CONTAINMENT TO THE BATTERIES AND BE EQUIPPED WITH COOLING, VENTILATION, AND FIRE SAFETY SYSTEMS.
9. BESS SHALL BE ENCLOSED BY A SECURITY FENCE AT LEAST 8' IN HEIGHT OF OTHER GREATER HEIGHT AS REQUIRED BY APPLICABLE CODES OR DESIGN REQUIREMENTS OF THE OPERATING ENTITY.
10. BESS SHALL NOT EXCEED A HEIGHT OF 30', EXCEPT FOR STRUCTURES ASSOCIATED WITH INTERCONNECTION TO THE ELECTRICAL GRID.
11. AERIAL IMAGERY FROM VGIN.
TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.
Clēnera
BEAR ISLAND BESS
SURRY COUNTY, VIRGINIA
02/28/2025
43880.008
BEAR ISLAND BESS
M. HILL
REVISIONS
PRELIMINARY SITE PLAN
SCALE (FEET)
0
100
200
C3.1

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

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Suite 300
Richmond, VA 23225

P 804.200.6500
F 804.560.1016
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MEMORANDUM

TO: Surry County Planning and Zoning Department

FROM: Timmons Group on behalf of Bear Island BESS

DATE: March 26, 2025

RE: Bear Island BESS Environmental and Cultural Resource Impact Analysis

Timmons Group has conducted a limited environmental review of the Bear Island Battery Energy Storage System (BESS) project for a battery energy storage facility. The project is located on approximately 32.5 acres of an approximately 430-acre parcel in Surry County, Virginia. This study was prepared to identify the proximity of the Bear Island BESS project (Site) to local, state, and federally regulated resources that have the potential to impact the feasibility of the Site.

I. Federal, State, and Local Conservation and Recreation Lands

No federal, state or local lands intersect with the Site. There are four managed lands located within five miles of the proposed project location. More information is available in Table 1. The nearest protected area is the Farm and Ranch Lands Protection Program agricultural easement managed by the National Resources Conservation Service, located 1.7 miles north of the Site. Other protected lands within the vicinity of the Site are the Chippokes Plantation State Park, the Hog Island Wildlife Management Area, and an Isle of Wight Wetlands Reserve Program conservation easement.

Table 1. Protected Lands within three miles of Bear Island BESS

Name	Land Type	Owner
Farm and Ranch Lands Protection Program	Agricultural Easement	National Resources Conservation Service
Chippokes Plantation State Park	State Park	Virginia Department of Conservation and Recreation
Hog Island Wildlife Management Area	Wildlife Management Area	Virginia Department of Wildlife Resources
Wetlands Reserve Program	Conservation Easement	National Resources Conservation Service

II. Wetlands and Streams

A wetland delineation was performed for the project parcel, and wetlands and streams are present. The BESS facility will avoid wetlands and streams, but jurisdictional waters may need to be crossed for Site access. If wetland or stream impacts are unavoidable, the Applicant will obtain the appropriate USACE permit for any impacts to USACE jurisdictional wetlands and streams. According to data from the Surry County GIS database, there are resource protection areas on the larger project parcel, but not with the project Site.

III. Threatened and Endangered Species

Timmons Group has conducted a threatened and endangered (T&E) species review to gain insight regarding the potential presence of Endangered Species Act (ESA) listed species as well as state listed species within two miles of the Site. The following databases were queried:

- U.S. Fish and Wildlife Service (USFWS) – Information, Planning, and Consultations System (IPaC)
- Virginia Department of Wildlife Resources (VDWR) – Wildlife Environmental Review Mapping System (WERMS)
- Virginia Department of Wildlife Resources (VDWR) – Virginia Fish and Wildlife Information Service
- Virginia Department of Wildlife Resources (VDWR) – Northern Long-eared Bat Regulatory Buffer Interactive Tool
- Virginia Department of Wildlife Resources (VDWR) – Little Brown Bat and Tri-Colored Bat Winter Habitat and Roost Locator

Based on the queried databases, there is the potential for T&E species to occur on or near the project.

- Northern Long-eared Bat, *Myotis septentrionalis,* Federal, State Endangered (IPaC)
- Tri-colored Bat, *Perimyotis subflavus,* Federal Proposed Endangered, State Endangered (IPaC)
- Monarch Butterfly, *Danaus plexippus*, Federal Proposed Threatened (IPaC)

According to the USFWS IPaC search results, the federally and state endangered northern long-eared bat, the federally proposed and state endangered tri-colored bat, and the federally proposed threatened monarch butterfly have the potential to occur on or near the Site. Based on the VDWR Northern Long-eared Bat Regulatory Buffer Interactive Tool and the VDWR Little Brown Bat and Tri-colored Bat Winter Habitat and Roost Locator, the Site does not intersect with any known capture buffers, roost trees, or hibernacula for either the tri-colored bat or the northern long-eared bat. The Site does not intersect with USFWS proposed critical habitat for monarch butterfly.

During permitting efforts at the state level, the Applicant will coordinate with resource agencies to ensure the protection and avoidance of T&E species that may occur onsite.

IV. Cultural and Historic Resources

The Project is not expected to have any impacts to cultural and historical resources due to the amount of cultural work required at the state permitting level. In-depth cultural resource surveys conducted by qualified professionals will be submitted for approval and concurrence by the Virginia Department of Historic Resources (VDHR).

According to the Virginia Cultural Resource Information System, there are no previously recorded architectural or archaeological resources within the project area, or within the half-mile buffer surrounding the Site.

<u>Attachments</u>

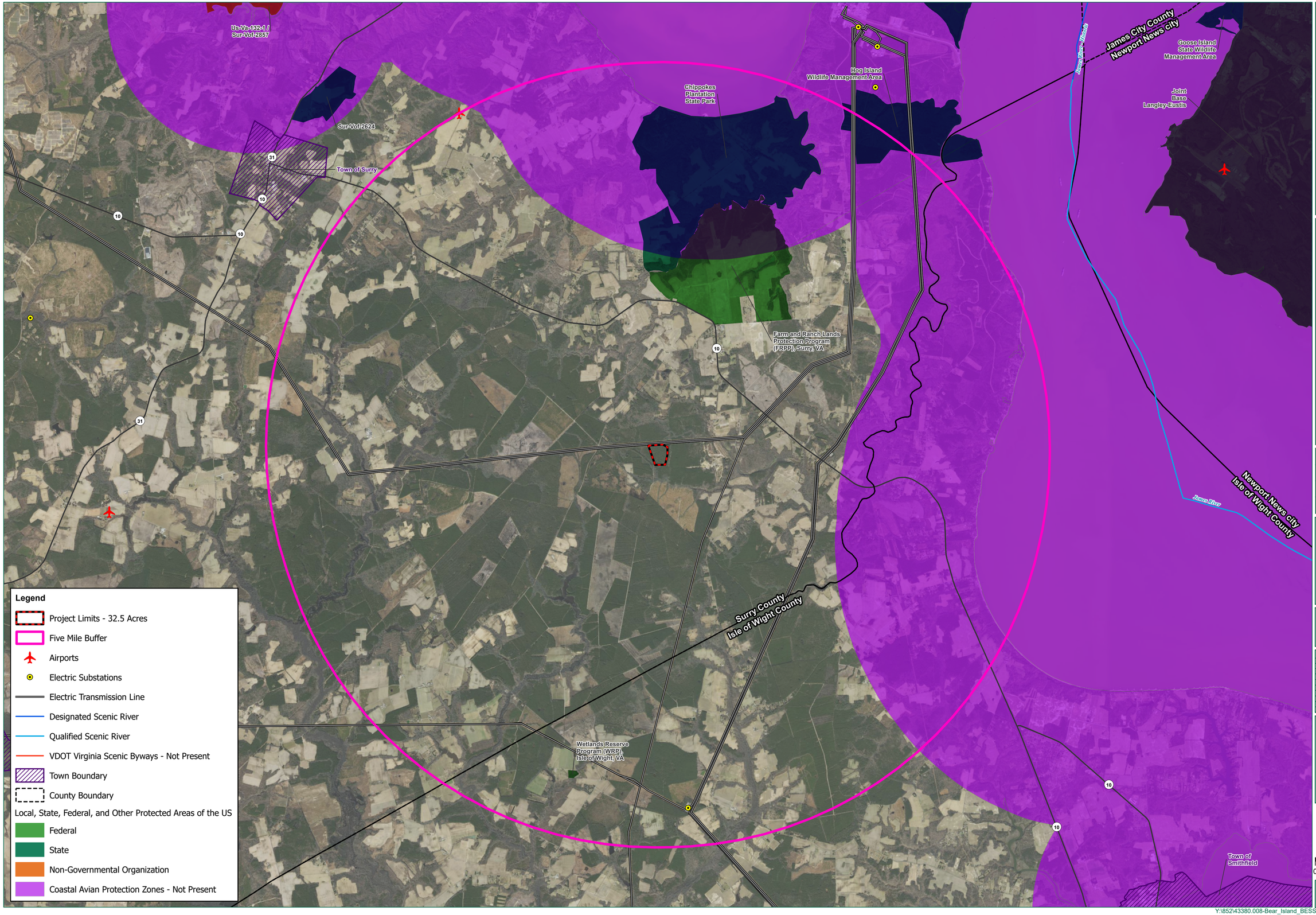
Attachment 1 Protected Lands Map

Attachment 2 Environmental Inventory Map

Attachment 3 Threatened and Endangered Species Database Search

Attachment 4 Cultural Resources Map

Attachment 1: Protected Lands Map



TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.
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Richmond, VA 23225
TEL 804.200.6500
www.timmons.com

PROJECT NAME & LOCATION

BEAR ISLAND BESS

SURRY COUNTY - VIRGINIA

DATE: 02/21/2025

PROJECT NUMBER: 43880.008

PROJECT NAME: BEAR ISLAND BESS

DESIGNED BY / DRAWN BY: M. HILL

NOTES:
Protected Lands data from USGS's PAD-US database.
Airport data from ESRI.
Aerial imagery from VGIN.

REVISIONS

#	MM/DD/YY	DESCRIPTION

DRAWING DESCRIPTION: PROTECTED LANDS MAP

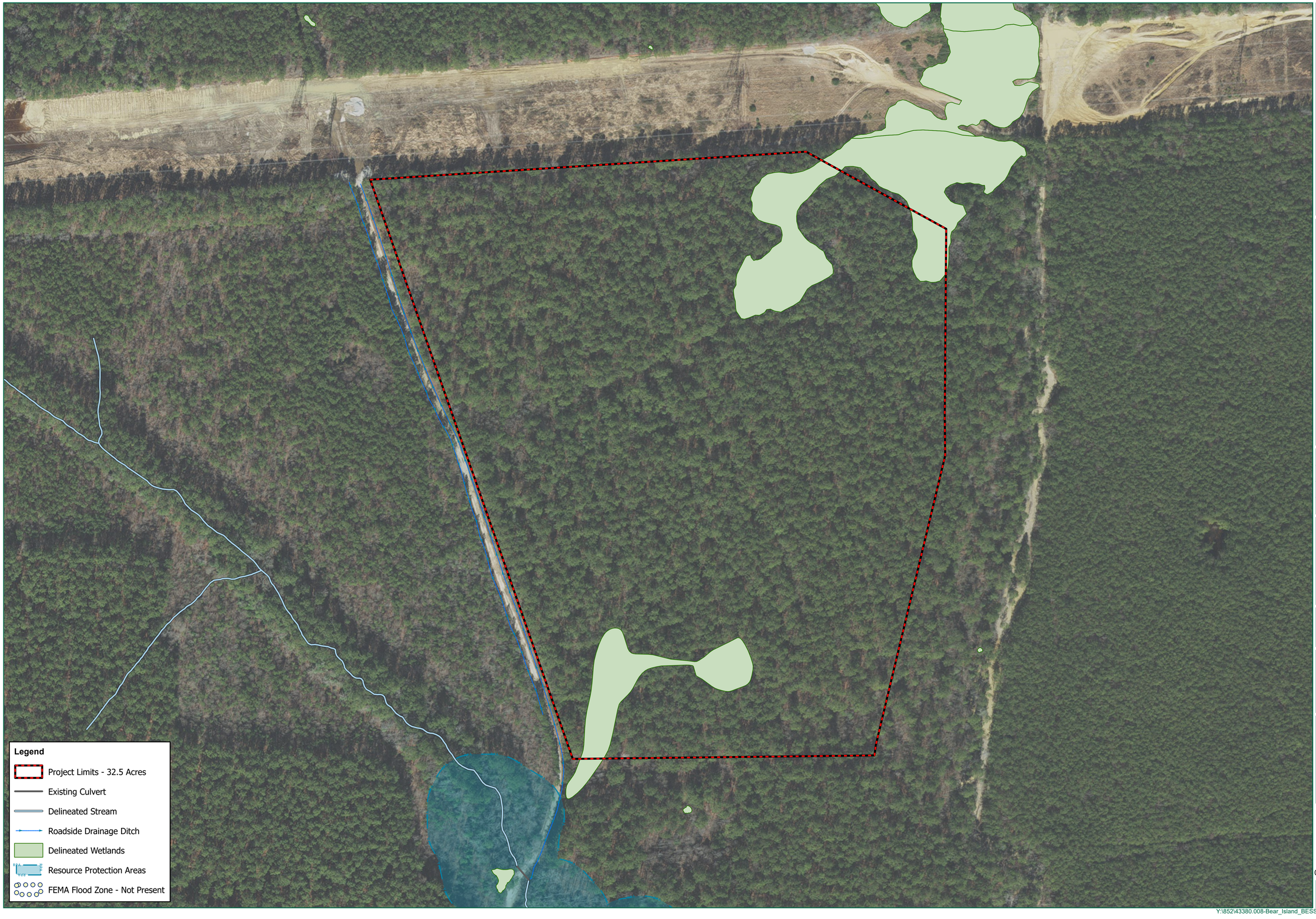
SCALE (FEET)
0 3,000 6,000
PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE: H: 1" = 3,000'

SHEET NUMBER: 1

Y:\852\43380.008-Bear_Island_BESS\GIS\43380.008\43380.008.aprx

Attachment 2: Environmental Inventory Map



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PROJECT NAME & LOCATION

BEAR ISLAND BESS

SURRY COUNTY - VIRGINIA

DATE	02/21/2025
PROJECT NUMBER	43380.008
PROJECT NAME	BEAR ISLAND BESS
DESIGNED BY / DRAWN BY	M. HILL

NOTES:
Wetlands and streams onsite have been delineated.
Flood zone data from FEMA's National Flood Hazard Layer.
Resource protection area from Surry County GIS.
Aerial imagery from VGIN.

REVISIONS

#	MM/DD/YY	DESCRIPTION

DRAWING DESCRIPTION

ENVIRONMENTAL INVENTORY MAP

SCALE (FEET)
0 100 200

PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE	SHEET NUMBER
H: 1" = 100'	1

Y:\852\43380.008-Bear_Island_BESS\GIS\43380.008\43380.008.aprx

Attachment 3: Threatened and Endangered Species Database Search

U.S. Fish and Wildlife Service (USFWS) – Information, Planning, and Consultations System (IPaC)

IPaC **U.S. Fish & Wildlife Service**

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

Surry County, Virginia

Local office

Virginia Ecological Services Field Office

(804) 693-6694

6669 Short Lane
Gloucester, VA 23061-4410

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 species[1] 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 Fisheries[2]).

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
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

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.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental

Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

Review the FAQs

The FAQs below provide important additional information and resources.

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 Oct 15 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 "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "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.

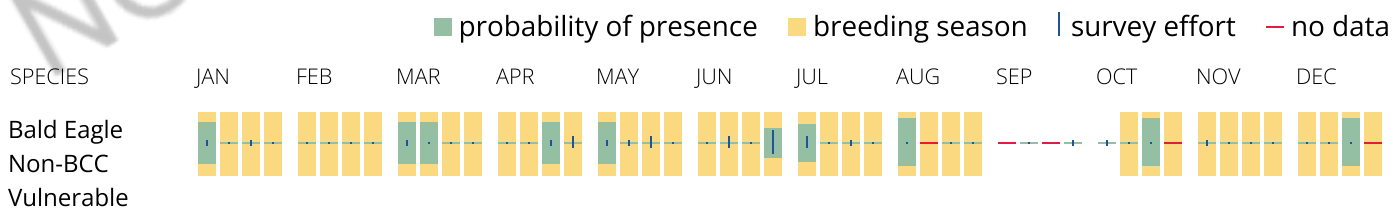
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

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.



Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence 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 an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report

On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). 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 line or no data line (red horizontal) 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 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 and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are 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 resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), 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.

Interpreting the Probability of Presence Graphs

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 taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

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

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.

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.

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.

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.

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service). The incidental take of migratory birds is the injury or death of birds that results from, but is not the purpose, of an activity. The Service interprets the MBTA to prohibit incidental take.

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:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Measures for Proactively Minimizing Migratory Bird Impacts

Your IPaC Migratory Bird list showcases birds of concern, including Birds of Conservation Concern (BCC), in your project location. This is not a comprehensive list of all birds found in your project area. However, you can help proactively minimize significant impacts to all birds at your project location by implementing the measures in the Nationwide avoidance and minimization measures for birds document, and any other project-specific avoidance and minimization measures suggested at the link Measures for avoiding and minimizing impacts to birds for the birds of concern on your list below.

Ensure Your Migratory Bird List is Accurate and Complete

If your project area is in a poorly surveyed area, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental

Information on Migratory Birds and Eagles document, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

Review the FAQs

The FAQs below provide important additional information and resources.

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 Oct 15 to Aug 31
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Chimney Swift Chaetura pelagica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
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
Grasshopper Sparrow Ammodramus savannarum perpallidus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Kentucky Warbler Geothlypis formosa 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 Setophaga discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Scarlet Tanager Piranga olivacea — Breeds May 10 to Aug 10
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

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 "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "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.

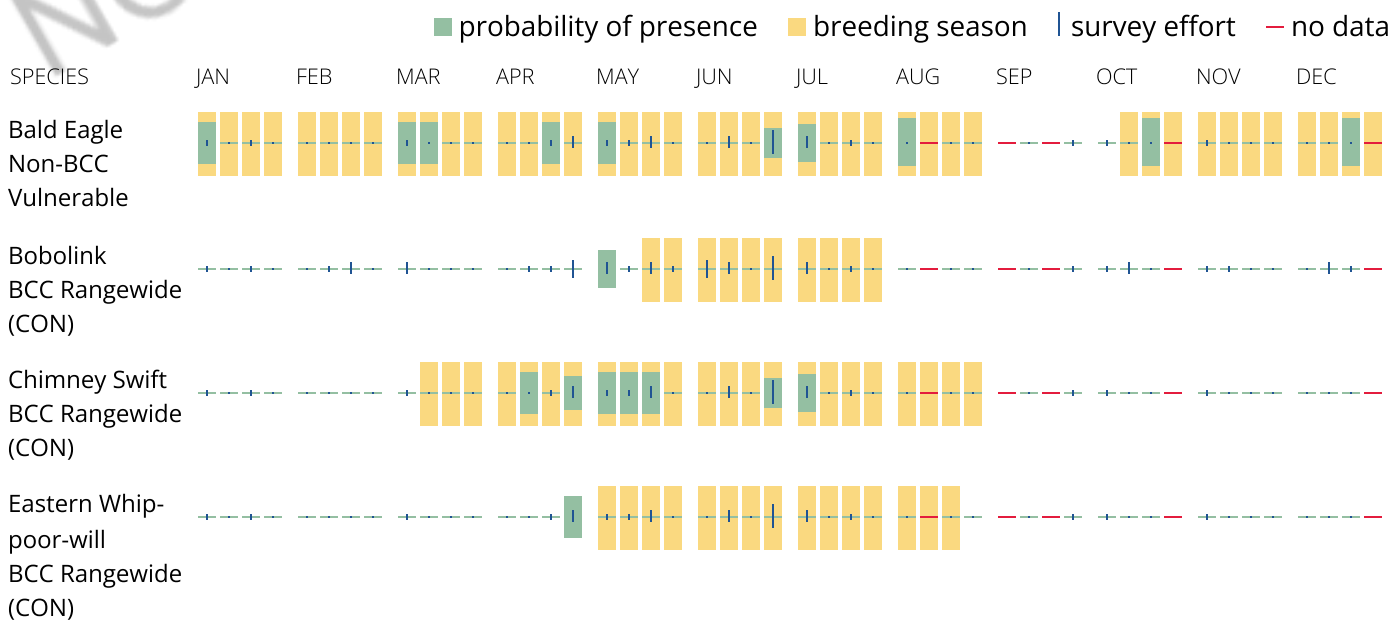
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

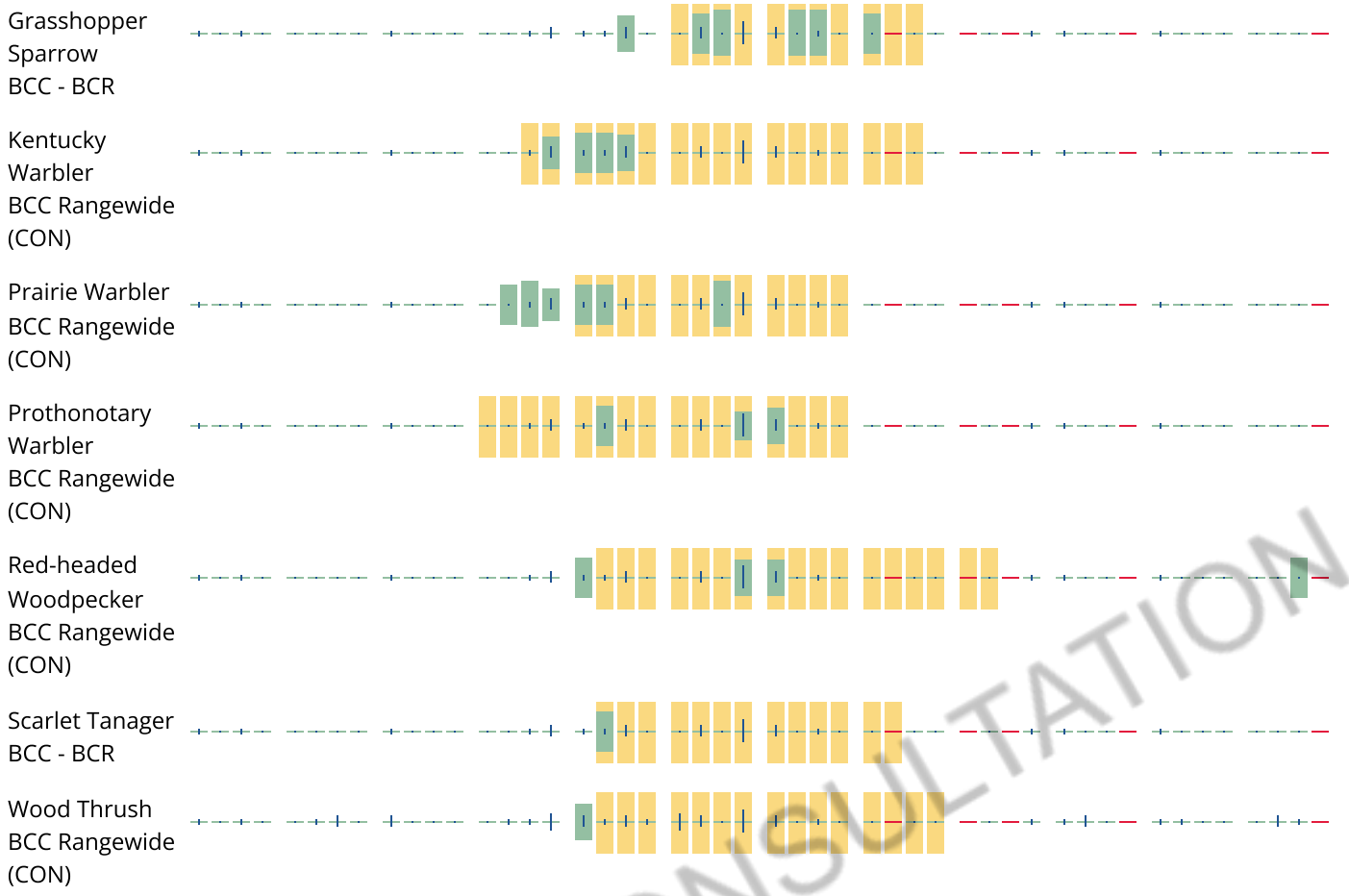
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

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.





Migratory Bird FAQs

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

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed 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 Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as "Vulnerable". See the FAQ "What are the levels of concern for migratory birds?" for more information on the levels of concern covered in the IPaC migratory bird species list.

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) with which your project intersects. These species have been identified as warranting special

attention because they are BCC species in that area, an eagle (Bald and Golden Eagle Protection 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, and to verify survey effort when no results present, please visit the Rapid Avian Information Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

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 to 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 resident), you may query your location using the RAIL Tool and view 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 IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), 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 Bald and Golden Eagle Protection 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 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 BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ "Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

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.

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 look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). 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 does not represent all birds present in your project area. 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 and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs

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 taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

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

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.

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.

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.

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.

Facilities

Wildlife refuges and fish hatcheries

Refuge and fish hatchery information is not available at this time

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

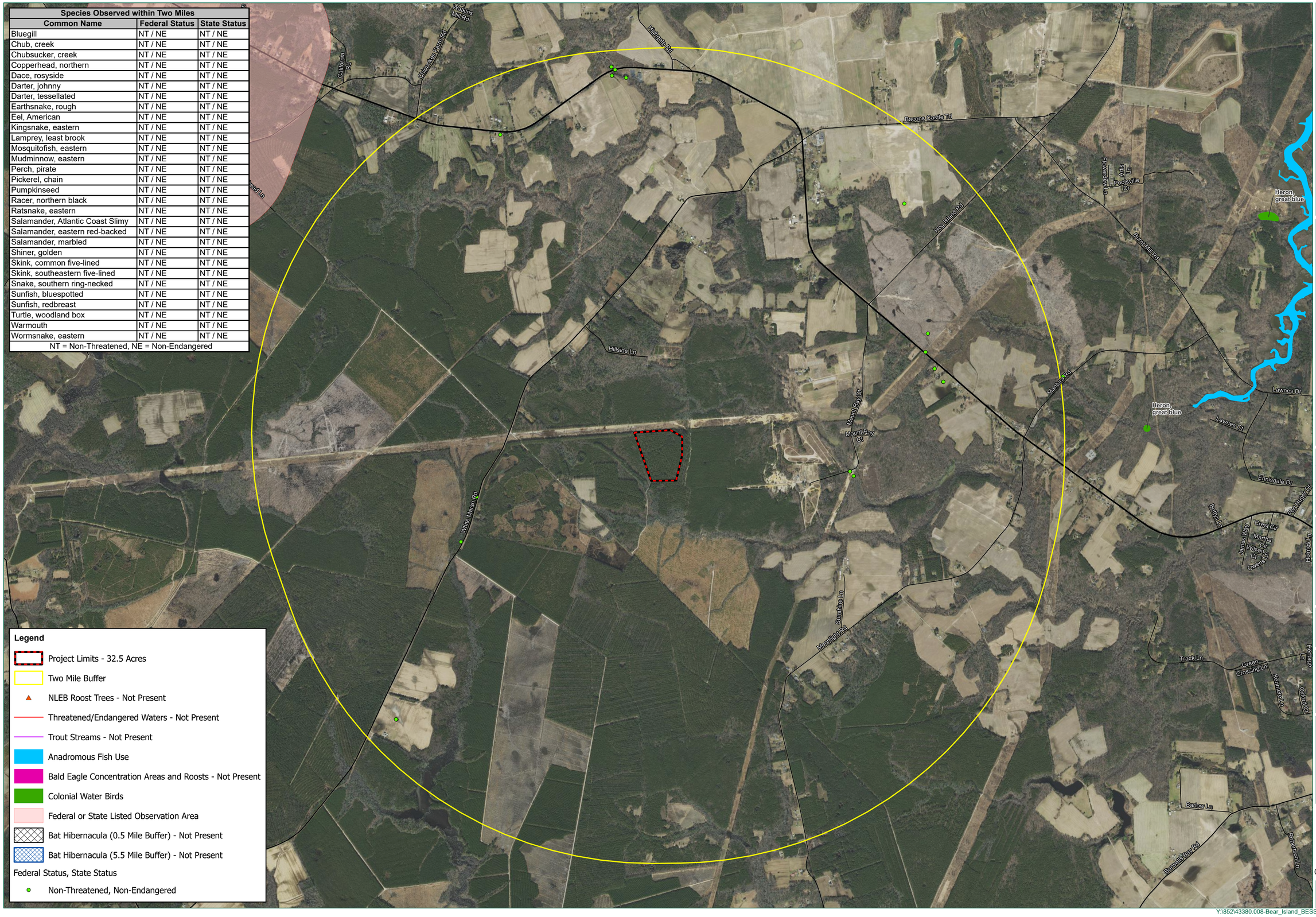
Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid 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.

Virginia Department of Wildlife Resources (VDWR) – Wildlife Environmental Review Mapping System (WERMS)

Species Observed within Two Miles		
Common Name	**Federal Status**	**State Status**
Bluegill	NT / NE	NT / NE
Chub, creek	NT / NE	NT / NE
Chubsucker, creek	NT / NE	NT / NE
Copperhead, northern	NT / NE	NT / NE
Dace, rosyside	NT / NE	NT / NE
Darter, johnny	NT / NE	NT / NE
Darter, tessellated	NT / NE	NT / NE
Earthsnake, rough	NT / NE	NT / NE
Eel, American	NT / NE	NT / NE
Kingsnake, eastern	NT / NE	NT / NE
Lamprey, least brook	NT / NE	NT / NE
Mosquitofish, eastern	NT / NE	NT / NE
Mudminnow, eastern	NT / NE	NT / NE
Perch, pirate	NT / NE	NT / NE
Pickerel, chain	NT / NE	NT / NE
Pumpkinseed	NT / NE	NT / NE
Racer, northern black	NT / NE	NT / NE
Ratsnake, eastern	NT / NE	NT / NE
Salamander, Atlantic Coast Slimy	NT / NE	NT / NE
Salamander, eastern red-backed	NT / NE	NT / NE
Salamander, marbled	NT / NE	NT / NE
Shiner, golden	NT / NE	NT / NE
Skink, common five-lined	NT / NE	NT / NE
Skink, southeastern five-lined	NT / NE	NT / NE
Snake, southern ring-necked	NT / NE	NT / NE
Sunfish, bluespotted	NT / NE	NT / NE
Sunfish, redbreast	NT / NE	NT / NE
Turtle, woodland box	NT / NE	NT / NE
Warmouth	NT / NE	NT / NE
Wormsnake, eastern	NT / NE	NT / NE
NT = Non-Threatened, NE = Non-Endangered		



Legend

- Project Limits - 32.5 Acres
- Two Mile Buffer
- NLEB Roost Trees - Not Present
- Threatened/Endangered Waters - Not Present
- Trout Streams - Not Present
- Anadromous Fish Use
- Bald Eagle Concentration Areas and Roosts - Not Present
- Colonial Water Birds
- Federal or State Listed Observation Area
- Bat Hibernacula (0.5 Mile Buffer) - Not Present
- Bat Hibernacula (5.5 Mile Buffer) - Not Present

Federal Status, State Status

- Non-Threatened, Non-Endangered

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1001 Boulders Parkway, Suite 300
Richmond, VA 23225
TEL 804.200.6500
www.timmons.com

PROJECT NAME & LOCATION

BEAR ISLAND BESS

SURRY COUNTY - VIRGINIA

DATE: 02/21/2025

PROJECT NUMBER: 43880.008

PROJECT NAME: BEAR ISLAND BESS

DESIGNED BY / DRAWN BY: M. HILL

NOTES:
WERMS data from DWR.
Bat hibernacula include identifications of Northern long-eared bat, Tri-colored bat, Little-brown bat, Virginia big-eared bat, Gray bat, and Indiana bat.
Aerial imagery from VGIN.

REVISIONS

#	MM/DD/YY	DESCRIPTION

DRAWING DESCRIPTION

WILDLIFE ENVIRONMENTAL REVIEW MAP

SCALE (FEET)

0 1,200 2,400

PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE	SHEET NUMBER
H: 1" = 1,200'	1

Y:\852\43380.008-Bear_Island_BESS\GIS\43380.008\43380.008.aprx

Virginia Department of Wildlife Resources (VDWR) – Virginia Fish and Wildlife Information Service

VAFWIS - Department of Wildlife Resources

37.08169 -76.74437
is the Search Point
Submit Cancel

Search Point
- **Change** to "clicked" map point
- **Fixed** at 37.08169 -76.74437

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
BW Aerial Photography

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

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

123 Impediment

2 mile radius Search Area

Bald Eagle Concentration Areas and Roosts

Bald Eagle nests 660 and 330 foot management zones

Data Observation Site

back | Refresh Browser Page | Help

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

N
1 0 1 2 3 4 Kilometers
1 0 1 2 3 4 Miles

Point of Search 37.08169 -76.74437
Map Location 37.08169 -76.74437

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: Black & White USGS Aerial Photography (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 336954 and top 4113359. Pixel size is 11. .
Coordinates displayed are decimal Degrees North and West. Map is currently displayed as 1000 columns by 1000 rows for a total of 1000000 pixles. The map display represents 16000 meters east to west by 16000 meters north to south for a total of 256.0 square kilometers. The map display represents 52502 feet east to west by 52502 feet north to south for a total of 98.8 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 Wildlife Resources.

map assembled 2025-02-24 16:03:49 (qa/qc March 21, 2016 12:20 - tn=3506591 dist=3218 I)
$poi=37.0834700 -76.7465700

VaFWIS Initial Project Assessment Report Compiled on 2/24/2025, 4:05:50 PM

Help

Known or likely to occur within a **2 mile buffer around polygon; center 37.0834700 -76.7465699** in **181 Surry County, VA**

View Map of Site Location

488 Known or Likely Species ordered by Status Concern for Conservation (displaying first 25) (25 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
050022	FEST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA
010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		BOVA
040110	FTSE	Ia	Rail, eastern black	Laterallus jamaicensis jamaicensis		BOVA
040228	FTSE	Ia	Woodpecker, Red-cockaded	Dryobates borealis		BOVA
010347	SE	Ia	Sunfish, blackbanded	Enneacanthus chaetodon		BOVA,Habitat
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050034	SE	Ia	Bat, Rafinesque's eastern big-eared	Corynorhinus rafinesquii macrotis		BOVA
050027	FPSE	Ia	Bat, tri-colored	Perimyotis subflavus		BOVA
040096	ST	Ia	Falcon, peregrine	Falco peregrinus		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA
020044	ST	IIa	Salamander, Mabee's	Ambystoma mabeei		BOVA,Habitat
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
100079	FP	IIIa	Butterfly, Monarch	Danaus plexippus		BOVA
030063	CC	IIIa	Turtle, spotted	Clemmys guttata		BOVA
010077		Ia	Shiner, bridle	Notropis bifrenatus		BOVA
020063		IIa	Toad, oak	Anaxyrus quercicus		BOVA,Habitat
020002		IIa	Treefrog, barking	Hyla gratiosa		BOVA
040052		IIa	Duck, American black	Anas rubripes		BOVA
040033		IIa	Egret, snowy	Egretta thula		BOVA
040029		IIa	Heron, little blue	Egretta caerulea caerulea		BOVA
040036		IIa	Night-heron, yellow-crowned	Nyctanassa violacea violacea		BOVA
040181		IIa	Tern, common	Sterna hirundo		BOVA
040320		IIa	Warbler, cerulean	Setophaga cerulea		BOVA
040140		IIa	Woodcock, American	Scolopax minor		BOVA
040105		IIb	Rail, king	Rallus elegans		BOVA

To view **All 488 species** View 488

*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 (1 Reach)

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	

Passenger Swamp (03010202)	SE	010347	SE	Ia	Sunfish, blackbanded	Enneacanthus chaetodon	Yes
Passenger Swamp (03010202)	SE	010347	SE	Ia	Sunfish, blackbanded	Enneacanthus chaetodon	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species (2 Species)

View Map of Combined Terrestrial Habitat Predicted for 2 WAP Tier I & II Species Listed Below

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
020044	ST	IIa	Salamander, Mabee's	Ambystoma mabeei	Yes
020063		IIa	Toad, oak	Anaxyrus quercicus	Yes

Public Holdings:

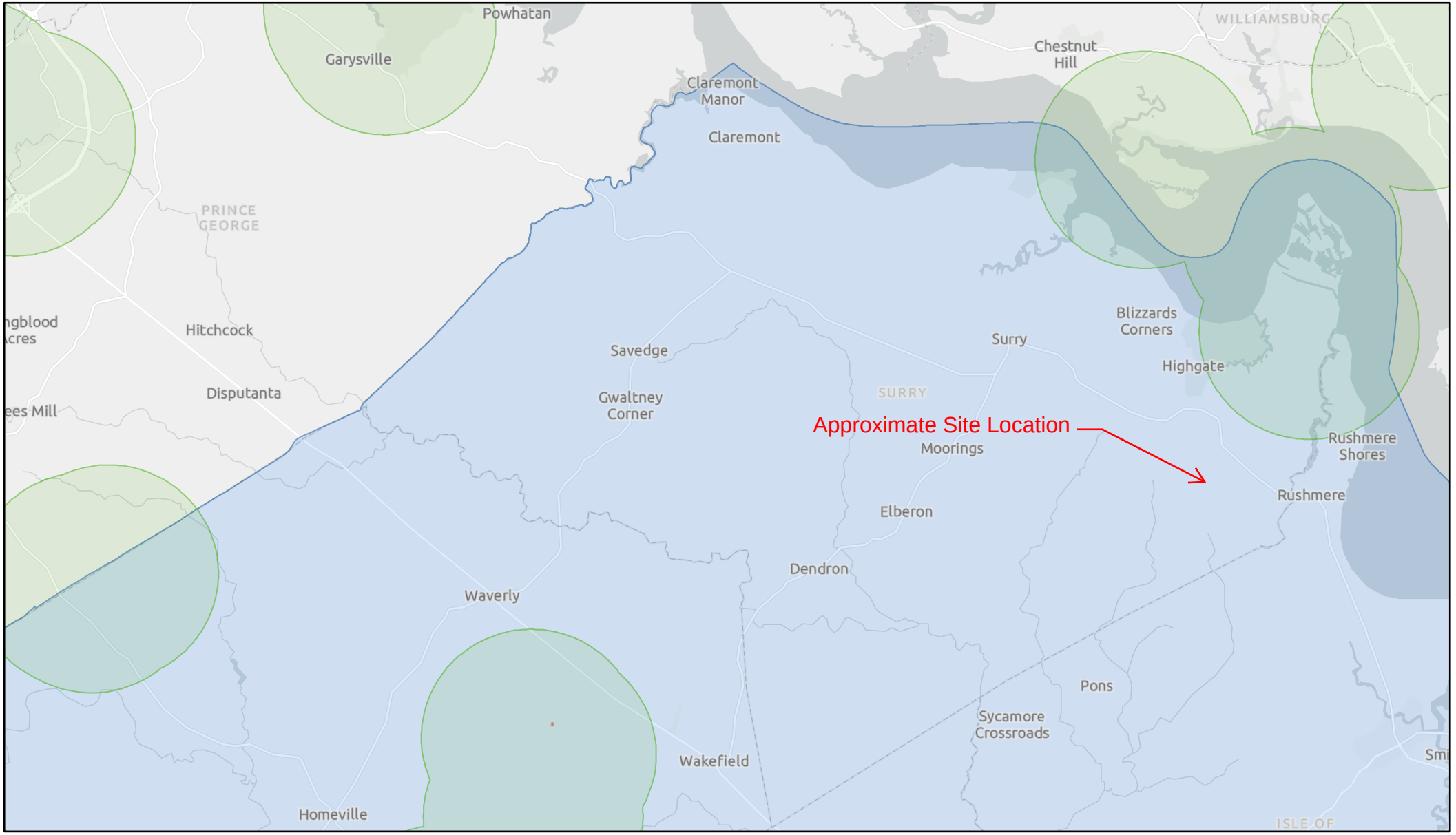
N/A

Compiled on 2/24/2025, 4:05:52 PM I3506591.0 report=IPA searchType= P dist= 3218 poi= 37.0834700 -76.7465699 siteDD= 37.0834708 -76.7465772;37.0835965 -76.7431358;37.0830921 -76.7420420;37.0819115 -76.7420808;37.0816590 -76.7420841;37.0807611 -76.7423748;37.0802898 -76.7425274;37.0801725 -76.7425654;37.0798420 -76.7426724;37.0797745 -76.7426851;37.0797878 -76.7450643;37.0834708 -76.7465772;

PixelSize=64; Anadromous=0.104816; BECAR=0.104968; Bats=0.107358; Buffer=0.069572; County=0.294631; Impediments=0.105703; Init=0.470911; PublicLands=0.109564; SppObs=0.836766; TEWaters=0.115827; TierReaches=0.189586; TierTerrestrial=0.209044; Total=9.813723; Tracking_BOVA=6.990056; Trout=0.111925

Virginia Department of Wildlife Resources (VDWR) – Northern Long-eared Bat Regulatory Buffer Interactive Tool

NLEB Locations and Roost Trees



2/24/2025, 4:21:42 PM

1:288,895

0 2 4 8 mi

0 3 6 12 km

VGIN, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA, USFWS

NLEB Roost Tree 150-Foot Buffer

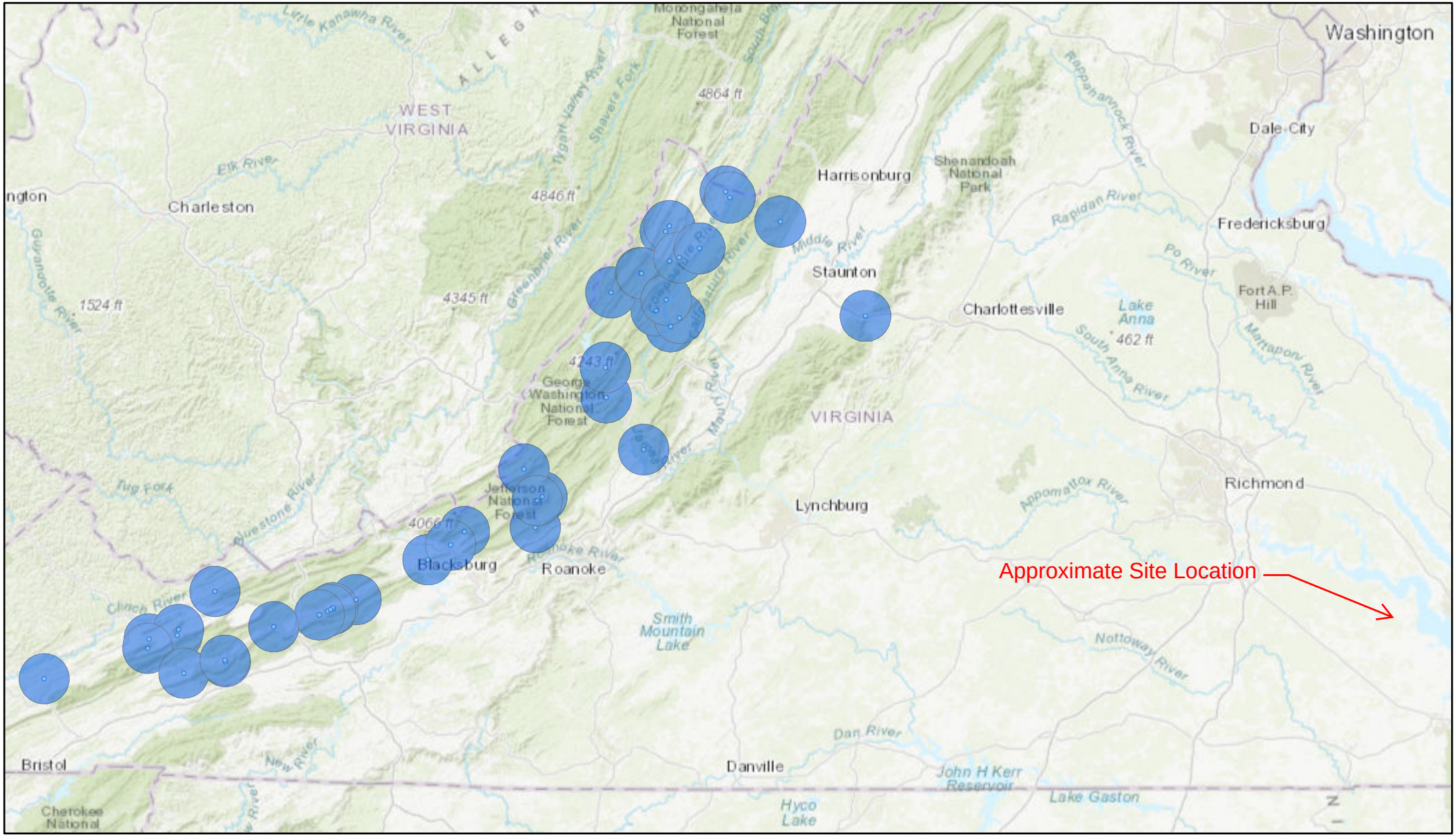
NLEB Capture 3 Mile Buffer

NLEB Year-Round Presence

VA Dept. Game & Inland Fisheries

Virginia Department of Wildlife Resources (VDWR) – Little Brown Bat and Tri-Colored Bat Winter Habitat and Roost Locator

Little Brown Bat & Tri-Colored Bat Winter Habitat and Roost Locator



2/25/2025, 12:23:39 PM

Tri-colored and Little Brown Hibernaculum Half Mile Buffer

Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

1:2,311,162

0 15 30 60 mi

0 25 50 100 km

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

Dept. Game and Inland Fisheries

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

Attachment 4: Cultural Resources Map

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TEL 804.200.6500
www.timmons.com

PROJECT NAME & LOCATION

BEAR ISLAND BESS

SURRY COUNTY - VIRGINIA

DATE
02/21/2025

PROJECT NUMBER
43380.008

PROJECT NAME
BEAR ISLAND BESS

DESIGNED BY / DRAWN BY
M. HILL

NOTES:
Cultural resource data from VDHR.
Aerial imagery from VGIN.

REVISIONS

#	MM/DD/YY	DESCRIPTION

DRAWING DESCRIPTION
CULTURAL RESOURCE MAP

SCALE (FEET)
0 400 800
PLANS PRINTED AS 11X17 ARE HALF SCALE

SCALE	SHEET NUMBER
H: 1" = 400'	1

Y:\852\43380.008-Bear_Island_BESS\GIS\43380.008\43380.008.aprx

Neighborhood Informational Meeting Report
Bear Island Battery Storage LLC
Conditional Use Permit – Battery Energy Storage Facility and Substation (utility service/major) Application

PERSONS AND ORGANIZATIONS CONTACTED WITH DATE AND EXPLANATION OF HOW CONTACTED:
A representative of the Petitioner mailed a written notice of the date, time, and location of the neighborhood informational meeting to the individuals and organizations set out on Exhibit A attached hereto by depositing such notice in the U.S. mail on Wednesday, April 16th. A copy of the written notice is attached hereto as Exhibit B.

DATE, TIME AND LOCATION OF MEETING:
The neighborhood informational meeting was held on April 30th, between 5:00 – 7:00PM at the Morning Surry County Parks and Recreation Center 205 Enos Farm Dr., Spring Grove, VA 23881.

PERSONS IN ATTENDANCE AT MEETING (see attached copy of sign-in sheet):
The neighborhood informational meeting was attended by those individuals identified on the sign-in sheet attached hereto as Exhibit C. The Petitioner was represented at the neighborhood informational meeting by Ed Rumler, Kalab Cox, and Landon Stevens, and Matt Kim (of Fire & Risk Alliance).

SUMMARY OF PRESENTATION/DISCUSSION:
The Petitioner's agents, Ed Rumler, Kalab Cox, and Landon Stevens, and Matt Kim (of Fire & Risk Alliance) conducted a town-hall style gathering. Boards with information about the project were set up around the room. A copy of the presentation used can be found attached hereto as Exhibit D.

Attendees were provided with several visual resource boards at stations around the room, which included maps to illustrate the location of the parcels and the proposed site plan, information about battery storage projects, information about Clenera, and information about safety and emergency response. That boards presented have been included as Exhibit D. Attendees circulated the room to learn about the project and ask questions. Below is a list of some of the most common questions and discussion points from the meeting.

Neighborhood Informational Meeting Report
Petitioner: Swift Creek Solar LLC
Solar and Battery Storage Project Development Plan and Use Permit Application

What will the traffic impacts be?

Traffic is limited to BESS projects. Only 100 – 150 heavy vehicle deliveries are expected during construction. That delivery will take place over a 1-2 month period, which means on average only 2-3 heavy vehicle trips per day. Applicant will also be required to coordinate a traffic management plan with the County prior to start of construction. That management plan can help mitigate any nuisance from the limited traffic generated by project construction.

How will you protect/fix the roads?

Traffic is expected to be minimal, which should limit road damage. However, a pre- and post-construction road survey will be conducted to ensure any damage caused by construction of the project is repaired.

What will it look like?

Several pictures were provided as a visual reference.

Why are you building it here?

Several factors, but mostly related to location of the transmission line, private landowners who agree to participate in the project, and strong demand throughout Virginia for renewable energy and battery storage.

Common comment: community members were glad this was not another solar project.

How loud will this be to neighbors?

The project is over 2,000 feet from the nearest home. Almost all sound will propagate over the physical distance between the project and nearby residences. Sound will be further dampened by existing forest between the battery and the neighbors.

What kinds of things (gas constituents) are released when the batteries vent? How far can this gas travel?

Batteries are hermetically sealed and do not vent during normal conditions. In the unlikely event of failure, the battery vent gas is primarily composed of carbon dioxide, carbon monoxide, hydrogen, and hydrocarbons (like methane and propane).

The distance that battery vent gas can travel in air is a product of many factors, including but not limited to vent duration, quantity, weather, etc. However, during typical conditions, the vented gases are diluted quickly such that measurable concentrations are not observed at the facility property boundaries.

Neighborhood Informational Meeting Report
Petitioner: Swift Creek Solar LLC
Solar and Battery Storage Project Development Plan and Use Permit Application

How are fires (thermal runaway) prevented in the batteries? What can cause a fire?

Thermal runaway can be caused by overheating, short circuiting/electrical arcing, water intrusion, and mechanical damage, for example. There are a number of protections in place to prevent these types of failures, examples of which are as follows:

Batteries are stored in containers rated IP 55 or higher, meaning the containers are dust-tight and prevent streams of water from entering the container.

Modules, or groups of individual battery cells, often have passive barriers to prevent overheating, such as aerogels between cells. Modules often have passive barriers to prevent overcurrent, such as fuses.

A battery system will typically have some form of cooling, such as HVAC, liquid cooling, or in some cases, both, to maintain the manufacturer-suggested operating temperature of the batteries.

Each battery system has a battery management system. This system measures battery data, such as temperature, current, voltage, and state of charge, at various levels of the system. The BMS performs actions to maintain balance of these data points during normal operation. When a potential fault is detected, the BMS can respond automatically in ways such as increasing cooling or disconnecting the batteries from the power source. In these cases, the BMS will communicate alarm signals to the system supervisors.

What is explosion protection/how are explosions prevented?

Explosions can occur when a buildup of contained flammable gases is ignited. Explosion protection is a code-required component of all battery systems. There are currently four available categories of explosion protection: NFPA 69 and performance-based design, as follows:

NFPA 69 system: This type of system is composed of gas sensors and active ventilation. If a gas sensor detects flammable gas within the container, it activates the ventilation system, which works to exhaust the gas and maintain a concentration less than ¼ of that which would be flammable.

If a manufacturer finds that an NFPA 68 or NFPA 69 system is not suitable for their BESS, they may choose an alternative method of explosion protection, which is required to be tested and shown to be effective.

Are the batteries actually in shipping containers? What else is inside these containers other than the batteries?

The batteries are not literally in shipping containers, but their containers are usually approximately the size of a 20 ft shipping container and may look similar. But BESS containers are custom-designed and constructed to be equipped with power electronics and control systems, a temperature management system, a battery management system, a fire detection and notification system, and an explosion control system, all of which are already installed by the manufacturer ahead of time.

Neighborhood Informational Meeting Report
Petitioner: Swift Creek Solar LLC
Solar and Battery Storage Project Development Plan and Use Permit Application

What happens if hazardous chemicals are released into the air during a fire? Is there anything in the design standards that addresses this, and/or best practices for managing issues with air quality during a controlled burn?

NFPA 855 will require that the BESS design must demonstrate through a large-scale fire test that an initiating fire does not propagate to an adjacent container.

Hazardous chemicals during a fire are difficult to identify because not all manufacturers have this data, or is proprietary only be used to support their product once you have some sort of agreement. However, there are publicly released reports indicating that battery fire smoke is comparable to a plastic fire.

...

ARTICLE II. DEFINITIONS AND USES

2-100. Definitions

Sec. 2-101. General rules of construction.

A. The following general rules of construction shall apply to the regulations of this ordinance:

1. The singular number includes the plural and the plural the singular, unless the context clearly indicates the contrary.
2. Words used in the present tense include the past and future tenses, and the future the present.
3. The word "shall" is always mandatory. The word "may" is permissive.
4. The word "building" or "structure" includes any part thereof, and the word "building" includes the word "structure".
5. Words and terms not defined herein shall be interpreted in accord with their normal dictionary meaning and customary usage.
6. The terms "main" and "principal" as used herein are synonymous.
7. Any words pertaining to gender shall be interchangeable. The word "he" shall mean "she", and "she" shall mean "he".
8. The word "person" includes a "firm, association, organization, partnership, trust, company," as well as an "individual."
9. The word "county" shall mean Surry County, Virginia.

Sec. 2-102. Definitions.

For the purpose of this ordinance, the following terms and words are hereby defined:

Accessory building or structure. A building or structure detached from a main building on the same lot (except as otherwise provided in this ordinance) and customarily incidental and subordinate to the main building or use. Where an accessory building or structure is attached to the principal building in a substantial manner, as by a wall or roof, such accessory building shall be considered a part of the principal building.

Accessory use. A use customarily incidental and subordinate to, and (except as otherwise provided in this ordinance) on the same lot as a principal use. When the term "accessory" is used in this ordinance, it shall have the same meaning as "accessory use".

Act. The Chesapeake Bay Preservation Act (CBPA) found in Chapter 21 (§ 10.1-2100 et seq.) of Title 10.1 of the Code of Virginia. The word Act does not refer solely to the Chesapeake Bay Preservation Act, and the acronym CPBA is also utilized to represent the Chesapeake Bay Preservation Area.

Administrator. The Zoning Administrator of Surry County, or their duly authorized designee. The director of planning shall serve as the administrator unless an alternate position or individual is specifically appointed by the board of supervisors.

Alley. A public or private way less than 30 feet in width and affording secondary means of access to abutting property.

Alteration. (See Structural alteration).

Animal unit. A unit of measure used to determine the total number of single animal types or combination of animal types which are fed, confined, maintained or stabled in an animal feeding operation. An animal unit equals 1,000 pounds of live weight. Combinations of animal types that exceed 300 units are classified as a confined animal feeding operation (CAFO) as described in section 2-202 of this ordinance.

Battery(ies). A single cell or a group of cells connected together electrically in series, in parallel, or a combination of both, which can charge, discharge, and store energy electrochemically and are used in a battery energy storage system.

Battery management system (BMS). An electronic regulator that manages a battery energy storage system by monitoring individual battery module voltages and temperatures, container temperature and humidity, off-gassing of combustible gas, fire, ground fault and DC surge, and door access and being able to shut down the system before operating outside safe parameters.

Base flood (one-hundred year flood). A flood that, on the average, is likely to occur once every 100 years (i.e., that has a one percent chance of occurring each year, although the flood may occur in any year).

Base flood elevation (BFE). The Federal Emergency Management Agency designated 100-year water surface elevation.

Basement. That portion of a building that is partly or completely below grade. A basement shall be counted as a story if it's ceiling is over six feet above the average level of the finished ground surface adjoining the exterior walls. For purposes of the Floodplain District only, a basement shall be any area of the building having is floor subgrade (below ground level) on all sides.

Best management practice (BMPs). A practice, or combination of practices, that is determined by a state or designated area-wide planning agency to be the most effective, practicable means of preventing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals.

Block. That property fronting on one side of a street or road and lying between two intersecting streets or roads or otherwise limited by a railroad right-of-way, a live stream, or un-subdivided tract, or other physical barrier of such nature as to interrupt the continuity of development.

Board. The term board shall refer to the Board of Supervisors of Surry County, Virginia, unless otherwise specifically indicated.

Board of zoning appeals (BZA). The term shall refer to the Surry County Board of Zoning Appeals.

Buffer area. An area of natural or established vegetation managed to protect other components of a resource protection area and state waters from significant degradation due to land disturbances.

Buildable area. The area of that part of the lot not included within the yards or "open spaces" herein required.

Buildable width. The width of that part of a lot not included within the open spaces herein required.

Building. A structure with a roof designed to be used as a place of occupancy, storage, or shelter.

Building, completely enclosed. Any building having no outside openings other than ordinary doors, windows, and ventilators.

Building coverage. That percentage of a lot which when viewed from above would be covered by a structure or any part thereof excluding roof eaves.

Building, height of. The vertical distance from the average" established curb grade or from the average level of the finished grade at the front building line, if higher, to the highest point of the coping of a flat roof, or to the deck line or highest point of coping or parapet of a mansard roof, or to the mean height level between eaves and ridge for gable, hip, shed, and gambrel roofs. When the highest wall of a building with a shed roof is within 35 feet of a street, the height of such building shall be measured to the highest point of coping or parapet. (For exemptions, see section 4-102)

Building, main. The principal building or buildings on a lot housing the principal use on the lot.

...

Sec. 2-202. Use type descriptions.

...

CIVIC USE TYPES

Battery energy storage system (BESS). A facility that houses battery energy storage equipment and technology that is capable of absorbing energy, storing such energy for a period of time, and redelivering such energy after it has been stored. Facilities are generally, but not always, used to supplement grid storage capacity. This definition does not include battery technologies utilized in consumer products and motor vehicles. In the Emerging Technology Zoning District, this use would be defined as an *Energy Storage Facility*.

Camp. A use that primarily provides recreational opportunities of an outdoor nature on a daily or overnight basis. Included in this use type would be scout camps, religious camps, children's camps, wilderness camps, and similar uses which are not otherwise specifically described in this ordinance.

Cemetery. A place used for interment of human or animal remains or cremated remains, including a burial park for earth interments, a mausoleum for vault or crypt interments, a columbarium for cinerary interments, or a combination thereof.

Child care institution. Any institution maintained for the purpose of receiving children for full-time care, maintenance, protection and guidance separated from their parents or guardians. This shall not include primary or secondary educational facilities or summer camps.

Club. A use providing meeting, or social facilities for social clubs, fraternal/sororal organizations, lodge, and similar organizations and associations, primarily for use by members and guests. Recreational facilities, unless otherwise specifically cited in this section, may be provided for members and guests as an accessory use. This definition excludes hunt clubs and dance halls, which are defined separately.

Community center. A place, structure, or other facility used for providing civic and/or recreational programs generally open to the public and designed to accommodate and serve significant segments of the community. This use can also be referred to as a convention or civic center.

Community recreation. A recreational facility for use solely by the residents and guests of a particular residential development, planned unit development, or residential neighborhood, including indoor and outdoor facilities. These facilities are proposed or planned in association with development and are usually located within or adjacent to such development. Such uses may include clubhouses, swimming pools, work out facilities, and tennis courts.

Community-scale solar energy facility. An energy generation with a rated capacity greater than 1 MWac (megawatts alternating current) and no greater than 5 MWac. Facilities do not require connections to high voltage transmission lines.

Correctional facility. A public or privately operated use providing housing and care for individuals legally confined, designed to isolate those individuals from the community.

Crisis center. A facility providing temporary protective sanctuary for victims of crime or abuse, and homelessness including emergency housing during crisis intervention for individuals, such as victims of rape, child abuse, or physical beatings.

Cultural service. A library, museum, or similar public or quasi-public use displaying, preserving and exhibiting objects of community and cultural interest in one or more of the arts or sciences. Such uses shall include, but are not limited to libraries, museums, art galleries, and art centers.

Day care center. A facility that provides care during part of the day only to: (i) two or more children under the age of 13 in a facility that is not the residence of the provider or of any of the children in care; and/or (ii) two or more adults and which includes personal supervision of the adults and promotes social, physical, and emotional well-being through companionship, self-education and leisure time activities.

Distributed solar energy facility. An solar energy generation facility with a rated capacity less than MWac. Distributed solar energy facilities are used to meet energy demands on-site and include rooftop and groundmounted photovoltaic arrays on residential, commercial, and institutional properties.

Educational facility. An educational institution, whether it is public, private or parochial, recognized or authorized by the Commonwealth of Virginia (or a similar reputable accreditation institution) to offer instruction in the branches of learning and study typical of primary, secondary, or collegiate institutions and authorized to award diplomas, or associate, baccalaureate or higher degrees. This shall include publicly supported vocational schools, but shall not include business and trade schools described as a commercial use type.

Halfway house. An establishment providing accommodations, rehabilitation, counseling, and supervision to persons suffering from alcohol or drug addiction or similar disorders, and/or to persons re-entering society after being released from a correctional facility or other institution.

Nursing home. A facility whose primary function is to provide nursing, assisted living, and health-related services for the treatment and inpatient care of two or more unrelated individuals, including facilities known as convalescent homes, skilled nursing facilities or skilled care facilities, intermediate care facilities, extended care facilities and nursing or nursing care facilities. A hospice is also included in this use. Excluded from this use type is any facility providing surgical or emergency medical services and facilities providing care for alcoholism, drug addiction, mental disease, or communicable disease.

Park and ride facility. A publicly owned, short-term parking facility for commuters.

Post office. Postal services directly available to the consumer operated by the United States Postal Service.

Public facilities. Facilities owned and operated by a government or quasi-government agency accommodating offices, safety and emergency services, and places of public assembly. Typical uses include federal,

state and county offices, auditoriums, sports auditorium, convention facilities, fairgrounds, and police, fire and ambulance services.

Public maintenance facility. A government owned or operated facility supporting maintenance, repair, vehicular or equipment servicing, material storage, and similar activities.

Public park and recreational area. Government owned and operated park, picnic area, playground, indoor or outdoor athletic facility, game preserve and open space.

Religious assembly. A use providing regular organized religious worship and related incidental activities within or out of a structure including accessory uses, such as daycare facilities, but not including educational facilities, primary and secondary.

Rehabilitation service. A use providing recuperative or similar services for persons requiring rehabilitation assistance as a result of physical, mental illness, alcoholism, detention, drug addiction, or similar conditions for only part of a 24-hour day.

Utility service/major. A service of a regional nature which normally entails the construction of new buildings or structures such as switching facilities and stations or substations, community waste water treatment plants, and water supply and production in excess of 50,000 gallons per day. Included in this definition is also electric, gas and other utility transmission lines of a regional nature that are not otherwise reviewed and approved by the Virginia State Corporation Commission.

Utility service/minor. A services which is necessary to support development within the immediate vicinity and involve only minor structures. Included in this use type are distribution lines and small facilities that are underground or overhead, such as transformers, relay and booster devices, remote switching stations well, water, and sewer pump stations.

Utility-scale solar energy facility. A solar energy generation facility with a rated capacity greater than 5 MWac.

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3-300. A-R Agricultural-Rural District

Sec. 3-301. Purpose of the district.

The purpose of this district is to protect and conserve agricultural and forest lands in large enough tracts that will have the greatest probability of preserving the rural character and heritage of the community and serve as a working-and-living landscape in perpetuity. These agricultural and forest lands, and in particular the family farms, have framed the way of life and local economy for generations and should continue to play an important role in the county.

While preserving the rural heritage is critical, it is also important to enable each landowner with the ability to make a reasonable economic return from the use and future use and sale of their land. This should be accommodated without compromising basic community objectives such as preserving prime agricultural lands and discouraging strip residential development along the primary and secondary roads in the county. And while some uses might best be located in a rural area due to their characteristics, not all uses are necessarily appropriate throughout the community or this district. Therefore, many uses require additional approvals from the county

before they can be established. In addition, large residential developments are prohibited. Ultimately, however, those areas devoted to residential and other non-rural uses should meet the needs and desires of those who choose to live and work in a rural area.

Sec. 3-302. Permitted uses.

A. The following uses are permitted by right subject to all other applicable requirements contained in this ordinance. An asterisk (*) indicates additional, modified or more stringent standards are listed in article IV, Use and design standards, for those specific uses.

AGRICULTURAL USES

Agriculture*

Farm Employee Housing*

Greenhouse, Private

Roadside Stand*

Sawmill*

Silvicultural activities*

Stable, Commercial*

Stable, Private*

RESIDENTIAL USES

Accessory Apartment*

Dwelling, Single-Family, Detached

Dwelling, Single-Family, Farm

Family Day Care Home

Group Home

Guest House*

Home Occupation, Community*

Home Occupation, Rural*

Kennel, Private*

Manufactured Home, Class A

Manufactured Home, Class B

Temporary Emergency Housing*

CIVIC USE TYPES

Camp*

Cemetery

Club

Community Center

Community Recreation

Cultural Service

Day Care Center

Park and Ride Facility

Post Office

Public Facilities

Public Maintenance Facility*

Public Park and Recreational Area

Religious Assembly

Utility Service/Minor

COMMERCIAL USE TYPES

Agricultural Service*

Antique Shop

Construction Office, Temporary

Golf Course

Real Estate Office, Temporary

Studio, Fine Arts

Taxidermy*

MISCELLANEOUS USE TYPES

Amateur Radio Tower*

Hunt Club

Hunting Preserve

Outdoor Gathering*

Parking Facility

Turkey Shoot*

Windmill*

B. The following uses are allowed only by special exception from the board of zoning appeals pursuant to section 1-304. An asterisk (*) indicates additional, modified or more stringent standards are listed in article IV, Use and design standards, for those specific uses.

RESIDENTIAL USES

Manufactured Home, Family Member Residence*

Manufactured Home, Temporary Residence*

CIVIC USES

Day Care Center

COMMERCIAL USE TYPES

Campground, Workforce*

Office, General

Taxidermy

Veterinary Hospital/Clinic

INDUSTRIAL USE TYPES

Contractor's Yard*

Convenience Center*

Custom Manufacturing*

MISCELLANEOUS USE TYPES

Communication Tower*

C. The following uses are allowed only by conditional use permit from the board of supervisors pursuant to section 1-501. An asterisk (*) indicates additional, modified or more stringent standards are listed in article IV, Use and design standards, for those specific uses.

RESIDENTIAL USES

Dwelling, Multifamily Conversion*

Manufactured Home Park*

Manufactured Home Subdivision*

CIVIC USE TYPES

Child Care Institution

Correctional Facility

Crisis Center

Educational Facility

Halfway House

Nursing Home

Rehabilitation Service

Utility Service/Major*

Battery Energy Storage System*

COMMERCIAL USE TYPES

Auction Establishment

Bed and Breakfast*

Camp*

Campground*

Commercial Outdoor Recreation

Kennel, Commercial

Livestock Auction Market*

Lumber Yard

Marina

Motor Vehicle Repair Service/Minor

Motor Vehicle Repair Service/Major

INDUSTRIAL USE TYPES

Landfill*

Mining*

Power Plant

Scrap and Salvage Service*

Transfer Station

MISCELLANEOUS USE TYPES

Alternate Discharge Sewage System*

Aviation Facility, Commercial*

Aviation Facility, Private*

Reconstructed Wetland*

Shooting Range, Outdoor*

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3-900. M-1 General Industrial District

Sec. 3-901. Purpose of the district.

This district is intended to provide an environment suitable for industrial activities that do not create appreciable nuisances, hazards or threats to the natural environment or surrounding development. Uses that would typically be found in this district include a wide variety of light manufacturing, fabricating, processing, wholesale distributing and warehousing uses appropriately located for access to highways and providing a controlled environment within which uses are to be conducted in completely enclosed buildings. In order to preserve the land for industry, to reduce extraneous traffic, and avoid future conflicts between industry and other

uses, business and service uses are limited primarily to those which will be useful to employees in the district and future residential uses are restricted.

Sec. 3-902. Permitted uses.

A. The following uses are permitted by right subject to all other applicable requirements contained in this ordinance. An asterisk (*) indicates additional, modified or more stringent standards are listed in article IV, Use and design standards, for those specific uses.

AGRICULTURAL USES

Agriculture

Silvicultural activities

CIVIC USE TYPES

Park and Ride Facility

Parks and Recreation

Post Office

Public Maintenance Facility

Utility Service/Minor

COMMERCIAL USE TYPES

Auction Establishment

Bank

Business Support Service

Business or Trade School

Construction Office, Temporary

Equipment Sales and Rental

General Service and Repair

Mini Warehouse

Motor Vehicle/Outdoor Storage

Motor Vehicle Repair Service/Major

Office, General

Taxidermy

Truck Stop

INDUSTRIAL USE TYPES

Contractor's Yard

Convenience Center

Custom Manufacturing

Industry, Type I

Laboratory

Warehousing and Distribution

MISCELLANEOUS USE TYPES

Parking Facility

Reconstructed Wetland

Windmill*

B. The following uses are allowed only by special exception from the board of zoning appeals pursuant to section 1-304. An asterisk (*) indicates additional, modified or more stringent standards are listed in article IV, Use and design standards, for those specific uses.

RESIDENTIAL USES

Accessory Apartment

CIVIC USE TYPES

Day Care Center

MISCELLANEOUS USE TYPES

Communication Tower

C. The following uses are allowed only by conditional use permit from the board of supervisors pursuant to section 1-501. An asterisk (*) indicates additional, modified or more stringent standards are listed in article IV, Use and design standards, for those specific uses.

CIVIC USE TYPES

Battery Energy Storage System*

Utility Service/Major

Community-Scale Solar Energy Facility*

Utility-Scale Solar Energy Facility*

COMMERCIAL USE TYPES

Convenience Store

Lumber Yard

INDUSTRIAL USE TYPES

Industry, Type II

Recycling Center

Transfer Station

MISCELLANEOUS USE TYPES

Alternate Discharge Sewage System

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3-1000. M-2 General Industrial District

Sec. 3-1001. Purpose of the district.

The purpose of this district is to provide for a wide variety of industrial operations, but to restrict or prohibit those industries which have characteristics likely to produce serious adverse effects within or beyond the limits of the district. Certain potentially hazardous industries are permitted only after public hearings and review to assure protection of the public interest and surrounding property and persons. It is the intention of the district to preserve the land in the district for industrial use and to exclude new residential or commercial development except for certain uses determined to be supportive of industrial operations.

Sec. 3-1002. Permitted uses.

A. The following uses are permitted by right subject to all other applicable requirements contained in this ordinance. An asterisk (*) indicates additional, modified or more stringent standards are listed in article IV, Use and design standards, for those specific uses.

AGRICULTURAL USES

Agriculture

Silvicultural activities

RESIDENTIAL USES

Accessory Apartment

CIVIC USE TYPES

Day Care Center

Park and Ride Facility

Post Office

Public Maintenance Facility

Public Facility

Public Park and Recreational Area

Utility Service/Minor

COMMERCIAL USE TYPES

Adult Entertainment Establishment

Agricultural Service

Auction Establishment

Bank

Business Support Service

Business or Trade School

Construction Office, Temporary

Crematorium

General Service and Repair

Laundry

Livestock Auction Market

Office, General

Truck Stop

INDUSTRIAL USE TYPES

Convenience Center

Industry, Type I

Industry, Type II

Laboratory

Recycling Center

Scrap and Salvage Service

Transfer Station

Warehousing and Distribution

MISCELLANEOUS USE TYPES

Parking Facility

Reconstructed Wetland

Windmill*

B. The following uses are allowed only by special exception from the board of zoning appeals pursuant to section 1-304. An asterisk (*) indicates additional, modified or more stringent standards are listed in article IV, Use and design standards, for those specific uses.

CIVIC USE TYPES

Day Care Center

MISCELLANEOUS USE TYPES

Communication Tower

C. The following uses are allowed only by conditional use permit from the board of supervisors pursuant to section 1-501. An asterisk (*) indicates additional, modified or more stringent standards are listed in article IV, Use and design standards, for those specific uses.

CIVIC USE TYPES

Battery Energy Storage System*

Utility Service/Major

Community-Scale Solar Energy Facility*

Utility-Scale Solar Energy Facility*

COMMERCIAL USE TYPES

Convenience Store

INDUSTRIAL USE TYPES

Asphalt Plant

Industry, Type III

Landfill

Meat Packing

Power Plant

MISCELLANEOUS USE TYPES

Alternate Discharge Sewage System

(Ord. No. 2016-02, 8-4-2016)

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ARTICLE IV. – SUPPLEMENTARY REGULATIONS

...

4-200. – Supplementary Use Regulations Generally

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Sec. 4-204. Accessory uses.

A. The district regulations classify different principal uses according to their different impacts. Whenever a residential, civic, office, commercial, industrial, or miscellaneous activity (which may or may not be separately listed as a principal use) is conducted in conjunction with another principal use and that activity constitutes only an incidental or insubstantial part of the total use that takes place on a lot, then the activity shall be regarded as accessory to the principal use and shall be carried on in accordance with the permit issued for the principal use.

For purpose of interpreting this section;

1. A use may be regarded as incidental or insubstantial if it is incidental or insubstantial in and of itself or in relation to the principal use.
2. An accessory use does not have to be connected with a principle use. However, their association must take place with sufficient frequency that there is common acceptance of their relatedness.
3. Portable on demand storage (POD) units shall be considered a temporary structure. They are permitted for use for a total of six months, after which a zoning permit must be obtained through the planning and zoning department.
4. Distributed solar energy facility shall be considered an accessory use to be used to meet energy demands on-site and include rooftop and groundmounted photovoltaic arrays on residential, commercial, and industrial properties. Roof-mounted or ground-mounted solar collectors shall not exceed the square footage of the principal structure or use and shall meet the following requirements:
    a. Solar collectors shall be configured to avoid glare and heat transference to adjacent properties.
    b. Ground-mounted solar collectors shall not be located within ten feet of any side or rear lot line.
    c. Ground-mounted solar collectors located within a front yard shall meet the minimum setback required for the principal structure or use in the applicable zoning district where located and shall be sited as far back as the principal structure or use.
    d. The maximum height of a ground-mounted solar collector shall be 15 feet as measured from the grade or base of the collector to its highest point and shall not exceed the height of the principal structure or use.
    e. Roof-mounted solar collectors shall not extend beyond the exterior perimeter of the building or structure on which mounted or built and shall not exceed the maximum height for the applicable zoning district where the building or structure is located.
5. Battery energy storage systems shall be considered an accessory use in residential, civic, commercial, and industrial uses and properties in any zoning district when designed with appropriate storage capacity to serve the principal use only and not the electric power grid. All battery energy storage systems, all dedicated-use buildings, and all other buildings or structures that contain or are otherwise associated with a battery energy storage system shall be designed, erected, and installed in accordance with all applicable provisions of the codes, regulations, and industry standards as referenced in the Virginia Uniform Statewide Building Code, the Virginia Energy Conservation Code, and the Code of the County of Surry.

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4-600. Supplementary Regulations for Civic Uses

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Sec. 4-609. Battery Energy Storage Systems

Additional requirements and standards for battery energy storage systems permitted as a principle use. These requirements and standards also apply to electrochemical Energy Storage Facilities, as defined in Sec. 3-1108 of this Ordinance, that are located in an Emerging Technology Zoning District.

A. *Application Requirements.* Each application for a conditional use permit for a battery energy storage system shall include the following general information:

1. *Project Description*. A narrative identifying the applicant, owner, and operator, and describing the proposed battery energy storage system, including an overview of the project, its location, and a maintenance plan for the project; the approximate rated capacity of the battery energy storage system; and a description of ancillary facilities.

2. *Concept Development Plan.* The concept development plan shall include the following information:

   i. Existing and proposed buildings and structures, including preliminary location(s) of all proposed equipment;

   ii. Existing and proposed access roads, drives, turnout locations, and parking;

   iii. Location of any substations, electrical cabling, ancillary equipment, buildings, and structures (including those within any applicable setbacks);

   iv. A draft emergency action plan;

   v. Fencing or other methods of ensuring public safety; and

   vi. The location and nature of proposed buffers and screening elements, including vegetative and constructed buffers.

3. *Technical Review/Fees*. Applications for battery energy storage systems may require a technical review prior to site plan approval that will be conducted by a consultant selected by the county. Any fees associated with performance of this review will be paid by the applicant.

4. *Additional Considerations.* ~~Additional information may be required, as determined by the planning director, such as~~ Applications shall include a historic resource impact analysis, an environmental resource impact analysis, a traffic impact analysis, a scaled elevation view and other supporting drawings, photographs of the proposed site, photo or other realistic simulations or modeling of the proposed project, a landscaping and screening plan, a coverage map, or other additional information that may be necessary for a technical review of the proposal as determined by the planning director.

B. *Community Meeting Requirement*. The applicant shall hold a public community meeting prior to the Planning Commission's public hearing to give the community an opportunity to hear from the applicant and ask questions regarding the proposed facility under the following guidelines:

   i. The applicant shall inform the planning director and adjacent property owners in writing of the date, time and location of the meeting, at least seven but no more than 14 days in advance of the meeting.

   ii. The meeting shall take place within the county, at a location open to the public with adequate parking and seating facilities that will accommodate persons with disabilities.

Commented [A1]: Application requirements similar to solar application requirements.

Commented [A2]: Modified to require these items studies, as suggested by Planning Commission.

Commented [A3]: Confirmed this matches the solar ordinance notice regime.

iii. The meeting shall give members of the public the opportunity to review application materials, ask questions of the applicant and provide feedback.

iv. The applicant shall provide to the planning director a summary of any input received from members of the public at the meeting any responses.

v. The requirements of this section shall be deemed complete if the applicant chooses to fulfill the public participation requirements described in Virginia Administrative Code Section 9VAC15-100-90 related to an application for permit by rule for small energy storage facilities and holds the required public meeting within sixty (60) days of the Planning Commission's initial public hearing, provided that the applicant also informs the planning director and adjacent property owners in writing of the date, time and location of the meeting, at least seven but no more than 14 days in advance of the meeting.

C. *Performance Requirements*. All battery energy storage systems shall comply with the criteria:

1. *Operation*. Battery energy storage systems shall be constructed, maintained, and operated in accordance with national industry standards and regulations, including the most current adopted edition of the National Electrical Code, International Fire Code of the International Code Council, and the National Fire Protection Association Fire Code. The batteries shall be National Fire Protection Agency (NFPA) compliant. In the event of a conflict between the national industry standards and these conditions, the national industry standards shall control so that as technology advances, updated technology may be used.

2. *Configuration*. Battery cells shall be placed in a battery energy storage system container or similar modular assembly with a battery management system. The battery energy storage system shall provide a secondary layer of physical containment to the batteries and be equipped with cooling, ventilation, and fire safety systems. The facility shall have 24/7 automated fire detection. Each battery energy storage system shall include fire mitigation technology to prevent the ~~demonstrated passive mitigations against~~ spread of fire among containers or assemblies and shall not require the actions of personnel to suppress or otherwise engage a thermal event or fire.~~ If such a design is not available, Each container or assembly shall include built-in fire suppression technology intended to mitigate the risk of spread of fire among containers or assemblies~~. To the extent required by NFPA 855, the battery management system shall monitor individual battery module voltages and temperatures, container temperature and humidity, off-gassing of combustible gas, fire, ground fault and DC surge, and door access and be able to shut down and alarm in response to an unsafe condition.

3. *Safety Operation Standards.*

i. Each battery energy storage system shall install and maintain fire safety systems such as an automatic fire alarm/detection system and/or extinguishing technology built in based on specific hazards, as approved by the County Fire Official, under the direction of NFPA 855 standards, as amended, and the Virginia Statewide Fire Prevention Code. Active fire extinguishing technology may not be required if it can be shown that the battery energy storage system meets all applicable code requirements including NFPA 855 and subject to the approval of the County Fire Official.

ii. To the extent required by NFPA 855, the battery management system shall include 24/7 monitoring for individual battery module voltages and temperatures, container

Commented [A4]: Added to allow for consolidation of community meeting requirements if applicant chooses to combine PBR public meeting requirements with county's. PBR requirements are more stringent than county requirements (i.e. newspaper advertisements, multiple notices, etc.).

Commented [A5]: Requires conformity with National Fire Protection Association's latest standards (these more stringent than current state-adopted standards).

Commented [A6]: Modified to clarify that all BESS will include fire prevention technology.

temperature and humidity, off-gassing of combustible gas, fire, ground fault and DC surge, and door access.

iii. The battery management system shall be capable of shutting down and issuing an alarm in response to an unsafe condition.

4. *Warning Signage*. NFPA 704 placards shall be placed on the entry to the facility and as appropriate on individual containers and ~~building~~ facility entrances along with emergency contact information.

5. *Emergency Access.* Access to the property for Surry County Fire and EMS shall be provided in a manner acceptable to the Surry County Chief of Emergency Management and/or the Fire Marshal.

6. *Setbacks*. Battery energy storage systems shall comply with the following minimum setback requirements:

i. In the A-R District:

1. Be located at least 200 feet from all property lines, unless the adjacent parcel is zoned industrial, has an electric substation to which the battery energy storage system will connect and is located on the same side of the road, or is an adjacent parcel owned or leased by the battery energy storage system's owner or operator.

2. Be located 500 feet from all residential and commercial structures.

~~1.~~3. These setbacks may be increased as necessary to address sensitive adjacent uses by specific terms of the Conditional Use Permit.

ii. In the M-1 and M-2 District:

1. Be located a minimum of at least 75 feet from all property lines and otherwise comply with all minimum height, bulk, setback, and yard requirements of the underlying district.

2. These setback may be increased as necessary to address sensitive adjacent uses by specific terms of the Conditional Use Permit.

7. *Screening/Landscaping Buffers.*

i. Battery energy storage systems located in the A-R district shall be fully screened on all sides from ground-level view by a vegetative buffer of at least 100 feet located within the required setbacks, except for facilities located within or adjacent to parcels zoned industrial, or adjacent to a parcel with an electric substation located on the same side of the road.

ii. Battery energy storage systems located in the M-1 or M-2 shall conform to the screening and buffering requirements of the underlying district.

~~ii. Areas within 20 feet on each side of battery energy storage system shall be cleared of combustible vegetation and other combustible growth. Single specimens of trees, shrubbery, or cultivated ground cover such as green grass, ivy, succulents, or similar plants used as ground covers shall be permitted to be exempt provided that they do not form a means of readily transmitting fire. Removal of trees should be minimized to the extent possible.~~

Commented [A7]: Accepted adding signage to the entry of the facility and individual containers.

Commented [A8]: Requires coordination with county Fire and EMS.

Commented [A9]: Clarifies different buffers for BESS in A-R district vs industrial districts.

Commented [A10]: Takes into account new solar setbacks. BESS facilities are smaller and have reduced visual impact, but this ordinance still requires significant setbacks similar to solar.

Commented [A11]: Grants additional flexibility for setbacks in CUP conditions

Commented [A12]: For BESS located in industrial areas, there are reduced setbacks.

Commented [A13]: Sets a higher minimum setback than underlying industrial district requirements.

Commented [A14]: Grants additional flexibility for setbacks in CUP conditions

Commented [A15]: Clarifies A-R district vs M-1/M-2 district buffer requirements. A-R requires 100 ft landscaped buffer included within setbacks.

iii. A minimum 20 foot buffer shall be established around the perimeter of the battery energy storage system's fenceline and such buffer shall be cleared of combustible vegetation and other combustible growth. The buffer must also be covered in gravel, concrete, or some other non-combustible material to provide for additional fire protection.

iv. All screening and landscaping shall be in accordance with Article V, General Design Guidelines and Development Review Procedures, of this Ordinance.

8. *Fencing.* Battery energy storage systems shall be enclosed by a security fence at least eight (8) feet in height or other greater height as required by applicable codes or design requirements of the operating entity.

9. *Noise.* The average noise generated from the battery energy storage systems, components, and associated ancillary equipment at any time shall not exceed a noise level of ~~72~~65 dBA as measured from the property line of an adjoining parcel and shall not exceed 55dBA at the outer wall of any occupied structure on an adjacent parcel in the AR district in existence at the time the project receives its Conditional Use Permit.

i. *Noise Study.* Prior to site plan approval, ~~at the discretion of the planning director or building official , or as required by the conditions of its permit, the applicant may~~ the applicant shall be required to provide a noise study, which shall include equipment and component manufacturers' noise ratings and operating sound pressure level measurements from a reasonable number of sampled locations at the perimeter of the battery energy storage system and at the boundaries of the property in order to demonstrate compliance with this standard.

ii. If, prior to site plan approval, but subsequent to approval of the concept development plan by the Board of Supervisors, modifications to the concept development plan and/or associated permit conditions are required to be in compliance with noise standards, the planning director shall have the authority to permit minor structural additions or modifications to the concept development plan so long as such additions or modifications are limited to addressing noise levels.

10. *Signage*. No advertising of any type may be placed on a battery energy storage system or related facility, except that a sign shall be required displaying the name, registration number, and emergency contact number of the facility owner. The sign shall not exceed four (4) square feet in size and shall be located on the security fence or other approved location.

11. *Lighting*. Lighting of any battery energy storage system shall be limited to that minimally required for safety and operational purposes and all lighting shall be exclusively motion-sensor activated. All lighting must be in compliance with the International Dark-Sky Association's (IDA) guidelines and all lighting equipment shall have received third-party certification by the IDA's DarkSky Approved program. A lighting plan detailing compliance with these requirements shall be submitted prior to site plan approval.

12. *Height*. Battery energy storage systems shall not exceed a height of 30 ft, except for structures associated with interconnection to the electrical grid.

Commented [A16]: Consolidated section and clarified based on Planning Commission feedback.

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Commented [A17]: Creates minimum fence height.

Commented [A18]: Proactively creates decibel maximum.

Commented [A19]: Decreased from from 72 dBA to 65 dBA at the property line and added additional protection for adjacent occupied structures.

Commented [A20]: Named this section "Noise Study" and added it as a requirement, along with additional notation of the methods of modeling of the study.

Commented [A21]: Gives planning director authority to make minor modifications to allow for noise compliance (don't need to go back and update CUP).

Commented [A22]: Added Dark Sky compliant requirement, motion sensor activated and lighting plan to be submitted with site plan approval.

D. *Emergency Response Plan*. Prior to final site plan approval, an Emergency Response Plan shall be developed in coordination with the Surry County Chief of Emergency Management and/or the Fire Marshal and shall include:

i. Procedures for safe shutdown, de-energizing, or isolation of equipment and systems under emergency conditions to reduce the risk of fire, electric shock, and personal injuries, and for safe start-up following cessation of emergency conditions;

ii. Procedures for inspection and testing of associated alarms, interlocks, and controls;

iii. Procedures to be followed in response to notifications from the battery energy storage system, when provided, that could signify potentially dangerous conditions, including shutting down equipment, summoning service and repair personnel, and providing agreed upon notification to fire department personnel for potentially hazardous conditions in the event of a system failure;

iv. Emergency procedures to be followed in case of fire, explosion, release of liquids or vapors, damage to critical moving parts, or other potentially dangerous conditions. Procedures may include sounding the alarm, notifying the fire department, evacuating personnel, de-energizing equipment, and controlling and extinguishing the fire;

v. Response considerations similar to a safety data sheet (SDS) that will address response safety concerns and extinguishment when an SDS is not required;

vi. Procedures for dealing with battery energy storage system equipment damaged in a fire or other emergency event, including maintaining contact information for personnel qualified to safely remove damaged battery energy storage system equipment from the facility;

vii. A water containment plan;

viii. Other procedures as determined necessary by the city to provide for the safety of occupants, neighboring properties, and emergency responders; and

ix. Procedures and schedules for conducting drills of these procedures and for training local first responders on the contents of the plan and appropriate response procedures.

E. *Transportation and Traffic Control Plan*. Prior to site plan approval, the applicant or project owner shall prepare and submit such a plan to the Virginia Department of Transportation (VDOT) and the county for review and approval. Such plan shall address the following:

i. Directing employee traffic and delivery traffic to specific roadways to access the property to minimize conflicts with local traffic patterns;

ii. Lane closures, flagging procedures, directional and informational signage;

iii. Designated routes for employees, deliveries or equipment and materials on secondary roads to the property;

iv. Designated delivery and parking areas;

v. Dust control and mitigation, using water trucks, mulch, or similar methods;

vi. Measures necessary to prevent deposits of soil and mud onto adjacent roads from construction-related traffic; and

Commented [A23]: Detailed Emergency Response Plan required in coordination with county EMS prior to site plan approval.

Commented [A24]: Same traffic plan requirements as solar facilities.

vii. A pre-and post-construction road evaluation, an any necessary repairs to the public or private roads damaged by the project. If a traffic issue arises during the construction of the project, the applicant or project owner shall develop, with the input from the county and VDOT, a complete appropriate measures to mitigate the issue.

F. *Bonding Requirements.* The Board of Supervisors may require a bond or letter of credit in an amount and with surety satisfactory to the department of planning, securing to the county compliance with the conditions and limitations set forth in the conditional use permit.

G. Remediation. The battery energy storage system operator or owner shall be responsible for any environmental remediation required by the county or the state and the costs of such remediation. All remediation shall be completed in a timely manner.

H. *Decommissioning*. Decommission means the removal and proper disposal of equipment, facilities, or devices related to a battery energy storage system. Decommissioning shall be implemented upon abandonment and/or in conjunction with removal from the facility due to the end of its useful life which results in a permanent ceasing of operations. The disposal of battery components in any of the county's landfill facilities is prohibited.

1. *Decommissioning Plan.* The applicant shall submit a decommissioning plan prior to site plan approval. The decommissioning plan shall include:

i. A narrative description of the activities to be accomplished, including who will perform that activity and at what point in time, for complete physical removal of all battery energy storage system components, structures, equipment, security barriers, and transmission lines from the site;

ii. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations;

iii. The anticipated life of the battery energy storage system;

iv. The estimated decommissioning costs and how said estimate was determined;

v. The method of ensuring that funds will be available for decommissioning and restoration;

vi. The method by which the decommissioning cost will be kept current;

vii. The manner in which the site will be restored, including a description of how any changes to the surrounding areas and other systems adjacent to the battery energy storage system, such as, but not limited to, structural elements, building penetrations, means of egress, and required fire detection suppression systems, will be protected during decommissioning and confirmed as being acceptable after the system is removed; and

viii. A listing of any contingencies for removing an intact operational energy storage system from service, and for removing an energy storage system from service that has been damaged by a fire or other event.

2. *Decommissioning Agreement.* As a condition of the approval of a site plan for a battery energy storage system, the owner, lessee, or developer of the project shall enter into a written project development agreement with the county, setting forth, at a minimum that:

Commented [A25]: Bonding, Remediation, and Decommissioning are all the same requirements for BESS as for solar.

Commented [A26]: From solar ordinance.

i. If the facility ceases to generate electricity for more than 6 consecutive months, unless due to an act of God, the responsible party will provide for its decommissioning.

ii. If the owner, lessee, or developer defaults in the obligation to decommission the facility, the county has the right to enter the real property without further need of consent of the owner to engage in decommissioning.

iii. The owner and/or operator of the energy storage system shall provide surety in the in the form of certified funds, cash escrow, bond, letter of credit, or parent guarantee as approved by the County Attorney, for the removal of the battery energy storage system, for the period of the life of the facility. All costs of the financial security shall be borne by the owner and/or operator.

iv. The amount of the financial assurance based upon an estimate by a professional engineer licensed in the Commonwealth, engaged for and paid by the responsible party, who has experience in preparing decommissioning estimates, and approved by the County.

v. The amount of the surety required shall be 100% of the estimated decommissioning costs plus 20% in administrative fees. ~~Any solar panels, steel, aluminum, copper, fence posts, fencing, or other~~ all components and material removed from the facility as part of decommissioning shall be taken out of Surry County by the owner, lessee, or developer. ~~None of T~~the estimated salvage value of ~~any of this material~~the energy storage system components may be used to offset the decommissioning costs.

Commented [A27]: Modified to address salvage value.

vi. All references within the conditional use permitting and site development requirements, where the term "construction" is used, shall also mean "deconstruction" and "decommissioning" and vice-versa.

3. *Physical Decommissioning*. The decommission process shall occur within 6 months after the battery energy storage system permanently ceases operation. The decommissioning process shall conform to the Decommissioning Plan and shall include the reasonable restoration of the real property, to include:

Commented [A28]: From solar ordinance.

i. The removal from the surface of the property, any project facilities and appurtenances installed or constructed thereupon, including permanent foundations shall be completed both above and below ground. For facilities located in an M-1 or M-2 district, foundations shall be permitted to remain.

ii. The filling in and compacting of all trenches or other borings or excavations made in association with the project, the removal of all debris caused by the project from the surface of the property, soil stabilization of the project site, and revegetation of the ground cover of the real property disturbed by the removal of such equipment, facilities, or devices.

iii. For facilities located in the A-R district, at the completion of decommissioning, the properties shall be returned to a state in which agricultural or forestal use may continue in order to preserve and protect the county's rural and agricultural character.

4. *Decommission Review*. Upon completion of decommissioning, the project owner or operator shall provide to the planning director a report detailing compliance with all of conditional use permit and ordinance requirements required for decommissioning as well as perform and provide a phase II

Commented [A29]: From solar ordinance.

environmental site assessment report of the site to the County. County staff will review the provided decommissioning report for approval or denial. If denied, a list of corrective actions will be provided to the project owner or operator.

I. *Modification.* The Board of Supervisors may, in its sole discretion, by conditional use permit, waive or modify requirements set out in this article for battery energy storage systems, based on unique site conditions, if it finds that such waiver or modification promotes good land use planning and is compatible with surrounding land uses, and as long as the project still otherwise complies with applicable state law and local ordinances.

Commented [A30]: Allows BoS to modify or waive any requirements at their discretion.

Bear Island Battery Storage LLC

PROJECT NAME

Bear Island Battery Storage LLC

Hazard Mitigation Analysis and Emergency Response Plan - DRAFT

Prepared for:

Surry County Conditional Use Permit Application
May 2025

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The following is a draft report provided to Surry County in support of the Conditional Use Permit application for Bear Island Battery Storage LLC. Bear Island Battery Storage has not yet selected final equipment for the project. As such, this draft should be considered an illustrative example of an Emergency Response Plan / Hazard Mitigation Plan. A final plan will be provided prior to start of construction of the site, which will include full suite of information necessary for the County and first responders.

Bear Island Battery Storage is proposing to install a battery energy storage system (BESS) using [EQUIPMENT] with an approximate system capacity of 75 megawatts (MW) for up to four hours in Surry County, Virginia. Given the capacity of the BESS exceeds 600 MWh, a fire hazard mitigation analysis (HMA) is required by International Fire Code (IFC). This report is intended to document the required analysis, including the failure modes and mitigation of hazards outlined in 2024 IFC, and when approved by the fire code official, exceeding the BESS capacity limitations of the IFC is permitted.

As outlined throughout the report, the [EQUIPMENT] is a listed BESS product that has undergone regulatory and bespoke fire testing, which provides data from a large-scale fire, to meet the requirements of 2024 IFC. Appendix 1 of this report contains the product overview, regulatory testing, bespoke fire testing, and engineering analyses that has been used as technical justification throughout the product development and HMA to validate that the fault conditions required to be analyzed will not create an undue hazard.

Furthermore, the site-specific design and fire service features have been reviewed in accordance with 2024 IFC and appear to meet or exceed the requirements, when the [EQUIPMENT] is installed in accordance with the manufacturer's documentation. Following the site analysis, the fault conditions and conditions for approval from 2024 IFC are reviewed and documented.

Finally, a thermal radiation hazards analysis is performed for nearby electrical infrastructure as well as adjacent facilities, buildings, and structures, both on the site and in the adjacent community, to document the associated exposure hazards during a thermal event. As documented herein, the worst-case consequence from a thermal event may require additional personal protection equipment from emergency responders, as outlined in the recommended emergency response procedures.

Several considerations are provided for the site which will be incorporated throughout the life of the system and include evacuation procedures, operation and maintenance personnel training, site personnel training, signage, pre-incident planning, emergency response procedures, and emergency response training. By following these recommendations, the requirements of 2024 IFC, and manufacturer's installation and operation documentation, and maintaining the system as required, it is our professional opinion that the installation meets the intent of 2024 IFC for approval and does not create any undue hazards that cannot be appropriately managed.

INTRODUCTION

Bear Island Battery Storage ("Bear Island", "The Project") is proposing to install a Battery Energy Storage System ("BESS") in Surry County, VA. The Bear Island BESS is anticipated to include approximately [EQUIPMENT]. The project will store energy generated by the grid and discharge it back onto the grid at a later time. The BESS will be interconnected to the proposed, adjacent BESS substation.

A fire HMA is required by applicable national industry standards given the size/capacity of the proposed BESS installation. This narrative has been prepared by [Licensed Engineer] and summarizes our analysis. It is intended to be used as a tool for a fire code official (FCO) or an authority having jurisdiction (AHJ) to assist in their review of the BESS installation in Surry Count, VA. The fire HMA includes a review of the [equipment], its construction, design, fire safety features, listings, certifications, fire test data, and fire modeling results to evaluate the potential consequences of a failure and to determine what impact that failure might have to the surrounding areas.

Applicable Codes, Design Standards and Test Methods

The following codes and standards have been applied to this analysis:

- International Fire Code®, 2015 Edition (2015 IFC)
- International Fire Code®, 2024 Edition (IFC)
- NFPA 68, Standard on Explosion Protection by Deflagration Venting, 2018 edition (NFPA 68).
- NFPA 69, Standard on Explosion Prevention Systems, 2019 edition (NFPA 69).
- NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, 2023 Edition (NFPA 855).
- IEC 60529, Degrees of Protection Provided by Enclosures, 2.2 Edition, January 2019 (IP Code).
- IEC 62619, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications, Edition 1.0, 2017 (IEC 62619).
- UL 1642, Lithium Batteries, Edition 6, September 29, 2020 (UL 1642).
- UL 1973, Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail (LER) Applications, Edition 3, February 25, 2022 (UL 1973).
- UL 9540, Standard for Safety of Energy Storage Systems and Equipment, Edition 2,

February 27, 2020 (UL 9540).

- UL 9540A, Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems, Edition 4, November 12, 2019 (UL 9540A).

Reference Materials

The following reference materials were reviewed as part of this analysis:

- Equipment Design and Installation Manual
- Equipment Operation and Maintenance Manual (O&M)
- Industrial Lithium-Ion Battery Emergency Response Guide – Rev. 2.7, dated February 16, 2024 (ERG).
- Equipment UL 9540A Cell Level Fire Test Report, dated [x]
- Equipment UL 9540A Module Level Fire Test Report, dated [x]
- Equipment UL 9540A Unit Level Fire Test Report, dated [x]
- Equipment Fire Protection Report, dated [x]
- Equipment Destructive Fire Test and Fire Modeling Report, dated [x]
- The Society of Fire Protection Engineers (SFPE), Handbook of Fire Protection Engineering, 5th Edition.

Project Background

The Bear Island BESS will be comprised of [TBD] listed [EQUIPMENT] [EQUIPMENT] cabinets utilizing listed lithium- ion batteries. It will be installed per [EQUIPMENT PROVIDER]'s [EQUIPMENT] DIM and in compliance with 2024 IFC, which specifies the installation level requirements for BESS. The [EQUIPMENT] is a fully integrated BESS

consisting of battery modules, inverters, power electronics, a thermal management system, and control systems all pre-assembled within a single cabinet. It should be noted, the [EQUIPMENT] manufacturer's documentation does not require a fire detection, gas detection, or fire extinguishing system for safe operation. It is a modular style BESS, where the number of battery modules can be adjusted to increase/decrease the storage capacity of an individual [EQUIPMENT] cabinet. Furthermore, additional [EQUIPMENT] cabinets can be added to the site to increase the overall storage capacity of the BESS. In this case, the Bear Island BESS installation will utilize a 24 module [EQUIPMENT] with a 4-hour duration, capable of providing a capacity of 979.2 kW/3,916.8 kWh per [EQUIPMENT]. With each battery tray containing 112 cells, each battery module has 336 cells and the 24 module Bear Island BESS [EQUIPMENT] cabinets will have 8,064 cells. The system also includes the installation of auxiliary electrical equipment for interconnection with the utility grid, including meters, transformers, switchgears, and site controllers, as necessary. The point of interconnection (POI) between the Bear Island BESS and the electrical grid occurs in the adjacent substation, see Appendix 2 and 3.

Other electrical equipment associated with the PV system will also be installed at the Bear Island site, including photovoltaic arrays and their associated switchboards, transformers, and monitoring panels. The electrical equipment, other than the BESS, associated with the PV system is outside the scope of this report.

BEAR ISLAND BESS

The Bear Island BESS is being proposed for installation to store energy from the associated PV system and the grid, located within Surry County, Virginia. The project is surrounded by thousands of feer of commercial forest in all directions. As such, the Bear Island BESS is in a remote location in Surry County, VA, with no public facilities in the vicinity. The site level fire safety features installed at the Bear Island BESS and the adjacent exposures are discussed in more detail in the following sections.

Site Level Fire Safety

Bear Island BESS site level fire safety features and systems will include the following:

Monitoring and Emergency Notification

Remote monitoring of the [EQUIPMENT] cabinets will be provided by a Local Operations Center (LOC), which can be reached via [EQUIPMENT PROVIDER]'s urgent support hotline (XXX-XXX-XXXX). If an off-normal signal is received at the [EQUIPMENT PROVIDER] LOC, they will contact the operation and maintenance (O&M) management organization, the responsible service personnel (owner's O&M service personnel), and the site owner. If necessary, such as the off-normal condition leads to a thermal event, the O&M service personnel responding to the signal will then notify the fire department.

Local detection will be provided that is capable of alerting Bear Island personnel of a fire event at an [equipment] cabinet.

Periodic Maintenance

The Bear Island BESS will be periodically inspected and serviced by trained O&M service personnel from the O&M management organization, as required by [EQUIPMENT PROVIDER]'s [EQUIPMENT] O&M. Refer to [EQUIPMENT PROVIDER]'s [EQUIPMENT] O&M for routine maintenance frequencies.

Fire Department Access

The Surry Volunteer Fire Department building, located at 25 Bank St, Surry, VA 23883, is the closest fire department to the Bear Island BESS site and is approximately 9.5 miles to the west of the site access. Access to the Bear Island BESS is provided on the west side of the site and is accessed viaWhite Marsh Road (Route 617). After entering the Bear Island site, the fire department will travel southeast, utilizing the designated access road until taking a left, heading north. The project is located on the east side of the road approximately ½ mile from the final turning point. A 24 ft wide access gate will provide site access. In addition to the 24 ft wide access gate, 12 ft wide man gates are also provided for personnel access. The PV access road from White Marsh Road leading to the BESS yard is 20 ft wide. The access road provided around the BESS yard is also 20 ft wide.

Site Security

Site security is provided by fencing around the BESS yard and the project substation. The security fence is installed to prohibit access to the [EQUIPMENT] cabinets, and the PV arrays and associated electrical equipment, as required by 2024 IFC, and [EQUIPMENT] DIM.

External Fire Detection

[EQUIPMENT PROVIDER]'s LOC monitors the internal sensors of the [EQUIPMENT] cabinets, providing another layer of detection to ensure timely identification and response to potential thermal events.

Emergency Water

The site owner intends to apply the provisions of the 2023 NFPA 855, section 9.5.2.5: "*When agreeable with the ESS owner and approved by the AHJ, fire suppression systems and water supply shall not be required*." Per discussions with Surry County Chief of Emergency Management, an on-site water supply will be maintained for access in the event fire containment is necessary, and first responders choose to use water as a coolant.

Applicant Note: an off-site water source may be provided, pending approval of location and access from the Surry County Chief of Emergency Management/

Based on the large-scale fire testing performed by [EQUIPMENT PROVIDER], no internal or external fire suppression systems are provided or necessary for the [EQUIPMENT] cabinet. Furthermore, as outlined in [EQUIPMENT PROVIDER]'s ERG, no firefighting water is required to extinguish an [EQUIPMENT] fire as the product is designed to consume itself completely during a thermal event, and applying water to an [EQUIPMENT] unit undergoing a thermal event will only slow its eventual combustion.

Site Level Emergency Stop

As currently designed, the site may be disconnected from the grid through relay-operated circuit breakers by the remote operations center. Once the breakers are operated, the medium voltage breakers associated with the [EQUIPMENT] circuits from the medium voltage transformers will open, isolating the [EQUIPMENT] cabinets from electrical interactions. There will still be stranded energy within the [EQUIPMENT] cabinets once breakers have operated.

Site Level Fire Safety Summary

In addition to meeting all the design standards described previously, based on a review of the proposed Bear Island BESS (the [EQUIPMENT] documentation, design drawings, and the above site level fire safety features), the Bear Island BESS appears to meet the 2024 IFC requirements for the installation of an outdoor, ground-mounted, remote-location BESS when it is installed in accordance with [EQUIPMENT PROVIDER]'s [EQUIPMENT] DIM and the drawing set.

Permanent Exposures Associated with the Bear Island BESS or Electrical Grid

The Bear Island BESS, and its associated equipment mentioned below, are intended to operate year-round and would be available to receive (i.e., charge) or deliver (i.e., discharge) energy 24 hours a day, 365 days a year. Installed adjacent to the secured Bear Island BESS area (i.e., the area adjacent to the BESS inside the Bear Island security fence) is auxiliary electrical equipment for interconnection with the utility grid, including meters, transformers, switchgear, and site controllers, as necessary.

Table 1. Distance to Permanent Exposures Associated with the Bear Island BESS- DRAFT

Exposure	Distance
Low Voltage Cable Tray	x ft
Transformer and Field Network Enclosure	x ft
Service Storage Container(s)	x ft
Laydown Area (West)	x ft
AC Distribution Board	x ft
Automatic Transfer Switch/ Propane Generator	x ft
45 KVA Transformer	x ft

Permanent Public Exposure Hazards

No public exposures will be within 10 ft of the [EQUIPMENT] cabinets, as required by 2024 IFC Section 1207.8.3, (see Appendix 2 and 3). The proposed location for the Bear Island BESS is located in a remote area near White Marsh Road. There are no other public buildings or structures in the vicinity, and the closest property is over 2,000 feet to the north. Based on a review of the proposed installation (see Appendix 2 and 3), clearance distances to public exposures are summarized in Table 2.

Table 2. Distance to Permanent Public Exposures-DRAFT

Exposure	Distance	Comment
Nearest Property Line	220 ft	East of Cabinets
White Marsh Road Entrance	3,942 ft	West of Cabinets
230kV Utility Transmission Line	560 ft	North of Cabinets
Nearest Residence	2,318 ft	North of Cabinets

Most public exposures surrounding the new BESS installation are neighboring land, roads, and a utility transmission line. All permanently installed public exposures (public ways, buildings, stored combustible materials, hazardous materials, high-piled stock, and exposure hazards not associated with electrical grid infrastructure) appear to be greater than 10 ft from the [EQUIPMENT] cabinets and meet 2024 IFC requirements for clearance distances.

HAZARD MITIGATION ANALYSIS METHODOLOGY

2024 IFC specifies that an outdoor BESS can have a maximum system capacity of 600 kWh. For systems larger than 600 kWh (such as the proposed Bear Island BESS), an HMA can be provided to the FCO or AHJ as a basis of justification for surpassing the maximum system capacity per 2024 IFC Section 1207.5. This requirement is in place to ensure that proper planning and safeguards are provided for large BESS installations so that, in the unlikely event of an incident, it would not adversely affect occupants of the building (if the BESS is installed inside a structure) or other adjacent exposures (more applicable to outdoor installations, such as this Bear Island BESS installation).

2024 IFC Section 1207.1.6.1 Fault Conditions

Per 2024 IFC Section 1207.1.6.1 an HMA must evaluate the consequences of the following single- failure modes, and any others deemed necessary by the fire code official:

1. Thermal runaway or mechanical failure condition in a single electrochemical ESS unit.
2. A mechanical failure of a nonelectrochemical ESS unit.
3. Failure of any energy storage management system or protection system that is not covered by the product listing failure modes and effects analysis (FMEA).
4. Failure of any required protection system including, but not limited to, ventilation (HVAC), exhaust ventilation, smoke detection, fire detection, fire suppression, or gas detection.

The consequences of each of these for the [EQUIPMENT] are discussed in detail below in the HMA discussion.

2024 IFC Section 1207 1.6.2 Analysis Approval

Per the 2024 IFC, Section 1207.1.6.2, the FCO or AHJ is authorized to approve the HMA provided that it

demonstrates all of the following:

1. Fires will be contained within unoccupied ESS rooms for the minimum duration of the fire resistance rating separations identified in Section 1207.7.4.

2. Fires involving the ESS will allow occupants or the general public to evacuate to a safe location. (Material based on NFPA 855 2023 Ed.).

Each of these have been demonstrated for the [EQUIPMENT], which is discussed in detail below in the HMA discussion.

HAZARD MITIGATION ANALYSIS

Applicant Note: The following analysis is provided as an example of the information included in a normal hazard mitigation analysis. The final information and analysis for Bear Island BESS will be highly dependent upon the final equipment chosen, the characteristics of that system, and the test results referenced below. Although much of what is shown below is subject to change, the analysis, evaluation of worst-case scenario, summary of compliance, and proposed best practices will all be provided based on the chosen equipment for Bear Island prior to the start of construction.

Below is an analysis of the anticipated consequences of the four single failure modes listed above, as well as a discussion related to how the [EQUIPMENT] meets or exceeds the requirements of the Bear Island BESS for approving of the HMA based on the results of those failure mode consequences.

2024 IFC Section 1207.1.6.1 Fault Conditions

When analyzing the four fault conditions listed above for the [EQUIPMENT] Bear Island BESS installation, Bowman FLS reviewed [EQUIPMENT PROVIDER]'s [EQUIPMENT] DIM, ERG, [EQUIPMENT] UL 9540A cell, module, and unit level fire test results, destructive unit level fire testing, and fire propagation modeling. The [EQUIPMENT] DIM and ERG provide system details and emergency response procedures. The fire test results provide real-world data relating to the consequences of a fire event in an [EQUIPMENT] cell, module, or unit and the fire propagation model provides data relative to the likelihood of a fire spreading to adjacent exposures. After reviewing this information, the worst-case consequence associated with the three fault conditions is a controlled fire event that remains contained to a single [EQUIPMENT] cabinet, with no explosions or chemical/liquid spills. Each of the fault conditions are discussed in detail below:

1. A thermal runaway or mechanical failure condition in a single electrochemical ESS unit.

As part of its listing (UL and IEC), all [EQUIPMENT] battery modules must demonstrate, through testing, that a single cell undergoing thermal runaway will not propagate to adjacent cells (see [EQUIPMENT] Product Listings in Appendix 1). The [EQUIPMENT] has demonstrated this in order to gain its listings and has also demonstrated how widespread a failure must be in order to create a fire condition in its unit level UL 9540A fire test and destructive unit level fire test. In the UL 9540A unit level fire test, seven cells simultaneously failed, and no sustained fire occurred within the [EQUIPMENT] cabinet. To create a fire event, it required forty-eight cells to fail simultaneously during the destructive unit level fire test in order to propagate thermal runaway. Note, this HMA is required to look at single failure modes only (i.e., one cell failing);

whereas the [EQUIPMENT] required forty-eight simultaneous cell failures to propagate thermal runaway.

In that destructive unit level test, the flammable gases released from the forty-eight cells were ignited by the sparker system (as designed) to create a controlled fire event. The fire slowly burned from battery bay to battery bay until consuming one-half of the battery modules in the cabinet. The fire did not spread across the customer interface bay (CIB) and Thermal Bay into Battery Module Bays 1-4. Only Battery Module Bays 7-10 were consumed. No observations of explosion hazards, such as a failure of the cabinet, flying debris or an explosive discharge of gases were made. In addition, no observations of chemical or liquid runoff (such as from glycol or electrolyte solution) were observed during the test or afterwards during cleanup. Furthermore, based on the fire propagation model, thermal runaway would not be expected to propagate to an [EQUIPMENT] installed 8 ft in front, 6 inches behind or 6 inches to the side of the initiating [EQUIPMENT] cabinet.

Worst-Case Consequence: As demonstrated through testing and its listing, a single cell failure within an [EQUIPMENT] will not propagate into a thermal event such as a fire or explosion. However,

being conservative, a worst-case scenario for simultaneous, multiple cell failures within a battery module is a controlled fire that consumes the entire [EQUIPMENT] cabinet. This controlled fire would not be expected to produce explosions or spill hazards, as has been demonstrated through UL 9540A unit level fire testing and destructive unit level fire testing.

2. A mechanical failure of a nonelectrochemical unit

The [EQUIPMENT] is an electrochemical ESS unit. Therefore, the consideration of the mechanical failure of a nonelectrochemical ESS unit as a failure mode for the Bear Island BESS is not applicable.

Worst-Case Consequence: Because the [EQUIPMENT] is an electrochemical ESS unit, the mechanical failure of a nonelectrochemical ESS unit is not applicable to the Bear Island BESS.

3. Failure of Any Battery (Energy) Management System

[EQUIPMENT] has an integrated battery management system (BMS) that tracks the performance, voltage, current and state of charge (SOC) of the cells (among many other datapoints). The BMS is a layered system where each battery module has its own BMS as well as a bus controller supervising the [EQUIPMENT] (see Battery Management System). Based on this design and a review of the [EQUIPMENT] safety documents, the [EQUIPMENT] is equipped with several layers of redundant safety controls and features that work autonomously to ensure no single BMS failure would lead to adverse conditions for the [EQUIPMENT] cabinet as a whole. As described above, each battery module has its own integrated BMS, meaning, if a fault is detected in that battery module, the module BMS can address the issue locally. If the issue cannot be addressed by the module BMS or if the fault condition is within the battery module BMS itself, the bus controller, which supervises the entire [EQUIPMENT] cabinet, can isolate that battery module from the rest of the unit so that a fault condition in that battery module does not spread to adjacent battery modules.

In the unlikely scenario that multiple internal failures occur leaving the BMS and the [EQUIPMENT] bus controller inoperable, this condition would be detected and relayed to a [EQUIPMENT PROVIDER] LOC, which operates 24/7. The source of the BMS or bus controller failure could be addressed remotely, or O&M service personnel could be sent out to investigate the issue. In the meantime, when the [EQUIPMENT] has a BMS fault condition, it will automatically default to a safe, isolated state. While in this isolated state, the [EQUIPMENT] does not pull additional power from the PV system or put power back onto the site or grid. It can remain isolated for as long as needed to address the issue. If it does not automatically self-isolate, the [EQUIPMENT] can be shut down and electrically isolated remotely by a [EQUIPMENT PROVIDER] LOC, provided those functions are still operable. If they are not, [EQUIPMENT] can be manually isolated by O&M service personnel, with guidance from [EQUIPMENT PROVIDER]'s local operations center (LOC) support team. It should also be noted that the BMS does not control or power the thermal management system (TMS), the deflagration control system (sparker system and overpressure vents), or the [EQUIPMENT PROVIDER] System Controller (TSC), which provides a communication link

to the LOC. Those safety features are powered separately and would remain in operation during a BMS or bus controller failure. In summary, at no time would a failure of a BMS or bus controller go undetected or would the [EQUIPMENT] be left in operation without the BMS or bus controller operating as intended without multiple failures occurring within the [EQUIPMENT].

Worst-Case Consequence: The [EQUIPMENT] has a series of redundant safety features in place to address any single failure of a BMS component, a BMS, or the bus controller. If a failure of the entire BMS or bus controller were to occur, the system would be safely isolated as it awaits servicing, either remotely or in person. However, being conservative, a worst-case scenario for total BMS and bus controller failure would be a total loss of battery management, which if coupled with additional failures in the [EQUIPMENT], such as the unit not isolating and continuing to charge and discharge, could lead to a multiple cell failure event. Again, being conservative, a worst-case scenario for simultaneous, multiple cell failures within a battery module is a controlled fire that consumes the entire [EQUIPMENT]. This controlled fire would not be expected to produce explosions or spill hazards, as has been demonstrated through UL 9540A unit level fire testing and destructive unit level fire testing.

4. Failure of Any Required Protection System Including, but not limited to, Ventilation (HVAC), Exhaust Ventilation, Smoke Detection, Fire Detection, Fire Suppression, or Gas Detection

The TMS provides a suitable operating temperature for [EQUIPMENT] using liquid cooling via a 50/50 mixture of ethylene glycol and water and a R-134a gas refrigerant (see Thermal Management System in Appendix 1). The thermal roof, located above the battery bays within an IP20 enclosure, provides a ventilation airspace and contains exhaust fans and radiators that cool the ethylene glycol-water solution. This is the only ventilation or exhaust system the [EQUIPMENT] cabinet incorporates into the design. Based on the design of the [EQUIPMENT] and a review of the [EQUIPMENT] safety documents, the [EQUIPMENT] is equipped with several layers of redundant safety controls and features that work autonomously to ensure no single failure of a component would lead to the failure of its TMS.

In the unlikely scenario that multiple internal failures occur, which render the TMS inoperable, this condition would be immediately detected by the BMS. The BMS would derate the battery output power, and therefore the heat generation of the system, to maintain the cells in a safe operating temperature. In addition, this failure would be monitored and relayed to a [EQUIPMENT PROVIDER] LOC, which operates 24/7. The source of the failure could be addressed remotely, or O&M service personnel could be sent out to investigate the issue. In the meantime, the [EQUIPMENT], after having its battery output derated, automatically shuts down and isolates. While in this derated, isolated state, the [EQUIPMENT] does not pull additional power from the PV system or put power back onto the site or grid. It can remain isolated for as long as needed to address the issue. If it does not automatically self-isolate, the [EQUIPMENT] can be shut down and electrically isolated remotely by a

[EQUIPMENT PROVIDER] LOC, provided those functions are still operable. If they are not, [EQUIPMENT] can be manually isolated by O&M service personnel at the site, with guidance from a [EQUIPMENT PROVIDER] LOC support team. It should be noted, the TMS does not control or power the deflagration control system (sparker system and overpressure vents). They are not powered in any way, by the TMS or any other system. They are passive vents that only open if there is an overpressure event within the [EQUIPMENT] cabinet, such as the ignition of flammable gases. The sparkers are also powered separately from the TMS and would remain in operation during a TMS failure as well. In summary, at no time would a failure of the TMS go undetected or would the [EQUIPMENT] be left in operation with an inoperable TMS without multiple failures occurring within the [EQUIPMENT].

The [EQUIPMENT] does not require a fire detection, gas detection, or fire extinguishing system for safe operation. It includes a series of passive fire protection schemes (barriers) to protect it from spreading a fire from one unit to another. As demonstrated in UL 9540A unit level fire testing, a nearly simultaneous failure of up to seven cells did not result in thermal runaway propagating throughout the battery module or to adjacent [EQUIPMENT] cabinets. In addition, based on the fire propagation model, thermal runaway would not be expected to propagate to an [EQUIPMENT] installed 8 ft in front, 6 inches behind, or 6 inches to the side of the initiating [EQUIPMENT] cabinet. These results were without fire extinguishing, smoke, or gas detection systems. However, the [EQUIPMENT] does have a number of internal sensors within it that can detect an off-normal overheating event, such as a fire. In the event that these sensors detect an overheating event, this condition can be relayed by the BMS to the TSC and off-site to a [EQUIPMENT PROVIDER] LOC, which operates 24/7. The LOC can then inform O&M service personnel who, after responding to the signal, can notify the local fire department, if necessary.

Worst-Case Consequence: The [EQUIPMENT] has a series of redundant safety features in place to address any single failure of a TMS component automatically. If a failure of the entire TMS were to occur that required maintenance (i.e., could not be automatically addressed), the [EQUIPMENT] would be isolated as it awaits servicing, either remotely or in person. However, being conservative, a worst-case scenario for a total TMS failure, which if coupled with additional failures in the [EQUIPMENT], could lead to a multiple cell failure event. Again, being conservative, a worst-case scenario for simultaneous, multiple cell failures within a battery module is a controlled fire that consumes the entire [EQUIPMENT]. This controlled fire would not be expected to

produce explosions or spill hazards, as has been demonstrated through UL 9540A unit level fire testing and destructive unit level fire testing.

A fire detection, gas detection or fire suppression system integral to the [EQUIPMENT] cabinet is not required as part of its product listing; however, internal sensors within the [EQUIPMENT] cabinet are capable of detecting off-normal overheating events.

Fault Condition Summary

As described above, based on a review of [EQUIPMENT PROVIDER]'s [EQUIPMENT] DIM, ERG, [EQUIPMENT] UL 9540A cell, module, and unit level fire test results, destructive unit level fire testing, and fire propagation modeling, no single failure mode in an [EQUIPMENT] would be expected to lead to a thermal event. However, to provide additional context and analysis, a conservative worst-case consequence for multiple failures was presented for each fault condition. The worst-case consequence identified from the above analysis is a controlled fire that consumes the entire [EQUIPMENT] cabinet. This controlled fire would not be expected to produce explosions or spill hazards, as has been demonstrated through UL 9540A unit level fire testing and destructive unit level fire testing.

2024 IFC Section 1207.1.6.2 Analysis Approval

Analyzing this conservative, worst-case fire scenario (a controlled fire event that consumes the entire [EQUIPMENT] cabinet) provides more context regarding what hazards could be expected in the unlikely occurrence of an [EQUIPMENT] fire. The below analysis is based only on this conservative, worst-case scenario, as described above, no single failure mode in an [EQUIPMENT] would be expected to lead to a thermal event of this nature. Per IFC Section 1207.1.6.2, the FCO or AHJ is authorized to approve the HMA provided it demonstrates all the following:

1. Fires will be Contained

Fires will be contained within unoccupied BESS rooms or areas for the minimum duration of the fire resistance rating specified in 2024 IFC Section 1207.7.4.

Anticipated Result from a Fire: The Bear Island BESS meets this requirement as the system is installed outdoors, not within an unoccupied BESS room or area. It should be noted, however, that the [EQUIPMENT] design includes a series of passive fire protection schemes (barriers) to protect it from spreading a fire from one [EQUIPMENT] cabinet to another. As demonstrated in UL 9540A unit level fire testing, a nearly simultaneous failure of up to seven cells did not result in thermal

runaway propagating throughout the battery module or to adjacent [EQUIPMENT] cabinets. In addition, based on the fire propagation model, thermal runaway would not be expected to propagate to an [EQUIPMENT] installed 8 ft in front, 6 inches behind, or 6 inches to the side of the initiating [EQUIPMENT] cabinet. Although this requirement applies to BESS rooms (and not an outdoor installation), the Bear Island BESS still meets the intent of the requirement by containing a fire event to a single [EQUIPMENT] cabinet.

2. Occupants will be able to Safely Evacuate

Fires and products of combustion will not prevent occupants from evacuating to a safe location.

Anticipated Result from a Fire: The Bear Island BESS meets this requirement as the system is installed outdoors with limited facilities in the nearby vicinity. Furthermore, the site will typically be unoccupied, unless O&M service personnel are present. However, it should be noted, the [EQUIPMENT] does have a number of internal sensors within it that can detect an off-normal overheating event, such as a fire. The LOC or remote operations center can then inform O&M service personnel who, if necessary, can notify the fire department if there is a thermal event. The Bear Island BESS meets the intent of the requirement through the internal sensors provided within the [EQUIPMENT] and the remote monitoring provided by the LOC.

Furthermore, the Bear Island BESS meets this requirement as the system is installed outdoors, not within a building or adjacent to any means of egress. The nearest occupied building is well over 2,000 ft away from the [EQUIPMENT] cabinets. As described above, these distances are all greater than the 10 ft clearance distance required by 2024 IFC from the BESS to adjacent means of egress.

Although this requirement applies to a building or normally occupied facility that is immediately adjacent to a means of egress route, the Bear Island BESS still meets the intent of the requirement (i.e., do not produce toxic or highly toxic gases above the immediately dangerous to life or health (IDLH) during an [EQUIPMENT] fire event during the time deemed necessary to evacuate from the area). Products of combustion were not collected during the UL 9540A unit level fire test (nor were they required to as the test is a unit level test conducted outdoors in the open air); however, UL 9540A does require them to be collected and analyzed during module level testing. The module level test involves forcing a module of battery cells into thermal runaway. As described previously and in Appendix 1, a tray (made up of 112 cells) was tested during the UL 9540A module level fire test. The test is performed inside a laboratory under a hood where the products of combustion can be collected and analyzed in a controlled environment. The gases

collected during the UL 9540A module level test, measured using Fourier Transform Infrared spectroscopy (FTIR), are listed in Table 3 and can provide guidance as to what types of gases individuals or first responders can be expected to encounter when evacuating from or responding to a Bear Island BESS fire. As shown, the gases released from an [EQUIPMENT] battery module that is undergoing thermal runaway can include flammable and nonflammable gases.

Table 3. Products of Combustion: UL 9540A Module Level Testing

Gas Name	Chemical Structure	Measurement Peak (ppm)	Detection Method
Carbon Monoxide	CO	204.84	FTIR
Carbon Dioxide	CO_2	6720.62	FTIR
Methane	CH_4	67.83	FTIR
Acetylene	C_2H_2	17.11	FTIR
Benzene	C_6H_6	9.01	FTIR
Hydrogen	H_2	446	Hydrogen Sensor

Flammable Gases Released

The flammable gases collected during UL 9540A module level fire testing included trace amounts of hydrocarbons (methane, acetylene, and benzene) as well as hydrogen (the dominant byproduct of a typical lithium-ion cell failure). It can be assumed that during the full combustion of an [EQUIPMENT], such as what has been identified herein as the worst-case scenario consequence, these flammable gases would be fully consumed or nearly fully consumed. Meaning, these flammable gases inside the enclosed cabinet would burn with an active fire occurring within the [EQUIPMENT]. More importantly, the UL 9540A unit level fire test and destructive unit level fire testing demonstrated that any release of flammable gases during a failure event would not be expected to pose a deflagration or explosion risk to O&M service personnel, first responders, or the general public. During those tests, the explosion control system was proven to be effective in mitigating explosion hazards.

Non-Flammable Gases Released

The non-flammable gases collected during the module level testing are listed in Table 4 and can provide guidance as to what types of gases personnel and first responders can be expected to encounter when evacuating from or responding to an outdoor [EQUIPMENT] fire. In addition to flammable gases discussed above, typical fire byproducts, such as CO and CO_2, were the only non-flammable gases detected during the full combustion of an [EQUIPMENT] tray of cells. These nonflammable gases are similar to gases first responders would encounter in a typical Class A

structure fire and do not contain any unique, or atypical, gases beyond what you would find in the combustion of modern combustible materials, such as plastics.

Table 4 also provides the IDLH values for each of the gases based on data published by National Institute for Occupational Safety & Health (NIOSH).[1] The IDLH is an atmospheric concentration of any toxic, corrosive or asphyxiant substance that: poses an immediate threat to life; would cause irreversible or delayed adverse health effects; or would interfere with an individual's ability to escape from a dangerous atmosphere. The values measured from UL 9540A module level fire testing (where the products of combustion were collected within a hood) are well below the IDLH value for each gas. Since the Bear Island BESS is an outdoor installation (not within an occupied building) and is within a secured area limiting access by the general public, the only personnel that should be in proximity to the [EQUIPMENT] would be the O&M service personnel. Given the Bear Island BESS is installed outdoors, where any gas release would be diluted by the entrainment of outside air, these gases, at the quantities measured during UL 9540A module level fire testing, would not be expected to have an adverse effect on O&M service personnel during the time deemed necessary to evacuate from the area (i.e., approximately 30 seconds to walk 100 ft away/evacuate from a burning [EQUIPMENT]). Nor would these gases, at the quantities measured during UL 9540A module level fire testing, be expected to have an adverse effect on emergency response personnel, who are wearing appropriate personal protective equipment (PPE) while responding to an [EQUIPMENT] fire. As such, no toxic or highly toxic gases released would be expected to be in excess of IDLH levels in the building or adjacent means of egress routes during the time deemed necessary to evacuate from any affected area. However, should smoke become a concern or nuisance, the fire department can utilize a fog pattern to control the path of smoke to lessen its effects, as recommended by [EQUIPMENT PROVIDER]'s ERG. In addition, as they would when responding to other structure, vehicle, or equipment fires, fire department personnel should don their typical PPE when responding to an [EQUIPMENT] emergency.

Table 4. Products of Combustion: Nonflammable Gases and IDLH Values

Chemical Structure	Gas Name	Quantity Measured	IDLH Value
CO	Carbon Monoxide	204.84 ppm	1,200 ppm
CO2	Carbon Dioxide	6,720.62 ppm	40,000 ppm

[1] All IDLH values are provided by NIOSH: https://www.cdc.gov/niosh/idlh/intridl4.html

Analysis Approval Summary

The conservative worst-case consequence involving multiple failure modes was presented for each fault condition. The worst-case consequence identified from that analysis was a controlled fire event that consumes the entire [EQUIPMENT] cabinet. This controlled fire would not be expected to produce explosions or spill hazards, as has been demonstrated through UL 9540A unit level fire testing and destructive unit level fire testing, nor would it be expected to propagate to neighboring [EQUIPMENT] cabinets as determined by the fire propagation model. Based on the above analysis, the Bear Island BESS meets all 2024 IFC requirements for FCO or AHJ approval per 2024 IFC Section 1207.1.6.2 as it has demonstrated that:

1. Fires will be contained within unoccupied ESS rooms or areas for the minimum duration of the fire-resistance-rated separations identified in Section 1207.7.4.

2. Fires involving the ESS will allow occupants or the general public to evacuate to a safe location. (Material based on NFPA 855 2023 Ed.)

THERMAL RADIATION HAZARDS

Three main fire risks apply to a BESS failure in terms of life safety: the explosion hazard, the exposure hazard (products of combustion or liquid runoff contact), and the fire hazard.[2] The above analysis focused on the first two in detail, namely the explosion risk and the exposure hazards; however, the fire hazard was only analyzed in terms of fire spread within the [EQUIPMENT] and to other adjacent [EQUIPMENT] cabinets. This leaves a gap in the hazard analysis in terms of the impact an [EQUIPMENT] fire would have on nearby exposures (such as buildings or equipment) and on people (such as O&M service personnel or the general public). As such, in addition to the analyses performed above, an assessment regarding the effects of an [EQUIPMENT] fire on nearby exposures and people was also performed.

In a large fire, such as when an [EQUIPMENT] is fully consumed, thermal radiation is the dominant mode of heat transfer to nearby exposures. Thermal radiation in a fire involves an energy exchange between two surfaces (such as between the burning [EQUIPMENT] and nearby surfaces). In simple terms, the energy exchange through radiant heat can be physically felt when you sit in front of a campfire. The campfire emits energy in the form of light and heat that then warms the person sitting nearby. If you sit too far away from the campfire, you only feel a little warmth, or maybe none at all. If you sit too close to the campfire, you feel too much heat and may even feel pain.

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2 Other considerations, including but not limited to, electrical hazards, shock hazards, arc flashes, and environmental impacts, are not within the scope of this fire HMA.

The amount of energy that is emitted from a fire is often discussed in terms of heat flux. Heat flux is the rate of heat transferred (the energy transferred) per unit area (typically described in units as kW/m^2). As such, the heat flux values discussed previously during the UL 9540A unit level fire test were direct measurements of the radiant heat that was emitted off the [EQUIPMENT]. However, during the UL 9540A unit level fire test, the forced failure of six cells did not result in a fire event. As such, [EQUIPMENT PROVIDER] undertook a fire propagation model to determine the heat flux an [EQUIPMENT] fire would emit to nearby exposures. With these predicted heat fluxes, the potential impact of an [EQUIPMENT] fire on nearby exposures can be evaluated.

Table 5 provides a summary of the peak heat flux values that were predicted by the fire propagation model at distances up to 100 ft directly in front of an [EQUIPMENT] fire. The table lists the peak heat fluxes presented in Table A-1.6 (at distances of 8, 10, 20, 50, and 100 ft) as well as peak heat fluxes at other distances, including 5, 15, and 25 ft, as shown in Appendix 1. These additional predicted peak heat fluxes were determined by Bowman FLS by analyzing the fire model data and are being presented in Table 5 to provide additional heat flux data at other distances in proximity to the [EQUIPMENT]. Note the heat fluxes presented in Table 5 are only directly in front of the [EQUIPMENT] cabinet. Given flames exit the [EQUIPMENT] out the front and top of cabinet, the predicted heat flux values are the greatest directly in front of the [EQUIPMENT] as opposed to behind or to the side of the [EQUIPMENT] cabinet. By assuming the heat flux imposed on surrounding exposures is directly in front of the cabinet, even if the exposure is not in front of the [EQUIPMENT] cabinet, this analysis is conservative and provides a worst-case heat flux to exposures scenario.

Table 5. Predicted Peak Heat Flux Values Directly in Front of the [EQUIPMENT]

Distance	Directly In Front of the [EQUIPMENT] Cabinet	
	Time to Peak Predicted Heat Flux	Peak Predicted Heat Flux
<5 ft	40 minutes	>20 kW/m^2
8 ft	40 minutes	9.38 kW/m^2
10 ft	40 minutes	7.45 kW/m^2
15 ft	40 minutes	3.85 kW/m^2
20 ft	40 minutes	2.87 kW/m^2
25 ft	40 minutes	1.70 kW/m^2
50 ft	40 minutes	0.57 kW/m^2
100 ft	40 minutes	0.17 kW/m^2

The values presented in Table 5 can be analyzed to determine what impact there could be on nearby materials. Generally, common combustible materials will ignite (piloted) when exposed to a heat flux in the range of 10-20 kW/m^2 and will require an exposure to heat fluxes greater

than 20 kW/m^2 to auto ignite.[3] Based on the destructive unit level fire test, flames from an [EQUIPMENT] fire only extend a few feet out the front doors and above the top of the [EQUIPMENT] cabinet. As such, except for exposures installed within close proximity of the [EQUIPMENT] cabinet, within 3 ft for instance, direct flame impingement from a fire to surrounding exposures is unlikely. Therefore, in the scenario of an [EQUIPMENT] fire, except for exposures installed within close proximity of the [EQUIPMENT] cabinet, the primary concern would be nearby materials autoigniting; meaning just the heat radiating off the [EQUIPMENT] fire heats the exposure up to its autoignition temperature without the presence of a flame (a pilot) nearby to ignite it.

Permanent Exposures Associated with the Bear Island BESS or Electrical Grid

The nearest permanently installed structures, buildings, equipment and/or exposures associated with the Bear Island BESS, or the electrical grid is auxiliary electrical equipment for interconnection with the utility grid, including meters, transformers, switchgears, and site controllers, as necessary, as shown in Table 6. Note the heat fluxes presented in Table 6 are only directly in front of the [EQUIPMENT] cabinets, assuming an absolute worst-case scenario, even if the exposures are to the side or behind the [EQUIPMENT] cabinet.

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[3] The SFPE Handbook of Fire Protection Engineering, 5th Edition.

<5 ft (>20 kW/m^2)

Analysis to be provided with final equipment selection and building permit design plans, prior to start of construction.

20-25 ft (1.70-2.87 kW/m^2)

Analysis to be provided with final equipment selection and building permit design plans, prior to start of construction.

50-100 ft (0.17-0.57 kW/m^2)

Analysis to be provided with final equipment selection and building permit design plans, prior to start of construction.

All Other Permanent Exposures Associated with the Bear Island BESS or Electrical Grid

All other permanent exposures are over 100 ft from the [EQUIPMENT] cabinets. Given the predicted peak heat flux at 100 ft or more away from the [EQUIPMENT] cabinet is anticipated to be 0 kW/m^2 and direct flame impingement to this exposure is not anticipated (based on the destructive unit level fire test), fire propagation is not expected to occur to these exposures. During an [EQUIPMENT] fire event, based on real time fire conditions and observations (i.e., wind direction/speed, fire intensity, proximity of flames to the equipment, etc.), the fire department can selectively apply cooling water to the adjacent equipment to protect this exposure, if deemed necessary. As recommended by [EQUIPMENT PROVIDER]'s ERG for the protection of nearby exposures, the fire department can protect adjacent electrical equipment by periodically utilizing a fog pattern to cool the surfaces.

Life Safety Hazards

In terms of fire's impact on people, many studies have been performed regarding the impact of heat flux on people. For context, the heat flux we feel from the sun is generally found to be around 1 kW/m^2. Most studies have found that the pain threshold starts at heat flux levels above 1.7 kW/m^2.[4] Meaning, at heat fluxes below 1.7 kW/m^2, a person with exposed skin will typically not feel pain no matter the duration, as summarized in Table 8. However, at heat fluxes above 1.7 kW/m^2, they can feel pain if the duration of the exposure is long enough. As described earlier, the fire propagation model predicted it would take over 40 minutes for peak heat fluxes to occur. In other words, anyone within 25 ft of an [EQUIPMENT] fire, where the predicted peak heat flux was 1.7

[4] The SFPE Handbook of Fire Protection Engineering, 5th Edition.

kW/m^2, with exposed skin would have ample time, over 40 minutes, to move away from the fire to no longer feel pain.

Table 8. Estimated Times to Pain for a Given Heat Flux

Heat Flux	Estimated Time to Pain
<1.7 kW/m^2	No pain
5.0 kW/m^2	10 seconds
10.0 kW/m^2	5 seconds
>20.0 kW/m^2	1 second

O&M Service Personnel

The Bear Island BESS does not require dedicated O&M personnel. Dedicated O&M facilities are provided by on site storage containers which will not be manned unless there are ongoing maintenance activities. Therefore, full-time maintenance personnel are not expected to be on-site each day. In addition, best practices do not require or recommend that O&M service personnel respond to equipment in distress or attempt to manually suppress a system fire. The BESS will have internal sensors that can detect and notify O&M personnel to a fire event. Therefore, it is not anticipated that O&M service personnel would be in close proximity to the system while it is actively displaying distress (i.e., off-gassing, smoking, etc.) or visibly on fire. If a fire event does occur while O&M service personnel are within the secured Bear Island BESS area, it is possible for them to be exposed to heat fluxes greater than 20 kW/m^2. However, as described above, based on the destructive unit level fire test and fire propagation modeling results, O&M service personnel would have ample visual clues (off-gassing and smoking) for up to 10 minutes before flaming occurs and up to 30 minutes after flaming occurs before predicted heat flux levels would increase above the threshold where pain can occur at a distance of 25 ft. As such, it is unlikely O&M personnel would be exposed to heat fluxes capable of causing pain or injuries. However, fire conditions (i.e., wind direction/speed, fire intensity, proximity of flames, etc.) can differ from site to site and fire to fire. As such, if a fire was to occur while O&M service personnel are within the secured Bear Island BESS area, it is recommended that they immediately evacuate to a location that is upwind from the cabinets in distress and at least 300 ft away. It is also recommended that O&M service personnel be trained in these evacuation procedures. Lastly, it is recommended that O&M service personnel be trained not to respond to an [EQUIPMENT] in distress or attempt to manually suppress an [EQUIPMENT] fire, as recommended by [EQUIPMENT PROVIDER]'s ERG.

General Public

The closest the general public (a pedestrian) can get to the Bear Island BESS is at the security fence surrounding the site and associated cabinets and other equipment. At these locations, the general public could get within 50 ft of the closest cabinet. Realistically, the general public may be present at the surrounding roads around the Bear Island BESS, and the nearest the general public can get to the Bear Island BESS without trespassing on private property is approximately 4,000 ft away.

All other potentially occupied buildings, structures, fence line locations, and roads (besides those discussed above) are over 2,200 ft away from the cabinets. This indicates that the thermal radiation emanating off a fire is not expected to impact the occupants of these structures, pedestrians on the public streets, or the general public occupying or visiting these public exposures.

Life Safety Summary

When analyzing the above thermal radiation hazards of a fire on O&M service personnel and the general public, based on the destructive unit level fire testing and the fire propagation model, the effects of thermal radiation by a system fire is not expected to have an impact.

Evacuation Distances/Emergency Response Perimeter

As described above, over the course of the entire fire event, a 25 ft clearance is generally sufficient to ensure the heat flux from a cabinet fire will not cause pain to exposed skin; however, this distance could change based on the fire conditions that day. As such, if a fire were to occur, individuals in the area of the Bear Island BESS should immediately evacuate to a location that is upwind from the unit in distress and at least 300 ft away. This distance should ensure they are not momentarily exposed to heat fluxes capable of causing pain or become exposed to products of combustion. This evacuation distance should also be utilized by first responders when controlling the scene to ensure the general public, or any other individuals in the area, remain at least 300 ft away from the Bear Island BESS (an emergency response perimeter). This distance is a recommendation and should be reviewed and adjusted, if necessary, during a fire event by the responding emergency services to account for any local conditions affecting the fire that day.

RECOMMENDATIONS

Throughout the report, we have provided several recommendations related to the Bear Island BESS installation and emergency response to mitigate the hazards of a fire event. These recommendations are based on our review of the available materials, our background, experience and training, the analyses performed to date described above, [EQUIPMENT PROVIDER]'s ERG, common industry best practices for responding to a thermal event involving lithium-ion BESS, as well as from experience with lithium-ion battery hazards, lithium-ion battery BESS hazards, and previous [EQUIPMENT PROVIDER] BESS fires. These recommendations do not provide opinions or conclusions meant to address specific circumstances or all possible scenarios of an emergency. As with all emergency events, emergency response actions should be evaluated and performed based on real time fire conditions and observations (i.e., wind direction/speed, fire intensity, proximity of flames to adjacent electrical equipment and structures) during the actual emergency.

Below is a summarized list of the recommendations provided throughout the report:

1. **Evacuation Procedures:** During a Bear Island BESS emergency, individuals (O&M service personnel and the general public) should immediately evacuate to a location that is upwind from the unit in distress and at least 300 ft away. This distance should ensure they are not momentarily exposed to heat fluxes capable of causing pain or become exposed to products of combustion during a Bear Island

BESS fire event.

2. **O&M Training:** O&M service personnel, who could be in the secured Bear Island BESS area during an emergency, should, at a minimum, be trained on the following:

   a. Park O&M vehicles a minimum of 25 ft away from the [EQUIPMENT] to limit exposure risks of parked vehicles near a developing [EQUIPMENT] fire.

   b. How to respond to an [EQUIPMENT] in distress. [EQUIPMENT PROVIDER]'s ERG states that O&M service personnel SHOULD NOT respond to an [EQUIPMENT] that is in distress, they SHOULD NOT approach the [EQUIPMENT] cabinet, and they SHOULD NOT attempt to manually suppress an [EQUIPMENT] fire.

   c. Who to contact during an emergency.

   d. The established evacuation procedures.

3. **Signage**: Signage should be located around the perimeter of the Bear Island BESS fencing to direct individuals (O&M service personnel, or the general public) to evacuate to an area that is upwind and at least 300 ft away should they observe an [EQUIPMENT] in distress.

4. **Pre-incident Planning:** Prior to energizing the Bear Island BESS, emergency response personnel should be invited to the Bear Island site to familiarize themselves with the site, access routes, fire department resources (i.e., water tank), the location of emergency shut- offs, potential hazards, adjacent equipment/structures/exposures, the [EQUIPMENT] cabinets, and identify emergency contacts, as they would during typical pre-incident planning.

5. **Emergency Response:** During an [EQUIPMENT] fire event, emergency response personnel SHOULD NOT attempt offensive firefighting tactics as recommended by [EQUIPMENT PROVIDER]'s ERG. The [EQUIPMENT] cabinets have been designed to fail safely and does not require manual firefighting operations. Attempting to suppress an [EQUIPMENT] fire likely will only slow the fire (not suppress it), resulting in a longer duration fire event. During a fire event, based on real time fire conditions and observations, at a minimum, emergency response personnel should:

a. Call emergency contacts.

b. Don their typical PPE, including a self-contained breathing apparatus (SCBA) as they would when responding to other structure, vehicle, or equipment fires.

c. Establish an emergency response perimeter of at least 300 ft from the Bear Island BESS to limit access to the area. This distance is a recommendation and should be reviewed and adjusted, if necessary, during a fire event to account for any local conditions affecting the fire that day.

d. Cool adjacent exposures, if necessary, by periodically utilizing a fog pattern to cool the surfaces as recommended by [EQUIPMENT PROVIDER]'s ERG for the protection of nearby exposures.

e. If necessary, and provided it is safe to do so based on the local conditions affecting the fire that day, instruct O&M service personnel and other vehicle owners to remove their vehicles from the surrounding area. If that is not possible, the fire department can apply cooling water to the vehicles, as described above, to protect those exposures.

f. Control the path of smoke and/or break up the plume to lessen its effects, should smoke become a concern or nuisance. This can be accomplished by spraying a fog pattern into the plume as recommended by [EQUIPMENT PROVIDER]'s ERG.

6. **Emergency Response Training:** Emergency response personnel, who could be responsible for responding to a Bear Island BESS emergency, should, at a minimum, be trained on the pre- incident plan established for the Bear Island BESS and the [EQUIPMENT PROVIDER] ERG prior to energizing the Bear Island BESS. In addition, at a minimum, annual refresher training should be provided for those emergency response personnel as well as new personnel.

CONCLUSIONS

Based on our review of the available materials, our background, experience and training, and the analysis performed to date described above, the following conclusions are submitted within a reasonable degree of scientific and engineering certainty:

1. 2024 IFC specifies that an outdoor BESS can have a maximum system capacity of 600 kWh. For systems greater than 600 kWh, an HMA can be provided to the FCO or AHJ as a basis of justification for surpassing the maximum system capacity.

2. The Bear Island BESS is proposed to have a total system capacity of 75MW/300MWh and, as such, an HMA is required to analyze what effect, if any, a failure event with an [EQUIPMENT] cabinet would have on nearby structures, exposures, O&M service personnel, and/or the general public.

3. As directed by 2024 IFC, an HMA was performed that analyzed four fault conditions of the [EQUIPMENT] and it was determined that no single failure mode would lead to a fire or explosion in an [EQUIPMENT].

4. To provide additional context and analysis, a conservative, worst-case consequence involving multiple failure modes was presented for each fault condition.

    a. The worst-case consequence identified from the above analysis was a controlled fire event that consumes the entire [EQUIPMENT].

    b. This controlled fire would not be expected to produce explosions or create spill hazards, as has been demonstrated through UL 9540A unit level fire testing and destructive unit level fire testing nor would it be expected to propagate to neighboring [EQUIPMENT] cabinets, as determined by the fire propagation model.

5. Based on the conservative, worst-case fire scenario identified from the four fault conditions, the HMA has demonstrated that:

    a. Fires will be contained to a single [EQUIPMENT] cabinet as demonstrated by the fire testing and fire propagation model.

    b. Fires and products of combustion will not prevent occupants from evacuating to a safe location.

6. Based on the above HMA, the Bear Island BESS meets all 2024 IFC code requirements for FCO or AHJ approval as a basis of justification for exceeding the maximum system capacity.

7. The Bear Island BESS also appears to meet the installation level 2024 IFC requirements for an outdoor, ground mounted BESS when it is installed in accordance with [EQUIPMENT PROVIDER]'s [EQUIPMENT] DIM and the drawing set.

8. When analyzing the thermal radiation hazards to adjacent exposures:

    a. It is possible that transformers could be exposed to high heat fluxes (greater than 20 kW/m^2) and direct flame impingement during an [EQUIPMENT] fire. These heat fluxes are capable of causing heat or fire damage and could possibly lead to fire propagation to those exposures. If necessary, during an [EQUIPMENT] fire, emergency response personnel can apply cooling water to the transformers to reduce the likelihood of fire propagation to that exposure, as described above in Recommendation #5.

    b. It is unlikely that fire will propagate from an [EQUIPMENT] fire to O&M vehicles, however it is possible for heat damage to occur during an [EQUIPMENT] fire. To mitigate this risk, O&M

vehicles should be parked a minimum of 25 ft away from the [EQUIPMENT] cabinets to reduce the exposure risk, as described above in Recommendation #2. In addition, if necessary, during an [EQUIPMENT] fire, emergency response personnel can apply cooling water to any vehicles parked in the area to reduce the likelihood of fire propagation to that exposure.

c. It is unlikely that fire will propagate from an [EQUIPMENT] fire to the other electrical equipment installed around the Bear Island BESS.

d. It is unlikely that fire will propagate from an [EQUIPMENT] fire to other exposures near the Bear Island site, including the security fence, access gate, or adjacent roads.

e. As with all emergency events, emergency response actions should be evaluated and performed based on real time fire conditions and observations (i.e., wind direction/ speed, fire intensity, proximity of flames to adjacent exposures) during the actual emergency. Should a concern arise during a fire, the fire department can apply cooling water to adjacent electrical equipment, buildings, or structures to cool those surfaces.

9. When analyzing the thermal radiation hazards on O&M service personnel and the general public:

a. The effects of thermal radiation by an [EQUIPMENT] fire are not expected to have an impact on O&M service personnel and the general public.

b. The audible and visual clues include visible signs of distress (off-gassing/smoking/flaming) from the [EQUIPMENT] cabinet and internal sensors monitoring the [EQUIPMENT] will alarm O&M personnel of a fire event.

c. As described above in Recommendations #1, #2, and #5, O&M service personnel should not respond to an [EQUIPMENT] fire or attempt to suppress the fire. O&M service personnel, and the general public should evacuate the area as indicated on the signage provided around the perimeter security fence of the Bear Island BESS.

d. As described above in Recommendation #5 should smoke become a concern or nuisance to themselves or to the general public during a Bear Island BESS fire, the fire department can utilize a fog pattern to knock down and breakup the smoke plume to lessen its effects, as recommended by [EQUIPMENT PROVIDER]'s ERG.

BEAR ISLAND BATTERY STORAGE LLC – OPERATIONS AND MAINTENANCE PLAN

DRAFT

Bear Island Battery Storage LLC

Surry County, Virginia – Conditional Use Permit Application

Clenera LLC | 999 W. Main St., Suite 800, Boise, ID 83702

The following is a draft maintenance plan for a typical Battery Energy Storage Facility ("BESS"), provided as part of the Surry County Conditional Use Permit Application for Bear Island Battery Storage ("Bear Island", the "Project"). The plans below provide operations and maintenance best practices for the System Operator and all other parties who may access the site for service and maintenance ("Service Providers") or emergency response ("Emergency Service Providers").

Applicant Note: The following analysis is provided as an example of the maintenance procedures required to operate a typical Battery Energy Storage System ("BESS"). The final maintenance plan for Bear Island Battery Storage will be highly dependent upon the equipment chosen and the characteristics of that system. Prior to start of construction, the Project will provide a comprehensive management plan for the County's approval, which will include detailed maintenance procedures specific to the chosen technology, in addition to the high level maintenance procedures highlighted in the draft plan below.

1. Operations

System Operators, as designated by system owners, are responsible for the day-to-day operations of the BESS Site. Responsibilities of operators include:

- Monitoring and operating the site as required
- Providing for site access
- Providing a safe work environment
- If requested by a local authority, providing access or information about the system
- Arranging for decommissioning at the end of the project's useful life

A System Controller provides the single point of interface through which the Project remotely controls and communicates with the BESS. Applicant Note: once equipment has been chosen, prior to final site plan approval, further information will be provided about the BESS System Controller, their function, and specific operating procedures.

2. Site Maintenance

Access, Routes, and Zones

To service the BESS project, Service Providers will require frequent access to the site and to the battery packs themselves, over the full duration of the project's life. Routes and zones at the site must allow for year-round access, including for support of all vehicles as designated by the site's engineer of record. Access routes will be maintained to a standard necessary for emergency response access, as described in the Bear Island Emergency Response Plan.

NOTE: For installations not at grade, owners must provide the ability for Service Providers to safely service enclosures and system monitoring equipment.

Enclosure Access

- *The Service Providers must be allowed to have the ability to remove any locks preventing access.*
- *Doors of all enclosures must be kept free of all obstructions such as snow, sand, and blown debris during system operation.*
- *The area in front of each enclosure should support any of the vehicles required for operations and maintenance.*

Interior Project Access

- *At least two access points will be available to Emergency Service Responders. Gates will be locked from outside access, and the perimeter of the project will be surrounded by a fence that will restrict access.*
- *Emergency Service Providers will be provided with necessary codes for lock boxes required for gate access*
- *The perimeter of the fence line will be accessible via a 25' access road surrounding the project*

Site Access

- *Access roads to the site will be maintained to allow Emergency Service Providers to access the site with fire safety vehicles.*
- *Access road will be kept free of all debris and obstructions that could limit ingress/egress*
- *The site will be made available for Emergency Service Providers for training as necessary during operations*

Vegetation Management

Site vegetation will be examined at least once per year during annual maintenance described below. If the annual maintenance occurs during a season when the vegetation cannot be properly assessed, a separate examination will be required. Site vegetation management will focus on the Vegetative Buffer, the project's perimeter, and the interior of the BESS yard.

- *Vegetative Buffer*
  - *Vegetative screening will be maintained around the perimeter of the system throughout the life of the project. Dead or dying plants will be removed, with suitable replacements replanted immediately.*
  - *Routine maintenance, including tree trimming or thinning, may be required to maintain the health of the vegetative buffer. Any such maintenance should be done in a manner that limits visibility through the vegetative buffer, to the extent practicable.*
  - *Inspections will be conducted to ensure no vegetative screening encroaches upon the clearance requirements of the BESS enclosures and other equipment.*
- *Project Perimeter*
  - *The perimeter will be maintained in low growth grasses.*
  - *Annual inspections will ensure no encroachment on access routes or the fence line of the BESS which may impair access or system performance*
  - *Mowing may be required to maintain vegetation height and manage aesthetics*
- *Inside the Fence*

- *The inside of the fence will primarily be improved gravel surface, with limited vegetation*
- *Annual maintenance will remove any weeds or other plant growth inside of the fence line*
- *Herbicides may be used in limited quantity to limit growth*

3. BESS Maintenance

The BESS requires maintenance to ensure performance over its lifetime. The O&M Service Provider performs this maintenance, which includes preventative maintenance and corrective maintenance.

Preventative Maintenance

Service Providers will perform preventative maintenance activities that are scheduled annually, every 5 years, and every 10 years, as follows.

Annual Maintenance

Type	Activity
General	• Inspect anchor torque marks • Inspect site access • Inspect enclosure locks and access • Inspect enclosure cleanliness and integrity – touch up paint or clean as needed • Inspect exposure clearances • Inspect grade conditions • Inspect access routes (as described in (2) above)
Compartment Checks	• Inspect door latches, replacement in kind if damaged • Inspect door gaskets, replacement in kind if damaged • Inspect door grounding conductors, replacement in kind if damaged • Inspect door switch, replacement in kind if damaged • Harness inspection or replacement in kind if damaged (protective sleeve failure, rodents, and so on) • Thermal system inspection, service as needed • Torque checks • Check for moisture
Thermal Management	• Coolant level check, fill if needed • Inspect cabinet ventilation system • Clean radiators if needed • Remove any debris blocking air inlets
Close Out	• Secure door locks • Update service records
Reporting	• Provide a Preventative Maintenance Report

5-Year Maintenance

5-Year Maintenance Activities

Activity
Annual maintenance
BESS stirring fan replacement, if needed

10-Year Maintenance

10-Year Maintenance Activities

Activity
Annual maintenance
BESS coolant refill
BESS radiator fan replacement, if needed
BESS coolant pump replacement, if needed
BESS door gasket replacement, if needed

Corrective Maintenance

Corrective maintenance will include necessary replacements, configuration, and troubleshooting of components.

	SURRY COUNTY BOARD OF SUPERVISORS **STAFF REPORT** Public Hearing: September 11, 2025
	Applicant: Bear Island Battery Storage, LLC
	Staff: Horace H. Wade III, AICP, CZA
	Staff Contact: (757) 294-5212 or hwade@surrycountyva.gov

Request

Conditional Use Permit 2025-01

The Applicant, Bear Island Battery Storage LLC, seeks a Conditional Use Permit for a Battery Energy Storage System, and Utility Service/Major for an associated switchyard and substation, as permitted by Article III, Section 3-302, Permitted Uses, subsection (C) of the Surry County Zoning Ordinance. The subject property, Tax Map Parcel No. 54-1, is a 416 acre parcel zoned A-R, Agricultural-Rural, located in the Bacon's Castle District on White Marsh Road (SR 617), south of Colonial Trail East (SR 10). The proposed conditional use permit will allow the Applicant to build a 89-megawatt battery energy storage system and utility switchyard on 32.5 acres in the interior of this site. The Comprehensive Plan Map indicates that the project parcel is suitable for Rural Preservation.

Property Information

Mailing Address:
c/o Clenera, LLC
999 W Main St., Suite 800
Boise, ID 83702

Tax Map:
54-1

Legal Owner:
White Marsh Environmental, LLC

Site Size:
+/- 416 Parcel Acres

Zoning District:
A-R Agricultural-Rural

Comp Plan Land Use:
Rural Preservation (Future Land Use)
Energy Projects Amendment

Current Use: Agriculture / Forested

Public Hearing Timeframe

Planning Commission – June 23, 2025 at 6:30 P.M. Recommended Approval 10-0

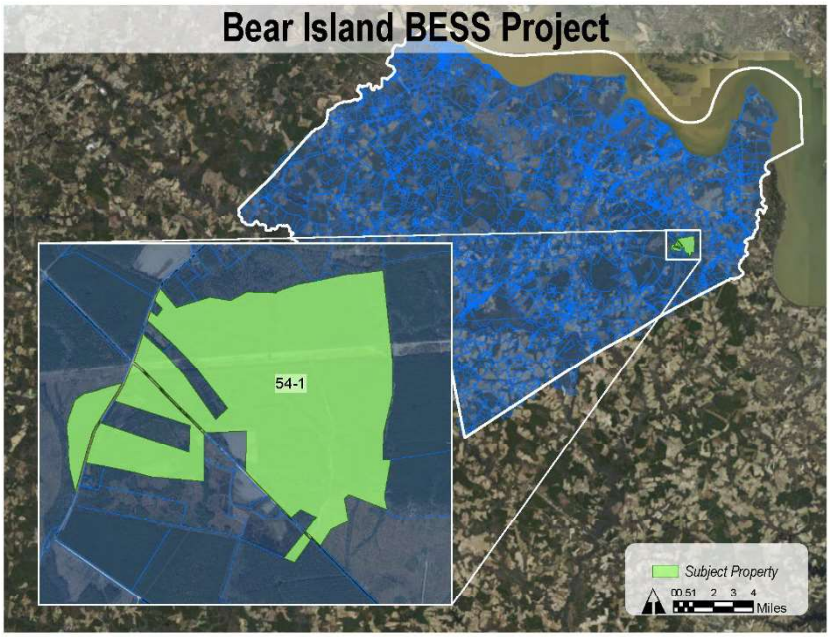
Board of Supervisors – September 11, 2025 at 6:00 P.M.

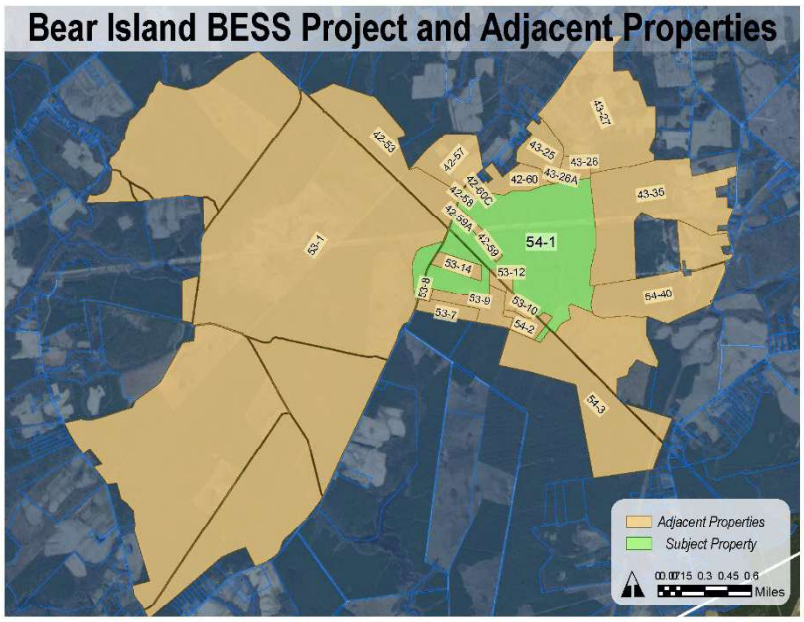
Project Overview

The application is for a 32.5-acre portion of a 416-acre parcel that will be used for a battery energy storage system facility and a new utility switchyard. The battery energy facility itself will span approximately 10 acres. The parcel, 54-1, is currently zoned A-R Agricultural Rural, which allows battery energy storage system facilities with the approval of a Conditional Use Permit per the April 3, 2025, Battery Energy Storage System Ordinance Amendment (**Surry County Zoning Ordinance sec. 4-609**). According to the Surry County Comprehensive Plan, concentrations of residential use are not appropriate in rural preservation areas unless it can be demonstrated that they significantly contribute to County-wide goals.

Vicinity Map

** Larger versions of all Figures and Maps can be seen in the Appendix of this document.*





Findings and Analysis

Summary of Application Packet

The following is a summary of the application packet. Please see the attached copy of each item for detailed information. (Application requirements can be found in **Surry County Zoning Ordinance Sec. 4-609. Battery Energy Storage Systems, subsection A**, is attached to this report.

1. **Cover Letter, Introduction/Narrative.** –
    - Includes a table of contents for the application, background of the applicant, and general information and data about the BESS project, including its rated capacity and a description of the switchyard and substation (**per Surry County Zoning Ordinance sec. 4-609.A.1**).
    - Summary of how the Applicant will approach safety and the project's impact on transportation. An emergency action plan is also required in the application (**per Surry County Zoning Ordinance sec. 4-609.A.2.iv**), as is a traffic study (**per Surry County Zoning Ordinance sec. 4-609.A.4**); the traffic study is included later in the Concept Plan.
    - There is information about tax revenue and their intent to negotiate a siting agreement (a notice of intent is included later).
    - There is a summary of the May 30, 2025, community meeting, which was performed in conformance with **Surry County Zoning Ordinance sec. 4-609.B**.
2. **Application document**.
3. **Proposed CUP Conditions.** (See a summary of these below).
4. **Notice of Intent to Locate Battery Energy Storage Facility**. This includes a request to negotiate a siting agreement.
5. **Concept Plan** (**per Surry County Zoning Ordinance sec. 4-609.A.2.i through vi**). –
    - Cover sheet including the parcel and project area.
    - Parcel and zoning map. This map shows the project limits within the parcel, the surrounding parcels, and their zoning.
    - Parcel information sheet. This table contains the parcels from the previous map, their tax map number, and the parcel owner.
    - Preliminary site plan (1). Includes the project limits, setbacks, project entrance, access road, internal roads for the BESS, location of the fence, fire protection buffer, battery containers and power conversion systems for the BESS, the Substation and Switchyard, existing culverts, streams and delineated wetlands, stream buffers of 100', Resource Protection Areas, area dwellings and 500' buffers around the dwellings. This site plan is "zoomed out" to provide context of the surrounding area.
    - Preliminary site plan (2). This site plan provides a more detailed view of the project site. It includes most of the same information as the previous view, but with the addition of 2-foot topographic contours and the location of a 100-foot retained vegetative buffer.
    - Proposed landscaping map. This map is similar to the previous, but it contains less detail (location of BESS components, fence, and vegetative buffer). In the notes, details about the buffers are provided. It is explained that there will be a minimum 20' gravel or concrete buffer around the BESS components that remains clear of combustible growth. This will provide additional fire protection. There will also be a 100-foot vegetative buffer retained around the project site to provide full screening. (**These buffers meet the zoning code requirements for BESS**.)
    - Landscaping notes. This expands upon the last sheet. Where existing vegetation cannot be retained, it will be planted. Every 100 linear feet, 15 large evergreen trees, 15 small evergreen trees, and 15 evergreen shrubs will be planted. The interior of the buffer will be fenced.

- The Draft Emergency Action Plan is included separately (see #11 below).

6. **Traffic & Route Evaluation Study** (**per Surry County Zoning Ordinance sec. 4-609.A.2.i**).
7. **Drawings and Visual References**. These include a datasheet and layout schematic of the Tesla Megapack 2 XL and Hitachi MVT, which were provided to illustrate the type of technology and layout that the units could use (the Applicant has been very clear that they will not choose a specific technology until later in the process). The drawings also include the types of warning and informational signs that alert the public of hazards and technology within the project, and a 3D scaled elevation rendering is provided (**per Surry County Zoning Ordinance sec. 4-609.A.4**).
8. **Decommissioning Plan**. Provides a list of project components, regulatory considerations, an outline of the decommissioning sequence, methods of recycling and disposal of materials, "site restoration to the pre-construction land uses", and BESS-specific considerations. A Decommissioning Cost Estimate and financial assurance follow this.
9. **Environmental and Cultural Impacts** (**per Surry County Zoning Ordinance sec. 4-609.A.4**).
10. **Community Meeting Minutes & FAQ**. The Applicant organized a community meeting on April 30th, 2025, per Surry County Zoning Ordinance 4-609.B. This document contains a summary of the meeting and FAQ, the written notice about the meeting and a list of the individuals it was sent to, the sign-in sheet from the event, and a copy of the presentation given.
11. **Draft Emergency Action Plan** (**per Surry County Zoning Ordinance sec. 4-609.A.2.iv**). This document includes potential worst-case hazard situations that the equipment in this project could incur, best-case mitigation outcomes, and recommendations. Throughout the report, it is repeatedly reiterated that the document is for "illustrative" purposes and does not exactly reflect the contents of the actual Emergency Action Plan, as the equipment for the site has not yet been chosen, and thus, equipment-specific data cannot be provided.
12. **Draft Operations and Maintenance Plan** (**per Surry County Zoning Ordinance sec. 4-609.A.1**). Includes information about operations, which take place remotely through the System Controller, and maintenance. Maintenance information includes access and vegetation maintenance (described as co-occurring with the annual BESS maintenance schedule) and maintenance of the BESS itself. The BESS units will require maintenance annually and on a 5- and 10-year schedule. The document lists tasks in a table that will occur during each maintenance interval.

Summary of Draft CUP Conditions

The following is a summary of the Applicant's 10 Draft Conditions. Please read the conditions in their entirety for more details.

1) The project will substantially conform with the conceptual plans but may vary within reasonable limits due to the dynamic nature of the still-developing technology. The Final Site Plan will more closely reflect the project's actual design, spacing, and technology.
2) Landscaping and buffering will conform to the Conceptual Site Plan, but the Zoning Administrator will approve the Final Site plan.
3) The BESS will be designed in compliance with National Fire Protection Association (NFPA) 855 (BESS-specific) regulations. These will be the latest at the time of site plan approval. If these vary from the Virginia Uniform Statewide Building Code, NFPA 855 will take precedence.
4) Conditions related to construction.
    a) The applicant will designate a public liaison whose contact information is posted at the site and provided to the Zoning Administrator.
    b) Hours that clearing and grading will take place (7 am to 6 pm weekdays; 7 am to 5 pm Saturday) and deliveries (between 8:30 am and 3:30 pm). The Zoning Administrator can approve a variance from these hours.

c) Erosion and sediment control measures will be taken before land disturbance occurs.
d) The applicant will coordinate with Surry Economic Development to coordinate local contractors and employee recruitment before the start of construction.
e) Applicant shall submit a Transportation and Traffic Control Plan designating routes for equipment and materials on secondary roads to the property. Monetary penalties for non-compliance with the plan are listed.

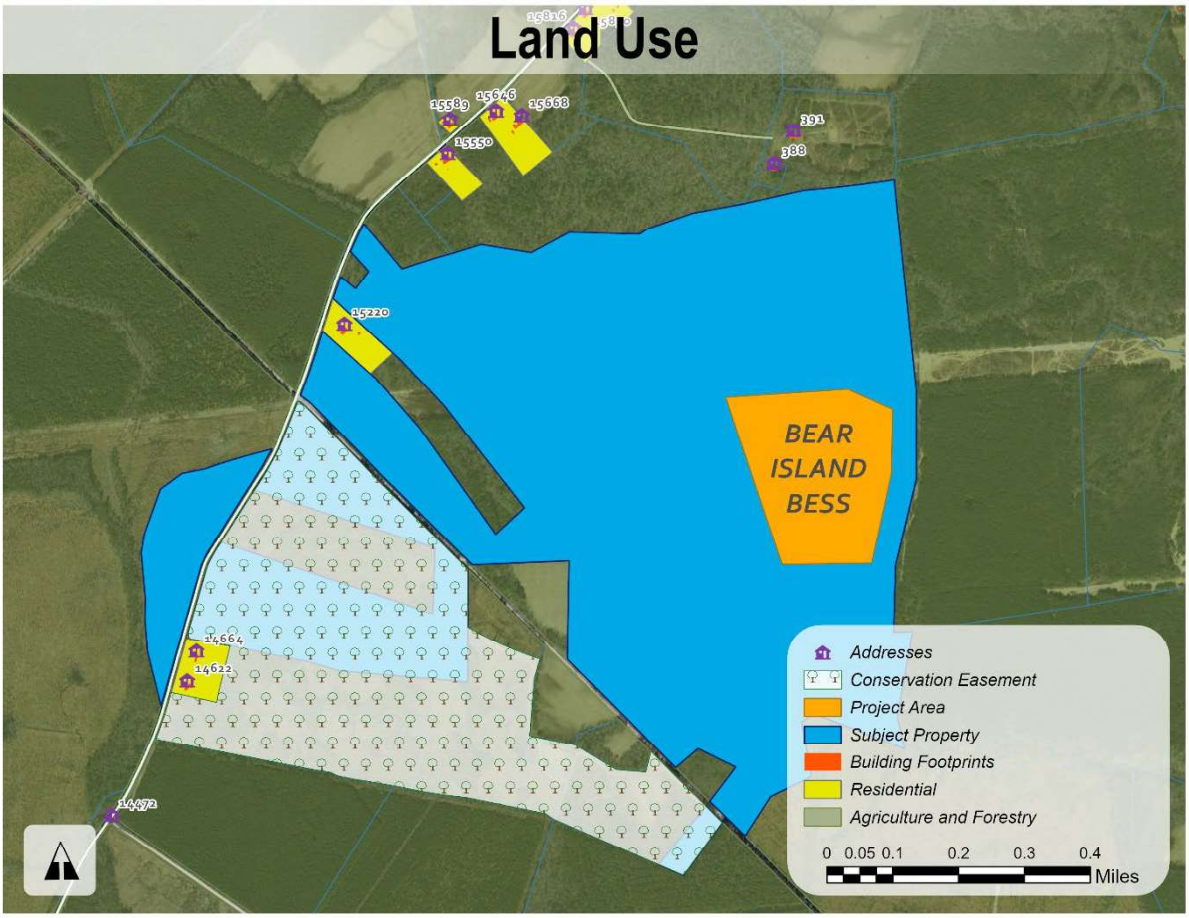
5) Erosion and sediment control and stormwater management plans will be submitted during the final site plan process. This design will comply with the Chesapeake Bay Preservation Act.
6) Operations.
    a) The County will have access to the site at all times for inspection purposes with 24 hours' notice. However, in an emergency, access will be immediate, and Emergency Services will have access through a Knox Box. Emergency Services may conduct familiarization tours twice yearly or as the Applicant approves.
    b) The Applicant will provide training and training materials to Emergency Services personnel. This training will reflect the Emergency Response Plan submitted in the Site Plan process. Additional training will be provided as needed once per calendar year as new staff are hired. Emergency Services will have a list of hazardous substances on-site, and the list will remain updated.
    c) If an emergency requires Emergency Services response, the Applicant will reimburse the county for overtime wages.
    d) The stormwater management design will consider retaining firefighting water, and the applicant will test any such water for hazardous materials and dispose of it as required by law.
    e) The project will have access to water as Emergency Services deems necessary. The water will be available to them. The project may include an on-site well, a well and water tank, or an off-site well and water tank. This will depend on the availability of water on and off-site.
    f) The access road will be at least 20 feet in width, subject to design approval by Emergency Services.
7) Decommissioning.
    a) When the BESS is decommissioned, it will be done according to the latest Decommissioning Plan. At that time, the County can request that the Plan be updated before it is implemented. The Plan will not apply to the Switchyard.
    b) The Applicant will decommission within 12 months from the end of the project's use; if not, the County will have the right to decommission it themselves and salvage the parts. If the BESS is decommissioned because of the Applicant's default, the County will release the Decommissioning Surety to its beneficiary. After decommissioning, the County will release the security.
8) Administrative.
    a) The Applicant must obtain building permits within 5 years of obtaining a CUP unless there is a written agreement with the County.
    b) The County can issue the Applicant a Stop Work Order if they have caused a situation that could cause harm to life or damage to property. In this situation, the Applicant will meet with the County to determine a process to ameliorate the issue.
    c) If the CUP conditions are violated, and the violation lasts for more than 60 days after the delivery of a Notice of Violation, the County can initiate proceedings to revoke the CUP. Within the 60 days after delivery, however, the Applicant can submit a plan to remediate the issues, in which case these proceedings cannot be initiated.
9) Binding effect.

10) If these conditions are inconsistent with or more specific than the Ordinance, they take precedence.

Existing Conditions

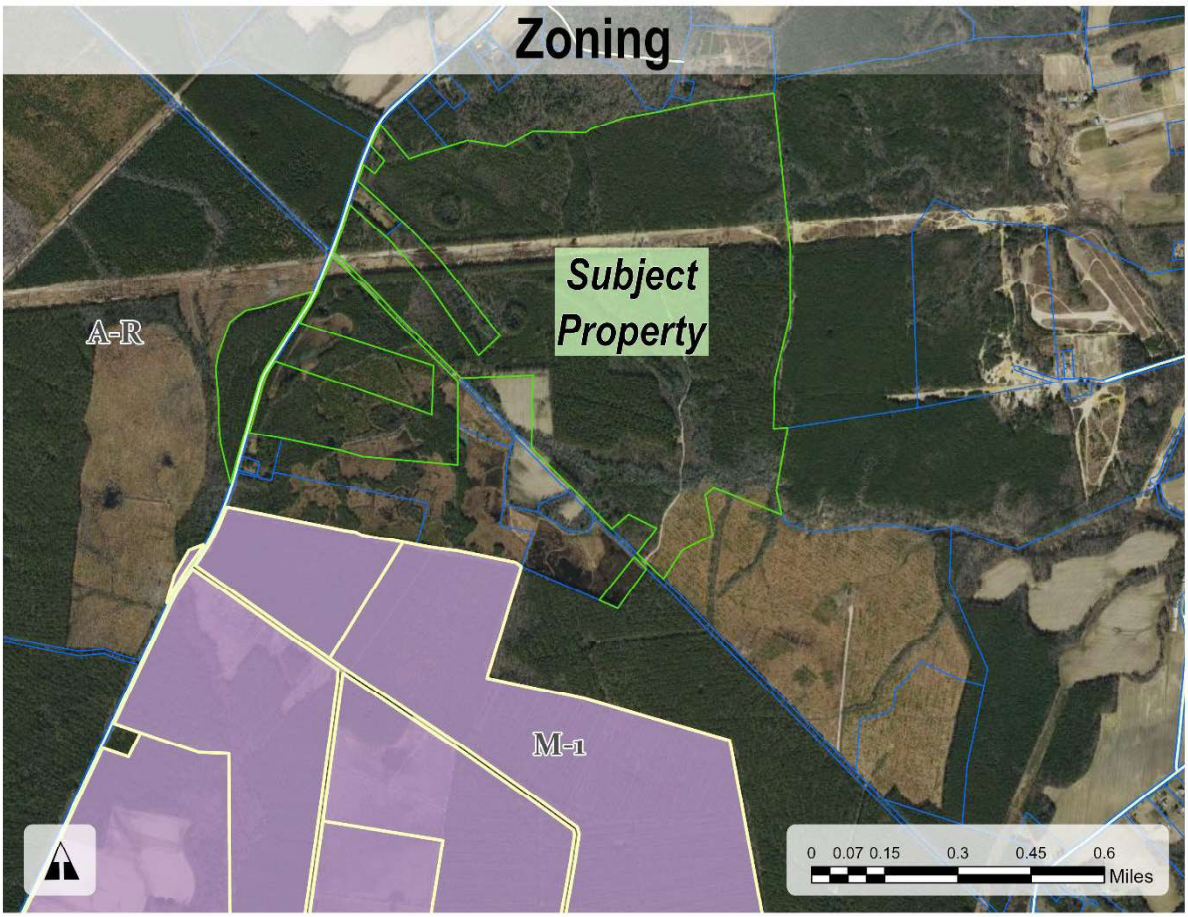
Current Land Use

The site is in a densely forested area with mature vegetation and relatively flat topography. The current parcel is used for silviculture and, along with ten adjacent parcels, contains part of a wetland mitigation bank conservation easement on its southern end. Other surrounding parcels contain silvicultural uses, and others contain agricultural uses. The residential density in the area is very low.



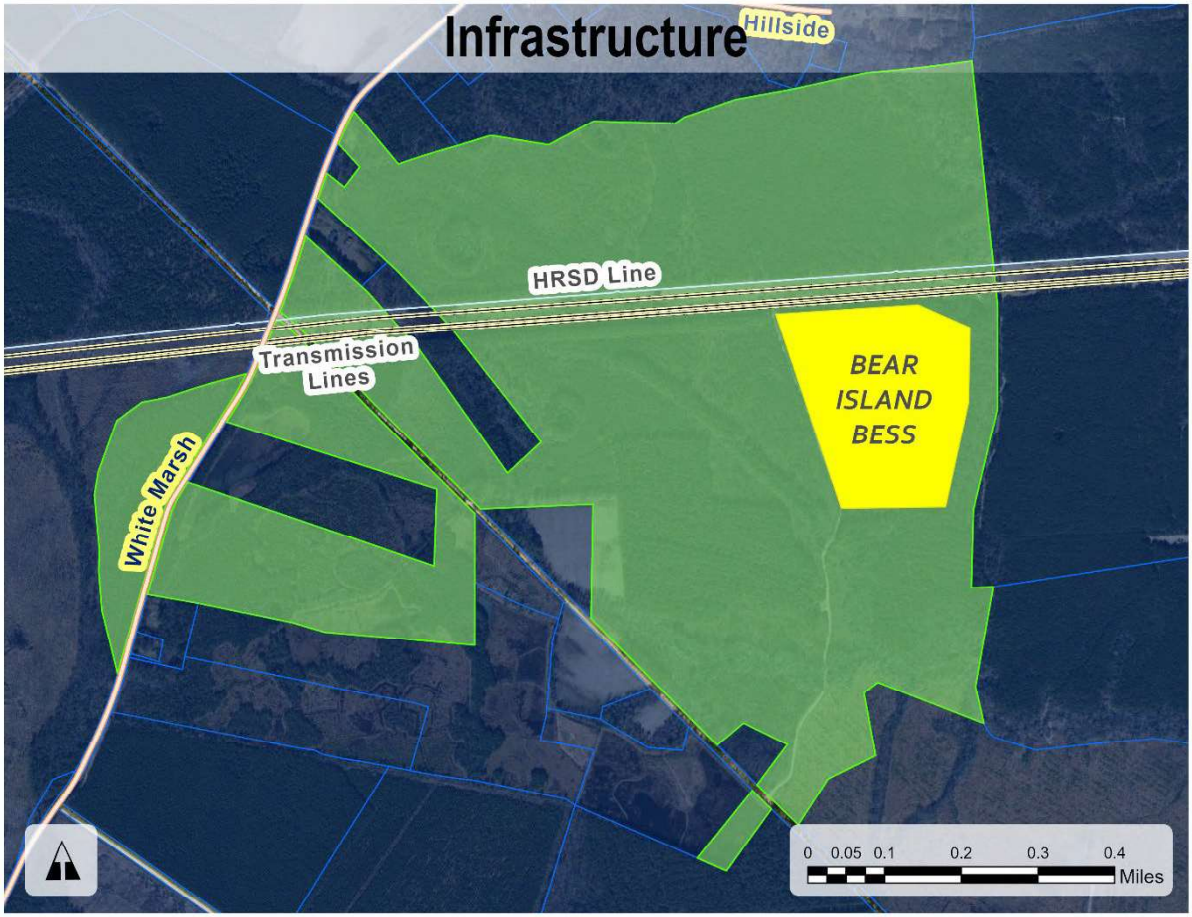
Zoning

The parent parcel (54-1) is zoned A-R, agricultural-rural residential. All of the adjacent properties are zoned A-R as well. Parcels to the south, part of the Cavalier Solar Project, are zoned M-1.



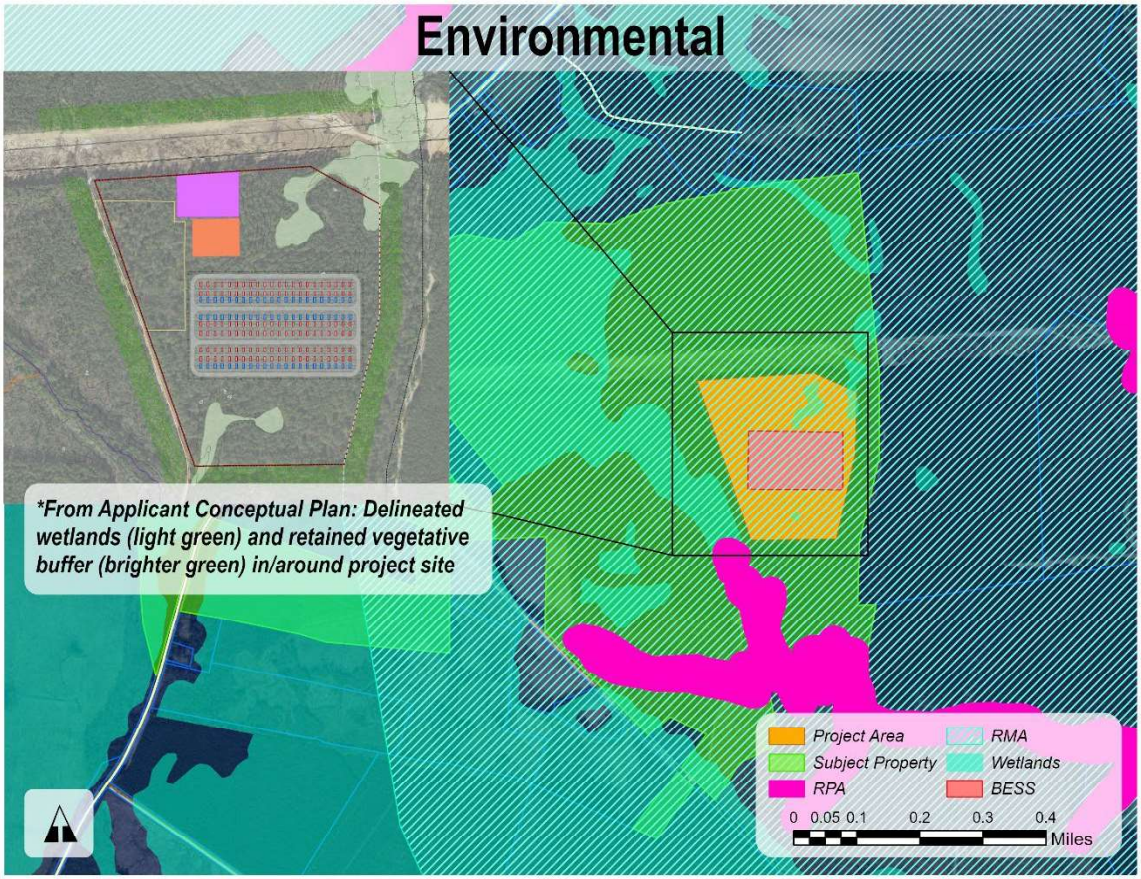
Infrastructure

Transmission lines run through the parent parcel concurrent with an HRSD Force Main.
Nearby roads include Route 617, White Marsh Road, from which the project is proposed to be accessed, and Route 10 and US Route 460, from which the site would be accessed from the North and South.



Environmental

The site is entirely within the Chesapeake Bay Resource Management Area. According to the County GIS data, the property contains Resource Protection Area (RPA) on the parent parcel, streams, and wetlands; the Applicant's concept plan includes delineated wetlands that are more extensive on the project site.



Accordance with Zoning Ordinance

Section 1-503, Conditional Use Permit – Application Requirements.

The application substantially conforms to the ordinance in that it provides information that demonstrates the proposed use's harmony with the purposes of the zoning district in which it is located and that it will have minimum adverse impact on adjoining property and the surrounding neighborhood in terms of public health, safety, or general welfare. The application also demonstrates the nature and extent of the proposed development.

Section 3-300, A-R Agricultural-Rural District.

The application substantially conforms to this section; BESS is permitted to use in the district with a conditional use permit.

Section 4-609, Battery Energy Storage Systems.

The application substantially conforms to the "Application" and "Community Meeting Requirement" requirements (subsections A and B, in the Appendix of this document). The conceptual plan describes other items meeting these requirements.

In accordance with the Comprehensive Plan

Surry County 2040 Comprehensive Plan

The subject property, 54-1, is within the Rural Preservation area in the Surry County 2040 Comprehensive Plan Future Land Use Map.

Rural Preservation Area	
Plan Recommendations	*Bear Island BESS*
Should generally not contain residential densities of greater than 1 dwelling unit per acre	Not residential, will not increase residential density
Should not require public utilities; public utilities should not be extended	Will not use public utilities
Recommends wooded or vegetated buffering to reduce impacts on surrounding land, especially agricultural land	The project incorporates a retained vegetative buffer, which should not significantly impact neighboring properties, especially agricultural operations.

Surry County 2040 Comprehensive Plan Energy Amendment

Although this amendment mainly addressed utility-scale solar, it provides guidance on energy projects in general within the County. Strategy 3 of the amendment provides guidelines for energy projects. The table below shows how this proposal meets the requirements of the Amendment.

Strategy 3, Comprehensive Plan Energy Amendment	
Plan Recommendations	*Bear Island BESS*
Avoid developing energy projects within ½ mile of registered historical sites and historic viewsheds, or within 750 feet of a place of worship/cemetery	Although the parcel property line is within 750 feet of a historic cemetery and a site owned by the Trustees of Tree of Life Church, the actual project site is over 5,900 feet from the former and over 3,500 feet from the latter
Avoid developing energy projects in residential investment areas and corridors	The site is in the rural preservation area.
Locate where the center of the site is within 1 mile of transmission lines	The site centroid is 888 feet from transmission lines
Maintain biodiversity and wildlife through undisturbed vegetation and buffering	• The site is surrounded by silviculture, including at least one conservation easement that spans multiple parcels. • Zoning ordinance requires a vegetative buffer of 100’
Locate at least 750 feet from the nearest residence	2,300 feet from the nearest residence
Locate at least half a mile from any existing utility-scale energy project sites	2,700 feet from the nearest solar facility

Key Issues and Considerations	
CUP Considerations per Surry County Zoning Ordinance Sec. 1-502	
Traffic Congestion	• This project would be expected to generate 100-150 vehicle deliveries during construction, generating 2-3 heavy vehicle trips per day for a 1-2 month period. • The Applicant is required to coordinate a traffic management plan with the County and VDOT prior to site plan approval (**per Surry County Zoning Ordinance sec. 4-609.E**). • After construction, this site will be operated remotely and is not expected to generate traffic.
Noise	• The site is over 2,000 feet from the nearest home, and the area is heavily wooded. The Applicant has suggested that while the cooling systems installed in the battery storage modules are expected to make some noise (comparable to an air conditioner unit), this will likely be heavily dampened by vegetation by the time it reaches any occupied structure. • Prior to site plan approval, the Applicant will be required to provide a noise study to ensure the noise standards in the ordinance are met. If the noise does not meet the ordinance’s standards, the Planning Director may permit structural additions or modifications to ensure that they are met prior to final site plan approval (**Surry County Zoning Ordinance, sec. 4-609.C.9**).
Lights	• Per the **Surry County Zoning Ordinance, sec. 4-609.C.11**, lighting will be limited to that which is minimally required, and all lighting will be motion-sensor activated.

	• No lighting is noted on the site plan; conformance to this standard will be considered during the final site plan approval process.
Dust	The Transportation and Traffic Control Plan submitted during the site plan approval process will address "dust control and mitigation, using water trucks, mulch, or similar methods" (per **Surry County Zoning Ordinance, sec. 4-609.E.v**).
Drainage	The draft conditions read that the final design for erosion and sediment control will be prepared in accordance with the Virginia Erosion and Sediment Control Handbook. This will be approved during the site plan review process with DEQ and the Planning Department. See the Applicant's draft condition 5, *Information about Erosion and Sediment Control and Stormwater Management.*
Water Quality	• The Applicant had a wetland delineation performed prior to application and found wetlands and streams on the parcel. The Applicant does not anticipate that these water bodies will be disturbed or impacted. • During site plan review, Surry County Planning Department and DEQ will consider this according to their standards.
Air Quality	• See "Dust." • In the event of a fire, the BESS would emit fumes. The nature of these fumes will depend on the chemistry of the batteries used. The Applicant has described a process of plume modeling to model and create a response plan for the mitigation of this issue if it arises.
Odor, Fumes	See "Air Quality" above. Outside of an emergency event, there are not expected to be odors or fumes with this project.
Vibrations	The equipment is not likely to vibrate significantly.
Timing of Operation	• There is a timing schedule for construction activities included in the Draft Conditions. After construction, operation of the site will be done remotely and traffic to the site will be very infrequent. • The Applicant has provided a timeline for construction and beginning of operations. This timeline suggests that, if approved by the Planning Commission and Board of Supervisors in Q3 2025, the construction would begin in Q4 of 2026, ending in Q3 of 2027, after which operation would begin.
Site Design	The Conceptual Site Plan provided by the Applicant reflects current technology, which could evolve before site plan approval. The Applicant's Draft Conditions (#1,3) reflect this potentiality, stating that the site design concept requires flexibility. The design will remain in substantial conformance and will be reviewed again at the time of site plan approval.
Access	• The site will be accessed by White Marsh Road. • Per the Applicant's Draft Conditions (#6.f), the Applicant will provide a road that is 20 feet wide minimum, pending Surry County Emergency Services approval.
Screening	The site will retain the existing vegetation to form a 100' buffer around the 32-acre project site. Where vegetation is not retained, the Applicant has provided a landscaping plan.
Historic and Cultural Resources	• There are no registered historical properties within or near the boundaries of the project according to the Virginia Department of Historic Resources, and the project will not be within the viewshed of any historic property. • The state-level permitting process that this project would have to undergo will require a higher-level survey of these resources to ensure that no previously unknown archaeological or architectural resources will be impacted.

Environmental	An Environmental Assessment was conducted (included in Conceptual Plan) and found few species effected by the project.

Public Outreach

Community Meeting

Per Surry County Zoning Ordinance 4-609.B, the Applicant arranged and hosted a Community Meeting on April 30th, 2025, from 5 pm-7 pm. This meeting was held in the Surry County Parks and Recreation Center at 205 Enos Farm Drive, Spring Grove, VA 23881. According to the Applicant's sign-in sheet, fourteen community members attended the meeting.

The Applicant's application packet includes a copy of the sign-in sheet, the notice they sent to properties in the surrounding area, a list of those contacted, FAQs from the event, and a summary of the presentation.

The presentation consisted of posters on easels. Staff from Clenera, the Applicant's parent organization, and two Fire & Risk Alliance staff members were present to answer questions and discuss the project in a conversational style.

Attendees asked about traffic during construction, noise, emergencies, and emergency procedures.

Adjacent Property Owner Notifications

All adjacent property owners of parcels within 200 feet of the subject property were notified of the June 23, 2025, Planning Commission Public Hearing via letter on June 9, 2025, per Surry County Zoning Ordinance Sec. 1-601.

All adjacent property owners of parcels within 200 feet of the subject property were notified of the September 11, 2025, Planning Commission Public Hearing via letter on August 28, 2025, per Surry County Zoning Ordinance Sec. 1-601.

15 letters were sent to the owners of 24 adjacent parcels.

Signs were posted on the property notifying the public of a pending zoning approval on June 13, 2025

Agency Comments

Virginia Department of Transportation (VDOT)

Robert Butler, PE
Assistant Resident Engineer – Land Use
Williamsburg Residency

VDOT's Williamsburg Office has reviewed the proposed Conditional Use Permit and has no comments. VDOT recommends approval of this plan as presented. VDOT will likely recommend temporary flagging operations to help facilitate heavy truck movements.

Surry County Emergency Services

Ray Phelps
Chief of Emergency Management

CUP Condition 6.c. currently reads "In the event of an emergency event at the Project, Applicant agrees to reimburse the County for overtime wages incurred by Surry County Emergency Services responding to the emergency event at the project"

Emergency Services recommends that Condition 6.c. include all expenses incurred by the County instead of only overtime wages. Surry County relies on Volunteer Fire Departments, and the amended condition should consider damage to equipment or additional costs borne by the County.

Surry County Building Inspections

Matt Westheimer
Building Official

No Comments at this time.

Recommendations

Strengths, Weaknesses

Strengths:

- The proposal mitigates its impacts and benefits economic development in Surry County.
- Battery energy storage systems have a limited impact on traffic and road maintenance, and their construction period is faster than energy projects like solar developments. After construction, the site will be operated remotely, and staff will not be present on a day-to-day basis.
- The site's footprint is relatively small compared with other energy uses.

Weaknesses:

- Because the technology involved is dynamic and developing, the applicant cannot provide precise information about the chemistry involved in the battery modules. This requires the County to provide an unusual amount of flexibility to the applicant, reflected in the conditions and other application materials.

Planning Commission Recommendation

At their June 23, 2025, meeting, the Planning Commission recommended to the Board of Supervisors, by a 10-0 vote, to approve the Conditional Use Permit for a Battery Energy Storage System and Utility Service/Major for an associated switchyard and substation for Bear Island Battery Storage, LLC.

Additionally, at their June 23, 2025 meeting, the Planning Commission approved the Substantial Accord Determination for the Battery Energy Storage System and Utility Service/Major for an associated switchyard and substation for Bear Island Battery Storage, LLC.

Appendix

Pertinent Code Sections

Surry County Zoning Ordinance, Section 1-503, Conditional Use Permit – Application Requirements.

A. An application for a conditional use permit may be initiated by:

1. Resolution of the board, or;

2. Motion of the commission, or;

3. Petition of the owner, contract purchaser with the owner's written consent, or the owner's agent, of the property for which a conditional use permit is requested.

B. The applicant for a conditional use permit shall provide at the time of application, information and or data to demonstrate that the proposed use will be in harmony with the purposes of the specific zoning district in which it will be located. Further, the applicant shall have the responsibility to demonstrate that the proposed use will have minimum adverse impact on adjoining property and the surrounding neighborhood in terms of public health, safety, or general welfare.

C. All applications submitted for conditional use permits shall show the nature and extent of the proposed use and development. If the proposed development is to be constructed in phases, all phases shall be shown at the time of the original application.

Section 3-302 – A-R Agricultural-Rural District – Permitted Uses.

....

C. The following uses are allowed only by conditional use permit from the board of supervisors pursuant to section 1-501. An asterisk (*) indicates additional, modified or more stringent standards are listed in article IV, Use and design standards, for those specific uses.

...

CIVIC USE TYPES

Child Care Institution
Correctional Facility
Crisis Center
Educational Facility
Halfway House
Nursing Home
Rehabilitation Service
Utility Service/Major*
Battery Energy Storage System*

Section 4-609 – Battery Energy Storage Systems.

**See full ordinance attached to application packet.*
Additional requirements and standards for battery energy storage systems permitted as a principle use. These requirements and standards also apply to electrochemical Energy Storage Facilities, as defined in Sec. 3-1108 of this Ordinance, that are located in an Emerging Technology Zoning District.

A. Application Requirements. Each application for a conditional use permit for a battery energy storage system shall include the following general information:

1. Project Description. A narrative identifying the applicant, owner, and operator, and describing the proposed battery energy storage system, including an overview of the project, its location, and a maintenance plan for the project; the approximate rated capacity of the battery energy storage system; and a description of ancillary facilities.

2. Concept Development Plan. The concept development plan shall include the following information:

i. Existing and proposed buildings and structures, including preliminary location(s) of all proposed equipment;
ii. Existing and proposed access roads, drives, turnout locations, and parking;
iii. Location of any substations, electrical cabling, ancillary equipment, buildings, and structures (including those within any applicable setbacks);
iv. A draft emergency action plan;
v. Fencing or other methods of ensuring public safety; and
vi. The location and nature of proposed buffers and screening elements, including vegetative and constructed buffers.

3.Technical Review/Fees. Applications for battery energy storage systems may require a technical review prior to site plan approval that will be conducted by a consultant selected by the county. Any fees associated with performance of this review will be paid by the applicant.

4. Additional Considerations. Additional information may be required, as determined by the planning director, such as Applications shall include a historic resource impact analysis, an environmental resource impact analysis, a traffic impact analysis, a scaled elevation view and other supporting drawings, photographs of the proposed site, photo or other realistic simulations or modeling of the proposed project, a landscaping and screening plan, a coverage map, or other additional information that may be necessary for a technical review of the proposal as determined by the planning director.

B. Community Meeting Requirement. The applicant shall hold a public community meeting prior to the Planning Commission's public hearing to give the community an opportunity to hear from the applicant and ask questions regarding the proposed facility under the following guidelines:

i. The applicant shall inform the planning director and adjacent property owners in writing of the date, time and location of the meeting, at least seven but no more than 14 days in advance of the meeting.

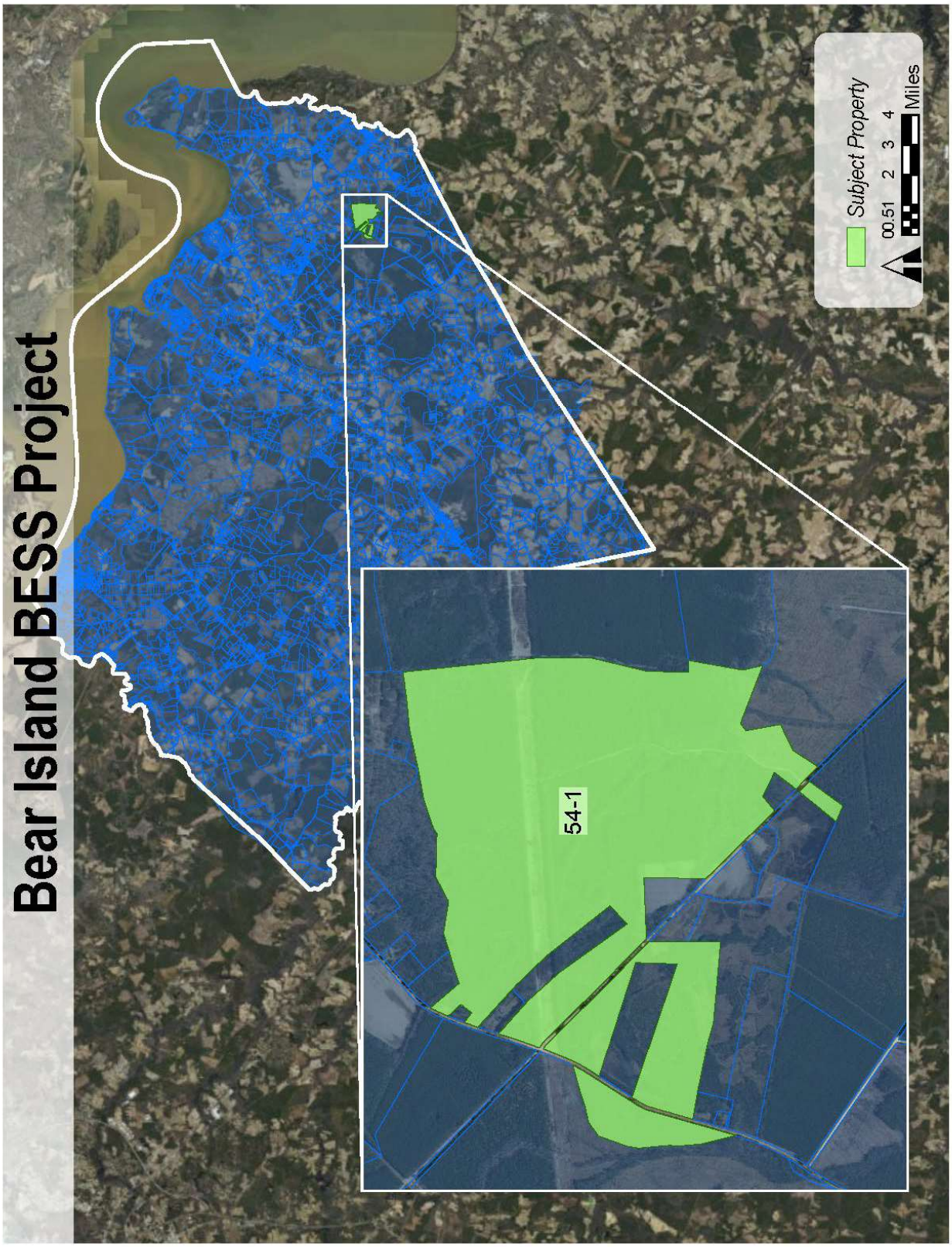
ii. The meeting shall take place within the county, at a location open to the public with adequate parking and seating facilities that will accommodate persons with disabilities.

iii. The meeting shall give members of the public the opportunity to review application materials, ask questions of the applicant and provide feedback.

iv. The applicant shall provide to the planning director a summary of any input received from members of the public at the meeting any responses.

v. The requirements of this section shall be deemed complete if the applicant chooses to fulfill the public participation requirements described in Virginia Administrative Code Section 9VAC15-100-90 related to an application for permit by rule for small energy storage facilities and holds the required public meeting within sixty (60) days of the Planning Commission's initial public hearing, provided that the applicant also informs the planning director and adjacent property owners in writing of the date, time and location of the meeting, at least seven but no more than 14 days in advance of the meeting.

Maps


Bear Island BESS Project
54-1
Subject Property
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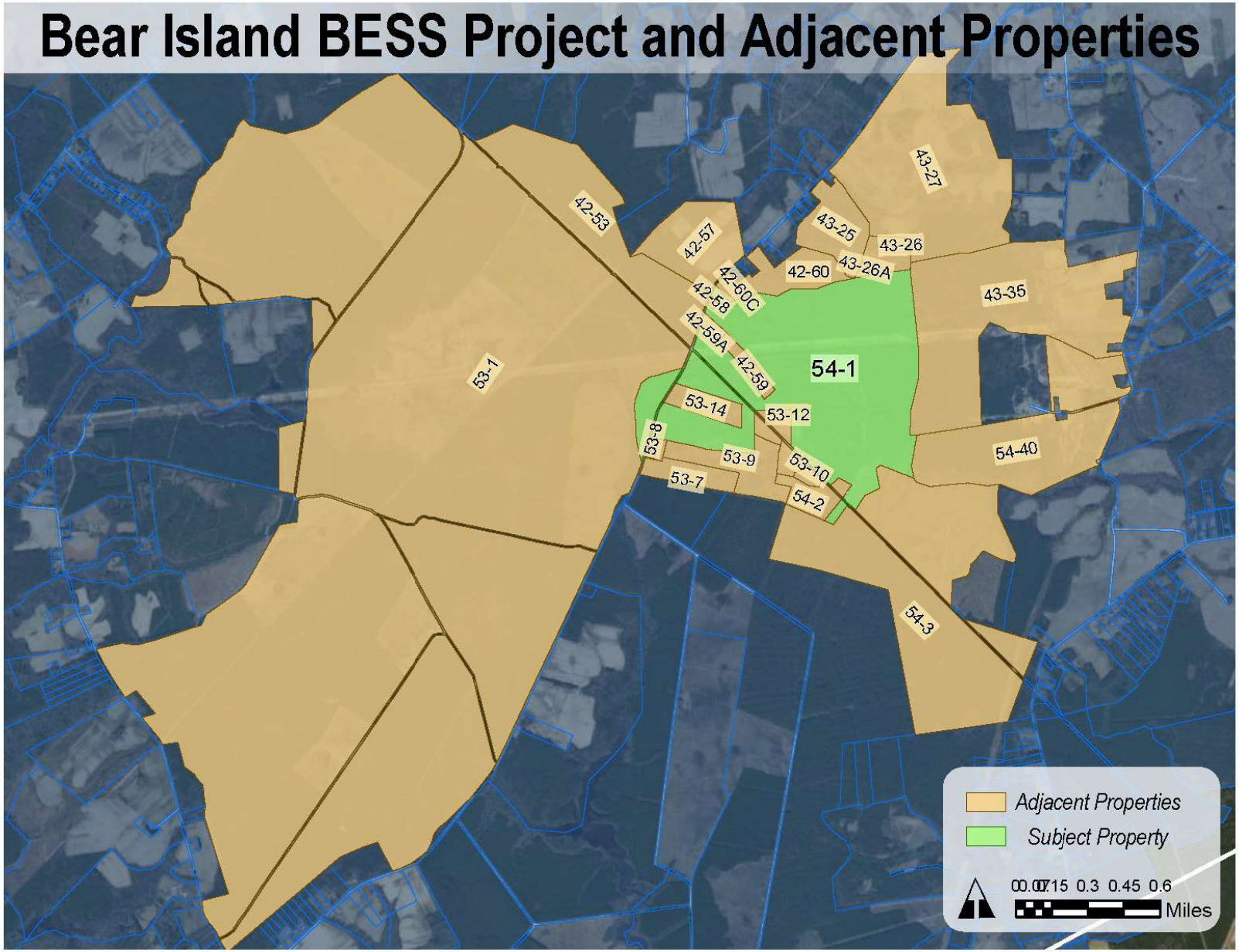
Miles


Bear Island BESS Project and Adjacent Properties
42-53
42-57
43-25
43-26
43-27
42-60
43-26A
42-60C
42-58
43-35
42-59A
42-59
54-1
53-1
53-14
53-12
53-8
53-9
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Adjacent Properties
Subject Property
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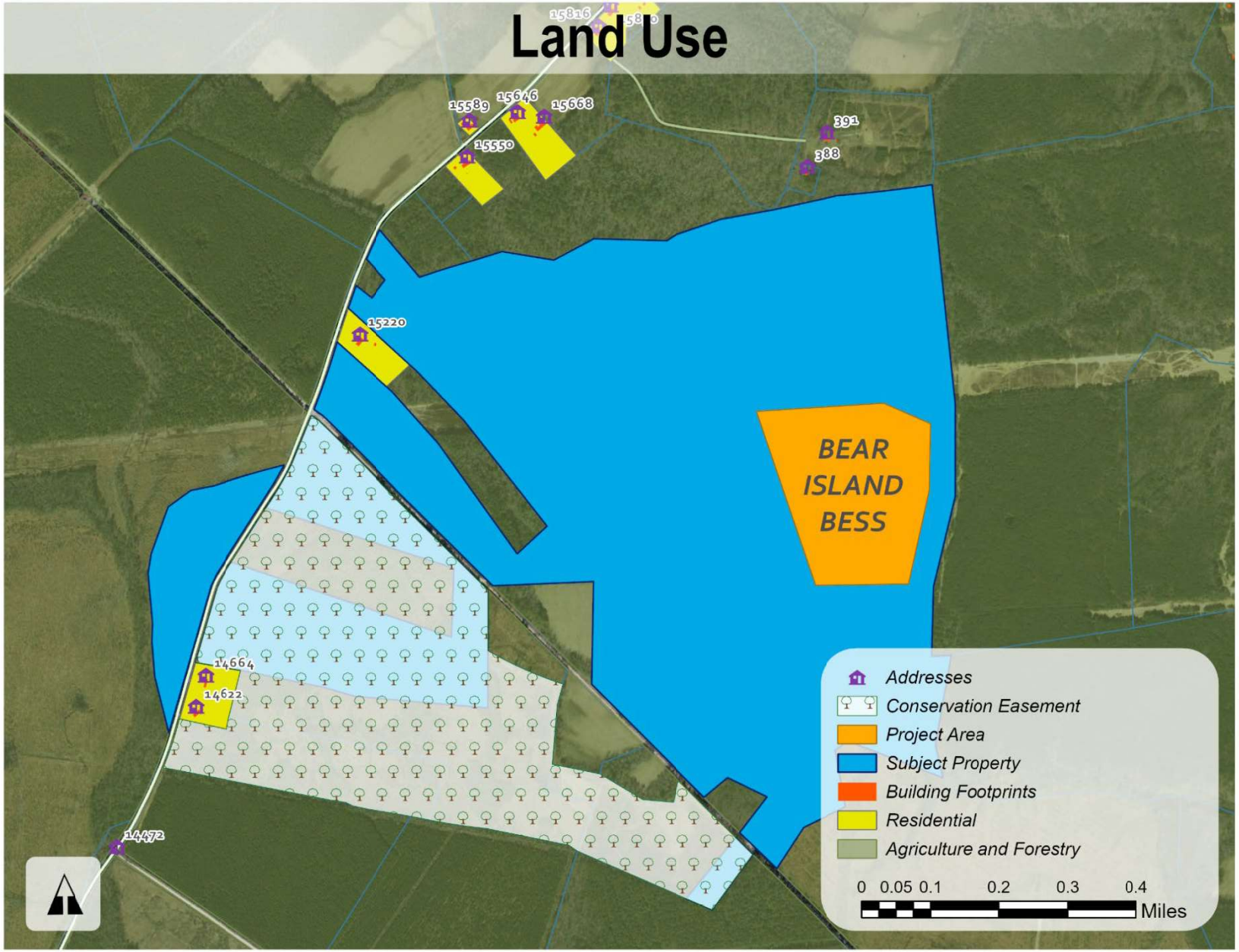
Miles


Land Use
15816
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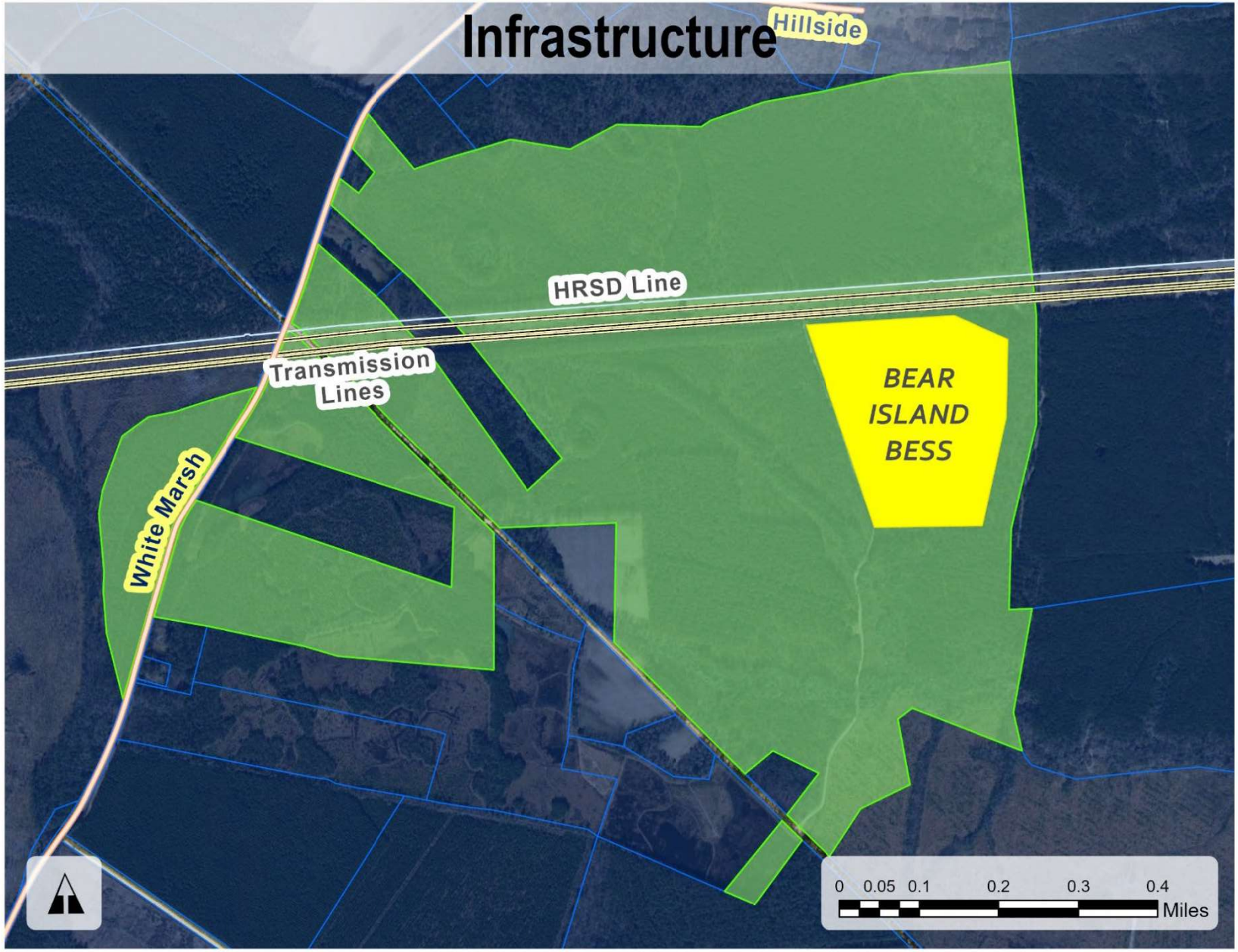
15646
15668
15550
391
388
15220
BEAR
ISLAND
BESS
14664
14622
14472
Addresses
Conservation Easement
Project Area
Subject Property
Building Footprints
Residential
Agriculture and Forestry
0 0.05 0.1 0.2 0.3 0.4
Miles


Infrastructure
Hillside
HRSD Line
Transmission Lines
White Marsh
BEAR ISLAND BESS
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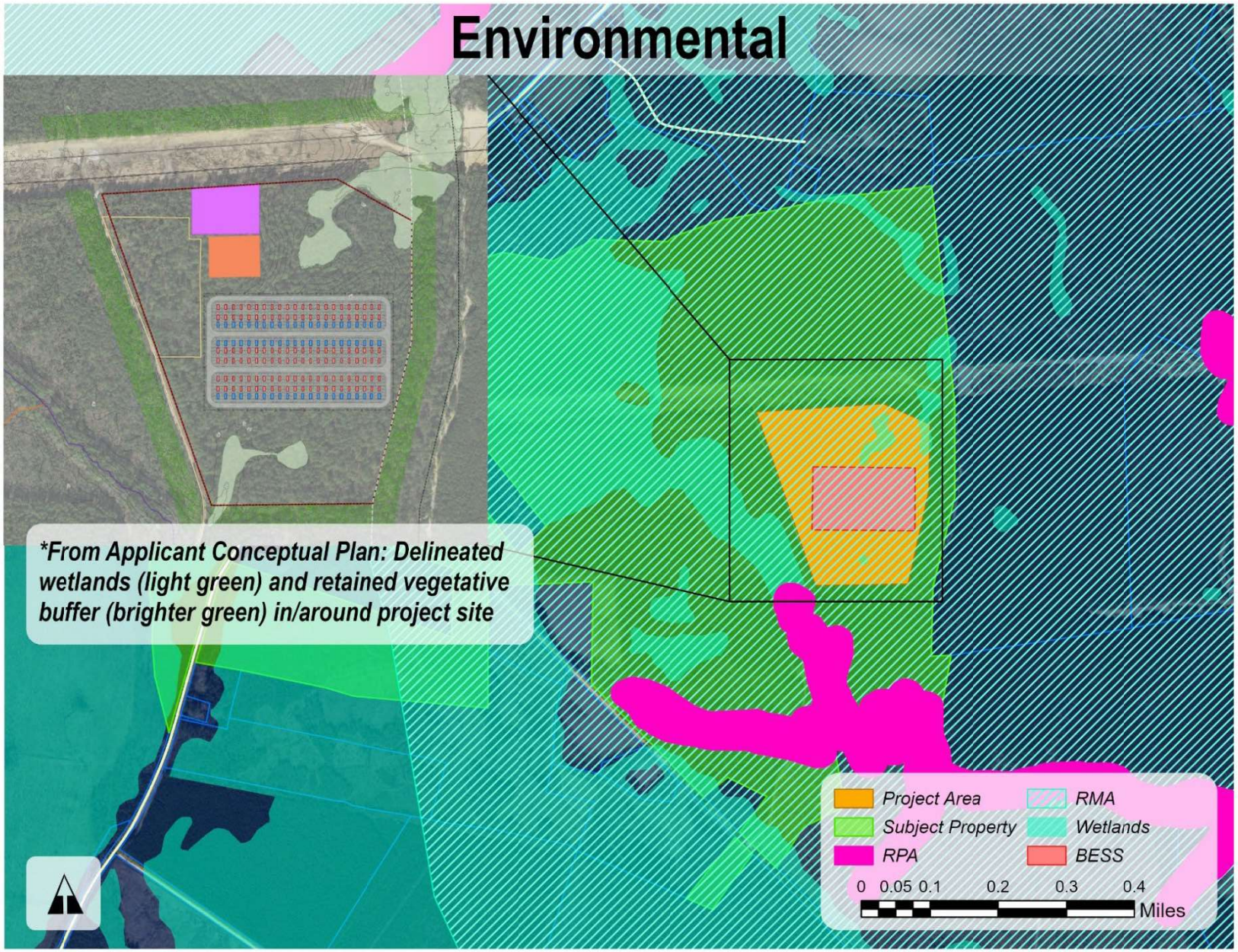
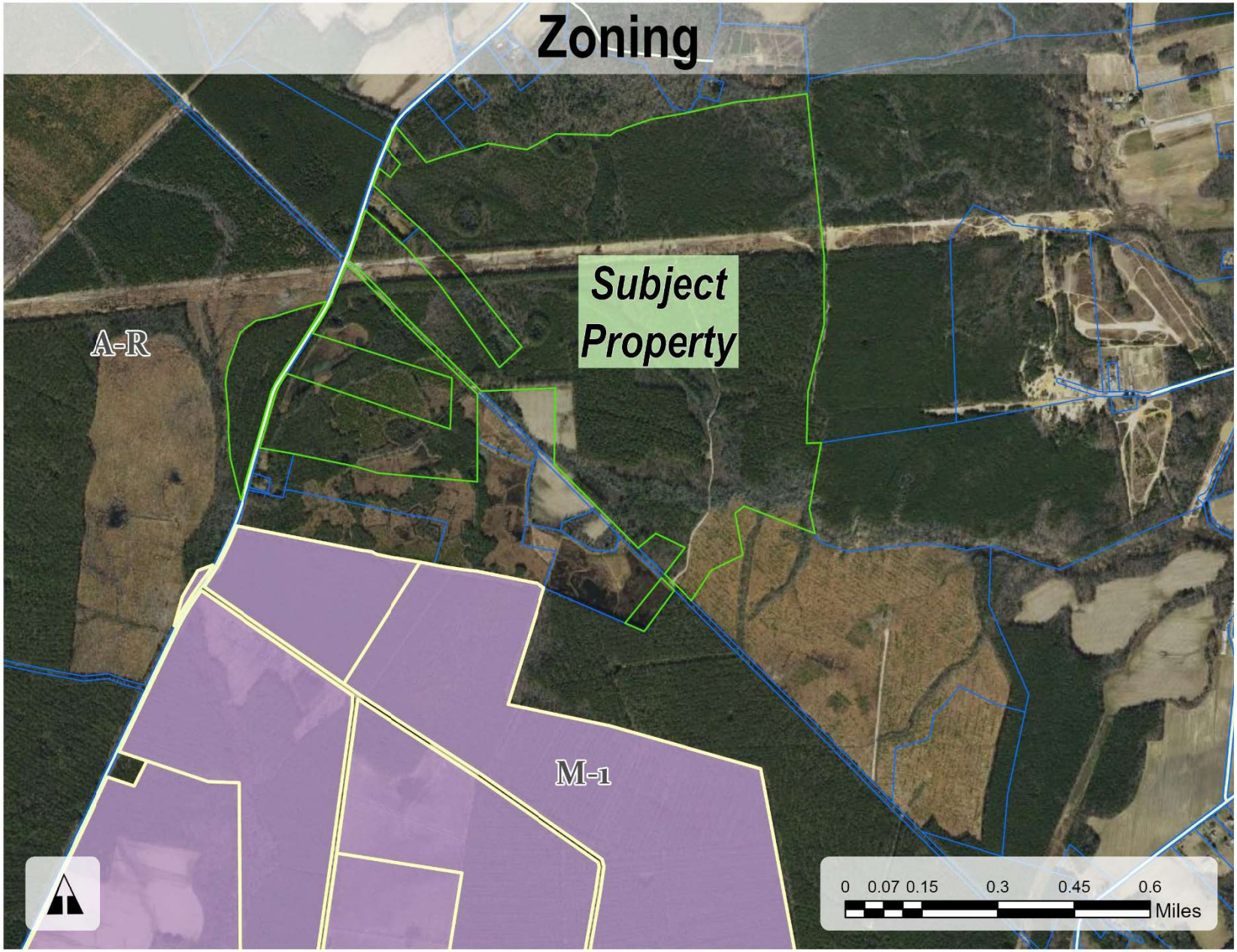
Miles


Environmental
*From Applicant Conceptual Plan: Delineated wetlands (light green) and retained vegetative buffer (brighter green) in/around project site
Project Area
Subject Property
RPA
RMA
Wetlands
BESS
0 0.05 0.1 0.2 0.3 0.4
Miles


Zoning
Subject Property
A-R
M-1
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