

CASE INFORMATION

CASE NO.: 26-47-S **PETITIONER:** LUMINA ENERGY STORAGE, LLC

AGENT OR REPRESENTATIVE: HANNAH PERL AND/OR TINA BRAZIL

ADDRESS: 800 TAYLOR ST., STE. 200, DURHAM, NC. 27701 **PHONE:** 919-960-6015

REQUEST FOR: The petition of Lumina Energy Storage, LLC requesting a Special Use to allow for the construction and operation of a 300 Mega Watt Energy Storage System Facility located in A-1 Agriculture Preservation Districts.

P.I.N.#'s 11-11-03-200-022 **PARCEL SIZE** 25.5 +/- acres **PRESENT ZONING:** A-1

SURROUNDING ZONING: **N** A-1 **S** A-1 **E** R-R/A-1 **W** A-1

PETITION RECEIVED: 9/18/26 **CASE ORIGIN:** By Petitioner

AGENCIES NOTIFIED AND COMMENTS MADE:

PLANNER: Notified 9/30/2026

HEALTH DEPT.: Notified 9/30/2026

TCSWCD: Notified 9/30/2026

TCFB: Notified 9/30/2026

COUNTY HIGHWAY: Notified 9/30/2026

COUNTY EMA: Notified 9/30/2026

MUNICIPALITY: N/A

TOWNSHIP: N/A

IDOT: N/A

SURROUNDING PROPERTY OWNERS: Notified 9/30/2026

PUBLICATION DATE: 9/30/2026 **WHERE:** TAZEWELL CHRONICLE

ACTION TAKEN:

ZONING BOARD OF APPEALS: **DECISION:**

LAND USE COMMITTEE: **DECISION:**

COUNTY BOARD: **DECISION:**

**TAZEWELL COUNTY COMMUNITY
DEVELOPMENT**

APPLICATION FOR ZONING HEARING

PETITION FOR:

☐ Special ☐ Use ☐ New Dwelling Site

☒ Special ☐ Use ☐ Other

Staff Use Only: Accepted by ☐ MK
Date Filed: 9/18/26 **CASE NO.** 26-47-S
Filing Fee ☐ \$50,000 Publication Fee ☐
☐ BA Hearing Date ☐ 11/4/2026
Decision Date ☐
☐ APPROVED ☐ DENIED ☐ OTHER

1. Applicant and Owner Information:

Applicant:

Name ☐ Lumina Energy Storage, LLC
Address ☐ 000 Taylor Street Ste. 000
City, State ☐ Durham, NC 07701
Phone ☐ 919-900-0010
☐ daytime contact
Email ☐ hannah.perl@stratacleanenergy.com

Owner:

Name ☐ Robert and Angela Wildermuth
Address ☐ 10700 Springfield Road
City, State ☐ Pekin, IL 01000
Phone ☐ 009-000-0000
☐ daytime contact
Email ☐ wildfarms@gmail.com

The property interest of the applicant, if not the owner ☐ Purchase Option in place

2. Site and Surrounding Property Information:

- a. 911 Address or property location of subject property ☐ TBD
- b. Correct Legal Description and Property Identification Number ☐ Attach an additional sheet if necessary - a copy of the legal description may be obtained from the Recorder of Deeds Office ☐ 1st floor, McKen~~ie~~ Building ☐
Current ☐ zoning A-1 Property ID Number ☐ 11-11-00-000-019
Proposed Parcel Si~~ce~~/Acreage ☐ 000 Soil Productivity Rate of Site ☐ Average Corn 0100
Legal Description ☐ Average Soy 000
See E~~x~~hibit X.
- c. Describe all e~~xi~~sting structures, physical attributes and current land use of the property ☐
See attached narrative.
- d. Previous Special ☐ Use/Variance re~~qu~~ests for this property ☒ No ☐ Yes ☐ Case No. _____

3. State the Reason For and Nature of the Special Use:

See attached narrative.

- a. Hours of operation ☐ 000 hours Number of employees ☐ 00
- b. Number of parking spaces ☐ 7 Handicapped ☐ 00 Parking Lot Surface ☐ 9' 01'
- c. Signs ☐ si~~ce~~ and number of ☐ TBD
- d. Number of new buildings to be constructed and proposed use of each building ☐
No occupied buildings will be constructed on the site.
- e. Future e~~x~~pansion and time schedule ☐ N/A

4. **New Dwelling Sites Only:** A livestock feeding operation is defined by the Tallapoosa County Zoning Code as "Any new or existing operation which stables or confines and feeds or maintains for a total of 30 days or more in any 1-month period a combination of at least fifty (50) animal units, or its equivalency. Contact the Tallapoosa County Farm Bureau Office at 907-100 for assistance if you are uncertain regarding location of active livestock feeding operations."

- a. Is the property located ☐ Check appropriate item ☐
1. Less than one-half (1/2) mile of a **livestock feeding operation** ☐ Yes ☐ No
- If less than 1/2 mile is a Variance necessary ☐ Yes ☐ No
- ☐ More than one-half (1/2) mile of a **livestock feeding operation** ☐ Yes ☐ No
- b. Type of livestock operation _____ Number of animal units _____

5. **The Zoning Board of Appeals makes a Finding of Fact for all Special Use. Please provide how your application conforms to the following: (attached an additional sheet if necessary)**

- a. The site will be so situated as to minimize adverse effects, including visual impacts on adjacent properties.
See attached narrative.

- b. The establishment, maintenance or operation of the Special Use will not be detrimental to or endanger the public health, safety, morals, comfort or general welfare of the neighboring vicinity.
See attached narrative.

- c. The Special Use will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted.
See attached narrative.

- d. The Special Use will not substantially diminish and impair property value within the neighborhood.
See attached narrative.

- e. Adequate utilities, access roads, drainage and other necessary facilities have been or are being provided.
See attached narrative.

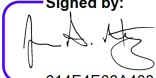
- f. Adequate measures have been or will be taken to provide ingress and egress so designed as to minimize traffic congestion and hazard on the public streets.
See attached narrative.

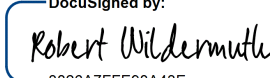
- g. Granting the special use, **which is located one-half mile or less** from a livestock feeding operation, will not increase the population density around the livestock feeding operation to such levels that would hinder the operation or expansion of such operation or granting the special use, which is located **more than one half mile** from a livestock feeding operation will not hinder the operation or expansion of such operation.
The project is not located one-half mile or less from a livestock feeding operation.

- h. The Special Use is consistent with the existing uses of property within the general area of the property in question.
See attached narrative.

- i. The property is suitable for the Special Use as proposed.
See attached narrative.

6. **Signature:** I/we certify that the proposed Special Use will conform to the standards for Special Uses in the Tallapoosa County Zoning Ordinance and hereby acknowledges that all the information contained in this application and accompanying documents are true and correct to the best of my/our knowledge.

Signed by:

614E4E66A40343B...
Applicant Signature
9/17/2026
Date

DocuSigned by:

3826A7FFE98A43E...
Owner Signature
9/17/2026
Date

**Lumina Energy Storage Project
Special Use Permit Application**

September 18, 2026

Submitted to:
Tazewell County Community
Development Administrator
McKenzie Building
11 S. 4th Street, Ste. 400
Pekin, IL 61554

Prepared by:
Lumina Energy Storage, LLC
c/o Strata Clean Energy, LLC
800 Taylor St. Suite 200
Durham, NC 27701



Table of Contents

I.	INTRODUCTION.....	3
II.	RENEWABLE ENERGY ORDINANCE CHECKLIST.....	3
III.	SPECIAL USE APPLICATION REQUIREMENTS.....	23
A.	Applicant and Owner Information	23
B.	Project Location	23
C.	Project Description	23
D.	Present and Proposed Land Use	24
E.	Surrounding Zoning Classifications	24
F.	Explanation of Need for Special Use at Proposed Site	24
G.	Site Plan	25
H.	Copy of Site Plan	25
I.	Statement from Road Official	25
IV.	SPECIAL USE REQUIREMENTS.....	25
A.	Special Use Classification	25
B.	Zoning Districts	25
C.	Application Documents.....	25
D.	Filing Fee	27
V.	DESIGN AND INSTALLATION.....	27
A.	General	27
B.	Energy Storage Systems.....	29
VI.	OPERATION AND MAINTENANCE	30
A.	General	30
VII.	COMPLAINTS	31
VIII.	LIABILITY INSURANCE.....	32
IX.	DECOMMISSIONING PLAN.....	32
X.	EMERGENCY RESPONSE PLAN.....	33
XI.	BUILDING PERMIT	33
XII.	APPROVAL STANDARDS	33
A.	Standards Applicable to Special Uses	33
B.	Standards Applicable to BESS	37

LIST OF APPENDICES

APPENDIX A	COUNTY APPLICATION FOR SPECIAL USE PERMIT
APPENDIX B	SITE PLAN
APPENDIX C	PURCHASE OPTION AGREEMENT
APPENDIX D	ECONOMIC IMPACT REPORT
APPENDIX E	INTERCONNECTION APPLICATION
APPENDIX F	ECOCAT CONSULTATION RECORDS
APPENDIX G	LISTED SPECIES AND HABITAT ASSESSMENT
APPENDIX H	SHPO RECORDS
APPENDIX I	DRAFT DECOMMISSIONING PLAN
APPENDIX J	DRAIN TILE SURVEY
APPENDIX K	AQUATIC RESOURCES DELINEATION
APPENDIX L	GEOTECHNICAL ENGINEERING REPORT
APPENDIX M	FLOODPLAIN ANALYSIS REPORT

I. Introduction

Lumina Energy Storage, LLC, a limited liability company ("**Applicant**"), a wholly owned subsidiary of Strata Solar Development, LLC ("**Strata**"), hereby submits this application ("**Application**") pursuant to Tazewell County's ("**County**") Renewable Energy Ordinance ("**Ordinance**") for its proposed 300 MW standalone battery energy storage system ("**BESS**") project (the "**Project**"), located in a rural agricultural area of the County next to the Ameren Tazewell Substation – an existing 16-acre utility substation serving a 345 kV transmission line and distribution network and accompanying laydown yard.

The Project will store excess electricity generated across the electric grid during periods of excess energy generation at times of low demand, allowing that energy to be redeployed to the grid during times of high demand or emergency needs, enhancing the reliability and stability of the regional grid and providing a tool to help manage delivery of energy to the residents of Tazewell County and the local region. Redeploying energy in this manner avoids the use of higher-cost energy generation during periods of high demand, which reduces energy bills for local consumers. BESS projects typically consist of rechargeable batteries, power conversion systems, project substation, and a control system.

Strata is a vertically integrated developer, EPC, O&M provider, asset manager and independent power producer ("IPP") with deep and diverse expertise throughout the solar and energy storage value chain. The Company was founded in 2008, has five hundred employees, is headquartered in Durham, NC and has offices in Arizona, Colorado, and New York. Strata's IPP owns 1+ GW of operating assets. Strata's development team is advancing an 8.2GW development pipeline, Strata's O&M team has contracted 3.0GW, and Strata's EPC team has installed 3.6GW of PV and 1.8GWh of energy storage.

The following Application materials, together with the attached Appendices meet each of the applicable criteria provided in the Ordinance.

The Applicant respectfully requests that the Tazewell County Board grant the Applicant a Special Use Permit to construct and operate the Project. For ease of reference, below, Applicant has provided a checklist of the items required by applicable sections of the Ordinance and where they are referenced in our Application.

II. Renewable Energy Ordinance Checklist

The Renewable Energy Ordinance provides regulations for the permitting of energy storage systems within Tazewell County. The below table outlines the requirements applicable to energy storage systems and identifies where in the Application the applicable criteria is met.

Location in Ordinance	Requirement	Location in Application
§ 157.437 SPECIAL USE APPLICATION PROCEDURE		
§ 157.437(A)	State the name and address of the applicant and the name and address of the owner, if applicant is not such owner;	Sec. III.A
§ 157.437(B)	The legal description and address (if available) of property;	Sec. III.B
§ 157.437(C)	A written description of the proposed use that includes information concerning proposed hours of operation, expected traffic patterns, and any other pertinent details concerning the proposed use;	Sec. III.C
§ 157.437(D)	The present and proposed land use;	Sec. III.D
§ 157.437(E)	The surrounding zoning classifications;	Sec. III.E
§ 157.437(F)	An explanation of the need for the special use at the proposed site;	Sec. III.F
§ 157.437(G)	A site plan which contains at a minimum the following: <ul style="list-style-type: none"> 1) All existing and proposed buildings and structures on the site; 2) All proposed parking and loading areas (when applicable); 3) Proposed water and sewage systems; 4) Placement of exterior lighting; and 5) Landscaping. 	Sec. III.G Appendix B
§ 157.437(H)	A copy of such site plan at a size not to exceed 11 inches by 14 inches; and	Sec. III.H
§ 157.437(I)	A statement signed by the appropriate road official stating that the proposed access way is adequate for the proposed use.	Sec. III.I
§ 157.438 STANDARDS APPLICABLE TO SPECIAL USES		
§ 157.438(A)		
When considering an application for a special use permit, the decision making body, based on evidence presented, shall find:		
§ 157.438(A)(1)	The special use shall, in all other respects, conform to the applicable regulations of this chapter for the district in which it is located. Special uses when combined with variances for this same property shall be considered compliant for the purposes of this section;	Sec. XII.A..A.1
§ 157.438(A)(2)	The special use will be consistent with the purposes, goals, objectives, and standards of the officially adopted county comprehensive land use plan and these regulations, or of	Sec. XII.A.A.2

Location in Ordinance	Requirement	Location in Application
	any officially adopted comprehensive plan of a municipality with a one and one-half mile planning jurisdiction; and	
§ 157.438(A)(3)	The petitioner has provided the information required by § 157.437, and has demonstrated the ability to complete the proposal shown in § 157.437(A) through (I), and has met those items required by the statements described in § 157.437(I).	Sec. XII.A.A.3
§ 157.438(B)		
When considering an application for a special use permit, the decision making body, based on evidence presented, shall also find, not one of which shall be controlling:		
§ 157.438(B)(1)	The site shall be so situated as to minimize adverse effects, including visual impacts on adjacent properties;	Sec. XII.A.B.1
§ 157.438(B)(2)	The establishment, maintenance, or operation of the special use shall not be detrimental to or endanger the public health, safety, morals, comfort, or general welfare of the neighboring vicinity;	Sec. XII.A.B.2
§ 157.438(B)(3)	The special use shall not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted;	Sec. XII.A.B.3
§ 157.438(B)(4)	The special use shall not substantially diminish and impair property value within the neighborhood;	Sec. XII.A.B.4
§ 157.438(B)(5)	Adequate utilities, access roads, drainage, and other necessary facilities have been or are being provided;	Sec. XII.A.B.5
§ 157.438(B)(6)	Adequate measures have been or will be taken to provide ingress and egress so designed as to minimize traffic congestion and hazard on the public streets;	Sec. XII.A.B.6
§ 157.438(B)(7)	The evidence establishes that granting the use, which is located one-half mile or less from a livestock feeding operation, will not increase the population density around the livestock feeding operation to such levels as would hinder the operation or expansion of such operation;	Sec. XII.A.B.7
§ 157.438(B)(8)	Evidence presented establishes that granting the use, which is located more than one-half mile from a livestock feeding operation will not hinder the operation or expansion of such operation;	Sec. XII.A.B.8
§ 157.438(B)(9)	Seventy-five percent of the site contains soils having a productivity index of less than 125;	Sec. XII.A.B.9

Location in Ordinance	Requirement	Location in Application
§ 157.438(B)(10)	The special use is consistent with the existing uses of property within the general area of the property in question; and	Sec. XII.A.B.10
§ 157.438(B)(11)	The suitability of the property in question is for the special use as proposed.	Sec. XII.A.B.11
§ 153.04 SPECIAL USE REQUIREMENTS		
§ 153.04(A)	Special Use Classification. All Wind, Solar or Energy Storage System Facility shall be considered a Class A Special Use and fulfill all general application requirements, in the manner specified for a Class A Special Use.	Sec. IV.A
§ 153.04(B)	Zoning Districts. Wind, Solar and Energy Storage System Facilities are permitted only in the A-1, A-2, CONS, I-1 and I-2 zoning districts and upon approval of a Special Use by the Tazewell County Board.	Sec. IV.B
§ 153.04(C)	Application Documents. The following documents must be filed along with the requirements specified in §157.437 of the Tazewell County Zoning Code.	Sec. IV.C
§ 153.04(C)(1)	1. AIMA. State approved Agricultural Impact Mitigation Agreement (AIMA) required by 55 ILCS 5/5--12020(c) for all Wind and Solar Facilities. The Facility Owner's compliance with the AIMA shall be a condition of the Special Use.	N/A
§ 153.04(C)(2)	2. Interconnection. The Facility Owner must provide proof of application to the ISO for interconnection or provide approved application for interconnection.	Sec. IV.C.2 Exhibit E
§ 153.04(C)(3)	3. EcoCAT. The Facility Owner shall provide the results and adhere to recommendations from consultation with the Illinois Department of Natural Resources that are obtained through the Ecological Compliance Assessment Tool (EcoCAT). Should the EcoCAT report expire prior to obtaining the building permit, the Facility Owner shall provide an updated report prior to obtaining a permit for construction.	Sec. IV.C.3 Exhibit F
§ 153.04(C)(4)	4. Protected Lands.	Sec. IV.C.4

Location in Ordinance	Requirement	Location in Application
	The Facility Owner shall demonstrate avoidance of protected lands as identified by the Illinois Department of Natural Resources and the Illinois Nature Preserve Commission or consider the recommendations of the Illinois Department of Natural Resources for setbacks from protected lands, including areas identified by the Illinois Nature Preserve Commission.	Exhibit F Exhibit G
§ 153.04(C)(5)	5. Illinois State Historic Preservation Office. Provide evidence of consultation with the Illinois State Historic Preservation Office to assess potential impacts on State-registered historic sites under the Illinois State Agency Historic Resources Preservation Act	Sec. IV.C.5 Exhibit H
§ 153.04(C)(6)	6. Compliance with Federal Aviation Administration (FAA). For wind energy system facilities, it shall be the responsibility of the Facility Owner to complete the proper FAA applications and obtain the proper permits or a determination of no significant impact to air navigation from the FAA.	N/A
§ 153.04(C)(7) (1-8)	7. Approval Standards. A request for Special Use for a Facility or modification of an approved Special Use, shall be approved if the request is in compliance with the standards and conditions imposed in Public Act 104-0458 and conditions imposed under any other State and/or federal statutes and regulations in addition to those specified herein, including consideration of the substantive due process requirements of the Illinois Constitution, sometimes referred to as the <i>LaSalle/Sinclair</i> factors, as follows: <ol style="list-style-type: none"> 1) The existing uses and zoning of nearby property; 2) The extent to which property values are diminished by the particular zoning restrictions; 3) The extent to which the destruction of property values of plaintiff promotes the health, safety, morals or general welfare of the public; 4) The relative gain to the public as compared to the hardship imposed upon the individual property owner; 5) The suitability of the subject property for the zoned purpose; 6) The length of time the property has been vacant as zoned considered in the context of the land development in the area in the vicinity of the subject property; 	Sec. IV.C.7 Sec. XII.B.1-8

Location in Ordinance	Requirement	Location in Application
	<p>7) Whether a comprehensive zoning plan for land use and development existing, and whether the ordinance is in harmony with it; and</p> <p>8) Whether the community needs the proposed use.</p>	
§ 153.04(D)	<p>Filing Fee.</p> <p>Energy Storage System \$5,000 per MW of nameplate capacity (DC), not to exceed \$50,000.</p> <p>An application for Special Use is considered filed for public hearing upon meeting all of the requirements of § 157.437 and those specified herein and upon receipt of the applicable filing fee.</p>	Sec. IV.D
§ 153.05 DESIGN and INSTALLATION		
A. General		
§ 153.05(A)(1)	<p>Code Compliance.</p> <p>All facilities must be designed in accordance with the International Codes, National Electrical Code enforced by Tazewell County at the time the permit application is accepted, in addition to any to requirement of other State and Federal regulatory agencies.</p>	Sec. V.A.1
§ 153.05(A)(2)	<p>Temporary Site Posting.</p> <p>Before construction begins and while under construction, all sites must have a posting which include but may not be limited to; the approved facility's name, the name of the Engineering, Procurement and Construction (EPC) firm developing the site, contact information for the EPC representative managing site development and the assigned 911 address. The temporary sign shall not be less than fifteen (15) square feet and must be clearly visible from the public roadway.</p>	Sec. V.A.2
§ 153.05(A)(3)	<p>Lighting.</p> <p>All outdoor lighting shall be designed and installed compliant with section §157.056 of the Tazewell County Zoning Code for Outdoor Lighting and any other required regulatory authority in an effort to minimize the visual impact of the structures.</p>	Sec. V.A.3

Location in Ordinance	Requirement	Location in Application
§ 153.05(A)(4)	<p>Parcel Identification Number.</p> <p>The Facility shall be separated from a larger tract and a new site specific parcel identification number assigned. The Facility Owner shall, at his or her own expense, utilize an Illinois registered land surveyor to prepare a metes and bounds survey description of the land upon which the facility is installed, including access routes, over which the Facility Owner has exclusive control and must deliver a copy of the survey to the Chief County Assessment Officer (CCAO) and to the owner of the land upon which the Facility is constructed. The new tract will not be considered to have new parcel boundary lines for setback purposes. The separate parcel number is issued so that the tax bill can be sent to the facility owner when the system is situated on leased ground.</p>	Sec. V.A.4
§ 153.05(A)(5) (a)-(f)	<p>Roads.</p> <p>When proposing to use any county, municipal or township road(s), for the purpose of transporting of components of the Facility or those accessory to the Facility, shall enter into a Road Use Agreement (RUA), approved by the Authority Having Jurisdiction (AHJ), agreements with the County will require approval of the County Board prior to obtaining a permit for construction. Any road work required must be specifically and uniquely attributable to the construction of the facility. A copy of the approved RUA shall be submitted to Community Development along with Appendix A – Affidavit of Acknowledgement/Road Use Agreement. The RUA may include, but need not be limited to, the following provisions:</p> <p>a. A Haul Route Map for review and approval by the respective Road District Commissioner and the County Engineer prior to the granting of the Building Permit. Traffic for construction purposes shall be limited to these roads.</p> <p>b. A pre-construction road surface scan shall be conducted to determine existing road conditions for assessing potential future damage. This study is to be conducted by an outside civil engineering firm agreed upon by both the road districts and the Facility Owner or their respective designee.</p>	Sec. V.A.5

Location in Ordinance	Requirement	Location in Application
	<p>c. Required roadway improvements; pre-construction, road upgrades needed prior to commencement of the construction of the facility to ensure the existing roads are capable of withstanding the proposed traffic and loading, and post construction.</p> <p>d. The applicant shall obtain a weight or size permit from all appropriate government agencies, to include; IDOT, the County, townships and municipalities prior to construction.</p> <p>e. Any road damage caused by the transport of the facility's equipment, the installation, maintenance or removal must be completely repaired to the satisfaction of the Road District Commissioner and the County Engineer. The Road District Commissioner and the County Engineer may choose to either require remediation of the road repair upon completion of the facility or are authorized to collect fees for necessary remediation.</p> <p>f. Financial assurance in the amount agreed upon by the Road District Commissioner and County Engineer to ensure future repairs are completed to their satisfaction shall be provided.</p> <p>All repairs and improvements to public roads and roadway appurtenances shall be subject to the prior approval of the AHJ before being made and shall also be subject to inspection and acceptance by the County after such repairs and improvements are completed. The County's Road Agreement, and any further agreements contemplated therein, regarding the maintenance and repair of public roads and highways, must be approved by the Tazewell County Board, to include the form of financial assurance desired by the AHJ prior to the approval of any Building Permit.</p>	
§ 153.05(A)(6) (a)-(c)	<p>Noise Levels.</p> <p>Noise levels shall be regulated by the Illinois Pollution Control Board under 35 Ill. Adm. Code Parts 900, 901, and 910. The facility owner shall, prior to the first anniversary of commercial operation, provide an octave band sound pressure level measurement(s) conducted by a third party acoustic consultant or engineer, from a reasonable number of sampled locations at the perimeter of the facility to demonstrate compliance with this Section.</p>	Sec. V.A.6

Location in Ordinance	Requirement	Location in Application
	<p>a. In accordance with Section 25 of the Environmental Protection Act, a participating property, participating residence, nonparticipating property, nonparticipating residence, or any combination of those properties or residences may waive enforcement of the rules adopted by the Illinois Pollution Control Board under 35 Ill. Adm. Code Parts 900, 901, and 910 by written waiver that complies with the applicable directive established in Section 25 of the Environmental Protection Act and is recorded in the Office of the Recorder of the county in which the participating property, participating residence, nonparticipating property, or nonparticipating residence is located. Once recorded, such a waiver shall be binding on current and future owners, residents, lessees, invitees, and users of the participating property, participating residence, nonparticipating property, or nonparticipating residence for enforcement purposes.</p> <p>b. An owner of any participating residence or nonparticipating residence shall disclose the existence of such a waiver to any lessee before entering any new lease for the residence.</p> <p>c. A seller or transferor of a participating property, participating residence, nonparticipating property, nonparticipating residence, or any combination of those properties or residences shall disclose the existence of such a waiver to any buyer or transferee before any sale or transfer of the property. If disclosure of the waiver occurs after the buyer has made an offer to purchase the property, the seller shall disclose the existence of the waiver before accepting the buyer's offer and shall (1) allow the buyer an opportunity to review the disclosure and (2) inform the buyer that the buyer has the right to amend the buyer's offer.</p>	
§ 153.05(A)(7) (a)-(c)	<p>Farmland Drainage Plan and Tile Repair.</p> <p>A final drainage plan shall be created independently by the Facility Owner and shall include the location of any potentially impacted drainage district facilities to the extent the information is publicly available from the county or the drainage district and plans to repair any subsurface drainage procedures outlined in the decommissioning plan. The plan shall be filed with the County and any impacted drainage district prior to obtaining a permit for construction.</p>	<p>Sec. V.A.7</p> <p>Exhibit I</p> <p>Exhibit J</p>

Location in Ordinance	Requirement	Location in Application
	<p>Notwithstanding any other provision of law, a Facility Owner with approval to construct a wind or solar energy facility is authorized to cross or impact a drainage system, including, but not limited to, drainage tiles, open drainage districts, culverts, and water gathering vaults, owned or under the control of a drainage district under the Illinois Drainage Code without obtaining prior agreement or approval from the drainage district, except that the Facility Owner shall repair or pay for the repair of any damage to the drainage system, in a manner that assures the tile line's proper operation at the point of repair, caused by the Facility Owner within a reasonable time following completion of such activity.</p> <p>a. Tile location.</p> <p>i. The Facility Owner or their designee(s) will work with the Landowner to identify the tile lines traversing the property included within the underlying agreement which will be crossed or disturbed by the construction of the Facility. All tile lines identified in this manner will be shown on the Construction and Decommissioning Plans and staked or flagged in the locations where expected crossing or disturbance is anticipated prior to construction or decommissioning to alert construction and decommissioning crews to the possible need for tile line repairs.</p> <p>b. Repair.</p> <p>i. All repairs should be made as soon as reasonably practicable. Temporary repairs shall be made by the Facility Owner, their designee or the property owner until such time any of the aforementioned parties can make permanent repairs.</p> <p>ii. Tile lines that are damaged, cut, or removed shall be staked or flags placed in such a manner will remain visible until the permanent repairs are completed. In addition, the location of damaged drain tile lines will be recorded using Global Positioning Systems (GPS) technology.</p>	

Location in Ordinance	Requirement	Location in Application
	<p>iii. During construction, if the tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repairs can be made by any of those parties previously mentioned within 14 days (weather and soil conditions permitting) of the time damage occurred; however, the exposed tile lines will be screened or otherwise protected to prevent the entry of foreign materials or animals into the tile lines. At other times, such repairs must be made at a time mutually agreed upon by the Facility Owner and the Landowner.</p> <p>iv. Where tile lines are severed by an excavation trench, repairs shall be made using the IDOA Drain Tile Repairs. If there is any dispute between the Landowner and the Facility Owner on the method of permanent tile line repair, the appropriate Soil and Water Conservation District's opinion shall be considered by the Facility Owner and the Landowner.</p> <p>v. To the extent practicable, there will be a minimum of one foot of separation between the tile line and the Underground Cable whether the underground cable passes over or under the tile line. If the tile line was damaged as part of the excavation for installation of the underground cable, the underground cable will be installed with a minimum one foot clearance under or over the tile line to be repaired or otherwise to the extent practicable.</p> <p>The original tile alignment and gradient shall be maintained. A laser transit shall be used to ensure the proper gradient is maintained. A laser operated tiling machine shall be used to install or replace tiling segments of one-hundred linear feet or more.</p> <p>vi. Following completion of the work, the Facility Owner will be responsible for correcting or paying for the correction of all tile line repairs</p>	

Location in Ordinance	Requirement	Location in Application
	<p>that fail due to construction, maintenance and/or decommissioning, provided any such failure was identified by the Landowner after construction or decommissioning. The Facility Owner will not be responsible for tile line repairs that the Facility Owner pays the Landowner to perform.</p> <p>c. Compensation</p> <p>i. A Facility Owner shall compensate Landowners for losses or other damage resulting from damage to a drainage system caused by the Facility. The Facility Owner shall repair or pay for the repair of all damage to the subsurface drainage system caused by the construction of the Facility. The Facility Owner shall repair or pay for the repair and restoration of surface drainage caused by the Facility as soon as reasonably practicable.</p>	
§ 153.05(A)(8)	<p>Waste.</p> <p>All solid waste, whether generated from supplies, equipment parts, packaging, from construction, operation or maintenance of the facility, including old parts and equipment, shall be removed from the site immediately and disposed of in an appropriate manner. All hazardous waste generated by the operation and maintenance of the facility including, but not limited to, lubricating materials, shall be removed from the site immediately and disposed of in a manner consistent with all local, state, and federal rules and regulations.</p>	Sec. V.A.8
§ 153.05(A)(9)	<p>Waiver of Requirements.</p> <p>For the purpose of this Section, “waivable requirements” include (1) any setbacks, imposed in this Section, from nonparticipating properties or nonparticipating residences, and (2) limits on shadow flicker from wind energy facilities on nonparticipating residences. Any waivable requirements may be waived with the written consent of the owner of the affected nonparticipating party.</p>	Sec. V.A.9
D. Energy Storage System Facility		

Location in Ordinance	Requirement	Location in Application
§ 153.05(D)(1)	<p>Setbacks. Occupied Community Buildings and Nonparticipating Dwellings, 150 feet from the nearest point on the outside wall of the structure. Public Road Rights-of-Way, 50 feet from the nearest edge.</p> <p>Boundary lines of Nonparticipating Property and Occupied Community Buildings, 50 feet to the nearest point on the property line of the nonparticipating property.</p> <p>Setbacks are measured from the nearest edge of the nearest battery or other electrochemical or electromechanical enclosure.</p>	Sec. V.B.1
§ 153.05(D)(2)	<p>Fence.</p> <p>A commercial ESS Facility shall be enclosed with a perimeter fence at least 7 feet and no more than 25 feet and consistent with the setback requirement of § 157.049.</p>	Sec. V.B.2
§ 153.05(D)(3)	<p>Design Standards.</p> <p>The Facility shall be designed and certified in accordance with NFPA 885 “Standard for the Installation of Stationary Energy Storage Systems”. All batteries integrated within an ESS shall be listed in accordance with the UL 1973 and UL 9540 standard.</p>	Sec. V.B.3
§ 153.05(D)(4)	<p>Reports.</p> <p>Prior to commercial operation the Facility Owner shall submit to the County a commission report, certifying the requirements of NFPA 855 Sections 4.2.4, 6.1.3 and 6.1.5.5, as published in the 2023 or the applicable section in the most recent version and also a hazard mitigation analysis per NFPA 885 Section 4.4.</p>	Sec. V.B.4
§ 153.05(D)(5)	<p>Vegetative Screening.</p> <p>Although not required, it is recommended that the Facility Owner provide vegetative screening similar to that of the solar requirement to lessen the visual impact of the Facility to nonparticipating landowners and the general public.</p>	Sec. V.B.5
§ 153.05(D)(6)	<p>Noise.</p>	Sec. V.B.6

Location in Ordinance	Requirement	Location in Application
	<p>The Facility Owner shall, at their expense and prior to the first anniversary of commercial operation, provide an octave band sound pressure level measurement(s) from a reasonable number of sampled locations at the perimeter of the facility to demonstrate compliance with the requirements of the Illinois Pollution Control Board under 35 Ill. Adm. Code Parts 900, 901, and 910.</p>	
§ 153.06 OPERATION and MAINTENANCE		
A. General		
§ 153.06(A)(1)	<p>Facility Owner.</p> <p>Sixty (60) days prior to any transfer of ownership of the Facility, the Facility Owner shall provide notice to the County of the transfer of ownership. Notice shall include primary contact information for the new Facility Owner. Notice shall also include the updated Operations and Maintenance contact information. This contact information shall be replaced on site immediately and no more than one week following the transfer.</p> <p>Failure to notify the County and provide the aforementioned information prior to the transfer of property will result in a violation and possible revocation of the Special Use Approval and potential decommissioning of the Facility.</p>	Sec. VI.A.1
§ 153.06(A)(2)	<p>Permanent Address Posting.</p> <p>The new tract of land shall also be assigned a separate 911 address by the Community Development Department, and upon final inspection and prior to commercial operation the address shall be posted in accordance with Chapter 154.150-154.999, Address Display Ordinance. If there are multiple entrances to the Facility, each access point shall be assigned an individual and unique address, identifying the main entrance as the primary address and point of interconnection.</p>	Sec. VI.A.2
§ 153.06(A)(3)	<p>Operation and Maintenance Contact.</p> <p>The Facility shall have a local contact for Operations and Maintenance, and it is the responsibility of the Facility Owner to ensure the County, at all times, has proper contact information on file. The Facility Owner shall update the County on an annual basis on or before the anniversary of</p>	Sec. VI.A.3

Location in Ordinance	Requirement	Location in Application
	commercial operation. Should the contact for the O&M change during the life of the Facility the Facility Owner must notify Community Development in advance and update both the County and the site posting not more than seven days following the change.	
§ 153.06(A)(4)	Annual Report. On an annual basis, following the commencement of commercial operation, the Facility Owner or their designee shall submit to Community Development an annual report. The annual report shall include the annual energy production and/or energy consumption and water usage if applicable. The annual report shall also include complaints received by the Facility Owner and the remedy of said complaint, including timeline for remediation.	Sec. VI.A.4
D. Energy Storage Systems – No requirements.		
§ 153.07 NONCONFORMING USE and STRUCTURES		
§ 153.07	[Omitted for brevity. The Project is not a nonconforming use.]	N/A
§ 153.08 COMPLAINTS		
§ 153.08	<p>All complaints shall be made directly to the Owner or their designee. Contact information for the Facility should be publicly accessible via a Facility website and at the point of access to each Facility site.</p> <p>The Facility Owner or their designee shall make the County aware of the any complaint and remedies of the complaint in writing as soon as it is feasible to do so but no more than seventy-two (72) hours following receipt of the complaint. Both the Owner and the County shall keep a log of all complaints related to the project.</p> <p>Should a complaint be validated that violates any of the criteria of approval, the Facility shall not be made operational until the violation has been resolved. Should it be necessary and safe to do so, the Facility may be made operational for the purpose of determining compliance.</p> <p>The cost of investigation into any non-compliance of the Approved Special Use or the permitted equipment throughout the life of the project shall be on the burden of</p>	Sec. VII

Location in Ordinance	Requirement	Location in Application
	<p>the Facility Owner and all costs of said investigation shall be incurred by the Facility Owner. Operations of the Facility shall cease and remain nonoperational until said investigations have been completed and compliance requirements have been satisfied.</p> <p>If the complaint is found to be valid and cannot be mitigated, the Landowner may seek a variance for the deviation of compliance to allow the continued operation of the Facility identified to be non-compliant. If the variance is not approved, the Facility shall remain nonoperational until which time a feasible and agreeable solution can be determined.</p>	
§ 153.09 LIABILITY INSURANCE		
§ 153.09	<p>Prior to issuance of any permit, the Facility Owner shall furnish Tazewell County with Certificate of Insurance and endorsements evidencing that Tazewell County, its officers, agents and employees are named as Additional Insureds on a primary non-contributory basis on the Commercial General Liability policy, with limits not less than those specified herein. The Facility Owner is encouraged to extend coverage to adjacent landowners in the event debris or containments extend beyond the property boundary of the Facility. Such coverage shall apply to claims arising out of the Facility Owners' operations, whether performed by the Facility Owner, subcontractor or any directly employed person. Coverage shall be maintained from permitting, throughout commercial operation, and not less than three (3) years following decommissioning. Proof of Certificate of Insurance (COI) is required to be submitted to the County for each policy renewal. The County shall be notified not less than sixty (60) days in advance of policy cancellation and shall be provided proof of current coverage, in the manner specified herein, not less than thirty (30) days prior to the expiration of the canceled policy.</p> <p>Coverage and limits must be maintained as follows: Commercial General Liability \$2,000,000 per occurrence / \$4,000,000 aggregate Umbrella Liability \$10,000,000 per occurrence / \$10,000,000 aggregate Worker's Compensation Statutory minimum plus \$1,000,000 Employers Liability Coverage</p>	Sec. VIII

Location in Ordinance	Requirement	Location in Application
	<div data-bbox="553 380 1214 737"> <div>Professional Liability \$2,000,000 minimum</div> <div>Automobile Liability \$1,000,000 minimum</div> <div>Commercial Pollution Liability < 5MW DC Capacity \$10,000,000 per claim / \$25,000,000 aggregate</div> <div>5MW – 50MW</div> <div>\$15,000,000 per claim / \$30,000,000 aggregate</div> </div> <p data-bbox="459 772 1219 905">* For facilities exceeding 50 MW capacity, the CPL limit shall increase by \$5 million per claim and \$5 million in the aggregate for each additional 50 MW, or portion thereof, of DC nameplate capacity above 50 MW.</p> <p data-bbox="459 940 1219 1171">The Facility Owner shall defend, indemnify, and hold harmless Tazewell County, its Board members, officers, employees, and agents from and against any and all claims, actions, damages, liability, costs, and expenses, including attorney's fees, arising out of or connected with the facility's operations, except to the extent caused by the County's sole negligence or willful misconduct.</p> <p data-bbox="459 1207 1219 1367">Following the tenth anniversary of commercial operation, and every five years thereafter, the County may have the ability to re-evaluate insurance coverage and may request coverage that is commercially reasonable for the Facility at that time.</p>	
§ 153.10 DECOMMISSIONING PLAN		
§ 153.10	<p data-bbox="459 1478 1219 1577">Prior to issuance of the County building permit, the facility owner shall have approval of the Decommissioning Plan, including the end of life cost estimate of decommissioning.</p> <p data-bbox="459 1612 1219 1835">The Energy Storage System Facilities shall be in accordance with the NFPA 855 standards. The associated cost estimate shall be increased at the inflation rate of the higher of either 2.5% or the average inflation rate of CPI-U of the three prior calendar years, at the time of approval. The base estimate should not be more than 12 months old at the time of consideration and based on the equipment</p>	<p data-bbox="1247 1478 1344 1509">Sec. IX</p> <p data-bbox="1247 1551 1349 1583">Exhibit I</p>

Location in Ordinance	Requirement	Location in Application
	<p>selected for construction. The cost estimate shall be phased over the life of the project as follows:</p> <p>Commercial Energy Storage Systems</p> <ul style="list-style-type: none"> A. 25% before commercial operation; B. 50% before the start of 5th year of commercial operation; and C. 100% before the start of the tenth year of commercial operation. <p>Financial assurance shall be made in the form of a surety or like bond. Following tenth anniversary, and every five years thereafter, the County may re-evaluate the Plan and associated cost estimate. All bond issuers must maintain an A+ rating by AM Best for viability and consideration of the County Board. Said revaluation must be certified by an independent third party Professional Engineer licensed in the State of Illinois and provided for review by the County.</p> <p>Should the County find reason to disagree with the revaluation, the County shall retain the services of an additional State of Illinois Licensed Professional Engineer, at the cost of the Facility Owner. After all available decommissioning funds have been utilized the property owner of record is responsible for any remaining cost to complete the decommissioning plan.</p> <p>Any areas of decommissioning not specifically addressed herein or conflicting with the Department of Agriculture's Agricultural Impact Mitigation Agreement shall adhere to the "Agreement" filed with the State of Illinois for all Wind and Solar Facilities and the plan approved by the County prior to issuance of the building permit. All Energy Storage System Facilities shall adhere to the decommissioning plan, created in compliance with NFPA 855, Section 8.1.4 or subsequent sections addressing decommissioning, approved by the County prior to issuance of the building permit. Appendix C includes a current summary of standards for each Facility.</p> <p>The financial assurance shall not release the surety from liability until the financial assurance is replaced. The salvage value of the Facility may only be used to reduce the estimated costs of decommissioning in the Plan if the</p>	

Location in Ordinance	Requirement	Location in Application
	<p>County agrees that all interests in the salvage value are subordinate or have been subordinated to that of the County if abandonment occurs.</p> <p>Upon abandonment, a period of twelve (12) months following the facility's end of life usefulness, the County may take all appropriate actions for decommissioning, including drawing upon the financial assurance.</p>	
§ 153.11 EMERGENCY RESPONSE PLAN		
§ 153.11 (A)-(E)	<p>The Facility Owner shall contact the appropriate first responders in the district where the Facility is located to provide for review or to develop in conjunctions with those having authority an Emergency Response Plan to be approved and a copy provided to the Community Development Department, prior to the issuance of a building permit, in addition to the Affidavit of Acknowledgement, Emergency Response Plan, Appendix B. Should the project be modified in any respect, an updated plan should be provided for further review and updates, if necessary, prior to commercial operation.</p> <p>[ERP Plan Criteria Omitted for Brevity]</p>	Sec. X
§ 153.12 BUILDING PERMIT		
§ 153.12	<p>Permit Processing.</p> <p>The County shall process the building permit application within 60 days upon receipt of the complete application to include all required documents. The County shall keep record of document filings and notify the facility owner when the application is complete and satisfactory for review.</p> <p>Permit Fees.</p> <p>The fees for processing the building permit applications for a wind, solar or energy storage facility shall be collected by the Community Development Administrator who shall be accountable to the County for such fees.</p> <p>Energy Storage Facility \$5,000 per MW of nameplate capacity (DC), not to exceed \$50,000.</p>	Sec. XI

Location in Ordinance	Requirement	Location in Application
	A single permit and fee are required for all Facilities and include all supporting facilities incidental to the primary use.	

III. Special Use Application Requirements

The County's form titled "Application for Zoning Hearing Petition for Special Use (Other)" is attached as **Appendix A**.

A. Applicant and Owner Information

Applicant Information

Lumina Energy Storage, LLC
800 Taylor Street, Suite 200
Durham, NC 27701

Owner Information

Lumina Energy Storage, LLC
800 Taylor Street, Suite 200
Durham, NC 27701

B. Project Location

The Project is located on approximately 25.5 acres of privately owned land in Tazewell County, Illinois. The Project area is generally depicted below and shown in more detail on the Site Plan attached as **Appendix B**. The Project's Purchase Option Agreement with the Landowner is attached as **Appendix C**.

The Project site is located on APN 11-11-03-200-019 in unincorporated Tazewell County directly adjacent to an existing Ameren Tazewell Substation near the intersection of Broadway Street and Springfield Road. The associated address is 16783 Springfield Road Pekin, IL 61554.

C. Project Description

This Application is for a battery energy storage system or "BESS" facility. The Project will store excess electricity generated across the electric grid during periods of excess energy generation at times of low demand, allowing that energy to be redeployed to the grid during times of high demand or emergency needs, enhancing the reliability and stability of the regional grid and providing a tool to help manage delivery of energy to the residents of Tazewell County and the local region. Redeploying energy in this manner avoids using higher-cost energy generation during periods of high demand, which reduces energy bills for local consumers. BESS projects typically consist of rechargeable batteries, power conversion systems, and a control system.

Attached as **Appendix B** is a Site Plan depicting the property lines, existing and proposed conditions at the site, proposed parking and loading areas (when applicable), proposed water system (a 30,000 gallon water tank for onsite water supply), placement of exterior lighting, and landscaping. A onsite septic system will be installed to serve one operations trailer. A Landscaping Plan will be provided with the application for building permit.

Project construction is expected to last for approximately 12-18 months starting in the fourth quarter of 2027 with a Commercial Operation Date (COD) projected in 2029. Construction will follow all applicable noise regulations and is expected to occur between the hours of 6:00 am and 9:00 pm Monday through Friday and between 7:00 am and 8:00 pm on Saturday, Sunday, and legal holidays. Approximately 241 workers are anticipated to be required during construction.

Operational activities on the Project site would involve routine monitoring and maintenance of the equipment and facilities along with vegetation management. Operational activities are generally expected to occur between 8:00 am and 5:00 pm Monday through Friday.

The Project will be accessible via Springfield Road and Broadway Street. Applicant expects the Project to create a minimal impact to existing traffic patterns. A detailed Haul Route and traffic analysis will be submitted as part of the building permit application.

D. Present and Proposed Land Use

The Project parcels are zoned “A-1” Agricultural Preservation District and are presently used primarily for agricultural purposes. The Applicant is proposing to use the parcels for a battery energy storage system facility.

E. Surrounding Zoning Classifications

The land use in the surrounding area is agriculture and rural residential. The property is directly adjacent to the Ameren Tazewell Substation.

F. Explanation of Need for Special Use at Proposed Site

The Project is needed to secure reliable and safe renewable energy sources in Tazewell County. The Project will store excess electricity generated across the electric grid during periods of excess energy generation at times of low demand, allowing that energy to be redeployed to the grid during times of high demand or emergency needs. Stored energy enhances the reliability and stability of the regional grid and will provide a tool to help manage delivery of energy to the residents of Tazewell County and the local region. Redeploying energy in this manner avoids using higher-cost energy generation during periods of high demand and helps reduce energy bills for local consumers.

Additionally, construction of the Project will create jobs and generate long-term tax revenue for the County. The Project will add an average of 214 full-time-equivalent (FTE) jobs on site over the 18-month construction period, of which 85 would be held by Tazewell County workers. The Average loaded compensation of \$135,700 per job is consistent with Peoria-Tazewell union scale. The Project will also add 8.2 direct full-time jobs supported each year over the 20-year operating life, of which 3.3 will be held by Tazewell County workers. The Project will include an annual operating investment of \$6.1 million, of which \$1.33 million in direct economic output would be

captured in Tazewell County, plus battery augmentation outlays of \$14.0 million in Years 5 and 9 and \$9.7 million in Year 13. Operations activity would generate \$67,229 per year in sales tax on locally sourced operations purchases, of which \$17,430 would be received by Tazewell County and local districts. Estimated at \$28.2 million over the 20-year lifetime: \$21.1 million in property tax, \$1.30 million in local taxes and fees on construction and operations spending, and \$5.78 million in local share of imported-equipment sales tax. A full breakdown of taxing district benefit is detailed in **Appendix D**.

The Project is expected to contribute an estimated \$14.0 million in property taxes to the Tremont Community Unit School District 702 over the operating life, or about \$702,000 per year on average.

G. Site Plan

A Site Plan for the Project including existing and proposed conditions, parking and loading areas, proposed 30,000 gallon water storage tank for onsite water usage, placement of exterior lighting, and landscaping is attached as **Appendix B**. An onsite septic system will be installed to serve one operations trailer.

H. Copy of Site Plan

A copy of the submitted site plan meeting the size requirements of § 157.437(H) has been submitted along with this Application.

I. Statement from Road Official

A copy of this Application is being provided to the relevant road authorities during agency review, and we will work with them to ensure the proposed access way is adequate for the Project's proposed use prior to the public hearing.

IV. Special Use Requirements

A. Special Use Classification

Applicant has fulfilled the general application requirements for a Class A Special Use.

B. Zoning Districts

The Project parcels are located within the A-1 Agricultural Preservation District.

C. Application Documents

Applicant has met the submission requirements of § 157.437. See Application, **Sec. III (A) – (I)**.

1. AIMA

An executed Agricultural Impact Mitigation Agreement is not required for BESS facilities.

2. Interconnection

Documents reflecting the Project's application for interconnection with MISO are attached as **Appendix E**.

3. EcoCAT

Applicant has conducted a natural resource review consultation with the Illinois Department of Natural Resources (IDNR) through the IDNR's Ecological Compliance Assessment Tool (EcoCAT). The EcoCAT assessment revealed no record of State-listed threatened or endangered species, Illinois Natural Area Inventory sites, dedicated Illinois Natural Preserves, or registered Land and Water Reserves in the vicinity of the Project. Due to the lack of impacts identified, the consultation was terminated and no specific recommendations were provided by IDNR. The results are provided in **Appendix F**.

Should the EcoCAT report expire prior to obtaining a building permit, Applicant understands that a new EcoCAT report will be required before obtaining a permit for construction.

4. Protected Lands

As demonstrated in the EcoCAT (**Appendix F**), the Illinois Department of Natural Resources has not identified any protected lands in the vicinity of the Project area and Applicant is not aware of any protected lands identified by the Illinois Nature Preserve Commission in the vicinity of the Project. Additionally, the Listed Species and Habitat Assessment concludes that the Project does not overlap any federally protected lands and is not within a FEMA moderate- to high-risk floodplain. See **Appendix G**. As Applicant continues site engineering, it shall comply with all applicable laws related to any protected lands.

5. Illinois State Historic Preservation Office

Applicant has conducted an online records search using the Illinois Inventory of Archaeological Sites – maintained by the Illinois State Museum and the Illinois State Historic Preservation Office (SHPO) – to identify previous cultural resource investigations and previously recorded archaeological sites and cemeteries within the ADOI and the 1.6-km (1.0-mi) study radius. Applicant has also searched the Historic & Architectural Resources GIS online database maintained by the Illinois SHPO to identify historic architectural resources within the AOI and architectural study radius. The results of these searches are attached in **Appendix H**.

Applicant has also initiated consultation with Illinois SHPO. See **Appendix H**.

6. Compliance with Federal Aviation Administration

Pursuant to the Ordinance, Applicant is not required to submit any approvals or determinations from the Federal Aviation Administration.

7. Approval Standards

See **Section XII** of this Application for a complete discussion of how this Application meets applicable approval standards.

D. Filing Fee

Applicant has submitted a filing fee in the amount of \$50,000.

V. Design and Installation

A. General

1. Code Compliance

The Project will be designed in accordance with all applicable International Codes, the National Electrical Code enforced by Tazewell County at the time the permit application is accepted, and any other State and Federal requirements.

2. Temporary Site Posting

Applicant agrees to post the information required by § 153.05(A)(2) at the Project site before and during construction. Applicant will ensure the temporary sign is not less than fifteen (15) square feet and clearly visible from the public roadway.

3. Lighting

Applicant agrees to design and install all outdoor lighting for the Project in compliance with § 157.056 of the Tazewell County Zoning Code for Outdoor Lighting and any other required regulatory authority in an effort to minimize the visual impact of the Project. A Lighting Plan will be submitted with the building permit application.

4. Parcel Identification Number

Applicant agrees to, at its own expense, utilize an Illinois registered land surveyor to prepare a metes and bounds survey description of the land upon which the facility is installed, including access routes, over which the Applicant has exclusive control. Applicant will deliver a copy of the survey to the Chief County Assessment Officer (CCAO) and to the owner of the land upon which the Facility is constructed. Applicant understands that the new site specific parcel identification number will be assigned for the purpose of tax billing and will not be considered to have new parcel boundary lines for setback purposes.

5. Roads

Applicant agrees to and will comply with the terms in § 153.05(A)(5). Applicant will enter into a Road Use Agreement (RUA) with the relevant Authority Having Jurisdiction. Applicant understands that the executed RUA must be approved by the County Board, to include the form of financial assurance desired by the County, prior to obtaining a Building Permit.

Applicant agrees that all repairs and improvements to public roads and roadway appurtenances shall be subject to prior approval from the County before being made and shall also be subject to inspection and acceptance by the County after such repairs and improvements are completed.

6. Noise Levels

Applicant agrees to design the Project in accordance with the Illinois Pollution Control Board regulations under 35 Ill. Adm. Code Parts 900, 901, and 910. Applicant will provide a complete Sound Study with the building permit application, which will include an operational noise impact evaluation of the Project for the proposed Project layout. Noise propagation from the proposed equipment will be modeled using manufacturer provided noise data. Project-generated noise levels will be calculated at all noise sensitive receptors as defined by the Illinois Pollution Control Board (IPCB) within ¼ mile of the proposed Project boundary. As required by the Ordinance, predicted noise levels will be compared to the noise level limits set forth by the IPCB within the Illinois Administrative Code (IAC). As the proposed Project location is directly adjacent to noise sensitive receptor(s), mitigation measures are anticipated as necessary to meet nighttime IPCB regulations. Mitigation design will be developed to meet regulations and will likely include a combination of equipment silencers (may be manufacturer provided or third-party) and noise barrier walls.

Prior to the first anniversary of commercial operation, Applicant will provide an octave band sound pressure level measurement(s) conducted by a third party acoustic consultant or engineer, from a reasonable number of sampled locations at the perimeter of the facility to demonstrate compliance with § 153.05(A)(6) of the Ordinance.

A Sound Study will be provided with the application for a building permit.

7. Farmland Drainage Plan and Tile Repair

Prior to obtaining a permit for construction, Applicant agrees to create and file a final drainage plan with the County and any impacted drainage district showing the location of any potentially impacted drainage district facilities, to the extent the information is publicly available from the county or drainage district, and plans to repair any subsurface drainage outlined in the Decommissioning Plan. A Farmland Drainage Plan will be provided with the application for building permit. A Draft Decommissioning Plan is attached as **Appendix I**. The Drain Tile Survey is attached as **Appendix J**.

Applicant is working with the Landowner and land surveyors to identify the tile lines traversing the property included within the underlying agreement which will be crossed or disturbed by construction of the Project. All tile lines identified in this manner will be shown on the Construction and Final Decommissioning Plans and staked or flagged in the locations where expected crossing or disturbance is anticipated prior to construction or decommissioning to alert construction and decommissioning crews to the possible need for tile line repairs.

Applicant agrees to make all repairs in accordance with the requirements set out in § 153.05(A)(7)(b)(i)-(vi). Applicant will compensate Landowner for losses or other damages resulting from damage to a drainage system caused by the Project. Applicant agrees to pay for the repair of all damage to the subsurface drainage system caused by the construction of the Project and for the repair or restoration of surface drainage caused by the Project as soon as reasonably practicable.

8. Waste

Applicant will immediately remove all solid waste generated by the Project from the Project site and dispose of it in an appropriate manner. Applicant will also immediately remove any hazardous waste generated by the Project from the Project site and dispose of it in accordance with all local, state, and federal rules and regulations.

9. Waiver Requirements

Applicant is not seeking a waiver of any Ordinance requirements.

B. Energy Storage Systems

1. Setbacks

The Project has been designed to conform with the BESS setback requirements outlined in § 153.05(D)(1) of the Ordinance. All setbacks are shown in the Site Plan, attached as **Appendix B**.

2. Fence

The Project design includes a perimeter fence encompassing the entire Project and meeting the setback requirements in § 157.049 of the Tazewell County Zoning Code. The fence will be at least 7 feet and no more than 25 feet in height.

3. Design Standards

The Project will be designed and certified in accordance with NFPA 885 “Standard for the Installation of Stationary Energy Storage Systems.” All batteries integrated within the BESS will be listed in accordance with the UL 1973 and UL 9540 standard.

4. Reports

Prior to commercial operation, Applicant will submit to the County a commission report certifying the requirements of NFPA 855 Sections 4.2.4, 6.1.3 and 6.1.5.5, as published in 2023 or the applicable section in the most recent version, and a hazard mitigation analysis per NFPA 885 Section 4.4.

5. Vegetative Screening

Applicant's proposed vegetative screening for the Project will be provided with the application for building permit in a complete Landscape Plan. The Site Plan in **Appendix B** shows the location and footprints of berms that will support vegetative screening to be shown in the Landscape Plan.

6. Noise

Applicant agrees to design the Project in accordance with the Illinois Pollution Control Board regulations under 35 Ill. Adm. Code Parts 900, 901, and 910. Applicant will provide a complete Sound Study with the building permit application, which will include an operational noise impact evaluation of the Project for the proposed Project layout. Noise propagation from the proposed equipment will be modeled using manufacturer provided noise data. Project-generated noise levels will be calculated at all noise sensitive receptors as defined by the Illinois Pollution Control Board (IPCB) within $\frac{1}{4}$ mile of the proposed Project boundary. As required by the Ordinance, predicted noise levels will be compared to the noise level limits set forth by the IPCB within the Illinois Administrative Code (IAC). As the proposed Project location is directly adjacent to noise sensitive receptor(s), mitigation measures are anticipated as necessary to meet nighttime IPCB regulations. Mitigation design will be developed to meet regulations and will likely include a combination of equipment silencers (may be manufacturer provided or third-party) and noise barrier walls.

Prior to the first anniversary of commercial operation, Applicant will provide an octave band sound pressure level measurement(s) conducted by a third party acoustic consultant or engineer, from a reasonable number of sampled locations at the perimeter of the facility to demonstrate compliance with § 153.05(A)(6) of the Ordinance.

A Sound Study will be provided with the application for building permit.

VI. Operation and Maintenance

A. General

1. Facility Owner

Applicant agrees to provide notice to the County sixty (60) days prior to any transfer of ownership of the Project, including primary contact information for the new Project Owner and updated Operations and Maintenance contact information. The contact information will be replaced on site immediately and no more than one week following the transfer.

Applicant understands that failure to notify prior to a transfer will result in a violation and possible revocation of the Special Use Approval and potential decommissioning of the Project.

2. Permanent Address Posting

Applicant will work with the Community Development Department to obtain a separate 911 address for the Project. Upon final inspection and prior to commercial operation, Applicant will post the address in accordance with § 154.150 – 154.999, Address Display Ordinance, of the Tazewell County Code.

The access point at the Project will be assigned an individual and unique address, identifying the entrance as the primary address and point of interconnection.

3. Operation and Maintenance Contact

Applicant agrees to have a local contact for Operations and Maintenance and ensure that the proper contact information is on file with the County at all times. Applicant will annually update the information before the anniversary of commercial operation. If the contact information changes during the life of the Project, Applicant will notify the County in advance and provide updated contact information to Community Development and an updated site posting not more than seven (7) days following the change.

4. Annual Report

Following the commencement of commercial operation, Applicant will annually submit to Community Development an annual report including the annual energy production and/or energy consumption and water usage, if applicable. The annual report will also include any complaints received and the corresponding remedy, including a timeline for remediation.

VII. Complaints

Applicant agrees to maintain contact information for the Project accessible via a Project website and at the point of access to each Project site. Applicant will make the County aware of any complaints and remedies of the complaint in writing as soon as it is feasible to do so but no more than seventy-two (72) hours following receipt of the complaint. Applicant agrees to keep a log of all complaints related to the Project.

If a complaint is validated that violates any of the criteria of approval, Applicant understands that the Project may not operate until the violation has been resolved unless operation is required for the purpose of determining compliance.

Applicant agrees to pay any and all costs incurred through any investigation(s) into any non-compliance with the Approved Special Use. If a valid complaint cannot be mitigated, Applicant understands that the Landowner may seek a variance for the deviation of compliance to allow the continued operation of the Project. If the variance is not approved, Applicant understands that the Project will remain nonoperational until which time a feasible and agreeable solution can be determined.

VIII. Liability Insurance

Applicant's will provide a Certificate of Insurance meeting the requirements of § 153.09 of the Ordinance prior to the public hearing.

Applicant agrees to maintain coverage from permitting, throughout commercial operation, and not less than three (3) years following decommissioning, and will submit Proof of Certificate of Insurance for each policy renewal. Applicant agrees to notify the County not less than sixty (60) days in advance of policy cancellation and provide proof of current coverage in the manner required by the Ordinance not less than thirty (30) days prior to the expiration of the canceled policy. Applicant understands that County may re-evaluate the insurance coverage and request commercially reasonable coverage following the tenth anniversary of the commercial operation, and every five years thereafter.

Applicant agrees to defend, indemnify, and hold harmless Tazewell County, its board members, officers, employees, and agents from and against any and all claims, actions, damages, liability, costs, and expenses, including attorney's fees, arising out of or connected with Project operations, except to the extent caused by the County's sole negligence or willful misconduct.

IX. Decommissioning Plan

Prior to issuance of the Building Permit, Applicant will obtain an approved Decommissioning Plan in accordance with the NFPA 855 standards and in compliance with the requirements included in § 153.10 and Appendix C of the Ordinance. The approved Decommissioning Plan will include the end of life cost estimate of decommissioning, to be increased at the inflation rate of the higher of either 2.5% or the average inflation rate of CPI-U of the three prior calendar years, at the time of approval. The base estimate provided will not be more than 12 months old at the time of consideration and will be based on the equipment selected for construction. The Decommissioning Plan will follow the BESS cost estimate phases provided in § 153.10.

Applicant agrees to provide financial assurance in the form of a surety or like bond. Applicant understands and agrees to the decommissioning and financial assurance terms included in § 153.10. Applicant will ensure the Project adheres to the approved Decommissioning Plan.

A Draft Decommissioning Plan, including a cost estimate, is attached as **Appendix I**.

X. Emergency Response Plan

Applicant has and will continue to meet with the appropriate first responders in the district where the Project is located to provide the Draft Emergency Response Plan (ERP) for review and to develop the ERP in conjunction with the relevant authorities. Prior to issuance of the Building Permit, Applicant will provide to the Community Development Department an approved ERP meeting the requirements in § 153.11(A)-(E) and the acknowledged Affidavit of Acknowledgement, Emergency Response Plan provided in Appendix B of the Ordinance.

The Project ERP will protect Tazewell County residents primarily through layered engineered safeguards built into the Tesla Megapack 3 units, including an autonomous battery management system, thermal management, and an explosion-control system of sparkers and overpressure vents designed to prevent uncontrolled deflagration and slow the spread of thermal runaway. A closed-loop liquid cooling system, as well as fans and radiators, will maintain an optimum battery operating temperature. The specific water supply, emergency contacts, site access, and additional emergency response details are forthcoming in a final ERP and HMP.

Should the Project be modified prior to commercial operation, Applicant agrees to provide updated plans for further review and updates.

XI. Building Permit

Applicant understands that the Project must obtain a building permit within three (3) years from the date of Special Use Approval, unless an extension is granted upon a showing of good cause.

XII. Approval Standards

A. Standards Applicable to Special Uses

- A) When considering an application for a special use permit, the decision making body, based on evidence presented, shall find:**
- 1) The special use shall, in all other respects, conform to the applicable regulations of this chapter for the district in which it is located. Special uses when combined with variances for this same property shall be considered compliant for the purposes of this section;**

The Project will conform with the applicable regulations in the A-1 Agricultural Preservation District in line with the intent of the A-1 District to protect agricultural uses in the County. The Project is not seeking a combined variance.

- 2) The special use will be consistent with the purposes, goals, objectives, and standards of the officially adopted county comprehensive land use plan and**

these regulations, or of any officially adopted comprehensive plan of a municipality with a one and one-half mile planning jurisdiction; and

The Tazewell County Comprehensive Plan was last updated in 2011, so it largely predates the energy supply and demand issues that have influenced the regional need for renewable energy resources. However, the Project remains consistent with and furthers the purposes, goals objectives and standards of the Plan. The Plan highlights the importance of agriculture in Tazewell County's history, economy and way of life and also notes the challenge of accommodating new development in a manner that protects local agriculture. The Project helps meet this challenge by providing a reliable energy source to Tazewell County's growing population on a relatively small land use footprint, while stimulating the local economy and providing a steady lease income to the Landowner.

The Project is not located within a one and one-half mile planning jurisdiction of a municipality.

- 3) The petitioner has provided the information required by § 157.437, and has demonstrated the ability to complete the proposal shown in § 157.437(A) through (I), and has met those items required by the statements described in § 157.437(I).**

Applicant has provided the information required by § 157.437 in Sec. III of this Application. A copy of this Application is being provided to the relevant road authorities during agency review, and we will work with them to ensure the proposed access way is adequate for the Project's proposed use prior to the public hearing.

- B) When considering an application for a special use permit, the decision making body, based on evidence presented, shall also find, not one of which shall be controlling:**

- 1) The site shall be so situated as to minimize adverse effects, including visual impacts on adjacent properties;**

The Project location, landscaping, lighting, and additional design components will be designed to minimize adverse effects, including visual impacts to adjacent properties. As shown in the Site Plan, **Exhibit B**, berms will be constructed and maintained to minimize the visual impacts of the Project. Additionally, detailed vegetation will be shown on a Landscaping Plan to be provided prior to the submittal of a building permit application. All lighting will be designed and installed in compliance with §157.056 of the Tazewell County Zoning Code for Outdoor Lighting to ensure safety while minimizing unnecessary light pollution.

- 2) The establishment, maintenance, or operation of the special use shall not be detrimental to or endanger the public health, safety, morals, comfort, or general welfare of the neighboring vicinity;**

The Project will not be detrimental to or endanger the public health, safety, morals, comfort, or general welfare of the neighboring vicinity. Instead, the Project will contribute positively to the welfare of the immediate neighborhood and surrounding communities.

The Project is a passive use that does not produce any noxious fumes or odors and will generate limited sound beyond the boundaries of the Project Site. As demonstrated in the Aquatic Resources Delineation, attached as **Appendix K**, the Project parcel contains two potentially jurisdictional waters and waters of the state. However, the Project will be designed to avoid impacts to wetlands or other sensitive water resource areas. The Project will be designed and constructed to comply with building, safety, and electric code requirements, as well as standard industry practices. All equipment utilized in connection with the Project will be tested against widely accepted certification standards.

Additionally, the Project will contribute to the general welfare of the community through regional investment and increases in the tax base, as well as construction and operation jobs. The Project benefits will support the private and public entities that help preserve the public's health, safety, and general welfare with minimal additional strain on local services. In addition to these economic benefits, the Project will help ensure a local energy supply for the benefit of the community and all Illinoisans.

3) The special use shall not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted;

The Project will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted. The surrounding properties are primarily used for agriculture, and the proposed BESS Project will be designed, constructed, and operated in harmony with such use. Due to the existing Ameren Tazewell Substation directly adjacent to the proposed Project, future enjoyment of other properties in the area would not be impacted. As described throughout this Application, the Project will be designed to ensure minimal impacts to the environment, farmland, noise, sound, lighting and roads. Once in operation, the Project will generate minimal traffic and will ensure proper procedures are maintained to resolve any complaints.

4) The special use shall not substantially diminish and impair property value within the neighborhood;

An assessment prepared by CohnReznick will be provided prior to the public hearing that will show that BESS facilities do not cause any consistent and measurable negative impacts on property values generally and are not expected to cause negative impacts to adjacent property values around this Project. Thus, the Project will not substantially diminish or impair property value within the neighborhood.

5) Adequate utilities, access roads, drainage, and other necessary facilities have been or are being provided;

The Project requires no additional or improved public utilities, public access roads, public drainage, or other public facilities, nor will the Project cause additional strain to existing public resources.

- 6) **Adequate measures have been or will be taken to provide ingress and egress so designed as to minimize traffic congestion and hazard on the public streets;**

The Project will ensure adequate measures are taken to minimize traffic congestion and hazard on the public streets. The Applicant will work with road authorities regarding use of public roads, plus road maintenance and upkeep prior to the beginning construction. During construction, the projected daily site trips would result in a minor increase in daily trips, causing minimal additional traffic that is not expected to materially impact traffic operations in the Project area. The Project will generate minimal traffic when construction is complete, typically in the form of small vehicles or light trucks performing routine maintenance activities.

- 7) **The evidence establishes that granting the use, which is located one-half mile or less from a livestock feeding operation, will not increase the population density around the livestock feeding operation to such levels as would hinder the operation or expansion of such operation;**

The Project is located more than one-half mile from any livestock feeding operations and will not hinder the operation or expansion any such operation.

- 8) **Evidence presented establishes that granting the use, which is located more than one-half mile from a livestock feeding operation will not hinder the operation or expansion of such operation;**

The Project is located more than one-half mile from any livestock feeding operations and will not hinder the operation or expansion any such operation.

- 9) **Seventy-five percent of the site contains soils having a productivity index of less than 125;**

Based on the Natural Resource Conservation Service crop productivity rating, the soil types within the parcel have an average corn productivity rating of 164 and an average soy productivity rating of 52. On average, the Project site has demonstrated relative low productivity. The Landowner intends to continue farming the areas of the parcel that will remain undeveloped.

This Application will also be provided to the Soil and Water Conservation District (SWCD) for review.

- 10) **The special use is consistent with the existing uses of property within the general area of the property in question; and**

The Project is consistent with the existing agricultural uses of the Project parcels and general area. Battery energy storage systems are a generally compatible use to agricultural and residential uses as they must meet strict safety requirements and are designed to produce minimal visual impact, sound, and land disturbance. Due to the existing Ameren Tazewell Substation directly adjacent to the proposed Project, future enjoyment of other properties in the area would not be impacted.

11) The suitability of the property in question is for the special use as proposed.

The chosen site is suitable for the Project because it provides proximity to the nearby point of interconnection, maintains distance from residential properties, and includes access to suitable roads. Additionally, as shown in the Geotechnical Engineering Report attached as **Appendix L**, the site characteristics are suitable for the required earthwork and Project infrastructure. Likewise, the Project is not located in in a FEMA-designated Special Flood Hazard Area. See **Appendix M**.

B. Standards Applicable to BESS

As required by § 153.04(C)(7) of the Ordinance, Applicant confirms that it meets the standards and conditions imposed in Public Act 104-0458 and the conditions imposed under all other applicable State and federal statutes and regulations. A discussion showing how Applicant meets each of the *LaSalle/Sinclair* factors is provided below:

1) The existing uses and zoning of nearby property:

The Project is compatible with the existing uses and zoning of the surrounding area. Surrounding property is primarily used for agricultural purposes, and is zoned A-1 Agricultural Preservation District. The Ordinance expressly authorizes development of BESS as a special use in the A-1 District. Additionally, as demonstrated in this Application, the Project has been intentionally sited immediately adjacent to the existing Ameren Tazewell Substation, which reduces the impacts associated with extending utility infrastructure. Required setbacks, fencing, landscaping, lighting and other design measures will further ensure compatibility with the surrounding area.

2) The extent to which property values are diminished by the particular zoning restrictions:

While the Project is not requesting a zoning modification, the existing land use development standards may limit the Landowner's property values. The Project parcel is uniquely suited for BESS development because of its location directly adjacent to the existing Ameren Tazewell Substation. Without a special use approval, the Landowner would be unable to reap the benefits associated with their property's characteristics.

An assessment prepared by CohnReznick will be provided prior to the public hearing that will show that BESS facilities do not cause any consistent and measurable negative impacts on

property values generally and are not expected to cause negative impacts to adjacent property values around this Project.

3) The extent to which the destruction of property values of plaintiff promotes the health, safety, morals or general welfare of the public;

Denying the special use approval for this Project would not provide a corresponding benefit to the health, safety, morals or general welfare of the public. Instead, preventing the Project would provide a corresponding detriment to both the Landowner and Tazewell County. Indeed, denying the Project would prevent the Landowner and public from securing a reliable local energy supply that is designed to protect the surrounding environment, historic resources, and agricultural way of life. Because the County's thoughtful BESS regulations ensure that the Project will be designed in conformance with applicable fire, building, electrical codes and will maintain aesthetically-pleasing design standards, denying the Project would decrease the Landowner's property values and negatively impact the public.

4) The relative gain to the public as compared to the hardship imposed upon the individual property owner;

The public will not benefit from a denial of the Project and the associated hardship that would be imposed upon the Landowner. There is currently a need for reduced electricity costs and grid reliability in the local area and this Project would directly provide a reliable energy resource that will help make electricity available at a lower cost. Denial of the special use request would prevent the Landowner's ability to generate income from property that is well suited for this particular Project, while providing no corresponding benefit to the public.

5) The suitability of the subject property for the zoned purpose;

The Project parcel is suitable for the proposed purpose due to its proximity to the existing Ameren Tazewell Substation, distance from residential properties, access to suitable roads, and relative size to accommodate BESS equipment while complying with required setbacks, stormwater management, screening, and safety features.

6) The length of time the property has been vacant as zoned considered in the context of the land development in the area in the vicinity of the subject property;

The Project has primarily been used for agricultural purposes and the Landowner has not previously tried to develop the land. However, recent energy storage development throughout Illinois has demonstrated that the proposed Project is a timely, compatible, and achievable benefit to the Landowner and the public.

7) Whether a comprehensive zoning plan for land use and development existing, and whether the ordinance is in harmony with it; and

As noted above, the Tazewell County Comprehensive Plan was last updated in 2011, so it largely predates the energy supply and demand issues that have influenced the regional need for renewable energy resources. However, the Project remains consistent with and furthers the purposes, goals objectives and standards of the Plan. The Plan highlights the importance of agriculture in Tazewell County's history, economy and way of life and also notes the challenge of accommodating new development in a manner that protects local agriculture. The Project helps meet this challenge by providing a reliable energy source to Tazewell County's growing population on a relatively small land use footprint, while stimulating the local economy and providing a financial opportunity for the Landowner.

8) Whether the community needs the proposed use.

Communities throughout the Illinois have recognized an increased need for infrastructure that can improve the flexibility, reliability and resilience of the electrical grid. In fact, the state of Illinois has established an express energy storage procurement target. The Project meets this need by storing electricity and making electricity available upon demand. Additionally, the Project will help stimulate the local economy by generating jobs and revenue for the community members and Landowner.

LEGEND:

- PROPERTY BOUNDARY
- RIGHT-OF-WAY LINE
- LOT LINE
- 50' BUILDABLE LIMITS
- EX. EASEMENT LINE
- EX. INDEX CONTOUR
- EX. INTERVAL CONTOUR
- EX. POWER BOX
- EX. UNDERGROUND POWER LINE
- EX. WATER LINE
- EX. WETLAND
- EX. 50' WETLAND SETBACK
- EX. DEED LINE
- EX. ASPHALT ROAD
- EX. GRAVEL ROAD
- PROPOSED EASEMENT LINE
- PROPOSED GENTLE EASEMENT
- PROPOSED 100' BATTERY SETBACK LINE
- PROPOSED WALL WITH TRAFFIC RATED GUARDRAIL
- PROPOSED SOLID FENCE/WALL
- PROPOSED WATER LINE
- PROPOSED UNDERGROUND MV LINE
- PROPOSED LIGHT FIXTURE
- PROPOSED AUX AREA
- PROPOSED SUBSTATION
- PROPOSED BERM
- PROPOSED LAYDOWN
- PROPOSED DRAINAGE BASIN
- PROPOSED SWALE
- PROPOSED FLOW LINE
- PROPOSED CULVERT
- PROPOSED DIVERSION SWALE
- PROPOSED INDEX CONTOUR
- PROPOSED INTERVAL CONTOUR
- PROPOSED GRADING LIMITS
- EX. WATER LINE TO BE REMOVED OR ABANDONED IN PLACE

NOTES:

- THIS PLAN IS PRELIMINARY AND IS SUBJECT TO CHANGE. ITEMS TO BE DETERMINED DURING DETAILED ENGINEERING, INCLUDING, BUT ARE NOT LIMITED TO: GRADING AND DRAINAGE DESIGN, PARKING AREAS, O&M FACILITIES, SIGNAGE, FIRE SUPPRESSION CONTROLS, AND STAGING AREA.
- ALTA SURVEY FEATURES SHOWN ARE BASED ON DATA FROM LANGAN ENGINEERING DATED ON 12/08/2025.
- TOPO SURVEY FEATURES SHOWN ARE BASED ON DATA FROM LANGAN ENGINEERING DATED ON 08/13/2026.
- FURTHER DETAILS ARE SUBJECT TO TAZEWELL COUNTY AND ILLINOIS STATE REQUIREMENTS.
- BOL (BEGINNING OF LIFE) EQUIPMENT REPRESENTS EQUIPMENT TO BE BUILT DURING INITIAL CONSTRUCTION. AUGMENTATION EQUIPMENT REPRESENTS EQUIPMENT THAT WILL BE INCREMENTALLY ADDED THROUGHOUT THE PROJECT OPERATIONS UNDER SEPARATE BUILDING PERMITS AT THE TIME OF EACH ADDITION.
- FOOTPRINT OF VEGETATED BERMS IS PRELIMINARY AND IS SUBJECT TO CHANGE PER FUTURE VISUALIZATION STUDIES.
- PROPOSED UNDERGROUND MV LINES SHOWN ARE FOR REFERENCE ONLY AND DO NOT REFLECT ANY FINALIZED ELECTRICAL DESIGN BY WESTWOOD.
- AUGMENTATION AREA TO BE USED AS TEMPORARY LAYDOWN STORAGE.

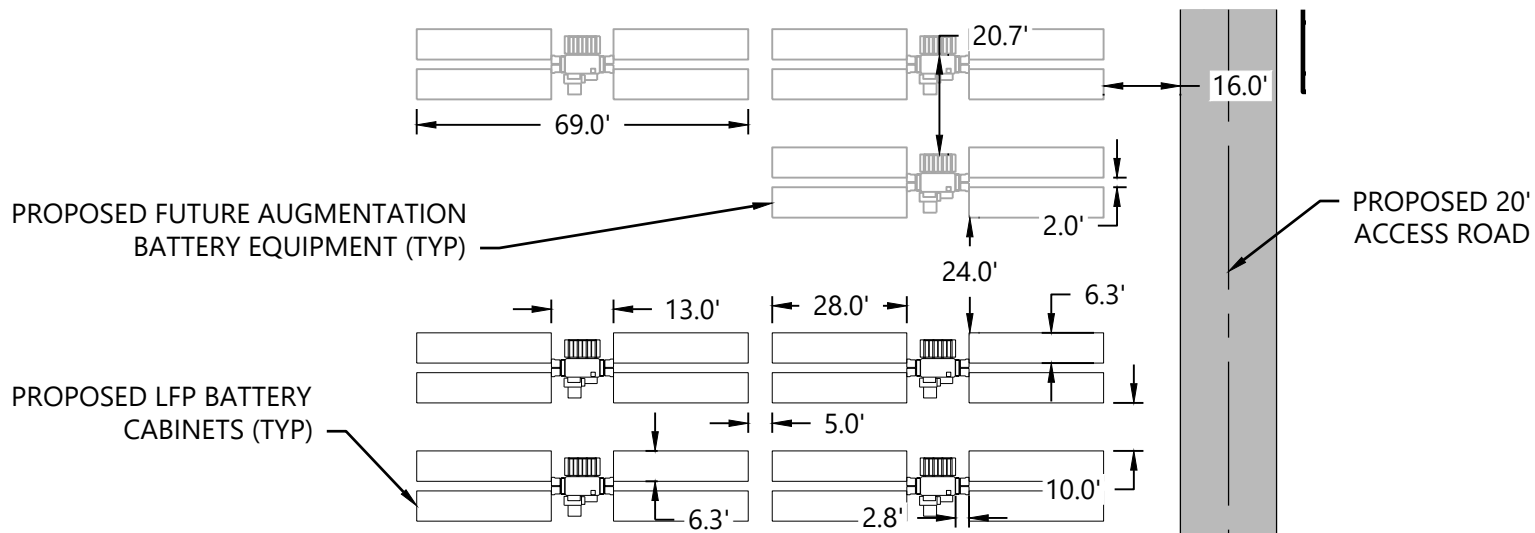
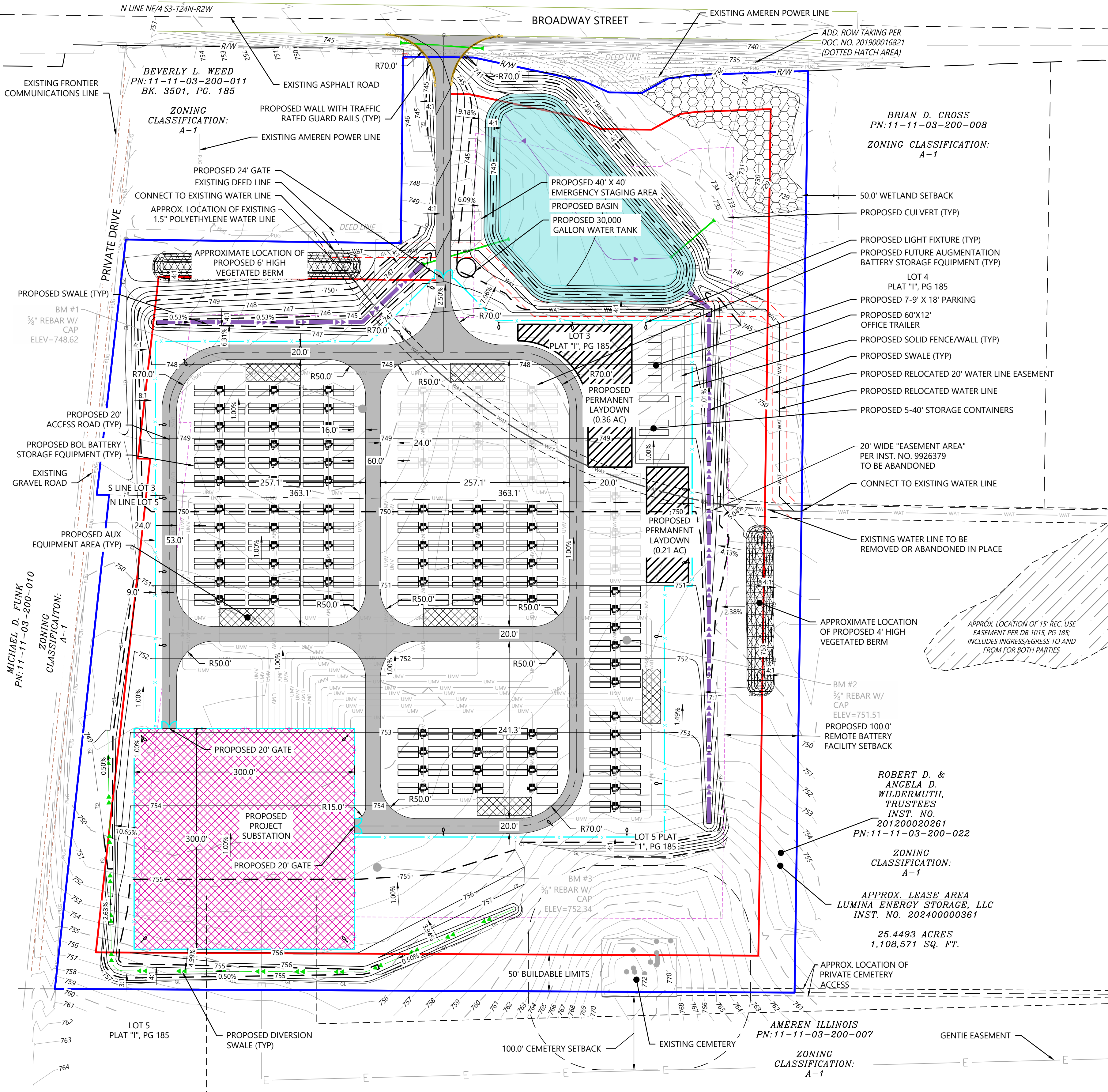
BESS SYSTEM SPECIFICATIONS	
SYSTEM SIZE	300 MW / 1200 MWh
BOL BATTERY + MVT COUNT	310 BATTERIES + 78 MVT
EOL BATTERY + MVT COUNT	87 BATTERIES + 22 MVT
BATTERY SETBACK	100 FT

PROJECT SPECIFICATIONS	
PROPERTY AREA	25.45 AC
FENCED/WALLED AREA	12.70 AC
SUBSTATION AREA	2.07 AC
WETLAND IMPACT	0.00 AC

SETBACK SPECIFICATIONS	
REMOTE BATTERY FACILITY	100'
BUILDABLE LIMITS	50'
CEMETARY CULTURAL	100'
OCCUPIED DWELLING	150'
RIGHT OF WAY	50'

TYPICAL EQUIPMENT LAYOUT:

SCALE: 1" = 40'



NON-EXHAUSTIVE LIST OF APPLICABLE DESIGN CODES AND STANDARDS:

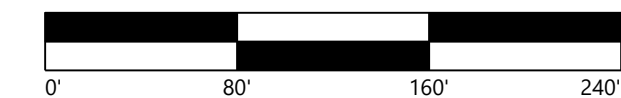
- 2018 INTERNATIONAL BUILDING CODE (IBC)
 - 2018 INTERNATIONAL FIRE CODE (IFC)
 - 2023 NATIONAL ELECTRIC CODE (NEC/NFPA 70)
- NOTE: WHERE MORE STRICT THAN THE CURRENTLY ADOPTED CODE, THE PROJECT DESIGN IS UTILIZING 2024 IFC AND 2023 NFPA 855 REQUIREMENTS.

PREPARED FOR:



800 Taylor St, Suite 200
Durham, NC 27701

REVISIONS:				
#	DATE	COMMENT	BY	CHK
A	09/18/2026	SITE PLAN FOR REVIEW	DM	MS
B	10/12/2026	ISSUED FOR 10% REVIEW	DM	MS
C	10/29/2026	ISSUED FOR 10% REVIEW	DM	MS



Lumina BESS

Tazewell County, Illinois

Preliminary Site Plan

NOT FOR CONSTRUCTION

DATE: 10/29/2026

SHEET: C100

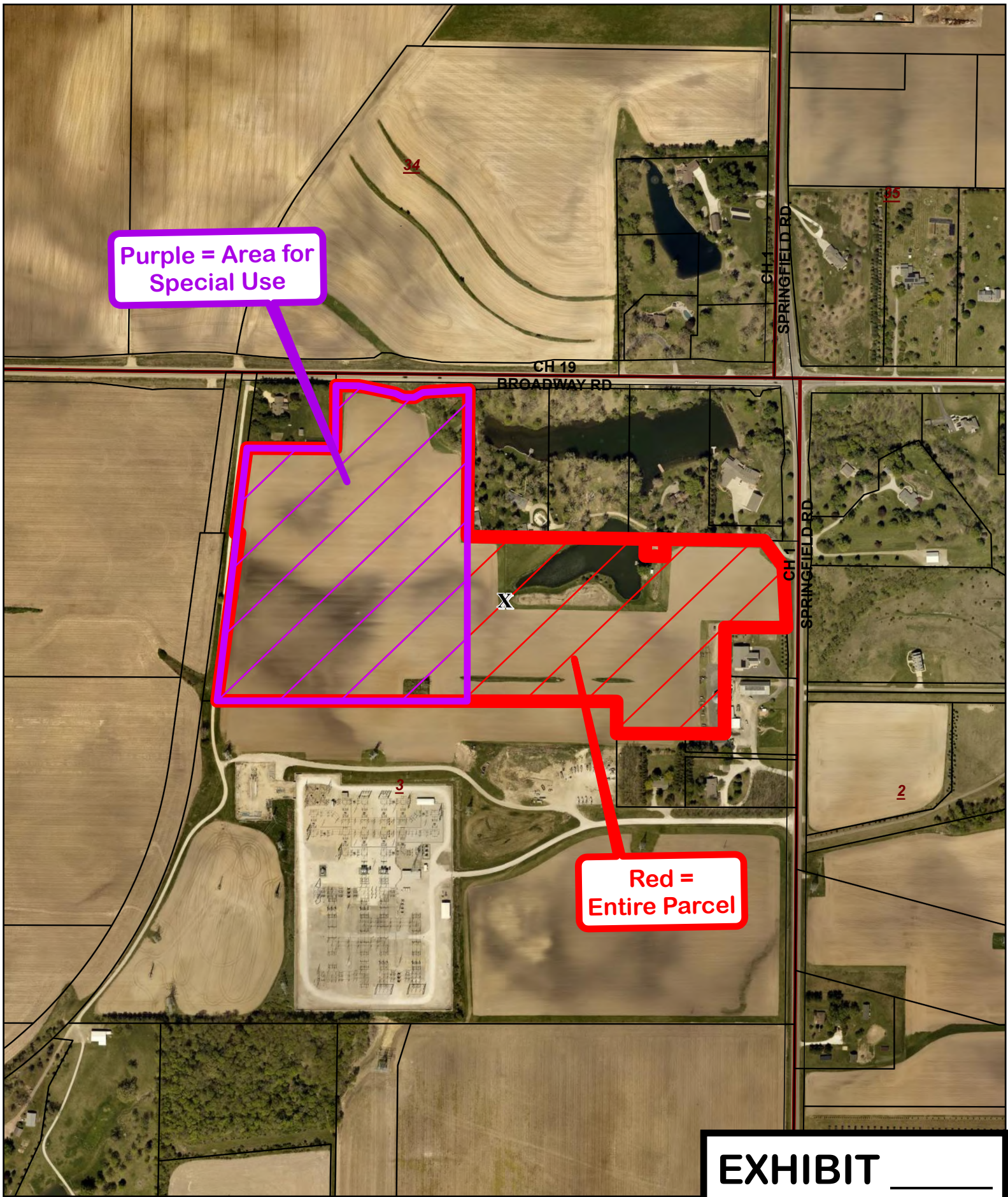
REV: C

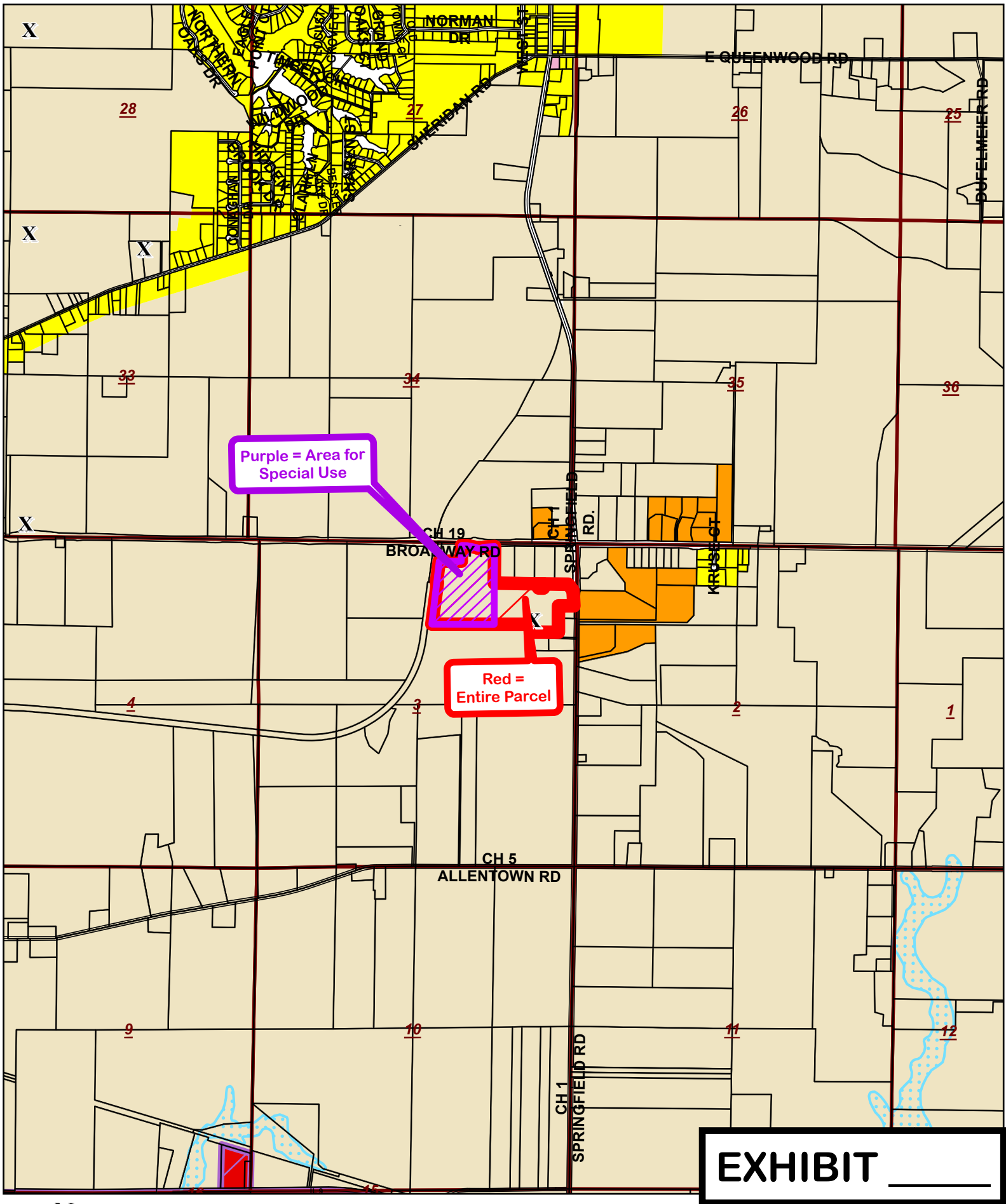
Purple = Area for
Special Use

Red =
Entire Parcel

EXHIBIT _____

N





Zoning

District

AG Area

A-1

A-2

C-1

C-2

CITY

CONS

I-1

I-2

R-1

R-2

R-R

A-1

A-2

C-1

C-2

CITY

CONS

I-1

I-2

R-1

R-2

R-R

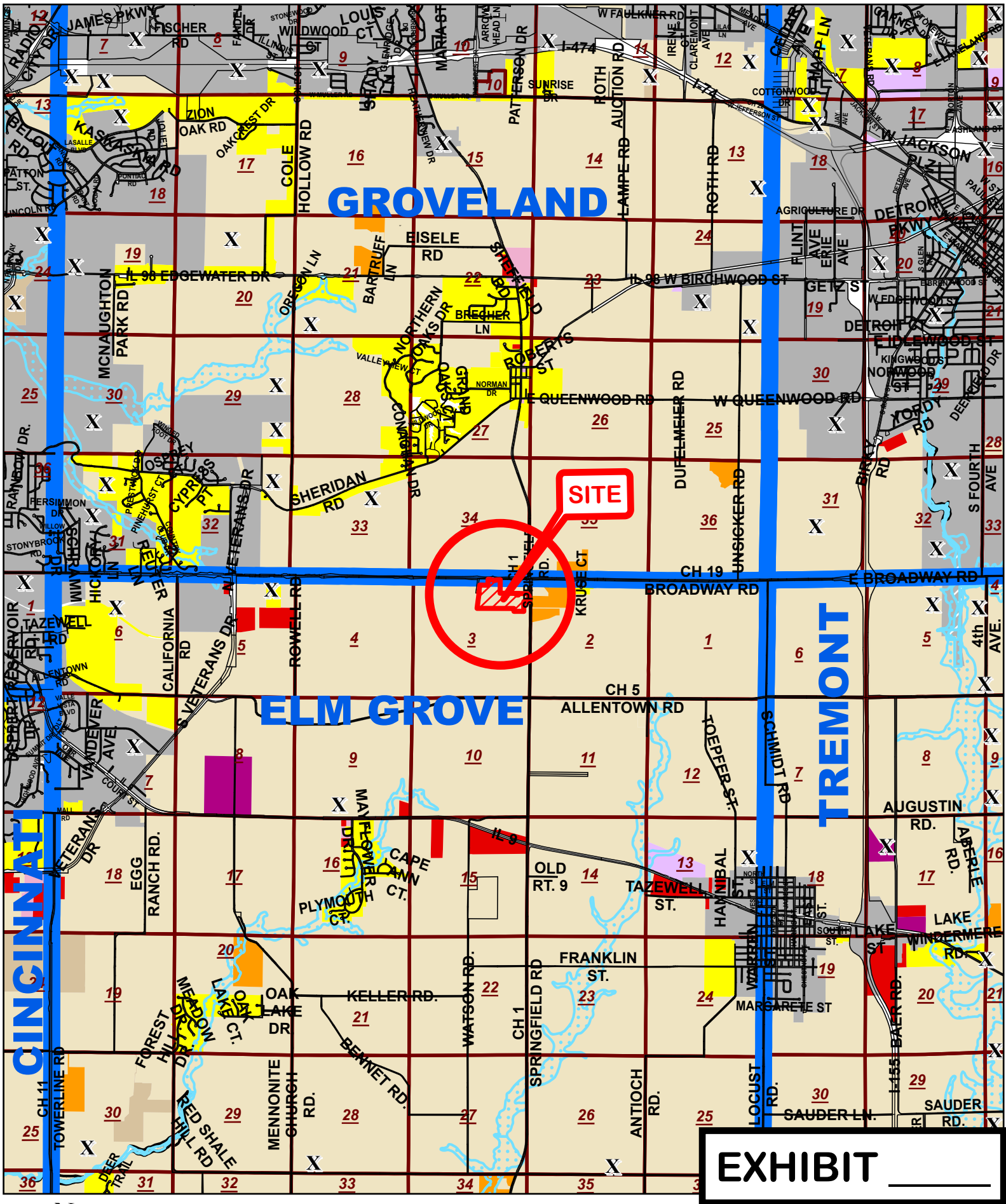


EXHIBIT _____



N

Zoning

	A-1		C-2		I-1		R-2
	A-2		CITY		I-2		R-R
	C-1		CONS		R-1		

District

	AG Area
---	---------

PURCHASE OPTION AGREEMENT

THIS PURCHASE OPTION AGREEMENT (this "Agreement"), made and entered into this the 21 day of December, 2023 (the "Effective Date"), by and between **ROBERT D. WILDERMUTH & ANGELA S. WILDERMUTH, TRUSTEES OR THEIR SUCCESSORS IN TRUST, UNDER THE ROBERT D. AND ANGELA D. WILDERMUTH LIVING TRUST DATED SEPTEMBER 13, 2012, AND ANY AMENDMENTS THERETO**, ("Seller"), and **LUMINA ENERGY STORAGE, LLC**, a North Carolina limited liability company, or its designees, successors, and/or assigns ("Purchaser") (Seller and Purchaser collectively referred to as the "**Parties**").

WITNESSETH THAT for and in consideration of FIVE HUNDRED and 00/100 DOLLARS (\$500.00) (the "**Option Fee**") and other good and valuable consideration paid to Seller by Purchaser, the receipt and sufficiency of which are acknowledged, and in further consideration of the mutual promises and conditions expressed below, Seller grants to Purchaser, its successors and permitted assigns, an option to purchase (the "**Option**"), at the price and subject to the terms, conditions and provisions set forth below, that certain tract or parcel of land, as described and approximately depicted on **Exhibits A and A-1** attached hereto and made a part hereof, and all appurtenances, rights, interests, easements and privileges, and all other improvements located thereon (collectively, the "**Property**"), and

The Parties hereby agree as set forth below.

1. Option. Seller hereby grants the Option to Purchaser to purchase the Property. The purpose of this Option is to enable Purchaser to develop, build and operate a solar photovoltaic power array, and/or an energy storage facility utilizing battery or other energy storage technology on the Property ("**Proposed Development**").

2. Purchase Price. The Purchase Price (the "**Purchase Price**") is subject to final determination of the acreage of the Property based on a certified boundary survey prepared by a qualified land surveyor licensed in the State of Illinois as delivered and approved by the parties hereto during the Option Period (as defined below), such approval not to be unreasonably withheld, conditioned or delayed (hereinafter the "**Survey**"). The final Purchase Price shall be calculated by multiplying (x) the final acreage of the Property as determined in the Survey by (y) the Dollar per Acre Purchase Price amount listed in the table below in corresponding to the Option Period Year in which the Closing Date (as defined in Exhibit B) is scheduled to occur. The parties shall confirm the final Purchase Price in a written acknowledgment delivered prior to the end of the Option Period. The exercise of the Option and purchase of the Property shall be subject to Purchaser completing its due diligence inspections and evaluation including approval by any financing parties for the Proposed Development.

Option Period Year	
1	
2	
3	
4	
5	
6	

3. Inspections. During the term of the Option and any extension hereof, Purchaser, or Purchaser's representative, shall have the right to enter the Property at any time, and shall have the right to make any required tests as to the adaptability of the Property for the Proposed Development (the "**Inspections**"). Purchaser may conduct or cause to be performed such studies, tests and inspections as Purchaser, in its sole discretion, deems necessary or appropriate to inform its decision whether or not to acquire the Property. Without limiting the foregoing, during the Option, Purchaser's consultants, contractors, agents and employees may access and enter the Property for purposes of preparing a survey and to conduct environmental and other physical inspections and testing, including by core sampling or other invasive methods; provided, that all such inspections, testing and surveying shall be performed in a good and workmanlike manner and Purchaser shall restore the Property to substantially the same condition in which it existed immediately prior to such studies, inspections and testing. Purchaser assumes all responsibility for the acts of itself, its agents, representatives and contractors in exercising its rights under this Section and agrees to indemnify and hold Seller harmless from any damages resulting therefrom. This indemnification obligation of Purchaser shall survive the Closing (as defined herein) or earlier termination of this Agreement. Purchaser shall, at Purchaser's expense, promptly repair any damage to the Property caused by Purchaser's entry and Inspections. If, as a direct result of Purchaser's activities on the Property, timber/crops or any portion of the timber/crops growing on the Property are destroyed or unable to be harvested, Purchaser shall pay Seller damages in the amount equal to the fair market value of the timber/crops which were destroyed or unable to be harvested. In the event the results of the Inspections are not satisfactory to Purchaser, in Purchaser's sole discretion, then Purchaser may terminate this Option by written notice to Seller and the Parties shall have no further obligation to each other except for those obligations of the Parties which expressly survive the termination of this Option.

4. Term and Option Money. The Option shall exist and continue for a period of six (6) years commencing on the Effective Date (the "**Option Period**"). Purchaser shall have ninety (90) days from the Effective Date during which time Purchaser shall have the exclusive right to conduct Purchaser's initial Inspections of the Property (the "**Initial Inspections Period**"). During the Initial Inspections Period, Purchaser shall have the right to terminate this Option at no cost to Purchaser except for the Option Fee provided herein, which shall be retained by Seller in the event of such termination. Within ten (10) days of the expiration of the Initial Inspections Period, Purchaser shall pay to Seller the sum of \$100,000.00 for year one of the Option Period (the "**Initial Option Money**"). Subsequent payments for year two through year five of the Option Period (the "**Additional Option Money**," and collectively with the Initial Option Money, the "**Option Money**") shall be paid according to the following schedule:

Year 2	
Year 3	
Year 4	
Year 5	
Year 6	

Each Additional Option Money payment shall be due and payable in semi-annual installments, with one payment being due on the anniversary of the Effective Date and the other payment being due six months thereafter during the year for which the Option Money is due. The Option Money shall be non-refundable.

In Addition to the Option Money, within thirty (30) days of the Effective Date, Purchaser shall pay to Seller a one-time signing bonus in the amount of \$100,000.00 (the "**Signing Bonus**"). The Signing Bonus shall be non-refundable and shall not be credited against the Purchase Price.

5. Property.

(a) During the Option Term, Purchaser may purchase the Property for the Proposed Development (the “**Option Property**”).

(b) Timber. Prior to the exercise of the Option, Seller and Purchaser shall mutually agree upon the net (after harvesting) fair market value of any harvestable and marketable timber Purchaser needs to remove to accommodate the Proposed Development (the “**Timber**”), which value shall be based on a written estimate from an Illinois licensed forester with substantial and verifiable experience in the field of timber appraisal and harvesting. Within thirty (30) days of exercise of the Option, Purchaser shall pay to Seller the agreed upon fair market value of the Timber.

6. Title and Due Diligence Items. Promptly following the Effective Date, and in no event later than the expiration of the Initial Inspections Period, Seller shall inform Purchaser of any and all known encumbrances affecting the Property, including but not limited to liens, easements, restrictions, covenants, leases (recorded or unrecorded), environmental assessments, and any parties, other than Seller, in possession of any portion of the Property. Purchaser may obtain a title report regarding the Property and shall provide a copy of said title report to Seller within thirty (30) days of receipt thereof. Upon Purchaser’s request, Seller shall cooperate with Purchaser in removing any encumbrances on the Property revealed by said title report that are objectionable to Purchaser.

(a) Within three (3) days of the Effective Date, Seller shall provide to Purchaser, at Purchaser’s address set forth in **Section 12** hereof, copies of any permits, plans, specifications, approval, declarations, surveys, reports (including but not limited to any Phase I and Phase II environmental reports and zoning resolutions and ordinances), license agreements and/or title insurance policies, concerning the Property, in Seller’s possession or reasonable control, and not previously provided to Purchaser.

(b) During the Option Period, Seller shall not further encumber the Property or any part thereof, or sell, convey, assign, lease, or otherwise transfer any interest therein (or suffer or permit the occurrence of any such actions) without Purchaser’s prior written consent.

7. Rezoning and Land Use Change. In the event that the Property will require a different zoning classification, re-parceling in the tax records of the city or county where the Property is located, and/or land use change in order to permit the Proposed Development, Seller agrees to cooperate with Purchaser in acquiring any necessary approvals, consents, authorizations, and/or permits from the applicable governing unit. Purchaser shall be solely responsible for the cost of any such rezoning, re-parceling, and/or land use change.

8. Easements. Seller shall grant to Purchaser, at no additional cost, an access easement as may be needed for the Proposed Development over property owned or controlled by Seller adjacent to the Property (the “**Adjacent Property**”). The location(s) of any easement on the Adjacent Property shall be subject to Seller’s consent, not to be unreasonably withheld, conditioned, or delayed. Any easements affecting the Property or the Adjacent Property shall be confirmed in writing and recorded in the land records of Tazewell County, Illinois.

9. Exercise Option and Closing.

(a) Purchaser may exercise the Option at any time during the Option Period by providing Seller with notice as provided in this Agreement.

(b) Upon exercise of the Option, the Parties shall execute the Purchase Contract in the form substantially similar to the form attached hereto and made a part hereof as **Exhibit B**.

(c) The Parties shall close on the Option Property within sixty (60) days after the exercise of the Option or such other date as mutually agreed upon by the Parties.

(d) At the closing of the sale and purchase of the Property (the "**Closing**"), Seller shall deliver those items to Purchaser listed in Section 6.2 of the Purchase and Sale Agreement entered into by the Parties for the purchase and sale of the Property.

(e) At Closing, Seller shall pay any and all deferred taxes and assessments, and any interest thereon, due as of the date of Closing.

10. Damage or Condemnation Prior to Closing. Seller agrees to give Purchaser prompt written notice of any fire or other casualty affecting the Property between the Effective Date and the date of Closing or of any actual or threatened taking or condemnation of all or any portion of the Property. If prior to the Closing there shall occur any fire, casualty, notice of taking or condemnation of all or any portion of the Property, then, in any such event, Purchaser, as its option, may terminate its obligations under this Agreement by written notice given to Seller within ten (10) days after Purchaser has received the notice referred to above or at the Closing, whichever is earlier, and neither party shall have any further right or obligation hereunder. If Purchaser does not so elect to terminate its obligations under this Agreement, then the Closing shall take place as provided herein and, at Purchaser' option, Seller either shall assign, transfer and set over to Purchaser all of Seller's right, title and interest in and to any insurance proceeds or awards that may be made for such casualty or taking (and Seller will pay any insurance deductible applicable to the casualty insurance), or Seller shall agree with Purchaser for a reduction in the Purchase Price based on the extent of the casualty or taking.

11. Termination. Purchaser may terminate the Option by providing written notice to Seller as provided in this Agreement no less than five (5) days before the effective date of such termination. Upon such termination, Seller shall retain any installments of the Option Money due and payable prior to the effective date of the termination and the Parties shall have no further obligation to each other except for the obligations of the Parties which expressly survive the termination of the Option.

12. Notices. Any notice or other communications hereunder shall be in writing and shall be deemed to have been given (unless otherwise set forth herein), if delivered in person, deposited with an overnight express agency, fees prepaid, or mailed by United States express, certified or registered mail, postage prepaid, return receipt requested, to the Parties at the following addresses, or to such other address as shall be later provided in writing by one party to the other:

As to Seller:
Robert D. Wildermuth, Trustee
16783 Springfield Road
Perkin, IL 61554
Phone: (309) 208-4320
Email: wildfarms2@gmail.com

With a copy to:
Brewer Law Office, LLC
Attn: Thomas K. Brewer
P.O. Box 44
Tremont, IL 61568
Phone: (309)925-9066
Email: tbrewer@brewerlaw.org

(b) As to Purchaser:
Lumina Energy Storage, LLC
c/o Strata Solar Development, LLC
800 Taylor Street, Suite 200
Durham, NC 27701
(919) 960-6015
Attn: Asset Management Department
Email: assetmanagement@stratacleanenergy.com

13. Confidentiality. Seller shall keep in strict confidence and shall not disclose to third parties, other than Seller's counsel: (i) its dealings with Purchaser and Purchaser's intentions and actions regarding the Proposed Development, (ii) the execution of this Agreement, and (iii) the commercial terms set forth in this Agreement, unless Purchaser consents in advance in writing to such disclosure.

14. Entire Agreement. This Agreement and any exhibits contain the entire agreement of the Parties, and there are no representations, inducements or other provisions other than those expressed in writing. All changes, additions or deletions to this Agreement must be in writing and signed by each party. Any and all references to Seller or Purchaser shall be deemed to include their respective successors, heirs or assigns (and in the case of Purchaser, permitted assigns).

15. Assignment. The rights of Purchaser to the Option are fully assignable and shall be binding on Purchaser's successors and assigns. The rights and obligations of Seller hereunder shall inure to, and be binding on, Seller's successors and assigns.

16. Authority. Seller has full power and authority to enter into this Agreement and to perform all of its obligations hereunder, and that its acts hereunder and as contemplated have been duly authorized by all requisite action; that consummation of this transaction on the part of Seller will not conflict with, or breach, any condition or provision of, or constitute a default under, the terms of any contract, mortgage, lien, lease, agreement, instrument or judgment by which Seller is bound.

17. Option of Record and Exclusivity. This Agreement shall not be recorded; however, within ten (10) days following Purchaser's request, Purchaser and Seller shall execute a memorandum of this Agreement in recordable form and in the same form as set forth in **Exhibit C** attached hereto and made a part hereof. At Purchaser's option, Purchaser may record the memorandum of purchase option agreement in the office of the Recorder of the County where the Property is situated at Purchaser's sole cost and expense. Seller shall not enter into any agreement with any other party during the Option Period whereby Seller agrees to sell, lease, or otherwise encumber the Property. Purchaser shall have the sole and exclusive right during the Option Period to purchase the Property.

18. Governing Law; Legal Costs. This Agreement shall be governed by the law of the State of Illinois without reference to the choice of law principles of the State of Illinois or any other state. The parties further agree that the venue of all legal and equitable proceedings related to disputes under this Agreement shall be situated in Tazewell County, Illinois, and the parties agree to submit to the personal jurisdiction of any State or Federal court situated in or with jurisdiction over Tazewell County, Illinois. If any legal action is brought by either party to enforce any provision in this Agreement, the prevailing party shall be entitled to recover from the other party reasonable attorneys' fees and court costs in such amounts as shall be allowed by the court.

19. Time is of the Essence. Time is of the essence in connection with every provision of this Agreement.

20. Failure to Close. Purchaser shall be entitled to specific performance of this Agreement in the event Seller wrongfully fails to perform its obligations hereunder. In the event Purchaser, following exercise of the Option, fails to close within the time required hereby, Purchaser acknowledges that Seller may retain the Option Money, which shall be Seller's sole and exclusive remedy for such failure to close by Purchaser.

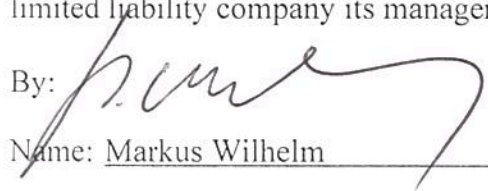
[END OF TEXT. SIGNATURE PAGES FOLLOW]

IN WITNESS WHEREOF, Seller and Purchaser have executed this Agreement by their proper officers duly authorized on the date set for below and effective as of the Effective Date.

PURCHASER:

LUMINA ENERGY STORAGE, LLC, a North Carolina limited liability company

By: Strata Manager, LLC, a North Carolina limited liability company its manager

By: 

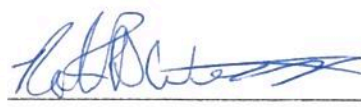
Name: Markus Wilhelm

Title: Manager

Date: December 21, 2023

SELLER:

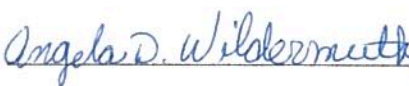
THE ROBERT D. AND ANGELA D. WILDERMUTH LIVING TRUST DATED SEPTEMBER 13, 2012, AND ANY AMENDMENTS THERETO

By:  Trustee

Name: Robert D. Wildermuth

Title: Trustee

Date: 12/19/2023

By:  Trustee

Name: Angela D. Wildermuth

Title: Trustee

Date: 12/19/2023

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

All that certain TWENTY-FIVE AND 50/100 (25.50) acre, more or less, portion of that certain tract or parcel of land located in Tazewell County, Illinois, that contains 46.30 acres, more or less, and is commonly identified as Tax Parcel ID 11-11-03-200-019, and being the same tract or parcel of land conveyed to Seller by that certain Deed in Trust dated September 13, 2012, and recorded on October 11, 2012 as Instrument No. 201200020261 in the County Recorder's Office of Tazewell County, Illinois, and being more particularly described therein as follows:

Parcel 2:

Part of Lots 3 and 5 of the Northeast Quarter Section 3, Township 24, Range 4 West of the 3rd P.M., Tazewell County, Illinois, further described as follows:

Commencing at the Southeast corner of said Northeast Quarter Section 3; thence North 89° 51' 56" West, a distance of 39.97 feet to a point being on the Westerly right of way line of County Highway No.1, Springfield Road; thence North 0° 26' 43" East, along said Westerly right of way a distance of 1422.76 feet to an iron rod being the Point of Beginning (P.O.B.); thence North 89° 32' 21" West, a distance of 265.23 feet to an iron pipe; thence South 2° 02' 31" East, a distance of 235.09 feet to an iron rod; thence South 87° 56' 53" West, a distance of 440.85 feet to an iron pipe; thence North 1° 17' 53" East, a distance of 150.92 feet to an iron pipe; thence North 89° 36' 29" West, a distance of 1627.23 feet to an iron rod; thence North 6° 23' 31" East, a distance of 676.09 feet to an iron rod; thence North 89° 01' 34" West, a distance of 16.98 feet to an iron rod; thence North 6° 36' 13" East, a distance of 363.44 feet to an iron rod; thence South 89° 08' 07" East, a distance of 372.80 feet to an iron rod; thence North 0° 46' 47" East, a distance of 250.00 feet to an iron rod; being on the Southerly right of way line of County Highway No.19, Broadway Road; thence South 89° 07' 38" East, along said Southerly right of way, a distance of 551.19 feet to a PK nail & shiner in fence post; thence South 0° 56' 38" West. A distance of 613.27 feet to an iron rod; thence South 89° 01' 34" East, a distance of 1308.36 feet to an iron rod being on said Westerly right of way Springfield Road; thence South 0° 26' 43" West, along said Westerly right of way, a distance of 547.07 feet to the said Point of Beginning, (P.O.B.), containing 46.48 acres, more or less

Excepting therefrom the following:

1. Part of Lot 3 of the NE ¼ Section 3, T24N, R4W of the 3rd P.M., Tazewell County, Illinois, further described as follows:

Commencing at the Northeast corner of said Section 3; thence S 89° 40' W, (bearings previously recorded), along the North line of said NE ¼ Section 3, also being the centerline of Broadway Road, a distance of 1893.84 feet to a point; thence S 00° 20' E, 40.00 feet to an iron rod being on the southerly right of way of said Broadway Road, and being the Northeast corner of a tract of land described in document number 9608675; thence continuing S 00° 20' E, along the East line of said tract, 250.00 feet to an iron rod, being the Southeast corner of said tract, and being the point of beginning; thence continuing S 00° 20' E, 14.00 feet to a point; thence S 89° 40' W, 375.20 feet to a point of being on the Easterly Right of Way of the now abandoned A.T. & S.F. Railroad; thence N 09° 18' E, along said now abandoned railroad, 14.20 feet to an iron rod being **the Southwest corner of said tract**; thence N 89° 40' E, along the South line of said tract, 372.80 feet to the said point of beginning, containing 0.12 acres more or less and subject to all existing easements and Rights of Way.

2. Part of Lots 3 and 5 as recorded in the Tazewell County Recorder's Office in Plat Book I on Page 185 and being in the Northeast Quarter of Section 3, Township 24 North, Range 4 West of the Third Principal Meridian, Tazewell County, Illinois, more particularly described as follows:

Commencing at the northeast corner of Section 3; thence South 00 degrees 58 minutes 56 seconds West, 656.39 feet on the east line of Section 3 to the north line of Lot 5; thence North 88 degrees 30 minutes 30 seconds West, 40.00 feet on the north line of Lot 5 to the existing west right-of-way line of County Highway 1 (Springfield Road) and the Point of Beginning; thence South 00 degrees 58 minutes 46 seconds West, 98.68 feet on the existing west right-of-way line; thence South 01 degrees 02 minutes 16 seconds West, 363.96 feet on the existing right-of-way line; thence North 03 degrees 02 minutes 51 seconds West, 358.91 feet; thence North 35 degrees 03 minutes 08 seconds West, 130.51 Feet to the north line of Lot 5; thence South 88 degrees 30 minutes 30 seconds East, 102.35 feet on the north line of Lot 5 to the Point of Beginning; containing 0.259 acre (11,280 square feet), more or less situated in Tazewell County, in the State of Illinois.

Also excepting therefrom the following:

A part of the Northeast Quarter of Section 3, Township 24 North, Range 4 West of the Third Principal Meridian, Tazewell County, Illinois and being more particularly described as follows:

Commencing at the Northwest corner of said Northeast Quarter of Section 3, thence North 89 degrees 35 minutes 42 seconds East along the north line of said Northeast Quarter of Section 3, a distance of 780.66 feet to the Point of Beginning; thence North 89 degrees 35 minutes 42 seconds East along the north line of said Northeast Quarter of Section 3, a distance of 551.33 feet to a point; thence South 00 degrees 18 minutes 44 seconds East, a distance of 62.53 feet to a point on the proposed south right of way line of Broadway Road; the following 7 courses are along the proposed south right of way line of Broadway Road, thence South 86 degrees 44 minutes 26 seconds West, a distance of 155.44 feet to a point; thence South 81 degrees 28 minutes 23 seconds West, a distance of 35.36 feet to a point; thence South 59 degrees 51 minutes 29 seconds West, a distance of 40.31 feet to a point; thence South 89 degrees 36 minutes 11 seconds West, a distance of 45.00 feet to a point; thence North 67 degrees 11 minutes 54 seconds West, a distance of 38.08 feet to a point; thence North 79 degrees 05 minutes 13 seconds West, a distance of 152.97 feet to a point; thence South 89 degrees 36 minutes 11 seconds West, a distance of 95.92 feet to a point; thence North 00 degrees 28 minutes 33 seconds West, a distance of 50.22 feet to the Point of Beginning, and containing 37,808 square feet, more or less, or 0.868 acres, more or less of which 21,932 square feet, more or less, or 0.503 acres, more or less falls within existing public road right of way, situated in the County of Tazewell, State of Illinois.

For the avoidance of doubt, the Property includes approximately 25.50 acres, more or less, out of the entire 46.30 acres that is described above and the approximate boundary of such Property is depicted on the attached Exhibit A-1.

EXHIBIT A-1
DEPICTION OF PROPERTY

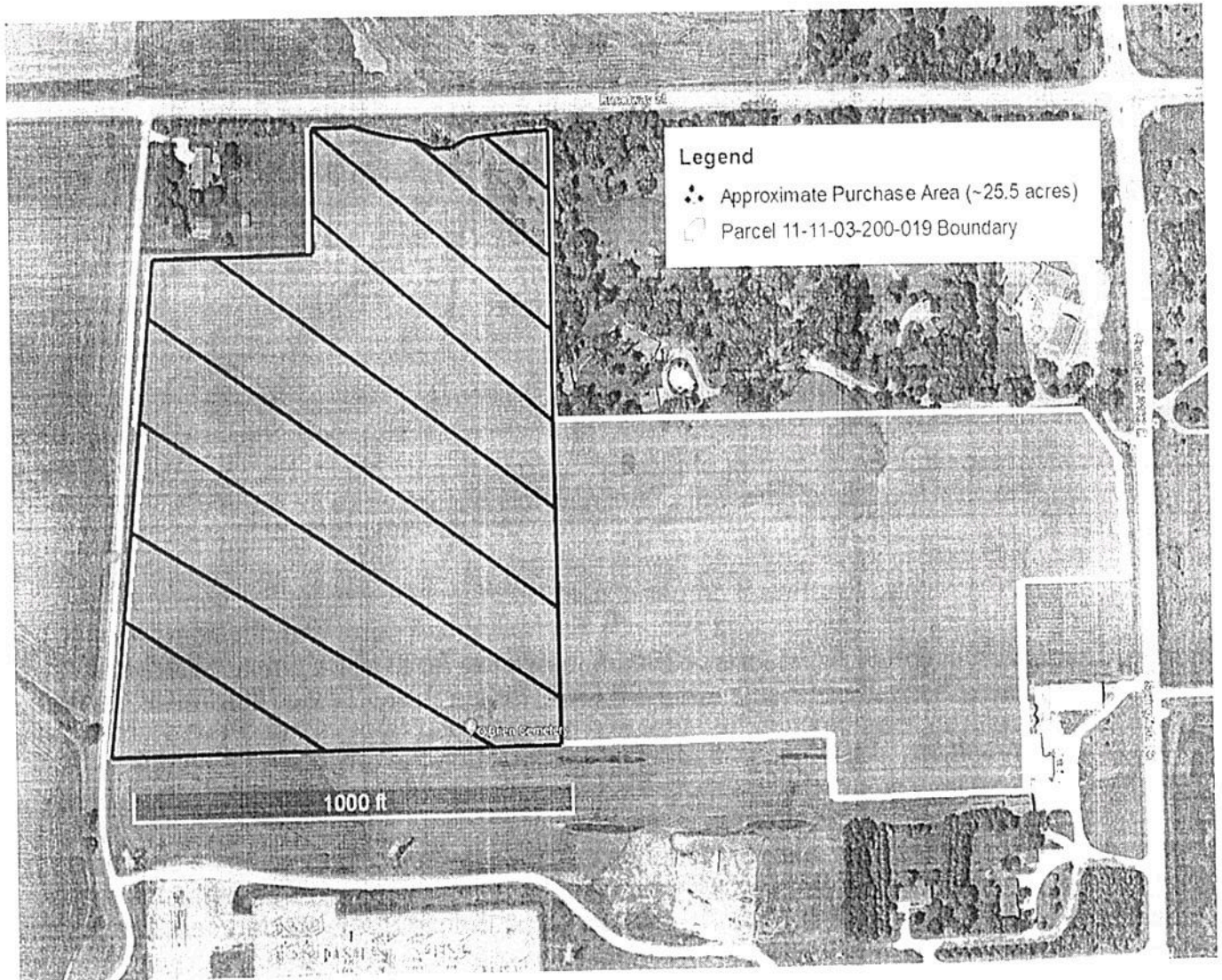


EXHIBIT B

FORM OF PURCHASE AND SALE AGREEMENT

RECORDING REQUESTED BY, AND
WHEN RECORDED, RETURN TO:

Attn: _____

Tazewell County Tax Parcel ID Numbers: 11-11-03-200-019

PURCHASE AND SALE AGREEMENT

THIS PURCHASE AND SALE AGREEMENT (this "**Agreement**") is made and entered into this _____ day of _____, 20____, by and between **Robert D. Wildermuth and Angela D. Wildermuth, Trustees, or their successors in Trust, under the Robert D. and Angela D. Wildermuth Living Trust, dated September 13, 2012, and any amendments thereto ("Seller")**, and **LUMINA ENERGY STORAGE, LLC**, a North Carolina limited liability company ("**Purchaser**").

WITNESSETH:

WHEREAS, Purchaser desires to purchase certain real property from Seller, and Seller has agreed to sell such property to Purchaser; and

WHEREAS, the parties desire to provide for said purchase and sale on the terms and conditions hereinafter set forth.

NOW, THEREFORE, for and in consideration of the foregoing premises, the mutual covenants and agreements set forth herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto do hereby agree as follows:

1. **DEFINITIONS AND MEANINGS.** In addition to any other terms whose definitions are fixed and defined by this Agreement, each of the following defined terms, when used in this Agreement with an initial capital letter, shall have the meaning ascribed thereto by this Section:

"**Agreement**" means this Purchase and Sale Agreement, together with all exhibits attached hereto.

"**Closing**" means the consummation of the purchase and sale contemplated by this Agreement by the deliveries required under **Section 6** hereof.

"**Closing Date**" means the time and date, established under **Section 6.1** hereof, when the purchase and sale contemplated by this Agreement is to be consummated, as such date may be extended by mutual agreement of the parties or pursuant to the provisions of this Agreement.

"**Effective Date**" means the date on which this Agreement is duly executed by Purchaser and Seller; such date shall be inserted in the preamble on the first page of this Agreement.

"Intended Use" means the development, construction, and operation of a solar photovoltaic power array, which may include an energy storage facility utilizing battery or other energy storage technology, either stand-alone or in connection with a photovoltaic power array, on the Real Property.

"Real Property" means those certain tracts or parcels of real property generally shown on **Exhibit A** attached hereto and incorporated herein by this reference, to be more specifically shown on a survey, and expressly including any easements benefitting such real property, and any and all other rights and appurtenances pertaining to such real property.

"Purchase Price" means the amount which Purchaser shall pay to consummate the purchase and sale of the Real Property as provided in **Section 3** hereof.

"Seller Property" means the certain tracts or parcels of Seller's real property from which the Real Property is subdivided.

"Title Matter" and **"Title Matters"** mean any mortgages, liens, financing statements, security interests, easements, leases, restrictive covenants, agreements, options, claims, clouds, encroachments, rights, taxes, assessments, mechanics' or materialmans' liens (inchoate or perfected), liens for federal or state income, estate or inheritance taxes and other encumbrances of any nature whatsoever, whether existing of record or otherwise, together with any and all matters of any kind or description, including, without limitation, matters of survey and any litigation or other proceedings affecting the Real Property or Seller and which affect title to the Real Property, or the ability, right, power and authority of Seller to convey to Purchaser fee simple, good and marketable and insurable title to the Real Property, in accordance with the terms of this Agreement.

2. **SALE AND PURCHASE.** Seller agrees to sell the Real Property to Purchaser on the terms and conditions contained in this Agreement, and Purchaser agrees to purchase the Real Property from Seller on the terms and conditions contained in this Agreement.

3. **PURCHASE PRICE.** The Purchase Price for the Real Property shall be _____ Thousand and no/100 Dollars (\$_____,000.00). The Purchase Price includes the sum of _____ and no/100 Dollars (\$_____.00) paid by Purchaser to Seller pursuant to that certain Option Agreement dated _____, 20__ (the "**Option Money**"). The Purchase Price less the Option Money shall be paid by Purchaser to Seller not later than 5:00 p.m. eastern time on the Closing Date by wire transfer of immediately available federal funds, subject to prorations, adjustments, and credits as otherwise specified in this Agreement.

4. **TITLE.**

4.1 **Satisfaction of Monetary Liens.** Notwithstanding anything herein to the contrary, Seller shall be obligated to remove or discharge any mortgage or other monetary lien affecting the Real Property; provided however, that Seller may, at its option, remove or discharge any such liens from the proceeds to be paid to Seller at the Closing of this transaction.

4.2 **No Additional Encumbrances.** Seller will not create or allow any additional encumbrances on the Real Property after the Effective Date.

5. **SELLER'S REPRESENTATIONS AND WARRANTIES.**

5.1 **Seller's Representations and Warranties.** Seller represents and warrants to Purchaser, as follows:

5.1.1 Seller is duly executed and existing Trust established in accordance with the laws of the State of Illinois and has the right, power and authority to enter into this Agreement, and the right, power and authority to convey the Real Property in accordance with the terms and conditions of this Agreement.

5.1.2 Seller has no knowledge of, and has received no written notice of, any pending action by any governmental authority or agency having the power of eminent domain, which might result in any part of the Real Property being taken by condemnation or conveyed in lieu thereof. Seller shall, promptly upon receiving any such notice, give Purchaser written notice thereof.

5.1.3 Seller has no knowledge of, and has received no written notice of, any action, suit or proceeding pending or threatened in writing against, by or affecting Seller's right to transfer the Real Property or the title of the Real Property.

5.1.4 Neither the entry into nor the performance of, or compliance with, this Agreement (i) has resulted in, or will result in, any violation of, or (ii) is or will be in conflict with, or (iii) has resulted in, or will result in, the creation or any mortgage, lien, encumbrance or other charge upon the Real Property pursuant to, or (iv) constitutes or will constitute a default under any permit, judgment, decree, order, statute, rule or regulation applicable to Seller or to the Real Property.

5.1.5 There are no rights of first refusal, options, or any other purchase rights in favor of any entity or person(s) other than Purchaser which are in force with respect to the Real Property.

5.1.6 There are no unwritten or unrecorded leases, easements, licenses, or agreements of any kind or nature, including but not limited to service agreements, management agreements or brokerage agreements made by Seller, which affect or encumber title to the Real Property.

5.1.7 Seller has no knowledge of and has received no written notice of any special improvement assessments for sidewalk, paving, water, sewer or other public improvements on the Real Property.

5.1.8 All bills for labor, services, materials and utilities and taxes which are in any way connected with or arising from the ownership of the Real Property by Seller, or any portion thereof, are current, except that rollback taxes have not been assessed and therefore are not paid at this date.

5.1.9 There are no current or pending tax appeals with respect to any portion of the Real Property.

5.1.10 All licenses and permits issued to Seller affecting the Real Property are expressly disclosed on **Exhibit B** attached hereto and made a part hereof.

5.1.11 There is no pending or, to Seller's knowledge, threatened litigation, arbitration, administrative hearing or governmental proceeding that could reasonably be expected to adversely affect the Real Property or the transactions contemplated by this Agreement.

5.1.12 No hazardous materials or substances (as collectively and generally defined in any Federal, state, or local law or regulations) have been located, released, stored, treated, generated, transported to or from, disposed of, or allowed to escape on the Real Property, including, without limitation, the surface and subsurface waters of the Real Property by Seller. Seller has never received written notice or other communication and has no knowledge concerning: (a) any current outstanding governmental investigation of the Real Property; (b) any alleged violation of any governmental requirement, environmental law, regulation or ordinance relating to the Real Property; or (c) any alleged

liability (including claims, suits, investigations or inquiries) associated with the presence or suspected presence of any toxic or hazardous material (as collectively and generally defined in any Federal, state, or local law or regulations) on the Real Property in violation of applicable law.

5.1.13 To Seller's knowledge, the Real Property is in full compliance with all applicable zoning and use requirements and there is no proceeding pending or, to Seller's knowledge, threatened to change the zoning status of the Real Property, unless approved by or pursued by Purchaser.

5.1.14 Seller discloses the existence of a Cemetery located upon the premises.

5.2 Purchaser's Representations and Warranties. Purchaser represents and warrants that:

5.2.1 Purchaser (i) is a limited liability company duly organized and validly existing under the laws of the State of North Carolina, and is duly authorized and qualified to do all things required of it under this Agreement; (ii) has authority and power to enter into this Agreement and consummate the transaction contemplated herein; and (iii) has the authority to execute and deliver this Agreement and all documents in connection with the purchase and sale of the Real Property as contemplated herein.

5.2.2 The execution and entry into this Agreement, the execution and delivery of the documents and instruments to be executed and delivered by Purchaser on the Closing Date and the performance by Purchaser of Purchaser's duties and obligations under this Agreement and of all other acts necessary and appropriate for the full consummation of the purchase and sale of the Real Property as contemplated herein, are consistent with and not in violation of, and will not create any default or adverse condition under, any contract, agreement or other instrument to which Purchaser is a party, or any judicial order or judgment of any nature by which Purchaser is bound. On the Closing Date, all necessary and appropriate action will have been taken by Purchaser authorizing and approving the execution of and entry into this Agreement, the execution and delivery by Purchaser of the documents and instruments to be executed by Purchaser on the Closing Date and the performance by Purchaser of Purchaser's duties and obligations under this Agreement and of all other acts necessary and appropriate for the consummation of the purchase and sale of the Real Property as contemplated herein.

6. THE CLOSING.

6.1 Closing Date. Closing shall occur on or before _____, 20____. Purchaser and Seller may extend the Closing Date to such a date upon which they may mutually agree.

6.2 Deliveries At Closing. On the Closing Date, the Closing shall occur as follows, subject to satisfaction of all of the terms and conditions of this Agreement:

6.2.1 Seller shall convey the Real Property to Purchaser free and clear of liens, claims and encumbrances other than any Title Matters consented to by Purchaser, by ~~Warranty~~ Trustees' Deed, duly executed, witnessed and notarized and in recordable form (together with any required State, County and, if applicable, municipal transfer tax affidavit(s) therefor).

6.2.2 Seller shall execute and deliver to Purchaser a certificate of nonforeign status.

6.2.3 Intentionally Omitted.

6.2.4 Seller shall deliver satisfactory evidence of Seller's organization and formation, existence, good standing, if applicable, and authority to execute and deliver the deed.

6.2.5 Seller shall deliver possession of the Real Property to Purchaser immediately on the Closing Date, free and clear of all uses and occupancies, except for any Title Matters consented to by Purchaser.

6.2.6 Seller shall execute and deliver to Purchaser a bill of sale with customary warranties conveying good title to that portion of the Real Property that constitutes personal property, if any.

6.2.7 Seller shall deliver to Purchaser a closing statement duly executed by Seller setting forth the proration and adjustments required by this Agreement or otherwise agreed to by Purchaser and Seller.

6.2.8 Seller shall deliver to Purchaser any and all other documents necessary to transfer or assign to Purchaser any approvals, permits, or other development rights with respect to the Real Property, if any.

6.2.9 Seller shall deliver to Purchaser such lien waivers or other appropriate documentation (certified to Purchaser and to Purchaser's title insurance company) as are necessary for Purchaser to obtain a title insurance policy insuring the Real Property, subject only to any Title Matters consented to by Purchaser.

6.2.10 Seller shall execute and deliver to Purchaser a Seller's Affidavit stating there are no persons having the right to be in possession other than Seller, other than any and all rights that may have been created or are present due to the existence of a cemetery upon the premises, and that there have been no improvements or repairs made to the Real Property by Seller for which full payment has not been made, containing such other matters as set forth in the title company's standard form owner's affidavit(s), and being otherwise in form reasonably satisfactory to Purchaser or Purchaser's title company.

6.2.11 In addition to all documents, instruments and Agreements expressly provided for herein, Purchaser and Seller shall execute and/or provide such other documents as may be reasonably required by the title insurance company or by counsel for either party to effectuate the purposes of this Agreement and for Purchaser to receive a title insurance policy to it subject only to the Permitted Exceptions.

6.3 Closing Costs. At the Closing, Seller and Purchaser shall respectively pay the following costs and expenses:

6.3.1 Seller shall pay (i) the fees and expenses of Seller's attorneys; (ii) the fees, expenses, and commissions of any brokers which may be payable as a consequence of the sale and purchase of the Real Property, (iii) state and county transfer taxes and any municipal transfer taxes (except to the extent such municipality expressly imposes the primary obligation to pay all or a portion of such transfer taxes on the Purchaser), if any, and any and all deferred taxes and assessments, and any interest thereon, due as of the date of Closing, (iv) the fees to record releases of encumbrances, if any, and (v) the premium for the owner's policy of title insurance, endorsements thereto, fifty percent (50%) of any closing or escrow fees and other title company charges customarily imposed on the Seller in similar transactions.

6.3.2 Purchaser shall pay all costs and expenses associated with the purchase and sale of the Real Property except for those fees which Seller has expressly agreed to pay pursuant to Section 6.3.1 including, but not limited to, (i) all costs and expenses associated with Purchaser's financing

of the Real Property, including without limitation any recording and filing fees necessary for the recordation of a mortgage or other security instrument at Closing to secure Purchaser's obligation to pay all or a part of the Purchase Price for the Real Property; (ii) any inspection costs incurred by Purchaser (including, but not limited to, the cost of any title search, title commitment, and/or survey obtained by Purchaser in connection with this transaction, including any fees, costs, premiums for any loan policy of title insurance, and other expenses therefor); (iii) fifty percent (50%) of any title company charges (other than premiums for the owner's title insurance policy and endorsements thereto) customarily imposed on Purchasers in similar transactions; (iv) fees to record the Warranty Deed; (v) municipal transfer taxes to the extent such municipality expressly imposes the primary obligation to pay all or a portion of such transfer taxes on the Purchaser; and (vi) the cost of any environmental assessments or reports obtained by Purchaser; and (iv) the fees and expenses of Purchaser's attorneys.

6.4 Prorations.

6.4.1 Seller shall be responsible for all state, county, township, city/town, school, library, and/or special unit ad valorem taxes assessed against the Real Property ("Taxes") for all years prior to calendar year in which Closing occurs and for that portion of the year in which Closing occurs to the Closing Date and Purchaser shall be responsible for all Taxes from and after the Closing Date. At or prior to Closing, Seller shall pay all Taxes for the year prior to Closing that are payable as of Closing Date (and any delinquent Taxes for prior years). Taxes for the year of Closing (and taxes for the year prior to Closing if not payable on or prior to the Closing Date) shall be prorated between Purchaser and Seller as of the Closing Date. If the actual amount of such Taxes is not known as of such date, either because bills for the period in question have not been issued or because such bills cover real property in addition to the Real Property, the proration at the Closing will be based on the most current and accurate billing information available. Should such proration not be based on the actual amount of the ad valorem taxes for the period in question and should such proration prove to be inaccurate with a discrepancy exceeding Five Hundred and 00/100 Dollars (\$500.00) upon receipt of the actual bills for the Real Property, then either Seller or Purchaser may demand at any time within thirty (30) days after receipt of the actual invoice for such item, a payment from the other party correcting such mal-apportionment.

6.4.2 If applicable, Purchaser shall be responsible for any increase in the Taxes assessed against the Real Property for the year of Closing resulting from the Real Property being reclassified from an agricultural assessment as a result of: (i) any actions taken in accordance with the Option Agreement by Purchaser or Seller or (ii) any action taken by Purchaser after the Closing. Purchaser agrees to indemnify Seller for such taxes and related interest and penalties. The provisions of this Section 6.4.2 shall survive the Closing or early termination of this Agreement.

6.4.3 Seller is responsible for and shall pay all management and/or operating expenses of Seller and all other expenses and charges in respect of Seller's ownership of the Real Property for all time periods through the day prior to Closing.

6.4.4 If any clerical mistakes in any adjustments or prorations or if any omissions in respect thereto resulting in a loss to either Purchaser or Seller exceeding Five Hundred and 00/100 Dollars (\$500.00) are discovered subsequent to the date of Closing, Purchaser and Seller agree to adjust such items between themselves. Such prorations and payments shall be determined and made by Seller and Purchaser, in good faith, as soon as practicable after Closing.

7. EASEMENTS. Any easements affecting the Real Property or the Seller Property shall be confirmed in writing and recorded in the land records of Tazewell County, Illinois.

8. DAMAGE OR CONDEMNATION PRIOR TO CLOSING. Seller agrees to give Purchaser prompt written notice of any fire or other casualty affecting the Real Property between the

Effective Date and the Closing Date or of any actual or threatened taking or condemnation of all or any portion of the Real Property. If prior to the Closing there shall occur any fire, casualty, notice of taking or condemnation of all or any portion of the Real Property; then, in any such event, Purchaser, at its option, may terminate its obligations under this Agreement by written notice given to Seller within ten (10) days after Purchaser has received the notice referred to above or at the Closing, whichever is earlier, and neither party shall have any further right or obligation hereunder. If Purchaser does not so elect to terminate its obligations under this Agreement, then the Closing shall take place as provided herein, and, at Purchaser's option, Seller either shall assign, transfer and set over to Purchaser all of Seller's right, title and interest in and to any insurance proceeds or awards that may be made for such casualty or taking (and Seller will pay any insurance deductible applicable to the casualty insurance), or Seller shall agree with Purchaser for a reduction in the Purchase Price based on the extent of the casualty or taking.

9. NO BROKERS. Seller and Purchaser warrant and represent that there are and will be no broker's or intermediaries' commissions or fees payable as a consequence of the sale and purchase of the Real Property, and do hereby indemnify, defend and hold harmless each of the other from and against the claims, demands, actions and judgments (including, without limitation, attorneys' fees and expenses incurred in defending any claims or in enforcing this indemnity) of any and all brokers, agents and other intermediaries alleging a commission, fee or other payment to be owing by reason of any dealings, negotiations or communications with the indemnifying party in connection with this Agreement or the sale and purchase of the Real Property. The provisions of this **Section 9** shall survive the Closing.

10. ACCESS TO AND EXAMINATION OF THE PROPERTY. From and after the Effective Date, upon reasonable notice to Seller and at reasonable times, Purchaser, through agents, employees or contractors, may go upon the Real Property during normal business hours to make surveys and to conduct such soil, engineering, environmental and all other tests, investigations, inspections and analyses of the Real Property that Purchaser shall deem advisable. Purchaser shall pay all costs incurred in making such surveys, tests, inspections, analyses and investigations. Purchaser hereby agrees to indemnify and hold Seller harmless from and against any and all loss, cost or damage to the Real Property incurred by Seller arising out of actions taken by Purchaser or its agents, engineers or consultants. Purchaser shall promptly repair all damage to the Real Property arising from any such inspections or tests and shall restore the Real Property to a substantially similar or better condition existing immediately prior to such inspections and tests.

11. DEFAULT.

11.1 Seller's Default. In the event of Seller's default, failure, or refusal to perform hereunder, Purchaser may elect, at its option, (i) to obtain Seller's specific performance of this Agreement; or (ii) to terminate this Agreement by giving written notice of termination to Seller, after which Seller shall (i) return the Option Money to Purchaser and (ii) reimburse Purchaser for any actual costs or expenses incurred in connection with its examination of the Real Property, including reasonable attorney's fees. Purchaser, at its option, may elect to waive the performance of any condition, contingency or provision in Purchaser's favor set forth in this Agreement.

11.2 Purchaser's Default. In the event of Purchaser's default, failure, or refusal to perform hereunder, Seller may elect to terminate this Agreement by giving written notice of termination to Buyer, after which Seller shall be entitled to retain the Option Money and this Agreement shall be deemed null and void and of no further force or effect, and no party hereto shall have any further rights, obligations or liabilities hereunder. Seller hereby agrees that in the event of Purchaser's default, retention of the Option Money is Seller's sole remedy and Seller shall not be entitled to any additional penalty or to liquidated damages. Seller, at its option, may elect to waive the performance of any condition, contingency or provision in Seller's favor set forth in this Agreement.

12. CONDITIONS PRECEDENT.

12.1 Purchaser's Conditions.

12.1.1 Purchaser's obligations under this Agreement are subject only to and conditioned upon the satisfaction (or waiver by Purchaser) of the following conditions precedent:

(a) Purchaser's determination, in Purchaser's sole discretion prior to the Closing Date, that the Real Property is physically and economically acceptable to Purchaser. In the event that Purchaser determines in its sole discretion, that the Real Property is not acceptable to Purchaser for any reason or for no reason, then Purchaser shall so notify Seller before the Closing Date, and this Agreement shall be terminated and the parties shall have no further liability to one another.

(b) The representations and warranties of Seller set forth in **Section 5** of this Agreement will be materially true on and as of the Closing with the same effect as though made at such time.

(c) Seller's performance of its obligations set forth in this Agreement.

(d) Purchaser shall have obtained any rezoning, re-parceling, permitting, and/or land use changes necessary to permit the Intended Use on the Real Property. Seller agrees to cooperate with Purchaser in acquiring any such rezoning, re-parceling, permitting, and/or land use changes.

(e) Purchaser shall have caused the Real Property to be subdivided from the Seller Property. Seller agrees to cooperate with Purchaser in acquiring any necessary approvals, consents, authorizations, and/or permits from the applicable governing unit and obtaining such subdivision.

12.1.2 If any of the conditions precedent in Section 12.1.1 are not satisfied or waived by Purchaser on or prior to the Closing Date, then Purchaser may terminate this Agreement by written notice to Seller given on or prior to the Closing Date for the conditions precedent set forth in 12.1.1, in which event Seller shall retain the Option Money and the parties shall have no further obligation to each other except for those obligations that expressly survive the termination of this Agreement.

12.2 Seller's Conditions. Seller's obligations under this Agreement are subject to and conditioned upon the satisfaction (or waiver by Seller) of the following conditions precedent:

(a) The representations and warranties of Purchaser set forth in **Section 5** of this Agreement will be materially true on and as of the Closing with the same effect as though made at such time, and Purchaser must have materially performed all obligations and complied with all covenants required in this Agreement to be performed or complied with by it prior to or at Closing.

(b) Purchaser's performance of its obligations set forth in this Agreement.

13. GOVERNING LAW; LEGAL COSTS. This Agreement shall be construed, interpreted and enforced in accordance with the internal laws of the State of Illinois without reference to the choice of law principles of the State of Illinois or any other state. The parties further agree that the venue of all legal and equitable proceedings related to disputes under this Agreement shall be situated in Tazewell County,

Illinois, and the parties agree to submit to the personal jurisdiction of any State or Federal court situated in or with jurisdiction over Taewell County, Illinois. If any legal action is brought by either party to enforce any provision in this Agreement, the prevailing party shall be entitled to recover from the other party reasonable attorneys' fees and court costs in such amounts as shall be allowed by the court.

14. NOTICES. Any notices, requests or other communications required or permitted to be given hereunder shall be in writing and shall be delivered by hand, confirmed facsimile, nationally recognized courier (such as Federal Express) which maintains a record or receipt of delivery, or mailed by United States registered or certified mail, return receipt requested, postage prepaid and addressed to each party at its address as set forth below:

To Seller: Robert D. Wildermuth, Trustee
16783 Springfield Road
Perkin, IL 61554
Phone: (309) 208-4320
Email: wildfarms2@gmail.com

With a copy to:
Brewer Law Office, LLC
ATTN: Thomas K. Brewer
P.O. Box 44
Tremont, IL 61568
Phone (309)925-9066
Email: tbrewer@brewerlaw.org

To Purchaser: Lumina Energy Storage, LLC
800 Taylor Street, Suite 200
Durham, NC 27701
(919) 960-6015
Attn: Asset Management Department
Email: assetmanagement@stratacleanenergy.com

Any such notice, request or other communication shall be considered given or delivered, as the case may be, on the date of hand, overnight delivery, courier or email. Rejection or other refusal to accept or inability to deliver because of changed address of which no notice was given shall be deemed to be receipt of the notice, request or other communication. By giving at least five (5) days prior written notice thereof, any party may from time to time at any time change its mailing address hereunder.

15. ENTIRE AGREEMENT; MODIFICATION. This Agreement supersedes all prior discussions and agreements between Seller and Purchaser with respect to the Real Property and contains the sole and entire understanding between Seller and Purchaser with respect to the Real Property. All promises, inducements, offers, letters of intent, solicitations, agreements, commitments, representations and warranties heretofore made between such parties are merged into this Agreement. This Agreement cannot be modified or amended in any respect except by a written instrument executed by or on behalf of each of the parties to this Agreement.

16. CAPTIONS. All captions, headings, and any section or subsection numbers and letters, and other reference numbers or letters are solely for the purpose of facilitating reference to this Agreement and shall not supplement, limit or otherwise vary in any respect to the text of this Agreement.

17. SURVIVAL. Except as otherwise specifically provided herein, the representations, warranties and covenants made herein shall not survive Closing.

18. EXHIBITS. Each and every exhibit referred to or otherwise mentioned in this Agreement shall be made a part of this Agreement in the same manner and with the same effect as if each such exhibit were set forth in full and at length every time it is referred to or otherwise mentioned herein.

19. COUNTERPARTS. This Agreement may be executed in several counterparts, each of which shall constitute an original and all of which together shall constitute one and the same instrument.

20. REFERENCES. All references to Sections or Subsections will be deemed to refer to the appropriate Section or Subsection of this Agreement. Unless otherwise specified in this Agreement, the terms "herein," "hereof," "hereunder" and other terms of like or similar import, will be deemed to refer to this Agreement as a whole, and not to any particular Section or Subsection hereof. Words of any gender used in this Agreement will be held and construed to include any other gender, and words of a singular number shall be held to include the plural, and vice versa, unless the context requires otherwise.

21. WAIVER. Any condition or right of termination, cancellation or rescission granted by this Agreement to Purchaser or Seller may be waived by such party.

22. RIGHTS CUMULATIVE. Except as expressly limited by the terms of this Agreement, all rights, powers and privileges conferred hereunder are cumulative and not restrictive of those given by law.

23. ASSIGNMENT. This Agreement and the rights, duties, interests, and obligations of Purchaser hereunder may be assigned by Purchaser upon written notice to Seller. This Agreement and the rights, duties, interests and obligations of Seller hereunder may not be assigned by Seller without prior written consent of Purchaser, not to be unreasonably withheld.

24. SUCCESSORS AND ASSIGNS. Subject to the provisions of **Section 23**, this Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective heirs, successors and permitted assigns.

25. FURTHER ASSURANCES. The parties hereto agree that they will each take such steps and execute such documents as may be reasonably required by the other party or parties to carry out the intents and purposes of this Agreement, including with respect to Seller's cooperation with any and all reasonable requirements of Purchaser's lender, if any, as applicable.

26. CONFIDENTIALITY. Seller shall keep in strict confidence and shall not disclose to third parties, other than Seller's counsel: (i) its dealing with Purchaser and Purchaser's intentions and actions regarding the Proposed Development, (ii) the execution of this Agreement, and (iii) the commercial terms set forth in this Agreement, unless Purchaser consents in writing to such disclosure.

27. SEVERABILITY. In the event any provision or portion of this Agreement is held by any court of competent jurisdiction to be invalid or unenforceable, such holding will not affect the remainder hereof, and the remaining provisions shall continue in full force and effect at the same extent as would have been the case had such invalid or unenforceable provision or portion never been a part hereof.

[Signature page follows]

PURCHASER:

LUMINA ENERGY STORAGE, LLC, a North
Carolina limited liability company

By: _____
Name: _____
Title: _____

STATE OF NORTH CAROLINA

COUNTY OF _____

I certify that the following person personally appeared before me this day, acknowledging to me
that he/she signed the foregoing instrument: _____.

WITNESS my hand and official stamp or seal, this ____ day of _____, 20__.

Notary Public

Printed Name: _____

My Commission Expires:

[AFFIX NOTARIAL STAMP OR SEAL]

EXHIBIT A TO PURCHASE AND SALE AGREEMENT
LEGAL DESCRIPTION OF PROPERTY

EXHIBIT B TO PURCHASE AND SALE AGREEMENT

Licenses and Permits

EXHIBIT C

FORM OF MEMORANDUM OF PURCHASE OPTION AGREEMENT

Prepared by and mail to:
Lumina Energy Storage, LLC
800 Taylor Street, Suite 200
Durham, NC 27701
Attn: Legal Department

MEMORANDUM OF PURCHASE OPTION AGREEMENT

This Memorandum of Purchase Option Agreement ("Memorandum") is made and entered into as of the _____ day of _____, 202__ by and between LUMINA ENERGY STORAGE, LLC, a North Carolina limited liability company, having an address of 800 Taylor Street, Suite 200, Durham, NC 27701 (the "Purchaser") and _____, having an address of _____ (collectively, "Seller").

1. PURCHASE OPTION AGREEMENT. Seller and Purchaser are parties to that certain Purchase Option Agreement dated _____, 202__ (the "Option Agreement") and desire to place this Memorandum of record for the purpose of notice to all third parties of the respective rights and obligations of Seller and Purchaser regarding the Property (as defined below).

2. PROPERTY. Seller is vested with fee simple title to approximately _____ acres of real estate located in _____, Tazewell County, Illinois, legally described on Exhibit A hereto (the "Property"). Pursuant to the Option Agreement, Seller has granted to Purchaser the right and option, exercisable during the period commencing the date of the Option Agreement and ending on _____, _____, to purchase the Property from Seller for a purchase price, and on the terms and conditions, more fully described in the Option Agreement.

3. OPTION AGREEMENT CONTROLS. This Memorandum has been executed for the purpose of recordation in order to give notice of certain of the material terms, provisions and conditions of the Option Agreement, and is not intended, and shall not be construed, to define, limit or modify the Option Agreement. This Memorandum is not a complete summary of the Option Agreement, nor shall any provisions of this Memorandum be used in interpreting the provisions of the Option Agreement. Reference should be made to the Option Agreement for a more detailed description of all matters contained in this Memorandum.

4. SUCCESSORS AND ASSIGNS. This Memorandum and the Agreement shall be binding upon and shall inure to the benefit of the parties hereto, and their respective heirs, devisees, executors, administrators and personal representatives, successors and assigns.

5. COUNTERPARTS. This Memorandum may be executed in multiple counterparts, each of which shall be deemed an original and which, when taken together, shall constitute one instrument.

{Balance of this page intentionally blank; Signature pages follow}

SELLER:

STATE OF Illinois)) SS.
COUNTY OF _____)

Given under my hand and Notarial Seal this ____ day of _____, 20__.

{AFFIX NOTARIAL SEAL}

{Purchaser signature page follows}

PURCHASER:

LUMINA ENERGY STORAGE, LLC,
a North Carolina limited liability company

By: _____
Name: _____
Title: _____

STATE OF NORTH CAROLINA

COUNTY OF _____

I certify that the following person personally appeared before me this day,
acknowledging to me that he/she signed the foregoing instrument: _____.

WITNESS my hand and official stamp or seal, this ____ day of _____, 20 ____.

Notary Public
Printed Name: _____

My Commission Expires:

[AFFIX NOTARIAL STAMP OR SEAL]

EXHIBIT A TO MEMORANDUM OF PURCHASE OPTION AGREEMENT

Legal Description of Premises

Economic and Fiscal Impacts Lumina BESS Project Tazewell County, Illinois



July 2026

Triple Point Strategic Consulting



Economic and Fiscal Impacts

Lumina BESS Project

Tazewell County, Illinois

Prepared for:

Lumina Energy Storage, LLC

1310 Westview Drive

Durham, North Carolina 27707

Prepared by:

Triple Point Strategic Consulting

PO Box 985

Crested Butte, Colorado 81224

July 2026

Cover photo credit: Lumina Energy Storage, LLC

Key Findings

Project Description

- Capacity: 300 megawatts alternating current (MWac) battery energy storage (1,200 megawatt-hours [MWh], 4-hour duration)
- Time horizon: 18 months of construction during 2028–2029 followed by 20 years of operations
- Site: approximately 25 acres in unincorporated Elm Grove Township, Tazewell County, Illinois

Economic Benefits During Construction

- Total developer investment of \$463.1 million, of which \$46.2 million in direct economic output would be captured in Tazewell County
- Direct construction labor income of \$17.4 million to Tazewell County workers, out of \$43.5 million across the full workforce
- Construction activity would generate \$3.68 million in sales tax on locally sourced materials, of which \$952,928 would be received by Tazewell County and local districts

Construction Employment Impacts

- An average of 214 full-time-equivalent (FTE) jobs on site over the 18-month construction period, of which 85 would be held by Tazewell County workers
- Average loaded compensation of \$135,700 per job, consistent with Peoria-Tazewell union scale

Annual Economic Benefits During Operations

- Annual operating investment of \$6.1 million, of which \$1.33 million in direct economic output would be captured in Tazewell County, plus battery augmentation outlays of \$14.0 million in Years 5 and 9 and \$9.7 million in Year 13
- 8.2 direct full-time jobs supported each year over the 20-year operating life, 3.3 of them held by Tazewell County workers
- Operations activity would generate \$67,229 per year in sales tax on locally sourced operations purchases, of which \$17,430 would be received by Tazewell County and local districts

Fiscal Benefits Accruing to Tazewell County and Local Taxing Bodies

- The Project would generate \$21.1 million in property tax over its 20-year operating life, including:
 - \$14.0 million to Tremont Community Unit School District 702
 - \$1.91 million to Brush Hill Fire Protection District
 - \$1.55 million to Tazewell County
 - \$1.42 million to Illinois Central Community College
 - \$2.2 million to other Elm Grove and Tremont Special Districts
- Sales tax on imported specialized equipment is estimated at \$19.67 million during initial construction and \$2.64 million over the operating life for augmentation and replacement parts, a lifetime total of \$22.31 million, of which \$5.78 million would be received by Tazewell County and local taxing bodies

Total Local Tax Revenue Accruing to Tazewell County and Local Taxing Districts

- Estimated at \$28.2 million over the 20-year lifetime: \$21.1 million in property tax, \$1.30 million in local taxes and fees on construction and operations spending, and \$5.78 million in local share of imported-equipment sales tax

Introduction

Lumina Energy Storage, LLC proposes to construct, operate, maintain, and decommission a utility-scale battery energy storage system (BESS) known as the Lumina BESS Project (Project) in Tazewell County, Illinois. The Project would be located on approximately 25 acres of private land in unincorporated Elm Grove Township, directly east of Pekin (Figure 1). Primary Project components include lithium-ion battery container systems, power conversion equipment, an on-site collector substation, and a generation-tie (gen-tie) interconnection line. Lumina would provide additional electric capacity to support the electric grid in Tazewell County and the surrounding region.

The Project would deliver 300 megawatts alternating current (MWac) of dispatchable power capacity with 1,200 megawatt-hours (MWh) of energy storage (4 hours of duration at full output). Site mobilization is expected to begin June 1, 2028, with commercial operation beginning December 1, 2029, followed by an operating life projected to be 20 years, consistent with the standard design and contracting horizon for this type of battery storage. This report describes the direct economic and fiscal benefits the Project would deliver to Tazewell County.



Figure 1. Project Location

Illinois Energy Objectives

Maintaining grid reliability requires substantial investment in flexible, fast-responding energy resources, of which battery energy storage is among the most important. Illinois statutes build on this framework by establishing procurement pathways for utility-scale energy storage and by setting a uniform statewide property tax valuation methodology for commercial battery energy storage facilities. The new methodology (35 ILCS 200/10-920) provides taxing districts with a predictable, multiyear revenue stream and gives developers a stable basis for investment.

The Project advances these objectives by adding 300 MWac of fast-responding capacity to the regional grid. Battery storage of this scale provides energy arbitrage between low- and high-demand hours, ancillary grid services such as frequency regulation and operating reserves, and resource adequacy contributions. Tazewell County stands to host a project that directly supports Illinois's reliability goals while delivering substantial local economic and fiscal benefits.

Methodology

This report describes the overall direct economic and fiscal benefits of constructing and operating the Project, as well as estimates of the direct benefits for Tazewell County. The analysis reports direct impacts only. Indirect and induced (multiplier) effects are not estimated in order to provide a more conservative analysis. Direct benefits are estimated in terms of labor income, employment, local supply purchases, and tax revenue. These direct benefits would not occur in the absence of the Project.

Economic impacts include the following:

- on-site labor income earned by Tazewell County workers
- locally sourced materials and supplies, and equipment leasing expenditures
- contractor profit and overhead earned on the locally executed scope of work
- local transaction taxes collected on local expenditures

Direct fiscal impacts include the following:

- commercial energy storage property tax on the facility over its 20-year operating life
- sales tax on imported specialized equipment

These tax revenues would fund the county, township, school district, community college district, fire and rescue districts, library, park district, and road and bridge district that overlap the Project parcel. All dollar figures are presented in 2026 dollars, except for the property taxes. Totals in tables may not sum due to rounding.

Tazewell County Socioeconomic Overview

Tazewell County sits in the heart of central Illinois along the eastern bank of the Illinois River, immediately south and east of the city of Peoria. The county has a population of approximately 131,000 and encompasses the cities of Pekin (the county seat), East Peoria, Morton, and Washington, as well as several smaller communities and unincorporated townships, including Elm Grove Township, where the Project would be located.

The regional economy is anchored by advanced manufacturing, agriculture, and logistics. Caterpillar Inc. maintains a significant manufacturing and engineering presence in the Peoria-Tazewell area. Pekin is home to large agricultural processing and chemical operations, and the surrounding townships remain in active row-crop agricultural use. The Illinois River corridor supports a working barge and rail logistics

network that moves grain, fuel, and industrial commodities through central Illinois to national and international markets.

Tazewell County's skilled-trades labor market is among the deepest in downstate Illinois. The Peoria-Tazewell area is the jurisdiction of International Brotherhood of Electrical Workers (IBEW) Local 34 (inside wiremen and industrial electricians), Laborers' International Union of North America (LIUNA) Local 165 (construction laborers), International Union of Operating Engineers (IUOE) Local 649 (operating engineers and heavy equipment operators), Ironworkers Local 112 (structural and reinforcing ironworkers), and Teamsters Local 627 (material hauling and construction drivers). As typical for major utility-scale construction projects in this region, Lumina Energy Storage, LLC intends to hire union crews and pay union scale, which contributes to the comparatively strong labor-income figures reported in this analysis.

Tazewell County and the State of Illinois have moved deliberately to accommodate utility-scale battery storage. Illinois law now provides a predictable, uniform framework for siting and valuing commercial storage, and Tazewell County has been actively developing battery storage siting standards informed by National Fire Protection Association (NFPA) fire-safety codes (NFPA 855). This combination of a deep skilled-trades workforce, and a county preparing specifically for projects of this kind positions Tazewell County to capture the economic and fiscal benefits the Project would deliver.

Capital Construction Investment

Developing a direct-impact estimate for constructing the Project requires preliminary development plans, a capital expenditure budget, and the duration of construction in years. Table 1 shows the planned capital expenditure for the Project broken out into four categories: developer soft costs; engineering, procurement, and construction (EPC); imported specialized equipment; and sales taxes on imported equipment.

Table 1. Capital Expenditure Budget

Project Component	Soft Costs	Construction Expenses ¹	Imported Equipment ²	Sales Tax on Imported Equipment	Total Capital Budget to Construct
BESS	\$39,700,719	\$86,453,787	\$265,029,488	\$17,889,491	\$409,073,485
Interconnection	\$0	\$25,786,190	\$26,417,339	\$1,783,170	\$53,986,699
Total	\$39,700,719	\$112,239,977	\$291,446,827	\$19,672,661	\$463,060,184

¹ Construction expenses: labor and basic materials, including local taxes and fees (Illinois Retailers' Occupation Tax on locally sourced materials and equipment).

² Imported equipment: battery container systems, power control system, the substation transformer and high-voltage breaker, and gen-tie line equipment. Excludes sales tax. Development and soft costs are project-wide and are reported on the BESS line.

Construction spending captured in the EPC category includes labor and supplies such as concrete, fencing, aggregate, fuel for construction equipment, and equipment rental, which can generally be sourced within Tazewell County and the broader Peoria-Tazewell region. Off-site expenses, such as engineering design, construction management performed remotely, the BESS warranty, and corporate overhead, are included as soft costs.

Specialized equipment, principally the lithium-ion BESS container systems, power conversion equipment, the substation transformer and high-voltage breaker, and a portion of the gen-tie

equipment, is not manufactured in the region and must be imported. Imported equipment does not directly impact the local economy, but it generates substantial sales tax revenue, described in the Fiscal Impacts section.

Geographic Distribution of Construction Expenses

Table 2 shows how the direct economic benefits of construction would be distributed between Tazewell County and outside the county. Of the \$112.2 million in total direct construction spending, \$46.2 million (41.1 percent) is estimated to be captured in Tazewell County. The balance would primarily flow to Peoria County with lesser amounts occurring in other counties throughout the region. The split is estimated using a gravity-based labor-shed model built from county-level construction employment (U.S. Bureau of Labor Statistics [BLS] Quarterly Census of Employment and Wages, North American Industry Classification System [NAICS] 23) and distance to the site. The actual distribution would depend on the EPC contractor and conditions at the time of construction.

Table 2. Direct Economic Benefits from Construction Expenses

Region	Average Annual Employment (FTE)	Labor Income	Supplies, Materials, Equipment	Local Taxes and Fees	Total Output
Tazewell County	85.4	\$17,395,338	\$27,815,352	\$952,928	\$46,163,618
Out of County	128.2	\$26,093,007	\$37,260,701	\$2,722,651	\$66,076,359
Total	213.6	\$43,488,346	\$65,076,052	\$3,675,579	\$112,239,977

Note: FTE = full-time equivalent.

Labor Income represents the total value of all forms of employment income, including benefits, payroll taxes, and payments received by self-employed individuals and/or unincorporated business owners. The supplies, materials, and equipment category includes basic materials, such as concrete and fencing, construction equipment, and other construction supplies. Local taxes and fees are sales taxes and fees resulting from EPC and related construction spending. These components sum to Total Output, the value of a good produced by an industry, in this case the BESS facility.

Tax Revenue Resulting from Construction Spending

Direct construction spending generates two distinct streams of tax revenue: local sales tax collected on the EPC construction expenses, and sales tax on imported specialized equipment delivered to the site. This section describes the first stream. The second stream is presented in the Fiscal Impacts section.

Sales tax on locally sourced EPC purchases is estimated at \$3.68 million over the construction period, based on the 6.75 percent Tazewell combined rate applied to locally sourced materials and equipment delivered to the Project site. Table 3 shows how this revenue would be distributed by recipient. Because purchases are taxed at the point of delivery in unincorporated Tazewell County, the local 1.75 percentage points of the rate stay with Tazewell County and its local districts: \$272,265 (the 0.50 percent county add-on) would be received directly and a further \$680,663 would be returned to local jurisdictions through the state's local-share allocation, a combined \$952,928 (the local taxes and fees amount shown in Table 2). The remaining \$2,722,651 accrues to the State of Illinois.

Table 3. Estimated Sales Tax from Construction

Recipient	County Level	Local (State-Distributed)	State of Illinois	Total
Tazewell County and local districts	\$272,265	\$680,663	\$0	\$952,928
State of Illinois	\$0	\$0	\$2,722,651	\$2,722,651
Total	\$272,265	\$680,663	\$2,722,651	\$3,675,579

Note: Illinois sales tax is sourced to the delivery location (Public Act 103-0983). Because materials and equipment are delivered to the Project site in unincorporated Tazewell County, the local 1.75 percentage points of the rate stay with Tazewell County and its local districts; the 5.00 percent state share accrues to the State of Illinois.

Employment Benefits for Tazewell County from Construction

This section describes estimates of the direct economic benefits accruing within Tazewell County during construction. Direct labor income captured in Tazewell County is estimated to be \$17.4 million, out of \$43.5 million across the full project workforce, for workers residing in Tazewell county either permanently or temporarily. The Tazewell County share supports an average of 85 full-time-equivalent (FTE) jobs on site over the 18-month construction period. Employment has been estimated using an hours-times-rate model that incorporates 21 construction occupations across the BESS power block, substation, gen-tie, and site civil components. Wage rates for skilled trades reflect market rates consistent with union scale in the Peoria-Tazewell labor market, producing an average loaded compensation of \$135,700 per full-time-equivalent job.

Table 4 provides estimates of the top 10 occupations directly associated with constructing the Project, listed by share of total construction labor hours. The mix reflects the technical character of a battery energy storage project, including a strong electrical and power-line trades component, operating engineers, construction laborers, supervisory trades, transportation, and other specialties. Total compensation includes benefits supplementing wages and salaries.

Table 4. Top 10 Average Annual Construction Occupations

Occupation	Average Annual Employment (FTE)	Average Hourly Total Compensation
Construction Laborers	11.4	\$61.65
Operating Engineers and Equipment Operators	11.0	\$71.60
Electricians	10.5	\$77.20
Helpers and Construction Apprentices	6.6	\$36.00
Electrical Power-Line Installers and Repairers	6.6	\$80.85
Heavy and Tractor-Trailer Truck Drivers	6.2	\$48.00
First-Line Supervisors of Construction Trades	5.3	\$78.60
Construction Managers	3.7	\$78.00
Cement Masons and Concrete Finishers	2.8	\$67.30
Civil Engineers	2.8	\$60.00

Annual Operations Investment

Developing a direct-impact estimate for operating the Project requires the developer's annual operating budget, decomposed into cost categories, and the share of each category that can be performed or sourced locally. The operating budget is comprehensive: it includes corporate soft costs (asset management, software licensing, cybersecurity compliance, and insurance) and sales taxes, and it excludes only property tax, which is addressed under Fiscal Impacts, and the periodic battery augmentation events, which are treated separately. As in the construction analysis, soft costs are incurred at the developer's headquarters or by national vendors and do not generate local economic activity.

The developer's stated Year 1 operating expenditure is \$6.1 million, distributed across eight cost categories: the long-term service agreement (LTSA) with the BESS vendor, balance-of-plant (BOP) operations and maintenance, spare parts, asset management, energy management software licensing, cybersecurity and NERC compliance, auxiliary cost and station loads, and on-site operations labor, plus operating-phase insurance. Battery augmentation events in Years 5, 9, and 13 represent additional discrete outlays of \$14.0 million, \$14.0 million, and \$9.7 million respectively.

Table 5 shows the planned Year 1 all-in operating budget for the Project, consolidated into three broad cost categories and split among soft costs, operations expenses that can be performed or sourced locally, and imported equipment and services.

Table 5. Annual Operating Expenditure Budget

Cost Category	Soft Costs	Operations Expenses ¹	Imported Equipment and Services ²	Sales Tax on Imported Equipment	Total Annual Operating Budget
Operations and Maintenance (LTSA, BOP, Spare Parts)	\$0	\$639,949	\$2,231,288	\$22,047	\$2,893,284
On-Site Labor and Station Power	\$0	\$1,554,000	\$0	\$0	\$1,554,000
Corporate Soft Costs (Asset Management, Software, Compliance, Insurance)	\$1,648,231	\$0	\$0	\$0	\$1,648,231
Total	\$1,648,231	\$2,193,949	\$2,231,288	\$22,047	\$6,095,515

¹ Operations expenses: on-site labor, locally performed service and maintenance work, locally sourced materials, and station power, including local taxes and fees (Illinois Retailers' Occupation Tax on locally sourced materials and utilities).

² Imported equipment and services: vendor service work dispatched from out-of-region hubs and imported spare parts and battery modules.

Across the Project's life, Project plans call for three battery augmentations which would also add approximately \$5.2 million of installation labor performed locally, over and above the average annual operations budget of \$6.1 million in those three years.

Geographic Distribution of Operations Expenses

Table 6 shows how the direct economic output from operations would be distributed between Tazewell County and outside the county. As in the construction analysis, this measure counts only the operations expenses that generate regional economic activity, and it excludes corporate soft costs, imported equipment and services, and the sales tax on imported equipment, each of which is treated separately.

Of the \$6.1 million annual operating budget, \$2,193,949 represents direct economic output, and an estimated \$1,334,099 (or 60.8 percent) of that amount would be captured in Tazewell County each year in the form of on-site labor, locally performed service and maintenance work, locally sourced supplies, station power, and the local share of sales tax. The split applies the same gravity-based labor-shed model used for the construction estimate, with 40 percent of operations labor accruing to Tazewell County workers.

Table 6. Direct Economic Benefits from Operations Expenses

Region	Average Annual Employment (FTE)	Labor Income	Supplies, Materials, and Equipment	Local Taxes and Fees	Total Output
Tazewell County	3.3	\$407,475	\$909,194	\$17,430	\$1,334,099
Out of County	4.9	\$611,212	\$198,839	\$49,799	\$859,850
Total	8.2	\$1,018,687	\$1,108,033	\$67,229	\$2,193,949

Note: FTE = full-time equivalent. The two-region split applies the gravity-based shares in the operations analysis, with 40 percent of operations labor, 50 percent of local materials, and 100 percent of station power accruing to Tazewell County. Consistent with the construction analysis, the table excludes corporate soft costs (\$1,648,231), imported equipment and services (\$2,231,288), and sales tax on imported equipment (\$22,047), which together account for the balance of the \$6.1 million annual operating budget. The Out-of-County row includes the \$49,799 state share of sales tax on local materials and station power.

Tax Revenue Resulting from Operations Spending

Direct operations activity generates \$67,229 per year in sales tax on locally sourced operating materials, BOP supplies, consumable spare parts, and station power purchased from the local utility, applied at the 6.75 percent Tazewell combined rate (Table 7). Of this amount, \$4,980 is the 0.50 percent county add-on retained by Tazewell County and \$12,450 is distributed to local governments through the state's local share, a combined \$17,430 to Tazewell County and its local districts, with the remaining \$49,799 accruing to the State of Illinois. One-time sales tax on imported augmentation equipment in Years 5, 9, and 13, together with property tax, is described under Fiscal Impacts.

Table 7. Estimated Annual Sales Tax from Operations

Recipient	County Level	Local (State-Distributed)	State of Illinois	Total
Tazewell County and local districts	\$4,980	\$12,450	\$0	\$17,430
State of Illinois	\$0	\$0	\$49,799	\$49,799
Total	\$4,980	\$12,450	\$49,799	\$67,229

Note: Operating materials and station power are purchased for use at the Project site in Tazewell County, so the local 1.75 percentage points of the rate stay with Tazewell County and its local districts; the 5.00 percent state share accrues to the State of Illinois.

Employment Benefits for Tazewell County from Operations

This section describes estimates of the direct economic benefits accruing within Tazewell County during operations. Direct operations labor income captured in Tazewell County is estimated at \$407,475 per year, out of \$1,018,687 across the operations workforce. The Tazewell County share supports 3.3 of the 8.2 FTE operations jobs each year over the 20-year operating life. The on-site team includes a plant or site manager, BESS field technicians, a substation and relay specialist, and an electrical engineer with operations support responsibilities, supplemented by long-term service agreement and BOP work performed by vendor crews and union trades dispatched from the regional labor market.

Table 8 provides estimates of the operations occupations directly associated with operating the Project, listed by average annual employment. The mix reflects the technical character of battery storage operations, anchored by skilled electrical and controls trades, with periodic electrician work dispatched from IBEW Local 34. Total compensation includes benefits supplementing wages and salaries.

Table 8. Average Annual Operations Occupations

Occupation	Average Annual Employment (FTE)	Average Hourly Total Compensation
Maintenance and Repair Workers (BESS Field Technicians)	2.3	\$42.00
Electrical and Electronics Repairers, Substation and Relay	1.3	\$82.95
Other Installation, Maintenance, and Repair Workers (BESS Specialists)	1.2	\$70.00
Electrical Engineers	1.1	\$68.00
Plant or Site Manager	0.8	\$80.00
Electrical and Electronic Engineering Technicians	0.5	\$45.00
Office and Administrative Support	0.4	\$35.00
Security Guards	0.4	\$38.95
Electricians	0.1	\$77.20

New Energy Technology Job Growth

Battery energy storage is now central to Illinois energy policy. The Clean and Reliable Grid Affordability Act, signed in January 2026, directs the state to bring 3,000 megawatts (MW) of grid-scale battery storage into commercial operation by the end of 2030, beginning with a 1,038 MW procurement in 2026 that includes 450 MW in the Midcontinent Independent System Operator (MISO) Zone 4 region of central and southern Illinois, which includes the Project's Tazewell County location. This rapid statewide expansion is broadening demand for skilled electrical, controls, and construction trades across central Illinois, deepening the regional workforce base that energy projects in the area draw on.

The skills required to operate a battery storage facility, including electrical and controls work, substation and relay maintenance, and high-voltage service, are durable and transferable, and they reinforce the regional trades base represented by IBEW Local 34, IUOE Local 649, and the other Peoria-Tazewell building trades. Demand for electricians and electrical power-line installers, the trades central to building and operating storage, is projected to grow faster than the average for all occupations over the

coming decade. As one of central Illinois's early utility-scale storage projects, the Project contributes to and benefits from this expanding technology and workforce base.

Fiscal Impacts

In addition to the construction and operations sales tax revenue described above, the Project would generate substantial property tax revenue over its 20-year operating life and substantial one-time sales tax revenue on the import of specialized equipment for initial construction. These fiscal impacts are described in this section.

Lifetime Total Property Tax Revenue

Property tax on the Project is calculated under Illinois's uniform statewide methodology for commercial battery energy storage systems, codified at 35 Illinois Compiled Statutes (ILCS) 200/10-920 and enacted as part of Public Act 104-0458 (the Clean and Reliable Grid Affordability Act, Senate Bill 25, signed January 2026). The statute takes effect with assessment year 2026 and applies in all Illinois counties outside Cook County (which includes Chicago and operates under a separate assessment framework). It replaces traditional cost-based or market-based assessment with a capacity-based valuation formula that produces a predictable property tax revenue stream for the developer and the overlapping local taxing districts. The statute sunsets after assessment year 2040. This analysis assumes the methodology is extended or replaced with an equivalent rule for years 2041 onward.

Under the statute, fair cash value is determined as \$65 per kilowatt-hour of rated energy capacity (2026 base year), trended by a statutory factor equal to the lesser of cumulative consumer price index growth since a fixed December 2024 base or 1.02. Because cumulative inflation since that base already exceeds 2 percent, the factor is held at the 1.02 ceiling for the life of the Project rather than compounding each year. Fair cash value is then reduced by an allowance for physical depreciation of 4 percent per year (straight line over 25 years), capped at a maximum total depreciation of 70 percent. Assessed value is 33.33 percent of fair cash value, with no equalization factor applied. The combined local tax rate is the sum of the rates levied by every taxing district whose boundaries overlap the project parcel.

The analysis assumes no property tax abatement, Enterprise Zone designation, or High Impact Business designation, so figures should be read as pre-abatement upper bounds. If the developer secures any such designation later, realized property tax revenue would be lower than projected.

Applied to the Project's 1,200 MWh-rated energy capacity, this methodology produces a 20-year nominal property tax revenue stream of \$21.1 million, with an average annual amount of \$1.06 million. The first full operating year (2030) is the peak year, at \$1.72 million. The annual revenue stream declines gradually as cumulative depreciation grows, reaching the 70 percent depreciation floor in operating year 18 and stabilizing at \$537,514 per year for the final years of the operating life (Figure 2).

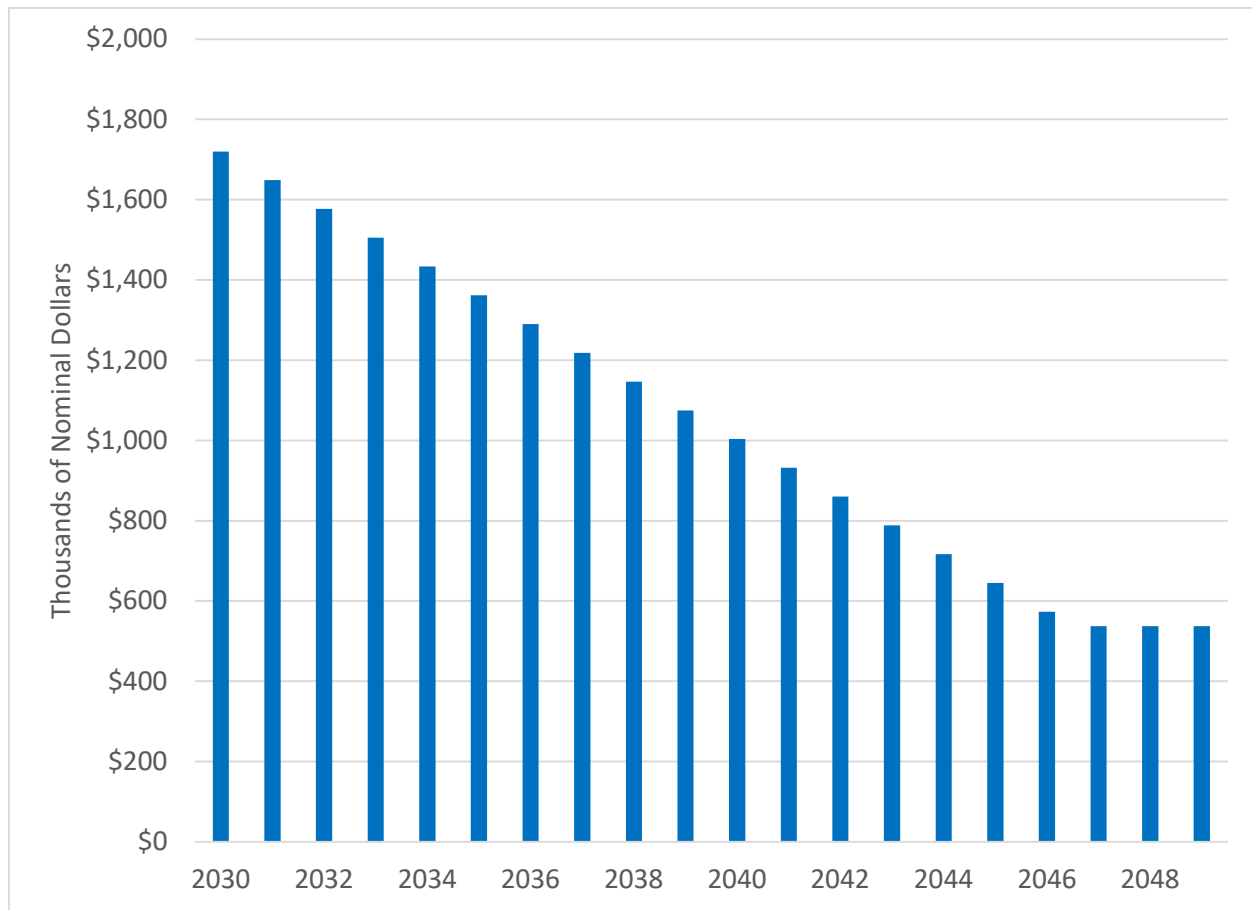


Figure 2. Estimated Annual Property Tax Revenue

Annual property tax payments are expressed in nominal (as-billed) dollars: because the trending factor is held at the 1.02 statutory cap, the trended cost basis is fixed at \$79,560,000 over the operating life, so the year-over-year decline reflects depreciation of the equipment rather than inflation.

Property Tax Revenue by District

Table 9 reports the 20-year property tax distribution across the eight overlapping taxing districts, in proportion to each district's share of the combined local tax rate of 6.75608 percent (the 2025 actual rate for Tax Code Area 11009, held constant over the operating life per standard convention). Tremont Community Unit School District 702 receives the largest share at 66.5 percent of the total. Brush Hill Fire Protection District receives 9.0 percent, Tazewell County itself receives 7.3 percent, and the remaining five taxing districts share the balance. District amounts in Table 9 are rounded to the nearest dollar and may not sum precisely to the total.

Table 9. Estimated Tazewell County 20-Year Property Tax Revenue by Taxing District, Nominal Dollars

Taxing District	Tax Rate	Lifetime Tax Revenue
Tremont Community Unit School District 702	4.49521%	\$14,043,288
Brush Hill Fire Protection District	0.61045%	\$1,907,080
Tazewell County	0.49500%	\$1,546,408
Illinois Central Community College (District 514)	0.45371%	\$1,417,415
Elm Grove Road and Bridge	0.24503%	\$765,487
Tremont District Library	0.22795%	\$712,129
Tremont Area Park	0.16552%	\$517,094
Elm Grove Township	0.06321%	\$197,472
Total	6.75608%	\$21,106,372

Source: 2025 payable 2026 tax bill for the parent parcel (Parcel Identification Number [PIN] 11-11-03-200-022). Combined rate held constant over the operating life per standard convention.

Sales Tax on Imported Equipment

In addition to property tax, the Project's purchase of \$291.4 million of imported specialized equipment generates substantial sales tax revenue. Under Illinois's destination-based Retailers' Occupation Tax sourcing rules (Public Act 103-0983, effective January 1, 2025), equipment delivered to the Project site is taxed at the 6.75 percent combined rate in effect at the delivery location.

The 6.75 percent tax on imported equipment generates \$19.7 million in tax revenue during construction, of which \$5.1 million is retained by Tazewell County and local taxing bodies. Battery augmentation in Years 5, 9, and 13 and the recurring import of replacement parts generate a further \$2.64 million over the operating life, for a lifetime total of \$22.31 million, of which \$5.78 million accrues to Tazewell County and local taxing bodies (Table 10). Of the 6.75 percent rate, 1.75 percentage points (25.9 percent of each sales tax dollar) stay local. The remaining 5.00 percentage points accrue to the State of Illinois. These figures assume no sales tax exemption. The Project's scale could qualify it for a High Impact Business designation, which would exempt the state share on qualifying equipment and reduce the local total to roughly \$1.7 million. Equipment imported directly by the developer and self-assessed under the 6.25 percent state Use Tax would likewise carry no local share.

Table 10. Estimated Sales Tax Revenue from Imported Equipment

Tax Authority	Construction (2028–2029)	Operations and Augmentation (Years 1–20)	Lifetime Total
State of Illinois Retailers' Occupation Tax	\$14,572,342	\$1,954,527	\$16,526,869
Tazewell County and local districts	\$5,100,319	\$684,084	\$5,784,403
Total Tax Revenue	\$19,672,661	\$2,638,611	\$22,311,272

The augmentation events are projected to total \$37.8 million across Years 5, 9, and 13, of which roughly \$32.6 million would be imported battery cells and modules. Because specialized battery equipment is manufactured overseas and delivered to the site, it is taxed as imported specialized equipment rather than as local operations spending, and it is the source of the augmentation portion of the sales tax included in Table 10.

Tax District Beneficiaries

The Project's property tax revenue is shared among the eight local taxing districts whose boundaries overlap the site, in proportion to each district's share of the combined tax rate. The descriptions below summarize each beneficiary and the revenue the Project would provide over its 20-year operating life. Lifetime amounts are nominal totals and the average annual figures are simple 20-year averages; the actual amount is highest in the first operating year and declines as the equipment depreciates.

Tremont Community Unit School District 702

Tremont Community Unit School District 702 educates roughly 900 students across three schools and operates on annual revenue of about \$14.9 million, most of it from local property tax. The district receives the largest share of the Project's property tax, an estimated \$14.0 million over the operating life, or about \$702,000 per year on average. This is the most significant local fiscal benefit of the Project.

Brush Hill Fire Protection District

The Brush Hill Fire Protection District provides fire protection and emergency response to the rural area that includes the Project site, funded almost entirely by local property tax. Over the operating life the Project would deliver an estimated \$1.91 million to the district, an average of about \$95,000 per year, a meaningful addition for a small district that depends on a limited tax base.

Tazewell County

Tazewell County provides countywide services, including public safety, the courts, roads, and health and human services, under an annual budget of about \$137.7 million. The Project would add an estimated \$1.55 million to the county's property tax revenue over the operating life, an average of about \$77,000 per year, accruing to the county's general tax base.

Illinois Central Community College (District 514)

Illinois Central College, community college District 514, serves the Peoria-Tazewell region from its East Peoria campus under an annual budget of roughly \$76.7 million. The Project would provide an estimated \$1.42 million to the college over the operating life, an average of about \$71,000 per year, supporting the workforce and technical training that serve the regional economy.

Elm Grove Road and Bridge

The Elm Grove Township road and bridge district maintains the local roads and bridges in the township, including those serving the Project area, with funding from local property tax. The Project would deliver an estimated \$765,000 to the road and bridge fund over its lifetime, averaging about \$38,000 per year.

Tremont District Library

The Tremont District Library serves about 4,900 residents and operates on roughly \$406,000 per year, the great majority of it from local property tax. The Project would provide an estimated \$712,000 to the library over the operating life, an average of about \$36,000 per year, equal to a substantial share of its annual budget.

Tremont Area Park

The Tremont Area Park District operates parks, a swimming pool, a fitness center, and community recreation programs, funded primarily by local property tax. The Project would deliver an estimated \$517,000 to the park district over the operating life, an average of about \$26,000 per year.

Elm Grove Township

Elm Grove Township provides general township functions, including general assistance and property assessment, for residents of the unincorporated area that includes the Project site. The Project would add an estimated \$197,000 to the township over its lifetime, averaging about \$10,000 per year.

Conclusion

Development of the Project would result in significant direct economic and fiscal benefits to Tazewell County. The developer would invest a total of \$463.1 million to construct the Project. Of that total, \$46.2 million in direct economic output would be captured in Tazewell County in the form of local labor, materials, contractor profit, and local taxes and fees. Construction would support an average of 214 full-time-equivalent jobs over the 18-month build, of which 85 jobs and \$17.4 million in direct labor income would accrue to Tazewell County workers.

Over the 20-year operating lifetime of the Project, the developer would invest \$6.1 million per year in operating the facility, with additional battery augmentation outlays of \$14.0 million in Year 5, \$14.0 million in Year 9, and \$9.7 million in Year 13. On-site operations and locally captured long-term service work would support 8.2 FTE jobs per year over the operating life, 3.3 of them held by Tazewell County workers.

The Project would also deliver substantial and lasting tax revenue to local government. Taken together, an estimated \$28.2 million in tax revenue would accrue to Tazewell County and its local taxing bodies over the 20-year operating life, combining three streams: property tax of \$21.1 million, local taxes and fees on locally sourced construction and operations spending of \$1.30 million, and the local share of sales tax on imported equipment of \$5.78 million. The State of Illinois would receive the larger portion of the imported-equipment sales tax (\$16.5 million of the \$22.3 million lifetime total), while the property tax and the local taxes and fees would remain entirely with local jurisdictions, providing a steady new revenue stream for the school district, fire district, county, community college, library, park district, road district, and township that serve the area.

In addition to the direct economic and fiscal benefits described in this report, the Project would advance Illinois's energy and grid-reliability objectives by adding 300 MW of fast-responding, dispatchable storage capacity to the regional grid. Battery storage at this scale provides energy arbitrage, ancillary grid services, and resource-adequacy contributions that help keep electricity service reliable and affordable.

References and Data Sources

Illinois Statutes and Public Acts

- Public Act 104-0458 (Clean and Reliable Grid Affordability Act, Senate Bill 25), effective June 1, 2026
- Public Act 103-0983 (Leveling the Playing Field for Illinois Retail Act; destination-based Retailers' Occupation Tax sourcing), effective January 1, 2025
- 35 ILCS 200/10-920 – Commercial Energy Storage System Valuation
- 35 ILCS 200/18-165 – Property Tax Abatement by Counties and Municipalities
- 820 ILCS 130 – Illinois Prevailing Wage Act
- 30 ILCS 565/5.5 – High Impact Business Designation (as amended by Public Act 103-1066)
- 35 ILCS 105/3-50 – Use Tax Act Exemptions

Illinois Department of Revenue (IDOR) Guidance

- IDOR Commercial Energy Storage Systems property tax page
<https://tax.illinois.gov/localgovernments/property/commercial-energy-storage-systems.html>
- IDOR Form PTAX-CESSV: Commercial Energy Storage Systems Valuation Schedule
- IDOR Use Tax and Local Use Tax Guidance <https://tax.illinois.gov/localgovernments/usetax.html>
- IDOR Leveling the Playing Field for Illinois Retail Act (destination-based ROT, effective January 1, 2025) <https://tax.illinois.gov/research/taxinformation/sales/level-the-playing-field.html>
- IDOR Publication PIO-114, How Sales and Use Taxes Are Distributed
- IDOR Informational Bulletin FY 2025-10 (Public Act 103-0983; destination-based Retailers' Occupation Tax)
- IDOR Building Materials Exemption Certification FAQs
<https://tax.illinois.gov/businesses/incentives/exemptionfaqs.html>

Illinois Administrative Code

- 86 Ill. Adm. Code 130.1940 – Construction Contractors and Real Estate Developers
- 86 Ill. Adm. Code 130.2075 – Sales to Construction Contractors and Real Estate Developers
- 86 Ill. Adm. Code 130.1952 – Sales of Building Materials to a High Impact Business
- 86 Ill. Adm. Code 270.115 – Retailers' Occupation Tax sourcing

Illinois Department of Commerce and Economic Opportunity (DCEO)

- High Impact Business Program overview, including eligibility for battery energy storage facilities
<https://dceo.illinois.gov/expandrelocate/incentives/highimpactbusinessprogram.html>

Tazewell County Records

- Tazewell County Clerk, 2024 Final Tax Computation Report (issued April 22, 2025)
<https://tazewell-il.gov>
- Tazewell County Property Tax Inquiry portal <https://tazewellil.devnetwedge.com>

Labor and Wage Data

- U.S. Bureau of Labor Statistics, Occupational Employment and Wage Statistics, Peoria, Illinois Metropolitan Statistical Area (May 2024) <https://www.bls.gov/oes/tables.htm>
- Illinois Department of Labor, Prevailing Wage Schedules (Tazewell County)
<https://labor.illinois.gov/laws-rules/conmed/rates.html>

Peoria-Tazewell Building Trades Unions

- IBEW Local 34 (Peoria, Bartonville) <https://www.ibew34.org>
- LiUNA Local 165 (Peoria) <https://greatplainslaborers.org/our-local-unions/laborers-local-165>
- IUOE Local 649 (Peoria) <https://iuoe649.org>
- Ironworkers Local 112 (East Peoria) <https://www.ironworkers112.org>
- Teamsters Local 627 (Peoria)

Third-Party Tax Analysis

- Avalara: Illinois implements new sales tax sourcing rules in 2025
<https://www.avalara.com/blog/en/north-america/2025/01/illinois-sales-tax-sourcing-rule-changes.html>
- Illinois CPA Society: Decoding Illinois's Major Sales Tax Exemptions
<https://www.icpas.org/information/copy-desk/insight/article/fall-2022/decoding-illinois-major-sales-tax-exemptions>

About Triple Point Strategic Consulting

Triple Point specializes in developing custom economic and financial models. Focus areas are energy, affordable housing, resource management, health assessments, sustainable tourism, and economic development. Triple Point has conducted numerous socioeconomic studies necessary for planning, resource allocation, approvals, the National Environmental Policy Act (NEPA), Colorado 1041, California Energy Commission (CEC) Opt-In, and other permitting. We deliver results for our clients with high-value and accurate information, as demonstrated by our many repeat clients.

Jeff Moffett, Ph.D., founded Triple Point Strategic Consulting in 2013 to provide marketing, strategic planning, and economic analysis services. Triple Point is active across the western United States and Canada, modeling for scenario planning, financial forecasting, and optimal decision-making. Economic impact studies are conducted using a combination of IMPLAN, RIMS II, and/or proprietary statistical models. Jeff earned his master's degree in Econometrics and a doctorate in Applied Statistics at the University of Washington, Seattle. For more information, visit www.tpsconsulting.net.

Nathan Perry, Ph.D., is the owner of Alvarium Economics, LLC, and is a Professor of Economics at Colorado Mesa University. Dr. Perry has conducted numerous regional studies on energy transition in Western Colorado, including oil and gas economic impacts, economic impact of coal transition, economic development strategies for coal transition, solar and wind economic impact modeling, nuclear power preference surveys, public lands, outdoor recreation, and rural economic development. Alvarium Economics, LLC specializes in regional economic development, economic forecasting, and economic impact analysis.

His academic work includes publications on deficits and debt, inflation, and the Great Depression. Dr. Perry produces quarterly economic newsletters for several counties in Western Colorado that dive into the regional economy including regional energy markets for coal, oil, and gas. He frequently presents economic conditions in Western Colorado, the national economy, and energy markets, and serves on the Governor's Revenue Estimating Advisory Committee (GREAC). He teaches courses in Money and Banking, Econometrics, and Macroeconomics.

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

APPENDIX 1 TO GIP INTERCONNECTION REQUEST

1. [The undersigned Interconnection Customer submits this request to interconnect its Generating Facility, located in Tazewell, , County, [IL State], with the Transmission System pursuant to the Tariff.] or;
[The undersigned MHVDC Connection Customer submits this request for Injection Rights for its MHVDC Transmission Line, located in Tazewell, , County, [IL State], with the Transmission System pursuant to a Tariff.]

2. This Interconnection Request is for (check one):

- ☒ Proposed new Generating Facility
- ☐ Increase in the generating capacity or a Material Modification of an Existing Generating Facility
- ☐ Replacement of Existing Generating Facility with no increase in capacity
- ☐ Interconnection Request made in connection with a Generating Facility proposed for inclusion in a resource solicitation process
- ☐ Network Resource Interconnection Service for a Generating Facility in Commercial Operation or with an executed GIA
- ☐ Generating Facility requesting Surplus Interconnection Service
- ☐ Fast Track Process for Small Generating Facility
- ☐ Injection Rights associated with a new MHVDC Transmission Line.

3. The type of interconnection service requested is (check one as appropriate):

- ☐ Energy Resource Interconnection Service only
- ☒ Network Resource Interconnection Service (includes Energy Resource Interconnection Service)

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

- ☐ Network Resource Interconnection Service only for an Existing Generating Facility
- ☐ Network Resource Interconnection Service in connection with a resource solicitation process
- ☐ Surplus Interconnection Service
- ☐ External Network Resource Interconnection Service (E-NRIS) for projects connecting to a Distribution System or non-MISO transmission system

4. Interconnection Customer provides the following definitive information:

- a. Specific address or location (use closest street or intersection if no address is available) for the proposed new Generating Facility site or, in the case of an Existing Generating Facility, the name and specific location of the Existing Generating Facility (provide a site map and GPS coordinates);

Address: 16783 Springfield Road

City: Pekin State: IL Zip: 61554

GPS Coordinates: 40.5622290588817 N -89.5345641688715 W

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

- b. The following specific information related to the Interconnection Service Requested:

Required Information Related to Interconnection Request			Additional Information/Documentation
Installed Generating Facility Capacity (Maximum Gross Output)	Summer (MW/MVAR): <u>362.3/119.08</u>	Winter (MW/MVAR): <u>362.3/119.08</u>	
Existing Interconnection Service, if any	ERIS (MW/MVAR): <u>∅</u>	NRIS (MW/MVAR): <u>∅</u>	Provide GIA, and SIS report for Existing Generating Facility
New Interconnection Service or Increase in Existing Interconnection Service Requested (Maximum Injection at POI)	ERIS (New) (MW/MVAR): <u>300/98.61</u> or ERIS (Increase) (MW/MVAR): <u>∅</u>	NRIS (New) (MW/MVAR): <u>300/98.61</u> or NRIS (Increase) (MW/MVAR): <u>∅</u>	Requested total ERIS must be less than or equal to Installed Generating Facility Capacity. Requested total NRIS must be less than or equal to total requested ERIS.
Station	Summer (MW/MVAR): <u>7/2.3</u>	Winter (MW/MVAR): <u>7/2.3</u>	

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

Service Load, if any			
Surplus Interconnection Service Requested (No increase in Existing Interconnection Service)	Surplus Interconnection Service (MW/MVAR): <u> / </u>		SIS report for existing unit and written statement pursuant to Section 6 of this Interconnection Request
“NRIS only”/ External NRIS	NRIS Only (MW/MVAR): <u> / </u>	External-NRIS (MW/MVAR): <u> / </u>	CP Node: Point of Interconnection: Bus Number in Power Flow Models:

- c. A description of the equipment configuration (i.e. Number of generators/inverters and number of Intermediate Step-up transformers, is this phase 2 of an existing project, etc.) for the entire Generating Facility:
The Battery Energy Storage System (BESS) facility has a net Point of Interconnection (POI) capacity of 300 MW. It comprises 370 Tesla inverters integrated into the system architecture. The facility is designed to deliver a total energy storage capacity of 1200 MWh, with a discharge duration of up to 4 hours, enabling efficient grid support and energy management.
- d. Generating Facility Commercial Operation Date 12/01/2030, Synchronization Date 10/01/2030, and required Interconnection Facilities In-Service Date 06/01/2030 by day, month, and year;

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

- e. Name, address, telephone number, and e-mail address of the Interconnection Customer. If the Interconnection Customer has designated an agent, include its agent's contact person:

Interconnection Customer

Company: Strata Clean Energy

Name: Hunter Burgett

Address: 800 Taylor St. #200,

City: Durham State: NC Zip: 27701

Phone: 9376201745 Email: Hunter.Burgett@StrataCleanEnergy.com

Interconnection Customer's Agent (if applicable)

Company Name:

Address:

City: State: Zip:

Phone: Email:

Agent's contact person:

- f. An Internal Revenue Service Form W-9 or comparable state-issued document for the Interconnection Customer submitting this Interconnection Request;
- g. As applicable, documentation proving the existence of a legally-binding relationship between the Interconnection Customer and any entity with a vested interest in this Interconnection Request (e.g., a parent company, a subsidiary, or financing company acting as agent for the Interconnection Customer) that the Interconnection Customer reasonably anticipates may claim rights or authority under this Interconnection Request. Such documentation may include but is not

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

limited to the Interconnection Customer's Articles of Organization and Operating Agreement describing the nature of the legally-binding relationship;

- h. Interconnection Customer's banking information, or the banking information of any entity with a legally-binding relationship to the Interconnection Customer, in accordance with Section 4(f) of this Appendix 1, that wishes to make payments and receive refunds on behalf of the Interconnection Customer and in association with this Interconnection Request;

Bank Name: [REDACTED]
Account Hol [REDACTED]
ABA Number: [REDACTED]
Account Numb [REDACTED]
Company: Lumina Energy Storage, LLC
Tax Reporting Name: Lumina Energy Storage, LLC
Tax ID: [REDACTED]
Address 800 Taylor St. Suite 200,
City: Durham
State: NC
Zip: 27701
Phone:
Email:

- i. Location of the proposed Point of Interconnection including the substation name or the name of the line to be tapped (including the voltage), the estimated distance from the substation endpoints of a line tap, and GPS coordinates (Not applicable to External NRIS Applications);
POI substation name: Tazewell or
POI line name:
POI Distance from endpoint 1: miles
POI Distance from endpoint 2: miles
Interconnection voltage: 345kV
Address: 16689 Springfield Road
City: Pekin State: IL ZipCode: 61554
GPS Coordinates: 40.56256564379617N -89.53685923383517W

- j. Generating Facility Data (set forth in Attachment A);

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

k. Fuel Source(s) [Check all that are applicable]:

- | | | |
|--------------------------------------|----------------------------------|--|
| ☐ Coal | ☐ Nuclear | ☒ Storage, specify type:
<u>Battery Storage</u> |
| ☐ Hydro | ☐ Oil | ☐ Wind |
| ☐ Natural Gas | ☐ Solar | ☐ Other, specify type: |

Describe the configuration of Generating Facility utilizing more than one fuel source:

Battery Storage Facility with a net POI capacity of 300 MW. The Facility is made up of 370 Tesla MP2XL Inverters

If the proposed Generating Facility includes storage device(s), indicate whether the storage device(s) will be charged using energy from the Transmission System at any time: Yes ☒ or No ☐. If Yes, specify maximum MW that will be withdrawn from the Transmission System at any time: 300 MW;

- l. Qualifying Facility status including an indication of state and / or federal qualifications that have been met (optional);
- m. If this Interconnection Request is made in connection with a resource solicitation process, attach a copy of a written agreement assigning the Interconnection Customer's rights under the GIP to the solicitor of the process and granting the solicitor the right to act as the Interconnection Customer's agent for all purposes in the GIP;

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

- n. If this Interconnection Request is for Surplus Interconnection Service, attach a copy of the MISO Interconnection System Impact Study performed for the Existing Generating Facility when the Generating Facility was originally proposed for interconnection to the MISO Transmission System or, for Generating Facilities studied under a predecessor transmission provider's interconnection process, the original system impact study performed at the time such Generating Facility was originally studied for interconnection to the transmission system. If no such study is available, indicate this by checking the appropriate box below.
 - Study Attached (if this box is checked, a copy of the study must be included as an attachment to this Interconnection Request); or
 - No previous study is available;
- o. Energy Displacement Agreement (Appendix 12) and Monitoring and Consent Agreement (Appendix 11). In order for a Surplus Interconnection Request to remain valid, the Energy Displacement Agreement and Monitoring and Consent Agreement must be submitted prior to the conclusion of Generator Interconnection Agreement negotiations, pursuant to Section 11 of this GIP;
- p. Primary frequency response operating range for electric storage resources;
- q. If this Interconnection Request is for Generating Facility Replacement, Interconnection Customer must submit:
 - Planned or Actual date of cessation of operation for the Existing Generating Facility ;
 - Expected Commercial Operation Date for the Replacement Generating Facility: ٠

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

- r. For Interconnection Requests proposing to share Interconnection Facilities with another Interconnection Request or existing project, a consent agreement meeting the requirements of Section 3.3.1.3 of the GIP and the Generator Interconnection Business Practices Manual executed by the applicable Transmission Owner and all Interconnection Customers affiliated with projects that propose to connect, or are connected, to the shared Interconnection Facilities.

- ☐ (check if applicable) Interconnection Customer proposes to share Interconnection Facilities with another Interconnection Request or existing project and has attached a fully executed consent agreement to this Interconnection Request.

If Interconnection Facilities will be shared, the MISO Project Number(s) of other Existing Generating Facilities or Interconnection Requests with which Interconnection Facilities will be shared shall be listed below. If no project number is available for any of the other Generating Facilities with which Interconnection Facilities will be shared, state the name of the Interconnection Customer and describe the applicable Generating Facilities below:

- 5. Interconnection Customer shall provide the applicable deposit amount as specified in the GIP;

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

6. If this Interconnection Request is submitted to request Surplus Interconnection Service, the undersigned Interconnection Customer shall supply a written statement from an officer of the Existing Generating Facility that is associated with this request for Surplus Interconnection Service that confirms the following:
 - (i.) the amount of Surplus Interconnection Service made available by the Interconnection Customer of the Existing Generating Facility;
 - (ii.) the type of Interconnection Service (i.e., ERIS or NRIS) made available by the Interconnection Customer for the Existing Generating Facility in accordance with the provisions in Section 3.2.3.1 of GIP (Attachment X); and
 - (iii.) the circumstances under which the proposed Surplus Interconnection Service would be available, including an indication of whether the proposed Interconnection Service would be available on a continuous basis (i.e., a certain number of MW of Surplus Interconnection Service would always be available for use by a co-located generating facility) or on a scheduled, periodic basis (i.e., a specified number of MW of Surplus Interconnection Service that would be available intermittently).
7. Evidence of Site Control as specified in the GIP (check one)
☒ Is attached to this Interconnection Request
☐ Will be provided at a later date in accordance with the GIP
8. This Interconnection Request shall be submitted electronically to the Transmission Provider in the manner specified by the Generator Interconnection Business Practices Manual (BPM-015).

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

9. Primary Representative of Interconnection Customer to contact:

[To be completed by Interconnection Customer]

Name: Hunter Burgett

Address: 800 Taylor St. STE 200,

City: Durham State: NC Zip: 27701

Phone: 9376201745 Email: Hunter.Burgett@StrataCleanEnergy.com

Effective On: June 19, 2021

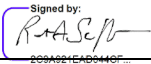
MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

10. This Interconnection Request is submitted by:

[Name of Interconnection Customer Company]

Lumina Energy Storage, LLC

By (signature):  Signed by:
20240515A00448F...

Name (type or print): Robert A. Schaffeld, III

Title: Authorized Signatory

Date: 5/23/2025 | 12:15 PM EDT

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

**Attachment A to Appendix 1
Interconnection Request**

GENERATING FACILITY DATA

A. Unit Ratings

1. Total Generator Rated Output (MW)	362.304
2. Rated MVA	407
3. Number of Generating units (repeat items 3-11 for each type of generator)	370
4. Individual generator rated output (MW)	0.9792
5. Individual generator rated MVA	1.1
6. Manufacturer	Tesla Megapack 2XL
7. Year manufactured*	
8. Nominal terminal voltage (kV)	0.48
9. Minimum Short Circuit Ratio for turbine operation	1.2
10. Rated power factor Refer: i. FERC Order No. 827_ https://www.ferc.gov/whats-new/comm-meet/2016/061616/E-1.pdf ii. MISO TO power factor requirements_ https://cdn.misoenergy.org/Reactive_Generator_Requirements108137.pdf	0.8901818182
11. Generator Voltage Regulation range (+/-)	1.1/0.9
12. Generator Power Factor Regulation range (+/-)	1 / 0.9
13. Primary frequency response operating range for electric storage resources: i. Minimum state of charge: ii. Maximum state of charge:	<u>0</u> <u>0</u>
14. Type (Induction, Synchronous, D.C. with Inverter)	D.C with Inverter
15. Connection (Delta, Grounded WYE, Undergrounded WYE, Impedance Grounded)	Underground WYE

***If available**

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

A-1. Generator Short Circuit Information*

(Provide following reactances in p.u. on the generator base)

1. X''1—Positive sequence sub transient reactance (p.u.)	0.53
2. X2—Negative sequence reactance (p.u.)	10
3. X0—Zero sequence reactance (p.u.)	10
4. Generator grounding: 4.a. Solidly grounded (yes/no) <u>Yes</u> 4.b. Grounded through an impedance (yes/no) <u>No</u> If yes: R p.u. X p.u. 4.c. Ungrounded <u>No</u>	

A-2. Main Generator Step-up Up (GSU) Transformer

(Please fill out data in table below for each GSU transformer)

Number of Transformers 2

RATINGS

	Self-Cooled	Maximum Nameplate	
Capacity (kVA)	112500	187500	
	Generator Side	System Side	Tertiary
Voltage Ratio (kV)	34.5	345	13.8
	Low Voltage	High Voltage	Tertiary Voltage
Winding Connections (Delta or Wye)	Wye	Wye	Delta
IMPEDANCE	Primary - Secondary	Primary – Tertiary	Secondary - Tertiary
Positive Z1 (on self-cooled kVA rating)	<u>8.5%</u> <u>27X/R</u>	<u>8.5%</u> <u>27X/R</u>	<u>8.5%</u> <u>27X/R</u>
Zero Z0 (on self-cooled kVA rating)	<u>8.5%</u> <u>27X/R</u>	<u>8.5%</u> <u>27X/R</u>	<u>8.5%</u> <u>27X/R</u>
	Fixed Taps Available	Present Tap Setting	
TAP SETTING	33	Nominal	

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

A-3. Pad Mount Transformer

(Please fill out data in table below for each GSU transformer)

Number of Transformers 93

RATINGS

	Self-Cooled	Maximum Nameplate	
Capacity (kVA)	4.4	4.4	
	Generator Side	System Side	Tertiary
Voltage Ratio (kV)	0.48	34.5	
	Low Voltage	High Voltage	Tertiary Voltage
Winding Connections (Delta or Wye)	Wye	Delta	
IMPEDANCE	Primary-Secondary	Primary – Tertiary	Secondary – Tertiary
Positive Z1 (on self-cooled kVA rating)	<u>7</u> % <u>9.7</u> X/R	% X/R	% X/R
Zero Z0 (on self-cooled kVA rating)	<u>7</u> % <u>9.7</u> X/R	% X/R	% X/R
	Fixed Taps Available	Present Tap Setting	
TAP SETTING	<u>Nominal</u>	<u>5</u>	

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

A-4. Interconnection Facilities Tie Line Information

(Only list data for lines that are to be added by the generation developer)

1. Nominal Voltage (kV)	345	
2. Line length (miles)	0.23	
3. Line termination points	1. Collector Substation	2. Tazewell 345kV Substation
4. Conductor Type/Size (kcm)	1590 MCM ACSR	
5. Phase Configuration (Vertical or Horizontal)	Horizontal	
6. Summer line ratings in amperes (MVA)	1354	
7. Positive sequence resistance (R) for entire length (in p.u.*)	1.28824e-05	
8. Positive sequence reactance (X) for entire length (in p.u.*)	3.86473e-05	
9. Zero sequence resistance (R0) for entire length (in p.u.*)	2.57649e-05	
10. Zero sequence reactance (X0) for entire length (in p.u.*)	7.2947e-05	
11. Positive sequence line charging (B) for the entire length (in p.u.*)	0.00109505	

* On 100-MVA and nominal line voltage (kV) Base

For wind/photovoltaic plants, provide System Equivalence Impedance Data. (Provide values for each equivalence collector circuit at all voltage levels. Equivalent collector system impedance does not include pad mount impedance)

1. Nominal Voltage (kV)	34.5
2. Summer line ratings in amperes (MVA)	6140
3. Positive sequence resistance (R) for entire length (in p.u.*)	8.59885e-05
4. Positive sequence reactance (X) for entire length (in p.u.*)	0.000104364
5. Zero sequence resistance (R0) for entire length (in p.u.*)	0.000229297
6. Zero sequence reactance (X0) for entire length (in p.u.*)	7.23587e-05
7. Positive sequence line charging (B) for the entire length (in p.u.*)	2.2644e-05

* On 100-MVA and nominal line voltage (kV) Base

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

A-5. Dynamic Modeling Information

The Interconnection Customer is to provide the appropriate PSS/E library model in the form of a Siemens PTI PSS/E dyr file. A detailed model of a generator must include:

- Generator Model
- Excitation System Model
 - May be omitted if unit is operated under manual excitation control
- Turbine-Governor Model
 - May be omitted if unit doesn't regulate frequency
- Power System Stabilizer Model
 - May be omitted if device is not installed or not active
- Reactive Line Drop Compensation Model
 - May be omitted if device is not installed or not active

Models submitted must be acceptable and recommended in the NERC Acceptable Model List posted at: [http://www.nerc.com/comm/PC/Pages/System-Analysis-and-Modeling-Subcommittee-\(SAMS\)-2013.aspx](http://www.nerc.com/comm/PC/Pages/System-Analysis-and-Modeling-Subcommittee-(SAMS)-2013.aspx) and also comply with MISO MOD-032 Model Data Requirements & Reporting Procedures posted at: <https://www.misoenergy.org/planning/planning-modeling/mod-032-1>

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

A-6. ONE-LINE & MODEL INFORMATION

The Interconnection Customer shall provide a Power Flow model describing the generator in a format compatible with Siemens PTI PSS/E (.sav .raw, .idev, .py, .prj, or equivalent format as specified by MISO).

The Interconnection Customer is to provide the definitive one-line diagram for the POI - Information shall include:

- Breaker layout, bus configuration (if available) and number of generators
- The zero sequence impedance (if applicable)
- The distance from the collector substation to the POI referenced in miles and the line impedance
- If the POI is a line tap, distance from the tap to the endpoints of the existing line referenced in miles
- Generator step up (GSU) transformer data and collector substation transformer data, including impedances for each phase of the transformer (if applicable)
- For inverter based generators, FERC Order 827 requires
 - Location and size of any dynamic and/or static VAR compensation devices
 - Equivalent collector system impedance

Models submitted should comply with MISO's Model Data Requirements and Reporting Procedures posted at: <https://www.misoenergy.org/planning/planning-modeling/mod-032-1>

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

B. Synchronous Generator Information
(e.g. Biomass, Coal, Diesel, Hydro, Natural Gas, Nuclear, Oil)

1. (Repeat the following for each generator model) Rated Generator speed (rpm)			
2. Maximum Turbine MW (°F)			
3. Moment-of-Inertia, WR^2 (lb.ft. ² for combined Turbine-Generator-Exciter-Inertia Data)			
4. Inertia Constant, H (kW sec/kVA for combined Turbine-Generator-Exciter-Inertia Data)			
Reactance Data (Per Unit- Rated kVA)			
	Direct Axis	Quadrature Axis	
Synchronous-saturated	Xdv:	Xqv:	
Synchronous-unsaturated	Xdi:	Xqi:	
Transient – saturated	Xdv:	Xqv:	
Transient – unsaturated	Xdi:	Xqi:	
Subtransient – saturated	Xdv:	Xqv:	
Subtransient – unsaturated	Xdi:	Xqi:	
Negative Sequence - saturated	X2v:		
Negative Sequence - unsaturated	X2i:		
Zero Sequence – saturated	X0v:		
Zero Sequence – unsaturated	X0i:		
Leakage Reactance	Xlm:		
Field Time Constant Data (sec)			
Open Circuit	Td0:	Tq0:	
Three-Phase Short Circuit Transient	Td3:	Tq:	
Line-to-Line Short Circuit Transient	Td2:		
Line-to-Neutral Short Circuit Transient	Td1:		
Short Circuit Subtransient	Td:	Tq:	
Open Circuit Subtransient	Td0:	Tq0:	
Armature Time Constant Data (sec)			
Three Phase Short Circuit	Ta3		
Line-to-Line Short Circuit	Ta2		
Line-to-Neutral Short Circuit	Ta1		

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

Armature Winding Resistance Data (Per Unit)	
Positive	R1:
Negative	R2:
Zero	R0:
Rotor Short Time Thermal capacity I22t	
Field Current Rated kVA, Armature Voltage and, PF	= amps
Field Current Rated kVA, Armature Voltage and, 0 PF	= amps
Three Phase Armature Winding Capacitance	= microfarad
Field Winding Resistance	= ohms C
Armature Winding Resistance (per Phase)	= ohms C
5. Attach generator reactive capability curves	
6. Attach a plot of generator terminal voltage versus field current showing the air gap line, open-circuit saturation curve, and saturation curve at full load and rated power factor, and power quality curves specifying percent total harmonic distortion vertically and percent power output horizontally from 25 – 100% power output for both current and voltages or specify that the unit is IEEE 519 compliant	

B-1. Excitation System Information
(Repeat the following for each generator model)

1. Manufacturer and Type of excitation system used for the generator.	
2. Excitation System Response Ratio (ASA)	
3. Full load rated exciter output voltage	
4. Maximum exciter output voltage (ceiling voltage)	
5. Other comments regarding excitation system	
6. Attach IEEE block diagram of the excitation system and power system stabilizer (PSS) for computer representation in power system stability simulations and the corresponding excitation system and PSS constants for use in the model.	

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

B-2. Turbine Governor Information

(Repeat the following for each generator model and complete only section that applies to corresponding turbine type)

For all turbine types	a. Turbine manufacturer	
	b. Maximum turbine power output (MW)	
	c. Minimum turbine power output while on-line (MW)	
	d. Droop setting (speed regulation)	
	e. Is the governor mechanical-hydraulic or electro-hydraulic?	
	f. Other comments about turbine governor system?	
Steam, gas or combined cycle	a. Unit type (Steam, Gas, Combined Cycle)	
	b. If steam or combined-cycle, does turbine system have re-heat process (both high and low pressure turbines)?	
	c. If steam with reheat process, or if combined cycle, indicate low/high pressure turbine gas/steam (%)	
Hydro Turbines	a. Turbine efficiency at rated load (%)	
	b. Length of penstock (ft)	
	c. Average cross-sectional area of penstock (ft ²)	
	d. Typical maximum head (vertical distance from the bottom of the penstock, at the gate, to the water level (ft)	
	e. Water supply (run-of-the-river or reservoir)	
	f. Water flow rate at typical maximum head (ft ³ /sec)	
	g. Average energy rate (kWh/acre-ft)	
	h. Estimated yearly energy production (kWh)	

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

B-3. Induction Generator Information

1. Motoring Power (kW)	N/A
2. Neutral Grounding Resistor (If Applicable)	N/A
3. I22t or K (Heating Time Constant)	N/A
4. Rotor Resistance	N/A
5. Stator Resistance	N/A
6. Stator Reactance:	N/A
7. Rotor Reactance:	N/A
8. Magnetizing Reactance:	N/A
9. Short Circuit Reactance:	N/A
10. Exciting Current:	N/A
11. Temperature Rise:	N/A
12. Frame Size:	N/A
13. Design Letter:	N/A
14. Reactive Power Required In Vars (No Load):	N/A
15. Reactive Power Required In Vars (Full Load):	N/A
16. Total Rotating Inertia, H:	<u>N/A</u> in Per Unit on KVA Base

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

C. Non-Synchronous Generator Information

C-1. Wind Generators Information

1. Number of generators to interconnect pursuant to Interconnection Request	
2. Average site elevation	
3. Field Volts	
4. Field Amperes	
5. Heating time constant (I^2Rt)	
6. Rotor Resistance	
7. Stator Resistance	
8. Rotor Reactance	
9. Stator Reactance	
10. Exciting Current	
11. Temperature Rise	
12. Total Rotating inertia (H) (Per unit on 100 MVA Base)	
13. List of adjustable set- points for protective equipment or software*	
14. Generator type (e.g. GE doubly fed induction machine with back-to-back IGBT converters, or Micon induction generator)	
15. Generator voltage ride through capability	Min low-voltage threshold in percent to enable tripping Max low-voltage duration in seconds to enable tripping
16. Provide voltage flicker data, if available, for the wind generator model to be installed specified in percent of total voltage output. The data may be provided at 25, 50, 75, and 100% of output or in the form of a curve with the Y-axis showing percent of flicker versus total output and the X-axis showing percent load output from at least 25% to 100% of total output.	
17. Provide voltage dropout limits expressed in voltage level versus time	
18. Provide frequency dropout limits expressed in frequency versus time	
19. Provide reactive power capability curve	

*If available

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

C-2. Inverter-Based Parameters (e.g. Solar, Storage, Type 4 Wind Turbines)

1. Number of inverters to be interconnected	370
2. Inverter Manufacturer	Tesla
3. Inverter Model Name	Megapack 2 XL
4. Inverter Model Number	P110-EC24-GT01
5. Inverter Version Number	NA
6. List of adjustable set points for the protective equipment or software	Per Tesla Data Specifications
7. Maximum design fault contribution current	1.2
8. Harmonics Characteristics	Per Tesla Data Specifications
9. Start – up requirements	Per Tesla Data Specifications

***PSCAD models may be required/requested for inverter based resources as needed during the Generator Interconnection Process. If available please provide with application materials.**

MISO
FERC Electric Tariff
ATTACHMENTS

Appendix X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

**ATTACHMENT B TO APPENDIX 1 TO GIP
INTERCONNECTION STUDY AGREEMENT (GENERATING FACILITY)**

THIS AGREEMENT is made and entered into this 17, day of April, 2025 by and between Lumina Energy Storage, LLC, a Limited Liability Company organized and existing under the laws of the State of North Carolina, a (“Interconnection Customer,”) and the **Midcontinent Independent System Operator, Inc.**, a non-profit, non-stock corporation organized and existing under the laws of the State of Delaware, sometimes hereinafter referred to as the “Transmission Provider.” Interconnection Customer and Transmission Provider each may be referred to as a “Party,” or collectively as the “Parties.” Any capitalized term used herein but not defined herein shall have the meaning assigned to such term in the GIP and the GIA.

RECITALS

WHEREAS, Interconnection Customer is proposing to develop a Generating Facility or generating capacity addition to an Existing Generating Facility consistent with the Interconnection Request submitted by Interconnection Customer dated March 31, 2025; and

WHEREAS, Interconnection Customer desires to interconnect the Generating Facility with the Transmission System; and

WHEREAS, Interconnection Customer has requested Transmission Provider to perform Interconnection Studies and/or Provisional Interconnection Studies to assess interconnecting the proposed Generating Facility to the Transmission System, and of any Affected Systems;

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein the Parties agreed as follows:

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Appendix X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

- 1.0 When used in this Agreement, with initial capitalization, the terms specified shall have the meanings indicated in the Transmission Provider's Commission-approved GIP.
- 2.0 Interconnection Customer elects and Transmission Provider shall cause to be performed an Interconnection Study and/or an Provisional Interconnection Study consistent with the GIP in accordance with the Tariff, an Interconnection System Impact Study consistent with the GIP and an Interconnection Facilities Study consistent with the GIP, collectively referred to as the "Studies."
- 3.0 The Studies shall be based on the technical information provided by Interconnection Customer in the Interconnection Request, as may be modified as the result of the Scoping Meeting, study results, or any other reason identified in the GIP. Transmission Provider reserves the right to request additional technical information from Interconnection Customer as such information may reasonably become necessary consistent with Good Utility Practice during the course of the Studies and as designated in accordance with Section 3.3.3 of the GIP. If, after the designation of the Point of Interconnection pursuant to Section 3.3 of the GIP, Interconnection Customer modifies its Interconnection Request pursuant to Section 4.4, Transmission Provider may extend the time to complete The Studies.
- 4.0 **{Reserved}**
- 5.0 The Interconnection System Impact Study report shall provide the following information:

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Appendix X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

- identification of any equipment short circuit capability limits exceeded as a result of the interconnection;
- identification of any thermal overload or voltage limit violations resulting from the interconnection;
- identification of any instability or inadequately damped response to system disturbances resulting from the interconnection (including as necessary, transient stability, both large and small signal, sub synchronous stability, dynamic voltage stability, mid and long-term stability, voltage flicker analyses, and excessive neutral current studies in accordance with Good Utility Practice), and
- preliminary description and non-binding, good faith, planning level estimated cost of facilities required to interconnect the Generating Facility to the Transmission System and to address the identified short circuit, instability, and power flow issues.

6.0 The Interconnection Facilities Study shall provide draft GIA appendices and supporting documentation, which will: (i) provide a description, estimated cost of (consistent with Attachment A), and schedule for required facilities to interconnect the Generating Facility to the Transmission System and (ii) address the short circuit, instability, and power flow issues identified in the Interconnection System Impact Study.

7.0 Interconnection Customer shall provide deposits in the amount and timing outlined in Sections 3.3 of the GIP for the performance of the Studies.

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Appendix X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

Any difference between the deposit and the actual cost of The Studies shall be paid by or refunded to Interconnection Customer, as appropriate under Section 13.3 of the GIP.

- 8.0 Interconnection Customer may request all Base Cases and work papers associated with this Interconnection Request, subject to Transmission Provider provisions around acquiring Critical Energy Infrastructure Information.
- 9.0 Indemnity. To the extent permitted by law, each Party shall at all times indemnify, defend and hold the other Parties harmless from any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the other Party's performance, or non-performance of its obligations under this Agreement on behalf of the indemnifying Party, except in cases of gross negligence or intentional wrongdoing by the indemnified Party.
- 10.0 Limitation of Liability. Except with respect to the duties of defense and indemnity expressly provided in this Agreement, a Party shall not be liable to another Party or to any third party or other person for any damages arising out of actions under this Agreement, including, but not limited to, any act or omission that results in an interruption, deficiency or imperfection of Interconnection Service, except as provided in the Tariff. The provisions set forth in the Tariff shall be additionally applicable to any Party acting in good faith to implement or comply with its obligations under this Agreement, regardless of whether the obligation is preceded by a specific directive.

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Appendix X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

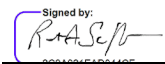
11.0 Miscellaneous. Except as otherwise provided herein, this Agreement shall include standard miscellaneous terms including, but not limited to, representations, disclaimers, warranties, governing law, amendment, execution, waiver, enforceability and assignment, that reflect best practices in the electric industry, that are consistent with regional practices, Applicable Laws and Regulations and the organizational nature of each Party. All of these provisions, to the extent practicable, shall be consistent with the provisions of the GIP and the GIA.

IN WITNESS THEREOF, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

**Midcontinent Independent
System Operator, Inc.**

By: 
Name: Aneta Godbole
Title: Resource Utilization Manger

Lumina Energy Storage, LLC

By: 
Name: Robert A. Schaffeld, III
Title: Authorized Signatory

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for Generating Facility
52.0.0

**ATTACHMENT C TO APPENDIX 1: UNIVERSAL NON-DISCLOSURE AND
CONFIDENTIALITY AGREEMENT**

PROJECT NO. J3946

This Universal Non-Disclosure and Confidentiality Agreement (the “Agreement”) is entered into on this 17 day of April, 2025 and effective as of 17 day of April, 2025 (the “Effective Date”), by and between Midcontinent Independent System Operator, Inc. (“MISO”) and Lumina Energy Storage, LLC, (“Company”) whose principal offices are located at 800 Taylor St. STE 200, Durham, NC 27701. MISO and Company each may be referred to individually as a “Party” or collectively as the “Parties.”

WHEREAS, MISO is prepared to disclose confidential information under this Agreement to Company in connection with MISO’s business with, or possible engagement of, Company (the “Purpose”);

WHEREAS, Company represents that it desires to receive confidential information pursuant to this Agreement; and,

WHEREAS, MISO and Company desire to set forth in writing the terms and conditions of their agreement.

NOW THEREFORE, in consideration of the mutual promises, covenants, representations and agreements contained in this Agreement and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for Generating Facility
52.0.0

- 1.0 Confidential Information.** “Confidential Information” as used in this Agreement means all information disclosed to Company by MISO or its employees, agents, contractors, representatives, consultants and advisors (collectively “Disclosing Party”) in connection with the Purpose. Confidential Information includes, without limitation, (i) any and all business, technical, marketing, financial or other information, whether in electronic, oral or written form; (ii) trade secrets, business plans, techniques, methods, or systems, data, know-how, formulae, compositions, designs, sketches, mock-ups, prototypes, photographs, charts, graphs, forms, documents, drawings, samples, inventions, ideas, research and development, customer and vendor lists (including, without limitation, the identity, characteristics, contact persons, product and service needs thereof), rates, price lists, computer software programs and systems, financial statements, and budgets; (iii) all memoranda, summaries, notes, analyses, compilations, studies or those portions of other documents prepared by Company to the extent they contain or reflect such information of, or the contents of discussions with the Disclosing Party (“Company’s Material”), including the contents or existence of discussions or negotiations related to the Purpose; (iv) information not generally known or readily ascertainable; (v) information that provides a competitive advantage for Disclosing Party; and (vi) information that is marked “Confidential” or nonpublic information which under the circumstances surrounding disclosure a reasonable person would conclude should be treated as confidential. Confidential Information shall not include information that (a) is or becomes part of the public domain other than as a result of disclosure by Company, (b) becomes available to Company on a non-confidential basis from a source other than Disclosing Party, provided that, to the best of Company’s knowledge, such source is not prohibited from transmitting such information by a contractual, legal, or other obligation, or (c) was in Company’s possession prior to disclosure of the same by Disclosing Party.
- 2.0 Non-Use; Protection and Dissemination of Confidential Information.** Company agrees not to disclose, discuss, use, reproduce, duplicate, distribute, copy, reconstruct or

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for Generating Facility
52.0.0

in any way communicate, directly or indirectly, the Confidential Information for purposes other than in connection with the Purpose. Company shall not disclose, discuss, use, reproduce, duplicate, distribute or in any way communicate, directly or indirectly, the Confidential Information to any other party and will use all reasonable efforts to protect the confidentiality of such information. Company will require that Company's employees, officers, directors, agents, contractors, representatives, consultants and advisors who need to have access to such Confidential Information in order to assist Company in connection with the Purpose (1) are aware of the Company's confidentiality obligation hereunder, and (2) agree to be bound by such confidentiality obligations. Company shall notify Disclosing Party immediately of any loss, misuse, or misappropriation of any Confidential Information of which Company becomes aware.

3.0 Ownership and Return. All Confidential Information, including Company's Material, shall be and remain the property of Disclosing Party, and no right or license is granted to Company with respect to any Confidential Information. No transfer or creation of ownership rights in any intellectual property comprising Confidential Information is intended or shall be inferred by the disclosure of Confidential Information by Disclosing Party, and any and all intellectual property comprising Confidential Information disclosed and any derivations thereof, shall continue to be the exclusive intellectual property of Disclosing Party. Upon the termination by any Party of the Purpose, or sooner if so requested, Company agrees to immediately return all Confidential Information, including Company's Material, to Disclosing Party or to destroy all Confidential Information, including all copies of the same, however, Company shall not be required to destroy Confidential Information that has become embedded in Company's planning models. Upon request, the fact of any such destruction shall be certified in writing to Disclosing Party by Company. Nothing in this Agreement obligates Disclosing Party to disclose any information to Company or creates any agency or partnership relation between them.

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for Generating Facility
52.0.0

- 4.0 Compliance and Protection of Confidential Information.** Company represents and warrants that it has practices and procedures adequate to protect against the unauthorized release of Confidential Information received. Company must educate its employees, agents, and assigns in the provisions of this Agreement and provide to Disclosing Party upon request any information necessary to determine compliance with the terms of this Agreement.
- 5.0 Indemnification.** To the extent permitted by law, Company agrees to indemnify, hold harmless and defend MISO, its employees, principals (owners, partners, shareholders or holders of an ownership interest, as the case may be), agents, contractors, representatives, consultants and/or advisors against any and all liability, loss, costs, damages, expenses, claims or actions, joint or several, arising out of or by reason of any breach of this Agreement by Company and/or Company's employees, agents, contractors, representatives or consultants, or arising out of or by reason of any act or omission of Company and/or Company's employees, agents, contractors, representatives or consultants in the execution, performance, or failure to adequately perform their obligations under this Agreement. For purposes of this Section, to "indemnify" means to defend and pay all expenses (including reasonable attorneys' fees) and satisfy all judgments (including costs and reasonable attorneys' fees) which may be incurred or rendered against MISO, its employees, principals (owners, partners, shareholders or holders of an ownership interest, as the case may be), agents, contractors, representatives, consultants and/or advisors.
- 6.0 Compelled Disclosure.** If Company is requested or required by legal or administrative process to disclose any Confidential Information, Company shall promptly notify Disclosing Party of such request or requirement so that Disclosing Party may seek an appropriate protective order or other relief. In any case, Company will (a) disclose only that portion of the Confidential Information that its legal counsel advises is required to be disclosed, (b) use its reasonable efforts to ensure that such Confidential Information is

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for Generating Facility
52.0.0

treated confidentially, including seeking an appropriate protective order, and (c) notify Disclosing Party as soon as reasonably practicable of the items of Confidential Information so disclosed.

- 7.0 Remedies.** The Parties acknowledge that remedies at law may be inadequate to protect Disclosing Party against any actual or threatened breach of this Agreement by Company, and, without prejudice to any other rights and remedies otherwise available to Disclosing Party, agree to the immediate granting of preliminary and final injunctive relief (without prior notice and without posting any bond) in favor of Disclosing Party to enjoin and restrain any breach or violation, either actual or anticipatory, of this Agreement.
- 8.0 Purpose.** None of the Parties will be under any legal obligation of any kind whatsoever with respect to the Purpose by virtue of this Agreement, except for the matters specifically agreed to herein. No representation or warranty is made by the Disclosing Party as to the accuracy or completeness of any information provided to the Company.
- 9.0 Term and Termination.** Company's obligations under this Agreement shall be effective on the date set forth above and shall be perpetual, notwithstanding any expiration, cancellation or termination of this Agreement. Upon termination of the Agreement, Company shall either promptly (1) deliver or cause to be delivered to Disclosing Party or (2) certify to the Disclosing Party the destruction of, all Confidential Information, including all copies of the Confidential Information in Company's possession or control including, without limitation, originals and copies of documents, customer lists, prospect lists, price lists, operations manuals, and all other documents reflecting or referencing the Confidential Information, as well as all other materials furnished to or acquired by Company to facilitate the Purpose of the Agreement.
- 10.0 Agency.** This Agreement is binding on Company, its employees, agents, contractors, representatives, consultants, advisors, successors and assigns. In the event of a dispute regarding liability for breach of this Agreement, common law agency principles apply.

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for Generating Facility
52.0.0

- 11.0 Waiver.** No waiver of any of the provisions of this Agreement will be deemed or will constitute a waiver of any other provision, whether or not similar, nor will any waiver constitute a continuing waiver. No waiver will be binding unless executed in writing by an authorized representative of the Party making the waiver. The failure of either Party in any one or more instances to insist upon strict performance of any of the terms and conditions of this Agreement will not be construed as a waiver or relinquishment, to any extent, of the right to assert or rely upon any such terms or conditions on any future occasion.
- 12.0 Modification.** This Agreement may not be amended except in a writing signed by authorized representatives of both Parties.
- 13.0 Governing Law.** Indiana law shall govern the interpretation and implementation of the Agreement and the resolution of any dispute between the parties regarding the effect of the Agreement without giving effect to principles of conflicts of law, and shall supplement, but not replace, the Uniform Trade Secrets Act as enacted by the State of Indiana. Each Party hereby submits itself for the sole purpose of this Agreement and any controversy arising hereunder to the exclusive jurisdiction of the federal or state courts located in the State of Indiana serving the counties of Hamilton and Marion, and any courts of appeal therefrom, and waives any objection (on the grounds of lack of jurisdiction, or forum not convenient or otherwise) to the exercise of such jurisdiction over it by any such courts.
- 14.0 Severability and Survival.** Should any clause, portion or paragraph of this Agreement be unenforceable or invalid for any reason, such unenforceability or invalidity will not affect the enforceability or validity of the remainder of this Agreement, and any court having jurisdiction is specifically authorized and encouraged by the Parties to hold inviolate all portions of this Agreement that are valid and enforceable without consideration of any invalid or unenforceable portions hereof.

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for Generating Facility
52.0.0

- 15.0** The headings of the sections in this Agreement are for the purposes of convenient reference only and are not intended to be part of this Agreement, or to limit or affect the meaning or interpretation of any of the terms hereof.
- 16.0 Assignment and Succession.** This Agreement shall inure to the benefit of and be binding upon the successors and permitted assigns of the Parties hereto. Any successor to or assignee of MISO shall assume its rights and obligations under this Agreement with or without notice to Company. Company may not assign its rights hereunder without the written permission of MISO.
- 17.0 Attorney's Fees.** If Company breaches or defaults in the performance of any of the covenants, agreements, representations, or warranties described in this Agreement, then in addition to any and all of the rights and remedies which MISO may have against Company, Company will also be liable to and pay MISO its court costs and reasonable attorney's fees incurred in enforcing MISO's covenants, agreements, representations and warranties herein.
- 18.0 Employees Bound by Agreement.** The representative executing this Agreement hereby acknowledges and agrees that he/she is duly authorized to execute this Agreement on behalf of Company and that this Agreement shall bind and be enforceable by and against the employees, agents, or consultants of Company. The authorized representative of Company further acknowledges and agrees that only those employees who are listed on the attached Appendix A incorporated herein shall be authorized to receive Confidential Information directly from MISO and that he/she will notify MISO in writing of any modification to Appendix A prior to releasing Confidential Information to those employees listed on Appendix A.
- 19.0 Notices.** All notices and other communications hereunder shall be in writing and shall be deemed given if delivered personally or by commercial delivery service, or mailed by registered or certified mail (return receipt requested) or sent via facsimile (with

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for Generating Facility
52.0.0

acknowledgment of complete transmission) to the parties at the following addresses (or at such other address for a party as shall be specified by like notice):

if to MISO, to: 720 West City Center Drive
Carmel, Indiana 46032
Attn: General Counsel
Facsimile No.: (317) 249-5912

if to Lumina Energy Storage, LLC, to: 800 Taylor St. STE 200

Durham, NC 27701
Facsimile No.: (919) 960-6015

20.0 Entire Agreement. The Parties agree that this Agreement, including Appendix A incorporated herein and as modified, constitute their entire agreement with respect to the subject matter hereof and that it supersedes any prior agreements or understandings between them, whether written or oral.

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for Generating Facility
52.0.0

Company acknowledges that it has read the Agreement, had the opportunity to discuss it with counsel, and is executing it with an understanding of its provisions. This Agreement may be executed in two or more counterparts, each of which will be deemed an original and all of which together will constitute one and the same document.

remainder of page left intentionally blank

[signatures appear on following page]

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for Generating Facility
52.0.0

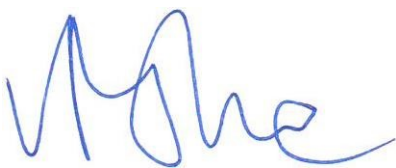
IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed,
effective as of the day, month and year written above.

Midcontinent Independent System Operator, Inc.

**Midcontinent Independent System
Operator, Inc.**

Company:

Lumina Energy Storage, LLC

By: 

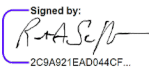
Print name: Aneta Godbole

Title: Resource Utilization Manager

Date: 6/2/2025

Phone: 317-617-8476

Fax: n/a

Signed by:

2C9A921EAD044CF...

By: _____

Print Name: Robert A. Schaffeld, III

Title: Authorized Signatory

Date: 5/23/2025 | 12:15 PM EDT

Phone: (919) 960-6015

Fax: _____

Effective On: June 19, 2021

MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

ATTACHMENT E TO APPENDIX 1: SITE CONTROL DEMONSTRATION

Midcontinent Independent System Operator, Inc.
Attn: Manager, Queue Administration
720 City Center Drive
Carmel, IN 46032

April 17, 2025

Subject: Proof of Site Control Affidavit

1. The undersigned (“Affiant”) is an officer or an agent of the Interconnection Customer for the Interconnection Request associated with **Lumina Energy Storage**.
2. Affiant affirms that all of the Site Control documents for **Lumina Energy Storage** required pursuant to Section 7.2 of Attachment X of the MISO Tariff are submitted to MISO in their entirety.
3. Affiant has reviewed all such Site Control documents submitted for **Lumina Energy Storage** and has personal knowledge of its contents.
4. **Affiant hereby affirms that the Interconnection Customer [PLEASE SELECT FROM THE FOLLOWING]:**
☐ (1) possesses Site Control for **Lumina Energy Storage** in accordance with Sections 7.2.1.1 of this GIP; OR
☒ (2) is presently subject to regulatory restrictions that preclude Interconnection Customer from obtaining Site Control for **Lumina Energy Storage** pursuant to Section 7.2.1.2 of this GIP].

Effective On: June 19, 2021

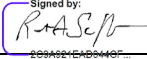
MISO
FERC Electric Tariff
ATTACHMENTS

Attachment X: Appendix 1
Interconnection Request for a Generating Facility
52.0.0

**5. [TO THE EXTENT THAT REGULATORY RESTRICTIONS PRECLUDE SITE
CONTROL PURSUANT TO GIP SECTION 7.2.1.2]**

In accordance with Section 7.2.1.2 of the GIP, attached hereto the affiant provides a description of conditions that must be met in order to satisfy the regulatory restrictions and the anticipated time by which the Interconnection Customer expects to satisfy the regulatory restrictions.

Sincerely,

Affiant signature:  _____
Signed by: 255A521EAD50446F...

Affiant printed name: Robert A. Schaffeld, III

Affiant title: Authorized Signatory

Affiant company name: Lumina Energy Storage, LLC

Effective On: June 19, 2021



Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
<http://dnr.state.il.us>

JB Pritzker, Governor

Jim Montgomery, Director

October 19, 2026

Allen Wynn
Lumina Energy Center, LLC
800 Taylor Street, Suite 200
Durham, NC 27701

RE: Lumina Energy Center
Project Number(s): 2706500 [2706196]
County: Tazewell

Dear Applicant:

This letter is in reference to the project you recently submitted for consultation. The natural resource review provided by EcoCAT identified protected resources that may be in the vicinity of the proposed action. The Department has evaluated this information and concluded that adverse effects are unlikely. Therefore, consultation under 17 Ill. Adm. Code Part 1075 is terminated.

However, if tree clearing is necessary, the Department recommends removing trees between November 1st and March 31st to avoid impacts to birds and bats.

This consultation is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, you must comply with the applicable statutes and regulations. Also, note that termination does not imply IDNR's authorization or endorsement of the proposed action.

Please contact me if you have questions regarding this review.

Isabella Allyn
Division of Ecosystems and Environment
217-785-5500

PROTECTED SPECIES AND HABITAT ASSESSMENT:

LUMINA ENERGY STORAGE, LLC PROJECT TAZEWELL COUNTY, ILLINOIS

21 July 2025

Prepared for:

Lumina Energy Storage, LLC
800 Taylor Street, Suite 200
Durham, NC 27701

Prepared by:



Environmental Solutions & Innovations, Inc.

4525 Este Avenue
Cincinnati, Ohio 45232
Phone: (513) 451-1777
Fax: (513) 451-3321

Indianapolis, IN • Ravenna, OH • Pittsburgh, PA • Teays Valley, WV • Houston, TX • Orlando, FL

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
2.0 METHODS	1
2.1 Database Review	1
2.1.1 Protected or Managed Lands	1
2.1.2 Potential Species Occurrence	2
2.2 Field Habitat Assessment	2
3.0 RESULTS	3
3.1 Database Review	3
3.1.1 Protected or Managed Lands	3
3.1.2 Potential Species Occurrence	3
3.1.2.1 Federally Protected Species	3
3.1.2.2 State Protected Species.....	3
3.2 Field Habitat Assessment	4
4.0 CONCLUSION	5
5.0 LITERATURE CITED	5

Appendices

Appendix A: Figures

Appendix B: USFWS IPaC Official Species List and Determination Keys

Appendix C: Tables

Appendix D: Ecological Compliance Assessment Tool Results

Appendix E: Representative Habitat Photographs

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1.0 Introduction

Lumina Energy Storage, LLC is evaluating an area in Tazewell County, Illinois for potential development of the Lumina Energy Storage Project (Project; Appendix A, Figure 1). The total secured acreage of the Project's proposed area of investigation (AOI) is approximately 25.5 acres (10.32 ha) and encompasses a single parcel: 11-11-03-200-019. The Project is approximately 5.0 miles (8.0 km) east of Pekin, Illinois and just south of Broadway and west of Springfield Avenue. The AOI is at approximate central coordinates: latitude 40.565932 N, longitude -89.537738 W.

On behalf of Lumina Energy Storage, LLC, Environmental Solutions & Innovations, Inc. (ESI) completed a field assessment of the Project AOI for rare, threatened, and endangered (RTE) species habitat 22 May 2025. This report details methods and results of desktop analyses of publicly available data, agency database inquiries, and on-site assessments.

2.0 Methods

2.1 Database Review

Data acquired from the following databases are uploaded to the ESRI ArcMap (ESRI 2021) geospatial information system (GIS), and a 3-mile (4.8-km) buffer is applied to the AOI's boundary to determine whether the Project spatially overlaps protected lands or areas of known species occurrence.

2.1.1 Protected or Managed Lands

Prior to field assessments, publicly available state and federal databases are reviewed to determine whether protected or significant wildlife conservation lands are present within 3 miles (4.8 km) of the Project. Sources include:

- Bureau of Land Management (BLM) National Conservation and Grazing Lands;
- Bureau of Reclamation Lands;
- Department of Defense Lands;
- National Park Service (NPS) National Parks, National Scenic, Historic, and Recreation Trails, National Monuments, and Conservation and Historical Properties;

- National Audubon Society Important Bird Areas (IBA);
- Non-governmental organization (NGO) -owned or -managed lands;
- U.S. Fish and Wildlife Service (USFWS) National Wildlife Refuges, National Fish Hatcheries, Wildlife Management Areas, Waterfowl Production Areas, Designated and Proposed Critical Habitat; and
- U.S. Forest Service (USFS) National Forests, National Grasslands, National Wild and Scenic River Segments, National Wilderness Areas, Experimental Forest and Range Areas and Locations.

2.1.2 Potential Species Occurrence

The following state, federal, and NGO publicly available databases are reviewed for potential RTE species occurrence within or adjacent the Project site:

- Cornell's Lab of Ornithology eBird records;
- USFWS Information for Planning and Consultation (IPaC); and
- Illinois Natural Heritage Commission protected species information.

2.2 Field Habitat Assessment

Field assessments to determine presence of habitat suitable for supporting RTE species are completed concurrently with Project aquatic resource delineation efforts. Habitat data and photographs are recorded on GPS-enabled handheld tablets preloaded with informative base layers and include U.S. Geological Survey (USGS) topographic data, Natural Resources Conservation Service (NRCS) soil survey data, USFWS National Wetlands Inventory (NWI) data, and the USGS National Hydrography Dataset. Biologically similar "habitat patches" are delineated and major vegetative components (e.g., dominant tree species, subcanopy clutter, herbaceous density, etc.) are recorded, particularly patches potentially suitable for state- and/or federally listed species use. Locations of general wildlife and plant observations are also recorded and photographed using the GPS-enabled tablet.

Field data are used to characterize habitat within the Project based on three main categories: woodland, developed/open space, and scrub/shrub/old-field/early successional. Woodland habitat is defined as land with vegetation cover consisting of at least 20 percent tree cover and includes the USGS National Land Cover Database (NLCD) habitat classifications deciduous, evergreen, mixed forests, and woody wetlands (MRLC 2024) . Developed/open space is defined as areas exhibiting a high degree of impervious surface, residential areas, and an overall lack of natural tree canopy (MRLC 2024) . Developed/open space category includes the NLCD habitat classifications: developed (open, low, moderate, and high intensity), barren land, pasture/hay, emergent wetlands, shrub/scrub wetlands, open water, and cultivated crops. Old-field/early successional is defined as unmanaged areas with cluttered

herbaceous cover and less than 20 percent tree cover and encompasses the NLCD habitat classification grassland/herbaceous (MRLC 2024) .

3.0 Results

3.1 Database Review

3.1.1 Protected or Managed Lands

The Project does not overlap federally protected lands and is not within a Federal Emergency Management Agency (FEMA) moderate- to high-risk floodplain (Zone A). No state-managed lands occur within 3 miles (4.8 km) of the Project's AOI.

3.1.2 Potential Species Occurrence

3.1.2.1 Federally Protected Species

The USFWS IPaC Official Species List generated for the Project was reviewed to determine potential occurrence of species considered federally threatened, endangered, proposed, or of candidate status (Appendix B). Six species with potential to occur within the Project include the Indiana bat (*Myotis sodalis*), whooping crane (*Grus americana*), monarch butterfly (*Danaus Plexippus*), Decurrent False Aster (*Boltonia decurrens*), Eastern prairie fringed orchid (*Platanthera leucophaea*), and lakeside daisy (*Hymenoxys herbacea*; Appendix C, Table 1).

The USFWS IPaC Official Species List includes species protected under the Bald and Golden Eagle Protection Act (BGEPA) and/or the Migratory Bird Treaty Act (MBTA). The Project is within Bird Conservation Region 22 – Eastern Tallgrass prairie. No birds listed under the MBTA or the BGEPA potentially occur within the Project.

3.1.2.2 State Protected Species

Per the Illinois Natural Heritage Database (INHD;), 32 state-listed species are recorded in Tazewell County. Following the INHD ecological compliance assessment tool (EcoCAT), no records occur within the Project AOI (Appendix D). As Illinois currently has no enforced state-listed species regulations, projects triggering a federal nexus to comply with Section 404 of the Clean Water Act (CWA) require USFWS and Illinois Department of Natural Resources (IDNR) consultation. An IDNR information request is recommended to obtain known records of listed species within a 1- or 5-mile (1.6- or 8-km) radius of the Project and determine whether presence/probable absence surveys are warranted.

3.2 Field Habitat Assessment

On-site habitat assessment results (completed 22 May 2025) documented six discrete habitat patches (Appendix A, Figure 2; Appendix C, Table 2). Habitat patches containing similar vegetative communities (i.e., emergent wetlands and deciduous forest) are grouped together in Appendix C, Table 2. Approximately 96.96 percent of the Project is active agricultural crop fields (24.85 acres [10.05 ha]). The remaining 3.04 percent (0.98 acre [0.40 ha]) comprises woody wetlands, scrub shrub wetlands, emergent wetlands, and deciduous forest. Representative photographs of habitat patches are provided in Appendix E.

Within the Project, potentially suitable habitat was observed for three federally listed, proposed, or candidate species identified on the USFWS IPaC Official Species List: Indiana bat, eastern prairie fringed orchid, and monarch butterfly (Appendix C, Tables 1 and 2).

Three habitat patches (combined totaling 0.41 acre [0.16 ha]) potentially provide suitable summer roosting habitat for the Indiana bat (Appendix C, Table 2). Patches comprise mixed deciduous forests and forested wetlands (Appendix A, Figure 2; Appendix C, Table 2). Neither caves nor underground mines were determined present during site visits and impacts to winter bat hibernacula are not anticipated. If a presence/probable absence survey is not conducted, the USFWS recommends assuming listed bat presence and restricting tree clearing activities to the bats' inactive season (currently 16 November to 14 March) to avoid direct impacts during the summer maternity and migratory seasons (USFWS 2024).

Two habitat patches (combined totaling 0.39 acre [0.16 ha]) exhibit potential foraging habitat for the monarch butterfly (Appendix A, Figure 2; Appendix C, Table 2). Monarch butterflies are associated with open lands, including meadows, native prairie patches, roadsides, woodland clearing, early successional woody habitat, utility corridors, and grassland/shrublands, where host and nectar plants are commonly found. Monarchs are considered *habitat generalists* as they forage on any nectar-producing flowering vegetation, but also considered *habitat specialists* as monarch caterpillars (larvae) exclusively rely on milkweed species (*Asclepias* spp.) (Malcolm et al. 1993, CEC 2008, USFWS 2020). No milkweed was identified during field reconnaissance on 22 May 2025. The monarch butterfly is currently proposed for listing as threatened under the Endangered Species Act (ESA).

A single habitat patch (0.23 acre [0.09]) exhibits potential habitat for the eastern prairie fringed orchid. Eastern prairie fringed orchid prefers moist soils with full sun but is occasionally found at the edges of wetlands with woodland encroachment (USFWS 1999; 2021). Avoiding impacts to open wetland areas is recommended to avoid a direct impact to this species.

4.0 Conclusion

Database review indicates the Project does not overlap federally protected lands. The USFWS IPaC Official Species List revealed six federally threatened, endangered, proposed, or candidate status species potentially occur within the Project. The INHD indicates 32 state-listed species are recorded within Tazewell County; however, no records were identified within the Project's AOI.

The Project primarily consists of actively cultivated agriculture land (96.96%). Onsite assessments within the Project area confirmed presence of habitat suitable to support three federally listed, proposed, or candidate species.

At minimum, informal consultation with USFWS Iowa-Illinois Ecological Services Field Office in Moline, Illinois is recommended to confirm proposed avoidance, minimization, and conservation measures adequately result in either *No Effect* or *May Affect – Not Likely to Adversely Affect* determinations for select federally listed species potentially present. Alternatively, completion of presence/probable absence surveys for species *Likely to be Adversely Affected* offers potential to result in *Not Likely to be Adversely Affected* if absence is confirmed. Although Illinois does not require formal consultation, an information request to the IDNR is recommended to obtain known records of listed species within a 1- or 5-mile (1.6- or 8-km) radius of the Project to avoid future complications and potential Project delays.

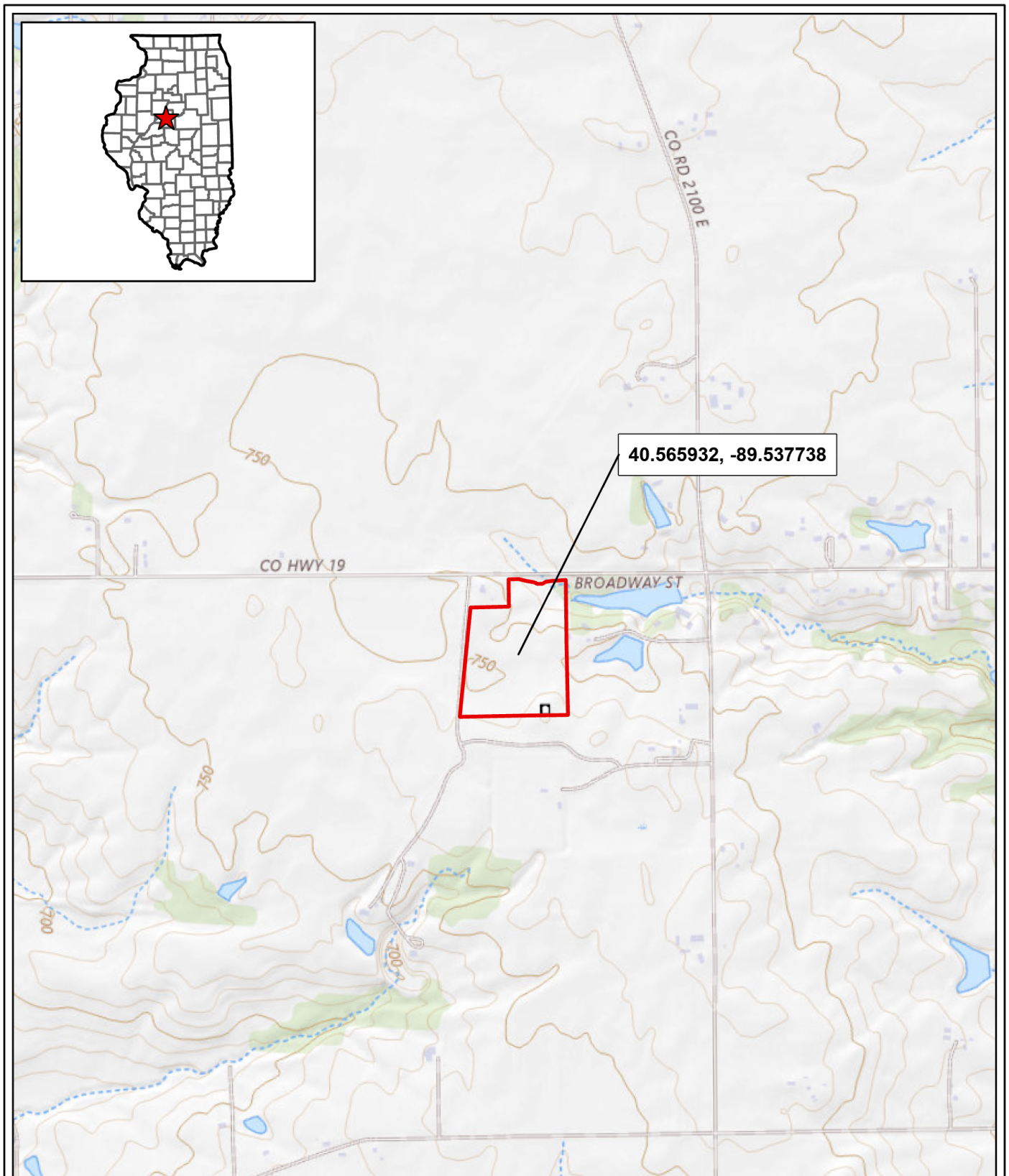
5.0 Literature Cited

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- USFWS. 2021. Eastern prairie fringed orchid (*Platanthera leucophaea*). U.S. Department of the Interior, Fish and Wildlife Service, Maine Field Office, East Orland, Maine. 2 pp.
- USFWS. 2024. Range-wide Indiana bat & northern long-eared bat survey guidelines. U.S. Department of the Interior, Fish and Wildlife Service, Region 3, Bloomington, Minnesota. 95 pp.

APPENDIX A FIGURES



 Area of Investigation (AOI)

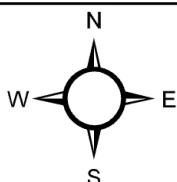


Figure 1. Location of the proposed Lumina Energy Storage, LLC Project in Tazewell County, Illinois.

Project No.
2523

0 1,000 2,000
US Feet
Base Map: USGS Topographic Map



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Figure 2. Habitat patch classification on the proposed Lumina Energy Storage, LLC Project in Tazewell County, Illinois.

 Area of Investigation (AOI)

Field-Delineated Wetland

 PEM

 PFO

 PSS

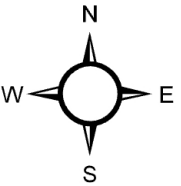
Habitat Patch Type

 Cultivated Crops

 Deciduous Forest

 Emergent Herbaceous Wetlands

 Woody Wetlands



0 200 400 Feet

Service Layer Credits: World Imagery: Maxar, Microsoft
World Topographic Map: County of Peoria, Missouri Dept. of Conservation, Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/NASA, EPA, USDA
World Transportation (for Export) - ae2s: Esri, HERE, Garmin, (c) OpenStreetMap contributors



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& INNOVATIONS, INC.**

Project No. 2523

APPENDIX B
USFWS IPAC OFFICIAL SPECIES LIST AND DETERMINATION KEYS



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
Phone: (309) 757-5800 Fax: (309) 757-5807

In Reply Refer To:
Project Code: 2025-0109376
Project Name: Lumina Energy Storage, LLC

06/16/2025 13:12:46 UTC

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

To Whom It May Concern:

The attached species list identifies federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat, if present, within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) **the accuracy of this species list should be verified after 90 days**. This verification can be completed formally or informally. You may verify the list by visiting the ECOSPHERE Information for Planning and Consultation (IPaC) website <https://ipac.ecosphere.fws.gov> at regular intervals during project planning and implementation and completing the same process you used to receive the attached list.

Section 7 Consultation

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the U.S. Fish and Wildlife Service (Service) if they determine their project "may affect" listed species or designated critical habitat. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action may affect endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service to make "no effect" determinations. If you determine that your proposed action will have no effect on threatened or endangered species or their respective designated critical habitat, you do not need to seek concurrence with the Service.

Note: For some species or projects, IPaC will present you with *Determination Keys*. You may be able to use one or

more Determination Keys to conclude consultation on your action.

Technical Assistance for Listed Species

1. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain information on the species life history, species status, current range, and other documents by selecting the species from the thumbnails or list view and visiting the species profile page.

No Effect Determinations for Listed Species

1. If there are *no* species or designated critical habitats on the Endangered Species portion of the species list: conclude "no species and no critical habitat present" and document your finding in your project records. No consultation under ESA section 7(a)(2) is required if the action would result in no effects to listed species or critical habitat. Maintain a copy of this letter and IPaC official species list for your records.
2. If any species or designated critical habitat are listed as potentially present in the **action area** of the proposed project the project proponents are responsible for determining if the proposed action will have "no effect" on any federally listed species or critical habitat. No effect, with respect to species, means that no individuals of a species will be exposed to any consequence of a federal action or that they will not respond to such exposure.
3. If the species habitat is not present within the action area or current data (surveys) for the species in the action area are negative: conclude "no species habitat or species present" and document your finding in your project records. For example, if the project area is located entirely within a "developed area" (an area that is already graveled/paved or supports structures and the only vegetation is limited to frequently mowed grass or conventional landscaping, is located within an existing maintained facility yard, or is in cultivated cropland conclude no species habitat present. Be careful when assessing actions that affect: 1) rights-of-ways that contains natural or semi-natural vegetation despite periodic mowing or other management; structures that have been known to support listed species (example: bridges), and 2) surface water or groundwater. Several species inhabit rights-of-ways, and you should carefully consider effects to surface water or groundwater, which often extend outside of a project's immediate footprint.
4. Adequacy of Information & Surveys - Agencies may base their determinations on the best evidence that is available or can be developed during consultation. Agencies must give the benefit of any doubt to the species when there are any inadequacies in the information. Inadequacies may include uncertainty in any step of the analysis. To provide adequate information on which to base a determination, it may be appropriate to conduct surveys to determine whether listed species or their habitats are present in the action area. Please contact our office for more information or see the survey guidelines that the Service has made available in IPaC.

May Effect Determinations for Listed Species

1. If the species habitat is present within the action area and survey data is unavailable or inconclusive: assume the species is present or plan and implement surveys and interpret results in coordination with our office. If assuming species present or surveys for the species are positive continue with the may affect determination process. May affect, with respect to a species, is the appropriate conclusion when a species might be exposed to a consequence of a federal action and could respond to that exposure. For critical habitat, 'may affect' is the appropriate conclusion if the action area overlaps with mapped areas of critical habitat and an essential physical or biological feature may be exposed to a consequence of a federal action and could change in response to that exposure.
2. Identify stressors or effects to the species and to the essential physical and biological features of critical habitat that overlaps with the action area. Consider all consequences of the action and assess the potential for each life stage of the species that occurs in the action area to be exposed to the stressors. Deconstruct the action into its component parts to be sure that you do not miss any part of the action that could cause effects to the species or physical and biological features of critical habitat. Stressors that affect species' resources may have consequences even if the species is not present when the project is implemented.
3. If no listed or proposed species will be exposed to stressors caused by the action, a 'no effect' determination may be appropriate – be sure to separately assess effects to critical habitat, if any overlaps with the action

area. If you determined that the proposed action or other activities that are caused by the proposed action may affect a species or critical habitat, the next step is to describe the manner in which they will respond or be altered. Specifically, to assess whether the species/critical habitat is "not likely to be adversely affected" or "likely to be adversely affected."

4. Determine how the habitat or the resource will respond to the proposed action (for example, changes in habitat quality, quantity, availability, or distribution), and assess how the species is expected to respond to the effects to its habitat or other resources. Critical habitat analyses focus on how the proposed action will affect the physical and biological features of the critical habitat in the action area. If there will be only beneficial effects or the effects of the action are expected to be insignificant or discountable, conclude "may affect, not likely to adversely affect" and submit your finding and supporting rationale to our office and request concurrence.
5. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, check IPaC for species-specific Section 7 guidance and conservation measures to determine whether there are any measures that may be implemented to avoid or minimize the negative effects. If you modify your proposed action to include conservation measures, assess how inclusion of those measures will likely change the effects of the action. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, contact our office for assistance.
6. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

For additional information on completing Section 7 Consultation including a Glossary of Terms used in the Section 7 Process, information requirements for completing Section 7, and example letters visit the Midwest Region Section 7 Consultations website at: <https://www.fws.gov/office/midwest-region-headquarters/midwest-section-7-technical-assistance>.

You may find more specific information on completing Section 7 on communication towers and transmission lines on the following websites:

- Incidental Take Beneficial Practices: Power Lines - <https://www.fws.gov/story/incidental-take-beneficial-practices-power-lines>
- Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning. - <https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation>

Tricolored Bat Update

On September 14, 2022, the Service published a proposal in the Federal Register to list the tricolored bat (*Perimyotis subflavus*) as endangered under the Endangered Species Act (ESA). The Service has up to 12-months from the date the proposal published to make a final determination, either to list the tricolored bat under the Act or to withdraw the proposal. The Service determined the bat faces extinction primarily due to the rangewide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across North America. Because tricolored bat populations have been greatly reduced due to WNS, surviving bat populations are now more vulnerable to other stressors such as human disturbance and habitat loss. Species proposed for listing are not afforded protection under the ESA; however, as soon as a listing becomes effective (typically 30 days after publication of the final rule in the Federal Register), the prohibitions against jeopardizing its continued existence and "take" will apply. Therefore, if your future or existing project has the potential to adversely affect tricolored bats after the potential new listing goes into effect, we recommend that the effects of the project on tricolored bat and their habitat be analyzed to determine whether authorization under ESA section 7 or 10 is necessary. Projects with an existing section 7 biological opinion may require

reinitiation of consultation, and projects with an existing section 10 incidental take permit may require an amendment to provide uninterrupted authorization for covered activities. Contact our office for assistance.

Other Trust Resources and Activities

Bald and Golden Eagles

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act, as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, please contact our office for further coordination. For more information on permits and other eagle information visit our website <https://www.fws.gov/library/collections/bald-and-golden-eagle-management>. We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Wetlands

OFFICIAL SPECIES LIST

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

This species list is provided by:

Illinois-Iowa Ecological Services Field Office

Illinois & Iowa Ecological Services Field Office

1511 47th Ave

Moline, IL 61265-7022

(309) 757-5800

PROJECT SUMMARY

Project Code: 2025-0109376

Project Name: Lumina Energy Storage, LLC

Project Type: Power Gen - Other

Project Description: Energy Storage facility within Tazewell County, Illinois

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@40.565765049999996,-89.53787925079438,14z>



Counties: Tazewell County, Illinois

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

MAMMALS

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered

BIRDS

NAME	STATUS
Whooping Crane <i>Grus americana</i> Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non- Essential

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

FLOWERING PLANTS

NAME	STATUS
Decurrent False Aster <i>Boltonia decurrens</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7705	Threatened
Eastern Prairie Fringed Orchid <i>Platanthera leucophaea</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/601	Threatened
Lakeside Daisy <i>Hymenoxys herbacea</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3615	Threatened

CRITICAL HABITATS

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

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

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

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

WETLANDS

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](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R4SBC

APPENDIX C TABLES

Appendix C. Table 1. Federally protected species potentially occurring on the Lumina Energy Storage, LLC Project in Tazewell County, Illinois.

Common Name Scientific Name	Federal Listing ¹	Habitat Preference ²	Habitat Observed?	Avoidance Dates	Comments ²	Determination ³
Indiana bat <i>Myotis sodalis</i>	E	Summer roost habitat includes trees exhibiting loose bark, crevices, or cavities. Forages within riparian areas, upland forests, ponds, and field/forest edges. Hibernates in caves and mines.	Yes	15 March through 15 November	Potential summer roosting and foraging habitat exists within the Project. USFWS recommends conserving trees exhibiting loose, shaggy bark and/or crevices, holes, or cavities. If tree cutting is restricted to 16 November through 14 March, impacts may affect, but are not likely to adversely affect the species.	Not Likely to Adversely Affect
whooping crane <i>Grus americana</i>	Experimental population, non-essential	Shallow herbaceous wetlands, prairie marshes and wet meadows.	No	N/A	Because whooping crane is an experimental population species, no regulations are in place for avoidance.	N/A
monarch butterfly <i>Danaus plexippus</i>	PT	Fields, roadside areas, open areas, wet areas, or urban gardens. Milkweed and flowering plants are habitat requisites	Yes	N/A	Because monarch butterfly is a candidate species, no regulations are in place for avoidance.	N/A
decurrent false aster <i>Boltonia decurrens</i>	T	Moist, sandy floodplains and prairie wetlands along the Illinois river.	No	N/A	The unnamed intermittent stream within the Project area does not directly connect to the Illinois river and does not provide floodplain habitat.	Not Likely to Adversely Affect
eastern prairie fringed orchid <i>Platanthera leucophaea</i>	T	Prefers mesic prairies, wetlands, sedge meadows, marsh edges, and bogs with full sun and little no woody encroachment	Yes	N/A	Potential habitat is within wetland areas but area is small and subject to woody encroachment.	Not Likely to Adversely Affect
lakeside daisy <i>Hymenoxys herbacea</i>	T	Little life history data are available but previous records indicate the species preferred dry rocky prairies	No	N/A	The species is believed to be extirpated from Illinois and no preferred habitat was found within the Project area.	Not Likely to Adversely Affect

¹E=Endangered; T=Threatened; PT=Proposed Threatened;

²Information is based on literature review: IPaC Official Species List and USFWS recovery plans.

³Determination of Effects is only applicable to federally listed species protected under the Endangered Species Act. Thus, determinations for candidate species, experimental populations, or species proposed for listing are not applicable (N/A).

Appendix C. Table 2. Habitat patches on the Lumina Energy Storage, LLC Project in Tazewell County, Illinois.

Patch ID	Area (ac)	Patch Type	Habitat Description	Dominant Canopy Species ¹	Diameter at Breast Height (DBH) Range (in)	Subcanopy Clutter	Potential Federal Listed Species ²
HP-002	0.06	Woody wetlands	Palustrine forested (PFO) wetlands	pignut hickory black walnut honey locust box elder	11-16	Moderately Closed	Indiana bat
HP-005	0.23	Emergent herbaceous wetlands	Palustrine emergent (PEM) wetlands	N/A	N/A	Open	monarch butterfly eastern prairie fringed orchid
HP-003, HP-004	0.35	Deciduous forest	Woodlot surrounding stream and agricultural field	pignut hickory black walnut honey locust box elder	11-16	Moderately Closed	Indiana bat
HP-001	24.70	Cultivated crops	Agricultural land used for row crop cultivation	N/A	N/A	Open	none
HP-006	0.16	Scrub-shrub wetlands	Palustrine scrub-shrub (PSS) wetlands	honey locust box elder	8-11	Moderately Closed	monarch butterfly

¹ **Dominant Canopy:** black walnut (*Juglans nigra*), box elder (*Acer negundo*), honey locust (*Gleditsia triacanthos*), pignut hickory (*Carya glabra*)

² **Federally Listed RTE Species:** Indiana bat (*Myotis sodalis*), monarch butterfly (*Danaus plexippus*), Eastern prairie fringed orchid (*Platanthera leucophaea*)

APPENDIX C
ECOLOGICAL COMPLIANCE ASSESSMENT TOOL RESULTS

Applicant: Lumina Energy Storage, LLC c/o Environmental Solutions & Innovations, Inc.

IDNR Project Number: 2514297

Contact: Tyler Remick

Date: 06/16/2025

Address: 4525 Este ave
Cincinnati, OH 45232

Project: Lumina Energy Storage, LLC

Address: 4516 Broadway St, Pekin

Description: Energy Storage facility located in Tazewell county Illinois.

Natural Resource Review Results

The Illinois Natural Heritage Database contains no record of State-listed threatened or endangered species, Illinois Natural Area Inventory sites, dedicated Illinois Nature Preserves, or registered Land and Water Reserves in the vicinity of the project location.

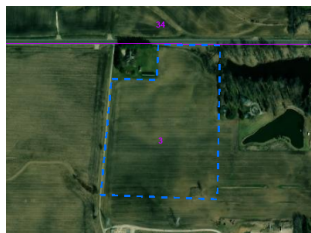
Consultation is terminated. This consultation is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary. Termination does not imply IDNR's authorization or endorsement.

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: Tazewell

Township, Range, Section:
24N, 4W, 3



IL Department of Natural Resources

Contact

Alex Davis
217-785-5500
Division of Ecosystems & Environment

Government Jurisdiction

U.S. Army Corps of Engineers

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

Terms of Use

By using this website, you acknowledge that you have read and agree to these terms. These terms may be revised by IDNR as necessary. If you continue to use the EcoCAT application after we post changes to these terms, it will mean that you accept such changes. If at any time you do not accept the Terms of Use, you may not continue to use the website.

1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

2. Unauthorized attempts to upload, download, or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act.

3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

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Unauthorized use, tampering with or modification of this system, including supporting hardware or software, may subject the violator to criminal and civil penalties. In the event of unauthorized intrusion, all relevant information regarding possible violation of law may be provided to law enforcement officials.

Privacy

EcoCAT generates a public record subject to disclosure under the Freedom of Information Act. Otherwise, IDNR uses the information submitted to EcoCAT solely for internal tracking purposes.

APPENDIX E
REPRESENTATIVE HABITAT PHOTOGRAPHS

Environmental Solutions & Innovations, Inc.
Photo Documentation

Client/Site Name:

Lumina Energy Storage, LLC
Lumina Energy Storage Project

Site Location:

Tazewell County, Illinois

Project #:

2523



Woody Wetlands (PFO)
representative photo



Scrub Shrub Wetlands (PSS)
representative photo



Emergent Herbaceous Wetland (PEM)
representative photo



Cultivated Crop
representative photo

Environmental Solutions & Innovations, Inc.
Photo Documentation

Client/Site Name:

Lumina Energy Storage, LLC
Lumina Energy Storage Project

Site Location:

Tazewell County, Illinois

Project #:

2523



Deciduous Forest
representative photo

September 15, 2026

Illinois Department of Natural Resources
State Historic Preservation Office
One Natural Resources Way
Springfield, IL 62702

Re: Lumina Energy Storage Project, Tazewell County, IL
File: R0080840.00

To Whom It May Concern:

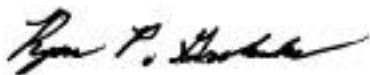
On behalf of Lumina Energy Storage LLC (Applicant), Westwood Professional Services is writing to request comments regarding the proposed Lumina Energy Storage Project, a Battery Energy Storage System (BESS) Project located in Tazewell County, Illinois (**Exhibit 1**). This Project is a proposed 300-megawatt (MW)/1,200-megawatt hours (MWh) with a storage duration of four hours. The BESS facility will be located on approximately 11.5 acres within a 25-acre Project Area consisting of undeveloped agricultural land in Section 3 of Township 24N, Range 4W. The Project is located on the south side of Broadway Rd approximately 0.25 mile west of Springfield Rd in Pekin, IL (40.5660, -89.5378; **Exhibit 2**). Proposed substation poles are 100' tall, gen-tie poles are 165' tall, and the batteries are 9' tall (**site plan**). As noted on the attached site plan, O'Brien Cemetery is located within the Project Area but it will be avoided by the BESS and all construction activities.

This review is requested to comply with the county ordinance. State level review may also be required as stormwater permits administered by the IEPA may be necessary for the Project. This consultation is to ensure compliance with Illinois State law regarding historic preservation. This Project has no known federal nexus as this time. Please refer to the appended Exhibits for additional information regarding site location and layout.

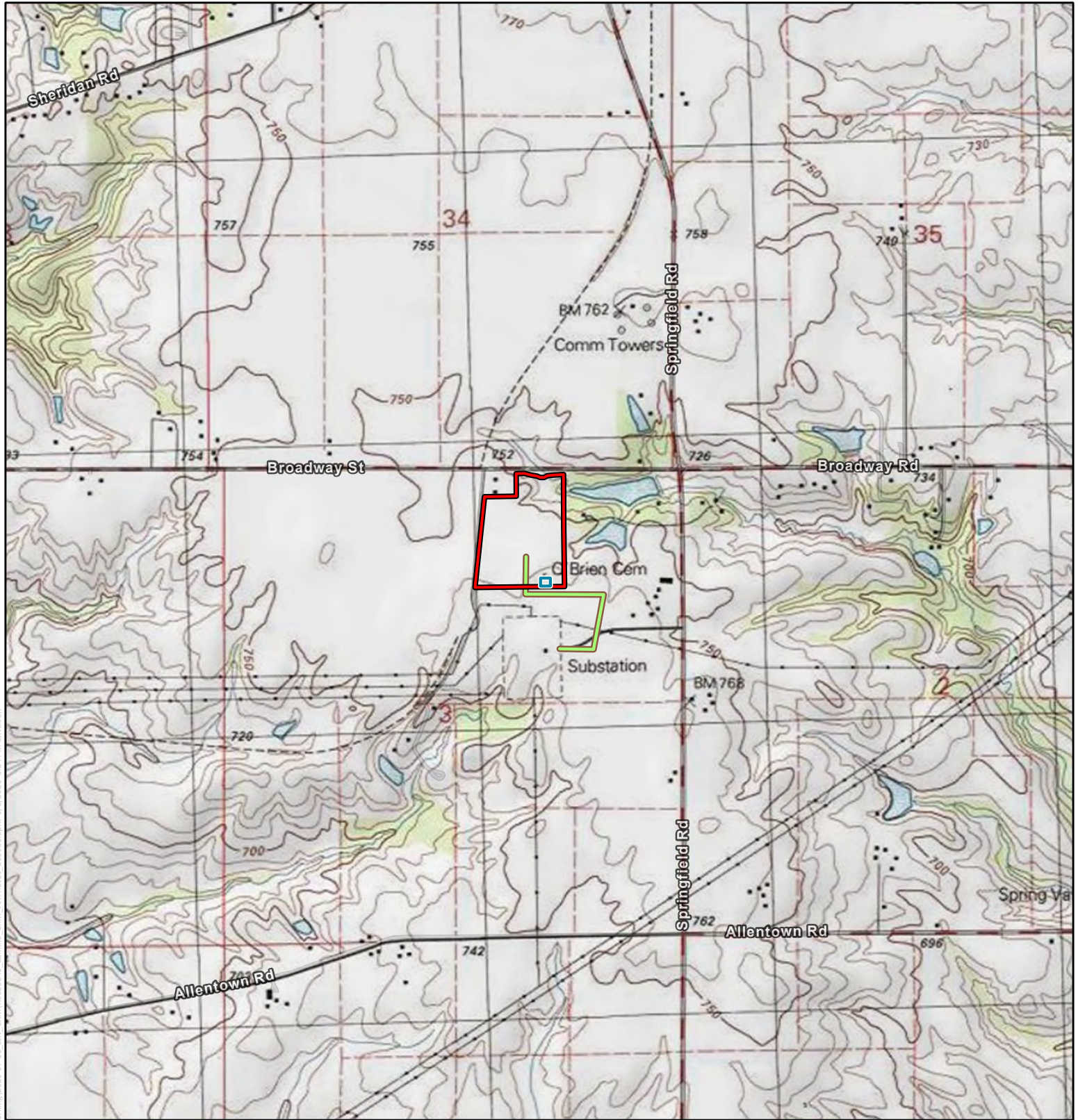
We would appreciate hearing any comments you may have regarding the BESS project. If you have questions, I can be reached at (612) 209-3352 or via email at ryan.grohnke@westwoodps.com.

Sincerely,

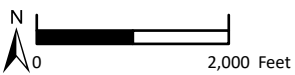
WESTWOOD PROFESSIONAL SERVICES



Ryan P. Grohnke
Cultural Resources Manager



Data Source(s): Westwood (2026); .



Westwood

Toll Free (888) 937-5150 westwoodsps.com

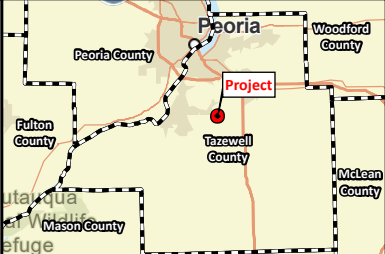
Lumina BESS Project

Project Location on USGS topographic map

-  Project Area
-  Proposed Overhead Line
-  O'Brien Cemetery

Tazewell County, Illinois

Exhibit 1





Data Source(s): Westwood (2026); Tazewell County (2026); Google (2025).



Lumina BESS Project

Project Area on 2025 Aerial Imagery

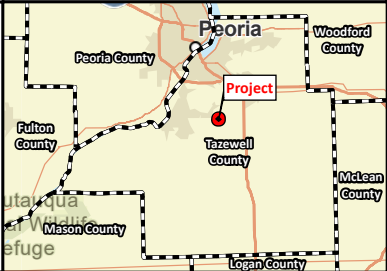
-  Project Area
-  Proposed Overhead Line
-  O'Brien Cemetery

Westwood

Toll Free (888) 937-5150 westwoodps.com

Tazewell County, Illinois

Exhibit 2



CULTURAL RESOURCE DESKTOP ASSESSMENT:
PROPOSED LUMINA ENERGY STORAGE, LLC, PROJECT,
TAZEWELL COUNTY, ILLINOIS

21 July 2025

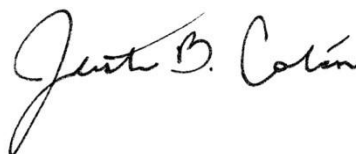
Prepared for:

Lumina Energy Storage, LLC
800 Taylor Street, Suite 200
Durham, NC 27701

Prepared by:



Environmental Solutions & Innovations, Inc.



Justin B. Colón, MA, RPA
Principal Investigator

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Indianapolis, IN • Ravenna, OH • Pittsburgh, PA • Teays Valley, WV • Houston, TX • Orlando, FL

TABLE OF CONTENTS

	<u>Page</u>
1.0 Introduction.....	1
2.0 Environmental Setting.....	2
2.1 Physiography and Geology	2
2.2 Hydrology	2
2.3 Soils	2
2.4 Land Use Pattern	3
3.0 Background Research.....	3
3.1 Previously Recorded Cultural Resources and Previous Investigations	3
3.2 Archival Research	4
3.3 Archaeological Probability Review	4
4.0 Summary and Recommendations	5
5.0 References Cited	7

LIST OF TABLES

<u>Table</u>	<u>Page</u>
Table 1. NRCS soil map units within the AOI.....	2
Table 2. Previously recorded archaeological sites within the AOI and a 1.6-km (1.0-mi.) radius of the AOI.	3
Table 3. Previous cultural resource investigations within the AOI and a 1.6-km (1.0-mi.) radius of the AOI.	3
Table 4. Previously recorded cemetery within the AOI and a 1.6-km (1.0-mi.) radius of the AOI.....	4
Table 5. Summary of reviewed archival resources.	4

Appendices

Appendix A: Figures

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1.0 Introduction

On behalf of Lumina Energy Storage, LLC (Lumina), Environmental Solutions & Innovations, Inc. (ESI), conducted a cultural resource desktop assessment for the proposed Lumina Energy Storage Project (Project) in Tazewell County, Illinois. The Project has a total secured acreage of approximately 25.5 acres (10.2 hectares) and is identified as a portion of parcel number 11-11-03-200-019. The approximate Project center point is at UTM coordinates of 285167.36 E, 4493668.33 N, Zone 16T (Appendix A, Figures 1 and 2).

The Project may require a general or individual permit from the US Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (33 US Code [USC] 1344) and would therefore become subject to the National Environmental Policy Act (NEPA; 42 USC 4321 et seq.); Section 106 of the National Historic Preservation Act of 1966, as amended (54 USC 306108), and its implementing regulations (36 Code of Federal Regulations [CFR] 800); and USACE's agency-specific procedures for the protection of historic properties (33 CFR 325, Appendix C). For Section 106 undertakings in Illinois, the Illinois State Historic Preservation Office (SHPO) fulfills consultation responsibilities.

The current investigation is a due-diligence effort designed for planning purposes only and potentially does not fulfill NEPA and Section 106 regulatory requirements. Desktop analysis includes the following:

- Identification of previous cultural resource investigations and previously recorded archaeological sites and cemeteries within the AOI and within a study area defined as a 1.6-kilometer (km; 1.0-mile [mi.]) radius of the AOI.
- Identification of previously recorded historic architectural resources and potential historic resources (PHRs) within the AOI and within a 0.40-km (0.25-mi.) radius of the AOI.
- Assessment of relevant factors affecting archaeological site potential within the AOI via a probability model.
- Assessment of relevant factors that may indirectly affect extant historic resources within the AOI and the architectural study radius.
- Recommendations for identifying undocumented cultural resources within the AOI (i.e., additional survey recommendations).

2.0 Environmental Setting

2.1 Physiography and Geology

The Project is in the Bloomington Ridged Plains within the Till Plains section of the Central Lowland Physiographic Province. The Bloomington Ridged Plains are characterized primarily by glacial till on low, broad moraine ridges with intermittent stretches of relatively flat to rolling plains with terminal and recessional moraines, prairie potholes, and old lake beds (Appendix A, Figure 3; Leighton et al. 1948). The topography of the AOI is predominantly flat to mildly undulating, with moderately steeper terrain near the east-adjacent ponds outside of the AOI.

2.2 Hydrology

The Project is within the Little Mackinaw River-Mackinaw River watershed (hydrologic unit code [HUC] 10-0713000408) in the Mackinaw Subbasin (HUC 8-07130004; see Appendix A, Figure 3), encompassing approximately 640 square kilometers (247 square miles) of central Illinois (Environmental Protection Agency 2025). The AOI intersects with an unnamed drainage at its northeastern corner that empties into an artificially modified pond in the east-adjacent property.

2.3 Soils

Review of the US Department of Agriculture's (USDA) Web Soil Survey database identified six soil map units within the AOI (Table 1; Soil Survey Staff, Natural Resources Conservation Service, USDA [NRCS] 2025). Three soil types are considered to have a high probability, while the remaining three soil types are considered to have a moderately-high probability for containing precontact archaeological sites given the relatively stable nature of the encompassing landscape and its proximity to natural water sources.

Table 1. NRCS soil map units within the AOI.

Map Unit Symbol	Map Unit Name	Hectares in AOI	Percent of AOI
138A	Shiloh silty clay loam, 0 to 2 percent slopes	2.2	21.6%
233C2	Birkbeck silt loam, 5 to 10 percent slopes, eroded	1.2	11.9%
233C3	Birkbeck silty clay loam, 5 to 10 percent slopes, severely eroded	0.8	7.8%
278A	Stronghurst silt loam, 0 to 2 percent slopes	5.5	53.9%
279B2	Rozetta silt loam, 2 to 5 percent slopes, eroded	0.2	2.0%
618D2	Senachwine silt loam, 10 to 18 percent slopes, eroded	0.1	1.0%
Total		10.2	100.0%

Source: NRCS (2025)

Note: AOI = Area of Investigation

2.4 Land Use Pattern

The proposed Project is approximately 3.2 km (2.0 mi.) south of the rural community of Groveland, Illinois, and 8.8 km (5.5 mi.) east of the town of Pekin, Illinois (Appendix A, see Figures 1 and 2). Current aerial imagery suggests that the AOI consists primarily of nearly level to mildly undulating active and fallow agricultural land directly southeast of its associated residence/farmstead, and west of a neighboring farmstead containing two artificially modified ponds. The O'Brien Cemetery, a family cemetery, that is not currently listed in the National Register of Historic Places in Illinois, occupies an area measuring roughly 0.08 ha (0.20 ac.) inside of the southeastern portion of the AOI (Appendix A, see Figure 1).

3.0 Background Research

On 21 May 2025, ESI staff conducted an online records search using the Illinois Inventory of Archaeological Sites—maintained by the Illinois State Museum and the Illinois SHPO—to identify previous cultural resource investigations and previously recorded archaeological sites and cemeteries within the AOI and the 1.6-km (1.0-mi.) study radius. That same day, ESI searched the Historic & Architectural Resources GIS online database—maintained by the Illinois SHPO—to identify historic architectural resources within the AOI and the architectural study radius. Archival sources were reviewed to identify PHRs within these same boundaries.

3.1 Previously Recorded Cultural Resources and Previous Investigations

Background research identified two previously recorded archaeological sites, one cemetery, and two previous cultural investigations within the AOI and a 1.6-km (1.0-mi.) study radius (Tables 2 and 3; Appendix A, Figure 4). No previously recorded archaeological sites were identified within the AOI. Of the two previous cultural investigations, one intersects the AOI, and the one cemetery is within the AOI (Table 4). Review identified no previously recorded historic architectural resources within the AOI or architectural study radius (Table 4).

Table 2. Previously recorded archaeological sites within the AOI and a 1.6-km (1.0-mi.) radius of the AOI.

Site ID No.	Cultural Period	Site Type	NRHP Status	Proximity to AOI
11T619	Precontact	Habitation	Not eligible	Outside
11T620	Precontact	Habitation	Not eligible	Outside

Note: AOI = Area of Investigation; NRHP = National Register of Historic Places

Table 3. Previous cultural resource investigations within the AOI and a 1.6-km (1.0-mi.) radius of the AOI.

Report No.	Year	Author	Title
23034	2018	Joseph Craig	17.2-Acre Solar Farm, Tazewell County, Illinois – Phase I Cultural Resource Survey
21439 ^a	2016	Jennifer Edwards and David J. Nolan	FAS 1467/Ch 19 Broadway Road Improvements

^a Cultural resource survey intersects the area of investigation.

Table 4. Previously recorded cemetery within the AOI and a 1.6-km (1.0-mi.) radius of the AOI.

Cemetery ID.	Description	NRHP Status	Proximity to AOI
1978	O'Brien Cemetery	Unknown	Inside

Note: AOI = Area of Investigation; NRHP = National Register of Historic Places

3.2 Archival Research

Available twentieth-century USGS quadrangles were reviewed to identify PHRs within the AOI and the architectural study radius (Table 5).

The Marquette Heights (1979) quadrangle depicts 13 PHRs and one cemetery within the AOI and architectural study radius. Of the 13 PHRs, one is depicted within the AOI, and one cemetery (previously recorded, see Table 4) is within the AOI (Appendix A, Figure 5). Review of the 13 PHRs via modern aerial imagery suggests 10 PHRs are extant and three are nonextant; one nonextant PHR was noted within the AOI. Additionally, the cemetery noted within the AOI remains visible in modern aerial imagery. Map review indicated a medium-high probability of historic archaeological sites within the AOI.

Table 5. Summary of reviewed archival resources.

Data Source	Name (Year)
US Geological Survey	Peoria, IL (1905 [1916, 1940 eds.] 15-minute series quadrangle Peoria, IL (1927 [1955 ed.]) 15-minute series quadrangle Peoria, IL (1958 [1969, 1973, 1981 eds.]) 1:250,000 quadrangle Marquette Heights, IL (1960 [1961, 1968, 1979 eds.]) 7.5-minute series quadrangle

3.3 Archaeological Probability Review

The Illinois State Archaeological Survey (ISAS), a part of Prairie Research Institute at the University of Illinois, maintains a GIS-based statewide archaeological predictive model (ISAS 2025a). The model factors variables includes previous archaeological work; known locations of precontact archaeological sites; and environmental and geophysical variables such as elevation, distance to water sources, and native vegetation (ISAS 2025b). According to the Illinois Archaeological Predictive Model, approximately 61% (6.35 ha [15.68 ac.]) of the area within the AOI are denoted as high probability for encountering precontact archaeological resources; 13.50% (1.39 ha [3.43 ac.]) as medium-high probability; 19.2% (2.0 ha [4.9 ac.]) as medium-low probability; and 6.3% (0.66 ha [1.63 ac.]) as low probability (Appendix A, Figure 6).

4.0 Summary and Recommendations

On behalf of Lumina, ESI conducted a cultural resource desktop assessment for the proposed Project in Tazewell County, Illinois.

The Project may require a general or individual permit from the USACE under Section 404 of the Clean Water Act (33 USC 1344) and would therefore become subject to the NEPA (42 USC 4321 et seq.); Section 106 of the National Historic Preservation Act of 1966, as amended (54 USC 306108), and its implementing regulations (36 CFR 800); and USACE's agency-specific procedures for the protection of historic properties (33 CFR 325, Appendix C). For Section 106 undertakings in Illinois, the Illinois State Historic Preservation Office (SHPO) fulfills consultation responsibilities.

The current investigation is a due-diligence effort designed for planning purposes only and potentially does not fulfill NEPA and Section 106 regulatory requirements. Contingent upon regulatory requirements, additional field studies may be required to assess the Project's impacts on known and unknown cultural resources potentially eligible for listing in the National Register of Historic Places.

Desktop analysis revealed the following:

- Three soil types identified within the AOI contain high probability, and three soil types contain moderately-high probability for precontact archaeological sites.
- Two previously recorded archaeological sites were identified within a 1.6-km (1.0-mi.) radius of the AOI; none were identified within the AOI.
- Two previous cultural resource investigations were identified within a 1.6-km (1.0-mi.) radius of the AOI; one intersects the AOI.
- One previously recorded cemetery was identified within the AOI.
- No previously recorded historic architectural resources were identified within the AOI or a 0.40-km (0.25-mi.) radius of the AOI.
- Thirteen PHRs were identified within the AOI and a 0.40-km (0.25-mi.) radius of the AOI; 10 PHRs are extant and three are nonextant. One nonextant PHR was identified within the AOI.
- The Illinois Archaeological Predictive Model (ISAS 2025a) suggests 6.35 ha (15.68 ac.) of high probability; 1.39 ha (3.43 ac.) of medium-high probability; 2 ha (4.9 ac.) of medium-low probability; and 0.66 ha (1.63 ac.) of low probability for potentially encountering unrecorded precontact archaeological sites.

Contingent upon regulatory requirements, additional field studies may be required to assess the Project's impacts on unknown and known cultural resources potentially eligible for listing in the National Register of Historic Places.

5.0 References Cited

- Environmental Protection Agency. 2025. TMDL Development for Mackinaw River Watershed. Electronic resources, <https://epa.illinois.gov/content/dam/soi/en/web/epa/topics/water-quality/watershed-management/tmdls/documents/fact-sheet-mackinaw-river-nov-2018.pdf>, accessed May 2025.
- Illinois State Archaeological Survey (ISAS). 2025a. The Illinois Archaeological Predictive Model (IAPM). Electronic database, <http://go.isas.illinois.edu/IAPM>, accessed May 2025.
- Illinois State Archaeological Survey (ISAS). 2025b. Illinois Archaeological Predictive Model (IAPM): An archaeological service from the Prairie Research Institute to the Citizens of Illinois. Electronic resource, https://www.isas.illinois.edu/office_of_the_illinois_state_archaeologist/illinois_archaeological_predictive_model, accessed May 2025.
- Leighton, M.M, George E. Ekblaw, and Leland Horberg. 1948. Physiographic Divisions of Illinois. Reprinted from *The Journal of Geology* 56(1). State of Illinois, Urbana.
- Soil Survey Staff, Natural Resources Conservation Service, US Department of Agriculture (NRCS). 2025. Web Soil Survey. Electronic document, <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>, accessed May 2025.

APPENDIX A FIGURES

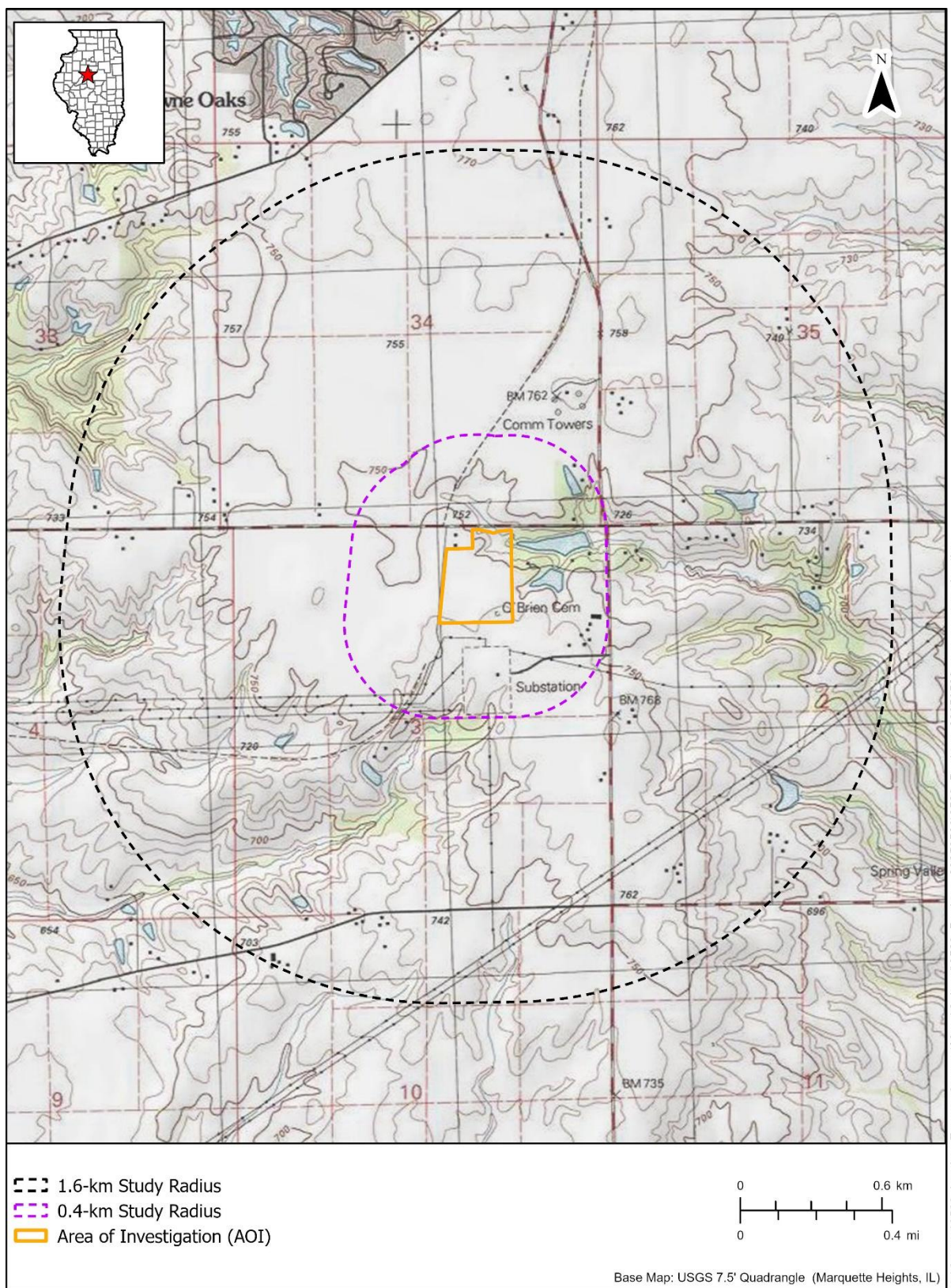


Figure 1. AOI and study areas depicted on a USGS topographic base map.

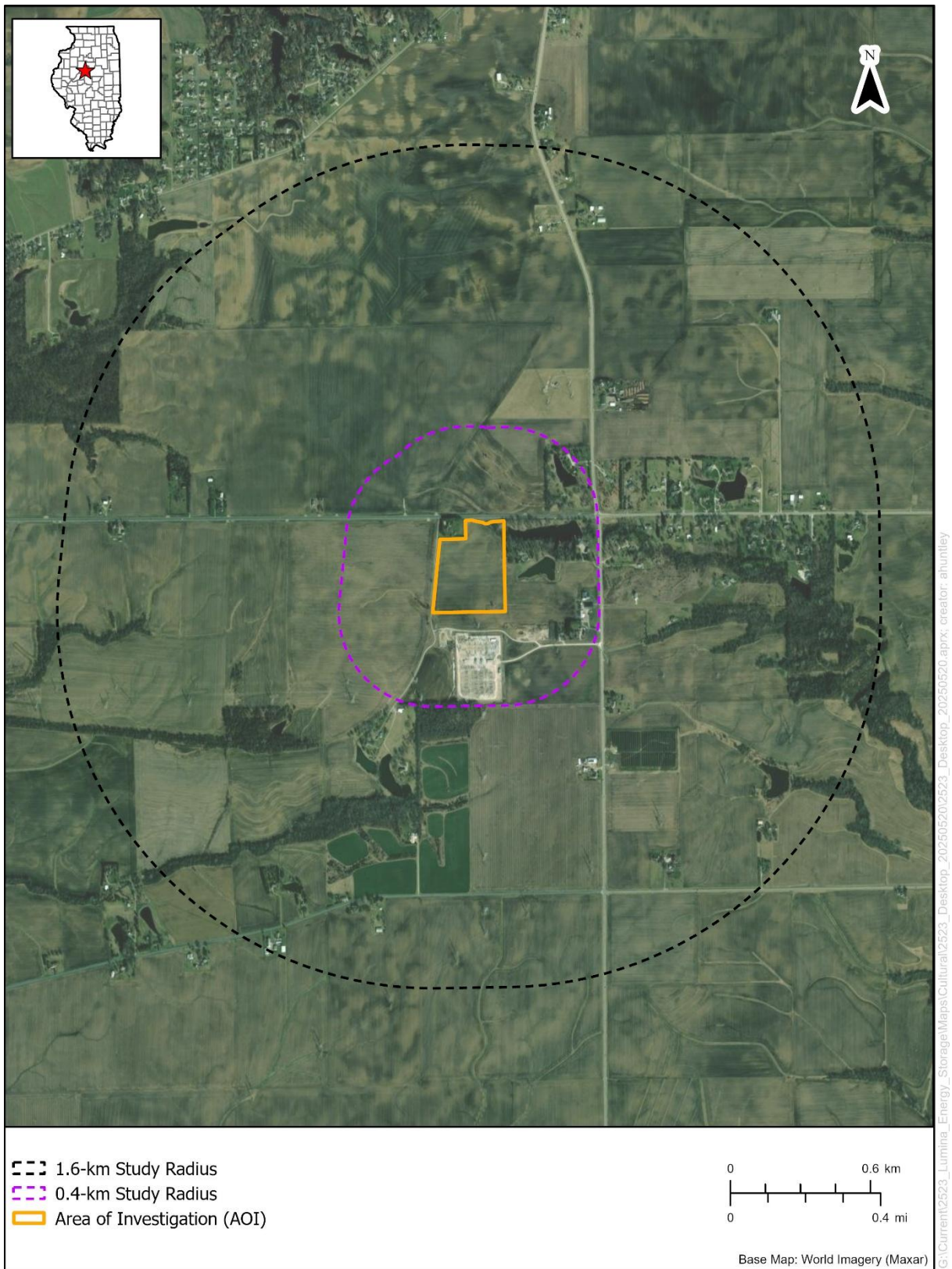


Figure 2. AOI and study areas depicted on aerial imagery.

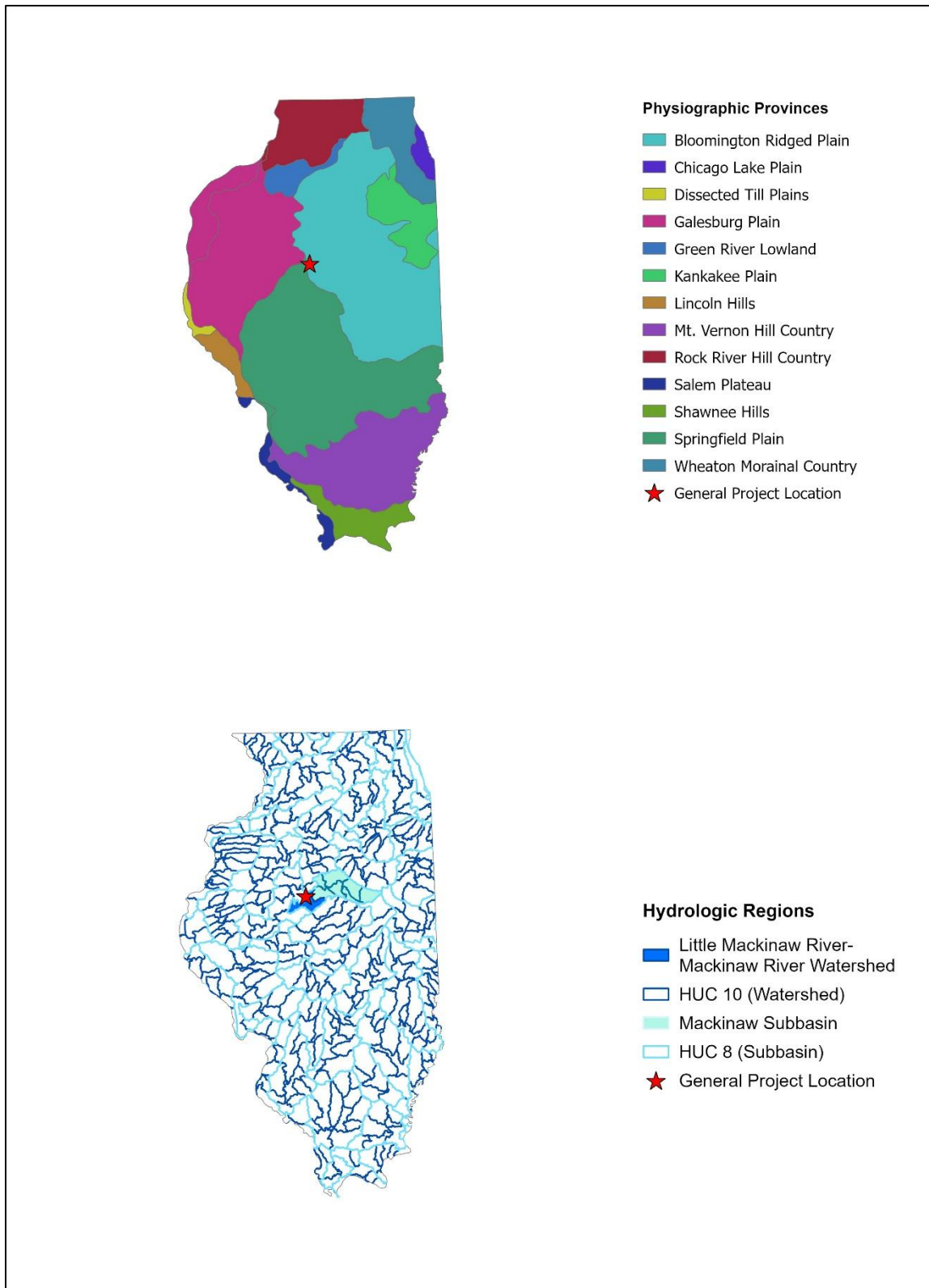


Figure 3. General Project location depicted on physiographic map (top) and hydrologic map (bottom).

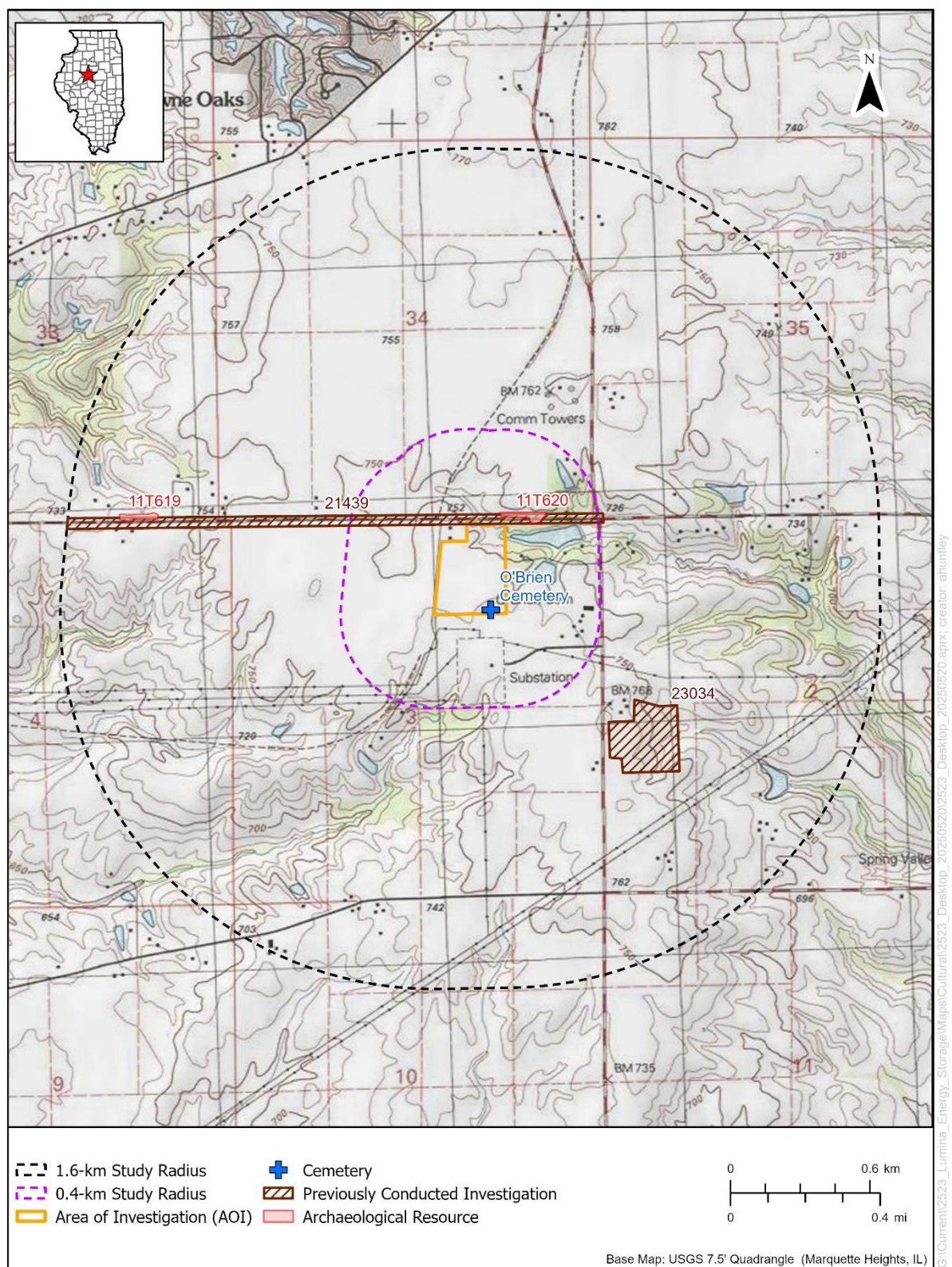


Figure 4. Previous investigations and previously recorded archaeological resources and cemeteries within the study areas depicted on a USGS topographic base map.

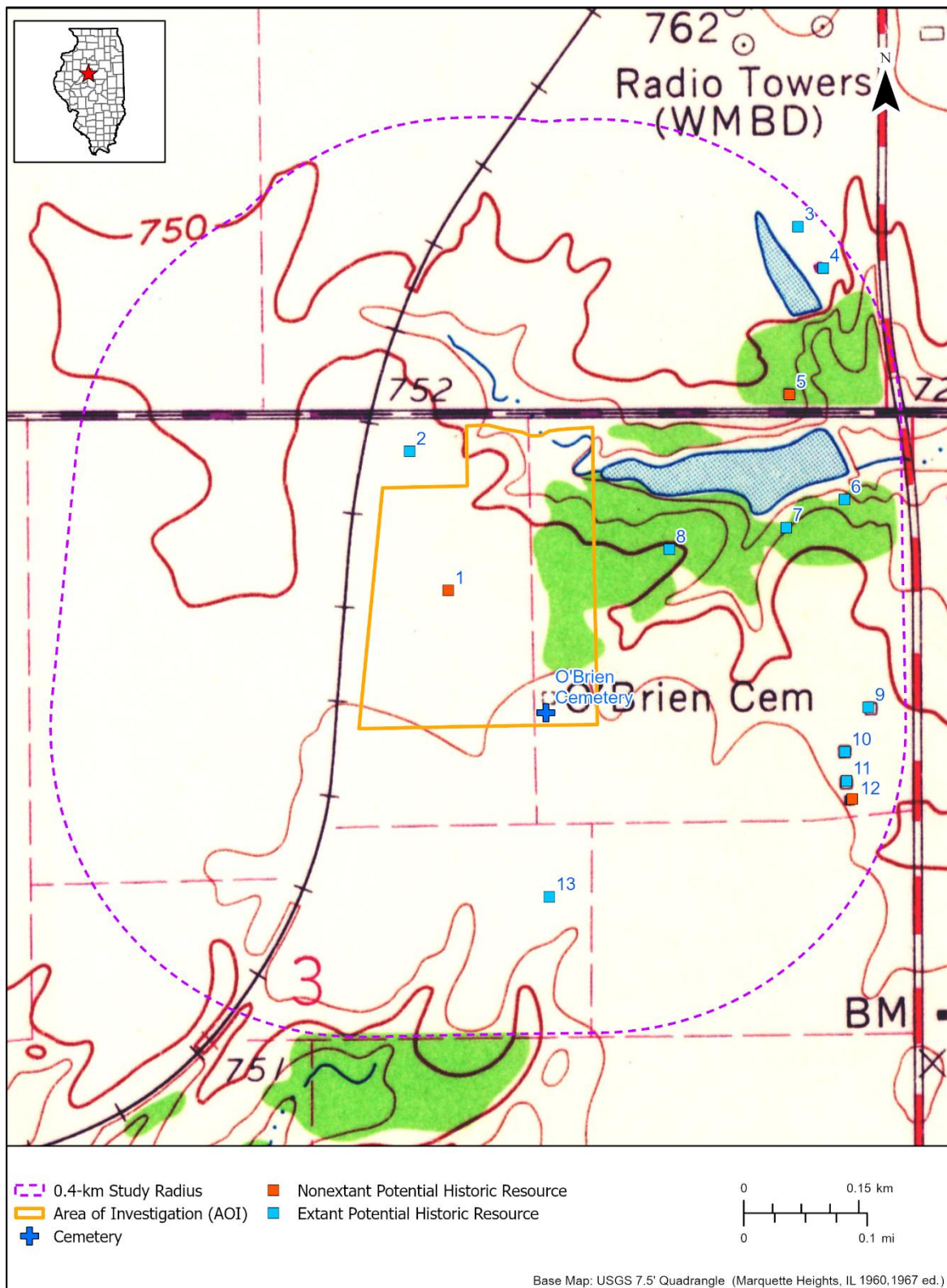


Figure 5. Potential historic resources within the study area depicted on mid-twentieth-century USGS topographic map.



Figure 6. Archaeological probability map depicted on aerial imagery (ISAS 2025a).



Tazewell County
Pekin
Broadway Rd, W of Springfield Rd
Section:3-Township:24N-Range:4W
IEPA, HRP
New Construction, Battery Energy Storage System

PLEASE REFER TO: SHPO LOG #025091526

October 8, 2026

Ryan P. Grohnke
Westwood Professional Services
12701 Whitewater Drive, Suite 300
Minnetonka, MN 55343

The Illinois State Historic Preservation Office is required by the Illinois State Agency Historic Resources Preservation Act (20 ILCS 3420, as amended, 17 IAC 4180) (Act) to review all state undertakings for their effect on cultural resources. Pursuant to this requirement, we have received information regarding the above-referenced project for our comment.

According to the information provided there is no federal involvement in your project. Be aware the state law is less restrictive than the federal cultural resource laws concerning archaeology. If your project will use any federal loans or grants, need any federal agency permits (including non-reporting), use any federal property, or involve any assistance from a federal agency, then your project must be reviewed under the National Historic Preservation Act of 1966, as amended, and/or the regulations set forth in 36 CFR 800. Please notify us immediately if such is the case, as additional archaeological survey beyond what is described below will be necessary.

No historic properties were identified within the area of potential visual effects. Additionally, our files do not identify any known archaeological sites within the area of potential direct effects, nor is it within a high probability area for archaeological resources as defined in the Act. Accordingly, this project is **EXEMPT** from archaeological survey requests pursuant to Section 6 of the Act. An archaeological survey is not *required* as there also is no public funding, nor is it on public land. Please notify us immediately if such is not the case.

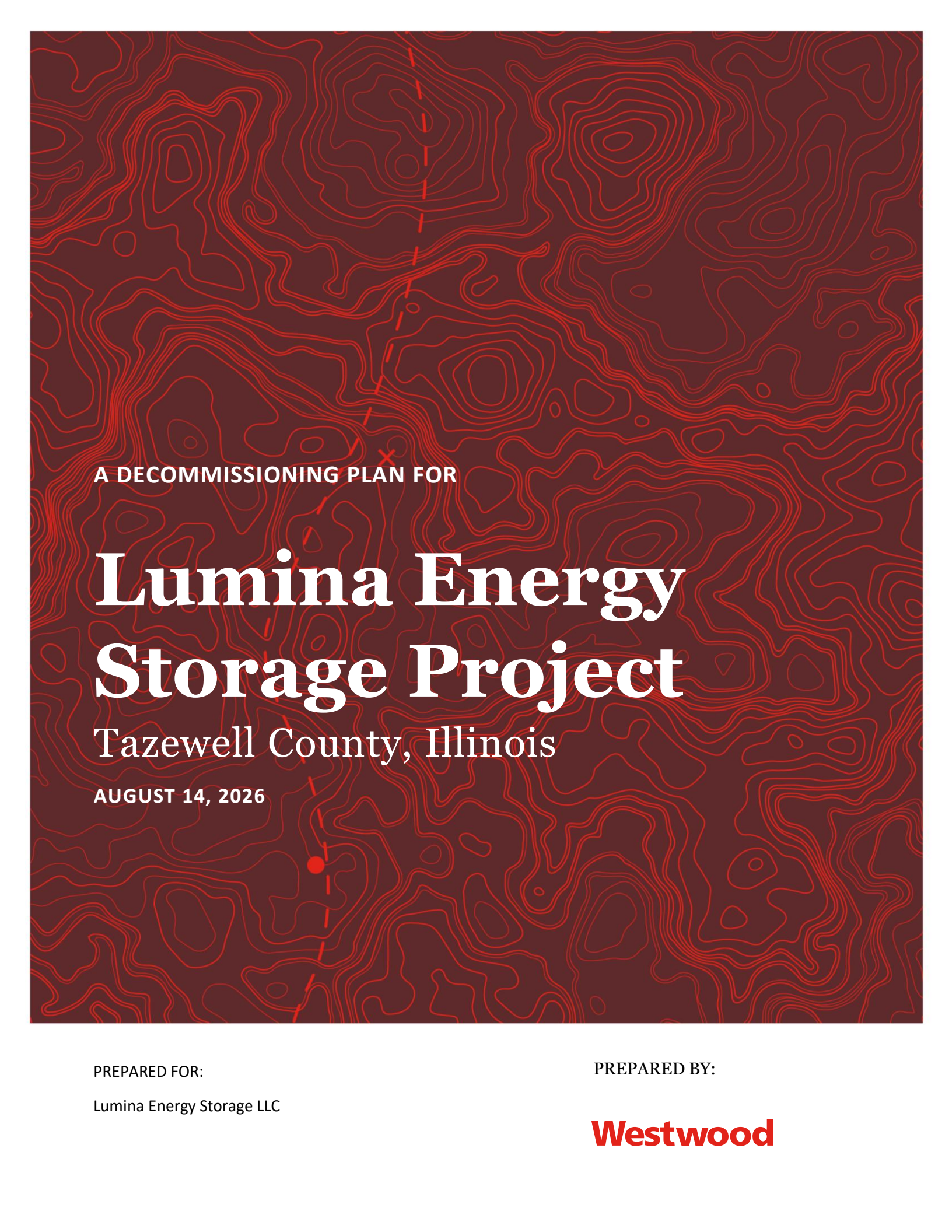
Since the area has never been surveyed for archaeological resources, however, it is possible that sites are present but remain unidentified. Portions of the project area are classified as having a high probability of containing archaeological resources per the Illinois Archaeology Predictive Model (IAPM), an updated and improved model not tied to the Act. Please consider assisting the State of Illinois in its efforts to preserve and protect historic resources by sharing with us the results of any due diligence archaeological surveys. Early awareness of the presence of historic properties may help prevent unanticipated discoveries and potential construction delays.

The O'Brien Cemetery is afforded protection under the Illinois Human Remains Protection Act, as amended (20 ILCS 3440), and it's implementing rules (17 IAC 4190) (HRPA). Pursuant to the HRP, a permit from the Department of Natural Resources will be required to ensure adequate avoidance. Please contact Dawn Cobb, HRP Coordinator, at 217/785/4992 or dawn.cobb@illinois.gov to initiate the permitting process.

Sincerely,

A handwritten signature in black ink that reads "Carey L. Mayer".

Carey L. Mayer, AIA
Deputy State Historic Preservation Officer



A DECOMMISSIONING PLAN FOR

Lumina Energy Storage Project

Tazewell County, Illinois

AUGUST 14, 2026

PREPARED FOR:

Lumina Energy Storage LLC

PREPARED BY:

Westwood

Decommissioning Plan

Lumina Energy Storage Project

Tazewell County, Illinois

Prepared for:

Lumina Energy Storage LLC
Broadway Street
Pekin, IL 61554

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Project Number: 0080840.00

Date: August 14, 2026

Table of Contents

1.0	Introduction / Project Description	1
2.0	Proposed Future Land Use	1
3.0	Decommissioning Activities	1
3.1	Decommissioning of Project Components	2
3.1.1	Steel Foundation Posts	2
3.1.2	Overhead and Underground Cables and Lines	2
3.1.3	Gen-Tie Lines	2
3.1.4	Inverters, Transformers, and Ancillary Equipment	2
3.1.5	Equipment Foundations and Ancillary Foundations	2
3.1.6	Fence	3
3.1.7	Access Roads	3
3.1.8	Substation	3
3.1.9	Operations and Maintenance Building	3
3.1.10	Battery Energy Storage Systems	4
3.2	Reclamation	4
4.0	Best Management Practices (BMPs)	5
4.1	Construction Stormwater Practices	5
4.1.1	Erosion Control	5
4.1.2	Sediment Control	5
4.1.3	Controlling Stormwater Flowing onto and Through the Project	5
4.2	Drain Tile	5
4.3	Permitting	6
4.4	Health and Safety Standards	6
5.0	Timeline	6
6.0	Decommissioning Costs	6
7.0	Financial Assurance	7

Attachments

Attachment A: Decommissioning Cost Estimate

1.0 Introduction / Project Description

This Decommissioning Plan ("Plan") has been prepared for the Lumina Energy Storage Project in accordance with the Tazewell County Renewable Energy Ordinance as well as the Illinois Department of Agriculture's (IODA) Standard Solar Agriculture Impact Mitigation Agreement (AIMA). The purpose of the Plan is to describe the means and methods that can be used to remove all structures, foundations, underground cables, and equipment and to reclaim and restore the land altered during the construction and operation of the battery energy storage system ("BESS") to its predevelopment condition to the extent feasible.

The Lumina Energy Storage Project ("Project") is a BESS proposed by Lumina Energy Storage LLC ("Applicant") in Tazewell County, Illinois. The Project will have a capacity of 300-megawatt (MW)/1,200-megawatt hours (MWh) with a storage duration of four (4) hours. Upon completion, the Project will comprise battery storage containers, medium voltage power stations containing inverters and transformers, collection lines, generation-tie (gen-tie) line, a substation, an operations and maintenance (O&M) facility, access roads, and fencing. The Project will be built within a general Project Area of approximately 11.5 acres.

The useful life a BESS is generally considered to be 25 years. At that time, the Project will either be decommissioned or repowered with newer technology. The Plan identifies components which may be removed and areas that may be restored once the Project has not operated for 12 consecutive months, when the Project owner is no longer making reasonable efforts to repair or decommission the Project, or when the Project has surpassed the useful lifespan of the batteries and facilities.

2.0 Proposed Future Land Use

Prior to the development of the Project, the land use of the Project Area was primarily agricultural production. After all equipment and infrastructure is removed during decommissioning, any holes or voids created by poles, concrete pads, and other equipment will be filled in with native soil to the surrounding grade, and the site will be restored to pre-construction conditions to the extent practicable. Access roads and other areas compacted by equipment may be decompacted to a depth necessary to ensure drainage of the soil and root penetration prior to fine grading and tilling to a farmable condition. Please refer to Section 3.2 for a detailed description of reclamation activities.

3.0 Decommissioning Activities

Decommissioning of the Project will include removing the battery containers, inverter transformer power stations, collection cables and lines, gen-tie line, equipment pads and foundations, equipment cabinets, and ancillary equipment. The civil facilities, access roads, security fencing, and drainage structures are included in the scope. Standard decommissioning practices will be utilized, including dismantling and repurposing, salvaging/recycling, or disposing of the battery energy storage improvements.

During decommissioning, the landowners will be consulted to identify the extent and type of work to be completed. Some Project infrastructure, such as the access roads, and fencing, may be removed at the

discretion of the landowner. Underground utility lines, if deeper than five (5) feet below ground surface elevation, may be left in place to minimize land disturbance and associated impacts to future land use.

Decommissioning will include the removal and transportation of all Project components from the Project site. All dismantling, removal, recycling, and disposal of materials generated during decommissioning will comply with rules, regulations, and prevailing Federal, State, and local laws at the time decommissioning is initiated and will use approved local or regional disposal or recycling sites as available. Recyclable materials will be recycled to the furthest extent practicable. Non-recyclable materials will be disposed of in accordance with State and Federal law.

3.1 Decommissioning of Project Components

3.1.1 Steel Foundation Posts

Structural foundation steel posts will be pulled out to full depth, removed, processed to appropriate size, and shipped to a recycling facility. The posts can be removed using back hoes or similar equipment. During decommissioning, the area around the foundation posts may be compacted by equipment and, if compacted, the area will be decompacted and re-stabilization will occur, in a manner to adequately restore the topsoil and sub-grade material to a density consistent for vegetation.

3.1.2 Overhead and Underground Cables and Lines

All underground cables and conduits will be removed to a depth of five (5) feet. Topsoil will be segregated and stockpiled for later use prior to any excavation and the subsurface soils will be staged next to the excavation. Proper erosion control best management practices will be installed/applied. The subgrade will be compacted and topsoil will be redistributed across the disturbed area and immediately re-stabilized with native vegetation.

3.1.3 Gen-Tie Lines

The overhead gen-tie lines, consisting of a conductor, a ground conductor, and SCADA line, will be destrung in the opposite manner that the conductor was installed, using pull trucks, reel trucks, tensioners, and pullers, in addition to standard equipment. Insulators and insulator gangs will also be removed from each tower. It is anticipated that one crew will work on removing the conductors while another crew works on the ground conductor and SCADA. Once the wires are removed, the steel transmission towers will be brought to the ground for disassembly. All removed equipment will be disassembled to sizes suitable for hauling, then properly hauled off site for recycling and/or disposal to a permitted facility.

3.1.4 Inverters, Transformers, and Ancillary Equipment

All electrical equipment will be disconnected and disassembled. All parts will be removed from the site and reconditioned, reused, sold as scrap, recycled, or disposed of appropriately, consistent with applicable local, state, and federal requirements.

3.1.5 Equipment Foundations and Ancillary Foundations

The ancillary foundations are pile foundations for the equipment pads. As with the other structural steel foundation posts, the foundation piles will be pulled out completely. Duct banks will be excavated to a

depth of five (5) feet. All unexcavated areas compacted by equipment used in decommissioning will be decompacted in a manner to adequately restore the topsoil and sub-grade material to a density similar to the surrounding soils, and immediately re-stabilized. All materials will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, in accordance with local, state, and federal requirements.

3.1.6 Fence

Fence parts and foundations will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, in accordance with local, state, and federal requirements. The surrounding areas will be restored to pre-development conditions to the extent feasible.

3.1.7 Access Roads

Project access roads will be used for decommissioning purposes, after which removal of roads will be discussed with the landowner and one of the following options will be pursued:

1. After final clean-up, roads may be left intact through mutual agreement of the landowner and the Applicant unless otherwise restricted by federal, state, or local requirements.
2. If a road is to be removed, aggregate will be removed and shipped from the site to be reused, sold, or disposed of appropriately. Internal service roads are constructed with geotextile fabric and eight inches of aggregate over compacted subgrade. Any ditch crossing connecting access roads to public roads will be removed unless the landowner requests it remains. The subgrade will be decompacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent for reintroduction of farming. Topsoil that was stockpiled during the original construction will be distributed across the open area. Finally, the access road corridors will be tilled to an agricultural condition.

3.1.8 Substation

Decommissioning of the collector substation will be performed with the rest of the Project. All steel, conductors, switches, transformers, and other components of the substation will be disassembled and taken off-site to be recycled or reused, and/or properly disposed of at an approved facility. Foundations and underground components will be removed to a depth of five feet. The rock base will be removed using bulldozers and backhoes or front loaders. The material will be hauled from the site using dump trucks to be recycled or disposed of at an off-site facility. Additionally, any permanent stormwater treatment facilities (e.g., infiltration ponds and engineered drainage swales) will be removed. Topsoil will be reapplied to match surrounding grade to preserve existing drainage patterns. Topsoil and subsoil will be decompacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent for reintroduction of farming. Any permitting requirements for excavation and land disturbance will be secured prior to initiating decommissioning work.

3.1.9 Operations and Maintenance Building

The O&M building is a sturdy, general purpose steel building. If the building is not repurposed, decommissioning will include disconnection of the utilities and demolition of the building structure, foundation, rock base parking lot, and associated vegetated/stormwater handling facilities. All associated materials will be removed from the site using wheeled loaders or backhoes and bulldozers

and hauled off-site in dump trucks. All recyclable materials will be brought to appropriate facilities and sold; the remaining materials will be disposed of at an approved landfill facility. Subgrade soils will be decompacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent for reintroduction of farming. Topsoil will be reapplied to match existing surrounding grade to preserve existing drainage patterns, and the site will be tilled either to a farmable condition, depending upon location.

3.1.10 Battery Energy Storage Systems

Prior to commencing decommissioning of the BESS, all personnel on-site during the decommissioning process will receive a site-specific safety briefing and will be made aware of all electrical shock and arc flash risks when working within the battery containers. Hazmat training will also be conducted for all personnel handling lithium-ion batteries during the process.

As of the writing of this Plan, Tesla offers complimentary recycling of its battery products at its Gigafactory in Sparks, Nevada. The battery facility will be fully discharged to the minimum state of charge required for removal and safe transportation as per battery manufacturer specifications. The battery containers will then be sealed, loaded onto trucks intact, and hauled to the Tesla GigaFactory in Sparks, Nevada for recycling. No disassembly of the battery containers will be required.

Aggregate ground cover will be removed and shipped from the Project site to be reused, sold, or disposed of appropriately, consistent with applicable local, state, and federal requirements. Clean aggregate can often be used as “daily cover” at landfills for no disposal cost. All internal service roads are constructed with geotextile fabric and eight inches of aggregate over compacted subgrade. All pile foundations will be pulled out completely. Underground cables and duct banks will be removed to a depth of five feet. Topsoil will be reapplied to the disturbed area. Soil and topsoil will be de-compacted, and the site will be restored to the pre-construction condition and re-vegetated in accordance with the Stormwater Pollution Prevention Plan (SWPPP) and/or construction stormwater permits.

In all cases, the Applicant, or their subcontractor as applicable, shall ensure all applicable OSHA, security, safety and health requirements are complied with during the removal and decommissioning of the BESS and its related equipment.

The United States Environmental Protection Agency (“U.S. EPA”) has guidelines for responsible disposal and recycling of lithium-ion batteries that have reached end of life (Title 40 Code of Federal Regulations Part 273: Standards for Universal Waste Management). Additionally, lithium-ion batteries are classified by the US Department of Transportation (DOT) as Class Nine hazardous materials. All applicable requirements related to the packaging, labelling, transportation, and disposal or recycling of the lithium-ion batteries contained in the Code of Federal Regulations, Title 49, Subchapter C, Parts 171-180, will be followed.

3.2 Reclamation

The Applicant will restore and reclaim the site to the pre-construction condition consistent with the site lease agreement. The Applicant assumes that most of the site will be returned to farmland after decommissioning through implementation of appropriate measures to facilitate such uses. If no specific use is identified, the Owner will vegetate the site with a seed mix approved by the local soil and water conservation district or similar agency. The goal of restoration will be to restore natural hydrology and

plant communities to the greatest extent practicable while minimizing new disturbance and removal of native vegetation. In addition to the reclamation activities described above for each decommissioning activity, all unexcavated areas compacted by equipment and activity during the decommissioning will be decompact and re-stabilized/vegetated as needed to ensure proper density of topsoil consistent and compatible with the surrounding area and associated land use. All materials and debris associated with Project decommissioning will be removed and properly recycled or disposed of at off-site facilities.

4.0 Best Management Practices (BMPs)

4.1 Construction Stormwater Practices

During decommissioning, erosion and sediment control BMPs will be implemented to minimize potential for erosion of site soils and sedimentation of surface waters and waters of the state. Because decommissioning will entail disturbance of more than one acre of soil, the Applicant will prepare a SWPPP and obtain coverage with the Illinois Environmental Protection Agency (Illinois EPA) under the NPDES Permit No. ILR10 prior to initiating soil disturbing activities. Potential BMPs to be implemented during decommissioning activities are described below and will be subject to refinement in the SWPPP. The decommissioning team will review the permitting requirements at the time of decommissioning and obtain any other necessary permits.

4.1.1 Erosion Control

Erosion control measures will be refined based on the standard of practice current at the time the SWPPP is developed for decommissioning. All disturbed areas without permanent impermeable or gravel surfaces, will be vegetated for final stabilization. All slopes steeper than 4:1 should be protected with erosion control blankets. Restoration should include seed application prior to application of the blanket. All slopes 4:1 or flatter should be restored with seed and mulch, which will be disc anchored.

4.1.2 Sediment Control

Sediment controls, such as silt fences, fiber logs, dewatering practices, construction entrances, and sedimentation traps and/or basins will be implemented during construction to prevent the transport of sediment off-site during decommissioning activities. Street sweeping/scraping will also be implemented to mitigate potential tracking of sediment onto public roadways. An Erosion and Sediment control plan and land disturbance permit will be approved prior to decommissioning.

4.1.3 Controlling Stormwater Flowing onto and Through the Project

Given the low gradient of the slopes in the Project Area, controlling stormwater flow that enters the Project Area will likely require minimal effort during decommissioning activities. Only newly disturbed areas may require new, temporary stormwater control. If necessary, water may be diverted around the Project site using diversion berms. A stormwater plan will be prepared in accordance with standards at the time of decommissioning.

4.2 Drain Tile

If drain tile lines are identified within the Project boundary, decommissioning activities should be performed in a manner that minimizes drain tile impact. A drainage plan will be created for the Project

and will include the location of any potentially impacted drainage district facilities to the extent the information is publicly available from the County or drainage district. All tile lines identified will be staked or flagged in the locations where expected crossing or disturbance is anticipated prior to decommissioning to alert decommissioning crews to the possible need for tile line repairs.

4.3 Permitting

All decommissioning and reclamation activities will comply with local, state, and federal permit requirements. Decommissioning activities that will disturb more than one acre of soil will require coverage under the NPDES Permit No. ILR10 for construction stormwater. The permits will be applied for and received prior to decommissioning construction activities commencing. A SWPPP will be developed prior to filing for construction stormwater permit coverage.

4.4 Health and Safety Standards

Work will be conducted in strict accordance with the Applicant's Health and Safety Plan ("Safety Plan") and in strict compliance with local, state, and federal safety requirements. The construction contractor hired to perform the decommissioning will also be required to prepare a site-specific health and safety plan. All site workers, including subcontractors, will be required to read, understand, and abide by the plans. A site safety officer will be designated by the construction contractor to ensure compliance. This official will have stop-work authority over all activities on the site should unsafe conditions or lapses in the safety plan be observed. The Applicant will also coordinate with local fire safety officials.

5.0 Timeline

Decommissioning of the Project will be initiated if the Project has not produced electricity for a period of up to 12 months or when the Project owner is no longer making reasonable efforts to repair or decommission the Project. It is anticipated that the decommissioning activities for the Project can be completed in a 52-week period. The estimated costs for decommissioning are tied to assumptions about the amount of equipment mobilized, the crew sizes, weather and climate conditions, and the productivity of the equipment and crews.

6.0 Decommissioning Costs

The decommissioning costs are calculated using current pricing. In keeping with the requirements of Tazwell County Renewable Energy Ordinance, the estimate of net costs should be updated following the tenth anniversary of Project commercial operations, and every five years thereafter, to recognize price trends for both decommissioning costs and the salvage and resale values of the components.

There are currently active markets for scrap steel, aluminum, and copper, and used transformers and electrical equipment. Scrap metal prices have been discounted from posted spot prices found on www.scrapmonster.com.

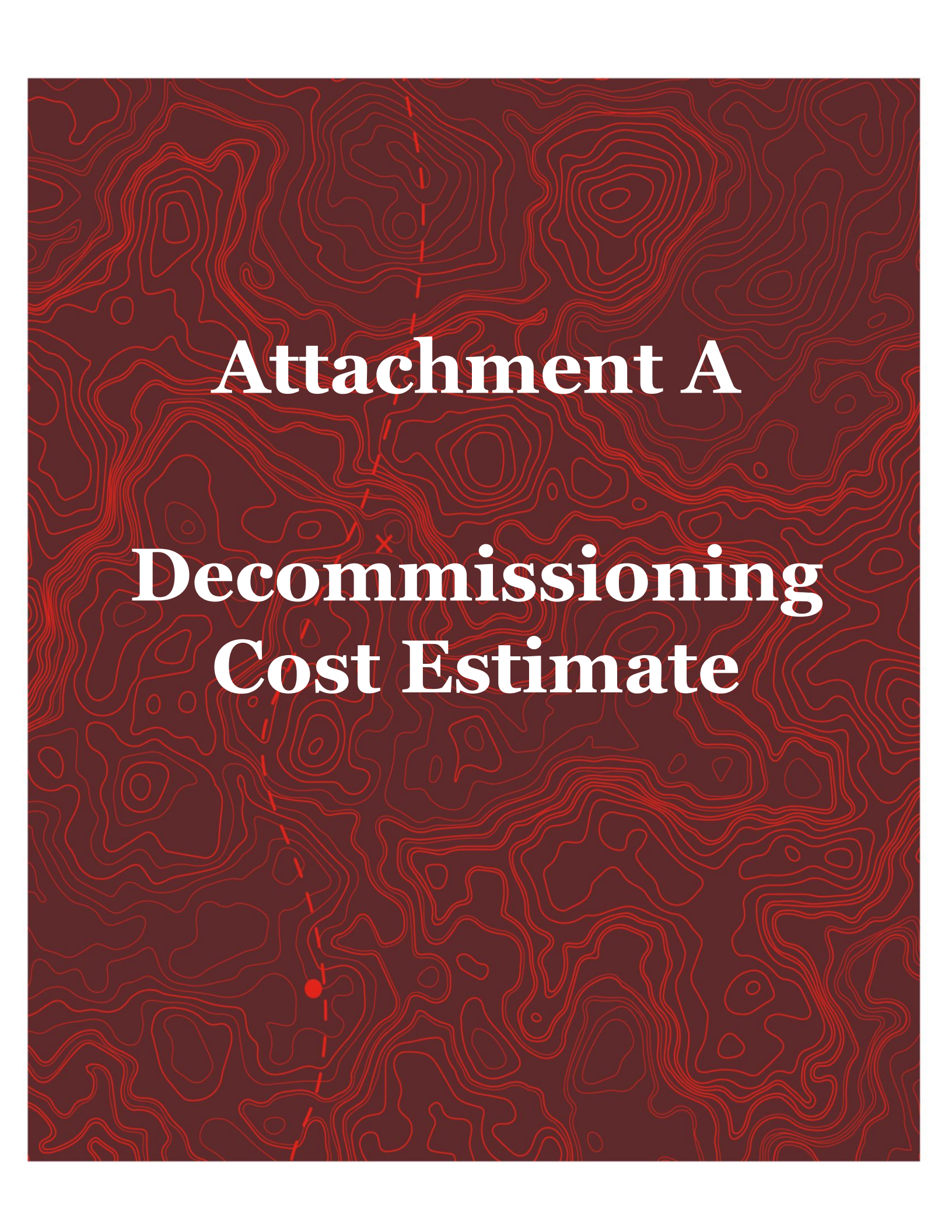
The total estimated cost of decommissioning the Lumina Energy Storage Project is approximately \$8,703,038 (\$29,010 per MW). Estimated salvage/scrap value of the battery storage containers, inverter transformer power stations, and other materials is approximately \$1,060,101. The net decommissioning

cost after accounting for resale and salvage values is approximately \$7,643,000, or \$25,477 per MW.

7.0 Financial Assurance

In accordance with the Tazwell County Renewable Energy Ordinance, the Applicant shall be responsible for submittal of financial assurance to cover the cost of decommissioning the Project. The financial assurance is defined as “a reclamation of surety bond or other commercially available assurance that is acceptable to the County, with the County as beneficiary”. The financial assurance shall be implemented as follows:

1. Before the commercial operations date (COD), the Applicant shall provide the municipality with Financial Security to cover twenty-five percent (25%) of the estimate decommissioning costs, as presented in this Plan; and
2. Before the fifth (5th) anniversary of the COD, the Applicant shall provide fifty percent (50%) of the estimate decommissioning costs to the municipality; and
3. Before the tenth (10th) anniversary of the COD, the Applicant shall provide one hundred percent (100%) of the estimated decommissioning costs to the municipality, as determined by the Decommissioning Plan.

The background of the slide is a dark red topographic map with intricate, lighter red contour lines. A dashed red line runs vertically down the left side of the slide, ending in a solid red dot near the bottom. There is also a small red 'x' mark on the map, located to the left of the main text.

Attachment A

Decommissioning Cost Estimate

Lumina Energy Storage Project

	Quantity	Unit	Unit Cost	Total Cost
Mobilization/Demobilization	1	Lump Sum	\$529,000.00	\$529,000

Mobilization was estimated to be approximately 7% of total cost of other items.

Permitting

County Permits	1	Lump Sum	\$10,000.00	\$10,000
State Permits	1	Lump Sum	\$20,000.00	\$20,000
Subtotal Permitting				\$30,000

Decommissioning will require SWPPP and SPCC Plans. Cost is an estimate of the permit preparation cost.

Battery Energy Storage System (BESS)

Train Crew in Safety and Hazmat	1	LS	\$5,000.00	\$5,000
Disconnect Battery Storage Containers	314	Each	\$1,632.40	\$512,574
Remove and Load Tesla MegaPacks	314	Each	\$1,516.96	\$476,324
Haul Battery Containers for Recycling	314	Each	\$1,371.93	\$430,785
Remove Equipment Skids	79	Each	\$1,241.98	\$98,116
Haul Inverters/Transformers to Transformer Disposal	79	Each	\$203.05	\$16,041
Remove Steel Foundation Posts (Storage Containers and Skids)	3,930	Each	\$17.08	\$67,124
Haul Steel Posts to Metal Recycler (Peoria, IL)	354	Tons	\$11.84	\$4,191
Removal of Underground AC Collector Cables (aluminum)	5,213	LF	\$2.38	\$12,407
Load and Haul Cables for Recycling	13	Tons	\$13.62	\$177
Decompact BESS Site	10	Acres	\$274.31	\$2,798
Grade BESS Site	445,352	SF	\$0.07	\$31,175
Subtotal BESS				\$6,972,246

Civil Infrastructure

Remove Gravel Surfacing from Road	1,373	Cubic Yards (BV)	\$3.05	\$4,188
Haul Gravel Removed from Road to Landfill (East Peoria, IL)	1,716	Cubic Yards (LV)	\$17.00	\$29,172
Dispose of Gravel Removed from Road (Landfill uses as Daily Cover)	2,224	Tons	\$0.00	\$0
Remove Geotextile Fabric from Beneath Access Roads	7,412	Square Yards	\$1.40	\$10,377
Haul Geotech Fabric to Landfill (East Peoria, IL)	2	Tons	\$9.35	\$19
Dispose of Geotech Fabric	2	Tons	\$81.00	\$162
Grade Road Corridor (Re-spread Topsoil)	2,779	Linear Feet	\$2.58	\$7,170
Decompact Road Area	1.5	Acres	\$274.31	\$411
Remove and Load Gravel Surfacing from BESS Site (Excluding Roads)	10,996	Cubic Yard (BV)	\$3.05	\$33,539
Haul Gravel Removed from BESS Site to Landfill (East Peoria, IL)	13,745	Cubic Yard (LV)	\$17.00	\$233,665
Dispose of Gravel from BESS Site (Use as Daily Cover)	20,618	Tons	\$0.00	\$0
Remove Chainlink Fence	2,419	Linear Feet	\$7.63	\$18,457
Haul Chainlink Fence to Metal Recycling (Peoria, IL)	13	Tons	\$11.84	\$154
Remove/Haul/Dispose Structures from Stormwater Basins	1	Each	\$5,000.00	\$5,000
Grade Basin Areas	1	LS	\$7,174.93	\$7,175
Subtotal Civil Infrastructure				\$349,488

Civil removal costs are a combination of MNDOT unit costs where applicable, RSMeans cost for Peoria, IL, and industry standards provided to Westwood.

Substation

Disassemble and Remove Main Power Transformers	2	Each	\$4,500.00	\$9,000
Haul Transformers Offsite (Tinley Park, IL)	2	Each	\$812.18	\$1,624
Haul Transformer Oil Offsite	25,660	Gallons	\$0.16	\$4,168
Excavate Around Transformer Foundations	2	Each	\$1,903.33	\$3,807
Remove Complete Transformer Foundations	167	Cubic Yards	\$164.61	\$27,490
Backfill Excavation Area from Transformer Foundation Removal	333	Cubic Yards	\$43.07	\$14,342
Haul Concrete (Foundations Transformer, Switch Gear, etc.)	339	Tons	\$10.47	\$3,549
Dispose of Concrete from Transformer Foundation	339	Tons	\$81.00	\$27,459
Demolish Substation Site Improvements (fences, etc)	1	LS	\$3,500.00	\$3,500
Demolish Control Building and Foundation	1	LS	\$12,000.00	\$12,000
Remove Medium/High Voltage Equipment	1	LS	\$3,500.00	\$3,500
Remove Structural Steel Substation Frame	1	LS	\$3,500.00	\$3,500
Remove Copper Ground Grid	1	LS	\$7,174.93	\$7,175
Load Copper Wire	20,000	Feet	\$0.78	\$15,600

Haul Copper Wire to Recycling (Peoria, IL)	6.5	Tons	\$11.84	\$77
Haul - Demolition Materials, Removed Equipment & Structural Steel	20	Tons	\$11.84	\$237
Dispose of Demolition Materials & Removed Equipment	20	Tons	\$81.00	\$1,620
Remove and Load Gravel Surfacing from Substation Site	2,222	Cubic Yards (BV)	\$3.05	\$6,777
Haul Gravel Removed from Substation Site to Landfill (East Peoria, IL)	2,778	Cubic Yards (LV)	\$17.00	\$47,226
Dispose of Gravel from Substation Site (Use as Daily Cover)	3,600	Tons	\$0.00	\$0
Grade Substation Site	1	LS	\$7,174.93	\$7,175
Erosion and Sediment Control at Substation Site	600	LF	\$4.03	\$2,418
Decompact Substation Site (Subsoiling)	2.1	Acres	\$274.31	\$576
Till Substation to Agricultural Condition	2.1	Acres	\$198.32	\$416
Subtotal Substation				\$203,237

Site Restoration

Stabilized Construction Entrance	1	Each	\$2,000.00	\$2,000
Perimeter Controls (Erosion and Sediment Control)	1,209	Linear Feet	\$4.03	\$4,872
Permanent Seeding on Roadway Areas	1.5	Acres	\$1,919.87	\$2,880
Revegetate BESS to Permanent Condition	12	Acres	\$1,919.87	\$22,079
Subtotal Site Restoration				\$31,831

Project Management

Project Manager	52	Weeks	\$3,749.00	\$194,948
Superintendent (full-time)	52	Weeks	\$3,525.00	\$183,300
Field Engineer (full-time)	52	Weeks	\$3,269.00	\$169,988
Clerk (full-time)	52	Weeks	\$750.00	\$39,000
Subtotal Project Management				\$587,236

Standard industry weekly rates from RSMeans.

Subtotal Demolition/Removals				\$8,703,038
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Salvage

Fencing (Chain Link)	13	Tons	\$248.34	\$3,228
Steel Posts	354	Tons	\$248.34	\$87,912
Transformers	404,875	Pounds	\$0.41	\$165,999
Transformers (Oil)	107,630	Gallons	\$0.70	\$75,341
DC Collection Lines (Copper)	12,560	Pounds	\$1.94	\$24,366
AC Collection Lines (Aluminum)	13,033	Pounds	\$1.19	\$15,509
Ground Conductor Lines (Copper)	3,310	Pounds	\$1.94	\$6,422
Subtotal Salvage				\$1,060,101

Salvage values are a combination of the following factors; current market metal salvage prices, discussions with national companies that specialize in recycling and reselling electrical transformers and inverters, and the assumption that care is taken to prevent any damage or breakage of equipment.

Total Demolition Minus Salvage				\$7,643,000
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Notes:

1. Prices used in analysis are estimated based on research of current average costs and salvage values.
2. Prices provided are estimates and may fluctuate over the life of the project.
3. Contractor means and methods may vary and price will be affected by these.

Cost Estimate Assumptions

To develop a cost estimate for the decommissioning of the Lumina Energy Storage Project, Westwood engineers made the following assumptions and used the following pricing references. 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. When publicly available bid prices or bid summaries were not available for particular work items, we developed time- and material-based estimates considering composition of work crews and equipment and material required. While materials may have a salvage value at the end of the Project life, the construction activity costs and the hauling/freight costs are separated from the disposal costs or salvage value to make revisions to salvage values more transparent.

1. Project quantities are based on Lumina Site Plan Rev B, dated February 12, 2026.
2. A project of this size and complexity requires a full-time project manager with full-time support staff.
3. RS Means pricing was used for the Peoria, Illinois region for the 2nd quarter of 2026.
4. Common labor will be used for the majority of tasks, supplemented by electricians, steel workers, and equipment operators where labor rules may require. The labor rates reflect union labor rates.
5. Mobilization was estimated at approximately 7% of total cost of other items.
6. Permit applications will require the preparation of a SWPPP.
7. Gravel removal was estimated on a time and material basis. Since the material will not remain on-site, a hauling cost is added to the removal cost. Clean aggregate can typically be used as “daily cover” at landfills without incurring a disposal cost. The road gravel may also be used to fortify local driveways and roads, lowering hauling costs but incurring placing and compaction costs. The hauling costs to a landfill represents an upper limit to costs for disposal of the road gravel.
8. The selected disposal facility (WM- Peoria Tazewell Transfer Station) is located in East Peoria, Illinois, approximately 12 miles from the Project site. Hauling costs to the landfill are estimated to be \$9.35 per ton.
9. Erosion and sediment control along road reflects the cost of silt fences on the downgradient side of the proposed roads. As such, the length of controls has been estimated to be approximately 50% of the road length.
10. Topsoil is required to be stockpiled on-site during construction, so no topsoil replacement is expected to replace the road aggregate. Subsoiling cost to decompact roadway areas is estimated as \$274.31 per acre, and tilling to an agriculture-ready condition is estimated as \$1,919.87 per acre.
11. The selected metal recycling facility (Alter Metal Recycling) is located in Peoria, Illinois, approximately 17.7 miles from the Project site. Hauling costs to the recycling facility are approximately \$0.00 per ton mile, or \$11.84 per ton.
12. It is assumed the battery containers will be hauled to a facility that can accept lithium-ion batteries and is located no more than 500 miles from the Project.
13. The transformers contain copper windings that have significant salvage value. They are typically oil filled, but most transformer recyclers will accept the transformers with oil. The estimated costs include removal of metal frame and conduits feeding the equipment.
14. Medium voltage (MV) equipment and SCADA equipment are mounted on the same equipment skids as the inverters and transformers, and they are enclosed in weatherproof cabinets. Their size

requires light equipment to remove them. The costs for the removal of the pile foundations are included in the "Remove Steel Foundation Posts" estimate.

15. The underground collector system cables are placed in trenches with a minimum of 18 inches of cover. Several cables/circuits are placed side by side in each trench. The conduits and cables can be removed by trenching.
16. Perimeter control pricing is based on silt fence installation around downgradient sides of the project perimeter.
17. Metal salvage prices (steel, aluminum, copper) are based on July, 2027 quotes from www.scrapmonster.com for the Midwest. Posted prices are three months old. These prices are based on delivery to the recycling facility with the material prepared to meet size, thickness, cleanliness, and other specifications.
18. A reduction of 25% has been taken from all pricing obtained from www.scrapmonster.com to reflect the processing by the contractor to meet the specifications.
19. The salvage value for steel uses pricing from the Midwest United States at \$365 per metric ton, or \$331.12 for U.S. ton.
20. There is an active market for reselling and recycling electrical transformers and inverters with several national companies specializing in recycling. However, we have assumed that the electrical equipment will be obsolete at the time of decommissioning, so we have based the pricing on a percentage of the weight that reflects the copper windings that can be salvaged. Pricing was used for Copper Transformer Scrap for the Midwest United States, at \$0.54 per pound.
21. The collection lines are priced assuming copper conductor wire for the direct current circuits and aluminum wire for the alternating current circuits. The prices reflect a reduced yield of copper or aluminum resulting from the stripping of insulation and other materials from the wire prior to recycling. The estimate uses the Midwest prices of #2 insulated copper wire with a 50% recovery rate (\$2.58 /pound) and E.C. Aluminum Wire (\$1.59 /pound).
22. Care to prevent damage and breakage of equipment, batteries, inverters, capacitors, and SCADA must be exercised, but removal assumes unskilled common labor under supervision.

EXISTING AGRICULTURAL DRAIN TILE INVESTIGATION PLAN

Lumina Energy Storage

Prepared for: Lumina Energy Storage, LLC

Section no. 3, Elm Grove Twp., Tazewell Co., IL

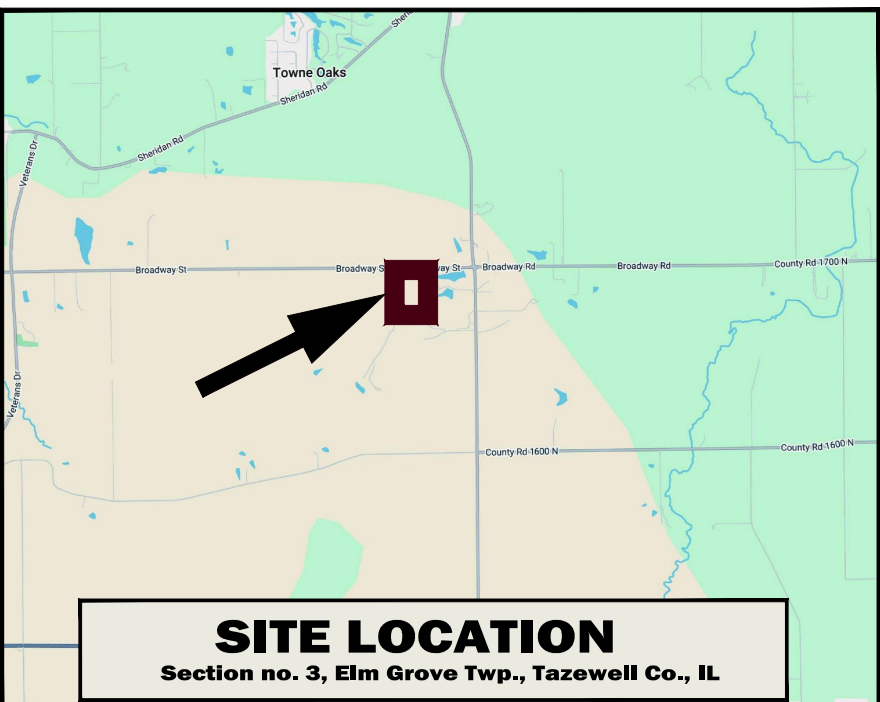
EXISTING SUBSURFACE AGRICULTURAL DRAIN TILE INVESTIGATION REPORT

Lumina Energy Storage Lumina Energy Storage, LLC

Lumina Energy Storage / Lumina Energy Storage, LLC, FIELD FILE NO. 35-6-3, DATE: 9/13/29
IN ACCORDANCE W/ LOCAL COUNTY AND A.L.M.A. EXISTING DRAIN TILE INVESTIGATION & LOCATION STANDARDS
COPYRIGHT © 2026, BY HUDDLESTON MCBRIDE LAND DRAINAGE COMPANY

DESCRIPTION CHART NO. 1A:

ID NO.	SZ.	TYPE / QUALITY	FLOW %	SILT %	DEPTH GRD./INV.	FIELD NOTES:
A1	5"	CLAY / GOOD	SLIGHT	30%	55"	ACTIVE FLOW RATE AND CAPACITY
B1	4"	POLY / GOOD	SLIGHT	CLEAN	52"	ACTIVE FLOW RATE AND CAPACITY
C1	5"	CLAY / GOOD	SLIGHT	30%	58"	ACTIVE FLOW RATE AND CAPACITY
D1	4"	CLAY / FAIR	SLIGHT	30%	53"	ACTIVE FLOW RATE AND CAPACITY
E	4"	CLAY / FAIR	SLIGHT	40%	37"	SILT RESTRICTED / PARTIAL CAPACITY
F	8"	POLY / GOOD	SLIGHT	CLEAN	40"	ACTIVE FLOW RATE AND CAPACITY
G1	4"	POLY / GOOD	SLIGHT	CLEAN	40"	ACTIVE FLOW RATE AND CAPACITY



MAP LEGEND:	
---	EXIST. DRAIN TILE COVER MEASUREMENT, TOP OF TILE TO SURFACE
---	EX. POLYETHYLENE MAINLINE OR SYSTEM PART
---	EX. CLAY DRAIN TILE MAINLINE OR SYSTEM PART
---	EX. CONCRETE DRAIN TILE MAINLINE OR SYSTEM PART
---	EXISTING DRAIN TILE CONTINUES TO UPLAND WATERSHED
---	EXISTING DRAIN TILE OUTLETS TO SURFACE
---	EXIST. DRAIN TILE (1) INSPECTION STRUCTURE / (2) CATCH BASIN
---	EXIST. DRAIN TILE (1) LOCATED END / (2) ASSUMED END
---	EXISTING DRAIN TILE CONTINUES TO OFF-SITE OUTLET SYSTEM
---	EXISTING DRAIN TILE FAILURE / FLOW SURCHARGE TO SURFACE
---	EXISTING DRAIN TILE MARKED BY SPECULATION AND ASSUMPTION
---	EXISTING DRAIN TILE ABANDONED (NOT FUNCTIONAL)
---	EXISTING DRAIN TILE "BLOWOUT" OR FAILURE
---	HAND PROBE OR ELECTRONIC SCAN FOR DRAIN TILE LOCATION
---	INVESTIGATION SLIT TRENCH FOR INVESTIGATION
---	SPECIFIC PIT EXCAVATION FOR INVESTIGATION
---	SURVEY DATA POINTS
---	REPORT IDENTIFICATION NUMBER

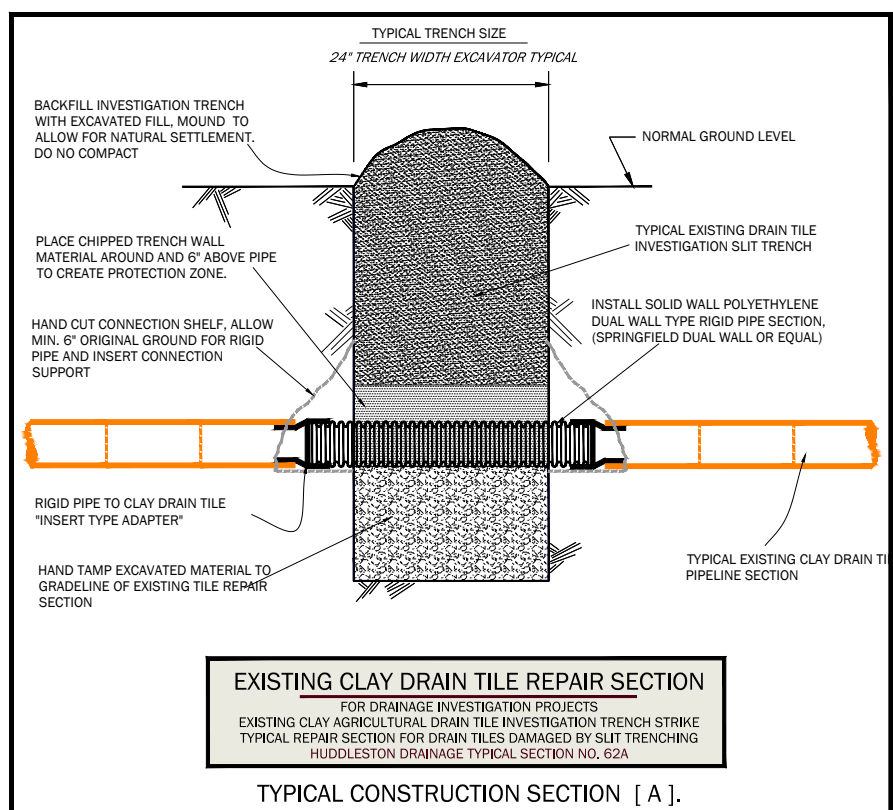
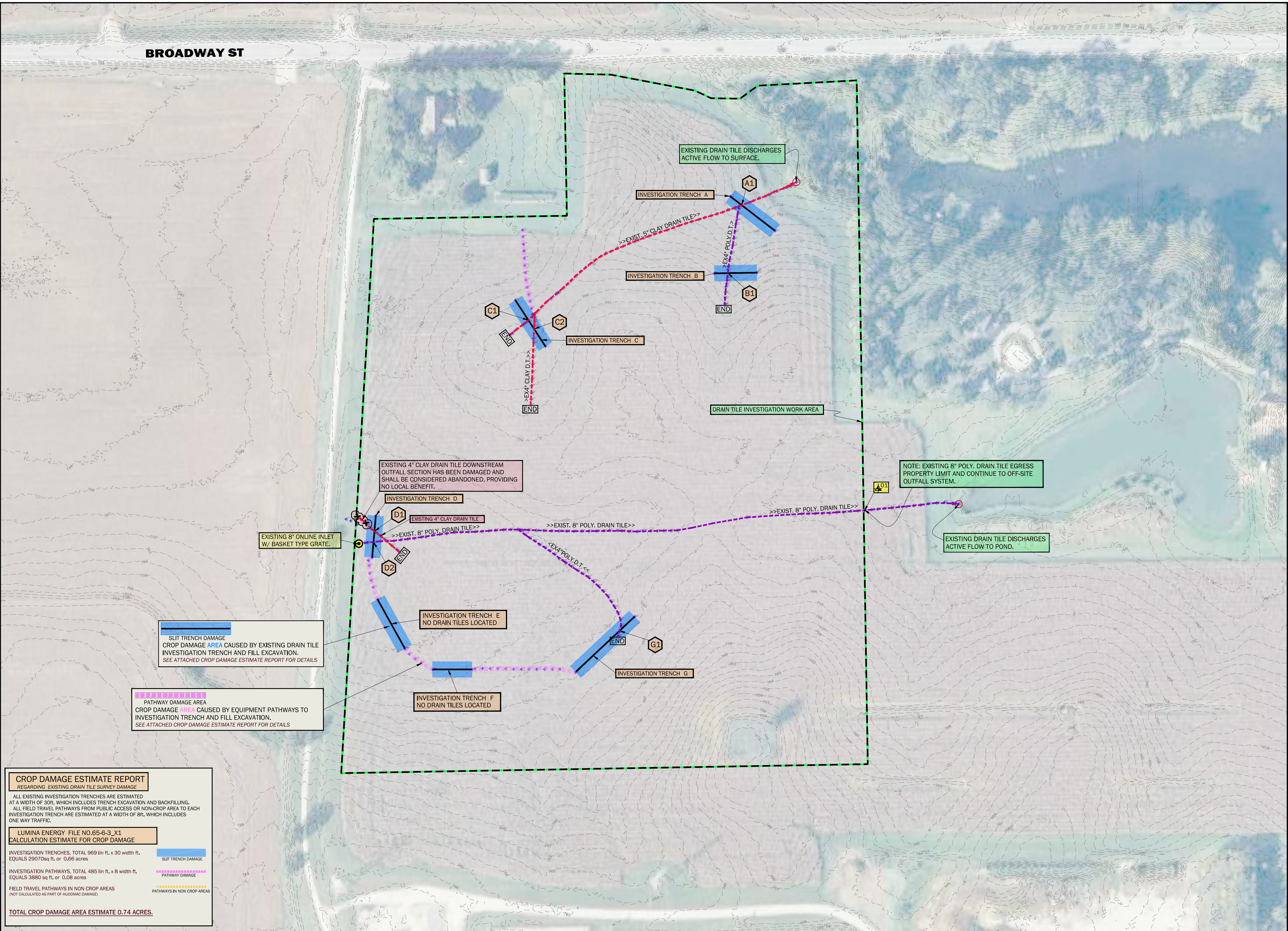
REPORT LEGEND:	
ID NO.	POINT OF EXCAVATION FOR SPECIFIC DRAIN TILE INVESTIGATION.
SZ. (SIZE)	DRAIN TILE INTERNAL DIAMETER IN INCHES.
MATERIAL / QUALITY	TYPE OF TILE MATERIALS, PIPE QUALITY - GOOD, FAIR & POOR.
FLOW %	PERCENTAGE OF TILE DIAMETER OCCUPIED BY ACTIVE FLOW.
RESTRICTED OR BACKED UP FLOW, SURCHARGED CONDITION	
SILT %	PERCENTAGE OF TILE DIAMETER OCCUPIED BY RESTRICTIVE SILT.
ABANDONED, FILLED WITH SILT / BLOCKAGE, NO FLOW POTENTIAL	
DEPTH	MEASUREMENT FROM EXISTING GROUND LEVEL TO PIPE INVERT.

(GENERAL NOTES)	
MAINLINE TILE	TRUNK LINE OR MUTUAL DRAIN, COLLECTOR OF SUB-SYSTEMS.
SUB-MAIN TILE	SECONDARY TRUNK LINE OR RANDOM SYSTEM COLLECTOR.
LATERAL TILE	FEEDER LINE, SERVICE TILE OR SYSTEM SPUR.
"BLOWOUT"	EXISTING SYSTEM PIPE FAILURE OR RESTRICTION.
DRAIN TILE ENDS	MAINLINE, SUB-MAIN OR LATERAL PLANNED TERMINATION.
SLIT TRENCH	INVESTIGATION TRENCH, TYPICAL 2'-0" WIDE x 6'-0" DEPTH.

- SPECIAL NOTES:**
- All existing agricultural drain tiles located during this investigation survey have been identified on this plan and field stated at < 50' intervals. In some occasions certain existing local drain tile sections may be speculated and considered as an assumed route which shall be delineated on this plan.
 - Any existing drain tile not encountered during slit trenching or probe transect procedures will remain unknown.
 - All existing drain tiles damaged during the investigation process shall be repaired to their original state in accordance with Natural Resource Conservation Service standards for drain tile installation and repair. All existing drain tile not encountered during slit trenching procedure will remain unknown.
 - (Huddleston McBride (C2) typical standard 4")
 - All existing drain tile location dimensions have been mapped in state plane coordinates by gps survey systems and include sub meter accuracy, all locations pertinent to final design shall be verified by the project surveyor.
 - This drain tile investigation report is intended to identify existing drain tile mainline systems only with additional priority on drain tiles which may service the upland property or others or with mutual drainage status.
 - This drain tile investigation report shall be filed with Huddleston McBride Drainage Co., and will be reproduced and disbursed only by permission of the contract principals.
 - Solar Field Development - It is our recommendation that all existing drain tile systems within the proposed solar field development should be replaced by "tile lined" construction which will ensure the location and replacement of unknown drain tile systems that were not located by this Existing Drain Tile Investigation.

DESCRIPTION CHART NO. 1B:

DATA POINT	SZ.	TYPE / QUALITY	FLOW %	SILT %	DEPTH GRD./INV.	FIELD NOTES:
1	8"	POLY / GOOD	SLIGHT	CLEAN	62"	MAINLINE AT PROPERTY EGRESS



CROP DAMAGE ESTIMATE REPORT	
REGARDING EXISTING DRAIN TILE SURVEY DAMAGE	
ALL EXISTING INVESTIGATION TRENCHES ARE ESTIMATED AT A WIDTH OF 30", WHICH INCLUDES TRENCH EXCAVATION AND BACKFILLING. ALL FIELD TRAVEL PATHWAYS FROM PUBLIC ACCESS OR NON-CROP AREA TO EACH INVESTIGATION TRENCH ARE ESTIMATED AT A WIDTH OF 8", WHICH INCLUDES ONE-WAY TRAFFIC.	
LUMINA ENERGY FILE NO. 35-6-3_X1	
CALCULATION ESTIMATE FOR CROP DAMAGE	
INVESTIGATION TRENCHES, TOTAL 969 lin ft. x 30 width ft. EQUALS 29070sq ft. or 0.66 acres	SLIT TRENCH DAMAGE
INVESTIGATION PATHWAYS, TOTAL 485 lin ft. x 8 width ft. EQUALS 3880 sq ft. or 0.08 acres	PATHWAY DAMAGE
FIELD TRAVEL PATHWAYS IN NON CROP AREAS (NOT CALCULATED AS PART OF HUDDMAC DAMAGE)	
TOTAL CROP DAMAGE AREA ESTIMATE 0.74 ACRES.	

PROJECT CLIENT:
Lumina Energy Storage, LLC
Hannah Perl, Project Manager
800 Taylor Street, Suite 200, Durham, NC 27701

APPROVED BY AND DATE:
RUDY P. DIXON, P.E., 9/13/29
ACKNOWLEDGMENTS:
HUDDLESTON DRAINAGE MAP and ARCHIVE SYSTEMS
DRAWN BY AND DATE:
TOM HUDDLESTON 9/13/29

PROJECT DATE:
9/13/29
FIELD FILE NO.:
35-6-3
DRAWING NO.:
35-6-3_X1

WEATHER CONDITIONS:
SUNNY / COOL - 80o
DRAWING SCALE:
1" TO 100'
SHEET NO.:
ONE OF ONE



Lumina Energy Storage
HUDDLESTON MCBRIDE
PROFESSIONAL LAND DRAINAGE SERVICES
Women-Owned Small Business (WOSB)
9504 FOWLER RD., ROCHELLE, ILLINOIS PHONE 815-562-6007

AQUATIC RESOURCE DELINEATION:
LUMINA ENERGY STORAGE, LLC PROJECT
TAZEWELL COUNTY, ILLINOIS

21 July 2025

Prepared for:

Lumina Energy Storage, LLC
800 Taylor Street, Suite 200
Durham, NC 277014

Prepared by:



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TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
2.0 REGULATORY SETTING	1
3.0 METHODS.....	2
3.1 Desktop Evaluation	2
3.2 Aquatic Resource Delineations	2
4.0 RESULTS.....	3
4.1 Desktop Evaluation	3
4.1.1 Topography and Drainage.....	3
4.1.2 Soil Survey	3
4.1.3 Aerial Imagery	3
4.1.4 National Wetlands Inventory (NWI) and National Hydrography Dataset (NHD).....	3
4.1.5 Climatological Precipitation Data.....	3
4.2 Aquatic Resource Delineation	4
4.2.1 Wetlands	4
4.2.2 Streams and Ephemeral Drainages	4
5.0 CONCLUSION	4
6.0 LITERATURE CITED	5

LIST OF TABLES

<u>Table</u>	<u>Page</u>
Table 1. Wetlands delineated within the Lumina Energy Storage, LLC Project in Tazewell County, Illinois.	4
Table 2. Streams delineated within the Lumina Energy Storage, LLC Project in Tazewell County, Illinois.	4

Appendices

- Appendix A: Figures
- Appendix B: Soil Report
- Appendix C: Antecedent Precipitation Tool Results
- Appendix D: Site Photos
- Appendix E: Wetland and Upland Data Sheets

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1.0 Introduction

Lumina Energy Storage, LLC retained Environmental Solutions & Innovations, Inc. (ESI) to delineate aquatic resources within the proposed Area of Investigation (AOI) for the Lumina Energy Storage Project in Tazewell County, Illinois (Project; Appendix A, Figure 1). The proposed area of investigation (AOI) encompasses approximately 25.5 acres (10.32 ha). The AOI is at approximate central coordinates: latitude 40.565932, longitude -89.537738.

The Project is approximately 5.0 miles (8.0 km) east of Pekin, Illinois and just south of Broadway and west of Springfield Avenue. Broadway Street provides direct access to the northern section of the AOI.

The assessment is completed to evaluate the Project for potential presence of aquatic resources including wetlands, ponds, and streams classified as regulated Waters of the United States (WOTUS) and/or Waters of the State regulated by the Illinois Department of Natural Resources (IDNR). Assessment is based on review of publicly available desktop data and onsite aquatic resource delineations completed 16 May 2025. This report outlines a review of published resource materials, existing site conditions, and results of field investigation.

2.0 Regulatory Setting

The U.S. Army Corps of Engineers (USACE) has regulatory oversight for any discharges into WOTUS and wetlands directly connected to relatively permanent waters of the U.S. pursuant to Section 404 of the Clean Water Act (CWA). WOTUS are defined in Title 40 of the Code Federal Regulation (CFR) Part 120., and the Supreme Court decision related to Sackett vs. Environmental Protection Agency (USACE 2023). Wetlands are defined by the USACE Wetland Delineation 87 Manual as areas inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, under normal conditions, a prevalence of vegetation typically adapted for life in saturated soil conditions.

IDNR and the Illinois Environmental Protection Agency (EPA) have regulatory oversight for State waters pursuant to Section 401 of the CWA. Illinois regulates non-federally jurisdictional waters such as isolated wetlands and some non-relatively permanent ephemeral drainages. Illinois does not currently have a statewide buffer rule for waters

impacts of all developments, but state, county, and local stormwater regulations potentially impose buffer requirements to protect state water quality.

3.0 Methods

3.1 Desktop Evaluation

Prior to visiting the Project's AOI, available USGS topographic maps, aerial(s) photographs, Natural Resource Conservation Science (NRCS) soils data, Federal Emergency Management Agency (FEMA) Flood Map, National Wetlands Inventory (NWI), and the National Hydrography Dataset (NHD) are reviewed to determine onsite areas mapped as potential aquatic resources. Key to classifying potentially jurisdictional streams, the EPA's Antecedent Precipitation Tool (APT) localized climate data is also reviewed to understand the relative climatological precipitation regime on the date of onsite assessment.

3.2 Aquatic Resource Delineations

Wetland delineation procedures follow the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region, Version 2.0 (USACE 2010) and the 1987 Corps of Engineers Wetland Delineation Manual (USACE 1987). Delineated aquatic resources are classified according to the Classification of Wetland and Deepwater Habitats of the United States (Cowardin et al. 1979) with wetlands characterized as palustrine forested (PFO), palustrine scrub/shrub (PSS) or palustrine emergent "herbaceous" (PEM) wetlands. Wetlands fully contained onsite without connection to relatively permanent waters, are further characterized as Isolated.

The federally regulated Ordinary High Water Mark (OHWM) of streams is delineated using the USACE Regulatory Guidance Letter 05-05 – Guidance on Ordinary High Water Mark Identification (USACE 2005). Each stream is categorized regarding its flow regime as perennial, intermittent, or ephemeral, as defined by the USACE. Perennial classified streams are relatively permanent waters with a defined OHWM, and bed and bank and are an expression of groundwater and flow under normal conditions throughout the year. Intermittent classified streams are relatively permanent waters with a defined OHWM and bed and bank and are an expression of groundwater and flow annually at least seasonally under normal conditions. Ephemeral classified drainages are non-relatively permanent waters and may or may not exhibit a well-defined bed and bank or well-defined OHWM. Ephemeral drainages flow only in direct response to precipitation or snowmelt for a relatively short duration under normal conditions.

Aquatic resource boundaries and sample points are surveyed using a GPS with sub-meter accuracy. USACE datasheets for wetland and corresponding upland areas are

documented through an electronic platform, Ecobot, conforming to USACE Wetland Delineation methods.

4.0 Results

4.1 Desktop Evaluation

4.1.1 Topography and Drainage

The Project appears on the Marquette Heights, Illinois U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map (Appendix A, Figure 1). The AOI consists of relatively flat ground at an approximate elevation of 750 feet (228.6 m) (Appendix A, Figure 2). The site drains to an unnamed stream in the northeast corner of the Project area.

4.1.2 Soil Survey

The Natural Resources Conservation Service (NRCS) mapped six soils series within the AOI; four soil series are identified as hydric. The NRCS soils map and soils list are provided in Appendix B.

4.1.3 Aerial Imagery

Aerial mapping from 1995 through 2025 was reviewed and shows the AOI as an agricultural field with a small woodlot in the northeast section. Aerial representation of the site is provided in Appendix A, Figure 2.

4.1.4 National Wetlands Inventory (NWI) and National Hydrography Dataset (NHD)

An NWI-NHD mapped stream was identified within the AOI (Appendix A, Figure 2). Note that NWI-NHD maps are generally derived from aerial photo interpretation, NRCS soils map, and USGS Topographic map interpretation and are suitable for general planning purposes only; the NWI-NHD may or may not accurately reflect potentially jurisdictional wetland or watercourse resources within any given area. The NWI-NHD mapped potential stream was assessed in the field to determine whether wetland or stream criteria are met.

4.1.5 Climatological Precipitation Data

Per the APT, onsite assessment was completed during the wet season. On 16 May 2025 the Project's regional precipitation was rated moderate drought based on the Palmer Drought Severity Index (PDSI) and rated drier than normal by the APT with a rating of 7 (Appendix C). Per the APT graph, no recorded precipitation fell within at least four days of site assessments.

4.2 Aquatic Resource Delineation

Field investigations confirmed aerial imagery and identified a single wetland complex and a single intermittent stream. Additionally, two upland sample points were taken to characterize the area. Representative photographs of aquatic resources and upland areas are provided in Appendix D. Field data sheets for sample points are provided in Appendix E.

4.2.1 Wetlands

A single wetland complex comprising PFO, PSS, and PEM segments was identified and delineated within the AOI (Appendix A, Figure 3; Table 1). The wetland continues offsite and is connected to the intermittent stream identified.

Table 1. Wetlands delineated within the Lumina Energy Storage, LLC project in Tazewell County, Illinois.

Wetland ID	Cowardin Class	Isolated	Area within AOI (acres)	Latitude	Longitude
1-A	PFO/ PSS/ PEM	No	0.45	40.567727	-89.536631

4.2.2 Streams and Ephemeral Drainages

A single intermittent stream segment (Relatively Permanent Waters) was delineated within the Project's AOI (Appendix A, Figure 3; Table 2). Typical of barren cropland erodible soils, the ephemeral/erosional drainages exhibited varying or non-continuous OHWMs. Representative photographs are provided in Appendix D.

Table 2. Streams delineated within the Lumina Energy Storage, LLC project in Tazewell County, Illinois.

Stream ID	Stream Classification	OHWM ¹ Width (feet)	Length within AOI (LF ²)	Latitude	Longitude	Relatively Permanent
1-001	Intermittent	3.5	574.34	40.56759	-89.53648	Yes

¹ OHWM = Ordinary High-Water Mark (range of values indicates non-continuous OHWM)

² LF = Linear Feet

5.0 Conclusion

Aquatic resource delineations were completed by ESI on 16 May 2025 during the regional wet season.

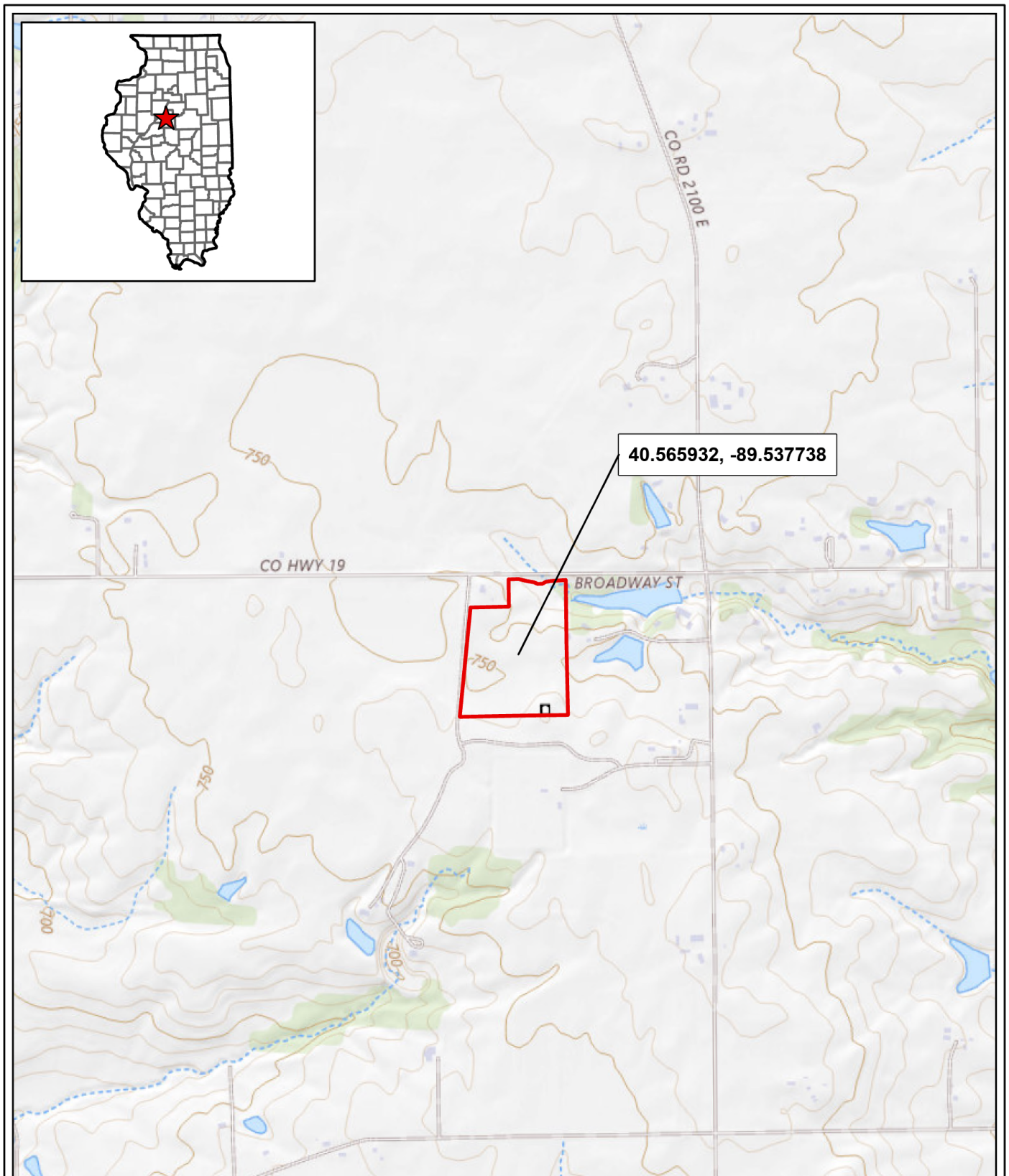
Within the Lumina Energy Storage Project's AOI, potentially jurisdictional waters and waters of the state were identified including one intermittent stream segment (Relatively Permanent Waters), and one wetland complex comprising PFO, PSS, and PEM segments. Temporary or permanent impacts to potentially jurisdictional waters require

permits from the USACE under Section 404 and the State of Illinois under Section 401 of the CWA. Additionally, as the Project site is greater than 1 acre (0.4 ha) in size, soil disturbance is also likely greater than 1 acre (0.4 ha). Thus, Section 401 Water Quality Certification (regulated through approval by IDNR) and a Storm Water Pollution Protection Plan (SWPPP) are potentially required to protect offsite water quality.

6.0 Literature Cited

- Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. FWSOBS 79/31, December 1979. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 79 pp.
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- USACE. 2010. Regional supplement to the Corps of Engineers wetland delineation manual: Midwest Region (Version 2.0). ERDC/EL TR-10-16, U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi. 154 pp.
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APPENDIX A FIGURES



Area of Investigation (AOI)

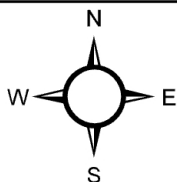


Figure 1. Location of the proposed Lumina Energy Storage, LLC Project in Tazewell County, Illinois.

Project No.
2523

0 1,000 2,000
US Feet
Base Map: USGS Topographic Map



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Figure 2. Desktop findings on the proposed Lumina Energy Storage, LLC project in Tazewell County, Illinois.

- Area of Investigation (AOI)
- Soils
- National Hydrography Dataset (NHD) Stream
- National Wetland Inventory (NWI)**
- Freshwater Pond
- Riverine



Service Layer Credits: World Imagery: Maxar, Microsoft
World Topographic Map: Missouri Dept. of Conservation, Esri, HERE, Garmin,
INCREMENT P, USGS, METI/NASA, EPA, USDA



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Project No. 2523

Imagery Date: 2/11/2024



Figure 3. Aquatic resource delineation on the proposed Lumina Energy Storage, LLC Project in Tazewell County, Illinois.

Area of Investigation (AOI)

Field-Delineated Intermittent Stream

Elevation Contour

Sample Point

Upland

Wetland

Field-Delineated Wetland

PEM

PFO

PSS

Feet

0200400

Service Layer Credits: World Imagery: Maxar, Microsoft
World Topographic Map: County of Peoria, Missouri Dept. of Conservation, Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/NASA, EPA, USDA
Hybrid Reference Layer: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

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Project No. 2523

APPENDIX B
SOIL REPORT





United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Tazewell County, Illinois**



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

Preface	2
Soil Map	5
Soil Map.....	6
Legend.....	7
Map Unit Legend.....	8
Map Unit Descriptions.....	8
Tazewell County, Illinois.....	10
138A—Shiloh silty clay loam, 0 to 2 percent slopes.....	10
233C2—Birkbeck silt loam, 5 to 10 percent slopes, eroded.....	11
233C3—Birkbeck silty clay loam, 5 to 10 percent slopes, severely eroded.....	12
278A—Stronghurst silt loam, 0 to 2 percent slopes.....	13
279B2—Rozetta silt loam, 2 to 5 percent slopes, eroded.....	15
618D2—Senachwine silt loam, 10 to 18 percent slopes, eroded.....	16
References	19

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tazewell County, Illinois
Survey Area Data: Version 18, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 30, 2023—Sep 2, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
138A	Shiloh silty clay loam, 0 to 2 percent slopes	5.4	21.1%
233C2	Birkbeck silt loam, 5 to 10 percent slopes, eroded	3.0	11.5%
233C3	Birkbeck silty clay loam, 5 to 10 percent slopes, severely eroded	2.1	8.3%
278A	Stronghurst silt loam, 0 to 2 percent slopes	14.4	56.0%
279B2	Rozetta silt loam, 2 to 5 percent slopes, eroded	0.6	2.2%
618D2	Senachwine silt loam, 10 to 18 percent slopes, eroded	0.2	0.7%
Totals for Area of Interest		25.7	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not

mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Tazewell County, Illinois

138A—Shiloh silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 60mp
Elevation: 340 to 1,020 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Shiloh and similar soils: 94 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shiloh

Setting

Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loess

Typical profile

H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 27 inches: silty clay loam
H3 - 27 to 52 inches: silty clay loam
H4 - 52 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R115XC016IL - Ponded Floodplain Marsh
Hydric soil rating: Yes

233C2—Birkbeck silt loam, 5 to 10 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2sssd

Elevation: 560 to 920 feet

Mean annual precipitation: 35 to 40 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 160 to 185 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Birkbeck, eroded, and similar soils: 95 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Birkbeck, Eroded

Setting

Landform: End moraines, ground moraines

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loess over loamy till

Typical profile

Ap - 0 to 9 inches: silt loam

Bt - 9 to 47 inches: silty clay loam

2BC - 47 to 51 inches: loam

2C - 51 to 60 inches: loam

Properties and qualities

Slope: 5 to 10 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: About 24 to 42 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 40 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: F108XA011IL - Loess Upland Forest

Hydric soil rating: No

Minor Components

Sabina

Percent of map unit: 5 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit, footslope

Landform position (three-dimensional): Interfluve

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F108XA011IL - Loess Upland Forest, F110XY012IL - Moist Glacial Drift Upland Forest

Hydric soil rating: No

233C3—Birkbeck silty clay loam, 5 to 10 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 60ng

Elevation: 590 to 930 feet

Mean annual precipitation: 32 to 40 inches

Mean annual air temperature: 48 to 54 degrees F

Frost-free period: 160 to 180 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Birkbeck and similar soils: 90 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Birkbeck

Setting

Landform: End moraines, ground moraines

Landform position (two-dimensional): Shoulder, backslope

Down-slope shape: Convex

Across-slope shape: Linear, convex

Parent material: Loess over till

Typical profile

H1 - 0 to 8 inches: silty clay loam

H2 - 8 to 44 inches: silty clay loam

H3 - 44 to 60 inches: loam

Properties and qualities

Slope: 5 to 10 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: About 24 to 42 inches

Custom Soil Resource Report

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 6.0
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F108XA011IL - Loess Upland Forest
Hydric soil rating: No

278A—Stronghurst silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 60np
Elevation: 340 to 1,500 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 47 to 54 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Stronghurst and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stronghurst

Setting

Landform: Flats on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

A - 0 to 8 inches: silt loam
Bt - 8 to 47 inches: silty clay loam
C - 47 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None

Custom Soil Resource Report

Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 11.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F115XC005IL - Loess Upland Forest
Hydric soil rating: No

Minor Components

Sable

Percent of map unit: 3 percent
Landform: Ground moraines, swales
Landform position (two-dimensional): Summit, toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XB009IL - Ponded Loess Sedge Meadow
Hydric soil rating: Yes

Rushville

Percent of map unit: 3 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F115XC006IL - Loess Upland Flatwoods
Hydric soil rating: Yes

Fayette

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F115XC005IL - Loess Upland Forest
Hydric soil rating: No

Greenbush

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XB006IL - Loess Upland Savanna
Hydric soil rating: No

Rozetta

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB010WI - Loamy and Clayey Upland

Hydric soil rating: No

Edgington

Percent of map unit: 1 percent

Landform: Depressions

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: R108XB009IL - Ponded Loess Sedge Meadow

Hydric soil rating: Yes

279B2—Rozetta silt loam, 2 to 5 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2tjp5

Elevation: 560 to 830 feet

Mean annual precipitation: 36 to 40 inches

Mean annual air temperature: 52 to 55 degrees F

Frost-free period: 175 to 180 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Rozetta and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rozetta

Setting

Landform: Ground moraines

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Interfluve, head slope, side slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silt loam

Bt1 - 6 to 25 inches: silty clay loam

Bt2 - 25 to 53 inches: silty clay loam

C - 53 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)

Depth to water table: About 48 to 72 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Custom Soil Resource Report

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Very high (about 12.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B

Ecological site: F115XC005IL - Loess Upland Forest

Hydric soil rating: No

Minor Components

Keomah

Percent of map unit: 5 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F115XC005IL - Loess Upland Forest

Hydric soil rating: No

Sable

Percent of map unit: 5 percent

Landform: Swales

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Ecological site: R108XB009IL - Ponded Loess Sedge Meadow

Hydric soil rating: Yes

618D2—Senachwine silt loam, 10 to 18 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2ww98

Elevation: 460 to 980 feet

Mean annual precipitation: 34 to 42 inches

Mean annual air temperature: 46 to 54 degrees F

Frost-free period: 152 to 187 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Senachwine, eroded, and similar soils: 93 percent

Minor components: 7 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Senachwine, Eroded

Setting

Landform: End moraines, ground moraines

Landform position (two-dimensional): Backslope

Custom Soil Resource Report

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Thin mantle of loess or other silty material over calcareous loamy till

Typical profile

Ap - 0 to 6 inches: silt loam

Bt1 - 6 to 15 inches: silty clay loam

2Bt2 - 15 to 28 inches: clay loam

2BCt - 28 to 34 inches: loam

2C - 34 to 60 inches: loam

Properties and qualities

Slope: 10 to 18 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 40 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: F108XA011IL - Loess Upland Forest

Hydric soil rating: No

Minor Components

Xenia, bloomington ridged plain

Percent of map unit: 3 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F108XA011IL - Loess Upland Forest

Hydric soil rating: No

Sawmill, frequently flooded

Percent of map unit: 2 percent

Landform: Flood plains

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R108XA018IL - Ponded Floodplain Marsh

Hydric soil rating: Yes

Sabina

Percent of map unit: 2 percent

Custom Soil Resource Report

Landform: End moraines, ground moraines

Landform position (two-dimensional): Summit, footslope

Landform position (three-dimensional): Interfluve

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F108XA011IL - Loess Upland Forest

Hydric soil rating: No

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Custom Soil Resource Report

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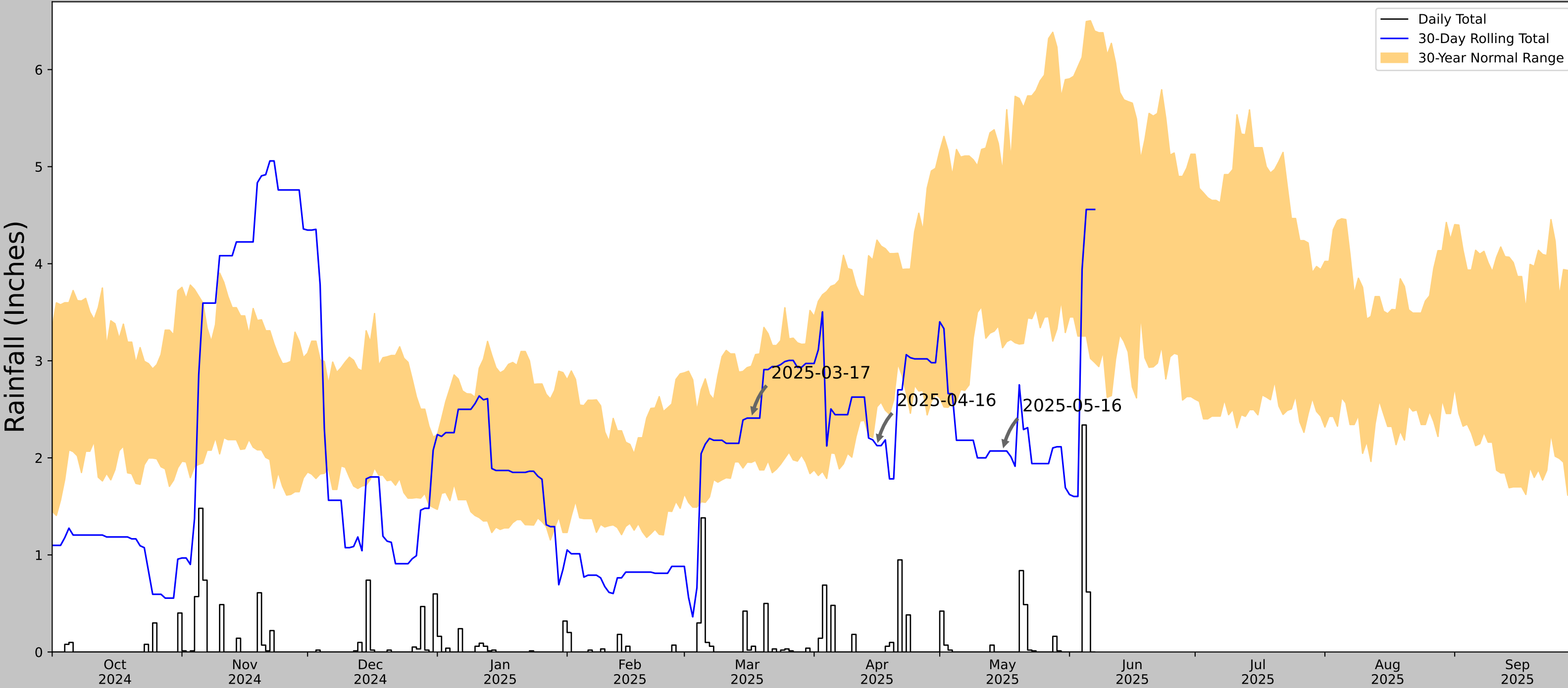
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APPENDIX C
ANTECEDENT PRECIPITATION TOOL RESULTS



Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	40.565932, -89.537738
Observation Date	2025-05-16
Elevation (ft)	752.992
Drought Index (PDSI)	Moderate drought
WebWIMP H ₂ O Balance	Wet Season

30 Days Ending	30 th %ile (in)	70 th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2025-05-16	3.134252	4.947244	2.070866	Dry	1	3	3
2025-04-16	2.525984	4.243307	2.125984	Dry	1	2	2
2025-03-17	1.95315	2.943701	2.409449	Normal	2	1	2
Result							Drier than Normal - 7



**US Army Corps
of Engineers®**

Figures and tables made by the
Antecedent Precipitation Tool
Version 2.0

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center



ERDC
ENGINEER RESEARCH & DEVELOPMENT CENTER

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
MORTON	40.6006, -89.4653	701.116	4.493	51.876	2.255	9946	90
MORTON 1.0 SSE	40.5976, -89.4634	702.1	0.23	0.984	0.104	47	0
MORTON 1.0 S	40.5974, -89.4706	705.053	0.355	3.937	0.161	46	0
MACKINAW 3WSW	40.5242, -89.4208	662.074	5.772	39.042	2.823	936	0
CONGERVILLE 2NW	40.6211, -89.2414	640.092	11.829	61.024	6.045	376	0
GENERAL WAYNE A DOWNING INTL A	40.6675, -89.6842	654.856	12.374	46.26	6.141	2	0

**APPENDIX D
SITE PHOTOS**



Environmental Solutions & Innovations, Inc.
Photo Documentation

Client/Site Name:

Lumina Energy Storage, LLC
Lumina Energy Storage Project

Site Location:

Tazewell County, Illinois

Project #:

2523



1-A PEM

Lat. 40.56760, Long. -89.53629



1-A PSS

Lat. 40.567727, Long. -89.536631
USACE Data Plot



1-A PFO

Lat. 40.6737, Long. -89.53624



1-A PSS

Lat. 40.567727, Long. -89.536631
USACE Data Plot Soil

Environmental Solutions & Innovations, Inc.
Photo Documentation

Client/Site Name:

Lumina Energy Storage, LLC
Lumina Energy Storage Project

Site Location:

Tazewell County, Illinois

Project #:

2523



1-A UPL

Lat. 40.567339, Long. -89.563764
USACE Data Plot



1-A UPL

Lat. 40.567339, Long. -89.563764
USACE Data Plot Soil



1-SP-001

Lat. 40.564933, Long. -89.539084
USACE Data Plot



1-SP-001

Lat. 40.564933, Long. -89.539084
USACE Data Plot Soil

Environmental Solutions & Innovations, Inc.
Photo Documentation

Client/Site Name:

Lumina Energy Storage, LLC
Lumina Energy Storage Project

Site Location:

Tazewell County, Illinois

Project #:

2523



1-001

Lat. 40.56759, Long. -89.53648
Intermittent



1-001

Lat. 40.56759, Long. -89.53648
Intermittent

APPENDIX E
WETLAND AND UPLAND DATA SHEETS



U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-COR	OMB Control #: 0710-0024, Exp: 09/30/2027 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: <u>Lumina Strata Solar Project</u>	City/County: <u>Tazewell County</u>	Sampling Date: <u>2025-05-22</u>
Applicant/Owner: <u>Lumina Strata</u>	State: <u>Illinois</u>	Sampling Point: <u>1-A</u>
Investigator(s): <u>K. Yount, A. Krahling</u>	Section, Township, Range: <u>S03 T24N R4W</u>	
Landform (hillside, terrace, etc.): <u>Depression</u>	Local relief (concave, convex, none): <u>Concave</u>	
Slope (%): <u>4</u>	Lat: <u>40.567727</u>	Long: <u>-89.536631</u>
	Datum: <u>WGS 84</u>	
Soil Map Unit Name: <u>233C2 - Birkbeck silt loam, 5 to 10 percent slopes, eroded</u>	NWI classification: <u>R4SBC</u>	
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)		
Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐		
Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)		

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐	
Wetland Hydrology Present? Yes ☒ No ☐	
Remarks: Wetland sample point taken for 1-001. Area at foot of agricultural field. No significant disturbances to soil, hydrology or vegetation. Likely periodically mowed.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83.33</u> (A/B)
1. <u>Salix nigra</u>	<u>15</u>	☒	<u>OBL</u>	
2. <u>Juglans nigra</u>	<u>10</u>	☒	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>25</u> =Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>15</u> x 1 = <u>15</u> FACW species <u>150</u> x 2 = <u>300</u> FAC species <u>30</u> x 3 = <u>90</u> FACU species <u>20</u> x 4 = <u>80</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>215</u> (A) <u>485</u> (B) Prevalence Index = B/A = <u>2.25</u>
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				
1. <u>Cornus amomum</u>	<u>55</u>	☒	<u>FACW</u>	
2. <u>Sambucus nigra</u>	<u>30</u>	☒	<u>FAC</u>	
3. <u>Morus rubra</u>	<u>5</u>	_____	<u>FACU</u>	
4. _____	_____	_____	_____	
<u>90</u> =Total Cover				Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☒ 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Herb Stratum (Plot size: <u>5 ft r</u>)				
1. <u>Impatiens pallida</u>	<u>60</u>	☒	<u>FACW</u>	
2. <u>Conium maculatum</u>	<u>25</u>	☒	<u>FACW</u>	
3. <u>Urtica dioica</u>	<u>10</u>	_____	<u>FACW</u>	
4. <u>Galium aparine</u>	<u>5</u>	_____	<u>FACU</u>	
<u>100</u> =Total Cover				Hydrophytic Vegetation Present? Yes ☒ No ☐
Woody Vine Stratum (Plot size: <u>30 ft r</u>)				
1. <u>Convolvulus arvensis</u>	<u>5</u>	☒	_____	
2. _____	_____	_____	_____	
<u>5</u> =Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation present. Predominant area is PSS, only a few large trees throughout area.

SOIL

Sampling Point: 1-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 8	10YR 3/1	100					Clay Loam	
8 - 20	10YR 3/1	90	10YR 5/6	10	C	M	Sandy Clay	
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
☐ Histosol (A1)	☐ Sandy Gleyed Matrix (S4)	☐ Iron-Manganese Masses (F12)	
☐ Histic Epipedon (A2)	☐ Sandy Redox (S5)	☐ Red Parent Material (F21) Very	
☐ Black Histic (A3)	☐ Stripped Matrix (S6)	☐ Shallow Dark Surface (F22)	
☐ Hydrogen Sulfide (A4)	☐ Dark Surface (S7)	☐ Other (Explain in Remarks)	
☐ Stratified Layers (A5)	☐ Loamy Mucky Mineral (F1)		
☐ 2 cm Muck (A10)	☐ Loamy Gleyed Matrix (F2)		
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)		
☐ Thick Dark Surface (A12)	☒ Redox Dark Surface (F6)		
☐ Iron Monosulfide (A18)	☐ Depleted Dark Surface (F7)		
☐ Sandy Mucky Mineral (S1)	☐ Redox Depressions (F8)		
☐ 5 cm Mucky Peat or Peat (S3)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):	Hydric Soil Present?
Type: _____ Depth (inches): _____	Yes ☒ No ☐

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☒ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☒ Saturation (A3)	☐ True Aquatic Plants (B14)	☐ Dry-Season Water Table (C2)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Crayfish Burrows (C8)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres on Living Roots (C3)	☒ Saturation Visible on Aerial Imagery (C9)	
☒ Drift Deposits (B3)	☒ Presence of Reduced Iron (C4)	☐ Stunted or Stressed Plants (D1)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☒ Geomorphic Position (D2)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☒ FAC-Neutral Test (D5)	
☒ Inundation Visible on Aerial Imagery (B7)	☐ Gauge or Well Data (D9)		
☐ Sparsely Vegetated Concave Surface (B8)	☐ Other (Explain in Remarks)		

Field Observations:				Wetland Hydrology Present? Yes ☒ No ☐
Surface Water Present?	Yes ☐ No ☒	Depth (inches):		
Water Table Present?	Yes ☒ No ☐	Depth (inches):	8	
Saturation Present?	Yes ☒ No ☐	Depth (inches):	1	

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Riparian wetland adjacent to stream 1-001. Recent rain event within week. Stream system connected to roadside ditch complex.

Remarks:

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-COR	OMB Control #: 0710-0024, Exp: 09/30/2027 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Lumina Strata Solar Project City/County: Tazewell County Sampling Date: 2025-05-22
Applicant/Owner: Lumina Strata State: Illinois Sampling Point: 1-A UPL
Investigator(s): K. Yount, A. Krahling Section, Township, Range: S03 T24N R4W
Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): Undulating
Slope (%): 2 Lat: 40.567339 Long: -89.536764 Datum: WGS 84
Soil Map Unit Name: 233C2 - Birkbeck silt loam, 5 to 10 percent slopes, eroded NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
Are Vegetation ☒, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No ☒	Is the Sampled Area within a Wetland? Yes _____ No ☒
Hydric Soil Present? Yes _____ No ☒	
Wetland Hydrology Present? Yes _____ No ☒	

Remarks:
Upland sample point taken for 1-A UPL. Area is recently planted with soybean and has been draintiled.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
=Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
=Total Cover			
Herb Stratum (Plot size: <u>5 ft r</u>)			
1. <u>Glycine max</u>	<u>10</u>	☒	
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
=Total Cover			
Woody Vine Stratum (Plot size: <u>30 ft r</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
=Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 0 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>0</u> (A)	<u>0</u> (B)
Prevalence Index = B/A = <u>0</u>	

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation
2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0¹
4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)
Planted Ag field. Soybean sprouts are just up.

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SOIL

Sampling Point: 1-A UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 20	10yr 3/2	100					Clay Loam	Consistently tilled, organic agricultural soil.
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
☐ Histosol (A1)	☐ Iron-Manganese Masses (F12)
☐ Histic Epipedon (A2)	☐ Red Parent Material (F21) Very
☐ Black Histic (A3)	☐ Shallow Dark Surface (F22)
☐ Hydrogen Sulfide (A4)	☐ Other (Explain in Remarks)
☐ Stratified Layers (A5)	
☐ 2 cm Muck (A10)	
☐ Depleted Below Dark Surface (A11)	
☐ Thick Dark Surface (A12)	
☐ Iron Monosulfide (A18)	
☐ Sandy Mucky Mineral (S1)	
☐ 5 cm Mucky Peat or Peat (S3)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No ☒
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Remarks:

No hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ True Aquatic Plants (B14)	☐ Dry-Season Water Table (C2)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Crayfish Burrows (C8)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres on Living Roots (C3)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Stunted or Stressed Plants (D1)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Geomorphic Position (D2)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ FAC-Neutral Test (D5)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Gauge or Well Data (D9)		
☐ Sparsely Vegetated Concave Surface (B8)	☐ Other (Explain in Remarks)		

Field Observations: Surface Water Present? Yes _____ No ☒ Depth (inches): _____ Water Table Present? Yes _____ No ☒ Depth (inches): _____ Saturation Present? Yes _____ No ☒ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No ☒
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology present.

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-COR	OMB Control #: 0710-0024, Exp: 09/30/2027 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: <u>Lumina Strata Solar Project</u>	City/County: <u>Tazewell County</u>	Sampling Date: <u>2025-05-22</u>
Applicant/Owner: <u>Lumina Strata</u>	State: <u>Illinois</u>	Sampling Point: <u>1-SP-001</u>
Investigator(s): <u>K. Yount, A. Krahling</u>	Section, Township, Range: <u>S03 T24N R4W</u>	
Landform (hillside, terrace, etc.): <u>Flat</u>	Local relief (concave, convex, none): <u>Undulating</u>	
Slope (%): <u>2</u>	Lat: <u>40.564933</u>	Long: <u>-89.539084</u>
	Datum: <u>WGS 84</u>	
Soil Map Unit Name: <u>138A - Shiloh silty clay loam, 0 to 2 percent slopes</u>	NWI classification: _____	

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☒, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present? Yes ☒ No ☐	
Wetland Hydrology Present? Yes ☐ No ☒	
Remarks: Upland sample point taken for 1-SP-001. Area is recently planted with soybean and has been draintiled.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>0</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.00</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
=Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>0</u> (A) <u>0</u> (B) Prevalence Index = B/A = <u>0</u>
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
=Total Cover				Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Herb Stratum (Plot size: <u>5 ft r</u>)				
1. <u>Glycine max</u>	<u>10</u>	☒	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
=Total Cover				Hydrophytic Vegetation Present? Yes ☐ No ☒
Woody Vine Stratum (Plot size: <u>30 ft r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
=Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)

Planted Ag field. Soybean sprouts are just up.

SOIL

Sampling Point: 1-SP-001

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 20	10YR 2/1	100					Clay Loam	Consistently tilled, highly organic agricultural soil.
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
☒ Histosol (A1)	☐ Iron-Manganese Masses (F12)
☐ Histic Epipedon (A2)	☐ Red Parent Material (F21) Very
☐ Black Histic (A3)	☐ Shallow Dark Surface (F22)
☐ Hydrogen Sulfide (A4)	☐ Other (Explain in Remarks)
☐ Stratified Layers (A5)	
☐ 2 cm Muck (A10)	
☐ Depleted Below Dark Surface (A11)	
☐ Thick Dark Surface (A12)	
☐ Iron Monosulfide (A18)	
☐ Sandy Mucky Mineral (S1)	
☐ 5 cm Mucky Peat or Peat (S3)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes ☒ No ☐
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Remarks:

midwest agricultural organic rich tilled soil presents as if Histosol in color -Checked Hydric on color and organic content specifically site is well drained by ag practices.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ True Aquatic Plants (B14)	☐ Dry-Season Water Table (C2)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Crayfish Burrows (C8)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres on Living Roots (C3)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Stunted or Stressed Plants (D1)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Geomorphic Position (D2)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ FAC-Neutral Test (D5)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Gauge or Well Data (D9)		
☐ Sparsely Vegetated Concave Surface (B8)	☐ Other (Explain in Remarks)		

Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes ☐ No ☒
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology present.

Proposed Lumina BESS Project

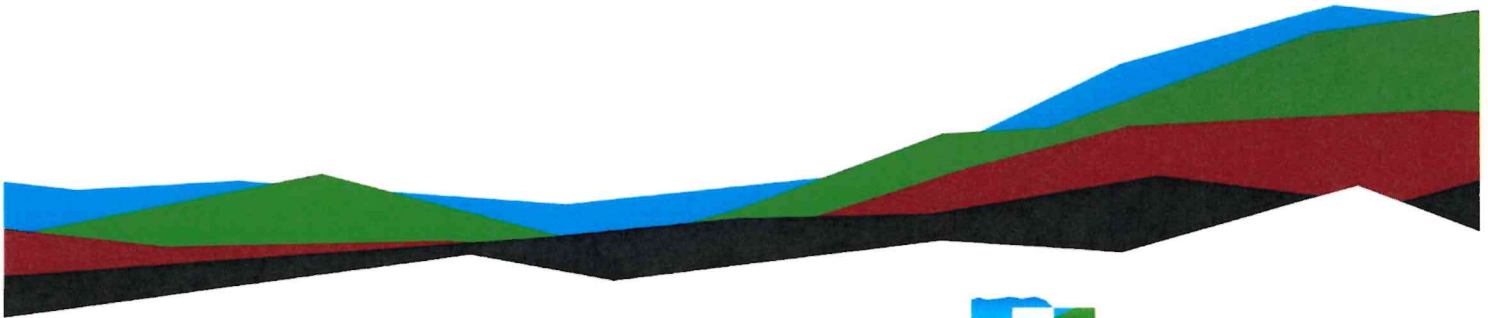
Geotechnical Engineering Report

Rural Pekin, IL

May 1, 2026 | Terracon Project No. 11255215

Prepared for:

Lumina Energy Storage, LLC
800 Taylor St, Suite 200
Durham, NC 27701



Nationwide
[Terracon.com](https://www.terracon.com)

- Facilities
- Environmental
- Geotechnical
- Materials



1145 N Main St.
Lombard, IL 60148
(P) (630) 953-9928
Terracon.com

May 1, 2026

Lumina Energy Storage, LLC
800 Taylor St, Suite 200
Durham, NC 27701

Attn: Mr. Philip Ramsey
E: philip.ramsey@stratacleanenergy.com

Re: Geotechnical Engineering Report
Proposed Lumina BESS Project
Rural Pekin, IL
Terracon Project No. 11255215

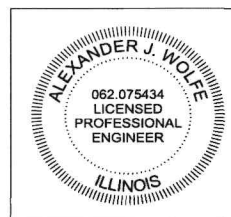
Dear Mr. Ramsey,

We have completed the scope of Geotechnical Engineering services for the referenced project in general accordance with Terracon Proposal No. P11255215 dated November 7, 2025. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning the earthwork and design and construction of foundations for the proposed project.

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

Sincerely,

Terracon
(Illinois Firm Registration No. 184004050-0006)



Rajneesh K. Singh

Rajneesh K. Singh
Senior Staff Engineer

A handwritten signature in black ink, appearing to read 'Alex Wolfe'.

Alexander J. Wolfe, P.E.
Geotechnical Department Manager/Principal
Illinois No. 062.075434
Renews: 11/30/2027

SME Review by Tyler Fguar, P.E. (WI)

Table of Contents

Introduction	1
Project Description	1
Site Conditions	3
Geotechnical Characterization	4
Geology	4
Subsurface Profile	4
Groundwater Conditions.....	5
Seismic Site Class.....	6
Infiltration Test Results	6
Laboratory Corrosion Testing	7
Laboratory Thermal Resistivity Testing	8
Contributory Risk Components.....	9
BESS Driven Pile Foundations	12
Geotechnical Considerations	12
Adfreeze Stress and Depth Which Adfreeze Applies	12
Preliminary Axial Capacity Recommendations	13
Lateral Capacity Recommendations.....	14
Construction Considerations	16
Shallow Foundations.....	16
Spread Footing Design Parameters – Compressive Loads	17
Mat Foundation Design Parameters.....	18
Ground Improvement Foundation Support	20
Helical Pier Foundations.....	22
Shallow Foundation Construction Considerations.....	22
Foundation Frost Considerations.....	23
Substation Foundations	24
Drilled Shaft Design Parameters.....	24
Lateral Resistance Parameters for Drilled Shafts	26
Substation Drilled Shaft Foundation Construction Considerations.....	28
Earthwork.....	29
Site Preparation	30
Subgrade Preparation	30
Fill Material Types.....	31
Fill Placement and Compaction Requirements.....	32
Utility Trench Backfill	34
Grading and Drainage.....	34
Earthwork Construction Considerations	34
Construction Observation and Testing	35
Granular Surfaced Access Roads	36
Subgrade Preparation	36
Granular Access Road Design Parameters	36



Granular Access Road Preliminary Design Recommendations37
Maintenance38
General Comments 39

Figures

GeoModel

Attachments

- Exploration and Testing Procedures**
- Site Location and Exploration Plans**
- Exploration and Laboratory Results**
- Supporting Information**

Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the Proposed Lumina BESS Project to be located at the Intersection of Clay Street and East 83rd Avenue in Rural Pekin, IL. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Subsurface water conditions
- BESS foundation design and construction
- Site preparation and earthwork
- Shallow and drilled shaft deep foundation design and construction
- Aggregate surfaced access roads

The geotechnical engineering Scope of Services for this project included the advancement of borings, performing test pits, laboratory testing, engineering analysis, and preparation of this report. We understand a pile test program is planned to be performed in the fall of 2026, and we plan to update our driven pile foundation recommendations after the completion of that test program.

Drawings showing the site and exploration locations are shown on the [Site Location](#) and [Exploration Plan](#), respectively. Results of the laboratory testing performed on samples obtained from the site during our field exploration are included in [Exploration and Laboratory Results](#).

Project Description

Our understanding of the project conditions is as follows:

Item	Description
Information Provided	<p>An email request for proposal was provided by Philip Ramsey on October 29, 2025. The request included:</p> <ul style="list-style-type: none">■ 2025-10-30 Lumina Site Geotech and PLT.kmz■ 2025-06-30 Lumina - Interconnection Site Plan RevA.pdf

Item	Description
Project Description	<ul style="list-style-type: none"> ■ We understand that the project involves the construction of a Battery Energy Storage System (BESS) on a 26-acre site in Tazewell County, Illinois with an anticipated energy capacity of 300 MWh. ■ The project includes plans for a substation (with an area of about 2 acres) on the east side of the Battery compartment area. ■ A detention basin is proposed for the northern area of the project site, with an estimated depth of 8 feet below the current grade.
Proposed Structures	<ul style="list-style-type: none"> ■ The BESS equipment is anticipated to be supported by driven W-section steel piles (W6x15 or similar). We anticipate the BESS equipment will be housed in steel containers. ■ Lightly loaded ancillary structures are expected to use reinforced concrete mat foundations ■ The proposed substation will consist of structures and equipment supported by shallow foundations and drilled piers.
Finished Elevation	<p>The finished elevations for the planned new structures were not provided. Based on current site grades, we anticipate that the new structures' finished elevations will be within one to two feet of the site's current ground surface elevation.</p> <p>Provided structural loads in the BESS areas will be:</p> <ul style="list-style-type: none"> ■ Battery container maximum weight: 85 to 100 kips ■ Inverters maximum weight: 60 kips
Maximum Loads	<p>We assume structural loads in the substation area will be:</p> <ul style="list-style-type: none"> ■ Transformers/Inverters: 50 kips ■ Gen-Tie Structures with Deep Foundations: <ul style="list-style-type: none"> ➤ 5 to 15 kips compression ➤ 5 to 15 kips shear ➤ 15 to 100 kip-ft moment
Grading/Slopes	<p>Grading plans were not provided at this stage of the project. However, it is anticipated that the site work involves cuts and fills within +/- 2 feet of existing grade. Localized high and low areas may require greater cut and/or fill; however, a site grading plan has not been developed at this time.</p>

Item	Description
Access Roads	Unpaved access roads are anticipated for the site as described below:
	<ul style="list-style-type: none"> ■ Access roads are to support post-construction traffic which we understand will be primarily light maintenance vehicles. The roads will be required to support a traffic loads of: <ul style="list-style-type: none"> ○ Light Duty – 5,000 ESALs ○ Medium Duty – 10,000 ESALs ■ We anticipate the substation access road will need to support heavy vehicle delivery (HS-20 loading) up to two times per year throughout the design period. ■ We understand it is acceptable for the access roads to require ongoing maintenance throughout their design period.
Below-Grade Structures	None anticipated

Terracon should be notified if any of the above information is inconsistent with the planned construction, as modifications to our recommendations may be necessary.

Site Conditions

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

Item	Description
Parcel Information	<p>The proposed project is located southwest of the Intersection of Broadway Street and Springfield Road in Rural Pekin, Tazewell County, Illinois.</p> <p>Latitude/Longitude (approximate): 40.5659° N; 89.5387° W</p> <p>See Site Location</p>
Existing Improvements	<p>The site is a farm field bordered by other fields and scattered homes, with Broadway Street to the north and Springfield Road to the east.</p> <p>A cemetery is located in the southeast portion of the proposed development area site.</p>
Current Ground Cover	Anticipated to be row crop areas

Item	Description
Existing Topography	The sites appear to be gently rolling with various surface elevations ranging from 740 feet to 761 feet.

Geotechnical Characterization

Geology

The rural Pekin, Illinois area is within the Illinois Basin and is underlain by Paleozoic (mainly Pennsylvanian) sedimentary rocks—sandstone, shale, limestone, and coal—formed about 300 million years ago in coastal/delta settings and tied to regional coal mining. Above this bedrock, thick Pleistocene glacial deposits (till, outwash sand and gravel, and lake-laid silts and clays) dominate, often capped by loess that helps create fertile soils and a mostly flat to gently rolling landscape.

Overlying the bedrock is a thick sequence of Quaternary glacial deposits left by the advance and retreat of continental ice sheets during the Pleistocene Epoch. These deposits consist mainly of till, outwash sands and gravels, and lacustrine silts and clays (Illinois State Geological Survey; Illinois Department of Natural Resources).

Subsurface Profile

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

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

Model Layer	Layer Name	General Description
1	Topsoil	Approx. 3 to 12 inches

Model Layer	Layer Name	General Description
2	Lower Strength Native Clay	Lean Clay with variable sand content; generally soft to medium stiff consistency Very soft and very loose zones extending to about 23 to 28 feet were encountered in B-4 and B-5
3	Higher Strength Native Clay	Lean clay with variable sand content; generally stiff to very stiff consistency
4	Granular	Sand and silt with variable fines content; generally medium dense

Groundwater Conditions

The borings were advanced using hollow stem augers allowing for short-term groundwater observations to be made while drilling. The boreholes were observed while drilling and after completion for the presence and level of groundwater. The water levels observed in the boreholes can be found on the boring logs in the [Exploration and Laboratory Results](#) section.

Boring Numbers	While Drilling (feet bgs) ¹	Shortly After Completion of Drilling (feet bgs)
B-1	Not encountered	Not encountered
B-2	Not encountered	Not encountered
B-3	Not encountered	Not encountered
B-4	27	Not encountered
B-5	18.5	Not encountered
B-6	8.5	Not encountered
B-7	Not encountered	Not encountered
B-8	Not encountered	Not encountered
B-9	Not encountered	Not encountered
B-10	Not encountered	Not encountered
B-11	Not encountered	Not encountered
B-12	Not encountered	Not encountered
B-13	19	Not encountered
B-14	Not encountered	Not encountered
B-15	43	Not encountered
B-16	Not encountered	Not encountered
P-1	Not encountered	Not encountered
P-2	Not encountered	Not encountered

1. bgs = below existing ground surface

The water levels observed in the borings do not necessarily correspond to stable groundwater levels. Long term observations in piezometers or observation wells sealed from the influence of surface water are often required to define groundwater levels, and subsurface water conditions may be different at the time of construction and over the life of the structure. Groundwater conditions may change because of seasonal variations in rainfall, runoff, and other conditions not apparent at the time of drilling. Long-term groundwater monitoring was outside the scope of services for this project.

Seismic Site Class

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Class is required to determine the Seismic Design Category for a structure. The Site Class is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the 2018 International Building Code (IBC). Based on the soil and bedrock properties observed at the site and as described on the exploration logs and results, our professional opinion is for that a **Seismic Site Class of D** be considered for the project. Subsurface explorations at this site were extended to a maximum depth of about 50 feet bgs. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

Infiltration Test Results

A drilling subcontractor and our field geologist performed 1 infiltration test in March 2026.

INFILTRATION TEST RESULTS				
Test Date: 03/17/26			Tester: Lisette Corral	
Location: B-16/INF-1 ¹			Weather: 25 F	
Test Location	Test Depth (feet)	Trial No.	Water Drop (inches)	Elapsed Time (minutes)
B-16/INF-1	3	1	1/8	15
		2	0	30
		3	1/8	45

INFILTRATION TEST RESULTS

Test Date: 03/17/26

Tester: Lisette Corral

Location: B-16/INF-1 ¹

Weather: 25 F

Test Location	Test Depth (feet)	Trial No.	Water Drop (inches)	Elapsed Time (minutes)
		4	0	60

NOTE: Rate of final trial: 0.3 in/hr

1. Test pipes were installed in boreholes made adjacent to test boring B-16/INF-1

Laboratory Corrosion Testing

Samples for corrosion testing were obtained from 6 locations. The tests were completed on samples obtained from depths of approximately 0 to 4 feet below existing ground surface. The samples were tested for pH, water soluble sulfate, sulfides, chlorides, total salts, Red-Ox potential, and electrical resistivity. The individual laboratory corrosion results are provided in [Exploration and Laboratory Results](#) of this report and are summarized in the table below. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Locations	Test Type						
	Soluble Sulfate (mg/kg)	Soluble Chloride (mg/kg)	pH	Sulfides (mg/kg)	Total Salts	Red Ox (mV)	Electrical Resistivity (Ω-cm)
TR-1/CR-1	163	200	7.4	Nil	560	+408	2994
TR-2/CR-2	125	183	7.6	Nil	827	+382	2891
TR-3/CR-3	211	167	8.1	Nil	829	+359	2478
TR-4/CR-4	195	117	7.5	Nil	689	+453	2375
TR-5/CR-5	211	117	7.3	Nil	586	+521	2891
TR-6/CR-6	136	133	7.4	Nil	499	+490	3201

Results of soluble sulfate testing can be classified in accordance with ACI 318 – Building Code Requirements for Structural Concrete. Numerous sources are available to characterize corrosion potential to buried metals using the parameters above. Section 10.7.5 of the AASHTO LRFD Bridge Manual, 9th Edition, 2020, states the following soil or site conditions should be considered as indicative of potential deterioration or corrosion situation for steel piles:

Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL
May 1, 2026 | Terracon Project No. 11255215



- Soil electrical resistivity less than 2,000 ohm-cm
- Ph less than 5.5
- Ph between 5.5 and 8.5 with high organic content
- Sulfate concentration greater than 1,000 ppm (mg/kg)

These test results are provided to assist in determining the type and degree of corrosion protection that may be required.

Imported fill materials may have significantly different properties than the site materials noted above and should be evaluated if expected to be in contact with metals used for construction.

Laboratory Thermal Resistivity Testing

Five samples were collected from the BESS area and 1 sample was collected from the substation area at depths ranging from 0 to 4 feet for laboratory thermal resistivity testing. The thermal resistivity testing was conducted in general accordance with ASTM and IEEE standards. The dry-out curves were developed from bulk soil samples compacted to approximately 90 percent of the maximum density determined in accordance with standard Proctor criteria at approximately the optimum moisture content and dried to near 0 percent moisture while obtaining intermediate moisture contents to develop the dry-out curves. The individual results of the thermal resistivity testing are presented in the [Exploration and Laboratory Results](#) of this report and summarized in the table below.

Location	Depth ¹ (ft)	Description	Optimum Water Content (%)	Max. Dry Unit Weight (lb/ft ³)	Test Condition	Thermal Resistivity (°C-cm/Watt)	
						Wet ²	Dry ³
TR-1/ CR-1	0-4	Fat Clay Trace Gravel	18	96	Remolded to 90% of max. standard Proctor	66	233
TR-2/ CR-2	0-4	Lean Clay Trace Sand and Gravel	17	99	Remolded to 90% of max. standard Proctor	81	217

Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL
 May 1, 2026 | Terracon Project No. 11255215



Location	Depth ¹ (ft)	Description	Optimum Water Content (%)	Max. Dry Unit Weight (lb/ft ³)	Test Condition	Thermal Resistivity (°C-cm/Watt)	
						Wet ²	Dry ³
TR-3/ CR-3	0-4	Fat Clay	22	89	Remolded to 90% of max. standard Proctor	64	242
TR-4/ CR-4	0-4	Fat Clay	17	98	Remolded to 90% of max. standard Proctor	68	230
TR-5/ CR-5	0-4	Lean Clay	19	93	Remolded to 90% of max. standard Proctor	68	243
TR-6/ CR-6	0-4	Fat Clay	19	94	Remolded to 90% of max. standard Proctor	66	235

1. The "Remolded Wet" samples were tested near the optimum moisture content.
2. The "Undisturbed As Received" samples were tested at the in-situ moisture content.
3. The "Dry" samples were tested at a moisture content of near 0%.

Contributory Risk Components

Item	Description
Soil Conditions	The borings encountered generally medium stiff to stiff consistency lean clay. Several borings encountered relatively thick layers of soft to very soft soils (e.g., B-4 to B-6, B-12, B-13, and B-15)

Item	Description
Access	<p>Wet and soft surface conditions, following periods of precipitation, will create access issues for vehicles. Additionally, the near-surface native materials may become unstable from repetitive construction activities and soil stabilization may be necessary to create a stable working surface. This site will generally be more accessible in the summer and early fall due to seasonally drier conditions.</p>
Grading	<p>We anticipate minor grading will be required. The majority of the on-site materials are low plasticity clay and can be reused as structural fill after moisture conditioning if they satisfy the requirements in this report.</p> <p>We expect localized areas of unsuitable conditions could be encountered prior to placing fill and near subgrade elevations for roadways and shallow foundations. Stabilization measures, such as undercutting/replacement, scarification/recompaction, or chemical treatment should be anticipated.</p>
Groundwater	<p>Groundwater was encountered at various boring locations at depths ranging from approximately 8.5 to 43 feet below ground surface.</p>
Embedment Depth for Frost Protection	<p>The typical frost protection depth for the design of shallow spread footing and mat foundations for unheated structures is 42 inches. Pile foundations for the BESS structures will have to be embedded deep enough to resist uplift loads associated with adfreeze conditions if the dead weight of the structures are not heavy enough to resist.</p>

Item	Description
Excavation Hazards	Based on the soil conditions encountered, difficult excavating conditions are not expected to be encountered at the project site. The long term groundwater is not expected to be encountered in typical shallow excavations (e.g., for shallow foundations); however, perched water conditions may be encountered within the sand and silt seams overlying the native clay soils.
	As a minimum, all temporary excavations should be sloped or braced as required by Occupational Health and Safety Administration (OSHA) regulations to provide stability and safe working conditions. Temporary excavations will probably be required during grading operations. The grading contractor, by his contract, is usually responsible for designing and constructing stable, temporary excavations and should shore, slope or bench the sides of the excavations as required, to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, state and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards.
Slope Hazards	The site is generally flat. Therefore, slope issues are not anticipated at the project site. Slopes should be placed a minimum of 3H:1V for slopes less than 5 feet in height. Slopes greater than 5 feet in height will require additional consultation and possibly additional analysis to be performed.
General Construction Considerations	The near surface soils at the project site will be sensitive to precipitation and could become unstable with typical earthwork and construction traffic. Effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. If possible, the grading should be performed during the warmer and drier times of the year.

The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the [Exploration and Laboratory Results](#)), engineering analyses, and our current understanding of the proposed project. The [General Comments](#) section provides an understanding of the report limitations.

BESS Driven Pile Foundations

Geotechnical Considerations

We anticipate the BESS structures might be supported by driven piles or on mat foundations. Medium stiff to stiff lean clay with intermittent sand and silt seams were encountered on the north side of the BESS. Soft clays transitioning to stiff clays at depths ranging from 13 to 28 feet below ground surface were observed on the south side of the BESS. We understand a pile load testing program is planned to be performed in the fall of 2026, and we anticipate this program could help reduce uncertainty in pile installation costs and help refine the overall pile design.

We have performed preliminary geotechnical analyses for driven pile foundations to support the BESS systems. Subsequent analyses will be performed after performing the pile load test program. Instead, this analysis is intended to assist you in roughly evaluating construction costs and development viability for the proposed project. It should also be noted that our analyses are based on short-term conditions based on boring information. For this type of foundation system, provisions for flexible or adjustable connections between the posts and the BESS superstructure are recommended.

Adfreeze Stress and Depth Which Adfreeze Applies

It is Terracon's professional opinion that the near-surface overburden soils encountered in the borings drilled at this site are frost susceptible. In cold weather climates, design to resist frost heave forces exerted on foundations is often a significant factor in the foundation design. Specifically, pile lengths will need to be long enough to counteract potential heave forces in the seasonal frost zone.

As the frost penetrates deeper into the soil and the ground swells due to freezing, a portion of the soil profile and ground surface will rise due to frost heaving. The upward displacement is due to freezing water contained in the soil voids along with the formation of ice lenses in the soil. The freezing material grips the steel pile and exerts an uplift force due to the adfreeze stress developed around the surface area of the pile. The amount of upward force depends on the following:

- The thickness of ice lenses formed in the seasonal frozen ground
- The bond between the steel pile surface and the frozen ground
- The surface area of the steel pile in the seasonally frozen ground

Adfreeze on pile foundations may be significant. If the anchorage of the foundations and the deadweight of the pile are not sufficient to resist these upward forces, adfreeze load can cause uplift to structures. Based on our review of soil samples and associated

references, we recommend an adfreeze stress of 1,500 psf be considered when determining the frost heave load on a pile. The box perimeter of the pile (two times the pile shape depth, d , plus two times the flange width, b_f) acting over a depth of **3.6 feet** should be considered when determining the adfreeze stress on a pile. The adfreeze depth was calculated using the Modified Berggren equation and the results of the soil borings completed at the site.

Preliminary Axial Capacity Recommendations

The axial uplift capacity of driven piles may be estimated based on skin friction developed along the perimeter of the pile, while the compression capacity may be estimated using the skin friction and end bearing. When determining embedment depths, the perimeter of a wide flange beam should be taken as twice the sum of the flange width and section depth.

Based on the results of our borings, we have developed the following preliminary soil parameters for zones of the site:

(Borings B-4 and B-5) - Axial Capacity ¹			
Depth Interval (feet-bgs)	Material	Ultimate Skin Friction (psf)	Ultimate End Bearing (psf)
0 to 25	Soft to Medium Stiff Lean Clay	250	Not Recommended
25 to 30	Stiff to Very Stiff Lean Clay	700	10,000
(Boring B-6) - Axial Capacity ¹			
Depth Interval (feet-bgs)	Material	Ultimate Skin Friction (psf)	Ultimate End Bearing (psf)
0 to 13	Soft to Medium Stiff Lean Clay	300	Not Recommended
13 to 20	Lean Clay	1,100	15,000
(Borings B-1, 2, 3, 7, 8, 9) - Axial Capacity ¹			

Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL
May 1, 2026 | Terracon Project No. 11255215



Depth Interval (feet-bgs)	Material	Ultimate Skin Friction (psf)	Ultimate End Bearing (psf)
0 to 8	Medium Stiff Lean Clay	500	Not Recommended
8 to 20	Stiff to Very Stiff Lean Clay	1,200	15,000

1. The upper 3.6 feet of soil should be neglected when determining axial skin friction capacity of the pile.

The estimated skin friction and end bearing values are ultimate values without factors of safety. We suggest considering factors of safety of 2 for skin friction and 3 for end bearing values. The values given in the above table are based on our borings and past experience with similar soil types. Piles should have a minimum center-to-center spacing of at least three times their largest cross-sectional dimension (i.e., diagonal distance of a W-section pile) to prevent reduction in the axial capacities due to group effects. If piles are spaced closer than 3D where D is the pile diameter, the axial capacity should be determined by applying a factor of 0.7.

We recommend a pile load testing program be developed as the project design progresses to refine the estimated values provided in this report.

Lateral Capacity Recommendations

The preliminary lateral design parameters, for input into LPILE, for driven steel piles based on our boring data are provided in the tables below. The parameters provided in this report should be considered preliminary in nature; they should be finalized after a pile-load testing program is carried out.

Based on the results of our borings, we have developed the following preliminary LPILE parameters for zones of the site.

(Borings B-4 and B-5) - LPILE Parameters						
Depth Interval (feet-bgs)	LPILE Soil Type ¹	Effective Unit Weight (pcf)	Friction Angle (degree)	Undrained Shear Strength (psf)	Soil Modulus (k)	P-Multiplier
0 to 3.6	Soft Clay (Matlock)	100	---	200	Default	0.7
3.6 to 7	Soft Clay (Matlock)	110	---	450	Default	1.0

Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL
 May 1, 2026 | Terracon Project No. 11255215



7 to 25	Soft Clay (Matlock)	55	---	450	Default	1.0
25 to 30	Stiff Clay w/o Free Water	60	---	1,250	Default	1.0

(Boring B-6) - LPile Parameters

Depth Interval (feet- bgs)	LPile Soil Type ¹	Effective Unit Weight (pcf)	Friction Angle (degree)	Undrained Shear Strength (psf)	Soil Modulus (k)	P- Multiplier
0 to 3.6	Soft Clay (Matlock)	100	---	200	Default	0.7
3.6 to 13	Soft Clay (Matlock)	55	---	500	Default	1.0
13 to 20	Stiff Clay w/o Free Water	60	---	2,000	Default	1.0

(Borings B-1, 2, 3, 7, 8, 9) - LPile Parameters

Depth Interval (feet- bgs)	LPile Soil Type ¹	Effective Unit Weight (pcf)	Friction Angle (degree)	Undrained Shear Strength (psf)	Soil Modulus (k)	P- Multiplier
0 to 3.6	Soft Clay (Matlock)	100	---	200	Default	0.7
3.6 to 8	Stiff Clay w/o Free Water	110	---	900	Default	1.0
8 to 20	Stiff Clay w/o Free Water	60	---	2,250	Default	1.0

1. The p-multiplier for piles with a minimum center-to-center spacing of at least five times their largest cross-sectional dimension in the direction of the lateral loads could consider a p-multiplier of 1.0. The p-multiplier in the upper 3.6 feet should be reduced due to seasonal freeze/thaw impacts.

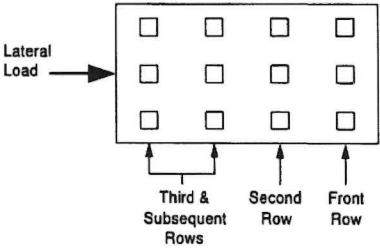
The structural engineer should evaluate the moment capacity of the pile as part of their structural evaluation. Piles should have a minimum center-to-center spacing of at least five times their largest cross-sectional dimension in the direction of the lateral loads, or the lateral capacities should be reduced due to group effects. If piles will be spaced

closer than five times their largest cross-sectional dimension, we should be notified to provide supplemental recommendations regarding resistance to lateral loads.

When piles are used in groups, the lateral capacities of the piles in the second, third, and subsequent rows of the group should be reduced as compared to the capacity of a single, independent pile. Guidance for applying p-multiplier factors to the p values in the p-y curves for each row of pile foundations within a pile group are as follows:

Center to Center Pile Spacing ^{1,2}	P-Multiplier, P_m ³		
	Front Row	Second Row	Third and Subsequent Rows
3B	0.8	0.4	0.3
4B	0.9	0.65	0.5
5B	1.0	0.85	0.7
6B	1.0	1.0	1.0

1. Spacing in the direction of loading. B = pile diameter
2. For the case of a single row of piles supporting a laterally loaded grade beam, group action for lateral resistance of piles would need be considered when spacing is less than three pile diameters (measured center-to-center).
3. See adjacent figure for definition of front, second and third rows.



Construction Considerations

Based on the field exploration and laboratory testing, it is our opinion that the soils on a majority of the site are generally suitable for direct drive pile installation into native soils.

The pile driving contractor should perform production pile testing as part of a Quality Control plan. If unforeseen conditions are found during the pile installation and testing, the Geotechnical Engineer should be contacted to provide additional recommendations.

Shallow Foundations

If the site has been prepared in accordance with the requirements noted in [Earthwork](#), the following design parameters are applicable for shallow foundations. We understand

that some equipment may be supported on mat foundations while other structures may be supported on shallow spread footing foundations.

Soft to medium stiff clays were encountered within approximately 6 to 8 feet bgs in several borings and will require improvement prior to foundation construction. Borings B-4 to B-6, B-12, B-13, and B-15 encountered very soft to medium stiff soils extending to about 13 to 23 feet bgs. Some amount of ground improvement might be required depending on the required bearing pressure and allowable settlement tolerances and this is discussed in the following sections. Alternatively, the shallow foundations within these areas could be supported by driven pile foundations similar to that of the BESS pile foundations.

Spread Footing Design Parameters – Compressive Loads

Item	Description
Maximum Net Allowable Bearing Pressure ^{1, 2}	1,500 psf
Required Bearing Stratum ³	<ul style="list-style-type: none"> ■ Medium stiff or better cohesive native soils ■ Structural fill or lean concrete extending to suitable native soils ■ Proprietary ground improvement system ■ Helical pier foundations
Minimum Foundation Dimensions	Per IBC 1809.7
Ultimate Passive Resistance ⁴ (equivalent fluid pressures)	220 pcf (cohesive backfill) 360 pcf (granular backfill)
Sliding Resistance ⁵	On suitable bearing material: 0.35
Minimum Embedment below Finished Grade ⁶	42 inches
Estimated Total Settlement from Structural Loads ²	About 2 inch or less
Estimated Differential Settlement ^{2, 7}	About ½ of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. Values assume that exterior grades are no steeper than 20% within 10 feet of structure.
2. Values provided are for maximum loads noted in [Project Description](#). Additional geotechnical consultation will be necessary if higher loads are anticipated.
3. Unsuitable or soft soils should be overexcavated and replaced per the recommendations presented in [Earthwork](#).

Item	Description
4.	Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing face. Assumes no hydrostatic pressure.
5.	Value can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Frictional resistance for granular materials is dependent on the bearing pressure which may vary due to load combinations. For fine-grained materials, lateral resistance using cohesion should not exceed ½ the dead load.
6.	Embedment necessary to reduce the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
7.	Differential settlements are noted for equivalent-loaded foundations and bearing elevation as measured over a span of 50 feet.

Mat Foundation Design Parameters

We understand the project will include transformers that are planned to be supported by mat foundations. Additionally, we believe BESS foundations might be supported on mat foundations.

Portions of the upper native soils in area (e.g. B-4, B-5, B-6, B-12, B-13, and B-15) of the site have relatively lower strengths. Additionally, very soft to medium stiff soils were encountered in several borings extending to about 13 to 23 feet bgs. We have provided a relatively low allowable bearing pressure for the mats supported above these soils, and we are estimating total settlements greater than 1 inch. To reduce the estimated total settlement magnitudes, options might include the following:

- overexcavation of soils and replacement with granular structural fill,
- the use of proprietary ground improvement (e.g., stone columns, aggregate piers), or
- intermediate foundations (e.g., helical piers)
- driven pile foundations

For the overexcavation and replacement option, overexcavations should be prepared to extend at least to depths encountering suitable GeoModel Layer 3 soils (e.g., stiff to very stiff lean clay). Based on our borings, the estimated overexcavation depths below the design bearing elevations of foundations should be confirmed by the Geotechnical Engineer or their representative during construction:

- If overexcavation is considered, approximately 13 to 25 feet of overexcavation may be required in the areas of B-4, B-5, B-6, and B-12, which might not be economically desirable.

The parameters in the following table apply to mat or pad foundations.

Item	Description
Maximum Net Allowable Bearing Pressure ^{1, 3}	<ul style="list-style-type: none"> Supported on suitable native soils or new structural fill extending to suitable soils: 1,000 psf Supported above ground improvement system or helical pier foundations: to be determined by designer/specialty contractor Designated thickness of granular structural fill (specific to site conditions) Subgrade per recommendations in Earthwork Minimum 6 inches of crushed aggregate compacted to at least 98% of ASTM D 698 Ground improvement system or helical pier foundations²: to be determined by specialty contractor
Required Bearing Stratum	
Maximum Mat Foundation Dimensions	25 feet
Minimum Embedment Below Finished Grade ⁴	3.5 feet
Estimated Modulus of Subgrade Reaction ⁵	<ul style="list-style-type: none"> Supported on approved native soil/structural fill: $K_1 = 100$ psi/inch dependent on location and site preparation depth of overexcavation Supported on ground improvement system ²: to be provided by specialty contractor Supported on native soils: about 2 inches or less With overexcavation to the designated depth and replacement with granular structural fill: About 1 to 1½ inches Ground improvement system or helical pier foundations ²: to be determined by specialty contractor
Estimated Total Settlement from Structural Loads ^{3, 6}	

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. Values assume that exterior grades are no steeper than 20% within 10 feet of structure.
2. Proprietary ground improvement system to be designed by specialty geotechnical contractor. See the [Ground Improvement Foundation Support](#) subsection.
3. Values provided are for maximum loads noted in [Project Description](#). Additional geotechnical consultation will be necessary if higher loads are anticipated.
4. Embedment depth required for the allowable bearing pressure, erosion protection and to reduce the effects of seasonal moisture variations in the subgrade soils.
5. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in [Earthwork](#), and the slab support as noted in this table. It is provided for point loads (e.g., less than

Item	Description
	<p>1 foot x 1 foot loaded area). The value used in design should be scaled based on the actual size of the loaded area. The modulus of subgrade reaction value decreases as the width of the loaded area increases. The following equation, provided in NAVFAC Design Manual 7.2 (Chapter 4, Table 4, Definitions and Procedures - Mats on Elastic Foundations) should be used to scale the modulus of subgrade reaction value:</p> $K_b = K_1 \times (1 / b) \text{ (for fine-grained soils directly below base of 6-inches)}$ $K_b = K_1 \left(\frac{b + 1}{2b} \right)^2 \text{ (for aggregate or subgrade over 2 feet thick)}$ <p>Where K_b = modulus of subgrade reaction for loaded area of width 'b' K_1 = modulus of subgrade reaction for a 1-ft by 1-ft area b = width of loaded area.</p> <p>6. Foundation settlement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the slab and slab reinforcing, the thickness of compacted fill, and the quality of earthwork operations. Settlements at the corners and edges of the mats are expected to approach approximately ½ to ¾ of the total settlement at the center. Control joints and sufficiently flexible connections are recommended help to accommodate differential settlement.</p>

Structural mats that support concentrated point or limited area storage (live) loads distribute those loads over a subgrade area defined by the mat stiffness and the subgrade modulus. The magnitude and distribution of mat bearing pressure is typically modeled by the Project Structural Engineer using a structural mat design program. Without this detailed information, the mat pressure should be assumed to entail the maximum anticipated mat pressure over the entire mat area. We recommend the initial structural mat computer analyses be performed using the subgrade modulus in the preceding table. If this assumption meets acceptable load threshold-settlement criteria, no further evaluation is required. If the conservative assumption exceeds the threshold, detailed settlement analyses of actual mat pressure distribution may be warranted.

Ground Improvement Foundation Support

Due to the soil conditions at the project site and maximum settlement magnitudes for some structures, ground improvement methods (e.g., aggregate piers or stone columns) could be considered an appropriate measure to support the spread footing and mat foundations of the substation structures.

Our experience with developments near the proposed facility suggests that the use of aggregate pier ground improvement is feasible for the subsurface soil conditions observed at this site. The use of ground improvement elements with these types of site

soil conditions may provide allowable bearing pressures on the order of 3,000 to 4,000 psf (or more) for the support of shallow foundations.

The actual bearing pressure used to proportion the footings will depend on the concentration of the aggregate piers per footing and their depth of penetration below the footings as well as the required performance criteria. Such systems are proprietary and are typically designed by the specialty contractor in consultation with the structural engineer and the geotechnical consultant. Due to the specialty of these soil improvement procedures, we recommend a performance specification associated with the structural basis of design be used.

The proprietary designer provides an allowable bearing pressure for the design of the foundation and provides an estimate of overall settlement performance. The contribution of settlement of deeper soils that are not reinforced by these methods needs to be considered.

These aggregate pier systems consisting of stone-filled columns constructed by excavating or creating a pattern of cylindrical holes beneath spread footing foundation locations and backfilling each with crushed stone placed in lifts and applying a high degree of compactive effort resulting in stone filled piers. The aggregate pier construction process results in a relatively rigid stone-filled column that lends support to structures and helps to densify the soils surrounding the pier.

Non-displacement, bored and filled procedures are often suited for profiles of low strength fine-grained soils; however, sloughing and caving of the low strength soils and any granular soils are potentially a hindrance to this method and should be accounted for. Methods using vibratory advanced mandrels and bottom feeding granular backfill during the densification process could also be considered. The means and methods of aggregate pier installation should be determined by the ground improvement designer.

Aggregate pier designs are based on a two-layer settlement analysis. Settlements within the "upper zone" (zone of soil that is reinforced with aggregate pier elements) are computed using a weighted modulus method that accounts for the stiffness of the aggregate pier elements, the stiffness of the matrix soil, and the area coverage of aggregate pier elements below supported footings. Settlements within the "lower zone" (zone of soils beneath the upper zone which receives lower intensity footing stresses) are computed using conventional geotechnical settlement methods.

If ground improvement methods are used to support the foundations, the ground improvement design firm is considered the geotechnical engineer of record for these foundations. As such, the design firm would provide the necessary design parameters for the planned foundation system including, but not limited to, allowable bearing capacity, settlement estimates and foundation-specific earthwork recommendations. Terracon can assist in the initial conceptual design of ground improvement systems and can review design submittals provided by the selected ground improvement system.

Helical Pier Foundations

The owner could also consider helical pier foundations to support the mat foundations. The use of helical piers could be considered to transmit foundation loads to suitable native bearing stratum below the soft to medium stiff layer (GeoModel Layer 2). This foundation system is a proprietary design and construction method that can assist with maintaining the foundation settlements to tolerable magnitudes.

This system generally consists of one or more helices welded to a steel shaft. The piers are rotated into the soil and usually the torque and other metrics are measured during installation. Design and installation of the helical piers are performed by specialty contractors based on the type and size of helical piers available as well as the spacing between the helices of a helical pier. The actual depth of embedment of the helical pier may vary due to variations in subsurface conditions and actual soil bearing conditions at the individual pier locations.

Field observation to evaluate bearing capacity should include an installation torque-to-capacity ratio or a minimum design installation torque value in suitable native soils. We anticipate the required capacity for the helical piers supporting the anticipated structural loads can be achieved by bearing within the native stiff to very stiff clays (GeoModel Layer 3). Care should be taken to reduce the possibility of the helices rotating but not advancing into the hard clay or very dense granular layers during installation.

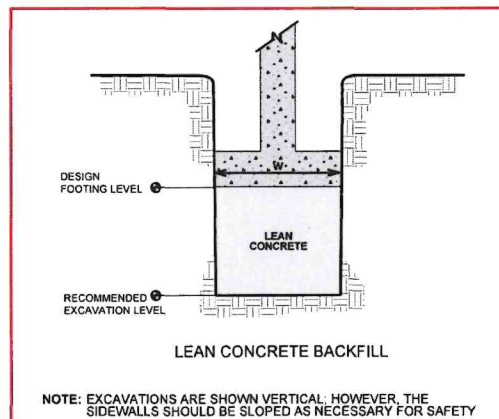
Shallow Foundation Construction Considerations

As noted in [Earthwork](#), the footing excavations should be evaluated under the observation of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

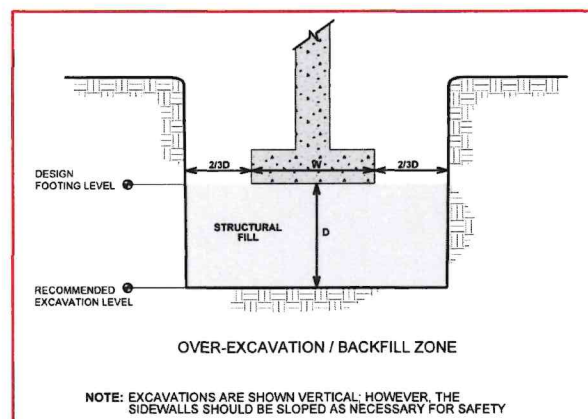
If unsuitable bearing soils are observed at the base of the planned footing excavation, the excavation should be extended deeper to suitable soils, and the footings could bear directly on these soils at the lower level or on lean concrete backfill placed in the excavations. The lean concrete replacement zone is illustrated on the sketch below.

Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL
May 1, 2026 | Terracon Project No. 11255215



If suitable soils are not encountered, widened overexcavations and replacement with structural fill or lean concrete will be required. Overexcavation for granular structural fill or lean concrete placement below footings should be conducted as shown below. The overexcavation should be backfilled up to the footing base elevation, with granular structural fill (e.g., Illinois Department of Transportation (IDOT) Gradation CA-6 or similar approved materials) placed as recommended in the [Earthwork](#) section.



Foundation Frost Considerations

Frost susceptible soils (e.g., silt, sands with fines, clay) are present in the borings, and these soils should be anticipated across the project site.

Mat foundations not supported at frost depth and exposed to freezing temperatures can be subjected to frost heave movements. The typical frost protection depth for the design of shallow spread footing and mat foundations for unheated structures is 3.5 feet. If frost action needs to be reduced in critical grade supported slab or mat foundation areas, we recommend the use of low-frost susceptible (LFS) fill in all or portions of the conventional frost depths of 3.5 feet or structural slabs. LFS fill is defined as granular

soil with less than 6% by weight passing a number 200 sieve. The following recommendations are provided to help reduce potential frost heave:

- Provide surface drainage away from the structure and slabs, and toward the site drainage system.
- Install drains around the perimeter of the structures, stoops, and below exterior slabs and connect them to the site drainage system. Drain tiles should be designed to adequately remove water that would otherwise collect in the granular material surrounded by the less permeable cohesive soils.
- Grade clayey subgrades so groundwater potentially perched in overlying fill or aggregate base, slope toward a site drainage system.
- Place LFS fill as backfill beneath mat foundations or slabs that are sensitive to movements.

Substation Foundations

Deep foundation systems can be considered for the substation structures and are anticipated to consist of drilled shafts. Vertical and lateral resistance parameters are discussed below. Borings B-10 to B-15 considered for the drilled shaft calculations.

Drilled Shaft Design Parameters

Soil design parameters are provided below in the **Drilled Shaft Design Summary** table for the design of drilled shaft foundations. The values presented for allowable side friction and end bearing include a factor of safety.

Drilled Shaft Design Summary (B-10 and B-12)¹

Depth (feet)	Stratigraphy ²		Allowable Skin Friction (psf) ³	Allowable End Bearing Pressure (psf) ⁴
	GeoModel Layer No.	Material		
0 to 3.5	Soil parameters should be ignored above a depth of 3.5 feet due to frost effects and construction disturbance			
3.5 ft. bgs to 22	2	Medium stiff Lean Clay	200	Not recommended
22 ft. bgs to 50	3	Stiff to Very stiff Lean Clay	500	4,000

Drilled Shaft Design Summary (B-10 and B-12)¹

Depth (feet)	Stratigraphy ²		Allowable Skin Friction (psf) ³	Allowable End Bearing Pressure (psf) ⁴
	GeoModel Layer No.	Material		

1. Design capacities are dependent upon the method of installation and quality control parameters. The values provided are estimates and should be verified when the installation protocol has been finalized.
2. See Subsurface Profile in [Geotechnical Characterization](#) for more details on stratigraphy.
3. Applicable for compressive loading only. Reduce allowable skin friction values to 2/3 of values shown for uplift loading. The effective weight of the shaft can be added to uplift load resistance to the extent permitted by IBC.
4. Shafts should extend at least one diameter into the bearing stratum for end bearing to be considered.

Drilled Shaft Design Summary (B-11, B-13, B-14, & B-15)¹

Depth (feet)	Stratigraphy ²		Allowable Skin Friction (psf) ³	Allowable End Bearing Pressure (psf) ⁴
	GeoModel Layer No.	Material		

0 to 3.5

Soil parameters should be ignored above a depth of 3.5 feet due to frost effects and construction disturbance

3.5 ft. bgs to 13	2	Medium stiff Lean Clay	200	Not recommended
13 ft. bgs to 33	3	Stiff to Very stiff Lean Clay	500	4,000
33 ft. bgs to 50	4	Medium dense Sand	700	5,000

Drilled Shaft Design Summary (B-11, B-13, B-14, & B-15)¹

Depth (feet)	Stratigraphy ²		Allowable Skin Friction (psf) ³	Allowable End Bearing Pressure (psf) ⁴
	GeoModel Layer No.	Material		

1. Design capacities are dependent upon the method of installation and quality control parameters. The values provided are estimates and should be verified when the installation protocol has been finalized.
2. See Subsurface Profile in [Geotechnical Characterization](#) for more details on stratigraphy.
3. Applicable for compressive loading only. Reduce allowable skin friction values to 2/3 of values shown for uplift loading. The effective weight of the shaft can be added to uplift load resistance to the extent permitted by IBC.
4. Shafts should extend at least one diameter into the bearing stratum for end bearing to be considered.

Shafts should be adequately reinforced as designed by the Structural Engineer for both tension and shear to sufficient depths. Buoyant unit weights of the soil and concrete should be used in the calculations below the highest anticipated groundwater elevation.

Drilled shaft should have a minimum (center-to-center) spacing of three diameters. Closer spacing may require a reduction in axial load capacity. Axial capacity reduction can be determined by comparing the allowable axial capacity determined from the sum of individual elements in a group versus the capacity calculated using the perimeter and base of the element group acting as a unit. The lesser of the two capacities should be used in design.

Lateral Resistance Parameters for Drilled Shafts

The following table lists input values for use in LPILE analyses considering the soil borings. Modern versions of LPILE provide estimated default values of K and ϵ_{50} based on strength and are recommended for the project. Since deflection or a service limit criterion will most likely control lateral capacity design, no safety/resistance factor is included with the parameters.

Lateral Resistance Parameters (B-10 and B-12)						
Stratigraphy ¹	γ / γ'	L-Pile Soil	S_u	ϕ ²	ϵ_{50}	K (pci)
Depth (feet bgs)	(pcf) ²	Model	(psf) ²			Static Cyclic

0 to 3.5

Soil parameters should be ignored above a depth of 3.5 feet due to frost effects and construction disturbance

Lateral Resistance Parameters (B-10 and B-12)						
Stratigraphy ¹	γ/γ'	L-Pile Soil	S_u	ϕ ²	E_{50}	K (pci)
Depth (feet bgs)	(pcf) ²	Model	(psf) ²			Static Cyclic
3.5 ft. bgs to 22	110	Stiff clay w/o free water	500	---		Use Default Value
22 ft. bgs to 50	60	Stiff clay w/o free water	3,000	---		Use Default Value

1. See Subsurface Profile in [Geotechnical Characterization](#) for more details on Stratigraphy.

2. Definition of Terms:

S_u : Undrained shear strength (psf)

ϕ : Internal friction angle (degree)

γ/γ' : Total unit weight/effective unit weight (psf)

criterion will most likely control lateral capacity design, no safety/resistance factor is included with the parameters.

Lateral Resistance Parameters (B-11, B-13, B-14, & B-15)						
Stratigraphy ¹	γ/γ'	L-Pile Soil	S_u	ϕ ²	E_{50}	K (pci)
Depth (feet bgs)	(pcf) ²	Model	(psf) ²			Static Cyclic
0 to 3.5		Soil parameters should be ignored above a depth of 3.5 feet due to frost effects and construction disturbance				
3.5 ft. bgs to 13	110	Stiff clay w/o free water	1,000	---		Use Default Value
13 ft. bgs to 33	60	Stiff clay w/o free water	3,000	---		Use Default Value
33 ft. bgs to 50	58	Sand (Reese)	---	28		Use Default Value

1. See Subsurface Profile in [Geotechnical Characterization](#) for more details on Stratigraphy.

2. Definition of Terms:

S_u : Undrained shear strength (psf)

ϕ : Internal friction angle (degree)

γ/γ' : Total unit weight/effective unit weight (psf)

When shafts are used in groups, the lateral capacities of the shafts in the second, third, and subsequent rows of the group should be reduced as compared to the capacity of a single, independent shaft. Spacing closer than 3D (where D is the diameter of the shaft) is not recommended without additional geotechnical consultation due to potential for the installation of a new shaft disturbing an adjacent installed shaft likely resulting in axial capacity reduction.

The shafts should be spaced at least three shaft diameters apart (center-to-center) if they are used to resist lateral loads. Pile caps and/or grade beams could be subject to uplift loading due to frost action; thus, perimeter foundation elements beneath unheated areas should extend at least 3.5 feet below the lowest adjacent finished grade for frost protection. The drilled shaft diameter should not be increased in the upper 3.5 feet to reduce the potential for uplift loads due to frost action.

The load capacities provided herein are based on the stresses induced in the supporting soil strata. The structural capacity of the shafts should be checked to assure they can safely accommodate the combined stresses induced by axial and lateral forces. Lateral deflections of shafts should be evaluated using an appropriate analysis method, and will depend on the shaft's diameter, length, configuration, ground slope, stiffness and "fixed head" or "free head" condition. We can provide additional analyses and estimates of lateral deflections for specific loading conditions on request.

Substation Drilled Shaft Foundation Construction Considerations

The drilling contractor should be experienced in the subsurface conditions observed at the site, and the excavations should be performed with equipment capable of providing a clean bearing surface. The drilled straight-shaft foundation system should be installed in general accordance with the procedures presented in "Standard Specification for the Construction of Drilled Piers", ACI Publication No. 336.1-01.

Sands and silt soils (GeoModel Layer 4) were encountered in the borings for the substation. Sloughing and caving could occur during excavation of drilled shafts. Temporary casing and/or slurry techniques should be anticipated to help reduce disturbance, control seepage, and maintain the integrity of the sides and bottom of the drilled shaft excavations. Groundwater and varied soil types should be anticipated for drilled shaft excavations.

Care should be taken so that the sides and bases of the drilled shaft excavations are not disturbed during construction. The base of the excavations should be free of loose or disturbed material prior to concrete placement. Concrete should be placed as soon as possible after the shaft excavation is completed to reduce the potential for disturbance at the bearing surface. Contractors should be prepared to dewater the shaft excavations. Otherwise, a tremie method should be used for concrete placement if accumulated water or drilling fluid is present at the base of the excavation at the time of concrete

placement. The depth of the tremie pipe outlet should be monitored such that the pipe extends to within about ½ foot of the base of the drilled shaft excavation at the start of concrete placement and is maintained a sufficient distance below the surface of the fluid concrete as the excavation is filled.

Where temporary casing is used, care should be taken during removal of the casing as concrete is placed. During casing removal, the concrete level should be maintained a sufficient distance above the bottom of the casing to counteract earth and hydrostatic pressures. A slump of at least 6 inches is recommended for tremie concrete placement and to facilitate temporary casing removal from excavations. Arching of the concrete, loss of seal, and other problems can occur during casing removal, which may cause contamination of the drilled shaft. These conditions should be considered during the design and construction phases. Placement of loose backfill should not be permitted around the casing prior to its removal.

We recommend that a representative of the Geotechnical Engineer be present during drilled shaft excavation and construction to evaluate that the materials removed from drilled shaft excavations are consistent with those encountered in the borings, to determine when suitable bearing depths have been reached, to observe the bases of excavations and check that cuttings have been adequately removed, and to observe concrete placements. If unsuitable materials are encountered in a drilled shaft excavation, it may be necessary to deepen the excavation and/or increase the shaft diameter, if possible.

Earthwork

Earthwork is anticipated to include excavations and structural fill placement. The site work conditions will be largely dependent on the weather conditions and the contractor's means and methods in controlling surface drainage and protecting the subgrade. Site preparation where inverter shallow foundations will be installed or the substation area should include clearing and grubbing, installation of a site drainage system (if necessary), and subgrade preparation, proofrolling and vibratory densification, as necessary. Where no grading is planned, site preparation is not necessary where structures will be supported on driven piles except to improve site drainage where necessary. Drainage should be planned to preserve overall stability of the ground surface and to reduce erosion in the area.

The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations and the granular surfaced access road.

Site Preparation

Site preparation within areas of planned shallow foundation supported structures, substations, or areas to receive fill should commence with stripping of vegetation, topsoil, organic soils, root systems, and any unsuitable materials (e.g., debris, desiccated soil, frozen soil, etc.) from the site surface within planned new construction area. Root systems should be satisfactorily grabbed and removed from these planned areas for new structures or to receive structural fill.

Based on our experience, stripping depths on the order of 8 to 12 inches may be required to remove soils containing more than 5 percent organics in this former agricultural field; however, zones of deeper organic material should be anticipated in areas. A representative of the Geotechnical Engineer should evaluate stripping depths during construction.

Existing utilities and agricultural field tiles should be rerouted around the area of new construction. The trench backfill and bedding materials of any rerouted utilities should also be removed and replaced with new structural fill. Sloping or benching of the sides of these excavations may be needed to accommodate proper placement of new structural fill. Field tile lines should be located and mapped prior to construction. Any field tile lines encountered or damaged during grading operations, should be repaired or connected to a new line to allow drainage to continue. The field tile lines should not be cut off or allowed to plug without providing alternate drainage routes.

Subgrade Preparation

Subsequent to stripping and undercutting any unsuitable materials within areas of planned shallow foundation supported structures, substations, or areas to receive fill, the subgrade should be proofrolled with an adequately loaded vehicle such as a fully-loaded tandem axle dump truck with a gross weight of at least 25 tons or similarly loaded equipment. The proofrolling should be performed under the observation of the Geotechnical Engineer or representative. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by the Geotechnical Engineer. Excessively wet or dry material should either be removed or moisture conditioned and compacted.

Based on the subsurface conditions encountered in the borings, near surface subgrade soils exposed during construction are anticipated to be relatively wet and sensitive to disturbance. Methods of subgrade improvement, as described below, could include scarification, moisture conditioning and compaction, removal of unstable materials and replacement with granular fill (with or without geosynthetics), and chemical stabilization. The appropriate method of improvement, if required, would be dependent on factors such as schedule, weather, the size, and depth of area to be stabilized, and the nature of the instability. More detailed recommendations can be provided during construction as

the need for subgrade stabilization occurs. Performing site grading operations during warm seasons and dry periods would help reduce the amount of subgrade stabilization required.

If the exposed subgrade is unstable during proofrolling operations, it could be stabilized using one of the methods outlined below.

- **Scarification and Compaction** - It may be feasible to scarify, dry, and compact the exposed soils. The success of this procedure would depend primarily on favorable weather and sufficient time to dry the soils. Stable subgrades likely would not be achievable if the thickness of the unstable soil is greater than about 1 foot, if the unstable soil is at or near groundwater levels, or if construction is performed during a period of wet or cool weather when drying is difficult.
- **Crushed Stone** - The use of crushed stone or crushed gravel could be considered to improve subgrade stability. The use of geotextiles (i.e., engineering fabric or geogrid) could also be considered after underground work such as utility construction is completed. Prior to placing the fabric or geogrid, we recommend that all below grade construction, such as utility line installation, be completed to avoid damaging the fabric or geogrid. Equipment should not be operated above the fabric or geogrid until one full lift of crushed stone fill is placed above it. The specifications of the reinforcement product manufacturer should be verified prior to material purchase/delivery and placement at the site.
- **Chemical Modification** - Improvement of subgrades with portland cement or lime could be considered for improving unstable soils. Chemical modification should be performed by a pre-qualified contractor having experience with successfully stabilizing subgrades in the project area on similar sized projects with similar soil conditions. Results of chemical analysis of the additive materials should be provided to the geotechnical engineer prior to use. The hazards of chemicals blowing across the site or onto adjacent property should also be considered. Additional testing would be needed to develop specific recommendations to improve subgrade stability by blending chemicals with the site soils. Additional testing could include, but not be limited to, determining the most suitable stabilizing agent, the optimum amounts required, the presence of sulfates in the soil, and freeze-thaw durability of the subgrade.

Further evaluation of the need and recommendations for subgrade stabilization can be provided during construction as the geotechnical conditions are exposed.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures, roads, or constructed slopes. General fill is material used to achieve grade outside of these areas.

Excavated on-site soils that satisfy the recommendations in this report can be selectively reused as structural fill. Regardless of its source, compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade.

Fine grained materials (e.g., clays) can be difficult to compact in relatively small areas, and we recommend fine-grained materials are only used where placed with proper equipment during mass grading or in broad excavations.

Moisture conditioning (e.g., wetting or drying) will be necessary to achieve compaction requirements, especially where fine grained materials are used as structural fill for the project.

Structural fill materials are discussed in the following table:

Soil Type ¹	USCS Classification	Acceptable Location for Placement (for Structural Fill)
Low Plasticity Cohesive ^{2, 3}	CL, CL-ML	<ul style="list-style-type: none"> Site mass grading fill Below aggregate base for grade-supported slabs
Granular ⁴	GW, GP, GM, GC, SW, SP, SM, SC	<ul style="list-style-type: none"> Below foundations in overexcavations Below grade-supported foundations

1. Structural fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site. Additional geotechnical consultation should be provided prior to use of uniformly graded gravel on the site.
2. Cohesive soils are susceptible to frost and should not be used within the frost protection depths beneath structures. See [Foundation Frost Considerations](#) section for recommendations for low frost susceptible material.
3. By our definition, low plasticity fine grained soil should have a Liquid Limit of 45 or less and a Plasticity Index of 23 or less.
4. Specific material requirements will need to be satisfied based on the intended use. More stringent criteria will apply for low frost susceptible materials.

Fill Placement and Compaction Requirements

Structural fill should meet the following compaction requirements.

Description	Per the Standard Maximum Density Test (ASTM D 698) ¹	Recommended Test Frequency ^{1, 2, 3}
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Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL

May 1, 2026 | Terracon Project No. 11255215



	Minimum Compaction Requirement (%) ^{4, 6}	Range of Moisture Contents for Compaction (% over optimum) ^{2, 5}		
		Minimum	Maximum	
Fill placed within BESS areas -non- load bearing areas (no surface supported foundations)	95	-2	+2	Each vertical foot of fill placed should be tested at a frequency of 1 test per every 20,000 square feet (SF) of fill placed, or a minimum of 1 test per BESS block quadrant per vertical foot of fill placed
Fill soils placed beneath the grade- supported structure areas (BESS area)	98	-2	+2	One test per 2,500 SF, per lift, or one per foundation, whichever is more frequent
Base Coarse Aggregate for Substation Pad	95	-2	+2	One test per lift
Access Road Grading Fill	95	0	+2	1 test per 1,000 linear feet (LF)
Access Road – Top of Subgrade	Proofroll	Maximum 1 inch rutting		At least 2 passes (out and back). Proofroll with a 25 ton fully loaded tandem axle dump truck, or equivalent water truck.
	95	-2	+4	1 test per 1,000 LF per lift
Access roads - chemically stabilized subgrade ⁷	Proofroll	Maximum 2 inches rutting		At least 2 passes (out and back). After sufficient curing, proofroll with a 25-ton fully loaded tandem axle dump truck or equivalent water truck.
Access Road – Aggregate base	98	-2	+2	One test per 1,000 LF per lift
Cable trench subgrade and backfill in non- structural areas ²	85	-2	+2	One test per 1,000 LF per lift
Cable trench subgrade and backfill under roadway ²	95	-2	+2	One test per lift at road crossings

1. Frequency of tests may be increased or decreased at the discretion of the Geotechnical Engineer of Record.

2. Compaction requirements may be increased by the electrical engineer based on thermal resistivity analyses. Compaction should be reviewed and approved by the Electrical Engineer of Record.

3. Maximum lift thickness is recommended 8 inches or less in loose thickness when heavy, self-propelled compaction equipment is used and 4 inches in loose thickness when hand-guided equipment (i.e., jumping jack or plate compactor) is used.
4. If the granular material is a coarse sand or gravel, or of a uniform size, or has a low fines content, compaction comparison to relative density may be more appropriate. In this case, granular materials should be compacted to at least 70% relative density (ASTM D 4253 and D 4254). Granular soils with less than 10 percent passing the No. 200 sieve may not be amenable to density testing and should be placed and compacted to a stable condition observed by the Geotechnical Engineer or representative.
5. Specifically, the moisture content of the granular material should be at a level to achieve compaction without the granular material bulking during placement or pumping when proofrolled.
6. For Non-structural areas (General Fill), compaction at least 85% of standard Proctor maximum dry density and at least 65% relative density.
7. In cases where the stabilized subgrade passes a proofroll (after the curing period), but does not meet the target density, the contractor should perform two passes (out and back) of proofroll over the tested area. If no pumping or excess rutting over 1 inch is observed, the stabilized subgrade may be acceptable as-is.

Utility Trench Backfill

All trench excavations should be made with sufficient working space to permit construction, including backfill placement and compaction. If utility trenches are backfilled with relatively clean granular material, they should be capped with at least 18 inches of clay fill to reduce the infiltration and conveyance of surface water through the trench backfill.

Grading and Drainage

All grades must provide effective drainage away from the structures and substation equipment during and after construction and should be maintained throughout the life of the structures. Water retained next to structures can result in soil movements greater than those discussed in this report.

Where paving or flatwork abuts a structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water

collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and compacted prior to construction.

The groundwater table could affect overexcavation efforts, especially for overexcavation and replacement of lower strength soils. The contractor is responsible for employing appropriate dewatering methods to control seepage and facilitate construction. In our experience, dewatering of isolated excavations in clay soils can typically be accomplished using sump pits and pumps; however, more extensive dewatering systems will be required where excavations extend below seasonal groundwater levels and/or into sands.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

Excavations or other activities resulting in ground disturbance have the potential to affect adjoining properties and structures. Our scope of services does not include reviewing available final grading information or considering potential temporary grading performed by the contractor for potential effects such as ground movement beyond the project limits. A preconstruction/ precondition survey should be conducted to document nearby property/infrastructure prior to any site development activity. Excavation or ground disturbance activities adjacent or near property lines should be monitored or instrumented for potential ground movements that could negatively affect adjoining property and/or structures.

Construction Observation and Testing

The earthwork efforts should be observed by a representative of the Geotechnical Engineer during construction. Observation should include documentation of adequate removal of surficial materials (vegetation, topsoil), as well as proofrolling and mitigation of unsuitable areas delineated by the proofroll. Field density tests should be conducted during placement and compaction of structural fill. Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, as recommended by the Geotechnical Engineer prior to placement of additional lifts. The Geotechnical Engineer may require additional tests as considered necessary to check on the uniformity of compaction. Test

frequency recommendations are included in the **Fill Placement and Compaction Requirements** section.

In areas of foundation excavations, the bearing subgrade should be evaluated by a representative of the Geotechnical Engineer. If unanticipated conditions are observed, the Geotechnical Engineer should recommend mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

Granular Surfaced Access Roads

Roadway designs are provided for the traffic conditions as noted in the **Project Description** and in the following sections of this report. Our recommendations are based on *Chapter 4 Low-Volume Road Design* found in AASHTO 1993.

Subgrade Preparation

On most project sites, the site grading is accomplished relatively early in the construction phase. Fills are typically placed and compacted in a uniform manner. However, as construction proceeds, the subgrade may be disturbed due to construction traffic, desiccation, or rainfall. As a result, the aggregate-surfaced roadway or parking area subgrade may not be suitable for construction and corrective action will be required. The subgrade should be carefully evaluated at the time of construction for signs of disturbance or instability. We recommend the subgrade be thoroughly proofrolled with a loaded tandem-axle dump truck prior to final grading. All aggregate-surfaced roadway or parking subgrade areas should be moisture conditioned and properly compacted to the recommendations in this report immediately prior to placement of the aggregate surfacing.

Granular Access Road Design Parameters

The unpaved road sections for post-construction use have been developed under the following assumptions:

Aggregate Roadway Design Parameters		
Parameter	Design Value	Comments
Traffic Loading	Substation & BESS Area: 10,000 ESALs ^{1, 2}	Assumed
Design life	20 years	Assumed
Design CBR	2.0	Assumed
Resilient Modulus	2,000 psi (untreated)	AASHTO
Aggregate Base Elastic Modulus	20,000 psi	Assumed
Allowable Rut Depth	2 inches	Assumed
Design Serviceability Loss	2.0	Assumed
Vehicle Tire Pressure	80 psi	Assumed

1. ESAL = 18-kip Equivalent Single Axle Load
2. BESS access roads assume post-construction traffic loading (e.g., consisting of pick-up trucks and a limited number of fire trucks). We have assumed the fire truck load to be equivalent to a HS-20 vehicle.

Granular Access Road Preliminary Design Recommendations

Recommended minimum aggregate surfacing thickness is provided in the table below.

Recommended Gravel Surface Thickness	
Locations	Minimum Aggregate-Surfacing Material Thickness, in. ¹
Access Roadways & Substation	12

1. AASHTO low volume subgrade support characteristics for clays.

Quality roadway surfacing materials might consist of Illinois DOT Gradation CA-6 for aggregate base course or material approved by the Geotechnical Engineer and geogrid manufacturer. We believe the maximum size particle should not exceed 1 inch in diameter and the gravel should be crushed with angular edges (not rounded). The blend of materials should be selected to allow for compaction resulting in a firm, low permeable surface promoting surface drainage off the roadway surface. Aggregate surfacing material should be placed and compacted following recommendations in [Earthwork](#).

Aggregate-surfaced roadways performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of aggregate-surfaced roadways:

- Site grades should slope a minimum of 5 percent away from the roadways;
- The subgrade and the aggregate-surfaced roadways have a minimum 10 percent slope to promote proper surface drainage;
- Consider appropriate edge drainage; and
- Install drainage in surrounding areas anticipated for frequent wetting.

Maintenance

Periodic maintenance extends the service life of the aggregate-surfaced roadways and parking areas and should include re-grading and replacement of aggregate base course in any deteriorated areas. Thicker aggregate base course sections could be used to reduce the required maintenance and extend the service life of the aggregate-surfaced roadways.

Proposed roadway design should maintain the integrity of the road and eliminate ponding. We anticipate the surface of the roadway is planned to match the surrounding ground surface to not impede natural drainage patterns. As such, positive drainage is anticipated to be more difficult as surface slopes are expected to be very small, with the potential to have ponding areas in the roadways. This will cause the roadways to erode quicker and become soft or rut quicker. These items should be considered in the maintenance plans for the project.

These roadways, regardless of the section thickness, will require ongoing maintenance and repairs to keep them in a serviceable condition. When potholes, ruts, depressions or yielding subgrades develop they must be addressed as soon as possible. Typical repairs could consist of placing additional aggregate in ruts or depressed areas and, in some cases, complete removal of crushed stone surfacing, repair of unstable subgrade, and replacement of the crushed stone surfacing. Potholes and depressions should not be filled by blading adjacent ridges or high areas into the depressed areas. New material should be added to the depressed areas as they develop. Failure to make timely repairs will result in more rapid deterioration of the roadways, making more extensive repairs necessary.

The roadways should be carefully re-evaluated at the time of use by heavy equipment or critical component delivery for signs of disturbance or excessive rutting. Roadway reevaluation should include proofrolling immediately prior to use by heavy or critical equipment, particularly after a rainfall event. If disturbance and/or excessive wetting have occurred, roadway areas should be reworked, moisture conditioned (if necessary), and properly compacted as indicated in this report.

Design alternatives which could reduce the risk of subgrade saturation and improve long-term performance include installing surface drains next to any areas where surface water could pond. Properly designed and constructed subsurface drainage will reduce the

time subgrade soils are saturated and can also improve subgrade strength and performance.

General Comments

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

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

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

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly affect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on

Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL

May 1, 2026 | Terracon Project No. 11255215



nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL

May 1, 2026 | Terracon Project No. 11255215



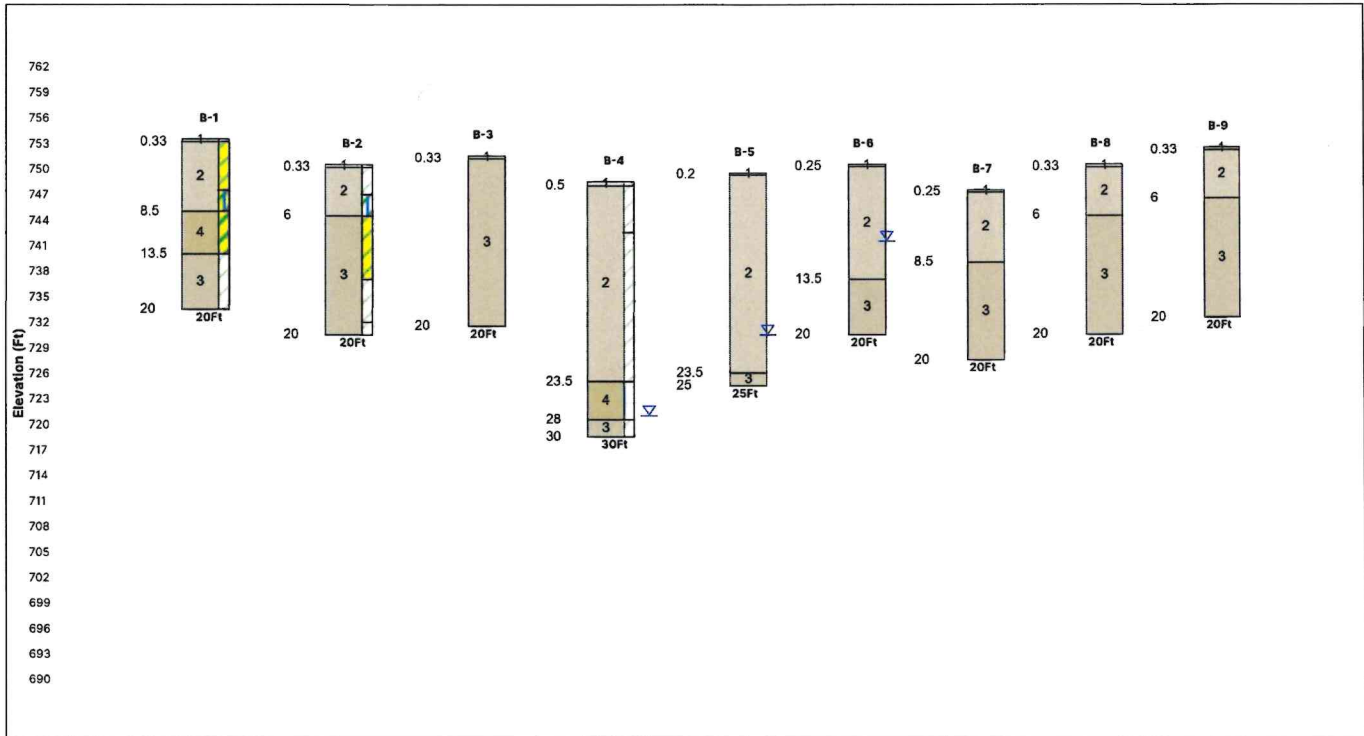
Figures

Contents:

GeoModel

Note: All attachments are one page unless noted above.

GeoModel



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

#	Layer Name	General Description
1	Topsoil	Approx. 3 to 12 inches
2	Lower Strength Native Clay	Lean clay with variable sand content; generally soft to medium stiff
3	Higher Strength Native Clay	Lean clay with variable sand content; generally stiff to very stiff
4	Granular	Sand and Silt with variable fines content; generally medium dense

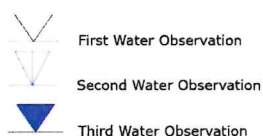
Legend					
	Topsoil		Lean Clay with Sand		Sandy Silty Clay
	Sandy Lean Clay		Silt		Silty Sand
	Clayey Sand		Silty Clay with Sand		Lean Clay
	Poorly Graded Sand		Silty Clay		Sandy Silt

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

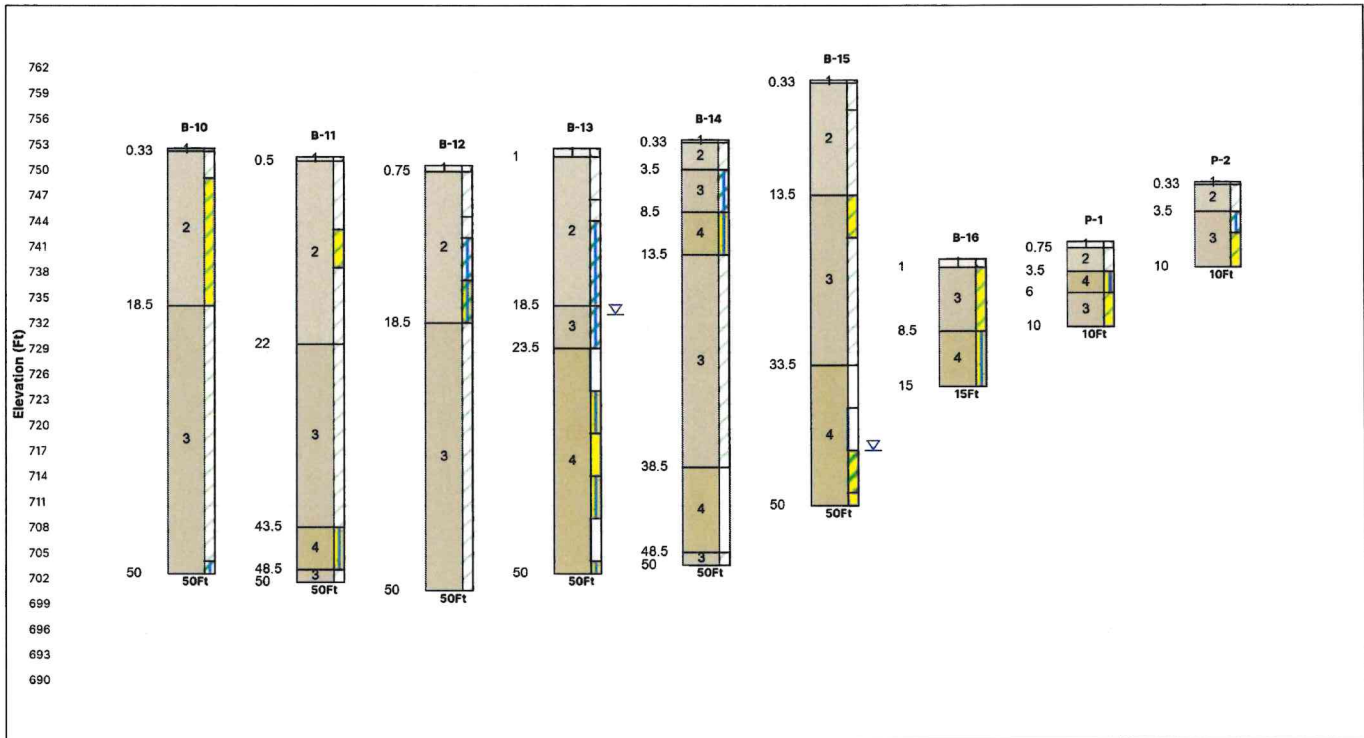
Notes:

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

Numbers adjacent to soil column indicate depth below ground surface.



GeoModel



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

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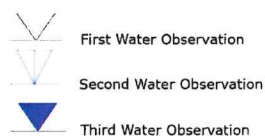
Legend					
	Topsoil		Lean Clay with Sand		Sandy Silty Clay
	Sandy Lean Clay		Silt		Silty Sand
	Clayey Sand		Silty Clay with Sand		Lean Clay
	Poorly Graded Sand		Silty Clay		Sandy Silt

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Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL

May 1, 2026 | Terracon Project No. 11255215



Attachments

Exploration and Testing Procedures

Field Exploration

Boring No.	Approximate Boring Depth (feet)	Location
B-1 to B-8	20 to 30	Proposed BESS area
B-9	20	O&M building area
B-10 to B-15	50	Proposed Substation area
B-16	15	Detention Basin area
P-1 and P-2	10	Access Road

Boring Layout: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about ± 10 feet) with the provided coordinates. The ground surface elevations indicated on the logs are approximate and obtained from Google Earth Pro. The ground surface elevations indicated on the logs are approximate and have been rounded to the nearest foot.

The locations and elevations of the borings are considered accurate only to the degree implied by the means and methods used to define them. If elevations and a more precise boring layout are desired, we recommend the borings be surveyed.

Subsurface Exploration Procedures: The borings were advanced with an ATV-mounted rotary drill rig using continuous flight augers (solid stem and/or hollow stem, as necessary, depending on soil conditions). In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observed and recorded subsurface water levels during drilling and sampling.

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

field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

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

- Moisture Content
- Unit dry weight
- Particle size distribution
- Unconfined compressive strength
- Atterberg Limits
- Standard Proctor

Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Corrosivity Testing: Samples for corrosion testing were obtained from six (6) locations, five (5) at the BESS area and one (1) at the substation area. The samples were obtained from depths of approximately 0 to 4 feet below existing ground surface. The samples were tested for the following properties:

- pH analysis
- Chloride, sulfate, sulfide content
- Oxidation-reduction potential
- Electrical resistivity testing
- Total salts

The results of the corrosion testing are presented in the [Exploration and Laboratory Results](#) appendix.

Laboratory Thermal Resistivity: A laboratory thermal resistivity test was performed on six (6) remolded soil samples, four (1) from the substation area and five (5) collected from the BESS area. These samples were taken from the design-level study at depths of 0 to 4 feet below the respective ground surface. The thermal resistivity testing was conducted in general accordance with ASTM D5334 and IEEE 442 standards. The dry-out curves were developed from bulk soil samples compacted to approximately 90 percent of the maximum density determined in accordance with Standard Proctor criteria (ASTM D698) at approximately the optimum moisture content and dried to 0 percent moisture while obtaining intermediate moisture contents to develop the dry-out curves. The results of the thermal resistivity testing are presented in the [Exploration and Laboratory Results](#) appendix.

Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL

May 1, 2026 | Terracon Project No. 11255215



Site Location and Exploration Plans

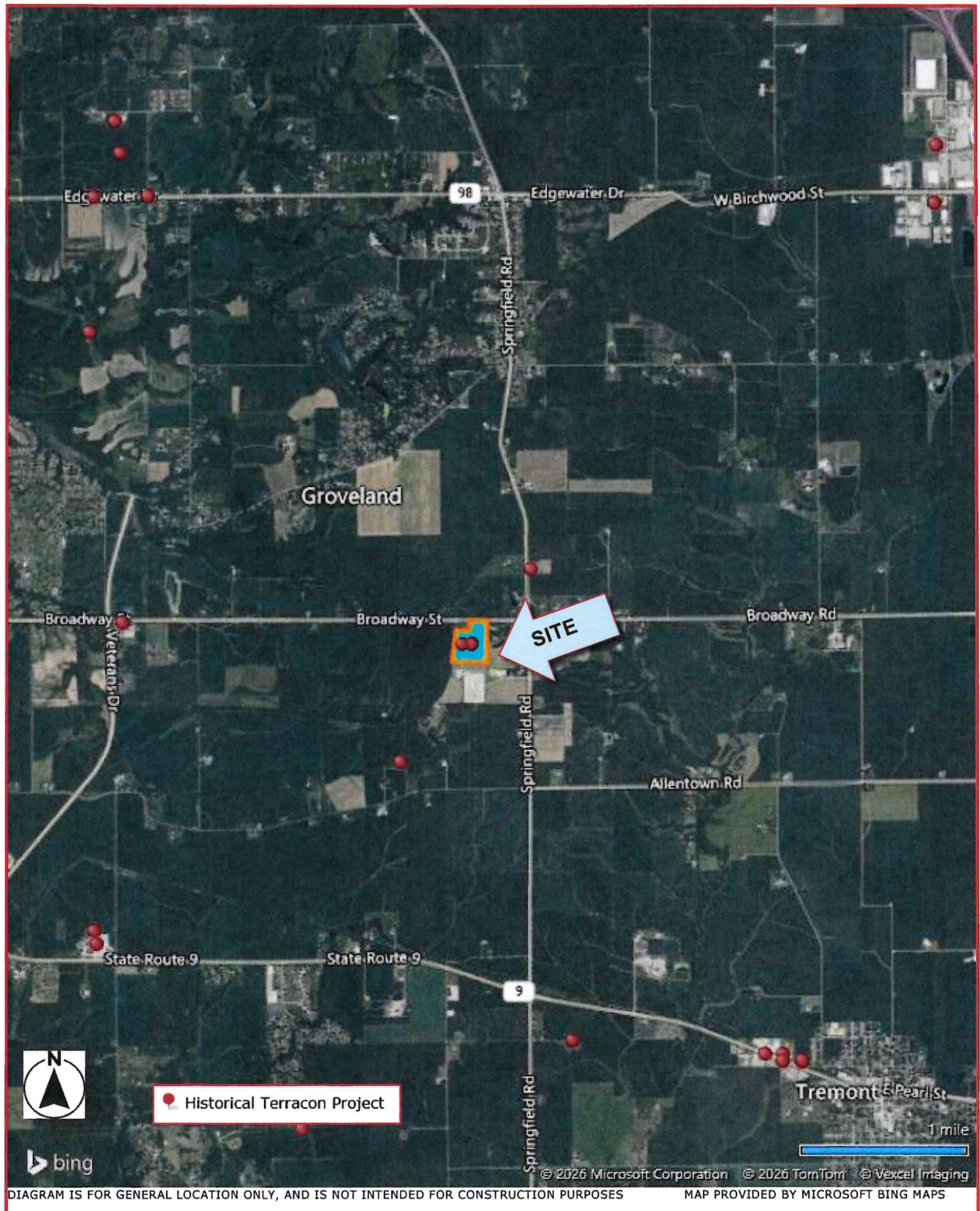
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Site Location Plan

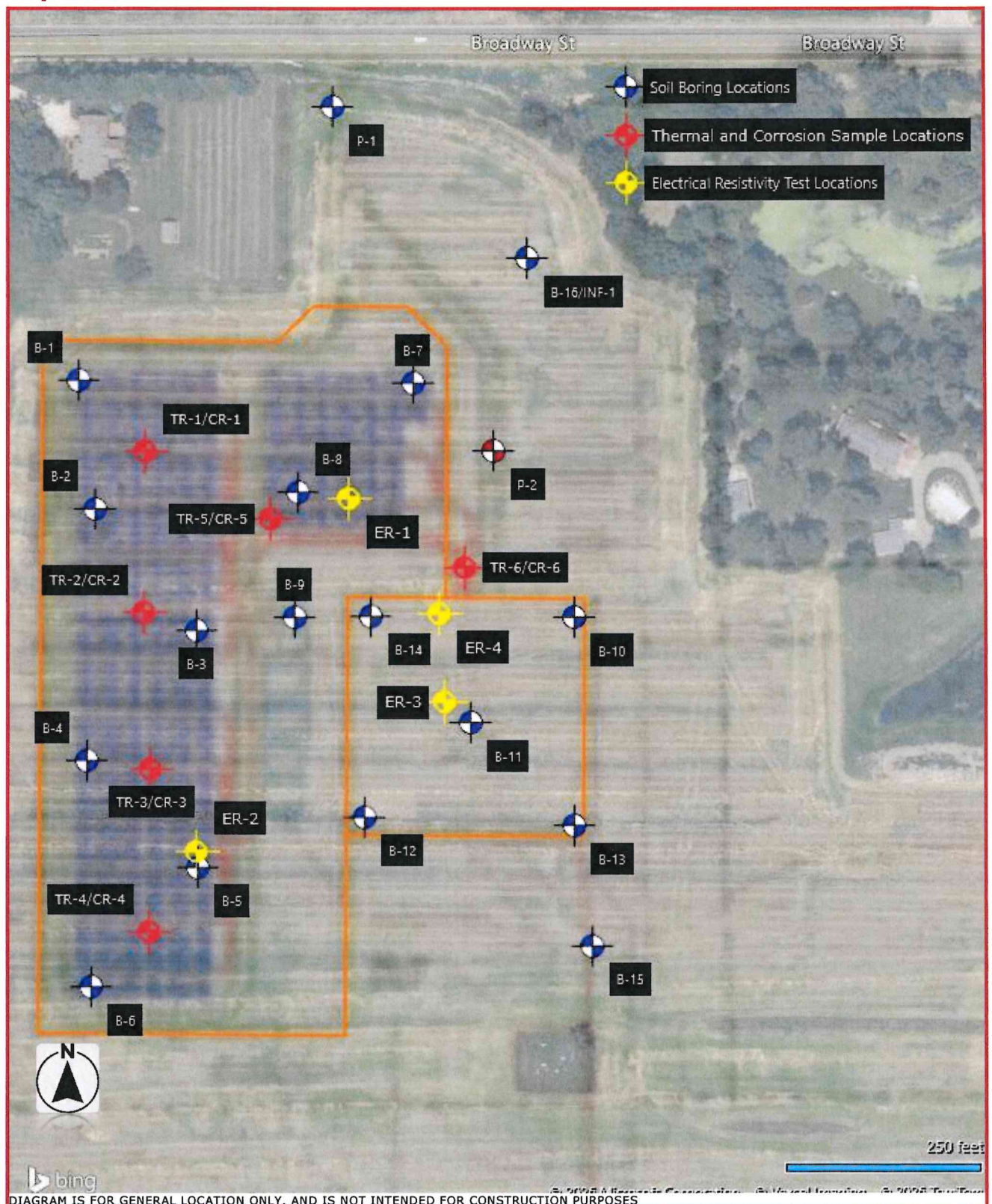
Exploration Plan

Note: All attachments are one page unless noted above.

Site Location



Exploration Plan





Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL
May 1, 2026 | Terracon Project No. 11255215



Exploration and Laboratory Results

Contents:

Boring Logs (B-1 to B-16; P-1 to P-2)
Grain Size Distribution (7 page)
California Bearing Ratio (2 pages)
Corrosion (6 pages)
Thermal Resistivity (7 Pages)

Note: All attachments are one page unless noted above.

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56686°

Longitude: -89.53902°

BORING LOG NO. B-1

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

754(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		0.3	TOPSOIL , Approx. 3 to 5 inches		754.0					
			LEAN CLAY WITH SAND (CL) , brown, medium stiff		753.7					
						X	14	2-4-4 N = 8	1.5	30
2				5		X	18	2-2-4 N = 6	0.5	35
							24			
		8.5	CLAYEY SAND (SC) , brown, moist, medium dense		745.5					
				10		X	15	4-5-10 N = 15		14
4										
		13.5	LEAN CLAY (CL) , trace sand, trace gravel, gray, very stiff		740.5					
				15		X	15	3-6-9 N = 15	3.0	13
3										
					734.0	X	16	5-9-11 N = 20	4.5	11
			Boring Terminated at 20 Ft							

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-20 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type

Automatic

Driller

Geocon: Zach/Anthony

Start Date
03/17/2026**Completion Date**
03/17/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56641°

Longitude: -89.53894°

BORING LOG NO. B-2

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

751(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		0.3	TOPSOIL , Approx. 4 inches		751.0					
2			LEAN CLAY (CL) , trace sand, brown, medium stiff		750.7	X	13	2-3-4 N = 7	1.0	31
		3.5	SILTY CLAY (CL-ML) , mottled brown and gray, medium stiff		747.5	X	15	2-3-4 N = 7	1.5	22
		6.0	SANDY LEAN CLAY (CL) , brown, stiff		745.0	X	17	4-6-8 N = 14	3.0	14
3						X	15	4-6-8 N = 14	2.75	13
		13.5	LEAN CLAY (CL) , trace sand, trace gravel, brown and gray, stiff		737.5	X	4	5-6-8 N = 14	1.0	24
		18.5	gray		732.5	X	18	4-7-9 N = 16	3.0	12
			Boring Terminated at 20 Ft		731.0					

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-20 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic

Driller
Geocon: Zach/Anthony

Start Date
03/17/2026

Completion Date
03/17/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56599°

Longitude: -89.53848°

BORING LOG NO. B-3

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

752(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
3		0.3	TOPSOIL , Approx. 4 inches		752.0					
			LEAN CLAY WITH SAND (CL) , brown, stiff		751.7					
						X	13	2-4-5 N = 9	2.25	28
		3.5	SILTY CLAY (CL-ML) , mottled brown and gray, stiff		748.5					
						X	10	3-4-4 N = 8	3.25	16
				5						
		8.5	SANDY LEAN CLAY (CL) , brown, very stiff		743.5					
						X	15	4-6-10 N = 16	2.5	13
				10						
		13.5	LEAN CLAY (CL) , trace sand, gray, stiff to very stiff		738.5					
						X	18	4-8-11 N = 19	4.5	12
				15						
					732.0	X	17	3-5-7 N = 12	2.5	13
			Boring Terminated at 20 Ft							

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-20 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic

Driller
Geocon: Zach/Anthony

Start Date
03/17/2026

Completion Date
03/17/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56554°

Longitude: -89.53898°

BORING LOG NO. B-4

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

749(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		0.5	TOPSOIL , Approx. 4 to 6 inches		749.0						
			LEAN CLAY (CL) , trace sand, brown and dark brown, soft		748.5	X	7		2-1-3 N = 4	1.0	28
2						X	9		1-2-2 N = 4	1.0	28
		6.0	SILTY CLAY (CL-ML) , gray, soft		743.0	X	11		2-2-2 N = 4	<0.25	26
						X	18		1-1-1 N = 2	<0.25	40
		13.5	ORGANIC LEAN CLAY (OL) , gray and dark gray, very soft to soft		735.5	X	18		1-1-WoH N = 1	<0.25	47
						X	18		WoH	<0.25	36
		23.5	SILT (ML) , gray, moist, very loose		725.5	X	9		2-2-1 N = 3		21
		28.5	LEAN CLAY (CL) , gray, stiff		720.5	X	15		3-4-6 N = 10	0.75	13
			Boring Terminated at 30 Ft		719.0						

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

27 Ft. While drilling

Advancement Method

0-30 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type

Automatic

Driller

Geocon: Zach/Anthony

Start Date

03/17/2026

Completion Date

03/17/2026

LUMINA BESS
Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554,USA
Terracon Project No. 11255215

Latitude: 40.56517° Longitude: -89.53847°

BORING LOG NO. B-5



192 Exchange Blvd
Glendale Heights, IL 60139-2089

Surface Elevation:
750(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
2		0.2	TOPSOIL , Approx. 2 inches		750.0						
			LEAN CLAY (CL) , dark brown, medium stiff, with silt		749.8	X	6		4-3-4 N = 7		33
						X	11		2-2-3 N = 5	1.25	29
		6.0	LEAN CLAY (CL) , mottled brown and gray, soft		744.0	X	12		2-1-2 N = 3	1.25	26
						X	16		1-1-2 N = 3	1.0	32
		13.5	ORGANIC LEAN CLAY (OL) , gray and dark gray, soft		736.5	X	18		1-1-2 N = 3	<0.25	40
3						X	18	▽	1-2-1 N = 3	1.0	30
		23.5	LEAN CLAY (CL) , gray, stiff		726.5	X	18		2-4-5 N = 9	1.25	23
					725.0						
			Boring Terminated at 25 Ft								

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (if any).
See Supporting Information for explanation of symbols and abbreviations.

Notes

Water Level Observations

▽ 18.5 Ft. While drilling

Advancement Method

0-25 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type

Automatic

Driller

Geocon: Zach/Anthony

Start Date

03/18/2026

Completion Date

03/18/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56476°

Longitude: -89.53896°

BORING LOG NO. B-6

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

751(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		0.3	TOPSOIL , Approx. 2 to 3 inches		751.0						
2			LEAN CLAY (CL) , dark brown to brown, medium stiff		750.8	X	11		2-3-5 N = 8	1.5	26
						X	10		2-3-3 N = 6	2.0	28
		6.0	SILTY CLAY (CL-ML) , mottled brown and gray, medium stiff		745.0	X	14		2-1-3 N = 4	1.25	24
							24	▽			
		13.5	LEAN CLAY (CL) , trace sand, gray, stiff to very stiff		737.5	X	16		2-5-8 N = 13	2.75	13
3						X	15		4-7-9 N = 16	2.25	13
			Boring Terminated at 20 Ft		731.0						

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

▽ 8.5 Ft. While drilling

Advancement Method

0-20 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type

Automatic

Driller

Geocon: Zach/Anthony

Start Date

03/18/2026

Completion Date

03/18/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56685°

Longitude: -89.53749°

BORING LOG NO. B-7

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

748(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
		0.3	<u>TOPSOIL</u> , Approx. 3 inches		748.0					
			<u>LEAN CLAY (CL)</u> , trace sand, brown, medium stiff		747.8					
2						X	12	2-2-3 N = 5	1.25	26
						X	18	2-3-3 N = 6	0.5	25
		6.0	<u>LEAN CLAY WITH SAND (CL)</u> , brown, stiff		742.0					
3							23			
						X	18	5-6-6 N = 12	2.5	13
		13.5	<u>LEAN CLAY (CL)</u> , trace sand, gray, very stiff		734.5					
						X	17	4-7-8 N = 15	2.5	12
						X	15	5-10-12 N = 22	4.5	12
					728.0					
			Boring Terminated at 20 Ft							

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-20 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type

Automatic

Driller

Geocon: Zach/Anthony

Start Date

03/17/2026

Completion Date

03/17/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554,USA

Terracon Project No. 11255215

Latitude: 40.56647°

Longitude: -89.53802°

BORING LOG NO. B-8

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

751(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		0.3	TOPSOIL , Approx. 4 inches		751.0					
2			LEAN CLAY (CL) , trace sand, brown, medium stiff		750.7					
						X	14	2-3-4 N = 7	2.0	25
						X	16	2-2-2 N = 4	1.25	25
		6.0	SANDY LEAN CLAY (CL) , brown, stiff to very stiff	5	745.0					
3						X	15	4-7-8 N = 15	3.0	12
		8.5	LEAN CLAY (CL) , trace sand, brown, stiff to very stiff		742.5					
						X	16	4-7-9 N = 16	3.5	12
		13.5	gray	15	737.5					
						X	13	4-6-8 N = 14	2.75	13
						X	15	4-6-8 N = 14	2.5	13
					731.0					
			Boring Terminated at 20 Ft							

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-20 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic

Driller
Geocon: Zach/Anthony

Start Date
03/17/2026

Completion Date
03/17/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554,USA

Terracon Project No. 11255215

Latitude: 40.56604°

Longitude: -89.53803°

BORING LOG NO. B-9

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

753(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		0.3	TOPSOIL , Approx. 3 to 4 inches		753.0					
2			LEAN CLAY (CL) , trace sand, brown, medium stiff		752.7					
						X	15	2-3-4 N = 7	2.0	24
						X	16	2-2-3 N = 5	1.0	25
		6.0	SANDY LEAN CLAY (CL) , brown, stiff		747.0					
3						X	14	4-6-6 N = 12		14
						X	14	3-5-8 N = 13	3.5	12
		13.5	LEAN CLAY (CL) , trace sand, trace gravel, gray, very stiff		739.5					
						X	18	4-7-10 N = 17	3.5	11
						X	17	3-7-9 N = 16	3.0	11
					733.0					
			Boring Terminated at 20 Ft							

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-20 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic**Driller**
Geocon: Zach/Anthony**Start Date**
03/17/2026**Completion Date**
03/17/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554,USA
Terracon Project No. 11255215

Latitude: 40.56604°

Longitude: -89.53676°

BORING LOG NO. B-10192 Exchange Blvd
Glendale Heights, IL 60139-2089Surface Elevation:
753(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		0.3	TOPSOIL , Approx. 4 inches		753.0					
3			LEAN CLAY (CL) , trace sand, brown, stiff		752.7	X	9	2-4-5 N = 9	2.25	24
2		3.5	LEAN CLAY WITH SAND (CL) , brown, medium stiff to stiff		749.5	X	13	3-3-5 N = 8	1.5	18
				5			24			
		8.5	LEAN CLAY (CL) , trace sand, brown, stiff to very stiff		744.5	X	18	4-4-6 N = 10	2.75	12
3				10			24			
		18.5	gray		734.5	X	18	4-6-8 N = 14	4.5	11
				20						
						X	18	4-6-8 N = 14	2.5	12
				25						
						X	18	4-7-9 N = 16	3.0	11

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling
Groundwater not encountered upon completion

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

EquipmentSubcontractor - Diedrich
D-70**Hammer Type**
Automatic**Driller**
Geocon: Zach/Anthony**Start Date**
03/20/2026**Completion Date**
03/20/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56604°

Longitude: -89.53676°

BORING LOG NO. B-10

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

753(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
3			gray (continued)		723.0					
				35		X	18	4-6-9 N = 15	2.5	10
				40		X	18	4-7-9 N = 16	2.5	11
				45		X	18	8-13-12 N = 25	2.75	11
					704.5					
		48.5	SILTY CLAY (CL-ML) , trace sand, gray, hard		703.0	X	12	4-15-21 N = 36		12
			Boring Terminated at 50 Ft							

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic**Driller**
Geocon: Zach/Anthony**Start Date**
03/20/2026**Completion Date**
03/20/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56567°

Longitude: -89.53724°

BORING LOG NO. B-11

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

752(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (lsf.)	Water Content (%)
1		0.5	TOPSOIL , Approx. 5 to 6 inches		752.0					
			LEAN CLAY (CL) , trace sand, brown and gray, medium stiff		751.5					
						X	12	2-3-4 N = 7	1.75	26
						X	16	2-3-3 N = 6	0.75	26
2				5						
							21			
		8.5	SANDY LEAN CLAY (CL) , brown, medium stiff to stiff		743.5					
						X	16	4-4-4 N = 8	3.0	18
				10						
							13			
				15						
		18.5	LEAN CLAY (CL) , trace sand, gray, medium stiff		733.5					
						X	15	2-3-4 N = 7	1.0	13
				20						
						X	0	6-9-12 N = 21		
				25						
		28.5	LEAN CLAY (CL) , trace sand, trace gravel, gray, stiff to very stiff		723.5					
3						X	18	8-9-10 N = 19	4.5	10

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling
Groundwater not encountered upon completion

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich
D-70

Hammer Type
Automatic

Driller
Geocon: Zach/Anthony

Start Date
03/19/2026

Completion Date
03/19/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554,USA

Terracon Project No. 11255215

Latitude: 40.56567°

Longitude: -89.53724°

BORING LOG NO. B-11

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

752(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
3			LEAN CLAY (CL) , trace sand, trace gravel, gray, stiff to very stiff (continued)		722.0					
				35		X	18	6-6-10 N = 16	4.0	10
				40		X	18	4-5-7 N = 12	2.0	11
4		43.5	SILTY SAND (SM) , gray, moist, medium dense		708.5	X	18	6-12-15 N = 27		8
				45						
3		48.5	LEAN CLAY (CL) , trace sand, gray, very stiff		703.5	X	18	8-8-10 N = 18	3.25	13
			Boring Terminated at 50 Ft		702.0					

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling
Groundwater not encountered upon completion

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic

Driller
Geocon: Zach/Anthony

Start Date
03/19/2026

Completion Date
03/19/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56535°

Longitude: -89.53772°

BORING LOG NO. B-12

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

751(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		0.8	TOPSOIL , Approx. 8 to 10 inches		751.0					
2			LEAN CLAY (CL) , trace sand, dark brown and brown, medium stiff to stiff		750.3	X	11	2-4-5 N = 9	2.0	25
						X	12	3-2-4 N = 6	1.25	33
		6.0	LEAN CLAY (CL) , trace sand, brown, soft		745.0	X	10	1-2-1 N = 3	<0.25	37
		8.5	SILTY CLAY (CL-ML) , brown and gray, soft		742.5	X	16	1-1-2 N = 3		21
		13.5	SILTY CLAY WITH SAND (CL-ML) , dark gray, stiff		737.5	X	15	4-4-5 N = 9	<0.25	26
3		18.5	LEAN CLAY (CL) , trace sand, gray, stiff to very stiff		732.5	X	16	3-4-7 N = 11	2.25	13
						X	18	4-8-9 N = 17	3.5	12
						X	18	5-8-10 N = 18	4.5	10

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type

Automatic

Driller

Geocon: Zach/Anthony

Start Date

03/19/2026

Completion Date

03/19/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554,USA

Terracon Project No. 11255215

Latitude: 40.56535°

Longitude: -89.53772°

BORING LOG NO. B-12

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

751(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
3			LEAN CLAY (CL) , trace sand, gray, stiff to very stiff (continued)		721.0					
				35		X	18	5-7-11 N = 18	4.5	11
				40		X	18	4-7-9 N = 16	2.5	12
				45		X	18	4-6-9 N = 15	2.25	11
					701.0	X	18	4-6-10 N = 16	3.25	10
			Boring Terminated at 50 Ft							

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic

Driller
Geocon: Zach/Anthony

Start Date
03/19/2026

Completion Date
03/19/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56532°

Longitude: -89.53676°

BORING LOG NO. B-13

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

753(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		1.0	TOPSOIL , Approx. 12 inches		753.0 752.0						
2		3.5	LEAN CLAY (CL) , dark brown, medium stiff to stiff			X	9		3-3-5 N = 8	1.0	23
3		8.5	LEAN CLAY (CL) , trace sand, brown and gray, stiff	5	749.5	X	15		3-4-5 N = 9	2.5	24
							18				
					744.5	X	18		2-2-3 N = 5	2.0	23
2			SILTY CLAY (CL-ML) , brown and gray, medium stiff	10			20				
					734.5	X	13	▽	5-7-10 N = 17	2.0	14
3		18.5	SILTY CLAY (CL-ML) , gray, stiff	20							
					729.5	X	12		6-10-11 N = 21		17
4		23.5	SILT (ML) , gray, moist, medium dense	25							
					724.5	X	15		5-8-12 N = 20		12
		28.5	SILTY SAND (SM) , gray, moist, medium dense								

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

▽ 19 Ft. While drilling

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type

Automatic

Driller

Geocon: Zach/Anthony

Start Date

03/16/2026

Completion Date

03/16/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56532°

Longitude: -89.53676°

BORING LOG NO. B-13

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

753(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
4			SILTY SAND (SM) , gray, moist, medium dense (continued)		723.0						
		33.5	POORLY GRADED SAND (SP) , fine to coarse grained sand, gray, wet, loose	35	719.5	X	15		4-4-3 N = 7		13
		38.5	SILTY SAND (SM) , gray, moist, medium dense	40	714.5	X	8		8-10-11 N = 21		13
		43.5	SILT (ML) , trace sand, gray, moist, medium dense	45	709.5	X	10		8-10-11 N = 21		14
		48.5	SILTY SAND (SM) , gray, moist, medium dense		704.5	X	4		3-7-7 N = 14		18
			Boring Terminated at 50 Ft		703.0						

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

19 Ft. While drilling

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type

Automatic

Driller

Geocon: Zach/Anthony

Start Date

03/16/2026

Completion Date

03/16/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56604°

Longitude: -89.53769°

BORING LOG NO. B-14

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

754(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		0.3	TOPSOIL , Approx. 3 to 5 inches		754.0					
3			LEAN CLAY (CL) , trace sand, brown, stiff		753.7	X	11	2-4-5 N = 9	2.0	31
		3.5	SILTY CLAY (CL-ML) , mottled brown and gray, medium stiff to stiff	5	750.5	X	15	2-4-6 N = 10	2.25	23
						X	16	2-3-3 N = 6	1.0	26
4		8.5	SILTY SAND (SM) , brown, moist, medium dense	10	745.5	X	15	4-5-7 N = 12		13
		13.5	LEAN CLAY (CL) , trace sand, trace gravel, brown to gray, stiff to very stiff	15	740.5	X	17	3-5-8 N = 13	3.0	14
3				20		X	18	4-6-8 N = 14	4.5	12
				25		X	15	4-5-8 N = 13	2.0	9
						X	18	4-6-8 N = 14	2.0	12

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic

Driller
Geocon: Zach/Anthony

Start Date
03/18/2026

Completion Date
03/18/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56604°

Longitude: -89.53769°

BORING LOG NO. B-14

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

754(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (bsf.)	Water Content (%)
3			LEAN CLAY (CL) , trace sand, trace gravel, brown to gray, stiff to very stiff (continued)		724.0					
				35		X	18	4-7-10 N = 17	2.5	12
4		38.5	no recovery - coarse gravel anticipated		715.5	X	0	7-8-10 N = 18		
				40						
				45		X	0	9-13-15 N = 28		
3		48.5	LEAN CLAY (CL) , trace sand, trace gravel, gray, stiff		705.5					
					704.0	X	18	4-5-9 N = 14	2.0	12
			Boring Terminated at 50 Ft							

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic**Driller**
Geocon: Zach/Anthony**Start Date**
03/18/2026**Completion Date**
03/18/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.5649°

Longitude: -89.53668°

BORING LOG NO. B-15192 Exchange Blvd
Glendale Heights, IL 60139-2089Surface Elevation:
761(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
		0.3	TOPSOIL , Approx. 3 to 5 inches		761.0 760.7						
3			LEAN CLAY (CL) , trace sand, brown, stiff			X	14		4-4-5 N = 9	2.0	26
		3.5	SILTY CLAY (CL-ML) , trace sand, brown, soft to medium stiff		757.5	X	17		3-3-4 N = 7	1.25	26
2				5		X	18		2-1-2 N = 3	0.5	26
						X	18		2-2-3 N = 5	0.25	29
		13.5	SANDY LEAN CLAY (CL) , brown, stiff		747.5	X	18		4-6-7 N = 13	1.0	13
3				15							
		18.5	LEAN CLAY (CL) , trace sand, gray, very stiff		742.5	X	11		4-8-9 N = 17	2.5	23
				20							
				25		X	18		4-7-10 N = 17	3.0	9
						X	16		6-9-12 N = 21	3.0	10

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

43 Ft. While drilling

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

EquipmentSubcontractor - Diedrich
D-70**Hammer Type**
Automatic**Driller**
Geocon: Zach/Anthony**Start Date**
03/16/2026**Completion Date**
03/16/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.5649°

Longitude: -89.53668°

BORING LOG NO. B-15

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

761(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Water Level Observations	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
3			LEAN CLAY (CL) , trace sand, gray, very stiff (continued)		731.0						
		33.5			727.5						
4			no recovery - coarse gravel anticipated	35			0		7-14-16 N = 30		
		38.5			722.5		18		10-15-19 N = 34		12
		43.5	SILT (ML) , trace clay, gray, moist, dense	40							
					717.5		12		3-6-7 N = 13		10
		48.5	CLAYEY SAND (SC) , gray, moist, medium dense	45							
					712.5		11		11-11-8 N = 19		22
			POORLY GRADED SAND (SP) , fine to coarse grained sand, gray, moist, medium dense		711.0						
			Boring Terminated at 50 Ft								

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

▽ 43 Ft. While drilling

Advancement Method

0-50 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic

Driller
Geocon: Zach/Anthony

Start Date
03/16/2026

Completion Date
03/16/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554,USA

Terracon Project No. 11255215

Latitude: 40.56728°

Longitude: -89.53697°

BORING LOG NO. B-16

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

740(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		1.0	TOPSOIL , Approx. 10 to 12 inches		740.0 739.0					
3			LEAN CLAY WITH SAND (CL) , trace gravel, brown, stiff			X	15	4-4-5 N = 9	1.25	15
				5		X	16	4-3-7 N = 10	2.25	14
						X	18	5-6-7 N = 13	2.25	14
		8.5	SILTY SAND (SM) , trace clay, brown, moist, medium dense		731.5	X	18	5-10-11 N = 21		10
4				10						
					725.0	X	14	5-10-12 N = 22		14
Boring Terminated at 15 Ft										

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-15 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic

Driller
Geocon: Zach/Anthony

Start Date
03/16/2026

Completion Date
03/16/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.5678°

Longitude: -89.53786°

BORING LOG NO. P-1

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

742(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		0.8	TOPSOIL , Approx. 9 inches		742.0					
2			LEAN CLAY (CL) , trace sand, brown, medium stiff		741.3	X	18	2-2-2 N = 4	2.0	12
4		3.5	SANDY SILT (ML) , brown, moist, loose		738.5	X	15	2-2-4 N = 6		15
3		6.0	SANDY LEAN CLAY (CL) , brown, stiff to very stiff		736.0	X	18	3-5-7 N = 12	2.5	13
					732.0	X	18	3-6-9 N = 15	4.5	11
Boring Terminated at 10 Ft										

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-10 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

Hammer Type
Automatic**Driller**
Geocon: Zach/Anthony**Start Date**
03/17/2026**Completion Date**
03/17/2026

LUMINA BESS

Intersection of Broadway St and Springfield Rd, Pekin, IL, 61554, USA

Terracon Project No. 11255215

Latitude: 40.56661°

Longitude: -89.53713°

BORING LOG NO. P-2

192 Exchange Blvd

Glendale Heights, IL 60139-2089

Surface Elevation:

749(Ft) +/-

Model Layer	Graphic Log	Lithology Depth (Ft.)	Material Description	Depth (Ft.)	Elevation (Ft.)	Sample Type	Recovery (In.)	Field Test Results	Hand Penetrometer (tsf.)	Water Content (%)
1		0.3	TOPSOIL , Approx. 3 to 5 inches		749.0					
2			LEAN CLAY (CL) , trace sand, brown, medium stiff		748.7					
						X	13	3-3-4 N = 7	1.25	28
		3.5	SILTY CLAY (CL-ML) , mottled brown and gray, stiff		745.5					
						X	16	3-3-5 N = 8	1.25	22
3		6.0	SANDY LEAN CLAY (CL) , brown, medium stiff to stiff		743.0					
						X	18	2-3-4 N = 7	1.5	16
						X	17	3-4-6 N = 10	1.25	13
					739.0					
			Boring Terminated at 10 Ft							

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

See Supporting Information for explanation of symbols and abbreviations.

Notes**Water Level Observations**

Groundwater not encountered while drilling

Groundwater not encountered upon completion

Advancement Method

0-10 Ft. 3.25" Hollow Stem Auger

Abandonment Method

Boring backfilled with auger cuttings and bentonite upon completion.

Equipment

Subcontractor - Diedrich D-70

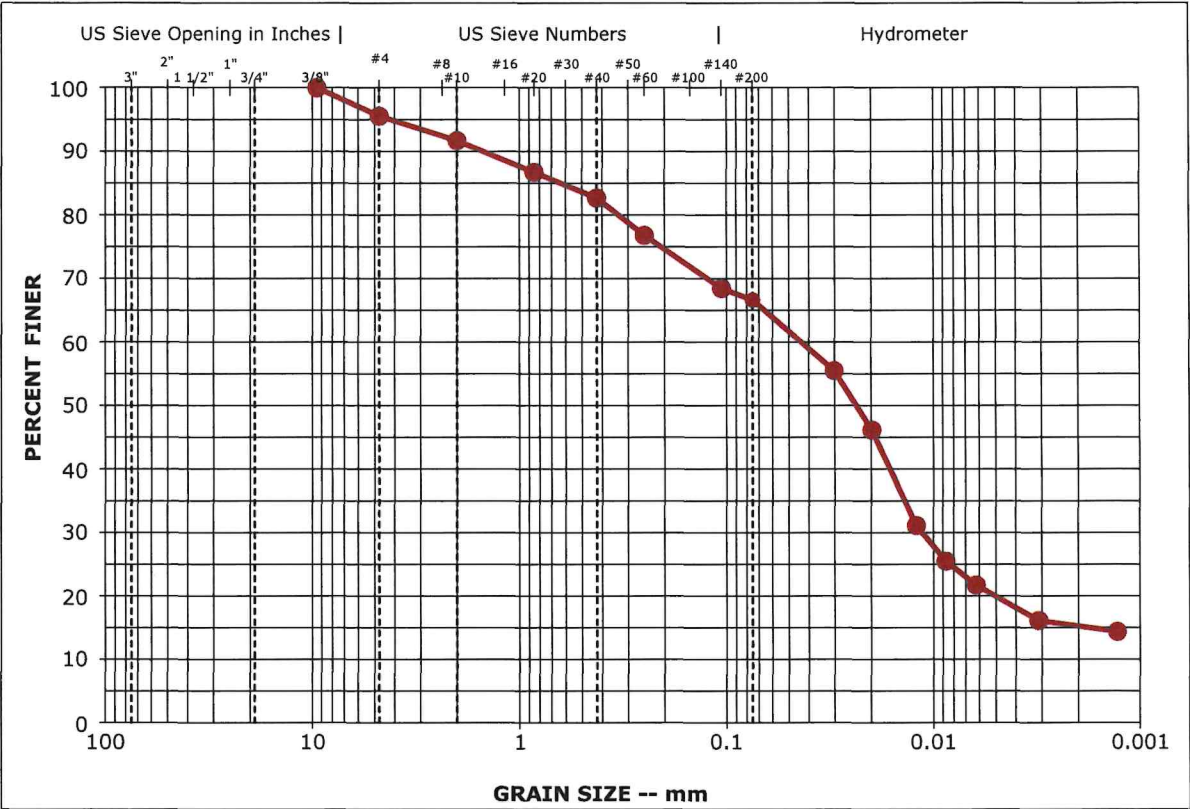
Hammer Type
Automatic

Driller
Geocon: Zach/Anthony

Start Date
03/17/2026

Completion Date
03/17/2026

Particle-Size Distribution of Soils Using Sieve Analysis
ASTM D422-Method B



Boring ID	Depth (Ft.)	Description	USCS	Assumed Spc. Gravity
B-1	6 - 8	Sandy Silty Clay	CL-ML	2.72

% Cobbles	% Gravel	% Sand	% Fines	% Silt	% Clay
0.0	4.5	28.9	66.6	46.7	19.9

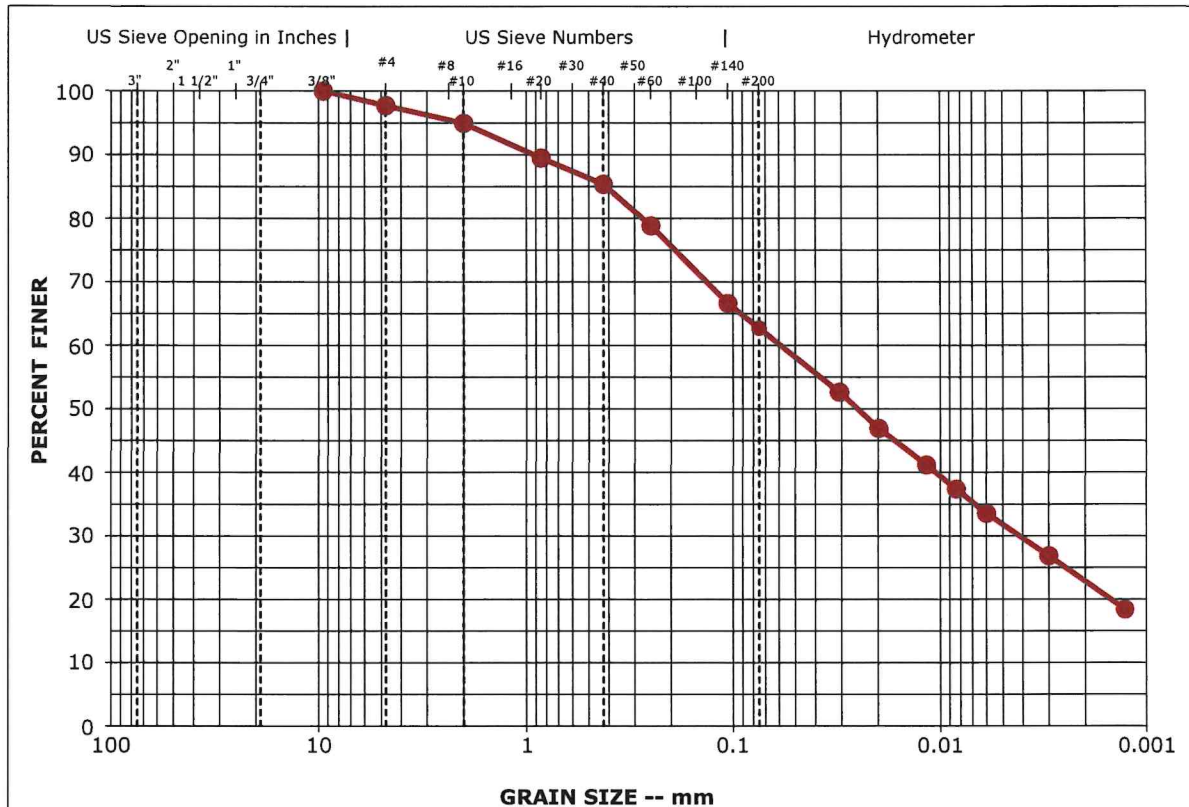
Sieve	% Finer	Sieve	% Finer	Grain Size	Coefficients
3"	100.0	#40	82.7	D ₁₀₀	9.500
2"	100.0	#60	76.8	D ₆₀	0.044
1 1/2"	100.0	#140	68.5	D ₃₀	0.011
1"	100.0	#200	66.6	D ₁₀	
3/4"	100.0				
3/8"	100.0				
#4	95.5				
#10	91.7				
#20	86.7				

Remarks

LUMINA BESS

Intersection of Broadway St and Springfield Rd | Pekin, IL 61554

Terracon Project No. 11255215


Particle-Size Distribution of Soils Using Sieve Analysis
ASTM D422-Method B


Boring ID	Depth (Ft.)	Description			USCS	Assumed Spc. Gravity
B-3	6 - 8	Sandy Lean Clay			CL	2.72
% Cobbles	% Gravel	% Sand	% Fines	% Silt		% Clay
0.0	2.3	35.0	62.7	30.9		31.8
Sieve	% Finer	Sieve	% Finer	Grain Size		Coefficients
3"	100.0	#40	85.4	D ₁₀₀	9.500	C _c
2"	100.0	#60	78.8	D ₆₀	0.059	
1 1/2"	100.0	#140	66.6	D ₃₀	0.004	C _u
1"	100.0	#200	62.7	D ₁₀		
3/4"	100.0	Remarks				
3/8"	100.0					
#4	97.7					
#10	94.9					
#20	89.5					

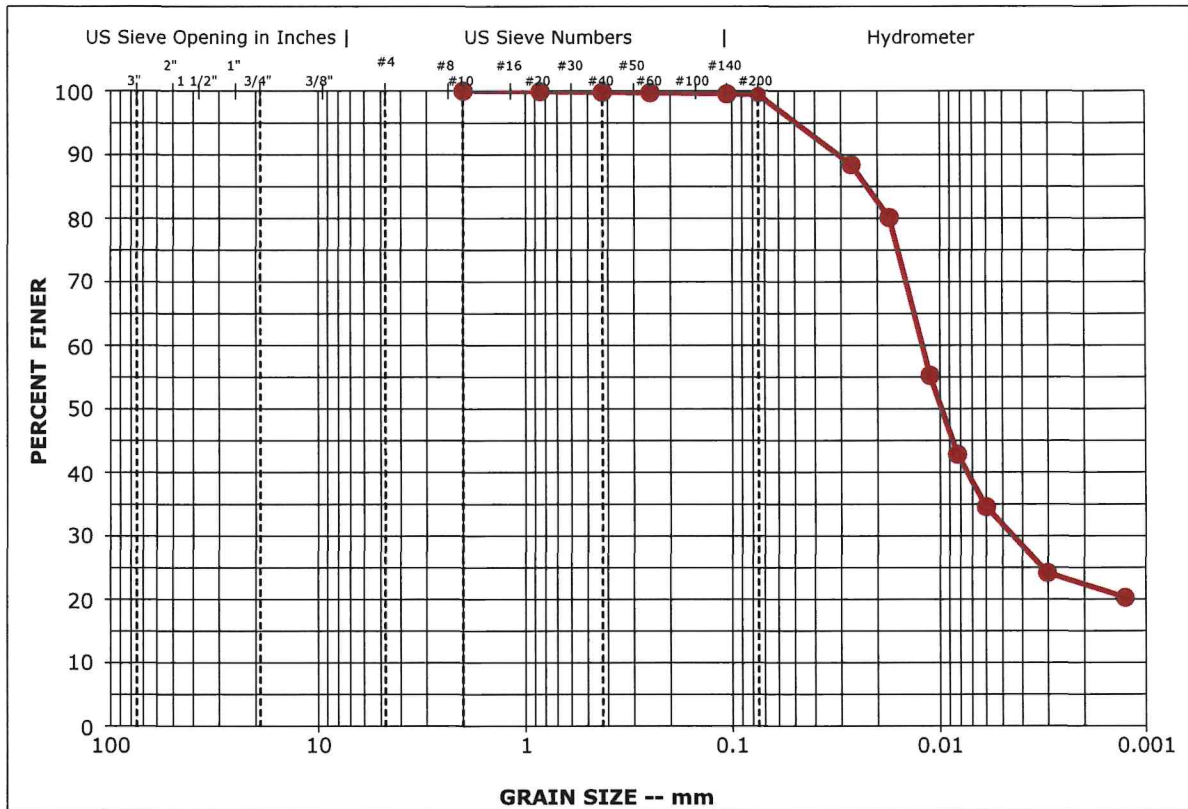
LUMINA BESS

Intersection of Broadway St and Springfield Rd | Pekin, IL 61554

Terracon Project No. 11255215



Glendale Heights, IL 60139-2089

Particle-Size Distribution of Soils Using Sieve Analysis
ASTM D422-Method B


Boring ID	Depth (Ft.)	Description		USCS	Assumed Spc. Gravity	
B-4	8.5 - 10	Lean Clay		CL	2.72	
% Cobbles	% Gravel	% Sand	% Fines	% Silt	% Clay	
0.0	0.0	0.5	99.5	67.7	31.8	

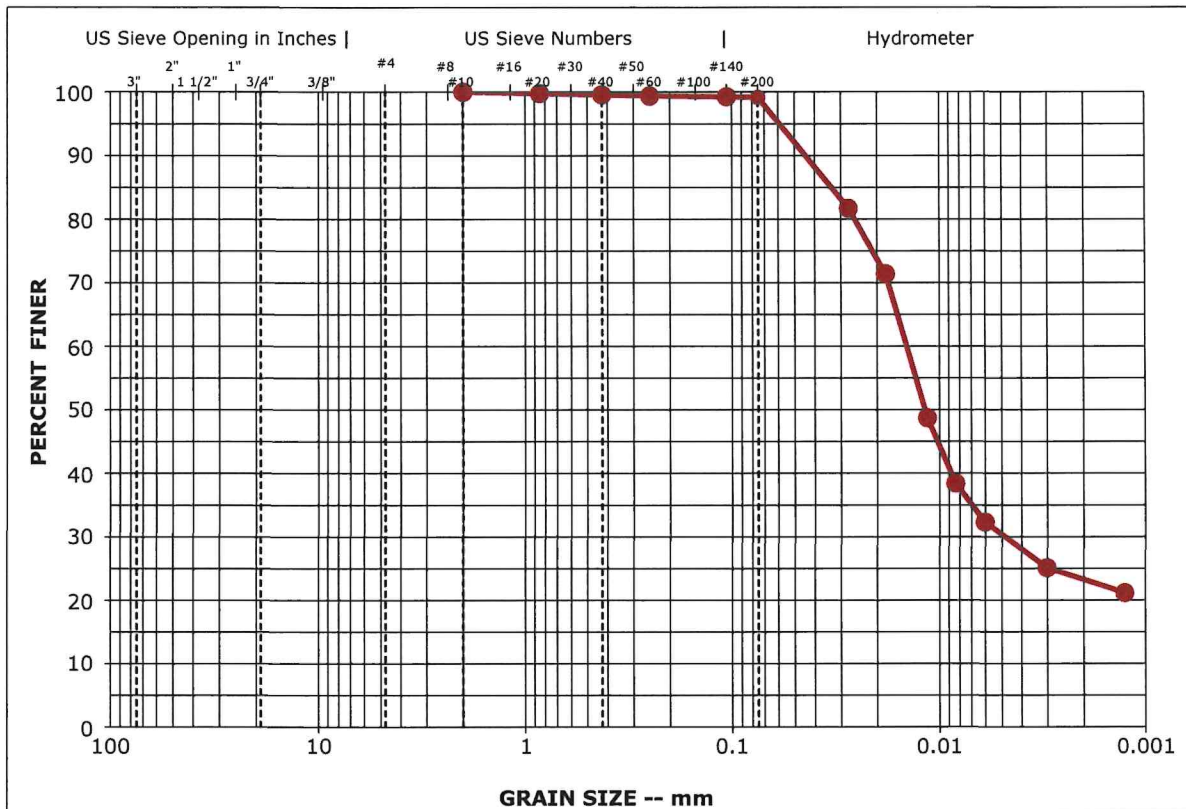
Sieve	% Finer	Sieve	% Finer	Grain Size	Coefficients
3"	100.0	#40	99.8	D ₁₀₀	2.000
2"	100.0	#60	99.8	D ₆₀	0.012
1 1/2"	100.0	#140	99.6	D ₃₀	0.004
1"	100.0	#200	99.5	D ₁₀	
3/4"	100.0				
3/8"	100.0				
#4	100.0				
#10	100.0				
#20	99.9				

Remarks

LUMINA BESS

Intersection of Broadway St and Springfield Rd | Pekin, IL 61554

Terracon Project No. 11255215


Particle-Size Distribution of Soils Using Sieve Analysis
ASTM D422-Method B


Boring ID	Depth (Ft.)	Description		USCS	Assumed Spc. Gravity	
B-5	6 - 7.5	Lean Clay		CL	2.72	
% Cobbles		% Gravel	% Sand	% Fines	% Silt	% Clay
0.0		0.0	0.8	99.2	68.9	30.3

Sieve	% Finer	Sieve	% Finer	Grain Size	Coefficients
3"	100.0	#40	99.6	D ₁₀₀	2.000
2"	100.0	#60	99.4	D ₆₀	0.014
1 1/2"	100.0	#140	99.3	D ₃₀	0.005
1"	100.0	#200	99.2	D ₁₀	
3/4"	100.0				
3/8"	100.0				
#4	100.0				
#10	100.0				
#20	99.7				

Remarks

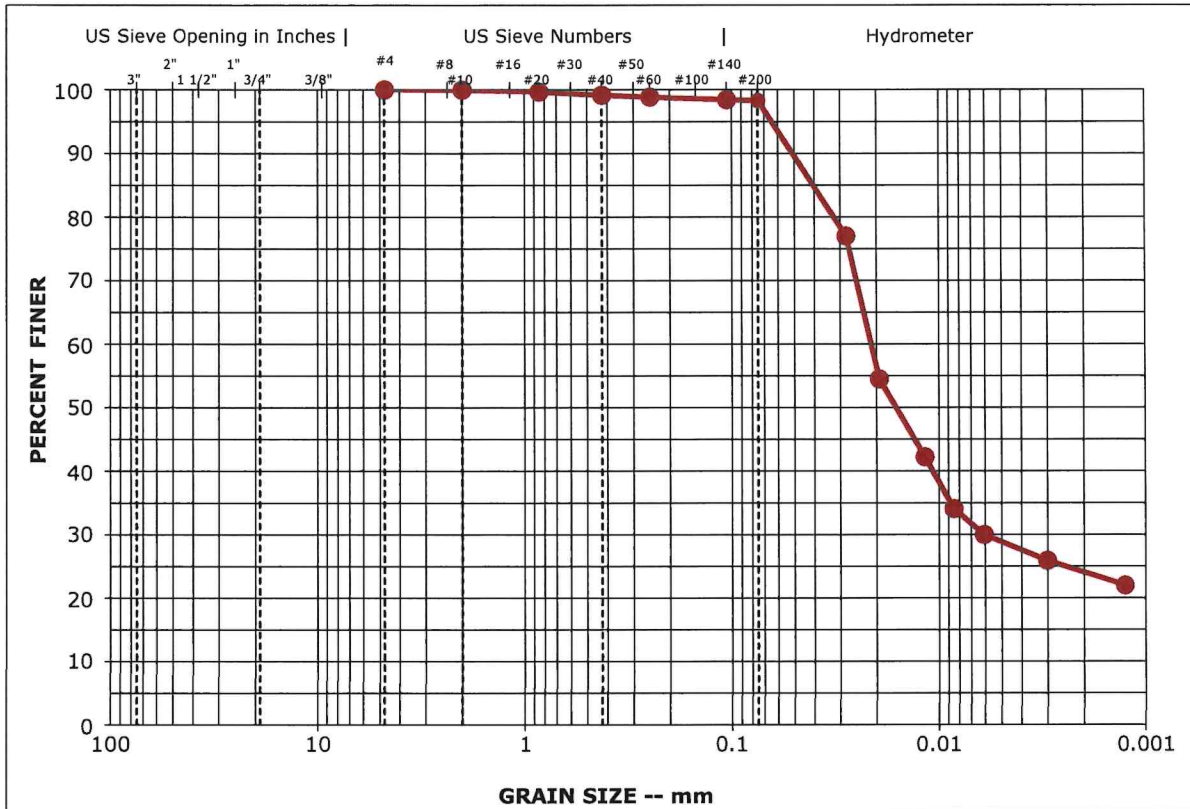
LUMINA BESS

Intersection of Broadway St and Springfield Rd | Pekin, IL 61554

Terracon Project No. 11255215



Glendale Heights, IL 60139-2089

Particle-Size Distribution of Soils Using Sieve Analysis
ASTM D422-Method B


Boring ID	Depth (Ft.)	Description	USCS	Assumed Spc. Gravity
B-12	6 - 7.5	Lean Clay	CL	2.72

% Cobbles	% Gravel	% Sand	% Fines	% Silt	% Clay
0.0	0.0	1.7	98.3	69.4	28.9

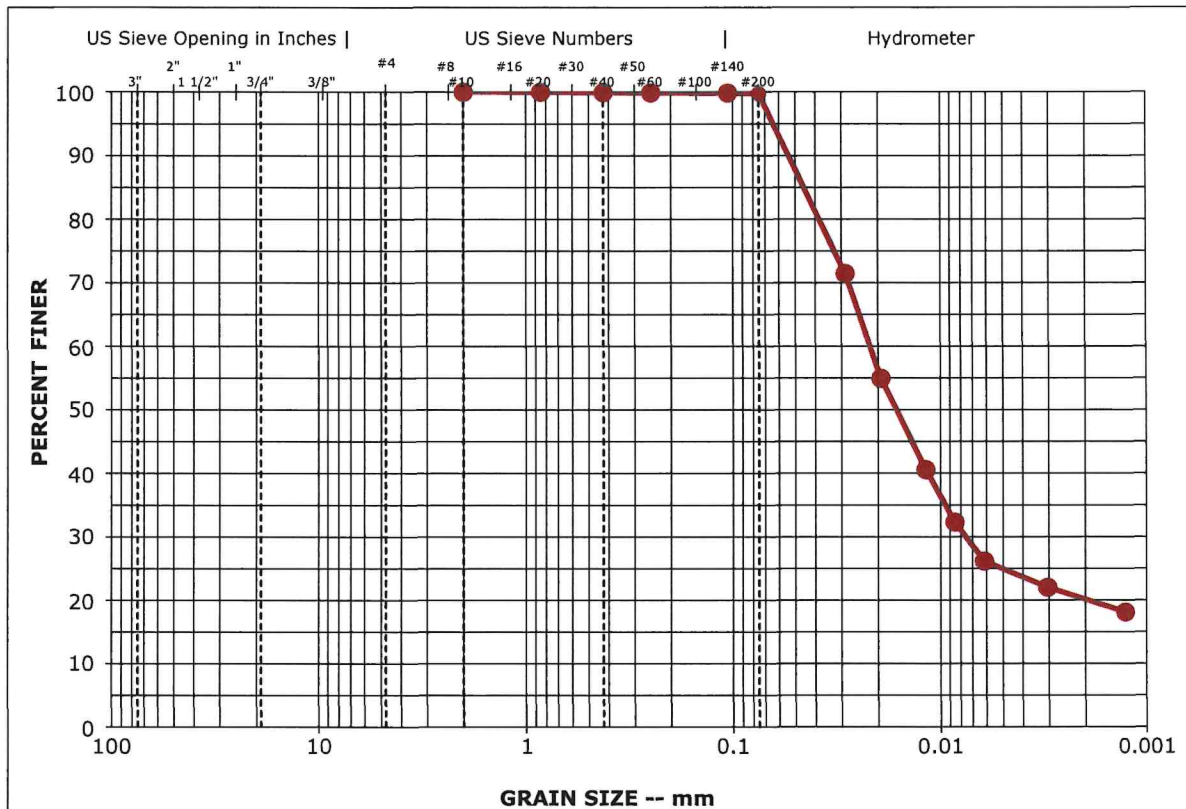
Sieve	% Finer	Sieve	% Finer	Grain Size	Coefficients
3"	100.0	#40	99.2	D ₁₀₀	4.750
2"	100.0	#60	98.9	D ₆₀	0.021
1 1/2"	100.0	#140	98.5	D ₃₀	0.006
1"	100.0	#200	98.3	D ₁₀	
3/4"	100.0				
3/8"	100.0				
#4	100.0				
#10	100.0				
#20	99.7				

Remarks

LUMINA BESS

Intersection of Broadway St and Springfield Rd | Pekin, IL 61554

Terracon Project No. 11255215


Particle-Size Distribution of Soils Using Sieve Analysis
ASTM D422-Method B


Boring ID	Depth (Ft.)	Description		USCS	Assumed Spc. Gravity	
B-15	8.5 - 10	Lean Clay		CL	2.72	
% Cobbles		% Gravel	% Sand	% Fines	% Silt	% Clay
0.0		0.0	0.3	99.7	74.8	24.9
Sieve	% Finer	Sieve	% Finer	Grain Size		Coefficients
3"	100.0	#40	99.9	D ₁₀₀	2.000	Cc
2"	100.0	#60	99.9	D ₆₀	0.022	
1 1/2"	100.0	#140	99.8	D ₃₀	0.008	Cu
1"	100.0	#200	99.7	D ₁₀		
3/4"	100.0	Remarks				
3/8"	100.0					
#4	100.0					
#10	100.0					
#20	100.0					

LUMINA BESS

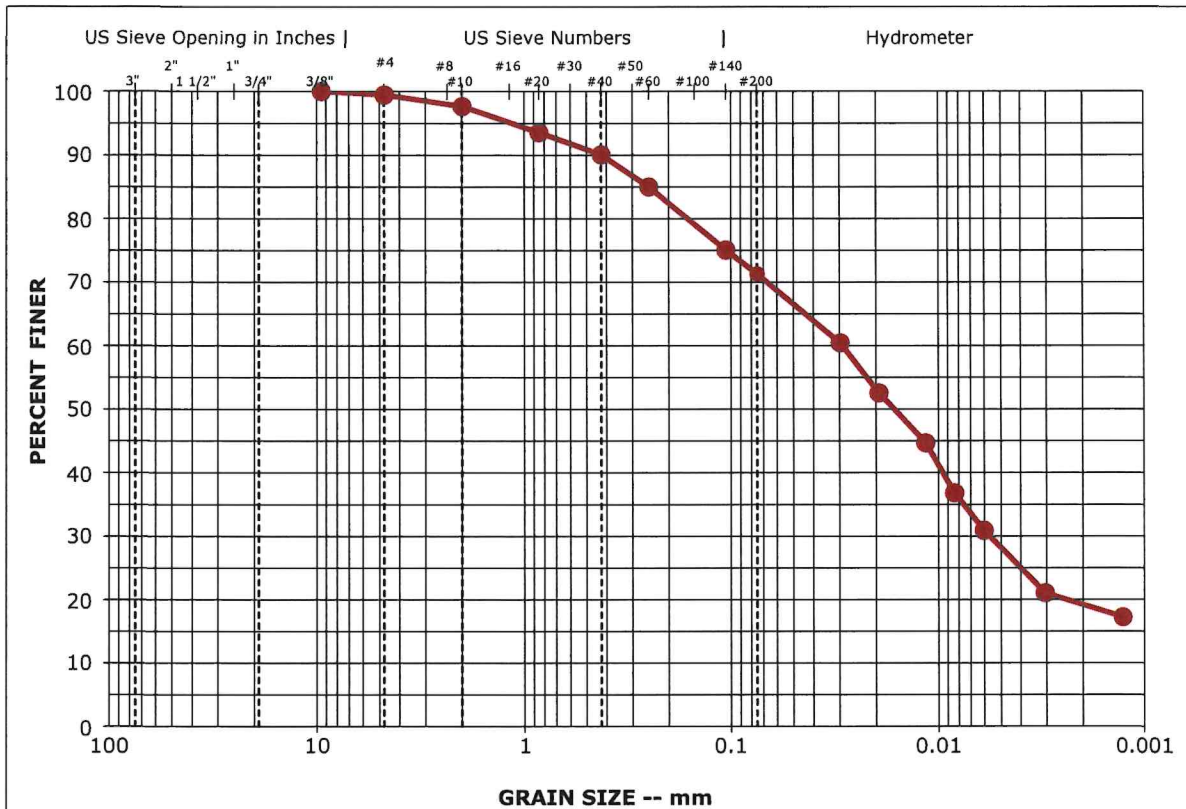
Intersection of Broadway St and Springfield Rd | Pekin, IL 61554

Terracon Project No. 11255215



Particle-Size Distribution of Soils Using Sieve Analysis

ASTM D422-Method B



Boring ID	Depth (Ft.)	Description	USCS	Assumed Spc. Gravity
B-16	6 - 7.5	Lean Clay with Sand	CL	2.72

% Cobbles	% Gravel	% Sand	% Fines	% Silt	% Clay
0.0	0.6	28.1	71.3	43.1	28.2

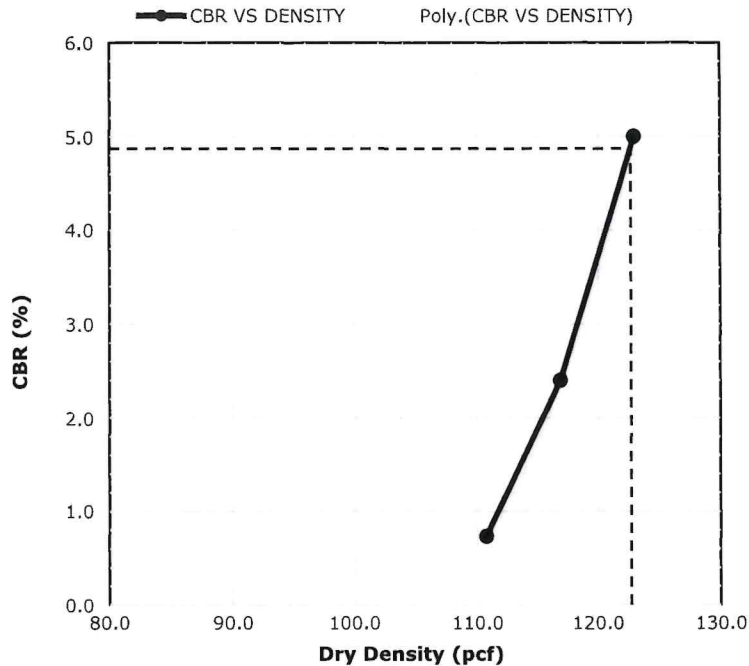
Sieve	% Finer	Sieve	% Finer	Grain Size	Coefficients
3"	100.0	#40	90.0	D ₁₀₀	9.500
2"	100.0	#60	85.0	D ₆₀	0.029
1 1/2"	100.0	#140	75.1	D ₃₀	0.006
1"	100.0	#200	71.3	D ₁₀	
3/4"	100.0				
3/8"	100.0				
#4	99.4				
#10	97.6				
#20	93.5				

Remarks

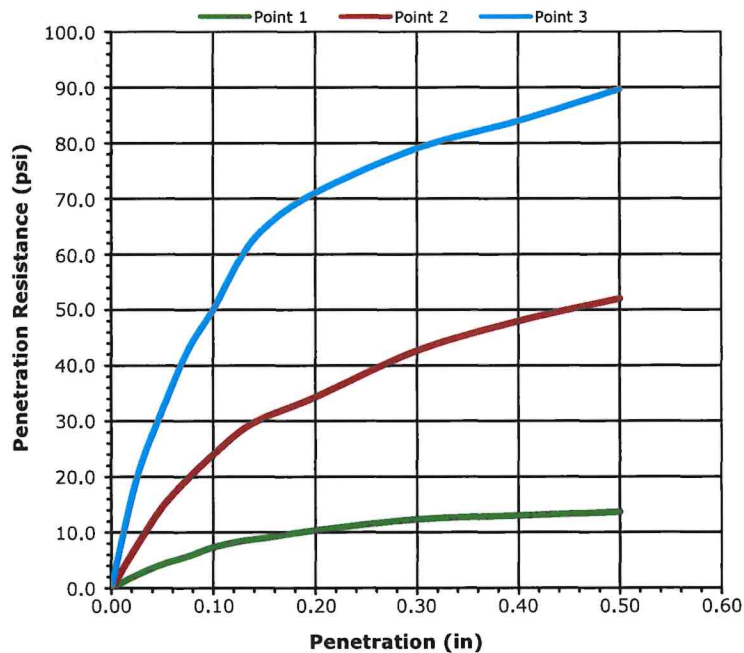
LUMINA BESS

Intersection of Broadway St and Springfield Rd | Pekin, IL 61554

Terracon Project No. 11255215

Terracon
Glendale Heights, IL 60139-2089**California Bearing Ratio****ASTM D1883**

Boring ID / Depth	P-1 / 1 - 2.5		
CBR Test Method	ASTM D1883 - 3 Point		
Sample Condition	Soaked		
Proctor Method	ASTM D698 - Method A		
Maximum Dry Density (pcf)	122.7		
Opt. Moisture (%)	11.1		
Atterberg Limits	LL	PL	PI
Fines (%)			
Description of Material	Silty Clay		
Remarks:			



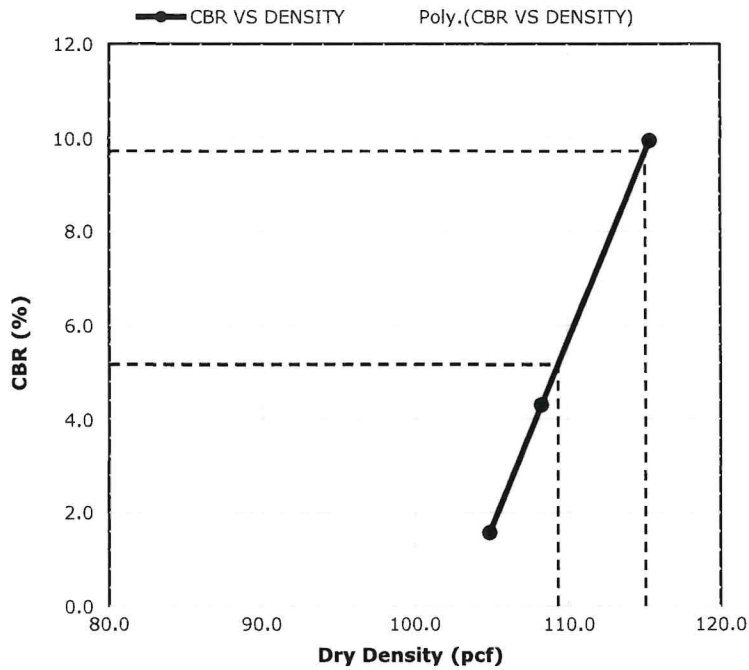
CBR Test Data	Point 1	Point 2	Point 3
Length of Soaking (hours)	96	96	96
Surcharge Weight (lbs)	10	10	10
Dry Density Before Soak (pcf)	110.8	116.9	123.0
Compaction of Proctor (%)	90.3	95.3	100.2
Moisture As Comp. (%)	11.0	11.2	11.2
Top 1" After Soaking	27.0	23.3	18.3
Swell (%)	0.207	0.574	0.172
CBR Value at 0.100 inch	0.7	2.4	5.0
CBR Value at 0.200 inch	0.7	2.3	4.7

LUMINA BESS

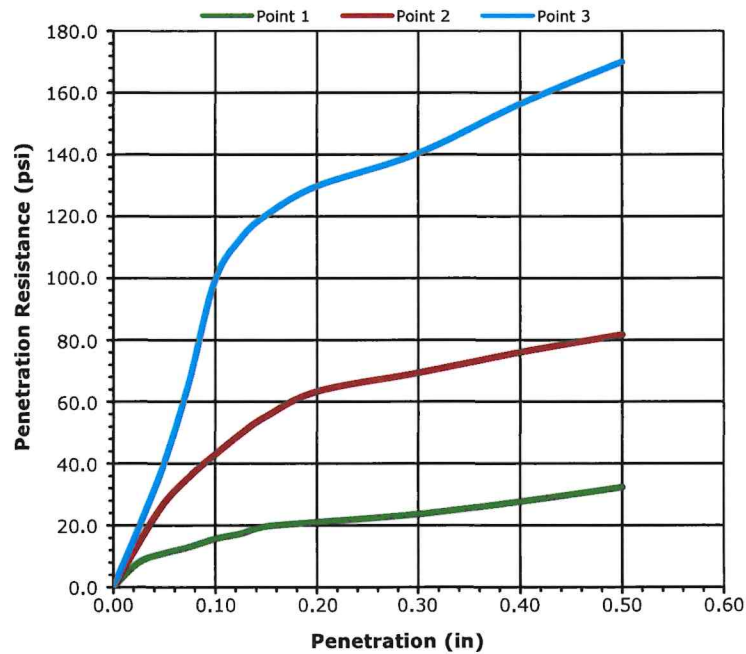
Intersection of Broadway St and Springfield Rd | Pekin, IL 61554
Terracon Project No. 11255215



California Bearing Ratio
ASTM D1883



Boring ID / Depth	P-2 / 1 - 2.5		
CBR Test Method	ASTM D1883 - 3 Point		
Sample Condition	Soaked		
Proctor Method	ASTM D698 - Method A		
Maximum Dry Density (pcf)	115.1		
Opt. Moisture (%)	14.1		
Atterberg Limits	LL	PL	PI
Fines (%)			
Description of Material	Lean Clay		
Remarks:			



CBR Test Data	Point 1	Point 2	Point 3
Length of Soaking (hours)	96	96	96
Surcharge Weight (lbs)	10	10	10
Dry Density Before Soak (pcf)	104.9	108.3	115.4
Compaction of Proctor (%)	91.1	94.1	100.3
Moisture As Comp. (%)	14.3	14.0	13.9
Top 1" After Soaking	21.2	21.5	18.1
Swell (%)	0.552	0.450	0.485
CBR Value at 0.100 inch	1.6	4.3	9.9
CBR Value at 0.200 inch	1.4	4.2	8.6

Soil Corrosivity Profile
Summary Report

Boring ID	TR-1 / CR-1
Sample Depth, (ft)	0-4
Sample Description	0

Test Method	Test Designation	Test Result
Electrical Resistivity (Ω -cm)	ASTM G57	2994
Oxidation Reduction Potential (RmV)	AWWA 2589-B	408
Acidity (pH)	ASTM G51	7.4
Chloride Ion Content (mg/kg)	AASHTO T291A	199.8
Soluble Sulfate Content (mg/kg)	AASHTO T290B	163
Total Dissolved Salts (mg/kg)	AWWA 2520 B	560
Sulfides (mg/kg)	ASTM A647 X1.6	Negative

Instrument Identifications			
Oxidation Reduction Potential		Acidity (pH)	
Probe ID	Oakton	Meter ID	Oakton pH 700
Meter ID	Oakton pH 700	Thermometric Type	Digital
Thermometric Type	Digital		

LUMINA BESS

Intersection of Broadway St and Springfield Rd | Pekin, IL 61554
Terracon Project No. 11255215



10400 State Highway 191
Midland, TX 79707-1497

Soil Corrosivity Profile**Summary Report**

Boring ID	TR-2 / CR-2
Sample Depth, (ft)	0-4
Sample Description	0

Test Method	Test Designation	Test Result
Electrical Resistivity (Ω -cm)	ASTM G57	2891
Oxidation Reduction Potential (RmV)	AWWA 2589-B	382
Acidity (pH)	ASTM G51	7.6
Chloride Ion Content (mg/kg)	AASHTO T291A	183.2
Soluble Sulfate Content (mg/kg)	AASHTO T290B	125
Total Dissolved Salts (mg/kg)	AWWA 2520 B	827
Sulfides (mg/kg)	ASTM A647 X1.6	Negative

Instrument Identifications

Oxidation Reduction Potential		Acidity (pH)	
Probe ID	Oakton	Meter ID	Oakton pH 700
Meter ID	Oakton pH 700	Thermometric Type	Digital
Thermometric Type	Digital		

LUMINA BESS

Intersection of Broadway St and Springfield Rd | Pekin, IL 61554
Terracon Project No. 11255215



10400 State Highway 191
Midland, TX 79707-1497

Soil Corrosivity Profile
Summary Report

Boring ID
Sample Depth, (ft)
Sample Description

TR-3 / CR-3
0-4
0

Test Method	Test Designation	Test Result
Electrical Resistivity (Ω -cm)	ASTM G57	2478
Oxidation Reduction Potential (RmV)	AWWA 2589-B	359
Acidity (pH)	ASTM G51	8.1
Chloride Ion Content (mg/kg)	AASHTO T291A	166.5
Soluble Sulfate Content (mg/kg)	AASHTO T290B	211.3
Total Dissolved Salts (mg/kg)	AWWA 2520 B	829
Sulfides (mg/kg)	ASTM A647 X1.6	Negative

Instrument Identifications			
Oxidation Reduction Potential		Acidity (pH)	
Probe ID	Oakton	Meter ID	Oakton pH 700
Meter ID	Oakton pH 700	Thermometric Type	Digital
Thermometric Type	Digital		

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10400 State Highway 191
Midland, TX 79707-1497

Soil Corrosivity Profile

Summary Report

Boring ID	TR-4 / CR-4
Sample Depth, (ft)	0-4
Sample Description	0

Test Method	Test Designation	Test Result
Electrical Resistivity ($\Omega\cdot\text{cm}$)	ASTM G57	2375
Oxidation Reduction Potential (RmV)	AWWA 2589-B	453
Acidity (pH)	ASTM G51	7.5
Chloride Ion Content (mg/kg)	AASHTO T291A	116.6
Soluble Sulfate Content (mg/kg)	AASHTO T290B	195
Total Dissolved Salts (mg/kg)	AWWA 2520 B	689
Sulfides (mg/kg)	ASTM A647 X1.6	Negative

Instrument Identifications

Oxidation Reduction Potential		Acidity (pH)	
Probe ID	Oakton	Meter ID	Oakton pH 700
Meter ID	Oakton pH 700	Thermometric Type	Digital
Thermometric Type	Digital		

Soil Corrosivity Profile
Summary Report

Boring ID
Sample Depth, (ft)
Sample Description

TR-5 / CR-5
0-4
0

Test Method	Test Designation	Test Result
Electrical Resistivity (Ω -cm)	ASTM G57	2891
Oxidation Reduction Potential (RmV)	AWWA 2589-B	521
Acidity (pH)	ASTM G51	7.3
Chloride Ion Content (mg/kg)	AASHTO T291A	116.6
Soluble Sulfate Content (mg/kg)	AASHTO T290B	210.6
Total Dissolved Salts (mg/kg)	AWWA 2520 B	586
Sulfides (mg/kg)	ASTM A647 X1.6	Negative

Instrument Identifications			
Oxidation Reduction Potential		Acidity (pH)	
Probe ID	Oakton	Meter ID	Oakton pH 700
Meter ID	Oakton pH 700	Thermometric Type	Digital
Thermometric Type	Digital		

LUMINA BESS

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Terracon Project No. 11255215



10400 State Highway 191
Midland, TX 79707-1497

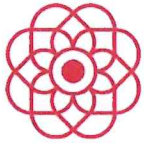
Soil Corrosivity Profile

Summary Report

Boring ID	TR-6 / CR-6
Sample Depth, (ft)	0-4
Sample Description	0

Test Method	Test Designation	Test Result
Electrical Resistivity (Ω -cm)	ASTM G57	3201
Oxidation Reduction Potential (RmV)	AWWA 2589-B	490
Acidity (pH)	ASTM G51	7.4
Chloride Ion Content (mg/kg)	AASHTO T291A	133.2
Soluble Sulfate Content (mg/kg)	AASHTO T290B	135.9
Total Dissolved Salts (mg/kg)	AWWA 2520 B	499
Sulfides (mg/kg)	ASTM A647 X1.6	Negative

Instrument Identifications			
Oxidation Reduction Potential		Acidity (pH)	
Probe ID	Oakton	Meter ID	Oakton pH 700
Meter ID	Oakton pH 700	Thermometric Type	Digital
Thermometric Type	Digital		



Geotherm

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April 28, 2026

Terracon
1145 N. Main Street
Lombard, IL 60148
Attn: Ravi Gorlagunta

Thermal Resistivity Report
Lumina BESS – Groveland, IL (Project No. 11255215)

The following is the report of thermal dryout characterization tests conducted on six (6) bulk samples of native soil from the referenced project sent to our laboratory.

Thermal Resistivity Tests: The samples were tested at the 'optimum' moisture content and at 90% of the standard Proctor dry density ***provided by Terracon***. The tests were conducted in accordance with the **IEEE standard 442-2017**. The results are tabulated below and the thermal dryout curves are presented in **Figures 1 to 6**.

Sample ID, Description, Thermal Resistivity, Moisture Content and Density

Sample ID	Depth (ft)	Effort (%)	Description (Terracon)	Thermal Resistivity (°C-cm/W)		Moisture Content (%)	Dry Density (lb/ft ³)
				Wet	Dry		
TR-1/CR-1	0 – 4	90	Fat Clay trace Gravel	66	233	18	96
TR-2/CR-2	0 – 4	90	Lean Clay trace Sand and Gravel	81	217	17	99
TR-3/CR-3	0 – 4	90	Fat Clay	64	242	22	89
TR-4/CR-4	0 – 4	90	Fat Clay	68	230	17	98
TR-5/CR-5	0 – 4	90	Lean Clay	68	243	19	93
TR-6/CR-6	0 – 4	90	Fat Clay	66	235	19	94

Comments: The thermal characteristic depicted in the dryout curves apply for the soils at their respective test dry density.

Please contact us if you have any questions or if we can be of further assistance.

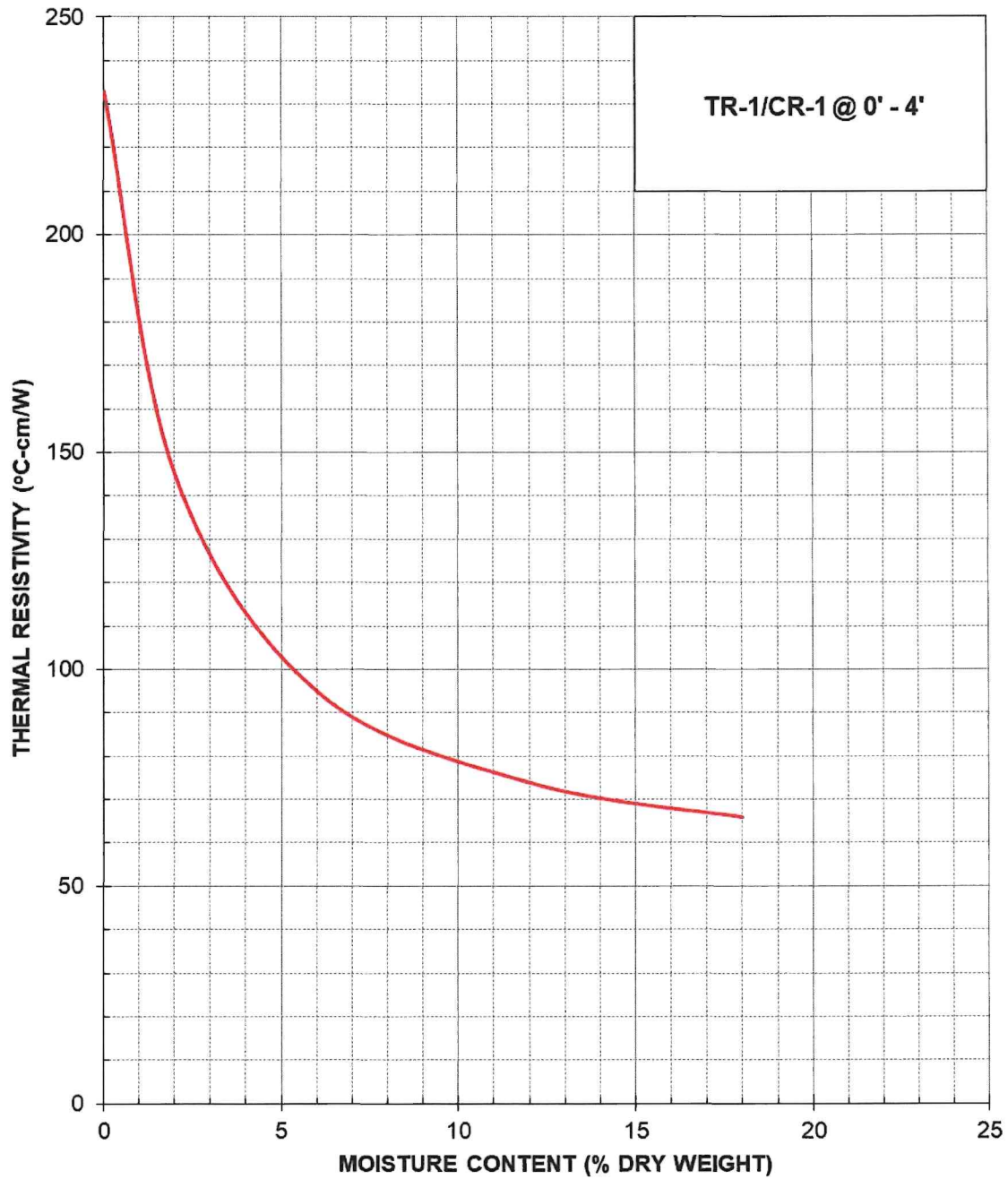
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Nimesh Patel

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THERMAL DRYOUT CURVE



Terracon (Project No. 11255215)

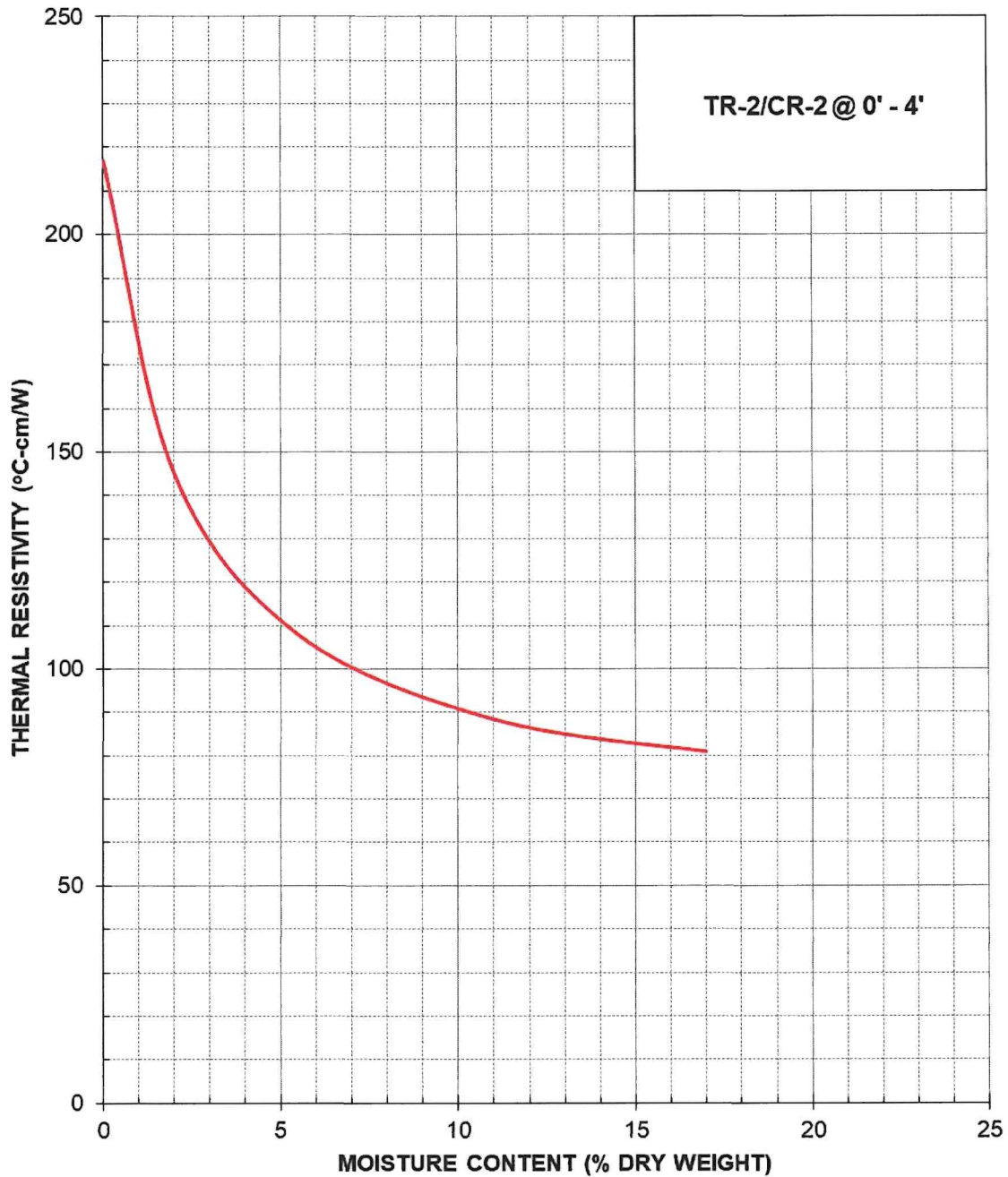
Lumina BESS – Groveland, IL

Thermal Resistivity Report

April 2026

Figure 1

THERMAL DRYOUT CURVE



Terracon (Project No. 11255215)

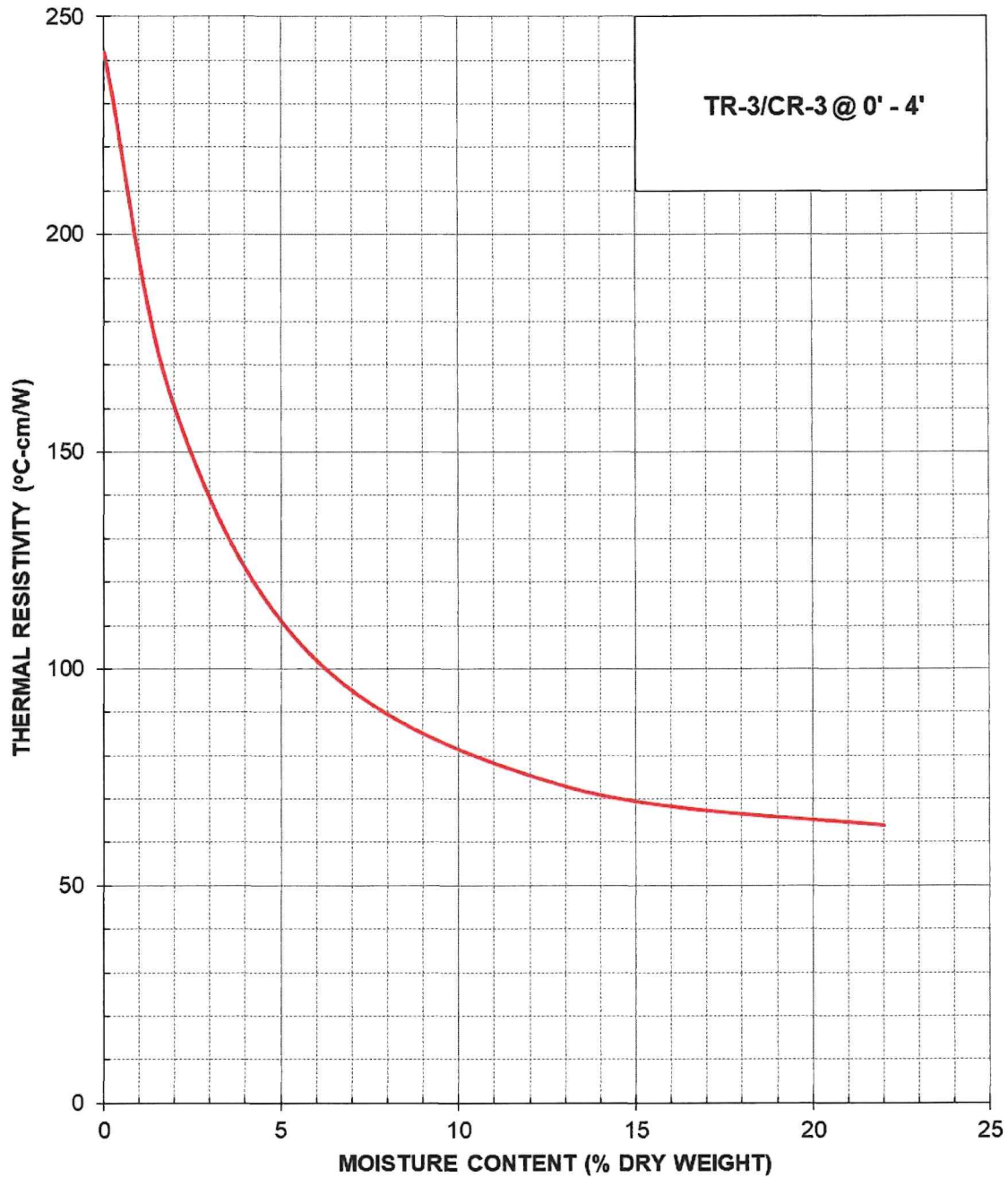
Lumina BESS – Groveland, IL

Thermal Resistivity Report

April 2026

Figure 2

THERMAL DRYOUT CURVE



Terracon (Project No. 11255215)

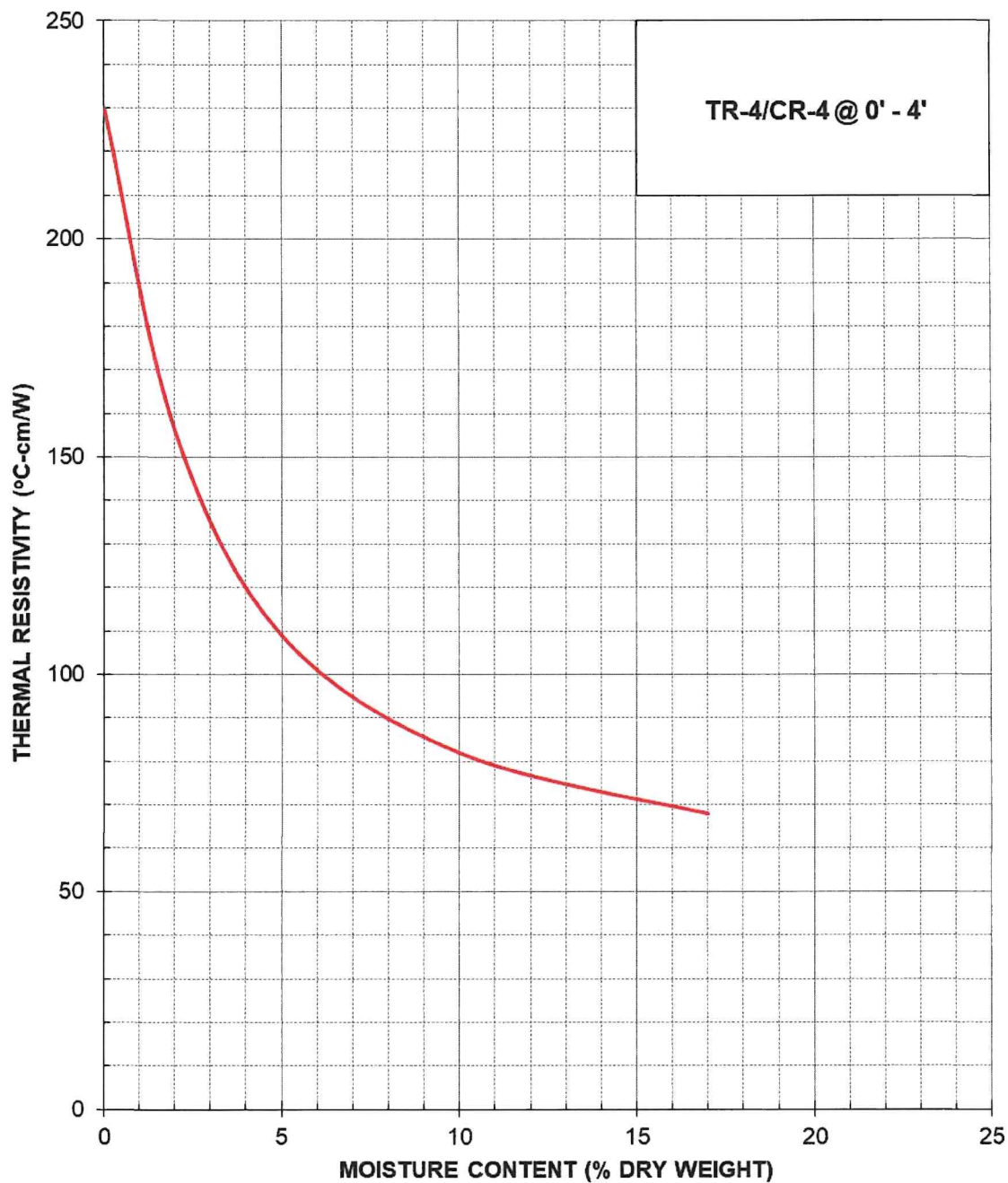
Lumina BESS – Groveland, IL

Thermal Resistivity Report

April 2026

Figure 3

THERMAL DRYOUT CURVE



Terracon (Project No. 11255215)

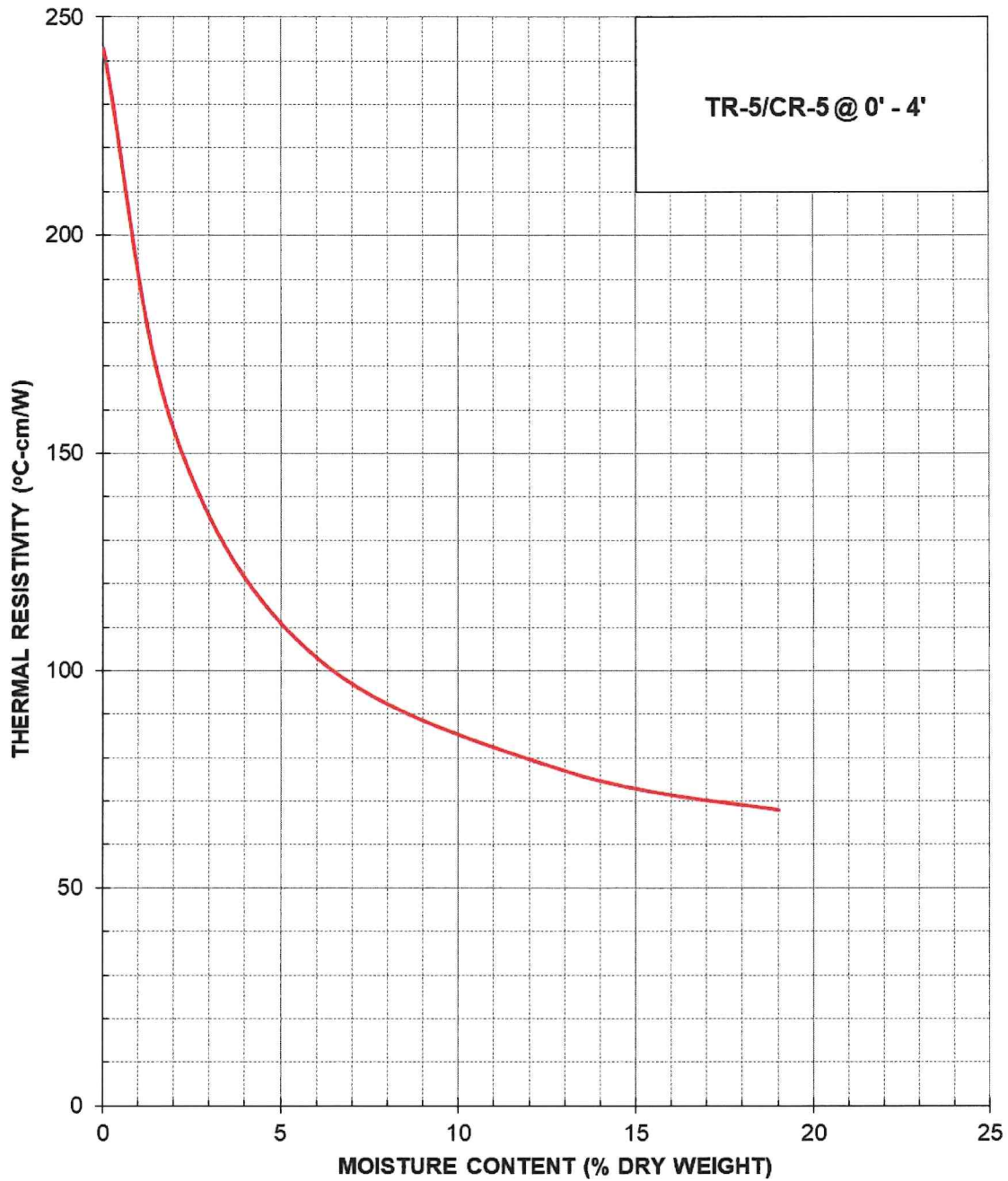
Lumina BESS – Groveland, IL

Thermal Resistivity Report

April 2026

Figure 4

THERMAL DRYOUT CURVE



Terracon (Project No. 11255215)

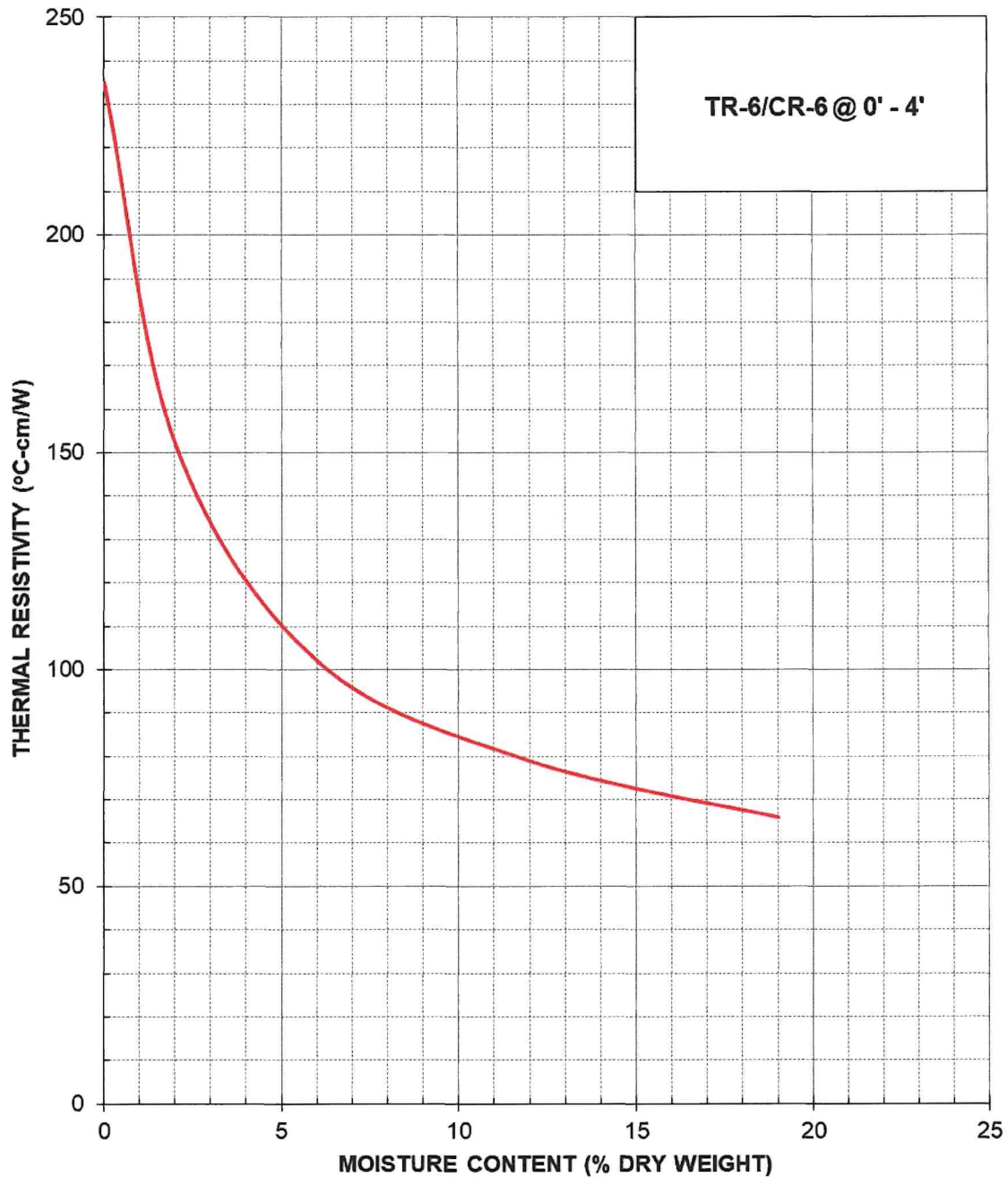
Lumina BESS – Groveland, IL

Thermal Resistivity Report

April 2026

Figure 5

THERMAL DRYOUT CURVE



Terracon (Project No. 11255215)

Lumina BESS – Groveland, IL

Thermal Resistivity Report

April 2026

Figure 6



Geotechnical Engineering Report

Proposed Lumina BESS Project | Rural Pekin, IL
May 1, 2026 | Terracon Project No. 11255215



Field Soil Electrical Resistivity Test Results

Contents:

Electrical Resistivity Test Procedures
Electrical Resistivity Results (4)

Field Electrical Resistivity Test Procedures

Field measurements of soil electrical resistivity were performed by Terracon on March 19 and 20, 2026. Field measurements of soil electrical resistivity were performed in general accordance with ASTM Test Method G 57, and IEEE Standard 81, using the Wenner Four-Electrode. The Wenner arrangement (equal electrode spacing) was used with the following “a” spacings:

- 0.5, 1, 1.5, 2, 3, 5, 7, 10, 20, 30, 45, 80, 150, 200, and 300 feet within the Substation area. The testing was performed in both a north-south and an east-west orientation at each location.
- 0.5, 1, 1.5, 2, 3, 5, 7, 10, 20, 30, 45, 80, 150, and 200 feet within the BESS area. The testing was performed in both a north-south and an east-west orientation.

Supporting Information

Contents:

General Notes

Unified Soil Classification System

Note: All attachments are one page unless noted above.

General Notes

Sampling			Water Level		Field Tests	
 Auger Cuttings	 Modified California Ring Sampler	 Rock Core	 Water Initially Encountered		N	Standard Penetration Test Resistance (Blows/Ft.)
 Dynamic Cone Penetrometer	 Modified Dames & Moore Ring Sampler	 Dual Sampler SPT	 Water Level After a Specified Period of Time		(HP)	Hand Penetrometer
 Grab Sample	 GeoProbe Macro Core or Large Bore	 No Recovery	 Water Level After a Specified Period of Time		(T)	Torvane
 Ring Sampler	 Shelby Tube	 Standard Penetration Test	 Cave In Encountered		(DCP)	Dynamic Cone Penetrometer
 Split Spoon	 Texas Cone Penetrometer	 Vane Shear	Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.		UC	Unconfined Compressive Strength
					(PID)	Photo-Ionization Detector
					(OVA)	Organic Vapor Analyzer

Descriptive Soil Classification

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

Location And Elevation Notes

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

Strength Terms

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

Relevance of Exploration and Laboratory Test Results

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

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A

Soil Classification	
Group Symbol	Group Name ^B
GW	Well-graded gravel ^F
GP	Poorly graded gravel ^F
GM	Silty gravel ^{F, G, H}
GC	Clayey gravel ^{F, G, H}
SW	Well-graded sand ^I
SP	Poorly graded sand ^I
SM	Silty sand ^{G, H, I}
SC	Clayey sand ^{G, H, I}
CL	Lean clay ^{K, L, M}
ML	Silt ^{K, L, M}
OL	Organic clay ^{K, L, M, N}
OH	Organic silt ^{K, L, M, O}
CH	Fat clay ^{K, L, M}
MH	Elastic silt ^{K, L, M}
PT	Peat

Coarse-Grained Soils:
More than 50% retained
on No. 200 sieve

Gravels:
More than 50% of
coarse fraction
retained on No. 4
sieve

Sands:
50% or more of
coarse fraction
passes No. 4 sieve

Silts and Clays:
Liquid limit less than
50

Fine-Grained Soils:
50% or more passes the
No. 200 sieve

Silts and Clays:
Liquid limit 50 or
more

Clean Gravels:
Less than 5% fines ^C

Gravels with Fines:
More than 12% fines ^C

Clean Sands:
Less than 5% fines ^D

Sands with Fines:
More than 12% fines ^D

Inorganic:

Organic:

Inorganic:

Organic:

$Cu \geq 4$ and $1 \leq Cc \leq 3$ ^E

$Cu < 4$ and/or $[Cc < 1 \text{ or } Cc > 3.0]$ ^E

Fines classify as ML or MH

Fines classify as CL or CH

$Cu \geq 6$ and $1 \leq Cc \leq 3$ ^E

$Cu < 6$ and/or $[Cc < 1 \text{ or } Cc > 3.0]$ ^E

Fines classify as ML or MH

Fines classify as CL or CH

$PI > 7$ and plots above "A" line ^J

$PI < 4$ or plots below "A" line ^J

$$\frac{LL_{oven\ dried}}{LL_{not\ dried}} < 0.75$$

PI plots on or above "A" line

PI plots below "A" line

$$\frac{LL_{oven\ dried}}{LL_{not\ dried}} < 0.75$$

Highly organic soils:

Primarily organic matter, dark in color, and organic odor

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

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

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

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

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

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

^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^H If fines are organic, add "with organic fines" to group name.

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

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

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

"with gravel," whichever is predominant.

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

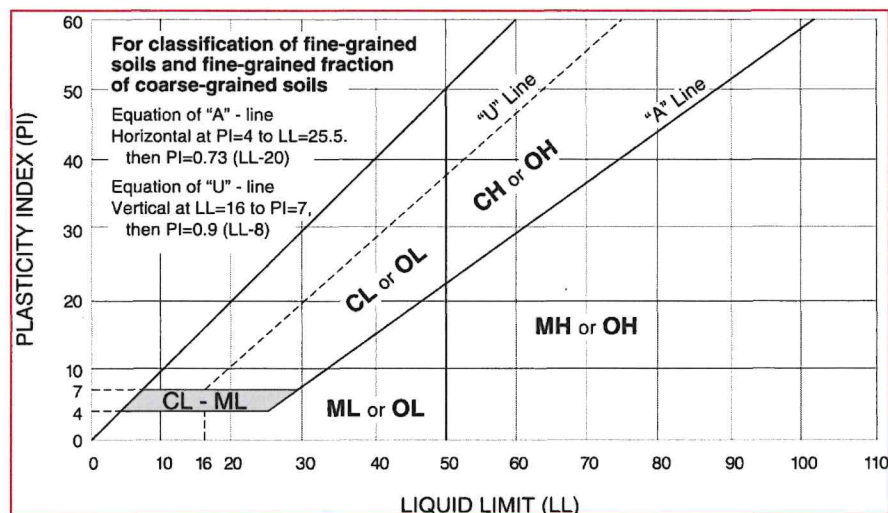
^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.

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

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

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

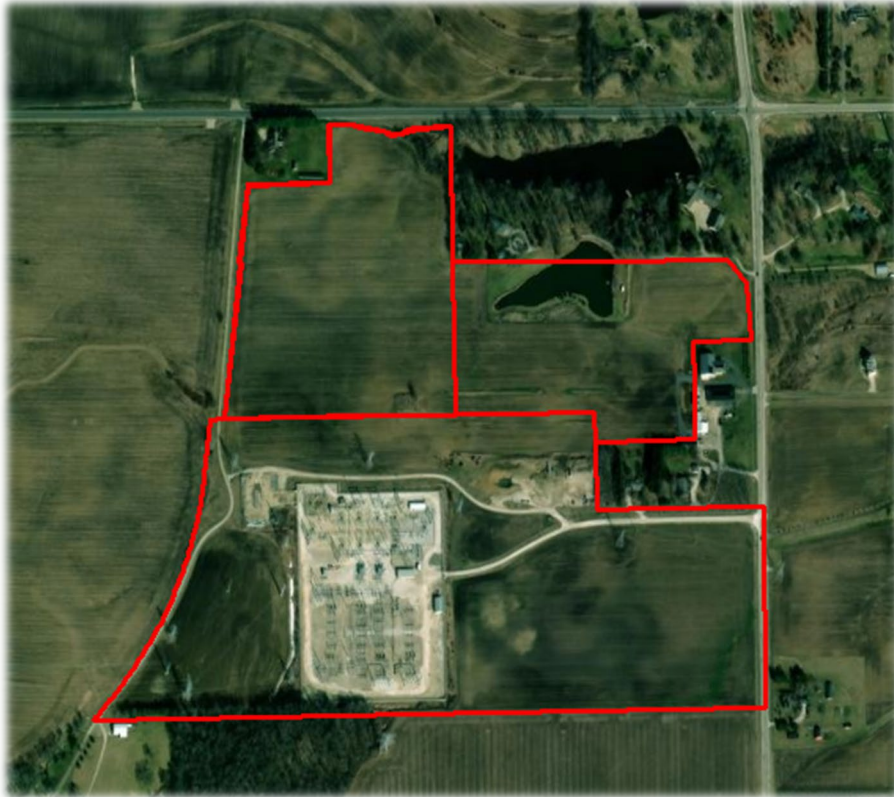
^Q PI plots below "A" line.



Pre-Development Drainage Report

Lumina BESS Site

(Tazewell County, Illinois)



December
2025

Prepared for | Lumina Energy Storage, LLC
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Durham NC, 27701



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Contents

1.	INTRODUCTION	1
2.	PROJECT LOCATION AND DESCRIPTION	1
2.1	Location.....	1
2.2	Project Purpose.....	1
2.3	Identified Regulatory Floodplains.....	1
3.	EXISTING CONDITIONS HYDROLOGIC & HYDRAULIC MODELING	5
3.1	Geometry	5
3.2	Precipitation.....	5
3.3	Loss & Roughness Parameters.....	6
3.4	Model Runs	8
4.	FLOODPLAIN ANALYSIS	13
5.	CONCLUSION	22
6.	ENGINEER'S STATEMENT.....	22
7.	REFERENCES	23
8.	APPENDIX A: PRECIPITATION AND SOILS DATA	
9.	APPENDIX B: SPATIAL FILES {PROVIDED ELECTRONICALLY}	

Figures

Figure 1.	Lumina BESS Location Map.....	2
Figure 2.	Lumina BESS Aerial	3
Figure 3.	FEMA Flood Zone Designation.....	4
FIGURE 4.	LUMINA BESS CONTRIBUTING WATERSHED	9
FIGURE 5.	LUMINA BESS LAND USE MAP.....	10
FIGURE 6.	LUMINA BESS SOILS MAP	15
FIGURE 7.	LUMINA BESS HEC-RAS SCHEMATIC	15
FIGURE 8.	LUMINA BESS 25-YEAR, 24-HOUR MAX DEPTH	15
FIGURE 9.	LUMINA BESS 25-YEAR, 24-HOUR MAX VELOCITY	15
FIGURE 10.	LUMINA BESS 100-YEAR, 24-HOUR MAX DEPTH	16
FIGURE 11.	LUMINA BESS 100-YEAR, 24-HOUR MAX VELOCITY	17
FIGURE 12.	LUMINA BESS 25-YEAR, 72-HOUR MAX DEPTH	17
FIGURE 13.	LUMINA BESS 25-YEAR, 72-HOUR MAX VELOCITY	19
FIGURE 14.	LUMINA BESS 100-YEAR, 72-HOUR MAX DEPTH	20
FIGURE 15.	LUMINA BESS 100-YEAR, 72-HOUR MAX VELOCITY	21

Tables

Table 1. Outflow Boundary Energy Grade Slope	5
Table 2. NOAA Atlas 14 Precipitation Depths.....	6
Table 3. Assigned CN Values	7
Table 4. Assigned Manning's N Values	7
Table 5. Peak Flow Comparison.....	13

1. INTRODUCTION

This narrative documents the assumptions, inputs, and results of the floodplain analysis for the potential Lumina BESS site, located in Tazewell County, Illinois. The report summarizes the hydrologic and hydraulic model development, which was completed using methodologies accepted by surrounding jurisdictions and in conformance with Tazewell County standards. The purpose of this analysis is to quantify 25- and 100-year flood event depths and flow velocities within the project boundary under existing conditions.

2. PROJECT LOCATION AND DESCRIPTION

2.1 Location

The Lumina BESS Site, comprised of approximately 26 acres, is located within Tazewell County in central Illinois, approximately 9 miles southeast of Peoria, at the southwest corner of the intersection of East Broadway Road and Springfield Road. A Project Vicinity and location map (Figure 1) have been provided as a visual representation of the project area in reference to the surrounding communities. An aerial view (Figures 2) of the project site is provided to further assist in the discussion.

2.2 Project Purpose

The purpose of this report is to provide the existing floodplain information necessary to support the development of the Lumina BESS Site. The analyses detailed in this report were used to determine the peak runoff rates, inundation extents, and velocities associated with the contributing watershed for the site. As part of this effort, the following tasks were completed:

- Collected topographic data for the area surrounding and contributing runoff to the project site from the USGS National Map Data Delivery System.
- Researched effective FEMA floodplain mapping relative to the project area.
- Developed a two-dimensional hydraulic model of the project area using the U.S. Army Corps of Engineers' HEC-RAS software (Version 6.6) to evaluate flooding depths, velocities, and extents within the project boundary under existing conditions.

The remainder of this report provides a detailed description of the analyses summarized above.

2.3 Identified Regulatory Floodplains

The Special Flood Hazard Areas (SFHA) for both the unincorporated and incorporated portions of Tazewell County, Illinois, are outlined in the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). Lumina BESS is located on FEMA FIRM Community Panel No. 17179C0200E, effective February 17, 2017. As shown in Figure 3, the subject site is located within a FEMA-designated Zone X. Zone X is assigned to areas outside of the 0.2% annual chance flood (500-year).

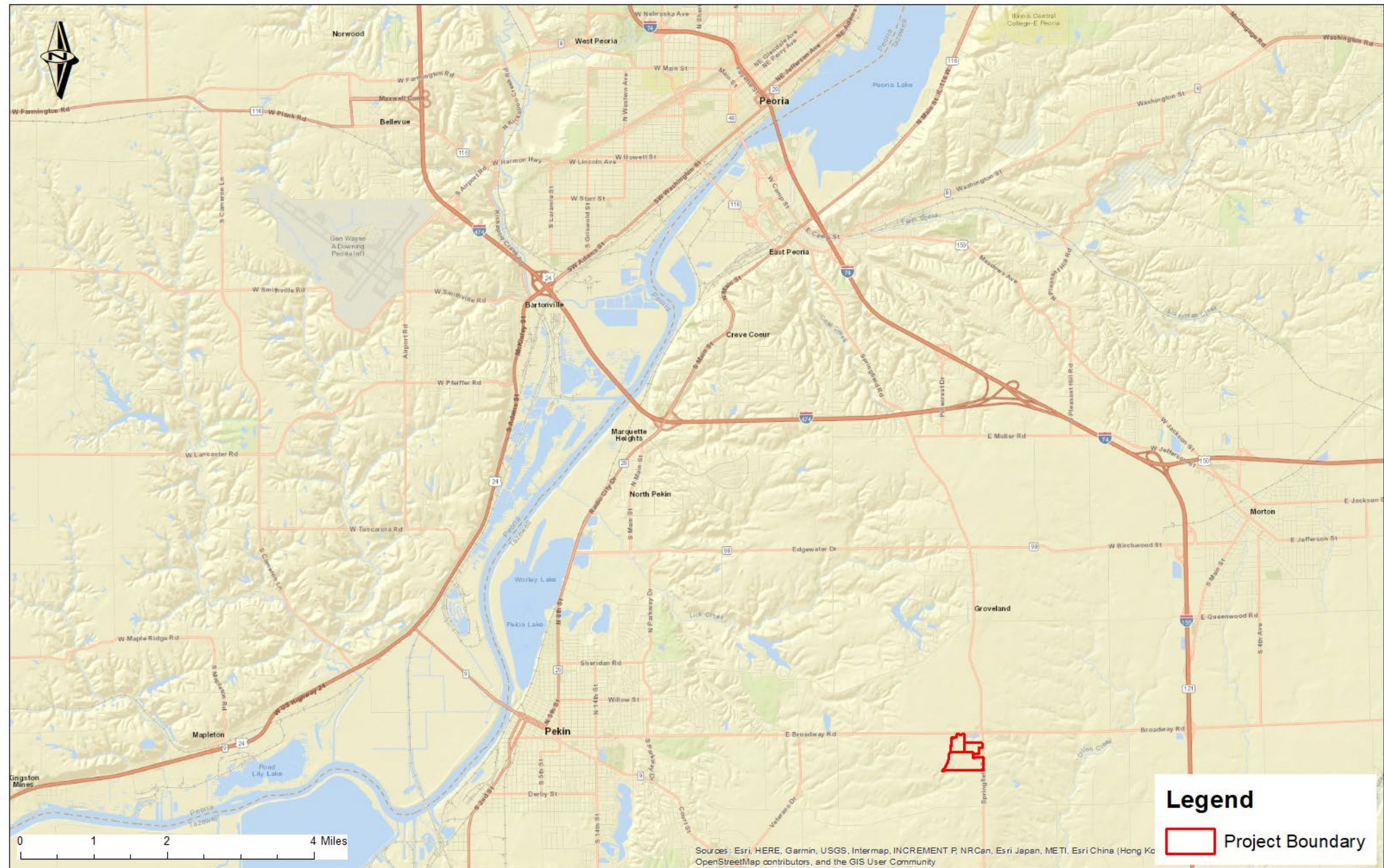


FIGURE 1. LUMINA BESS LOCATION MAP



FIGURE 2. LUMINA BESS AERIAL

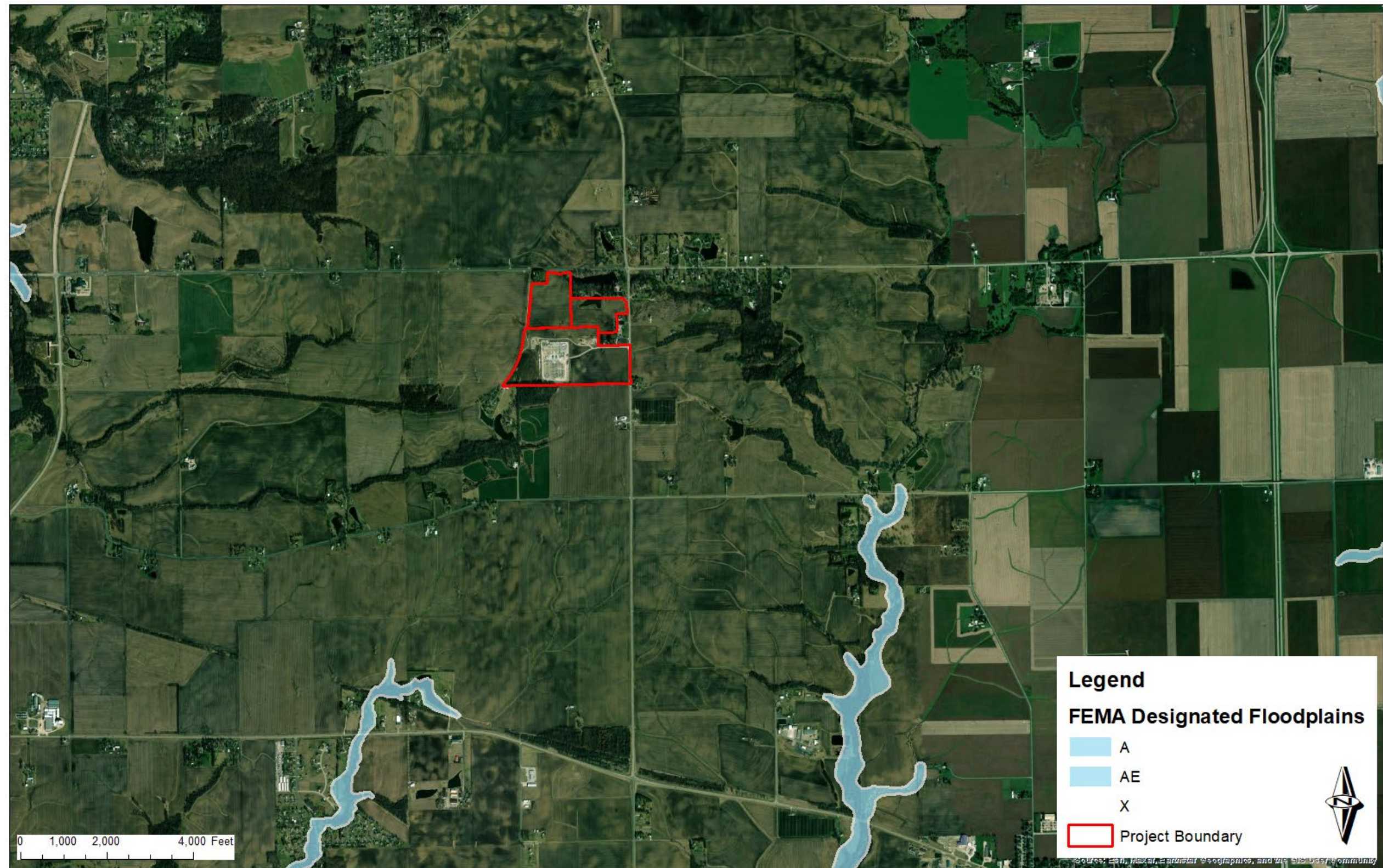


FIGURE 3. FEMA FLOOD ZONE DESIGNATION

3. EXISTING CONDITIONS HYDROLOGIC & HYDRAULIC MODELING

To evaluate the impact of the 25-year and 100-year events within the project limits, the two-dimensional functionality of the Army Corps of Engineers HEC-RAS software, Version 6.6, was employed. The modeling effort required input of the watershed terrain data, rainfall data, and surface characterization in terms of soil parameters, land use, and roughness coefficients. The domain of the model was set to reflect the entire contributing watershed associated with the site. Available USGS 3DEP DEM data were used for the site to model the existing terrain in the analyses. The modeling inputs and results for the BESS site are detailed in the following sections.

3.1 Geometry

The contributing watershed for the project site was delineated using detailed topographic data obtained through the USGS National Map Data Download Application. The LiDAR based DEM data available through the 3DEP program for this area was flown in leaf off/ no snow conditions in the spring of 2022. The surface within the contributing watershed was downloaded in DEM form. The USGS terrain tiles were mosaicked to create a final modeling terrain, which was incorporated into the HEC-RAS model. All terrain data and other spatial files used in this analysis used or were projected to a North American Datum 1983 State Plane coordinate system for West Illinois prior to incorporation into the model. The Lumina BESS project site has a contributing watershed of approximately 624 acres emanating primarily from areas north of the site, passing through the BESS site from the east to west. Figure 4 illustrates the contributing watershed/computation domain for Lumina BESS. Two (2) Outflow boundaries were applied to the modeling domain at the outfall points along the south and east side of the domain, which are highlighted in green in the model schematic in Figure 7. At the outflow points, the normal depth assumption was implemented, with the energy slope taken as the terrain slope immediately downstream of the boundary. Table 1 summarizes the slopes assigned at the outflow boundaries. The computation mesh was developed with a 50-foot by 50-foot grid cell spacing and breaklines with a refined 10-ft cell spacing were used to enforce abrupt changes in grade, flow lines and high points. Two (2) identified culverts were incorporated along East Broadway Road and Springfield Road, which were placed into the model domain as SA/2D area connections. The culvert geometry was estimated based upon available aerial photography and terrain data.

TABLE 1. OUTFLOW BOUNDARY ENERGY GRADE SLOPE

Outflow Boundary	Slope (ft/ft)
Outflow Boundary East	0.01
Outflow Boundary South	0.01

3.2 Precipitation

In order to determine the applicable precipitation depths and storm distributions for the 25- and 100-year, 24- and 72-hour events the *Section 151.12 – Standard for Stormwater Design Analysis of the Tazewell County Code of Ordinances* was used to determine that the NRCS Type II storm distribution is applicable within the study area with precipitation depths taken from Table 1 of Section 151.12.B of the Standard. Table 2 provides the selected values. The NRCS Type II distribution was used to develop incremental hyetographs for the 24-hour duration, while the 72-hour distribution was developed based upon the Balanced Storm Method with the peak centered around the 36th hour of the event. The resulting hyetographs were implemented into the HEC-RAS model using the software's rain-on-grid functionality.

TABLE 2. NOAA ATLAS 14 PRECIPITATION DEPTHS

Event	Precipitation Depth (in)
25-year, 24-hour	5.32
100-year, 24-hour	6.92
25-year, 72-hour	6.15
100-year, 72-hour	8.16

3.3 Loss & Roughness Parameters

The dominant land covers within the watershed are characterized as cropland based upon data available through the USGS National Land Cover Database, with some small pockets of sparse development. These classifications were used, along with available aerial photography, to determine the roughness coefficients associated with each polygon and to informed the selection of Curve Number values, as discussed below. Figure 5 depicts the spatially varied land uses present within the watershed.

To evaluate rainfall losses within the model domain, a soils shapefile was used in conjunction with available land use data. It should be noted that “transform” methodology is not necessary when using two-dimensional HEC-RAS models. Within Tazewell County, the standard methodology employed for estimating losses is the SCS Curve Number (CN) Method. This methodology requires estimation of the CN for each Hydrologic Soil Group (HSG) present, based upon the land use and condition of vegetative cover. To establish CNs for the watershed, the NCRS Web Soil Survey was used to extract HSG information for the soils. Based upon NRCS data, the watershed soils are classified as predominantly HSG type D, with smaller portions of B and C, indicating that most of the soils within the domain have a moderate to low infiltration rate when thoroughly wet. Figure 6 shows the HSG classification. It should be noted that for many of the soils within the studied watershed, the HSG classification is dependent upon whether they exist in a natural or developed state. These soils are considered to be HSG Type D in their natural state and can have a separate classification in an improved state. This was considered in the analysis by intersecting the soils and land use data and assigning the HSG classification based upon both sets of information.

Using the geoprocessing tools within ArcGIS, the soils and land cover data were intersected to create a polygon showing the spatial variation in both the HSG and varying land uses. Each of these regions was then assigned a CN value based upon the recommended values presented in the *Tazewell County Code of Ordinances, Section 151.12*. It should be noted that, for all land cover types, where hydrologic condition influences the selected CN, the hydrologic condition was assumed to be “Good” based upon available aerial photography. The initial abstraction ratio was assumed to be 0.2, as is indicated with the NRCS TR-55 guidance. Roughness values were assigned based upon available guidance for 2D hydraulic modeling in the HEC-RAS platform and engineering judgment. This data was then directly imported to RASMapper and assigned to the model geometry to simulate the watershed losses and resistance to flow within the overall modeling effort. Tables 3 and 4 provide the selected CN Values and Manning’s N values applied to the model domain.

TABLE 3. ASSIGNED CN VALUES

Land Use	HSG	CN
Barren Land	B	86
Developed Open Space	B	61
Open Water	B	98
Pasture Hay	B	61
Cultivated Crops	B	78
Developed Low Intensity	B	65
Deciduous Forest	B	58
Developed Medium Intensity	B	70
Developed High Intensity	B	92
Developed Open Space	C	74
Open Water	C	98
Grassland Herbaceous	C	71
Pasture Hay	C	74
Cultivated Crops	C	85
Developed Low Intensity	C	77
Deciduous Forest	C	72
Developed Medium Intensity	C	80
Barren Land	D	94
Developed Open Space	D	80
Open Water	D	98
Grassland Herbaceous	D	78
Pasture Hay	D	80
Cultivated Crops	D	89
Developed Low Intensity	D	82
Deciduous Forest	D	79

TABLE 4. ASSIGNED MANNING'S N VALUES

Land Use	N Value	% Impervious
Barren Land	0.03	0
Developed Open Space	0.035	10
Open Water	0.035	100
Grassland Herbaceous	0.04	0
Pasture Hay	0.045	0
Cultivated Crops	0.05	0
Developed Low Intensity	0.08	35
Deciduous Forest	0.1	0
Developed Medium Intensity	0.12	65
Developed High Intensity	0.15	90

3.4 Model Runs

Unsteady simulations were created for the modeled events, with a model time of 24 or 72 hours, dependent upon the storm. The computation interval was set to 1 second, and all output intervals set to 5-minutes. The simulations were run using the Shallow Water equation set. All runs successfully completed with minimal volume conservation error and no warnings.

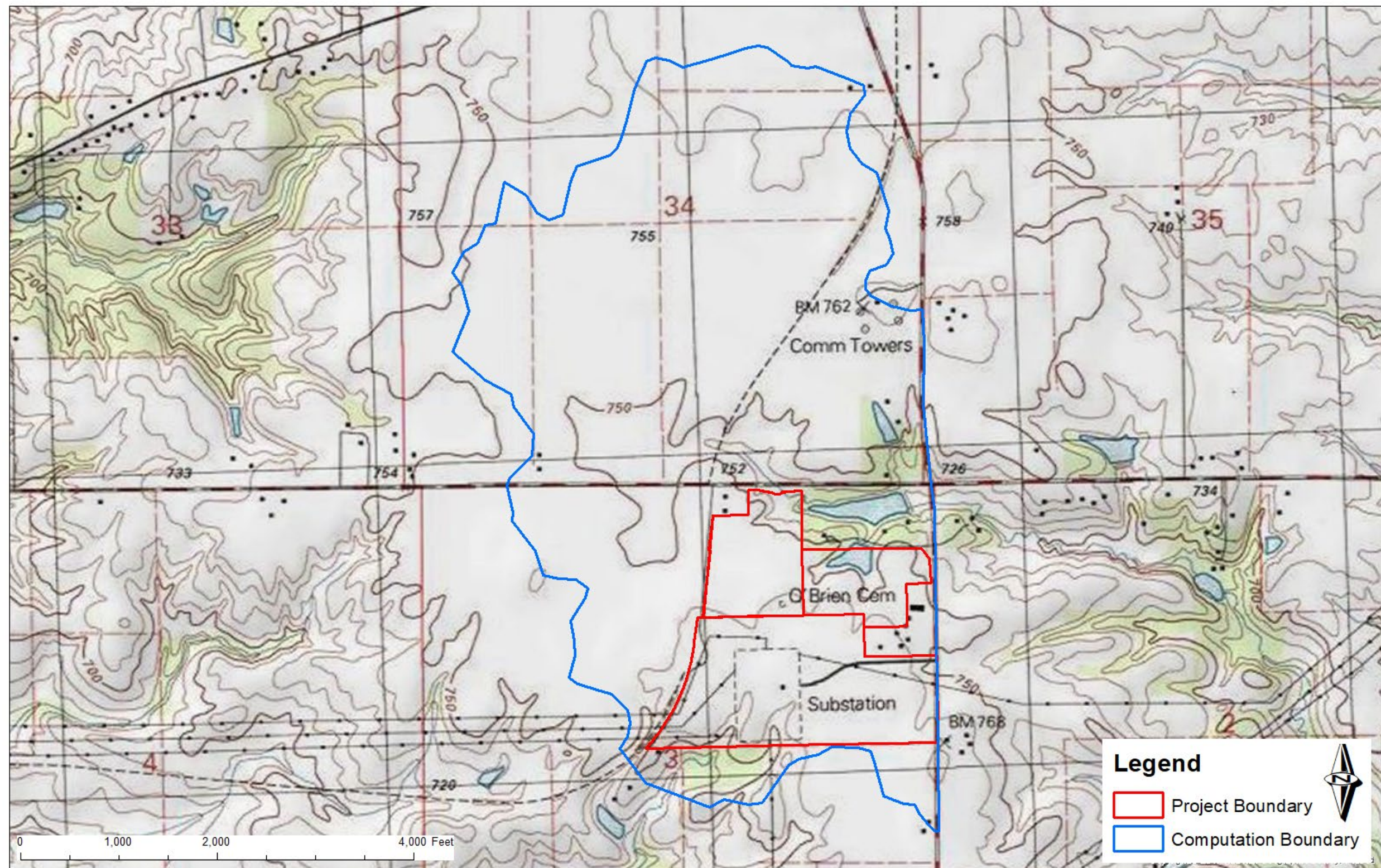


FIGURE 4. LUMINA BESS CONTRIBUTING WATERSHED

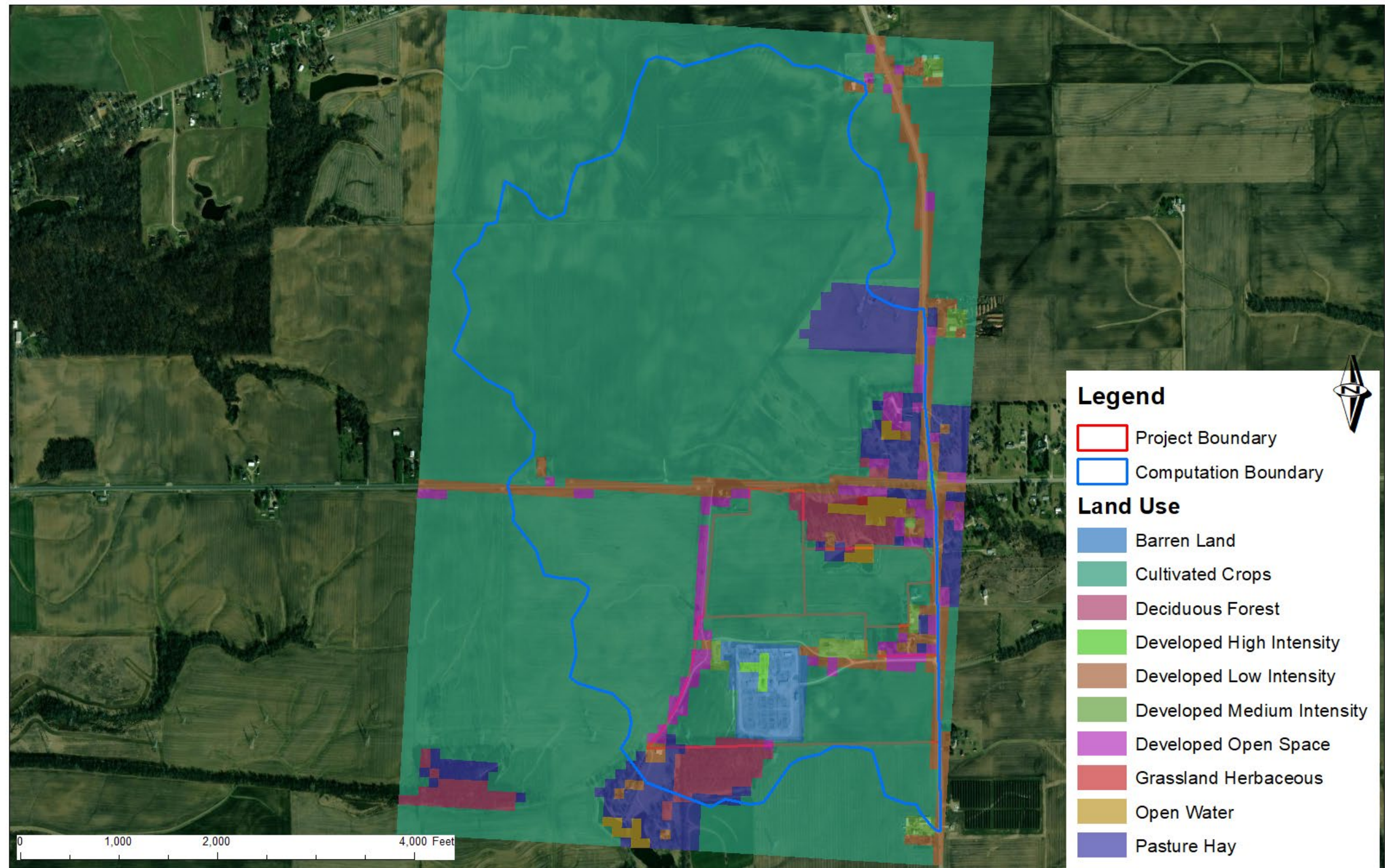


FIGURE 5. LUMINA BESS LAND USE MAP

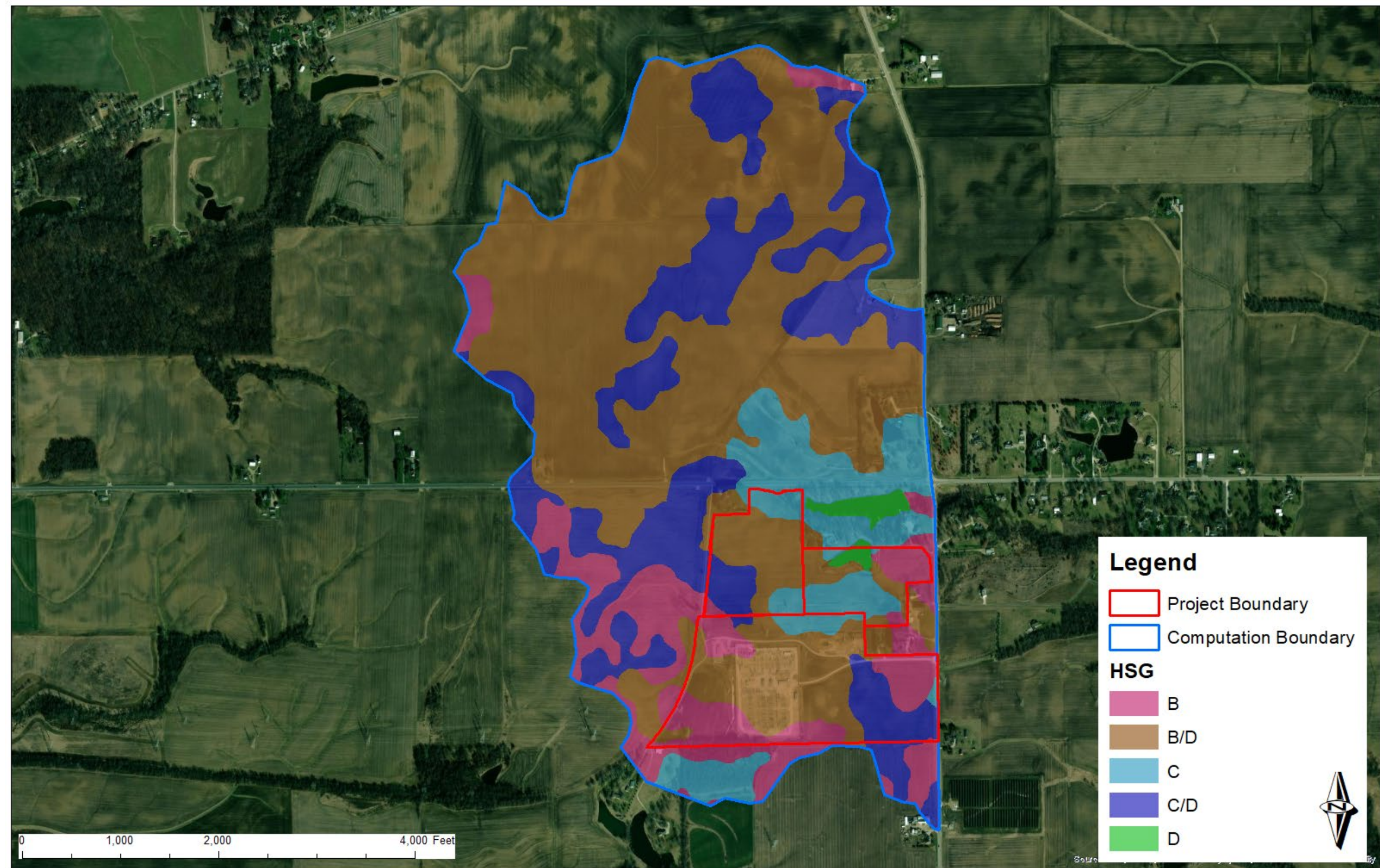


FIGURE 6. LUMINA BESS SOILS MAP

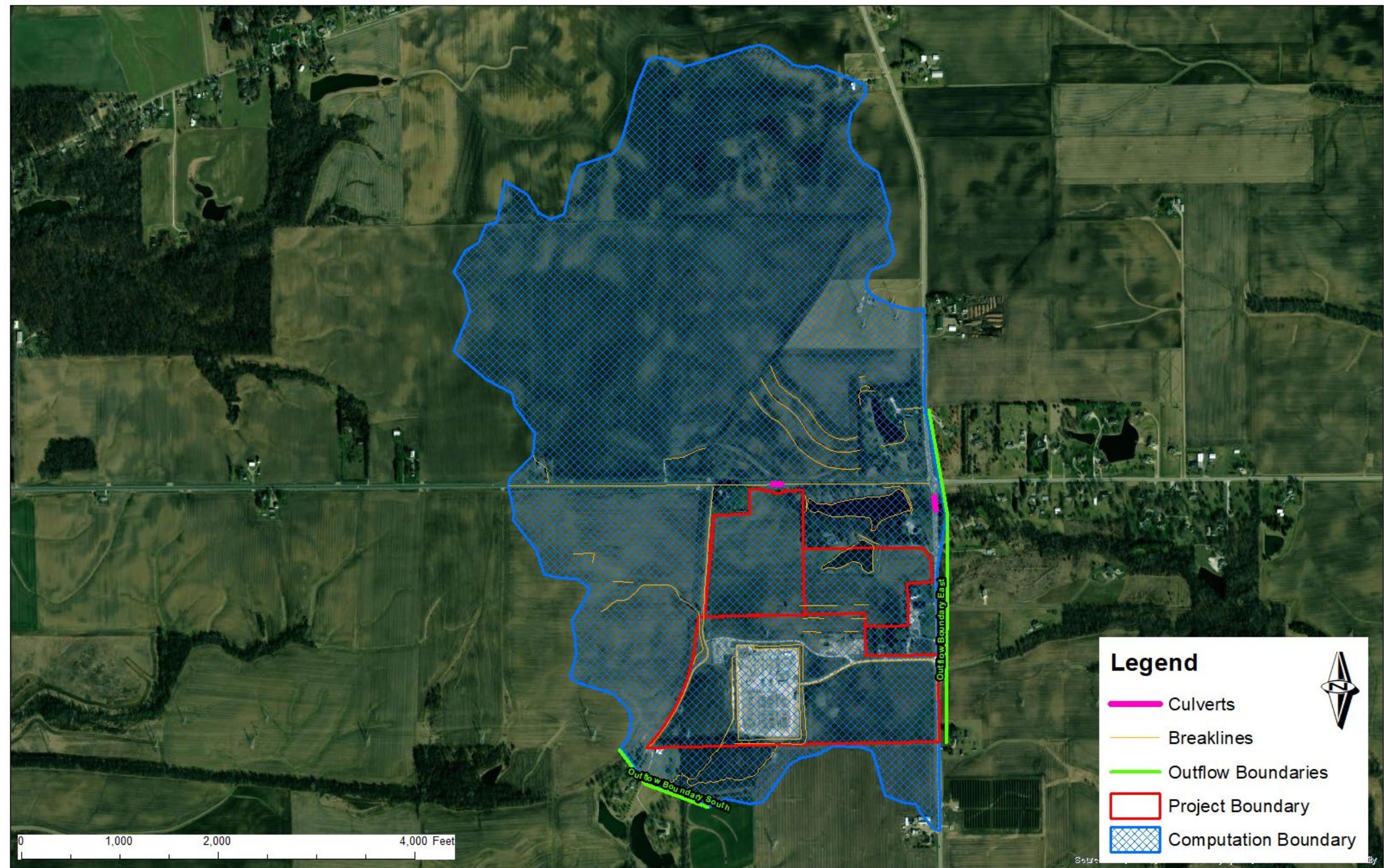


FIGURE 7. LUMINA BESS HEC-RAS SCHEMATIC

4. FLOODPLAIN ANALYSIS

The resulting depths, velocities, and water surface elevations within the domain for each event were computed and visualized using RASMapper. The TIFF files computed within this tool were then exported and used to develop mapping and surfaces for each result (i.e., depth, velocity, water surface elevation) in ArcGIS software. Figures 8 through 15 below depict the resulting inundation extents, depths and velocities associated with the 25- and 100-year, 24- and 72-hour events under pre-development conditions.

To verify the resulting floodplain extents, depths, and velocities for the project site, the peak flows generated within the HEC-RAS 2D model were checked against those produced using the USGS Regional Regression Equations (RRE) embedded within the online StreamStats tool. The peak discharges calculated in both the model and the StreamStats tool are provided in Table 5 below. As shown, the model values are lower than those calculated using the Regional Regression Equations. However, they are within the range of the prediction interval for the USGS estimates and are reasonable for this project, especially considering that the RRE estimates do not account for available storage within watersheds.

TABLE 5. PEAK FLOW COMPARISON

Location	Storm Event	USGS RRE	HEC-RAS 2D
@ Springfield Rd. Culvert	25 yr., 24 hr.	414 cfs	331 cfs
	100 yr., 24 hr.	586 cfs	347 cfs
@ Outflow Boundary South	25 yr., 24 hr.	148 cfs	92 cfs
	100 yr., 24 hr.	220 cfs	147 cfs

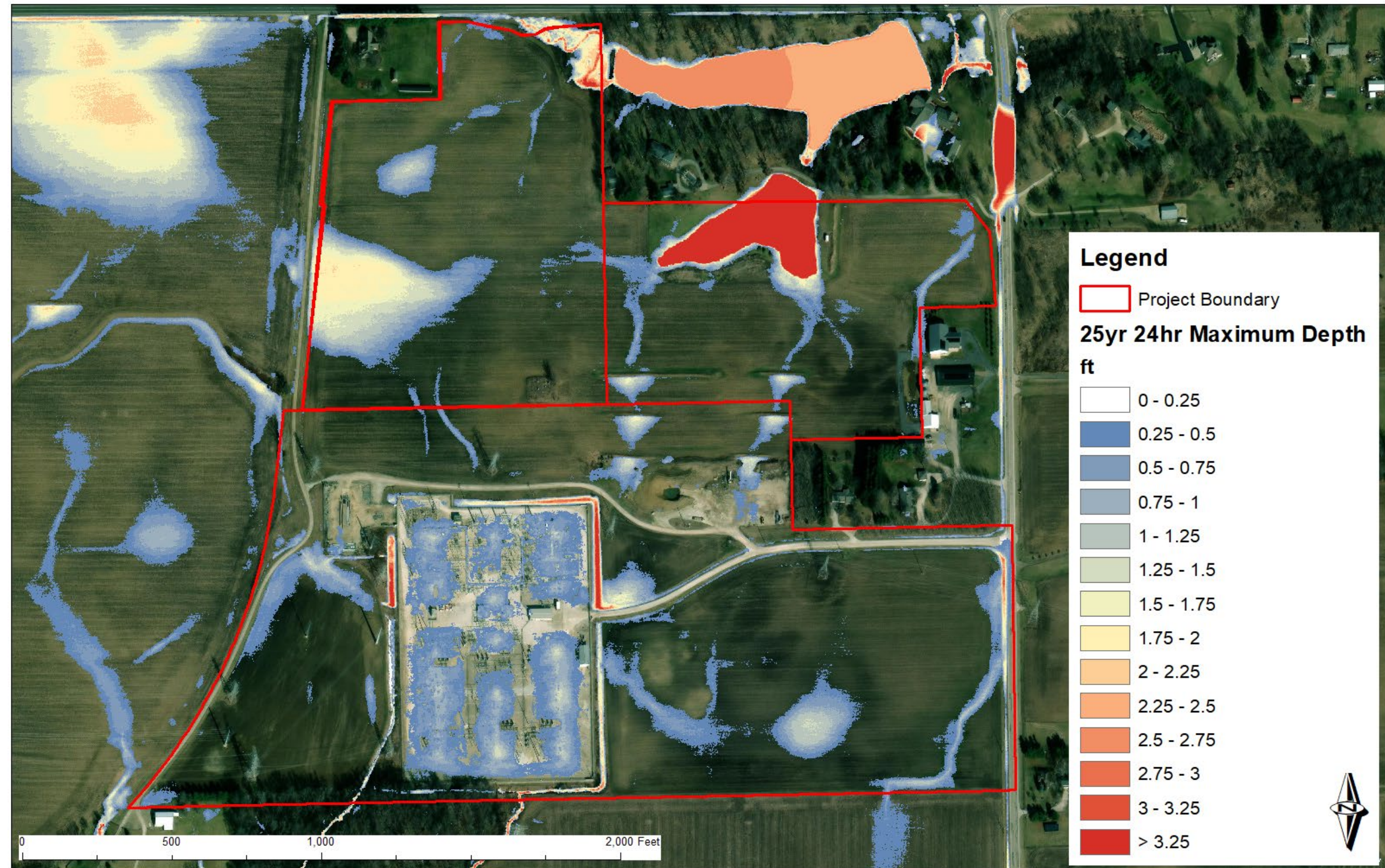


FIGURE 8. LUMINA BESS 25-YEAR, 24-HOUR MAX DEPTH

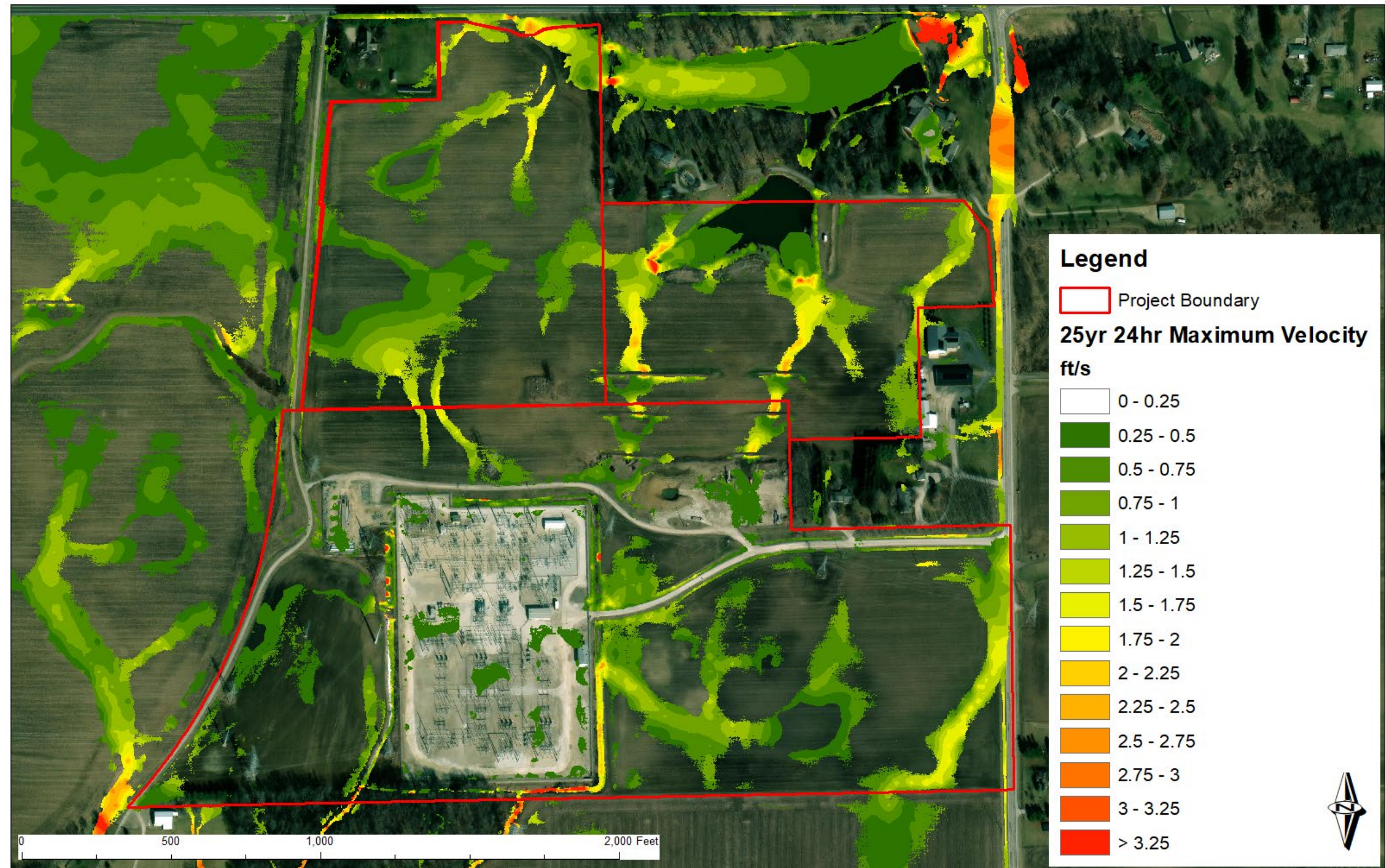


FIGURE 9. LUMINA BESS 25-YEAR, 24-HOUR MAX VELOCITY

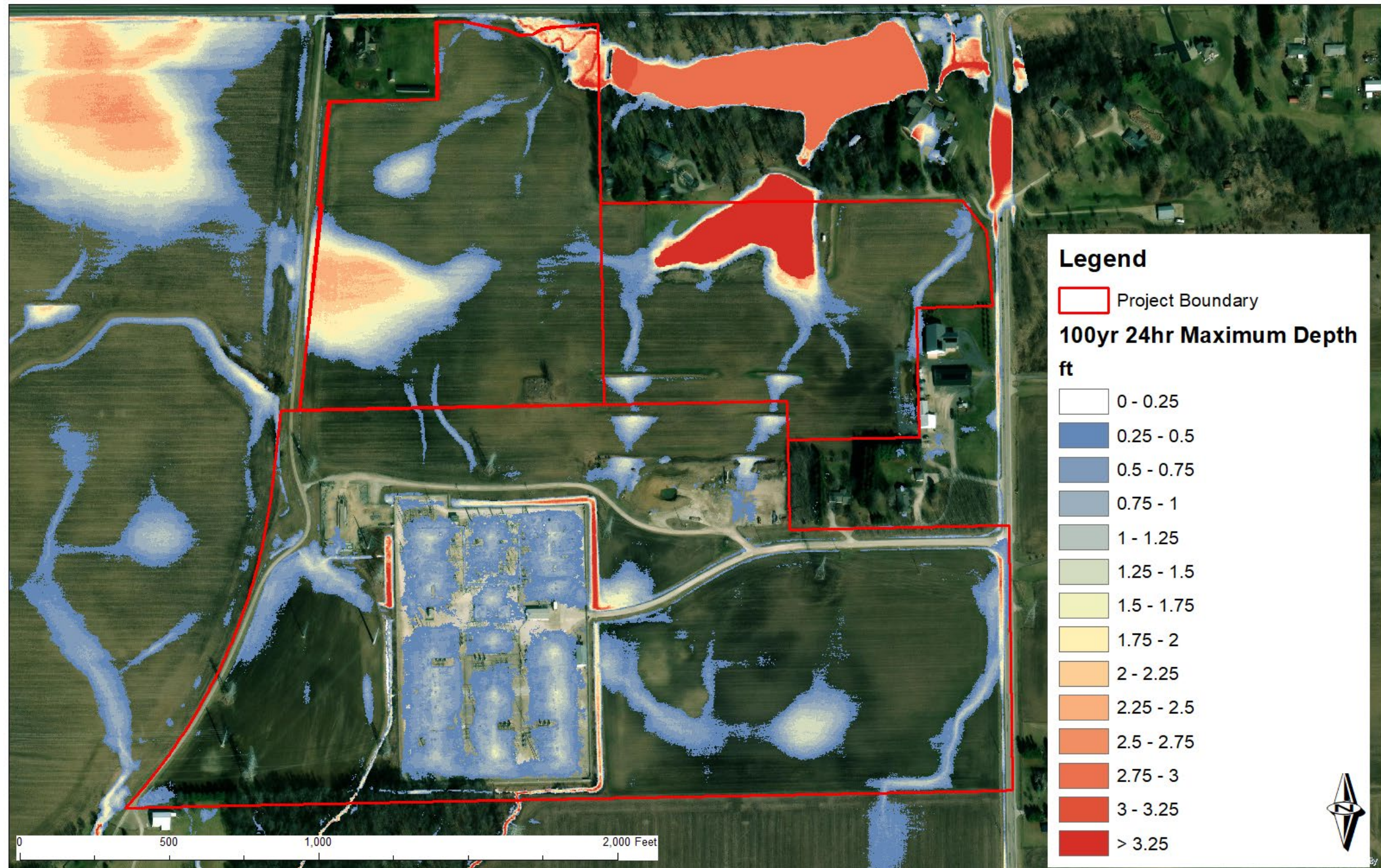


FIGURE 10. LUMINA BESS 100-YEAR, 24-HOUR MAX DEPTH

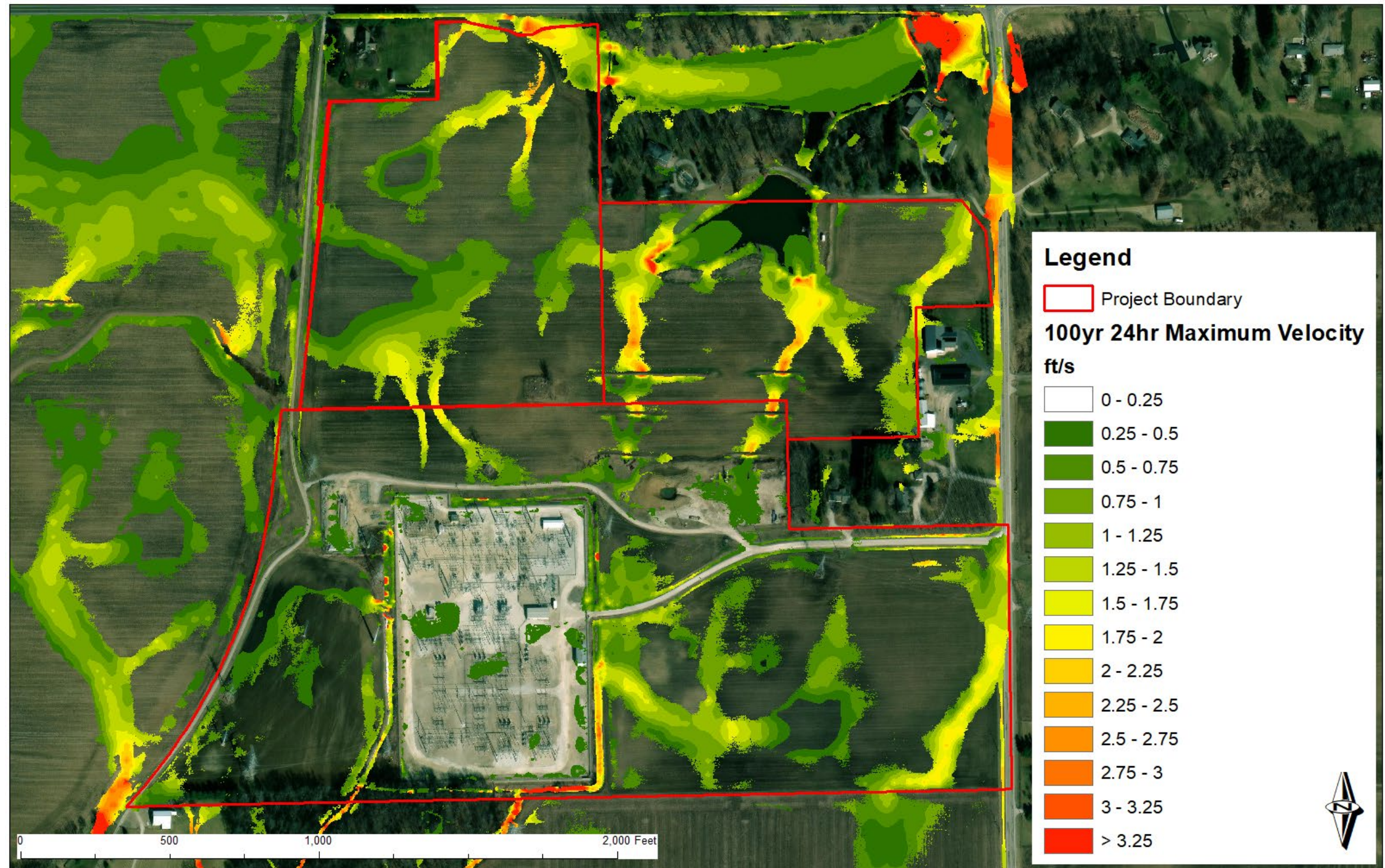


FIGURE 11. LUMINA BESS 100-YEAR, 24-HOUR MAX VELOCITY

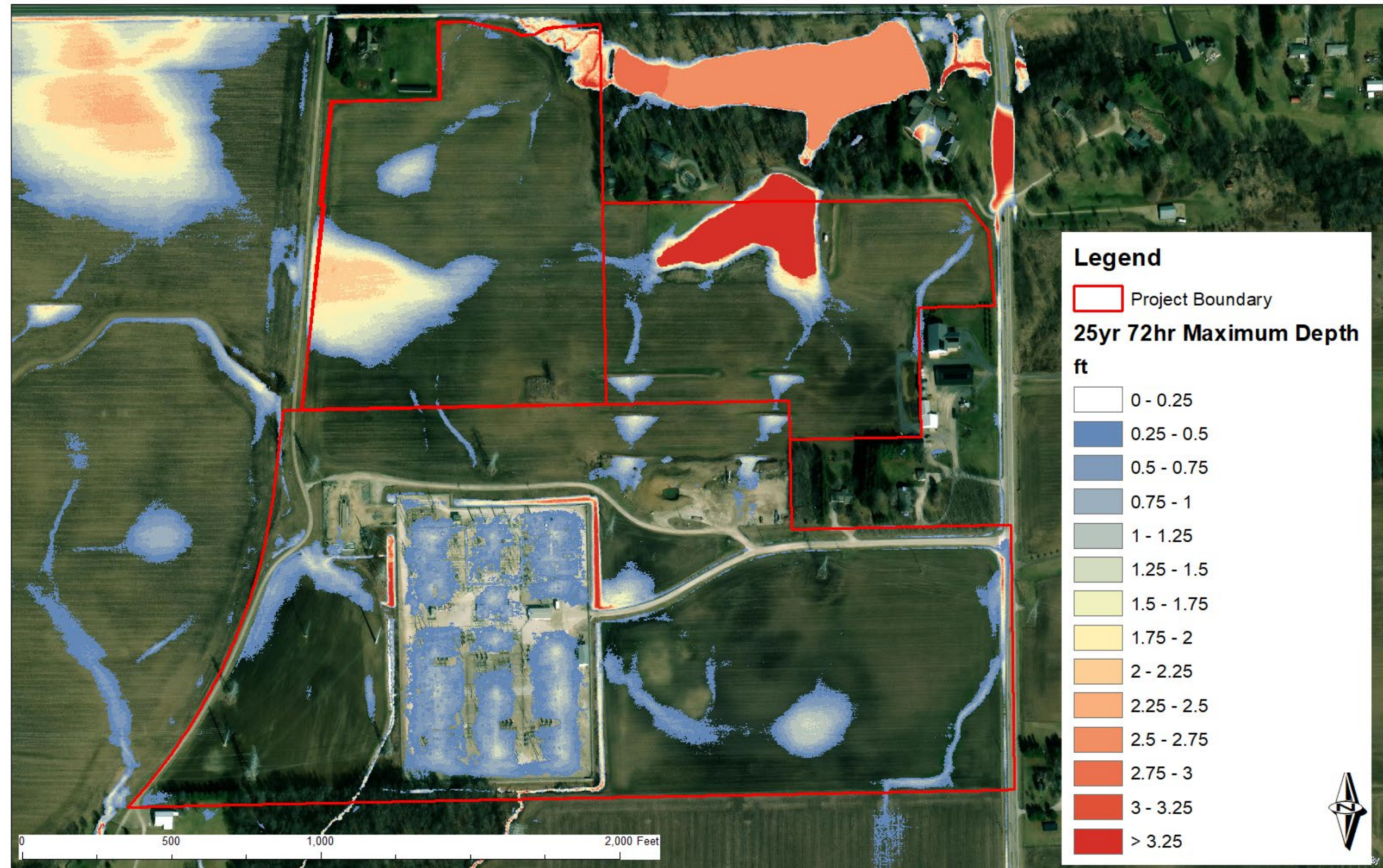


FIGURE 12. LUMINA BESS 25-YEAR, 72-HOUR MAX DEPTH

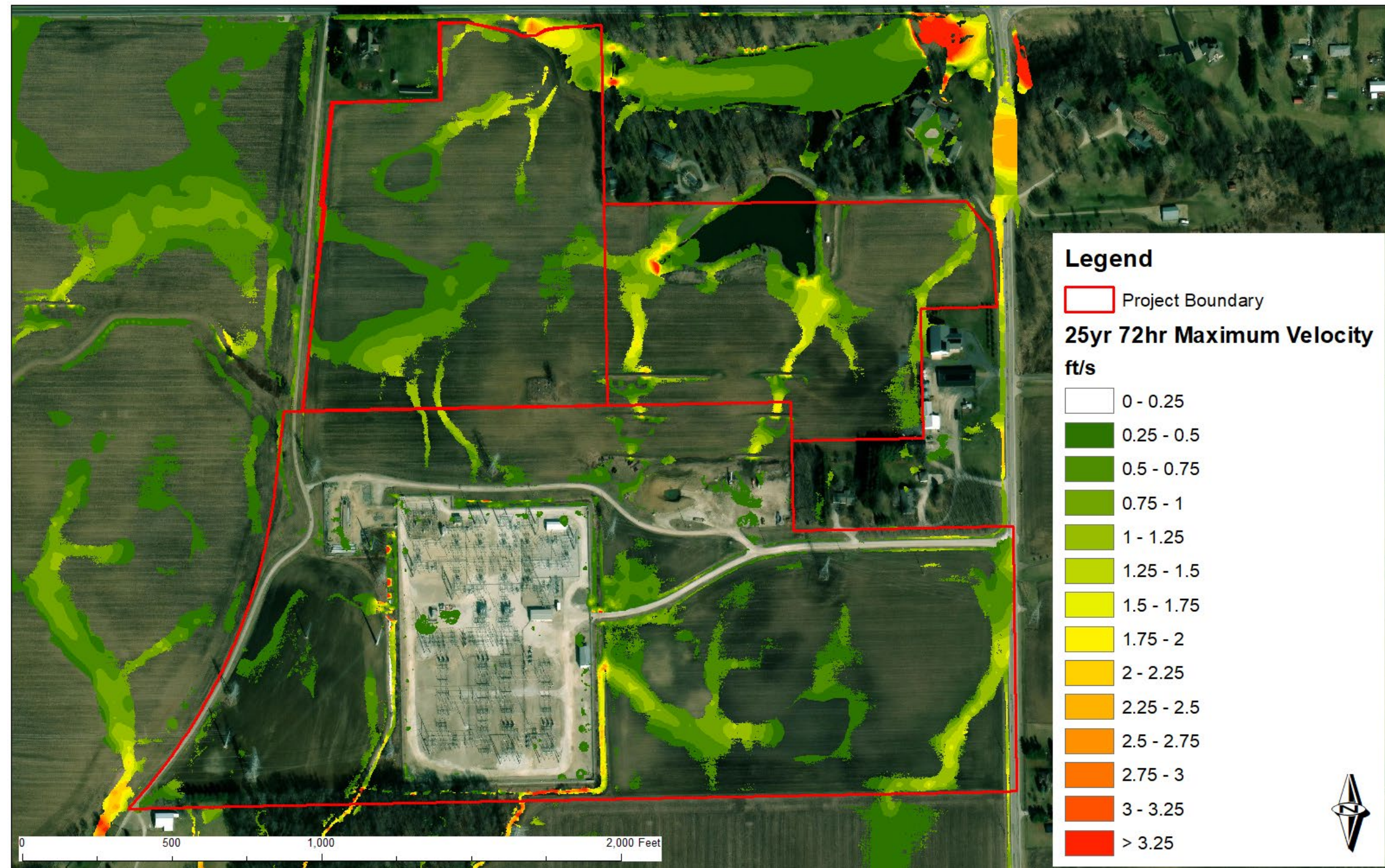


FIGURE 13. LUMINA BESS 25-YEAR, 72-HOUR MAX VELOCITY

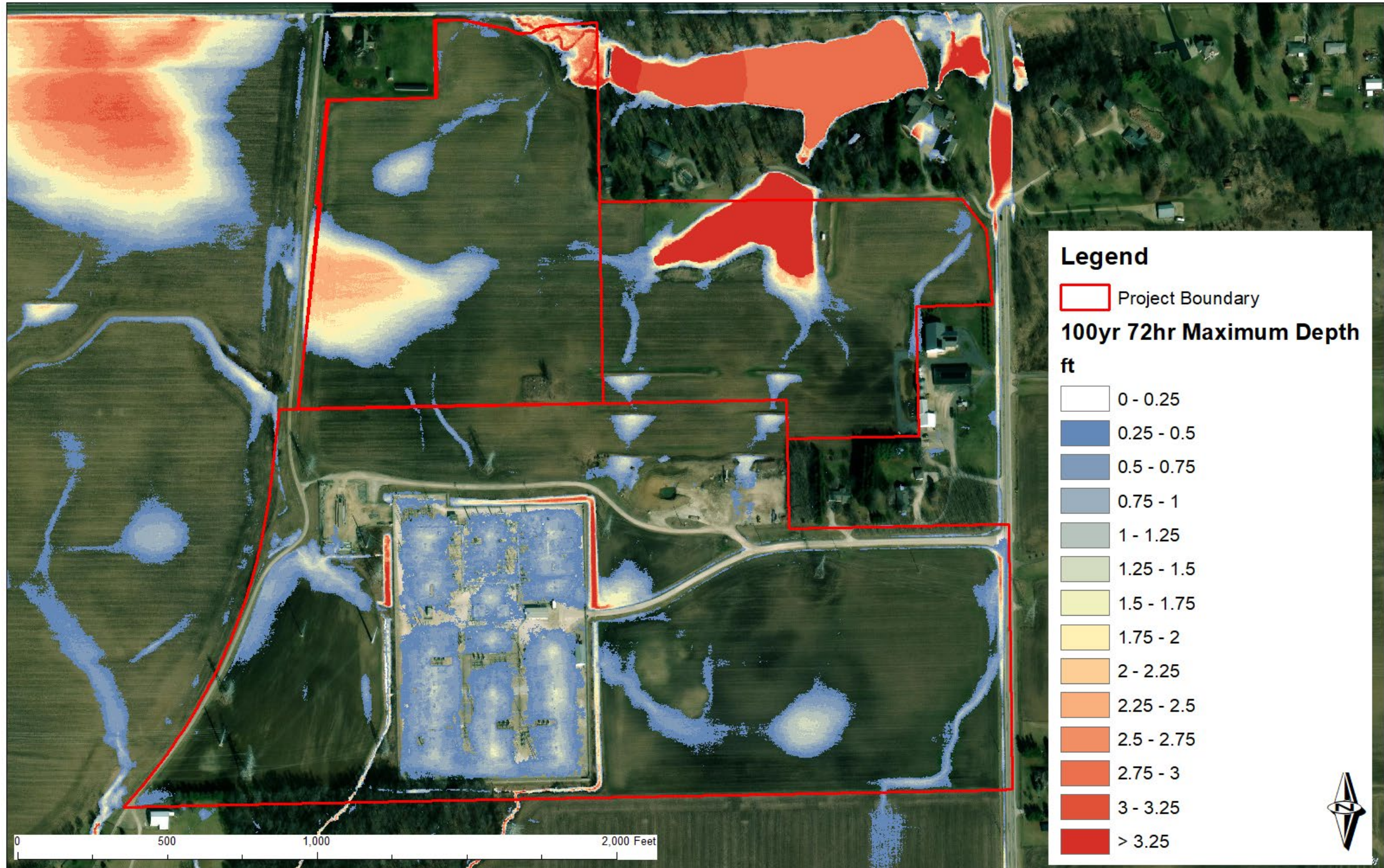


FIGURE 14. LUMINA BESS 100-YEAR, 72-HOUR MAX DEPTH

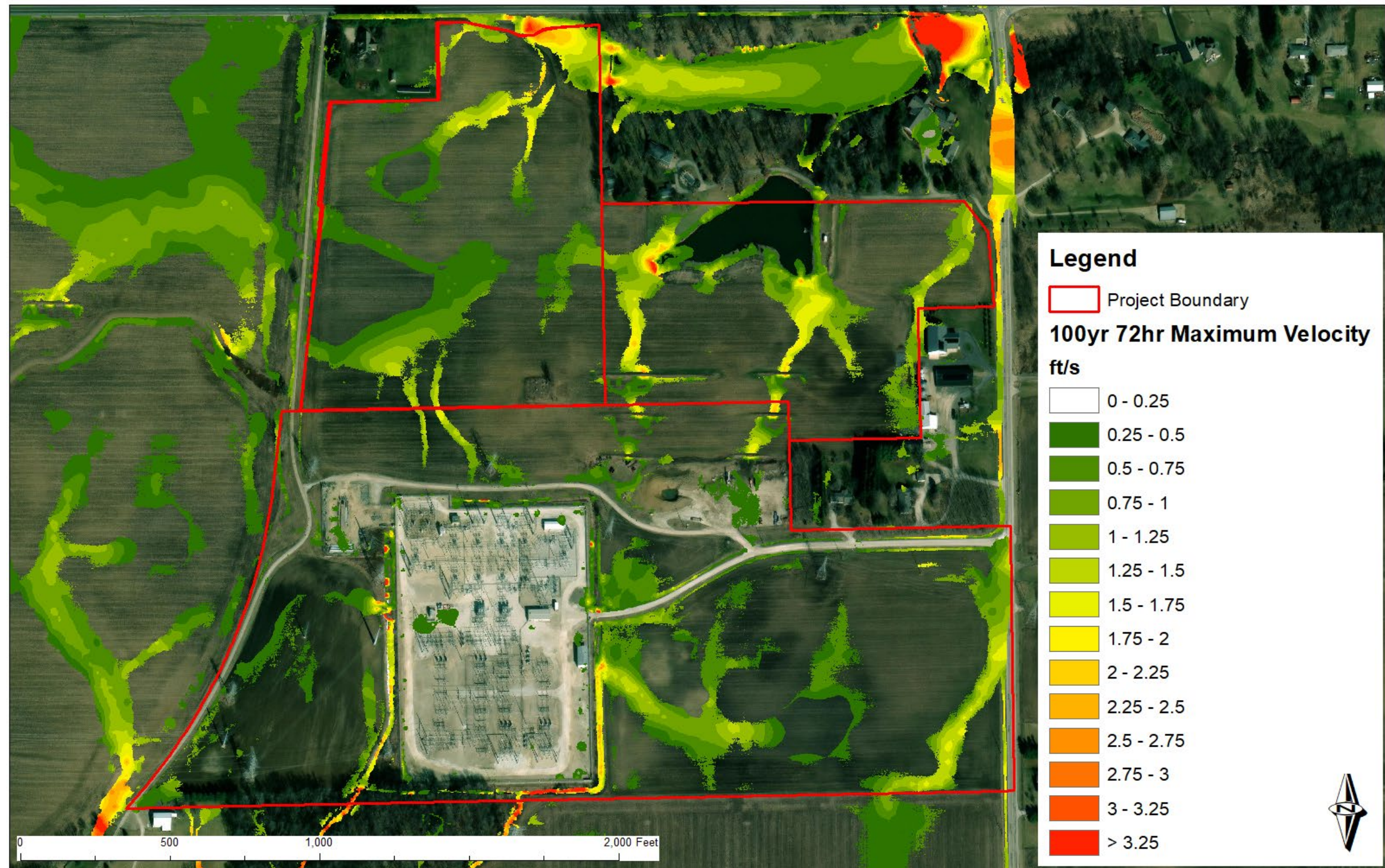


FIGURE 15. LUMINA BESS 100-YEAR, 72-HOUR MAX VELOCITY

5. CONCLUSION

The analyses summarized above were conducted to determine the preliminary floodplain extents, inundation depths and velocities associated with the Lumina BESS Site located within Tazewell County, Illinois. Preliminary hydrologic and hydraulic conditions during the modeled events within the project area show that the main areas of concern are within natural or manmade depressions which result in significant ponding during the modeled events. The following recommendations are provided for site development:

1. The Project should be designed to be in compliance with the applicable drainage standards established by Tazewell County and follow drainage laws recognized by the State of Illinois.
2. This project lies within a Zone X floodplain designation mapped by the Federal Emergency Management Agency. Therefore, the project is not currently located in a FEMA-designated Special Flood Hazard Area.
3. Offsite runoff from the 100-year storm shall be allowed to pass safely around and through the site. It is recommended that natural drainage features be maintained as much as possible. Small ponding locations also be filled.
4. Drainage features should be avoided as locations for BESS facilities.
5. Final design should account for expected flood depths, velocities, and scour to protect infrastructure.
6. Depth at infrastructure locations should be identified. Any proposed BESS facilities within this project should be elevated a minimum of 12-inches above the 100-year water surface elevation across the project site and should be designed based upon generally accepted engineering practices and in accordance with local requirements.
7. Culvert crossings may be required to accommodate onsite access road crossings where they cross existing ditches.
8. Stormwater management for sediment deposition before and after every measurable storm event should be addressed and incorporated into the final design. Regular and frequent monitoring of sediment and deposition following storm events is recommended after construction to ensure removal of deposition material and to fill areas of scour to re-establish the finish grade as necessary.
9. The overall site is suitable for the planned development by avoiding high flood depths within the depressed areas.

6. ENGINEER'S STATEMENT

The information presented in this drainage statement is specific to the development of the Lumina BESS Site in Tazewell County, Illinois. While the analyses and design are in accordance with state and local regulations, the results are not intended to be used outside the scope of this project. If so used, the engineer does not assume any liability associated with that use. It will be up to the individual or the individual's professional to certify the results on their own and accept all liability therein.

7. REFERENCES

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<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.
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8. APPENDIX A: PRECIPITATION AND SOILS DATA



United States
Department of
Agriculture

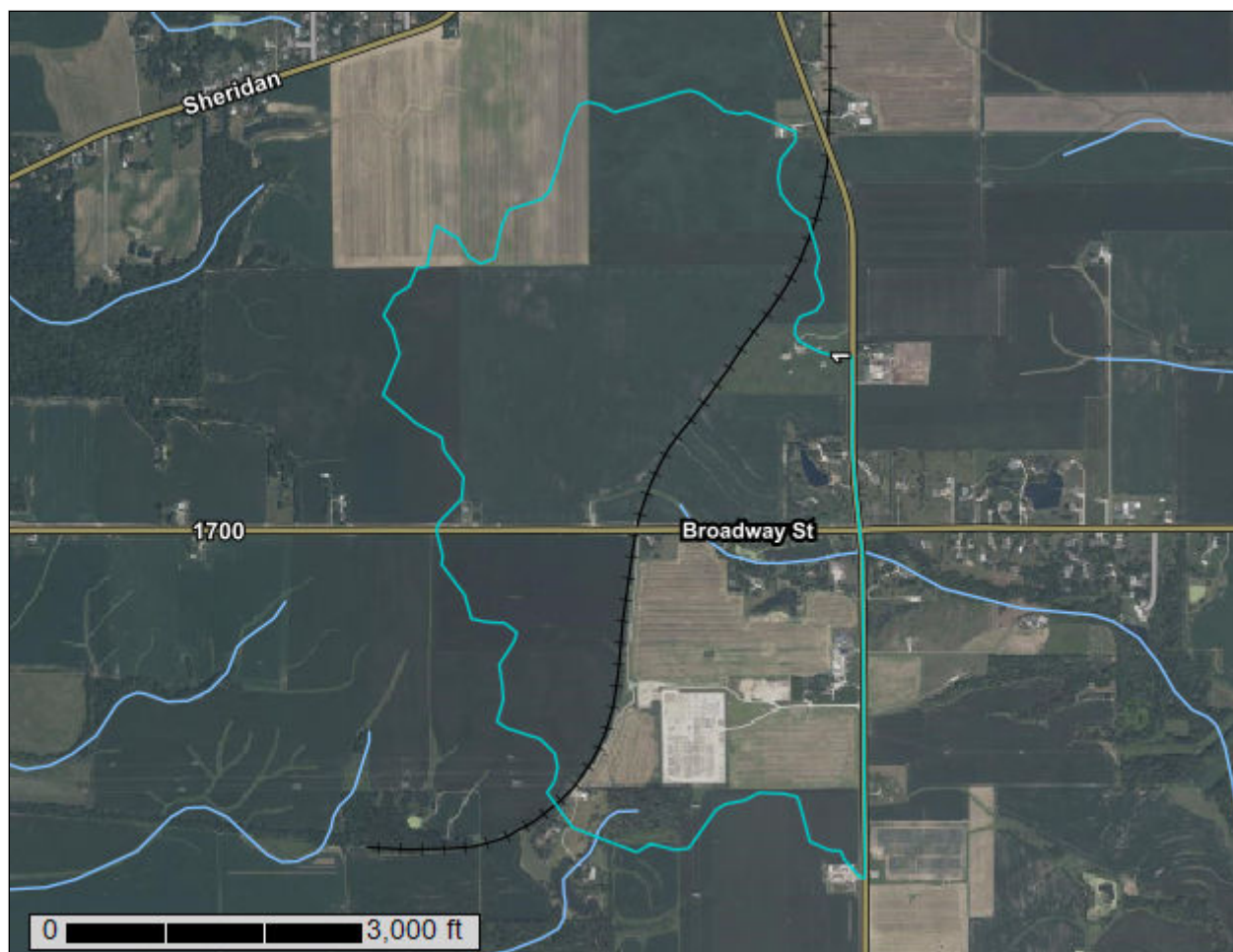
NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Tazewell County, Illinois**

Lumina BESS



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	11
Map Unit Descriptions.....	12
Tazewell County, Illinois.....	14
19D2—Sylvan silt loam, 10 to 18 percent slopes, eroded.....	14
27C2—Miami silt loam, 5 to 10 percent slopes, eroded.....	15
43A—Ipava silt loam, 0 to 2 percent slopes.....	16
61A—Atterberry silt loam, 0 to 2 percent slopes.....	17
68A—Sable silty clay loam, 0 to 2 percent slopes.....	19
86B—Oско silt loam, 2 to 5 percent slopes.....	21
138A—Shiloh silty clay loam, 0 to 2 percent slopes.....	23
171C2—Catlin silt loam, 5 to 10 percent slopes, eroded.....	24
224E—Strawn loam, 18 to 25 percent slopes.....	25
233C2—Birkbeck silt loam, 5 to 10 percent slopes, eroded.....	26
233C3—Birkbeck silty clay loam, 5 to 10 percent slopes, severely eroded.....	27
278A—Stronghurst silt loam, 0 to 2 percent slopes.....	28
279B2—Rozetta silt loam, 2 to 5 percent slopes, eroded.....	30
618D2—Senachwine silt loam, 10 to 18 percent slopes, eroded.....	31
675B—Greenbush silt loam, 2 to 5 percent slopes.....	33
712A—Spaulding silty clay loam, 0 to 2 percent slopes.....	35
3077A—Huntsville silt loam, 0 to 2 percent slopes, frequently flooded.....	36
W—Water.....	37
References	38

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

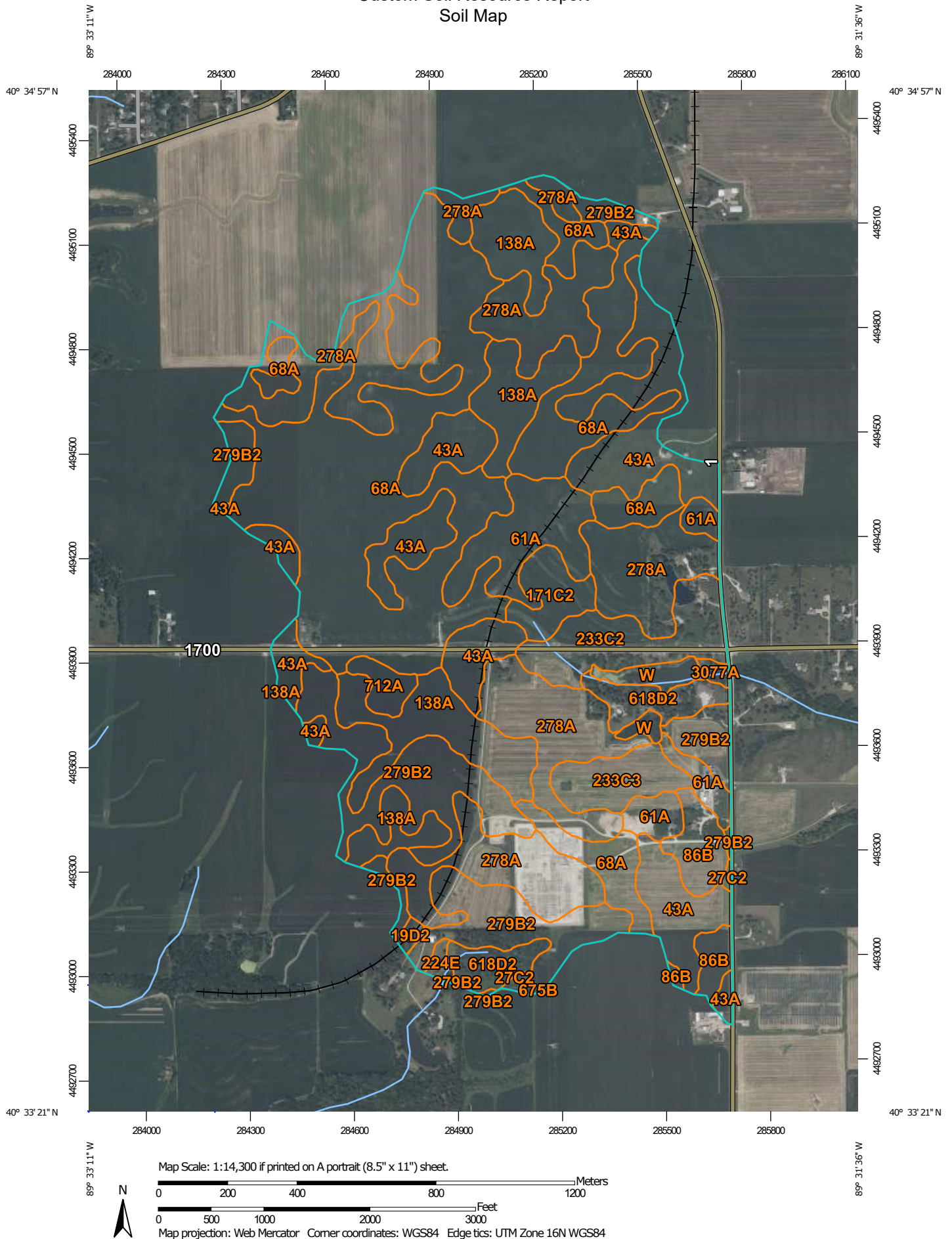
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tazewell County, Illinois

Survey Area Data: Version 19, Aug 31, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 30, 2023—Sep 2, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19D2	Sylvan silt loam, 10 to 18 percent slopes, eroded	1.2	0.2%
27C2	Miami silt loam, 5 to 10 percent slopes, eroded	1.4	0.2%
43A	Ipava silt loam, 0 to 2 percent slopes	80.5	12.9%
61A	Atterberry silt loam, 0 to 2 percent slopes	33.0	5.3%
68A	Sable silty clay loam, 0 to 2 percent slopes	174.0	27.9%
86B	Osco silt loam, 2 to 5 percent slopes	13.3	2.1%
138A	Shiloh silty clay loam, 0 to 2 percent slopes	56.9	9.1%
171C2	Catlin silt loam, 5 to 10 percent slopes, eroded	10.1	1.6%
224E	Strawn loam, 18 to 25 percent slopes	1.5	0.2%
233C2	Birkbeck silt loam, 5 to 10 percent slopes, eroded	23.2	3.7%
233C3	Birkbeck silty clay loam, 5 to 10 percent slopes, severely eroded	12.7	2.0%
278A	Stronghurst silt loam, 0 to 2 percent slopes	119.5	19.1%
279B2	Rozetta silt loam, 2 to 5 percent slopes, eroded	68.9	11.0%
618D2	Senachwine silt loam, 10 to 18 percent slopes, eroded	15.7	2.5%
675B	Greenbush silt loam, 2 to 5 percent slopes	0.2	0.0%
712A	Spaulding silty clay loam, 0 to 2 percent slopes	4.7	0.8%
3077A	Huntsville silt loam, 0 to 2 percent slopes, frequently flooded	1.3	0.2%
W	Water	6.1	1.0%
Totals for Area of Interest		624.2	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas

shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Tazewell County, Illinois

19D2—Sylvan silt loam, 10 to 18 percent slopes, eroded

Map Unit Setting

National map unit symbol: 60n2

Elevation: 350 to 1,350 feet

Mean annual precipitation: 32 to 40 inches

Mean annual air temperature: 48 to 54 degrees F

Frost-free period: 150 to 180 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Sylvan and similar soils: 90 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sylvan

Setting

Landform: Ground moraines

Landform position (two-dimensional): Backslope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Loess

Typical profile

H1 - 0 to 8 inches: silt loam

H2 - 8 to 24 inches: silty clay loam

H3 - 24 to 60 inches: silt

Properties and qualities

Slope: 10 to 18 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 35 percent

Available water supply, 0 to 60 inches: Very high (about 12.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: F115XC005IL - Loess Upland Forest

Hydric soil rating: No

27C2—Miami silt loam, 5 to 10 percent slopes, eroded

Map Unit Setting

National map unit symbol: 60nr

Elevation: 590 to 930 feet

Mean annual precipitation: 32 to 40 inches

Mean annual air temperature: 48 to 54 degrees F

Frost-free period: 160 to 180 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Miami and similar soils: 90 percent

Minor components: 3 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Miami

Setting

Landform: Ground moraines

Landform position (two-dimensional): Backslope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Silty loess over loamy till

Typical profile

H1 - 0 to 7 inches: silt loam

H2 - 7 to 11 inches: silty clay loam

H3 - 11 to 23 inches: clay loam

H4 - 23 to 36 inches: loam

H5 - 36 to 60 inches: loam

Properties and qualities

Slope: 5 to 10 percent

Depth to restrictive feature: 24 to 40 inches to densic material

Drainage class: Moderately well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: About 24 to 42 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 40 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 6.0

Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: F111XD010IN - Till Ridge

Custom Soil Resource Report

Hydric soil rating: No

Minor Components

Drummer

Percent of map unit: 3 percent
Landform: Swales
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XA013IL - Wet Outwash Prairie
Hydric soil rating: Yes

43A—Ipava silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2rmnj
Elevation: 420 to 870 feet
Mean annual precipitation: 36 to 42 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 160 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ipava and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ipava

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 10 inches: silt loam
A - 10 to 18 inches: silty clay loam
Btg1 - 18 to 31 inches: silty clay loam
Btg2 - 31 to 50 inches: silty clay loam
Cg - 50 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained

Custom Soil Resource Report

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: About 12 to 24 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 1

Hydrologic Soil Group: C/D

Ecological site: R108XB008IL - Wet Loess Upland Prairie

Hydric soil rating: No

Minor Components

Denny

Percent of map unit: 5 percent

Landform: Depressions

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: R108XB009IL - Ponded Loess Sedge Meadow

Hydric soil rating: Yes

Sable

Percent of map unit: 5 percent

Landform: Swales

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Ecological site: R108XB009IL - Ponded Loess Sedge Meadow

Hydric soil rating: Yes

Virden

Percent of map unit: 5 percent

Landform: Ground moraines

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R108XB009IL - Ponded Loess Sedge Meadow

Hydric soil rating: Yes

61A—Atterberry silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 60pp

Elevation: 400 to 1,500 feet

Custom Soil Resource Report

Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 47 to 55 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Atterberry and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Atterberry

Setting

Landform: Flats on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

A - 0 to 9 inches: silt loam
E - 9 to 17 inches: silt loam
Bt - 17 to 48 inches: silty clay loam
BC - 48 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 8 percent
Available water supply, 0 to 60 inches: High (about 11.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R108XA010IL - Loess Upland Savanna
Hydric soil rating: No

Minor Components

Sable

Percent of map unit: 1 percent
Landform: Swales
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R108XB009IL - Ponded Loess Sedge Meadow
Hydric soil rating: Yes

Denny

Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R108XB009IL - Ponded Loess Sedge Meadow
Hydric soil rating: Yes

Rozetta

Percent of map unit:
Landform: Ground moraines
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB010WI - Loamy and Clayey Upland
Hydric soil rating: No

Fayette

Percent of map unit:
Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F115XC005IL - Loess Upland Forest
Hydric soil rating: No

68A—Sable silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tjpl
Elevation: 640 to 1,130 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sable and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sable

Setting

Landform: Swales
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loess

Custom Soil Resource Report

Typical profile

Ap - 0 to 23 inches: silty clay loam
Btg1 - 23 to 38 inches: silty clay loam
Btg2 - 38 to 47 inches: silt loam
Cg - 47 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R108XB008IL - Wet Loess Upland Prairie
Forage suitability group: High AWC, high water table (G095BY007WI)
Other vegetative classification: High AWC, high water table (G095BY007WI)
Hydric soil rating: Yes

Minor Components

Muscatune

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB005WI - Moist Loamy or Clayey Lowland
Other vegetative classification: High AWC, high water table (G095BY007WI)
Hydric soil rating: No

Ipava

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XB008IL - Wet Loess Upland Prairie
Other vegetative classification: High AWC, high water table (G095BY007WI)
Hydric soil rating: No

Buckhart

Percent of map unit: 3 percent
Landform: Knolls
Landform position (two-dimensional): Summit, shoulder

Custom Soil Resource Report

Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R108XB005IL - Loess Upland Prairie
Other vegetative classification: High AWC, adequately drained (G095BY008WI)
Hydric soil rating: No

Elburn

Percent of map unit: 2 percent
Landform: Outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB002WI - Wet Floodplain
Other vegetative classification: High AWC, high water table (G095BY007WI)
Hydric soil rating: No

86B—Osco silt loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2tjnt
Elevation: 500 to 1,100 feet
Mean annual precipitation: 35 to 38 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 150 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Osco and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Osco

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, head slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

Ap - 0 to 14 inches: silt loam
Bt - 14 to 55 inches: silty clay loam
C - 55 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches

Custom Soil Resource Report

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)

Depth to water table: About 48 to 72 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 11.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B

Ecological site: R108XB005IL - Loess Upland Prairie

Hydric soil rating: No

Minor Components

Ipava

Percent of map unit: 3 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R108XB008IL - Wet Loess Upland Prairie

Hydric soil rating: No

Sable

Percent of map unit: 3 percent

Landform: Swales

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Ecological site: R108XB008IL - Wet Loess Upland Prairie

Hydric soil rating: Yes

Muscature

Percent of map unit: 3 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve, talf

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R108XB008IL - Wet Loess Upland Prairie

Hydric soil rating: No

Denny

Percent of map unit: 1 percent

Landform: Depressions

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: R115XC018IL - Wet Floodplain Sedge Meadow

Hydric soil rating: Yes

138A—Shiloh silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 60mp
Elevation: 340 to 1,020 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Shiloh and similar soils: 94 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shiloh

Setting

Landform: Depressions on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loess

Typical profile

H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 27 inches: silty clay loam
H3 - 27 to 52 inches: silty clay loam
H4 - 52 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R115XC016IL - Ponded Floodplain Marsh
Hydric soil rating: Yes

171C2—Catlin silt loam, 5 to 10 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2xcld

Elevation: 490 to 980 feet

Mean annual precipitation: 34 to 40 inches

Mean annual air temperature: 46 to 54 degrees F

Frost-free period: 159 to 186 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Catlin, eroded, and similar soils: 99 percent

Minor components: 1 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Catlin, Eroded

Setting

Landform: Moraines, till plains

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Side slope, interfluvium

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Loess over loamy till

Typical profile

Ap - 0 to 7 inches: silt loam

Bt1 - 7 to 43 inches: silty clay loam

2Bt2 - 43 to 52 inches: clay loam

2C - 52 to 60 inches: loam

Properties and qualities

Slope: 5 to 10 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: About 24 to 42 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 40 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: R108XA006IL - Loess Upland Prairie

Hydric soil rating: No

Minor Components

Urban land

Percent of map unit: 1 percent

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

224E—Strawn loam, 18 to 25 percent slopes

Map Unit Setting

National map unit symbol: 60n9

Elevation: 680 to 1,020 feet

Mean annual precipitation: 29 to 40 inches

Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 140 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Strawn and similar soils: 95 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Strawn

Setting

Landform: Ground moraines

Landform position (two-dimensional): Backslope

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Calcareous loamy till

Typical profile

H1 - 0 to 7 inches: loam

H2 - 7 to 22 inches: clay loam

H3 - 22 to 60 inches: loam

Properties and qualities

Slope: 18 to 25 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 40 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 6.0

Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F108XA011IL - Loess Upland Forest
Hydric soil rating: No

233C2—Birkbeck silt loam, 5 to 10 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2sssd
Elevation: 560 to 920 feet
Mean annual precipitation: 35 to 40 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 160 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Birkbeck, eroded, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Birkbeck, Eroded

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over loamy till

Typical profile

Ap - 0 to 9 inches: silt loam
Bt - 9 to 47 inches: silty clay loam
2BC - 47 to 51 inches: loam
2C - 51 to 60 inches: loam

Properties and qualities

Slope: 5 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: F108XA011IL - Loess Upland Forest

Hydric soil rating: No

Minor Components

Sabina

Percent of map unit: 5 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit, footslope

Landform position (three-dimensional): Interfluve

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F108XA011IL - Loess Upland Forest

Hydric soil rating: No

233C3—Birkbeck silty clay loam, 5 to 10 percent slopes, severely eroded

Map Unit Setting

National map unit symbol: 60ng

Elevation: 590 to 930 feet

Mean annual precipitation: 32 to 40 inches

Mean annual air temperature: 48 to 54 degrees F

Frost-free period: 160 to 180 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Birkbeck and similar soils: 90 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Birkbeck

Setting

Landform: End moraines, ground moraines

Landform position (two-dimensional): Shoulder, backslope

Down-slope shape: Convex

Across-slope shape: Linear, convex

Parent material: Loess over till

Typical profile

H1 - 0 to 8 inches: silty clay loam

H2 - 8 to 44 inches: silty clay loam

H3 - 44 to 60 inches: loam

Properties and qualities

Slope: 5 to 10 percent

Custom Soil Resource Report

Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 6.0
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F108XA011IL - Loess Upland Forest
Hydric soil rating: No

278A—Stronghurst silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 60np
Elevation: 340 to 1,500 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 47 to 54 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Stronghurst and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stronghurst

Setting

Landform: Flats on ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

A - 0 to 8 inches: silt loam
Bt - 8 to 47 inches: silty clay loam
C - 47 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Custom Soil Resource Report

Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 11.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F115XC005IL - Loess Upland Forest
Hydric soil rating: No

Minor Components

Sable

Percent of map unit: 3 percent
Landform: Swales, ground moraines
Landform position (two-dimensional): Summit, toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XB009IL - Ponded Loess Sedge Meadow
Hydric soil rating: Yes

Rushville

Percent of map unit: 3 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F115XC006IL - Loess Upland Flatwoods
Hydric soil rating: Yes

Greenbush

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XB006IL - Loess Upland Savanna
Hydric soil rating: No

Rozetta

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB010WI - Loamy and Clayey Upland
Hydric soil rating: No

Fayette

Percent of map unit: 1 percent

Custom Soil Resource Report

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F115XC005IL - Loess Upland Forest
Hydric soil rating: No

Edgington

Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R108XB009IL - Ponded Loess Sedge Meadow
Hydric soil rating: Yes

279B2—Rozetta silt loam, 2 to 5 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2tjp5
Elevation: 560 to 830 feet
Mean annual precipitation: 36 to 40 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 175 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Rozetta and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rozetta

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, head slope, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silt loam
Bt1 - 6 to 25 inches: silty clay loam
Bt2 - 25 to 53 inches: silty clay loam
C - 53 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Custom Soil Resource Report

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)

Depth to water table: About 48 to 72 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Very high (about 12.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B

Ecological site: F115XC005IL - Loess Upland Forest

Hydric soil rating: No

Minor Components

Sable

Percent of map unit: 5 percent

Landform: Swales

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Ecological site: R108XB009IL - Ponded Loess Sedge Meadow

Hydric soil rating: Yes

Keomah

Percent of map unit: 5 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: F115XC005IL - Loess Upland Forest

Hydric soil rating: No

618D2—Senachwine silt loam, 10 to 18 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2ww98

Elevation: 460 to 980 feet

Mean annual precipitation: 34 to 42 inches

Mean annual air temperature: 46 to 54 degrees F

Frost-free period: 152 to 187 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Senachwine, eroded, and similar soils: 93 percent

Minor components: 7 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Senachwine, Eroded

Setting

Landform: Ground moraines, end moraines

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Thin mantle of loess or other silty material over calcareous loamy till

Typical profile

Ap - 0 to 6 inches: silt loam

Bt1 - 6 to 15 inches: silty clay loam

2Bt2 - 15 to 28 inches: clay loam

2BCt - 28 to 34 inches: loam

2C - 34 to 60 inches: loam

Properties and qualities

Slope: 10 to 18 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 40 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: F108XA011IL - Loess Upland Forest

Hydric soil rating: No

Minor Components

Xenia, bloomington ridged plain

Percent of map unit: 3 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: F108XA011IL - Loess Upland Forest

Hydric soil rating: No

Sabina

Percent of map unit: 2 percent

Landform: End moraines, ground moraines

Landform position (two-dimensional): Summit, footslope

Custom Soil Resource Report

Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F108XA011IL - Loess Upland Forest
Hydric soil rating: No

Sawmill, frequently flooded

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XA018IL - Ponded Floodplain Marsh
Hydric soil rating: Yes

675B—Greenbush silt loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w6rj
Elevation: 460 to 1,120 feet
Mean annual precipitation: 34 to 39 inches
Mean annual air temperature: 47 to 55 degrees F
Frost-free period: 140 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Greenbush and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Greenbush

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

Ap - 0 to 7 inches: silt loam
E - 7 to 12 inches: silt loam
Bt - 12 to 54 inches: silty clay loam
C - 54 to 79 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Custom Soil Resource Report

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)

Depth to water table: About 48 to 72 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B

Ecological site: R108XB006IL - Loess Upland Savanna

Hydric soil rating: No

Minor Components

Atterberry

Percent of map unit: 5 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve

Down-slope shape: Concave

Across-slope shape: Linear

Ecological site: F095XB005WI - Moist Loamy or Clayey Lowland

Hydric soil rating: No

Muscatune

Percent of map unit: 3 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluve

Down-slope shape: Concave

Across-slope shape: Linear

Ecological site: R108XB008IL - Wet Loess Upland Prairie

Hydric soil rating: No

Sable

Percent of map unit: 1 percent

Landform: Swales

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Concave

Ecological site: R108XB008IL - Wet Loess Upland Prairie

Hydric soil rating: Yes

Denny

Percent of map unit: 1 percent

Landform: Depressions

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: R115XC018IL - Wet Floodplain Sedge Meadow

Hydric soil rating: Yes

712A—Spaulding silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2q7yd
Elevation: 590 to 1,000 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Spaulding and similar soils: 91 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spaulding

Setting

Landform: Depressions on ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loess

Typical profile

H1 - 0 to 22 inches: silty clay loam
H2 - 22 to 38 inches: silty clay loam
H3 - 38 to 44 inches: silty clay loam
H4 - 44 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Very high (about 12.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R108XB009IL - Ponded Loess Sedge Meadow, R108XA009IL -
Ponded Calcareous Loess Sedge Meadow
Hydric soil rating: Yes

Minor Components

Sable

Percent of map unit: 1 percent
Landform: Swales on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R108XB009IL - Ponded Loess Sedge Meadow
Hydric soil rating: Yes

3077A—Huntsville silt loam, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 60p0
Elevation: 340 to 1,360 feet
Mean annual precipitation: 30 to 45 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 160 to 200 days
Farmland classification: Prime farmland if protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Huntsville and similar soils: 91 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Huntsville

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 43 inches: silt loam
H2 - 43 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: Frequent
Frequency of ponding: None

Custom Soil Resource Report

Available water supply, 0 to 60 inches: Very high (about 13.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: B

Ecological site: F115XC020IL - Loamy Floodplain Forest

Hydric soil rating: No

Minor Components

Sawmill

Percent of map unit: 3 percent

Landform: Flood plains

Ecological site: F108XB021IL - Wet Loamy Floodplain Forest

Hydric soil rating: Yes

Beaucoup

Percent of map unit: 1 percent

Landform: Flood plains

Ecological site: F114XB203IN - Wet Floodplain Forest

Hydric soil rating: Yes

Otter

Percent of map unit: 1 percent

Landform: Flood plains

Ecological site: R108XA018IL - Ponded Floodplain Marsh

Hydric soil rating: Yes

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Setting

Landform: Drainageways, perennial streams, lakes, channels, rivers, oxbows

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

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Custom Soil Resource Report

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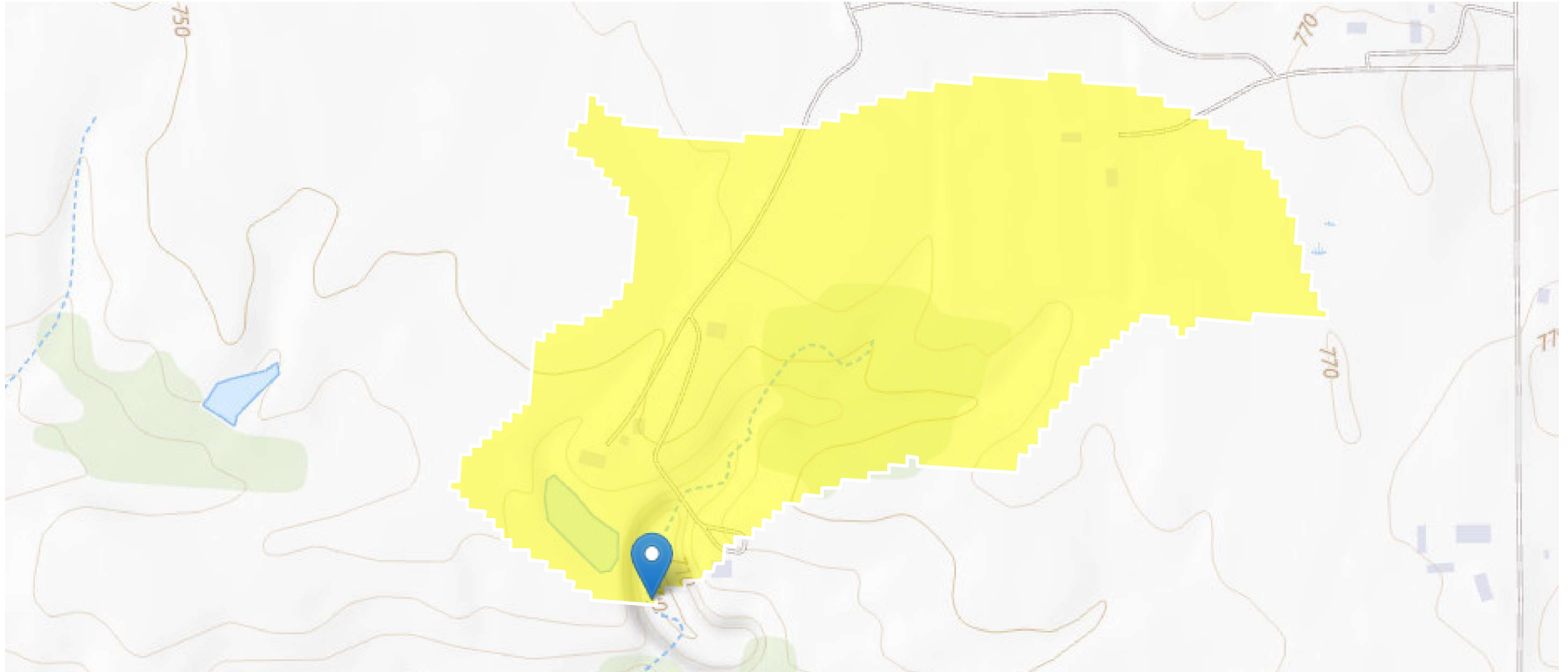
StreamStats Report

Region ID: IL

Workspace ID: IL20251205191312193000

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Time: 2025-12-05 12:13:37 -0700



[+ Collapse All](#)

➤ Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DEMSLX100	Average slope of 10-meter DEM cells, using a vertical exaggeration factor of 100, computed using Slope tool in ArcMap	63.62	degrees
DRNAREA	Area that drains to a point on a stream	0.118	square miles
TPISTATSGO	computed as 100*(percent sand) + 10*(percent silt) + (percent clay), using soil texture fractions from STATSGO	2727	percent
URBTHE2010	Fraction of drainage area that is in urban classes 7 to 10 from Theobald 2010	0	dimensionless

➤ Peak-Flow Statistics

Peak-Flow Statistics Parameters [IL Peakflow Region 3 ICT-23-014]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DEMSLX100	Exaggerated slope from 10 meter DEM	63.62	decimal degrees	22.12	77.92
DRNAREA	Drainage Area	0.118	square miles	0.0378	2618
TPISTATSGO	Weighted_soil_texture_from_STATSGO	2727	weighted percent	988	6582
URBTHE2010	Fraction_of_Urban_Land_Theobald_2010	0	dimensionless	0	1

Peak-Flow Statistics Flow Report [IL Peakflow Region 3 ICT-23-014]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU	ASEp
50-percent AEP flood	35.4	ft ³ /s	17.6	71.1	41.4
20-percent AEP flood	73	ft ³ /s	37.1	144	39.9
10-percent AEP flood	104	ft ³ /s	52.2	207	40.5
4-percent AEP flood	148	ft ³ /s	73	300	41.3
2-percent AEP flood	184	ft ³ /s	89	380	42.3
1-percent AEP flood	220	ft ³ /s	106	458	42.4
0.5-percent AEP flood	258	ft ³ /s	121	549	43.5
0.2-percent AEP flood	309	ft ³ /s	141	675	44.9

Peak-Flow Statistics Citations

Over, T.M., Marti, M.K., O'Shea, P.S., Sharpe, J.B.2023, Estimating peak-flow quantiles for selected annual exceedance probabilities in Illinois (Report No. FHWA-ICT-23-014). Illinois Center for Transportation. (<https://doi.org/10.36501/0197-9191/23-019>)

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Application Version: 4.29.4

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1

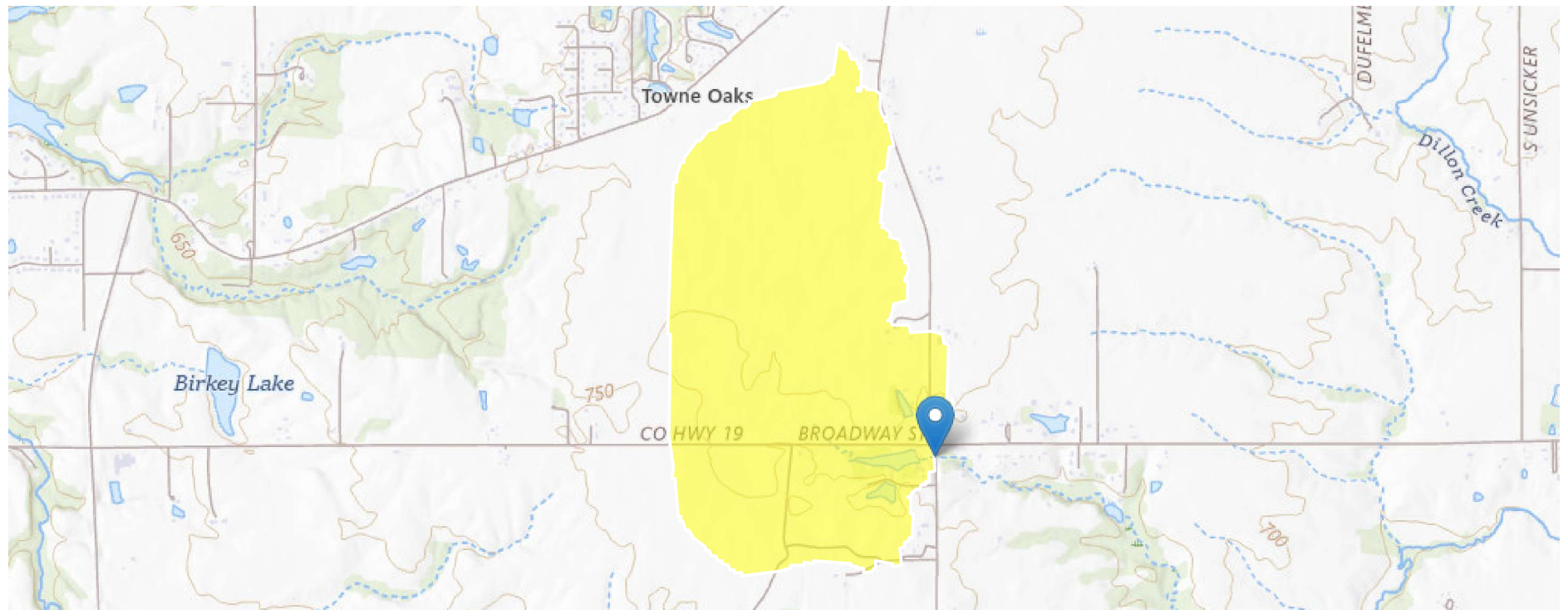
StreamStats Report

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Workspace ID: IL20251205191524971000

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Time: 2025-12-05 12:15:51 -0700



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➤ Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DEMSLX100	Average slope of 10-meter DEM cells, using a vertical exaggeration factor of 100, computed using Slope tool in ArcMap	51.75	degrees
DRNAREA	Area that drains to a point on a stream	0.973	square miles
TPISTATSGO	computed as 100*(percent sand) + 10*(percent silt) + (percent clay), using soil texture fractions from STATSGO	2533.05	percent
URBTHE2010	Fraction of drainage area that is in urban classes 7 to 10 from Theobald 2010	0.026	dimensionless

➤ Peak-Flow Statistics

Peak-Flow Statistics Parameters [IL Peakflow Region 3 ICT-23-014]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DEMSLX100	Exaggerated slope from 10 meter DEM	51.75	decimal degrees	22.12	77.92
DRNAREA	Drainage Area	0.973	square miles	0.0378	2618
TPISTATSGO	Weighted_soil_texture_from_STATSGO	2533.05	weighted percent	988	6582
URBTHE2010	Fraction_of_Urban_Land_Theobald_2010	0.026	dimensionless	0	1

Peak-Flow Statistics Flow Report [IL Peakflow Region 3 ICT-23-014]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU	ASEp
50-percent AEP flood	119	ft^3/s	61.3	231	41.4
20-percent AEP flood	223	ft^3/s	117	424	39.9

Statistic	Value	Unit	PIL	PIU	ASEp
10-percent AEP flood	304	ft ³ /s	158	583	40.5
4-percent AEP flood	414	ft ³ /s	213	804	41.3
2-percent AEP flood	499	ft ³ /s	253	985	42.3
1-percent AEP flood	586	ft ³ /s	296	1160	42.4
0.5-percent AEP flood	674	ft ³ /s	335	1360	43.5
0.2-percent AEP flood	793	ft ³ /s	386	1630	44.9

Peak-Flow Statistics Citations

Over, T.M., Marti, M.K., O'Shea, P.S., Sharpe, J.B.2023, Estimating peak-flow quantiles for selected annual exceedance probabilities in Illinois (Report No. FHWA-ICT-23-014). Illinois Center for Transportation. (<https://doi.org/10.36501/0197-9191/23-019>)

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Application Version: 4.29.4

StreamStats Services Version: 1.2.22

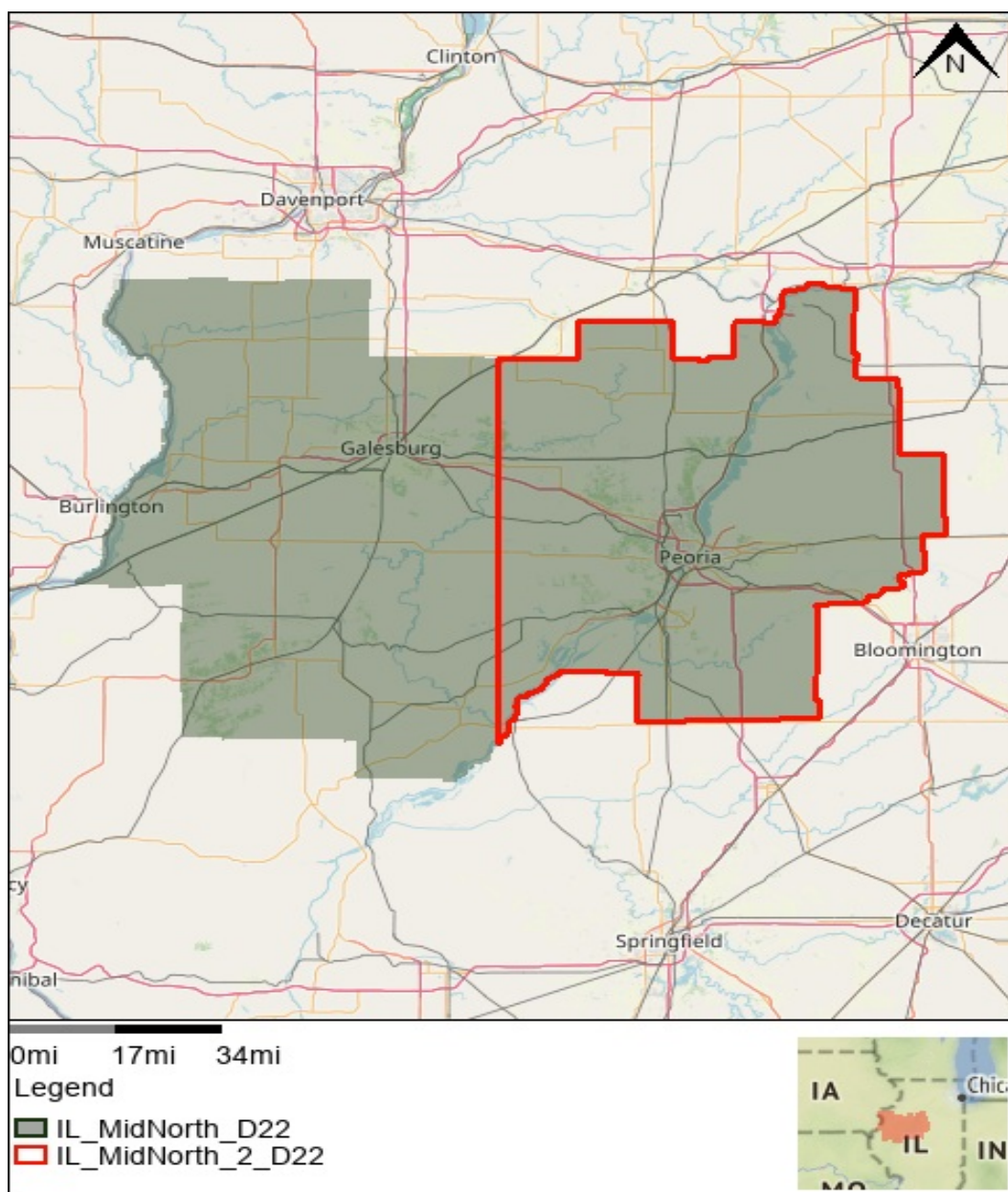
NSS Services Version: 2.2.1

Data Validation Report

from the National Geospatial Technical Operations Center in
Support of the 3D Elevation Program

IL_MidNorth_2_D22

2023-05-12



Based on this review, the delivered data is **EXPECTED TO MEET** 3D Elevation Program requirements.

Work Unit Summary Information

Project Name: IL_MidNorth_D22	Project ID: 229058	
WU Name: IL_MidNorth_2_D22	Work Unit ID: 300135	
Mechanism: GPSC	Lidar Base Spec: 2021 Revision A	
Quality Level: 2	P-Method: 7 - Linear-Mode Lidar	
Horizontal EPSG Code: 6457	Vertical EPSG Code: 6360	Geoid Model: GEOID18
The National Map Help Desk Email: tnm_help@usgs.gov		

The U.S. Geological Survey evaluates absolute vertical accuracy of the lidar and lidar-derived bare earth digital elevation model (DEM) data at the project level. Data are produced to meet 9.8 cm absolute vertical accuracy at the 95-percent confidence level in non-vegetated, open terrain. To review vertical accuracy results, please see the project report

Breaklines

Based on this Review, the USGS-NGTOC **ACCEPTS** the Breaklines

Breaklines are visually reviewed in conjunction with the bare earth DEM for spatial and geometric accuracy. Breaklines are confirmed to be three dimensional (3D) features and that elevations are at or just below the immediately surrounding terrain. Single- and double-line drainages are reviewed to ensure downstream flow. The USGS recognizes that differences in collection methodology, resampling techniques, and other factors that are unique to proprietary production do occur, and these will result in minor horizontal and vertical differences between breaklines derived on the fly.

Reporting Metadata

Based on this Review, the USGS-NGTOC **ACCEPTS** the Reporting Metadata

Reports from the contractor, including calibration, collection, and processing methods, are reviewed for accurate information. For more information, please see the work units metadata.

FGDC XML Metadata

Based on this Review, the USGS-NGTOC **ACCEPTS** the FGDC XML Metadata

CSGDM .xml metadata are parsed using the USGS Geospatial Metadata Validation Service and reviewed for accurate information. CSDGM is maintained by the Federal Geographic Data Committee (FGDC).

Spatial Metadata

Based on this Review, the USGS-NGTOC **ACCEPTS** the Spatial Metadata

Spatial metadata from the contractor, including raster and vector datasets, are evaluated together with pertinent deliverables for geometric fidelity and attribution accuracy. For more information, please see the work units metadata.

DEM

Based on this Review, the USGS-NGTOC **ACCEPTS** the DEM

Visual review is performed on .tif bare earth rasters at a 1:5,000 or larger viewing scale to validate point cloud geometry, raster processing methodology, point classification, and breaklines. Comprehensive review is completed to ensure consistency and accuracy across all files. For additional information, please see this work units metadata folder.

Pointcloud

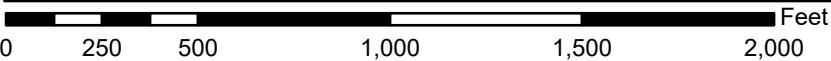
Based on this Review, the USGS-NGTOC **ACCEPTS** the Pointcloud

Visual and statistical review is performed on classified .las files to validate adherence to contracted specifications. A comprehensive review is completed to ensure consistency and accuracy across all files, including the spatial reference system. Classification verification is limited to the minimum required by applicable Lidar Base Specification. Classifications beyond the minimum are not verified by USGS. LAS files are evaluated to ensure the public header block, point data records, and variable/extended variable length records are correctly populated. For additional information, please see the work units metadata folder.

National Flood Hazard Layer FIRMMette



89°32'18"W 40°34'2"N



1:6,000

89°31'41"W 40°33'35"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/13/2025 at 11:15 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

CHAPTER 151: EROSION CONTROL

Section

- 151.01 Definitions
- 151.02 Applicability
- 151.03 Standards for design
- 151.04 Maintenance of control measures
- 151.05 General erosion and sediment control permits
- 151.06 Erosion, sediment, and stormwater control measures
- 151.07 Maintenance of permanent stormwater control measures
- 151.08 Enforcement and stop work order fee
- 151.09 Appeals Board
- 151.10 Appeals to Appeals Board
- 151.11 Appeals to Court
- 151.12 Standard for stormwater design analysis
- 151.13 Sediment control

- 151.99 Penalty

§ 151.01 DEFINITIONS.

For the purpose of this chapter, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

ADJACENT LANDS. Surrounding land that may either impact a site or be impacted by potential soil erosion, sediment, and/or stormwater runoff as a result of land disturbing activities conducted on a site, and at a minimum is an area within 50 feet of the site.

APPEALS BOARD. The Erosion, Sediment, and Stormwater Control Appeals Board.

AREAS OF CONCENTRATED FLOW OR BODIES OF WATER. Any area where water may accumulate or flow, whether continual or as the result of a storm event including, but not limited to, lakes, rivers, streams, creeks, ponds, ditches, swales, gullies, ravines, street gutters, and other similar features.

COMMISSION. The Tri-County Regional Planning Commission.

CONTROL MEASURE. Any proposed temporary or permanent measures to be installed to control erosion, sediment, and stormwater runoff from a project area.

COUNTY. The County of Tazewell, Illinois.

DEPARTMENT. The Tazewell County Community Development Department.

DEVELOPMENT. The division of a parcel of land into two or more parcels; the construction, reconstruction, conversion, structural alteration, relocation, or enlargement of any structure; any mining, excavation, landfill, or land disturbance; and any use or extension of the use of land.

DISTURBED AREA. Any area of land on which the pre-development ground surface will be affected or altered by the development activities. This includes, but is not limited to, grading, clearing, stockpiling, tracking, and other similar activities.

EROSION CONTROL ADMINISTRATOR. The person appointed by the Tazewell County Board to administer this chapter.

FIVE-YEAR FREQUENCY STORM EVENT. The storm event rainfall depth during a 24-hour period which is exceeded, on the average, once every five years.

FLOOD INSURANCE RATE MAPS (FIRM). Maps prepared by the federal emergency management agency (FEMA) that depict the special flood hazard areas (SFHA) within a community. These maps include insurance rate zones and floodplains any may or may not depict floodways.

INSTITUTIONAL USE. A religious or public use such as a church, library, public or private school, hospital, or government owner or operated building, structure, or land use for public purpose.

LAND DISTURBING ACTIVITY. Any change in land which may result in soil erosion from water or wind and the movement of sediments into state or county waters or onto lands in the county, or a change in the amount and/or intensity of stormwater runoff including, but not limited to, the covering with an impervious surface, stockpiling, clearing, grading, excavating, rehabilitating, transporting, depositing, or filling of land.

NORMAL AGRICULTURAL PRACTICES. Activities associated with the preparation and tilling of land for the purposes of growing crops or raising livestock which may include, but are not limited to, the construction of conservation measures, plowing, disking, and cultivating.

PERIMETER CONTROL. Any control measure installed between the down slope side of the disturbed area and the property line

and/or between the down slope side of the disturbed area and any area of concentrated flow.

PRE-PROJECT CONDITION. A condition that may impact erosion, sediment, or stormwater runoff characteristics of a site prior to start of construction activity. The **PRE-PROJECT CONDITION** shall be based on the predominant land use for the past five years. For example, if a site has been cropland for four of the past five years, and in grass just prior to development, the land use would be cropland for the pre-project condition.

PROJECT. Any development involving modification to land which involves a land disturbing activity.

REGIONAL STORMWATER MANAGEMENT SYSTEM. A system which is designed, constructed, and maintained to provide stormwater control for multiple land owners.

ROAD. Any right-of-way that has been improved for the purposes of providing a surface for vehicular traffic, including any federal, state, county, township, and municipal controlled facilities.

SINGLE-FAMILY DWELLING. A building designed for or occupied by one family.

SITE. The lot or parcel on which the project is to be developed.

SITE SPECIFIC PLAN. A general erosion and sediment control permit required for projects where slope is greater than 10% and/or the site contains areas of concentrated flow or bodies of water. Slope shall be determined by the maximum slope indicated on the site according to the USDA Soil Survey or topographic survey as prepared by a state registered surveyor.

STANDARD PLAN. A general erosion and sediment control permit for projects where slope is less than 10%, and there are no areas of concentrated flows or bodies of water on or water on or immediately adjacent to the site. Slope shall be determined by the maximum slope indicated on the site according to the USDA Soil Survey or topographic survey as prepared by a state registered surveyor.

STANDARDS. The Illinois Environmental Protection Agency's *Illinois Urban Manual, A Technical Manual designed for Urban Ecosystem Protection and Enhancement* published in 1995 and *Illinois Procedures and Standards for Urban Soil Erosion and Sedimentation Control* published in 1988 by the Urban Committee of the Association of Illinois Soil and Water Conservation District now in effect or as hereafter amended, which is incorporated by reference herein, and the county standards for stormwater design analysis, found at § 151.12, and the erosion and sediment control criteria and specifications found in §151.13.

SUBSTANTIAL COMPLETION. The point at which all exterior work is completed and the site can be used for the use intended.

TWENTY-FIVE-YEAR FREQUENCY STORM EVENT. The storm event rainfall depth during a 24-hour period which is exceeded, on the average, once every 25 years.

TWO-FAMILY DWELLING. A building designed for or occupied by two families.

TWO-YEAR FREQUENCY STORM EVENT. The storm event rainfall depth during a 24-hour period which is exceeded, on the average, once every two years.

UTILITY SERVICE LINE. Means by which utility service is provided to service users, such as electric, telephone, and television cable, or gas, water, and sewer pipes.

WORKING DAY. Shall not include Saturday, Sunday, or any holiday when the county offices are closed.

(Prior Code, 8 TCC 3-1)

§ 151.02 APPLICABILITY.

This chapter shall apply to:

(A) All projects within the boundaries and jurisdiction of the county. No land surface shall be disturbed unless an erosion and sediment control permit or an erosion sediment and stormwater control permit has first been issued for that project, except as follows:

(1) Land disturbing activities which do not involve the construction of any new single- or two- family dwellings, and for which the disturbed area is less than 5,000 square feet;

(2) Normal agricultural practices; or

(3) Routine maintenance of roads and utility service lines.

(B) County road departments. The Erosion Control Administrator reserves the right to require any non-agricultural, construction development activity, regardless of disturbed area or type of activity, to comply with this chapter if it is determined to be the cause of, or a contributor to, an existing or potential erosion, sediment, or stormwater impact; and

(C) Any land within the boundaries and jurisdiction of the county on which there is located a permanent stormwater control measure which was installed pursuant to this chapter.

(Prior Code, 8 TCC 3-2)

§ 151.03 STANDARDS FOR DESIGN.

(A) *Erosion and sediment control measures.* All control measures required under this chapter shall conform to the design criteria, standards, and specifications provided in the applicable standards referenced in § 151.13 now in effect or as hereafter amended. All control measures installed shall be sufficient to prevent sediment from leaving the permit site during a five-year frequency storm event. Measures shall be taken to prevent sediment from leaving the site. When sediment does leave the site, the owner, developer, or contractor shall remove the sediment within four hours, or by no later than the end of the work day. For example, installing a rock construction drive or cleaning tires could be used to minimize tracking of sediment onto public roads.

(B) *Permanent stormwater control measures.* All stormwater controls shall be designed so that the peak discharge rate from the permitted area resulting from the two-year and 25-year frequency storm events for the post-project condition do not exceed the

corresponding storm event peak discharges for the pre-project condition. Evaluation of submitted plans shall be based on the Stormwater Design Analyses Standards in § 151.12.

(C) *Regional stormwater control systems.* To allow for the beneficial development and maintenance of regional stormwater management systems, where they are available and they are appropriate, an applicant may submit a design dependent on such a system. The applicant may submit documentation of the approval for the use of the regional stormwater management facility from the governmental agency having jurisdiction over it. The applicant shall submit evidence showing that there will be no adverse flooding impact to any receiving stream between the point of discharge and the regional stormwater facility. If the applicant is approved to use the regional stormwater management system, the applicant may request exemption from the requirements in this section for permanent on-site stormwater controls from the Erosion Control Administrator. Such exemption shall not apply to any temporary stormwater control measures required by this chapter.

(Prior Code, 8 TCC 3-3)

§ 151.04 MAINTENANCE OF CONTROL MEASURES.

(A) *Erosion, sediment, and temporary stormwater control measures*

(1) On-site sediment control measures shall be constructed and functional prior to initiating clearing, grading, stripping, excavating, or fill activities on the site.

(2) Sediment control measures and temporary stormwater control measures are to be maintained so they are operating effectively until permanent ground surface protection and permanent stormwater control measures are established in a manner specified in the applicable permit issued pursuant to this chapter.

(3) Fully functioning temporary sediment control measures (including, but not limited to, perimeter sediment controls) shall remain in place until the ground is stabilized with permanent ground cover. The intent of the chapter is to keep the sites protected at all times until the ground is permanently stabilized. In cases where it is not practical to leave the temporary sediment control measures in place prior to establishing permanent ground cover (for example when control measures need to be removed in order to grade the area or install pavement or sod) an exception will be made only if one of the conditions listed below will be met. In no way does adhering to one of the conditions below relieve the owner of responsibility to clean-up or repair any damages caused from sediment or stormwater runoff leaving the site.

(a) Permanent ground cover shall be established with pavement, aggregate, or sod within three days of the removal of sediment barriers.

(b) Permanent vegetation shall be established by seeding with anchored mulch within three days of removal of sediment barriers during the spring or fall seeding periods. However, on project areas with slopes not exceeding 5%, permanent vegetation shall be established by seeding within three days of the removal of sediment barriers during the spring or fall seeding periods. Summer seeding is acceptable on project areas which shall be watered. This does not apply to concentrated flow areas.

(B) *Additional control measures.* The Erosion Control Administrator may require additional control measures pursuant to the standards if determined as necessary after site inspection, and prior to issuing the permit.

(Prior Code, 8 TCC 3-4)

§ 151.05 GENERAL EROSION AND SEDIMENT CONTROL PERMITS.

Before commencing any project involving construction of any new single- or two-family dwelling or commencing any project with an area of 5,000 square feet or greater, the owner of the land or his or her representative shall be required to file an application for a general erosion and sediment control permit, as either a standard or site specific plan, except as otherwise provided in §§ 151.02 and 151.06.

(A) *Application.* The applicant shall file the application with the Department on forms provided by the Department. The fee for a standard plan application shall be in the amount of \$175 for each permit, and the fee for a site specific plan application shall be \$250 for each permit. However, no fee shall be required for any project, the purpose of which is agricultural or initiated by a local unit of government. There shall be no refund of any fees paid and no application shall be accepted for filing unless the fee has been paid in full.

(B) *Application review.* Review of a general erosion and sediment control permit application shall be limited to verifying that the required information and permit fee have been provided and that it meets the standards. The Erosion Control Administrator shall issue or deny an application by approving the permit for a standard plan within two working days of the filing of a complete application, or initiate the review process for a site specific plan and approve the same within five working days of the filing of a complete application. If the permit is denied, it shall be returned to the applicant with a written explanation of its denial. The application shall be deemed approved if no response is made within the time frames provided above.

(C) *Duration.* The general erosion and sediment control permit shall be issued for a period not exceeding two years.

(D) *Content of general erosion and sediment control permit* The general erosion control permit shall contain at a minimum the following general conditions:

(1) Written approval be obtained from the Erosion Control Administrator prior to making any modification to the erosion and sediment control plan as set forth in the application;

(2) All control measures identified in the application shall be installed;

(3) All control measures shall be maintained during construction; and

(4) Such other conditions as the Erosion Control Administrator deems appropriate to ensure compliance with the specific requirements and the intent of this chapter.

(E) *Permanent ground surface cover.* Under all circumstances, temporary control measures shall be maintained in accordance with §

151.04. Without exception, all disturbed areas must have permanent ground cover within six months of project completion or within six months of occupancy, whichever comes first.

(Prior Code, 8 TCC 3-5) (Amended 3-26-2008; Res. LU-18-13, passed 8-29-2018)

§ 151.06 EROSION, SEDIMENT, AND STORMWATER CONTROL MEASURES.

Before commencing any commercial, institutional, multi-family, or industrial or industrial project with an area of more than one-half acre, or a project requiring subdivision approval by a unit of local government with an area of more than one-half acre, the owner of the land or his or her representative shall be required to file an application for an erosion, sediment, and stormwater control permit.

(A) *Application.* The applicant shall file the application with the Department on forms provided by the Department. The applicant shall supply the number of copies of application documents as provided in the application. Each application shall be accompanied by the following information:

(1) A map of existing site conditions on a scale of at least one inch equals 100 feet, showing the site and immediately adjacent areas and the locations of the following site information:

- (a) Site boundaries and adjacent lands which accurately identify site location;
- (b) Lakes, streams, wetlands, channels, ditches, and other watercourses on and immediately adjacent to the site;
- (c) Floodways and/or Zone A of the floodplain as determined on the flood insurance rate map (FIRM) and indicating the map panel number;
- (d) All off-site drainage onto or through the project site;
- (e) Location and dimensions of stormwater management systems on or adjacent to site;
- (f) Locations and dimensions of structures, roads, highways, easements, and paved areas; and
- (g) Site topography: show contours at vertical intervals as follows:
 - 1. Slope of 6% or less: two-foot intervals;
 - 2. Slope of over 6% but less than 15%: five-foot intervals; and
 - 3. Slope of over 15%: ten- or 20-foot intervals.

(2) A plan of final site conditions drawn to the same scale as the existing site map submitted pursuant to division (A)(1) above, and which includes information to accurately depict post-construction appearance of site (e.g., paved areas, buildings, landscaping, and other changes to the site), along with other predominant site features (e.g., open areas, bodies of water);

(3) Sediment and erosion control practices. A site construction plan including:

- (a) Locations and dimensions of all proposed land disturbing activities;
- (b) Locations and dimensions of all temporary soil and aggregate stockpiles;
- (c) Location, dimensions, and construction details of all construction site management control measures necessary to meet the requirements of this chapter, and including proposed re-vegetation of disturbed areas; and
- (d) Statement regarding provisions for maintenance and maintenance requirements of the construction site management control measures during construction;

(4) Stormwater management plans and controls. Design calculations and information related to the permanent stormwater management system for any project with a net increase of impervious area greater than one-half of an acre. For the purposes of this section, the net increase is the cumulative change since the implementation of this chapter, April 15, 1996. For example, in year one, a commercial site increases the parking lot by 20,000 square feet. In year two, the same commercial site adds a building with an area of 20,000 square feet. In year one, no permanent stormwater control measures (or calculations) are required by the chapter. In year two, stormwater calculations shall be submitted and shall be based on the total increase of 40,000 square feet of impervious area. The following information shall also be provided by the applicant:

- (a) A map showing the drainage area divides, including off-site drainage areas that drain into the site;
- (b) Location and identification of soil types for entire watershed;
- (c) Location and identification of vegetative cover for entire watershed;
- (d) Runoff curve number calculations for both pre- and post-project conditions for all sub- watersheds;
- (e) Time of concentration calculations for both pre- and post-project conditions for all sub- watersheds, and include a map showing hydraulic flow lengths used;
- (f) Peak flow-rate calculations for two-year and 25-year storms for both pre- and post- project conditions;
- (g) Design calculations for detention basin outlets for both two-year and 25-year storms, include stage-storage table and discharge rating curve data or outflow calculations (refer to optional form in § 151.12);
- (h) Location dimensions and construction details of proposed detention basins and outlets;
- (i) Detention volume calculations; and
- (j) Summary of peak flow-rates for pre, post, and proposed conditions with detention showing that the requirements of the chapter are met (refer to optional form in § 151.12).

(5) Schedule or sequence of development or installation of the elements of the site management control measures proposed above;

(6) A detailed estimate of quantities and estimated costs, prepared by a registered professional engineer, of all control measures required under this section;

(7) A plan of the continued management and maintenance of such permanent control measures; and

(8) An application fee shall be submitted at the time of application. The fee shall be in the amount of \$75 per acre with a minimum fee of \$450 and a maximum fee of \$3,000. However, no fee shall be required for any project, the purpose of which is agricultural. A fractional acre shall be rounded to the nearest whole acre. There shall be no refund of any fees paid and no application shall be accepted for filing unless the fee has been paid in full.

(B) *Application review.* Within five working days of submittal of the application, the Erosion Control Administrator shall respond in writing to the sediment and erosion control practices portion. Within 20 working days the Erosion Control Administrator shall respond to the stormwater management plans and control portion of the application by either issuing a permit, issuing a request for additional information, or issuing a statement denying the permit with an explanation of cause. The application shall be deemed approved if no response is made within the time frames stipulated above.

(C) *Financial security agreement.* Before any erosion sediment and stormwater control permit is issued, the applicant shall deliver to the Erosion Control Administrator a cash bond in the name of the county for 100% of the applicant's engineer's estimated cost for all control measures required under this section. Said cash bond will be delivered by the Erosion Control Administrator to the County Treasurer and deposited in an interest bearing escrow account in a county bank with interest to be paid to the applicant. Each security shall be accompanied by an agreement executed by the applicant, and approved by the Erosion Control Administrator, wherein the applicant agrees to install and maintain all maintenance control measures and specifying a date of completion in accordance with this chapter. If the control measures are necessitated by construction which is also subject to Chapter 155, the applicant may submit cash bond to cover 100% of both the control measures required pursuant to this section and the improvements governed by Chapter 155. A signed contractor's bid that meets the specifications of the engineer's estimate for the work can be used to establish the amount of security required, if such estimate is accepted by the Erosion Control Administrator.

(D) *Duration.* The erosion sediment and stormwater control permit shall be issued for a period not exceeding two years.

(E) *Permit conditions.* The erosion sediment and stormwater control permit shall contain, at a minimum, the following general conditions:

(1) The written approval shall be obtained from the Erosion Control Administrator prior to making any modification to the approved erosion and sediment control plan as set forth in the permit;

(2) All control measures required in the permit shall be installed;

(3) All control measures shall be maintained during construction; and

(4) Such other conditions as the Erosion Control Administrator deems appropriate.

(F) *Permanent ground surface cover.* Without exception, all disturbed areas must have permanent ground cover within six months of project completion or within six months of occupancy, whichever comes first.

(G) *Final inspection-notice of permanent stormwater control measures* Within 14 days after completion of construction, the applicant may notify the Erosion Control Administrator that the permanent stormwater control measures are ready for final inspection. If the inspection shows that the control measures and maintenance plan comply with the standards in § 151.12, the Erosion Control Administrator shall issue a notice of permanent stormwater control measures. The owner shall record the notice with the County Recorder of Deeds within 15 days after the notice is issued.

(Prior Code, 8 TCC 3-6) (Amended 3-26-2008)

§ 151.07 MAINTENANCE OF PERMANENT STORMWATER CONTROL MEASURES.

Anyone owning property with a permanent stormwater control measure existing thereon and installed pursuant to this chapter shall maintain the control measures so that it functions in compliance with the standards.

(Prior Code, 8 TCC 3-7)

§ 151.08 ENFORCEMENT AND STOP WORK ORDER FEE.

(A) This chapter shall be administered and enforced by the Erosion Control Administrator who shall make, or cause to be made, periodic inspections of all work authorized by permits issued in accordance with this chapter to ensure that said construction is in compliance with the provisions of the same. He or she shall make, or cause to be made, investigations of violations of this chapter and shall cause any violations to be corrected.

(B) Any permit issued pursuant to this chapter shall be revoked by the Erosion Control Administrator when he or she finds from personal inspection or from competent evidence that the rules, regulations, or standards under which said permit was issued are being violated. To defray costs of administering stop work orders posted by the field inspectors as a result of a violation of any of the terms of this chapter, a fee of \$250 per violation will be charged and an additional \$20 will be charged per day as the violation exists.

(Prior Code, 8 TCC 3-8)

§ 151.09 APPEALS BOARD.

The Appeals Board shall consider and decide upon appeals of any decision, order, or requirement of the Erosion Control Administrator made pursuant to this chapter.

(A) The Appeals Board is hereby authorized to be established. Said Appeals Board shall consist of five members. Each County

Board Chairperson of the counties adopting this chapter shall appoint one member, the Soil and Water Conservation Districts shall collectively appoint one member, and the Chairperson of the Tri-County Regional Planning Commission shall appoint one member. The members shall be professional engineers, licensed architects, licensed landscape architects, landscape contractors, earthmoving contractors, home builders, or citizens who have extensive experience in control of stormwater and soil erosion. The five members on the first Appeals Board shall draw lots to establish terms of one, two, three, four, and five years, respectively. Thereafter, as terms expire, each appointment shall be for five years.

(B) The Chairperson of the Appeals Board shall be elected at the beginning of each calendar year from among the members by a majority of the members.

(C) All decisions of the Appeals Board must receive the support of a majority of its members. A majority of the members of the Appeals Board shall constitute a quorum for the transaction of business; and all questions which shall arise at meetings shall be determined by the votes of the majority of members present. The Appeals Board shall keep minutes of its proceedings showing the vote of each member upon every question or, if absent or failing to vote, indicating such facts, and shall keep records of its examinations and other official actions. Every rule, and every order, requirement, decision, or determination of the Appeals Board shall immediately be filed in the office of the Board and shall be a public record. The concurring vote of three members of the Appeals Board shall be necessary to reverse any order, requirement, decision, or determination of the Erosion Control Administrator. The Appeals Board shall adopt its own rules of procedure not in conflict with state law or this chapter.

(Prior Code, 8 TCC 3-10)

§ 151.10 APPEALS TO APPEALS BOARD.

(A) Any person directly aggrieved by any decision, order, requirement, or determination of the Erosion Control Administrator made pursuant to this chapter shall have the right to appeal such action to the Appeals Board. Such appeal shall be made within 35 days from the date of the action appealed from, shall be filed in writing, and shall include a short, concise statement of why the action is being appealed. The fee for such an appeal shall be \$45 payable to the Commission and is due with the application. In addition, the person filing the appeal shall pay all required publication costs associated with the appeal.

(B) Upon receipt of a notice of appeal, the Commission shall set a date for a public hearing before the Appeals Board. Such public hearing shall commence not sooner than 15 days nor more than 30 days after the date of receipt of the notice of appeal. At least 15 days' notice of the time and place of such hearing shall be published in an newspaper of general circulation in the county. The Appeals Board shall decide the appeal within seven days after the conclusion of the public hearing. The Appeals Board may affirm, modify, or reverse any appealed action.

(Prior Code, 8 TCC 3-11)

§ 151.11 APPEALS TO COURT.

Appeals from the Appeals Board shall be made in conformity with the provisions of the state's Administrative Review Act, 735 ILCS 5/3-101 et seq. Copies of any orders or proceedings ordered by the appellant shall be furnished to him or her at his or her own cost.

(Prior Code, 8 TCC 3-12)

§ 151.12 STANDARD FOR STORMWATER DESIGN ANALYSIS.

The following are the minimum standard methods and procedures to be used to comply with this chapter. If an applicant determines that different methods are necessary based on site-specific conditions, the applicant must request approval from the Erosion Control Administrator to use other methods prior to submittal.

(A) *Design methods.* The design methods listed below are readily available in a number of computer programs, including the Soil Conservation Service's TR 20 (SCS) and HEC-1 (U.S. Army Corps of Engineers). Additionally, a simplified methodology which is based on the use of these methods is available in TR 55 (SCS, 1986). TR 55 can be applied using either manual computations or a computerized version.

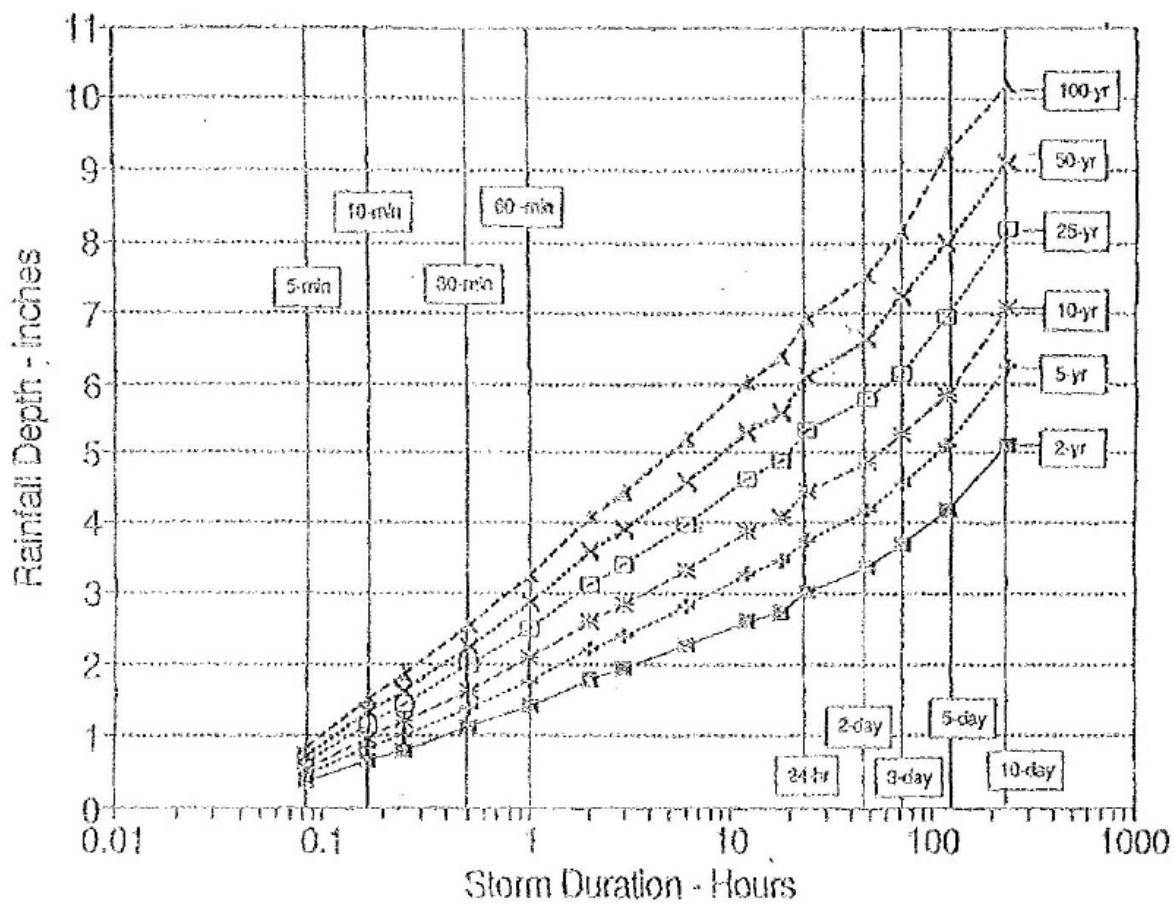
- (1) *Rainfall depth and intensity data.* Use data for the county from the state's water survey, BUL-70/89, 1989, as presented in division (B) below and graphically in division (C) below.
- (2) *Storm event rainfall runoff.* Use the SCS Runoff Curve Number Method to determine rainfall runoff depth. See divisions (D) and (F) through (H) below from TR 55. Soil type information is available from the SCS county soil survey, 1992.
- (3) *Storm distribution (cumulative rainfall versus time).* Use the SCS Type II storm distribution. See divisions (J) and (K) below.
- (4) *Runoff hydrograph.* Use the SCS dimensionless hydrograph. See SCS (1974) for information regarding this procedure. As a substitute for detailed hydrograph analysis, TR 55 (SCS, 1986) can be used, either manually or computer program.
- (5) *Storage routing (detention pond analysis).* Use the continuity equation, also known as the Modified-Puls and Storage Indication Methods. As a substitute for detailed storage routing of a hydrograph, TR 55 (SCS, 1986) can be used, either manually or computer program. If TR 55 is used and a detention basin with a two-stage outlet control structure including a rectangular weir and/or orifice outlet is included as a part of the control measures, use the attached detention basin outlet worksheet to determine and present the structure design information.

(B) Table 1, rainfall depth, duration, and frequency

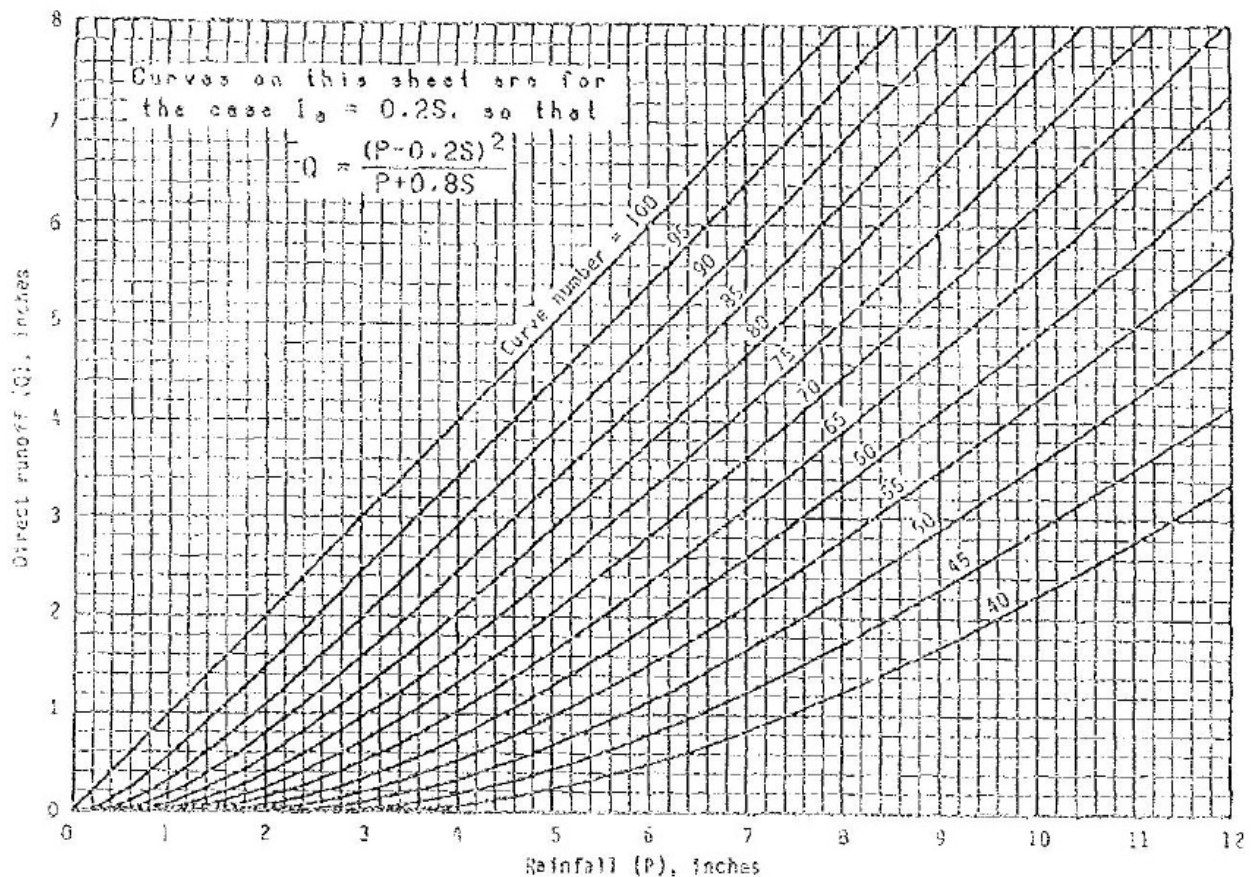
	Rainfall Depth (inches) for Given Frequency					
Duration	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
	Rainfall Depth (inches) for Given Frequency					

Duration	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
5-min.	0.36	0.45	0.53	0.64	0.73	0.83
10-min.	0.66	0.83	0.98	1.17	1.34	1.52
15-min.	0.81	1.02	1.20	1.44	1.64	1.87
30-min.	1.12	1.39	1.64	1.97	2.25	2.56
1-hr.	1.42	1.77	2.09	2.50	2.86	3.25
2-hr.	1.78	2.22	2.62	3.14	3.59	4.08
3-hr.	1.93	2.41	2.85	3.41	3.89	4.43
6-hr.	2.26	2.82	3.33	3.99	4.56	5.19
12-hr.	2.62	3.27	3.87	4.63	5.29	6.02
18-hr.	2.75	3.46	4.09	4.90	5.59	6.37
24-hr.	3.02	3.76	4.45	5.32	6.08	6.92
48-hr.	3.38	4.19	4.86	5.78	6.62	7.51
72-hr.	3.70	4.55	5.26	6.15	7.25	8.16
5-day	4.17	5.11	5.84	6.96	7.98	9.21
10-day	5.12	6.27	7.10	8.19	9.10	10.18

(C) Figure 1, rainfall depth, duration, and frequency data



(D) Figure 2.1, solution of runoff equation



(E) *Estimating runoff.*

(1) *SCS Runoff Curve Number Method.*

(a) The SCS Runoff Curve Number (Cn) Method is described in detail in NEH-4 (SCS 1985). The SCS runoff equation is (Eq. 2-1):

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S}$$

(b) Where: Q = runoff (in.); P = rainfall (in.); S = potential maximum retention after runoff begins (in.); and I_a = initial abstraction (in.).

(c) Initial abstraction (I_a) is all losses before runoff begins. It includes water retained in surface depressions, water intercepted by vegetation, evaporation, and infiltration. I_a is highly variable but generally is correlated with soil and cover parameters. Through studies of many small agricultural watersheds, I_a was found to be approximated by the following empirical equation (Eq. 2-2):

$$I_a = 0.2S$$

(d) By removing I_a as an independent parameter, this approximation allows use of a combination of S and P to produce a unique runoff amount. Substituting equation 2-2 into equation 2-1 gives (Eq. 2-3):

$$Q = \frac{(P - 0.2S)^2}{(P - 0.2S) + S}$$

(e) S is related to the soil and cover conditions of the watershed through the CN. CN has a range of 0 to 100, and S is related to CN by (Eq. 2-4):

$$S = \frac{1000}{CN} - 10$$

(f) Division (D) above and table 2-1 solve equations 2-3 and 2-4 for a range of CNs and rainfall.

(2) *Factors considered in determining runoff curve numbers*

(a) The major factors that determine CN are the hydrologic soil group (HSG), cover type, treatment, hydrologic condition, and antecedent runoff condition (ARC). Another factor considered is whether impervious areas outlet directly to the drainage system (connected) or whether the flow spreads over pervious areas before entering the drainage system (unconnected). Figure 2-2 is

provided to aid in selecting the appropriate figure or table for determining curve numbers.

(b) CNs in divisions (F) through (H) represent average antecedent runoff condition for urban, cultivated agricultural, other agricultural, and arid and semiarid rangeland uses. Divisions (F) through (H) assumes impervious areas are directly connected. The following sections explain how to determine CNs and how to modify them for urban conditions.

(3) Hydrologic soil groups.

(a) Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSGs (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. This section defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of interest may be identified from a soil survey report, which can be obtained from local SCS offices or soil and water conservation district offices.

(b) Most urban areas are only partially covered by impervious surfaces; the soil remains an important factor in runoff estimates. Urbanization has a greater effect on runoff in watersheds with soils having high infiltration rates (sands and gravels) than in watersheds predominantly of silts and clays, which generally have low infiltration rates.

(c) Any disturbance of a soil profile can significantly change its infiltration characteristics. With urbanization, native soil profiles may be mixed or removed or fill material from other areas may be introduced. Therefore, a method based on soil texture is given in Exhibit 2.2 for determining the HSG classification for disturbed soils.

(4) *Cover type.* Divisions (F) through (H) below address most cover types, such as vegetation, bare soil, and impervious surfaces. There are a number of methods for determining cover type. The most common are field reconnaissance, aerial photographs, and land use maps.

(5) *Treatment.* Treatment is a cover type modifier (used only in division (G) below) to describe the management of cultivated agricultural lands. It includes mechanical practices, such as contouring and terracing, and management practices, such as crop rotations and reduced or no tillage.

(6) *Hydrologic condition.* Hydrologic condition indicates the effect of cover type and treatment on infiltration and runoff and is generally estimated from density of plant and residue cover on sample areas. Good hydrologic condition indicates that the soil usually has a low runoff potential for that specific hydrologic soil group, cover type, and treatment. Some factors to consider in estimating the effect of cover on infiltration and runoff are canopy or density of lawns, crops, or other vegetative areas; amount of year-round cover; amount of grass or close-seeded legumes in rotations; percent of residue cover; and degree of surface roughness.

(7) *Antecedent runoff condition.* The index of runoff potential before a storm event is the antecedent runoff condition (ARC). ARC is an attempt to account for the variation in CN at a site from storm to storm. CN for the average ARC at a site is the median value as taken from sample rainfall and runoff data. The CNs in divisions (F) through (H) are for the average ARC, which is primarily used for design applications. See the SCS NEH-4 and Rallison and Miller for more detailed discussion of storm to storm variation and a demonstration of upper and lower enveloping curves.

(8) *Urban impervious area modifications.* Several factors, such as the percentage of impervious area and the means of conveying runoff from impervious areas to the drainage system, should be considered in computing CN for urban areas. For example, do the impervious areas connect directly to the drainage system, or do they outlet onto lawns or other pervious areas where infiltration can occur?

(9) Connected impervious areas.

(a) An impervious area is considered connected if runoff from it flows directly into the drainage system. It is also considered connected if runoff from it occurs as concentrated shallow flow that runs over a pervious area and then into a drainage system.

(b) 1. Urban CNs, division (F) below, were developed for typical land use relationships based on specific assumed percentages of impervious area.

2. These CN values were developed on the assumptions that pervious urban areas are equivalent to pasture in good hydrologic condition and impervious areas have a CN of 98 and are directly connected to the drainage system.

3. Some assumed percentages of impervious area are shown in division (F) below.

(F) Runoff curve numbers for urban areas¹.

Cover Description		Curve Numbers for Hydrologic Soil Group			
Cover type and hydrologic condition	Average percent impervious area ²	A	B	C	D
Cover Description		Curve Numbers for Hydrologic Soil Group			
Cover type and hydrologic condition	Average percent impervious area ²	A	B	C	D
Fully developed urban areas (vegetation established):					
Open space (lawns, parks, golf courses, cemeteries, and the like):					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84

Good condition (grass over > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, and the like (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (townhouses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas:					
Newly graded areas (pervious areas only, no vegetation)		77	86	91	94
1. Average runoff condition and $I_a = 0.2S$.					
2. The average percent impervious area shown was used to develop the composite CNs. Other assumptions are as follows: Impervious areas are directly connected to the drainage system; impervious areas have a CN of 98; and pervious areas are considered equivalent to open space in good hydrologic condition. CNs for other combinations of conditions may be computed using Figure 2-3 or 2-4 in TR 55.					

(G) *Runoff curve numbers for agricultural lands*¹.

Cover Description			Curve Numbers for Hydrologic Soil Group			
Cover type	Treatment ²	Hydrologic Condition ³	A	B	C	D
Cover Description			Curve Numbers for Hydrologic Soil Group			
Cover type	Treatment ²	Hydrologic Condition ³	A	B	C	D
Fallow	Bare soil	-	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87

		Good	64	74	81	85
	Contoured and terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T + CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T + CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast	SR	Poor	66	77	85	89
		Good	58	72	81	85
Legumes or rotation	C	Poor	64	75	83	85
		Good	55	69	78	83
Meadow	C&T	Poor	63	73	80	83
		Good	51	67	76	80
1. Average runoff condition and $I_a = 0.2S$.						
2. Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.						
3. Hydrologic condition is based on a combination of factors that affect infiltration and runoff, including: density and canopy of vegetative areas; amount of year-round cover; amount of grass or close-seeded legumes in rotations; percent of residue cover on land surface (good $\geq 20\%$); and degree of surface roughness. Poor factors impair infiltration and lend to increase runoff. Good factors encourage average and better than average infiltration and tend to decrease runoff.						

(H) *Runoff curve numbers for other agricultural lands¹.*

Cover Description		Curve Numbers for Hydrologic Soil Group			
Cover Type	Hydrologic Condition ³	A	B	C	D
Cover Description		Curve Numbers for Hydrologic Soil Group			
Cover Type	Hydrologic Condition ³	A	B	C	D
Brush - brush-weed-grass mixture with brush the major element ³	Poor Fair Good	48 35 30 4	67 56 48	77 70 65	83 77 73
Farmsteads - buildings, lanes, driveways, and surrounding lots	Poor	59	74	82	86
Meadow - continuous grass, protected from grazing and generally mowed for hay	Poor	30	58	71	78
Pasture, grassland, or range - continuous forage for grazing ²	Poor Fair Good	68 49 39	79 69 61	86 79 74	89 84 80

Woods - grass combination (orchard or tree farm) ⁵	Poor Fair Good	57 43 32	73 65 58	82 76 72	86 82 79
Woods ⁶	Poor Fair Good	45 36 30 4	66 60 55	77 73 70	83 79 77
1. Average runoff condition and $I_a = 0.2S$.					
2. Poor: < 50% ground cover or heavily grazed with no mulch. Fair: 50 to 75% ground cover and not heavily grazed. Good: > 75% ground cover and lightly or only occasionally grazed.					
3. Poor: < 50% ground cover. Fair: 50 to 75% ground cover. Good: > 75% ground cover.					
4. Actual curve number is less than 30; use CN=30 for runoff computations.					
5. CNs shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CNs for woods and pasture.					
6. Poor: forest litter, small trees, and brush are destroyed by heavy grazing or regular burning. Fair: woods are grazed but not burned, and some forest litter covers the soil. Good: woods are protected from grazing, and litter and brush adequately cover the soil.					

(I) *Computation sheet.*

COMPUTATION SHEET
FOR 2-STAGE DETENTION BASIN OUTLET DESIGN
(to be used with TR 55 worksheet 6a or computer printout for storage routing)

Project Name: _____ Structure ID: _____ Date: _____

Note: attach TR 55 worksheet 6a or computer printout with basin routing information

First Stage

Maximum stage for two-year storm (E_{2-yr}) = _____ ft
First stage control elevation (E_1) = _____ ft
Head on first stage structure ($H_{2-yr} = E_{2-yr} - E_1$) = _____ ft
Allowable discharge for two-year storm (q_{2-yr}) = _____ cfs

For rectangular weir outlet:

Required weir length $L_1 = q_{2-yr} / (3.2 * H_{2-yr}^{1.5}) = \text{_____} / (3.2 * \text{_____}^{1.5})$
= _____ ft

For orifice outlet:

Required orifice area $A_1 = q_{2-yr} / (4.98 * H_{2-yr}^{0.5}) = \text{_____} / (4.98 * \text{_____}^{0.5})$
= _____ sq ft

Second Stage

Maximum stage for twenty-five-year storm (E_{25-yr}) = _____ ft
Second stage control elevation (E_2) = _____ ft
Head on second stage structure ($H_{25-yr} = E_{25-yr} - E_2$) = _____ ft
Allowable discharge for twenty-five-year storm (q_{25-yr}) = _____ cfs

Twenty-five-year storm discharge through first stage:

Weir: $q' = 3.2 * L_1 * (E_{25-yr} - E_1)^{1.5} = 3.2 * \text{_____} * (\text{_____} - \text{_____})^{1.5}$
= _____ cfs

Orifice: $q' = 4.98 * A_1 * (E_{25-yr} - E_1)^{0.5} = 4.98 * \text{_____} * (\text{_____} - \text{_____})^{0.5}$
= _____ cfs

Allowable discharge through second stage (q'') $q_{25-yr} - q' = \text{_____}$ cfs

For rectangular weir outlet:

Required weir length $L_2 = q'' / (3.2 * H_{25-yr}^{1.5})$
= _____ / $(3.2 * \text{_____}^{1.5}) = \text{_____}$ ft

For orifice outlet:

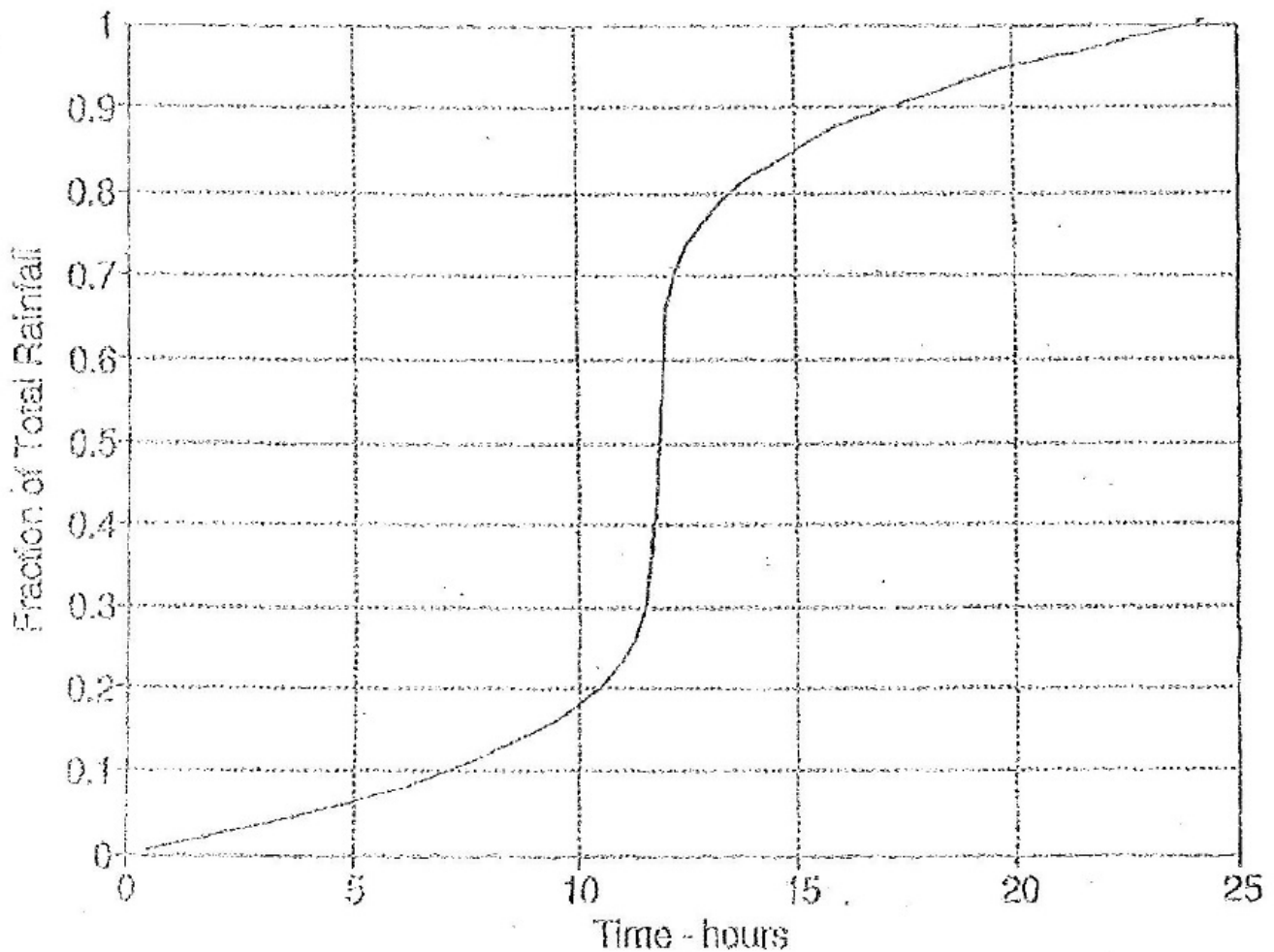
Required orifice area $A_2 = q'' / (4.98 * H_{25-yr}^{0.5})$
= _____ / $(4.98 * \text{_____}^{0.5}) = \text{_____}$ sq ft

(J) SCS Type II rainfall distribution.

Time		
Hour	Fraction of Total	Fraction of Total Rainfall
Time		
Hour	Fraction of Total	Fraction of Total Rainfall
0.50	0.021	0.005
1.00	0.042	0.011
1.50	0.063	0.017
2.00	0.083	0.023
2.50	0.104	0.029
3.00	0.125	0.035
3.50	0.146	0.042
4.00	0.167	0.049
4.50	0.188	0.056
5.00	0.208	0.064

5.50	0.229	0.072
6.00	0.250	0.080
6.50	0.271	0.090
7.00	0.292	0.100
7.50	0.313	0.110
8.00	0.333	0.120
8.50	0.354	0.134
9.00	0.375	0.147
9.50	0.396	0.163
10.00	0.417	0.181
10.50	0.438	0.204
11.00	0.458	0.235
11.25	0.468	0.260
11.50	0.479	0.300
11.75	0.490	0.420
12.00	0.500	0.663
12.25	0.510	0.710
12.50	0.521	0.735
13.00	0.542	0.772
13.50	0.563	0.799
14.00	0.583	0.820
14.50	0.604	0.835
15.00	0.625	0.850
15.50	0.646	0.865
16.00	0.667	0.880
16.50	0.688	0.889
17.00	0.708	0.898
17.50	0.729	0.907
18.00	0.750	0.916
18.50	0.771	0.925
19.00	0.792	0.934
19.50	0.813	0.943
20.00	0.833	0.952
20.50	0.854	0.958
21.00	0.875	0.964
21.50	0.896	0.970
22.00	0.917	0.976
22.50	0.938	0.982
23.00	0.958	0.988
23.50	0.979	0.994
24.00	1.000	1.000

(K) *Figure 3, SCS Type II storm distribution*



(Prior Code, 8 TCC 3-Appendix A)

§ 151.13 SEDIMENT CONTROL.

(A) General provisions.

(1) There are three ways to accomplish urban soil erosion and sedimentation control:

- (a) Allow erosion to take place and then control sediment before it leaves a site;
- (b) Stop erosion in the watershed (project area) by soil stabilization or runoff control measures; and
- (c) A combination of the two (most desirable).

(2) The following is a list of common measures that can be used to control erosion and sediment. It is by no means an exhaustive list. Some standard drawings are included in this appendix. Additional drawings, standards, and specifications can be found in the *Illinois Urban Manual*, IEPA and USDA, NRCS, 1995 and the *Illinois Standards for Urban Soil Erosion and Sediment Control*, the Urban Committee of the Association of the state's Soil and Water Conservation Districts, revised July 1988.

(B) Control measures.

(1) (a) Perimeter sediment control measures are to be installed between disturbed areas (including stockpiles) and property lines or drainage ways in order to protect off-site areas.

(b) Control measures should be installed on the down-slope sides of the disturbed areas where runoff will leave the site.

(2) Control measures for different slopes.

Slope Range	Control Measure	Comments
Slope Range	Control Measure	Comments
Less than 2%	Vegetative (grass) filter strips; no minimum width requirement	
	Vegetative (grass) filter strips; ten feet wide, minimum	Size should be increased in proportion to the drainage area and slope

2% to < 5%	Filter fence	Drainage area less than one-half acre per 100 feet; see standard for spacing criteria
	Straw bales	For use in small drainage areas, see standard for spacing criteria, maximum life is three months
	Vegetative buffer area (other than grass), about 50 feet wide, minimum	Minimizing disturbed areas is desirable; increase buffer size in proportion to drainage area and slope
	Sediment basin	Can handle sediment from a larger area
5% to < 10%	Vegetative (grass) filter strips 20 feet wide, minimum	Size should be increased in proportion to the drainage area and slope
	Filter fence	Drainage area less than one-half acre per 100 feet, see standard for spacing criteria
	Straw bales	For use in small drainage areas, see standard for spacing criteria, maximum life is three months
	Vegetative buffer area (other than grass), about 100 feet wide, minimum	Minimizing disturbed areas is desirable; increase buffer size in proportion to drainage area and slope
	Sediment basin	Can handle sediment from a larger area
> 10%	Filter fence	Drainage area less than one-half acre per 100 feet, see standard for spacing criteria
	Sediment basin	Can handle sediment from a larger area

(3) (a) Inlet sediment control is to be installed around storm sewer or other inlets to prevent sediment from entering the system. There are many different types depending on the type of inlet.

(b) Common measures include:

1. Inlet protection - excavated drain (division (F) below);
2. Inlet protection - block and gravel (division (G) below); and
3. Inlet protection - staked straw bales (division (H) below).

(4) (a) Mud and dust control is used to prevent mud and dust from leaving the site.

(b) Common measures include:

1. Stabilized construction entrance (division (I) below); and
2. Dust control, see the standards and specifications.

(C) *Runoff control.*

(1) *Concentrated flow areas.*

(a) Temporary erosion control measures should be installed to protect drainage ways such as road ditches and waterways until the area is permanently stabilized.

(b) Common measures include:

1. Rock checks for waterways (division (J) below);
2. Fabric checks for waterways (division (K) below); and
3. Erosion blanket.

(2) *Outlet protection.*

(a) All outlets should be stabilized to prevent downstream areas from erosion.

(b) Common practices include:

1. Pipe outlet channel (division (L) below); and
2. Pipe outlet to flat area.

(3) *Diversions.* Surface runoff from adjacent areas should be diverted around disturbed areas to stable outlets to reduce erosion

due to surface runoff.

(D) *Soil stabilization*. (Recommended seeding dates for central Illinois are shown in bold.)

(1) *Vegetative soil cover*.

(a) Temporary seeding is proved a temporary quick cover to control erosion when permanent seeding is not desired or the time of year is inappropriate. (**Early Spring - September 30.**)

(b) Permanent seeding provides permanent vegetative cover to control erosion, filters sediment from water; may be part of final landscaping plan. (**Spring seeding: early Spring - May 15; Fall seeding: August 1 - September 10**)

(c) Dormant seeding is the same as permanent seeding except seeding is done during dormant season. Higher rates of seed application are required. If no mulch is applied, then perimeter controls should be maintained until the vegetation is established. (**November 15 - March 1.**)

(d) Sodding is quick, permanent cover to control erosion; quick way to establish vegetative filter strip; and can be used on steep slopes or in drainage ways where seeding may be difficult. (**Anytime, except when the ground is frozen.**)

(e) Ground cover provides ground cover, shrubs, and trees in addition to permanent vegetation; may be used as part of a final landscape plan along with shrubs and trees.

(2) *Non-vegetative soil cover*.

(a) Mulching provides added insurance of a successful temporary or permanent seeding, controls unwanted vegetation and preserves moisture, and provides cover where vegetation cannot be established.

(b) Aggregate cover provides soil cover on roads and parking lots and areas where vegetation cannot be established; prevents mud from being picked up and transported off-site.

(c) Paving provides permanent cover on parking lots, roads, or other areas where vegetation cannot be established.

(E) *Silt fence plan*.

9. APPENDIX B: SPATIAL FILES {See Links Below }

HEC-RAS Model

{<https://jefuller.sharefile.com/d-s6643af3f4c35455aa8f4e29c29bf8b5c>}

HEC-RAS Modeling Results

{<https://jefuller.sharefile.com/d-sb6850d876a1b43f1b1779876deb5a69e>}



Tazewell County
South of E. Broadway Road, west of Springfield Road, Pekin
Section: 3, Township: 24 North, Range: 4 West
HRPA 2025-145, O'Brien Cemetery avoidance

20 October 2026

Lumina Energy Storage, LLC
16783 Springfield Road
Pekin, Illinois 61544

To Whom It May Concern,

We are in receipt of your permit application pursuant to the Human Remains Protection Act, as amended (HRPA; 20 ILCS 3440, 17 IAC 4170) for the installation of the Lumina battery storage facility adjacent to O'Brien Cemetery in rural Tazewell County, Illinois. The plan map submitted on your behalf by Westwood Professional Services illustrates that the cemetery will be avoided with the recommended buffer. Our staff have reviewed the plan and found that it meets the avoidance standards per the HRPA. This avoidance permit will remain with the property even if ownership changes. Please ensure that new owners are made aware of the cemetery and the restrictions below.

This letter, together with the project scope and avoidance plan map, will serve as the *HRPA avoidance permit*. This permit is issued with the following restrictions:

1. If suspected human bones are encountered during field work, a certified human osteologist must verify if the bone(s) is human.
2. If human bones, grave artifacts, or grave markers are encountered, and verified, during the field work, all work must stop immediately. A 100-foot buffer must be established around the encountered remains and all excavations within the buffer zone will cease.
3. The county coroner and our office must be notified within 48 hours of the discovery.
4. If ground disturbing maintenance work must be conducted within the 100-foot buffer, then a permit from the IDNR must be obtained prior to the work.

With the acceptance of this *avoidance permit*, deemed by initiation of work, the applicant agrees to abide by the permit's regulations, and to assume all accompanying legal and financial obligations. This permit does not release you from any obligation under any other law.

If you have any questions, please contact me at office 217/785-4992 or via E-mail: dawn.cobb@illinois.gov.

Sincerely,

A handwritten signature in blue ink that reads "Dawn Cobb".

Dawn Cobb
Archaeologist, Human Remains Protection Act Coordinator
Illinois Department of Natural Resources
Impact Assessment Section

Cc: Jeff Kruchten, Principal Archaeologist, State Historic Preservation Office

Lumina BESS



Emergency Response Plan

Outdoor Ground Mounted Battery Energy Storage System

Tazewell County, Illinois



Revision Draft Rev01

October 10, 2026

The distribution of this document to third parties not responsible for emergency response to this facility is prohibited without written approval from Fire & Risk Alliance, LLC.



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Fire & Risk Alliance
7620 Standish Place, Rockville, MD 20855



Table of Contents

1. Emergency Contacts	5
1.1 Emergency Contact	5
1.2 Site Details	5
2. General Information	6
2.1 Scope	6
2.2 Purpose	6
2.3 Limitations	6
3. Site Overview	7
3.1 General Site Overview	7
3.2 Energy Storage System Site Overview	7
4. Equipment and Safety Features	9
4.1 Cell	9
4.2 Module	9
4.3 Cabinet	10
4.4 Thermal Management System (TMS)	11
4.5 Battery Management System (BMS)	11
4.6 Explosion Control and Prevention System	12
4.7 Safety Controller	13
4.8 Emergency Stop	13
4.9 MV Transformer	13
4.10 Auxiliary Power System	14
4.11 Emergency Power	14
5. Fire Protection Overview	15
5.1 Site Access	15
5.2 Fire Protection Water Supply	15
5.3 Fire Alarm and Detection System	15
5.4 Fire Suppression System	15
6. BESS Hazards	16



6.1 Explosion Hazard 16

6.2 Thermal Runaway and Fire Hazards..... 16

6.3 Chemical Hazards..... 16

6.4 Electrical Hazards 17

7. Response18

7.1 Recommended PPE..... 18

7.2 Responsibilities..... 18

7.3 BESS Failure Response Tactics 19

7.4 Incident Stabilization 22

7.5 Additional Equipment Considerations..... 23

8. Recovery24

9. Revisions25

Appendix A: Emergency Response Action Plan26



List of Figures

Figure 1: Area Overview..... 7

Figure 2: Lumina BESS Facility Overview 8

Figure 3: Cells 9

Figure 4: Battery Modules..... 10

Figure 5: MP3 Cabinet Components 10

Figure 6: MP3 Thermal Management System Layout 11

Figure 7: MP3 Front View - Explosion Control System 12

Figure 8: MP3 Safety Controller Signal Diagram 13

Figure 9: MV Assembly Components..... 14

Figure 10: 100' Exclusion Zone 21

List of Tables

Table 1: Emergency Services Contact Information 5

Table 2: BMS Functions..... 12

Table 3: AEGL 1 Levels for Common Products of Combustion 21



1. EMERGENCY CONTACTS

1.1 Emergency Contact

The Remote Operations Center Name (ROC) can be reached 24/7 at [XXX.XXX.XXXX to be provided] for any emergency that may occur at the Lumina BESS.

Table 1: Emergency Services Contact Information

Emergency Services Agency	Phone	Address
All Emergencies	Call 911	--
Site Owner: Lumina Energy Storage, LLC	XXX.XXX.XXXX	[to be provided]
Site Operator: TBD	XXX.XXX.XXXX	[to be provided]
Pekin Fire Department Station 1	309.477.2388	3232 Court St, Pekin, IL 61554
Tremont Police	309.925.3600	211 S Sampson St, Tremont, IL 61568
Carle Health Pekin Hospital	309.347.1151	600 S 13th St, Pekin, IL 61554
City of Peoria: Emergency Services & Disaster Agency	309.494.8036	3615 N Grandview Dr, Peoria, IL 61614

1.2 Site Details

Address: [to be provided]

Coordinates: 40° 33' 56" N, 89° 32' 14" W



2. GENERAL INFORMATION

2.1 Scope

This document is an emergency response plan (ERP) for the Lumina battery energy storage system (BESS) facility. The ERP provides a facility overview, site design, type of equipment, safety features, suppression, and detection information along with response recommendations for potential BESS facility failure scenarios.

2.2 Purpose

The purpose of this ERP is to provide information to BESS subject matter experts (SMEs) and fire department personnel about potential hazards at BESS facilities. This guidance outlines the size-up and response tactics necessary to ensure safety and mitigate risks during emergency operations.

2.3 Limitations

At the request of Lumina Energy Storage, LLC, FRA developed an ERP for the Lumina BESS facility. The scope of the ERP may not comprehensively address all scenarios and events that may occur at the facility. Users of this document should reference and adhere to applicable jurisdictional standard operating procedures/guidelines (SOGs/SOPs) for the basis of response. Users of this report and any reuse of this report and recommendations herein are at the sole risk of the user. The recommendations and tactics formulated in this document are based on observations, industry best practices, and information available at the time of development. No guarantee or warranty as to future performance of any reviewed condition is expressed or implied.

The Lumina BESS facility is anticipated to include the installation of Megapack 3 (MP3) cabinets manufactured by Tesla or another outdoor containerized BESS product. As final site design and equipment decisions are made, this ERP will be modified and updated to match the exact layout and equipment installed.



3. SITE OVERVIEW

3.1 General Site Overview

The BESS facility will be located at [to be provided], with site access provided from Broadway Street. An existing cemetery, O'Brien Cemetery, is located to the southeast of the proposed battery facility outside of the proposed security fence, as shown in Figure 1. The facility will be located north of an existing substation and near the intersection between Broadway Street and Springfield Road. The Lumina BESS site will be situated in a rural area in Tazewell County near several agricultural and residential properties. During normal operation, the facility will be unstaffed and is monitored by the ROC.

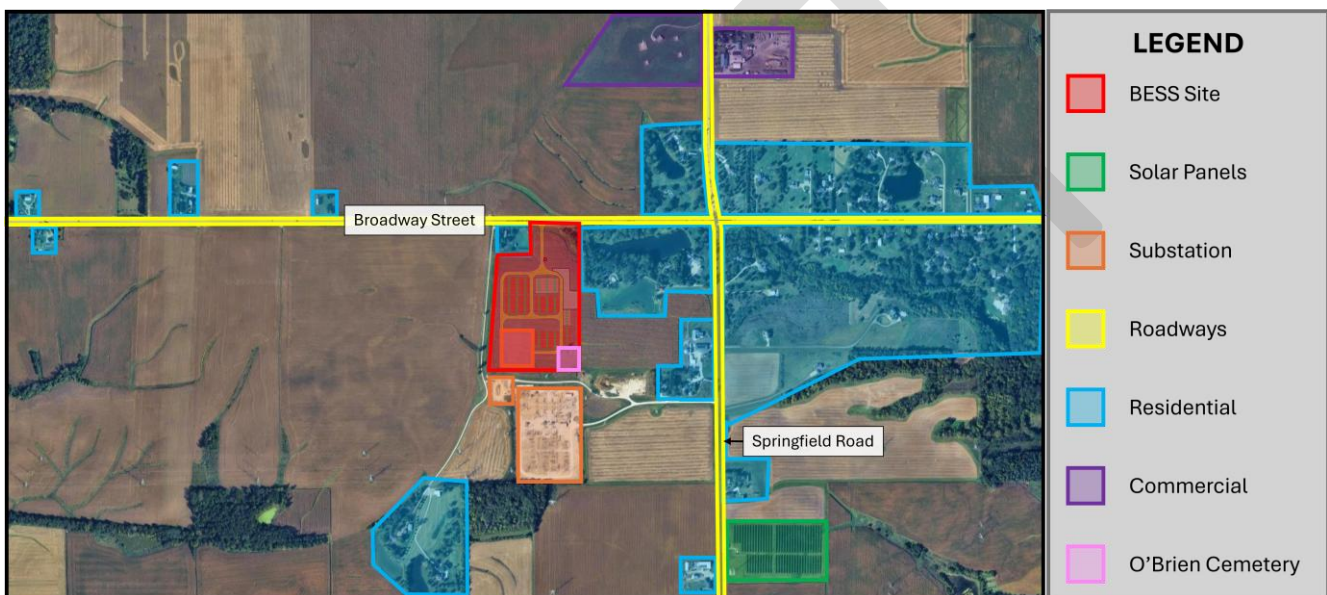


Figure 1: Area Overview

3.2 Energy Storage System Site Overview

The BESS facility is anticipated to include the installation of Megapack 3 (MP3) cabinets manufactured by Tesla or another outdoor containerized BESS product. The BESS facility is also anticipated to include power conversion systems (PCS), medium voltage transformers (MVTs), and auxiliary equipment/panels. The site also includes space for future augmentation of additional outdoor BESS cabinets and auxiliary equipment.

It is anticipated that the BESS cabinets will be divided into power blocks, as shown in Figure 2. Each battery block will contain BESS cabinets and one MVT. The BESS cabinet outputs 480 VAC to the associated MVT. The highest voltage within the BESS facility will be 34.5 kV from the MVT to the interconnection equipment.





4. EQUIPMENT AND SAFETY FEATURES

The MP3 is a fully integrated BESS consisting of battery modules, power electronics, control systems, a battery management system, a thermal management system, and an explosion control system all pre-assembled within a single, non-occupiable cabinet. The MP3 has a standardized, modular design that is not customizable or adjustable. MP3 arrives at the site fully assembled needing just the alternating current (AC) connection and communications cables to be connected on site. Thus, every installation has the same MP3 cabinets that are pre-assembled at the factory and delivered to the site. It is approximately 28.0 ft in length, 6.9 ft deep, 9.2 ft in height, and can weigh up to 86,000 pounds (8.550 m x 2.100 m x 2.785 m and 39,010 kg). Below is a brief description of the MP3, its components, design listing, and fire safety features.

4.1 Cell

The basic functional electrochemical unit containing an assembly of electrodes, electrolyte, separators, container, and terminals. It is a source of electrical energy by direct conversion of chemical energy. The MP3 uses a hermetically sealed, lithium iron phosphate (LFP) prismatic cell. Each cell is 356.45-amp hour (Ah) with a nominal voltage of 3.2 volts (V).

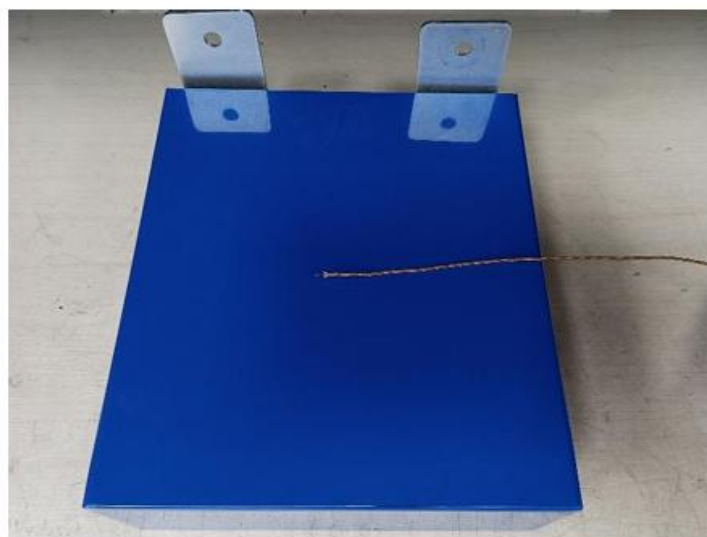


Figure 3: Cells

4.2 Module

Battery modules are factory-installed and contain prismatic lithium-ion battery cells. A battery module in turn is the smallest field-replaceable battery unit. The MP3 has 6 battery bays which can hold up to two battery modules each, as shown in Figure 4. Each module contains an integrated inverter, BMS system, fuses and is intended to function as a means to disconnect each pack from the DC bus. The modules do not require any field assembly or adjustments and may only be replaced by Service Providers.

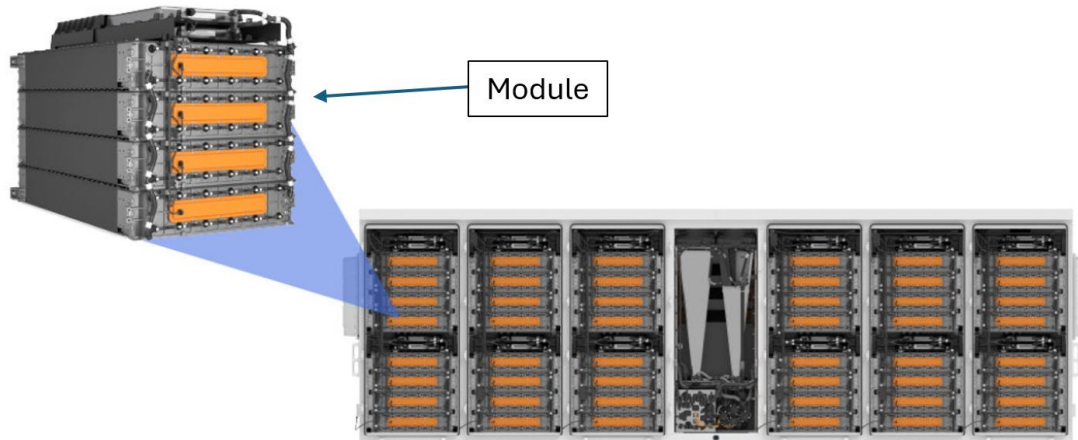
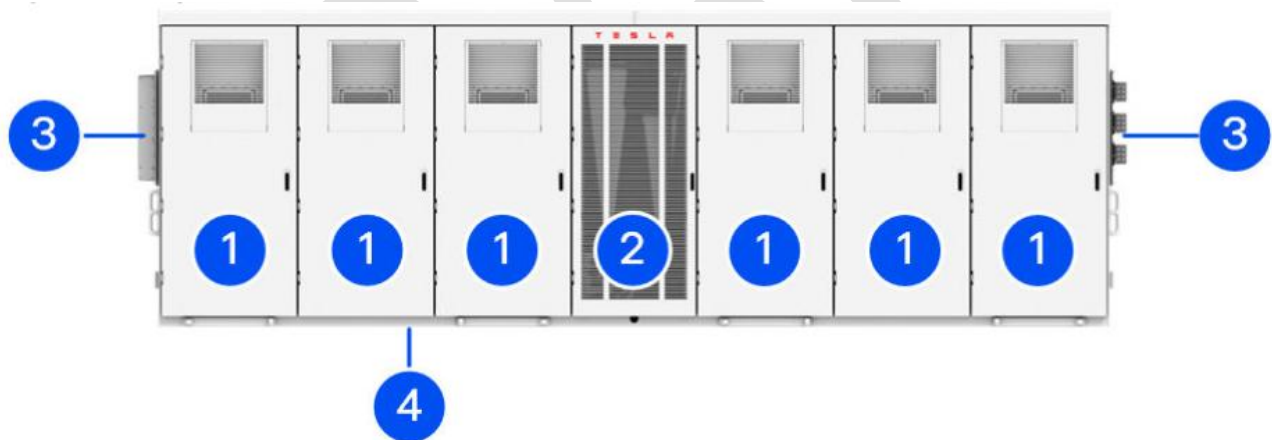


Figure 4: Battery Modules

4.3 Cabinet

The MP3 is intended for outdoor installations, ground-mounted to a foundation or base strong enough to support the weight of the equipment and anchor loads (including concrete pads, grade beams, etc.). The MP3 has a thermal bay located at the center with battery module bays on each side, as shown in Figure 5.



(1) Battery Module Bays (2) Thermal Bay (IP2X Enclosure) (3) Bus Connector (4) IP66 Enclosure

Figure 5: MP3 Cabinet Components

The lithium-ion batteries are housed inside an IP66 steel enclosure (battery module bay) that provides protection against particle and water ingress coming into contact with the battery modules and power electronics. This modular, cabinet-style approach allows for the system to be easily maintained and serviced from outside the cabinets (i.e., the battery modules, thermal management system, and power electronics are serviced through doors located on the front of the cabinets), thus eliminating the need for personnel to enter an enclosure, structure, building or container to perform those activities.



4.4 Thermal Management System (TMS)

The thermal management system (TMS) provides a suitable operating temperature for MP3. The thermal bay contains TMS components including fans, radiators, pumps, compressors, and thermal power electronics. The TMS contains a closed-loop liquid cooling system that circulates a 50/50 mixture of ethylene glycol and water throughout the battery modules and power electronics to maintain an optimum battery operating temperature. The thermal bay uses pumps to circulate the liquid coolant through the MP3, heaters that can warm the coolant and compressors that maintain thermal control for the cabinet. The thermal bay itself provides a ventilation airspace for the MP3. It contains fans and radiators that can cool the ethylene glycol-water solution. Cool air enters the thermal bay through the grates on the front of the MP3. The cool air then passes over the radiators, absorbing heat, and then is exhausted out of the top of the thermal bay via exhaust fans. The liquid cooling system utilizes up to 240 liters (63.4 gallons) of the ethylene glycol-water solution and the compressor utilizes 3.5 kg (7.7 lbs) of R-1234yf refrigerant for the 4 hour duration MP3.

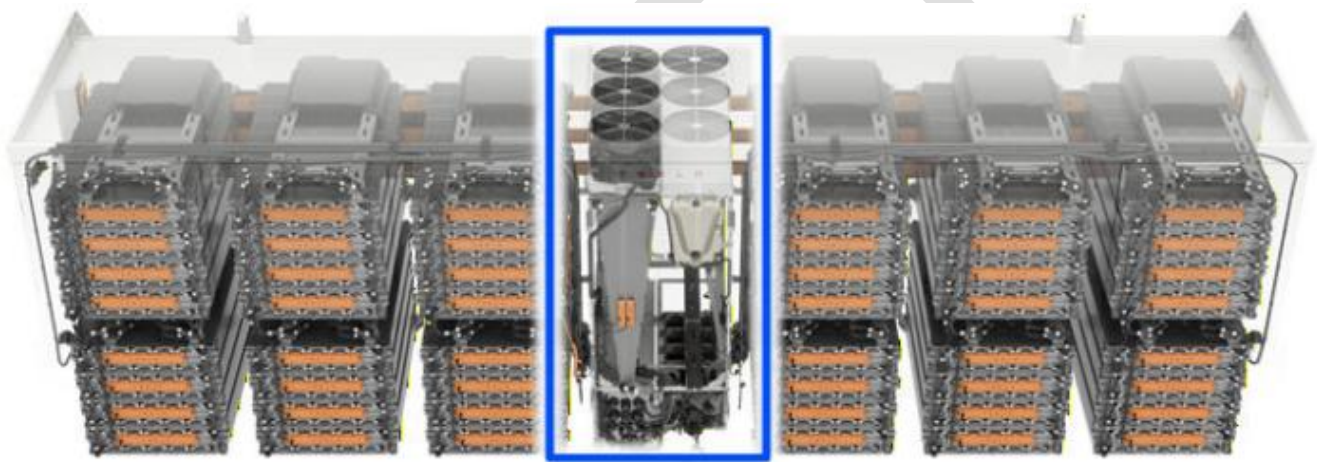


Figure 6: MP3 Thermal Management System Layout

4.5 Battery Management System (BMS)

The MP3 has an integrated Battery Management System (BMS) that monitors, protects, and manages the BESS, ensuring battery health parameters are maintained for efficient and continual operation. The BMS is a layered system, where each battery module has its own BMS and the MP3 itself has a bus controller supervising the output of all the battery modules at the AC bus level. The BMS is engineered to react to fault conditions in an autonomous manner, with safeguards built into the firmware. These fault conditions include, but are not limited to, over-temperature, loss of communication, over-voltage, and isolation.

Through a Tesla System Controller, the BMS for each BESS cabinet is monitored by Tesla at their Local Operations Center (LOC). The LOC provides remote equipment diagnostics, fault monitoring, and troubleshooting support. The BMS is also integrated into a site level SCADA system that is monitored by the Site Operator, 24-hour hours a day, 365 days a year.



Table 2: BMS Functions

Function	Description
Monitoring	The BMS continuously monitors key parameters such as voltage, current, temperature, and state of charge (SOC).
Protection	The BMS protects the battery from over-charging, over-discharging, over-current, over-temperature, and short circuits by isolating batteries that exceed predetermined operating parameters.
Balancing	The BMS helps to equalize the SOC across all cells.
Thermal Management	The BMS regulates the battery temperature by controlling heating or cooling systems, keeping the battery within the predetermined temperature range.
Power Control	The BMS regulates the power in and out of the batteries.
Communication	The BMS remotely communicates the status of monitored parameters and autonomously performed functions.

4.6 Explosion Control and Prevention System

The MP3 includes an explosion control system to mitigate the risk of an uncontrolled deflagration. The system includes pressure-sensitive vents (overpressure vents) and sparkers installed throughout the battery module bay. The sparkers are designed to ignite flammable gases released early in a thermal runaway event, near their lower flammability limit (LFL), before they accumulate within the cabinet in greater volumes. They are installed at a variety of locations and heights throughout the battery module bays to ensure the flammable gases released during thermal runaway quickly meet an ignition source regardless of the initial release location. Sparkers are operated from an independent power system and are designed to operate even if power is lost from the grid. Sparkers operate automatically at regular intervals over the life of the MP3.

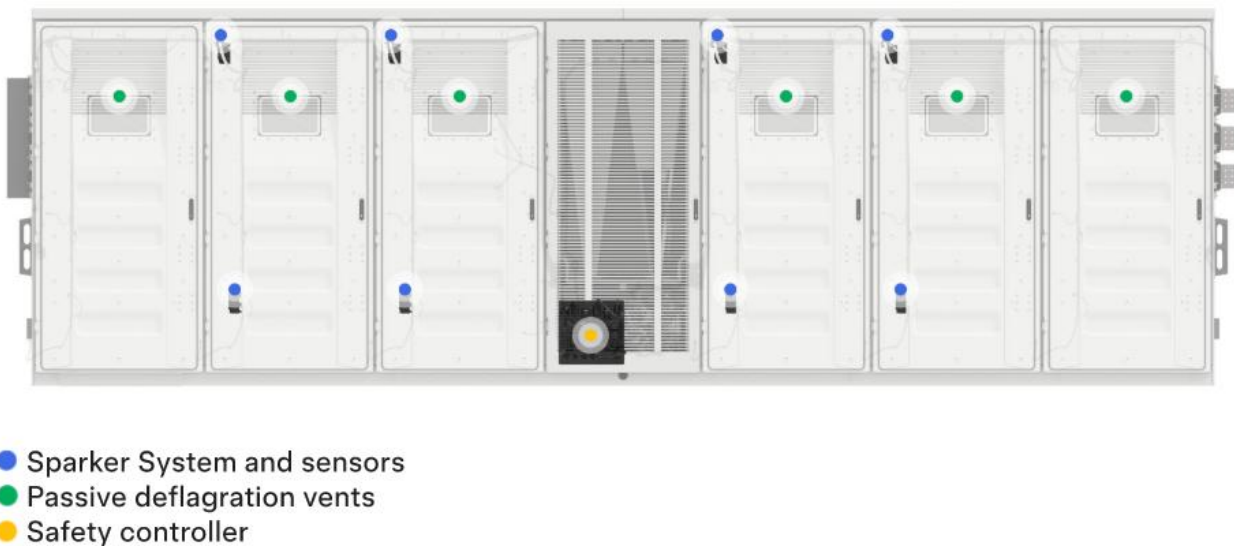


Figure 7: MP3 Front View - Explosion Control System



Overpressure vents installed in each battery bay are designed to open during an overpressure event, such as the rapid ignition of flammable gases by a sparker. Once opened, the overpressure vents permit gases, products of combustion, and flames to exhaust in a controlled path from the battery bay into the thermal roof. From the thermal roof, this exhaust releases out of the roof vents.

4.7 Safety Controller

The safety controller is located in the thermal bay and manages all safety data processing and alerting. The safety controller provides an external warning and communication system which consists of an audible alarm and flashing lights. In addition, the Tesla System Controller is then the direct point of connection to the site level SCADA monitoring system.

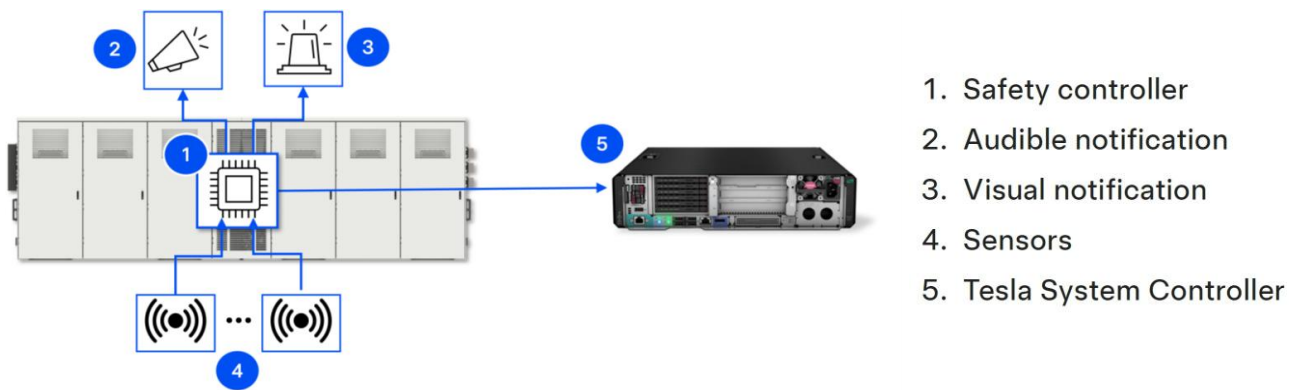


Figure 8: MP3 Safety Controller Signal Diagram

4.8 Emergency Stop

The MP3 cabinet and MVT do not include physical emergency stop (E-stop) buttons. Each MP3 can be shut down remotely by the ROC.

4.9 MV Transformer

Each battery block includes four MP3 battery cabinets and one medium voltage (MV) assembly, an integrated structure (also known as a skid) which consists of a MV transformer, MV switchgear, and a communications interface, as shown in Figure 9. The MV assembly connects to the site's medium-voltage power distribution system, transforming between low voltage 480 VAC from the battery and medium voltage 34.5 kV to the grid interface. The MV transformer is oil cooled and has a maximum operating temperature ranging from -40°C (-40°F) to 50°C (122°F) ambient.

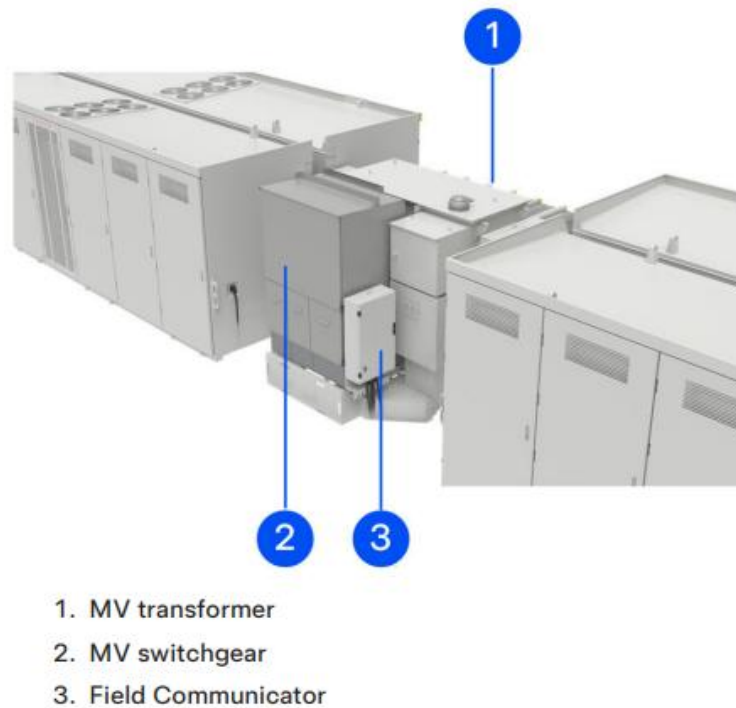


Figure 9: MV Assembly Components

4.10 Auxiliary Power System

Auxiliary power is the power drawn to support the Megapack internal controls and thermal management loads, not including battery inverter losses. This power may be drawn from the grid and/or battery modules. Auxiliary power for the site will be located in up to 6 dedicated blocks adjacent to the Megablocks and are supplied through a dedicated transformers and associated distribution equipment. Each auxiliary power block generally includes a 230 VAC disconnect switch. The loss of auxiliary power to the site will result in shutdown of operations.

4.11 Emergency Power

A backup power supply will be provided for auxiliary power in the event of a grid outage, capable of providing at least 2 hours of back up power.



5. FIRE PROTECTION OVERVIEW

5.1 Site Access

The Lumina BESS site can be accessed at the north end of the facility from Broadway Street, see Figure 1 and Figure 2. The site will be contained by a perimeter security fence and 24 ft wide entrance gate to prohibit unauthorized access to the facility. A knock box will be provided at the entrance gate for first responders.

A 40 ft-by-40 ft emergency staging area and water tank are proposed at the site entrance outside of the security gate. An access road is provided throughout the facility with a minimum width of 20 ft and minimum turning radius of 50 ft. Additional security gates and fencing separate the BESS area from the substation.

5.2 Fire Protection Water Supply

A 30,000 gallon water tank will be provided on site at the entrance and outside of the security gate. Typical BESS firefighting response procedures do not require or recommend offensive firefighting tactics to manually suppress a BESS fire. If manual firefighting tactics are used, water is considered the preferred agent for managing suppressing nearby combustibles, cooling nearby exposures, and controlling smoke. Other fire suppression methods, such as gaseous agents (CO₂, Halon), dry chemical suppressants, or foams, are unlikely to be effective.

5.3 Fire Alarm and Detection System

The MP3 cabinets do not contain internal fire alarm or detection systems. As described in Section 4.5, the BMS monitors battery and equipment operating conditions, while the Tesla LOC and site SCADA system provides site-level operational monitoring and control. These systems are primarily intended for equipment operation and system-health monitoring and are distinct from the dedicated fire detection and alarm systems.

5.4 Fire Suppression System

The MP3 is not equipped with any type of water sprinkler, gaseous agent, or aerosol-based fire suppression system. There are no listed agents or methods that can interrupt and contain a cell that is in thermal runaway. Other fire suppression methods, such as gaseous agents (CO₂, Halon), dry chemical suppressants, or foams, are unlikely to be effective and can increase the explosion risk in the event of battery failure.



6. BESS HAZARDS

6.1 Explosion Hazard

The failure of a cell will begin with the venting stage; this is the precursor to thermal runaway. Accumulation of flammable gases within a confined space, such as a BESS cabinet, can lead to an explosive atmosphere where the gas concentration falls within its upper and lower flammability limits. An explosion can occur when cell vent gases accumulate and contact a competent ignition source. While safety features are present to decrease the risk of an explosion, always assume that they are non-operational. Maintain an exclusion zone from the trouble equipment for the duration of the incident.

6.2 Thermal Runaway and Fire Hazards

Thermal runaway occurs when an electrochemical battery cell's temperature increases at an accelerating rate in an uncontrollable fashion sufficient to result in damage to the cell. The thermal runaway progresses when the cell's generation of heat is at a higher rate than the heat it can dissipate.

During thermal runaway, flammable gas and heat is produced. Failure may spread to adjacent cells or modules and the gas may ignite. Due to the high pressure at which these gases vent and the lack of a listed suppression agent, no attempt should be made to suppress this fire.

6.3 Chemical Hazards

6.3.1 Products of Combustion

During a failure event, battery cells produce toxic gases that have the potential to be harmful to site personnel and first responders. If the failure spreads to other BESS components, it can produce additional toxic gases similar to those released during the combustion of ordinary manufactured products.

- Common Gas Byproducts:
 - Carbon monoxide (CO)
 - Carbon dioxide (CO₂)
 - Hydrogen (H₂)
 - Hydrogen fluoride (HF)
 - Hydrogen cyanide (HCN)
 - Hydrogen chloride (HCl)

Battery fires result in the production of similar chemical compounds as typical structure fires.

Although outdoor BESS cabinets are not occupiable, site personnel and first responders can still be exposed to these toxic gases while operating near a BESS during a failure or fire event. In the event of a gas release, these



toxic gases are expected to be diluted by the entrainment of outside air. Fire department personnel should wear the appropriate personal protective equipment (PPE), as outlined in Section 7.1.

6.3.2 Transformer Dielectric Fluid

Dielectric fluid is used to insulate and cool site transformers such as medium voltage transformers and auxiliary power transformers. During a transformer failure, arcing and sustained fire can lead to heat retention in the windings and metal cabinet of the transformer, making this a persistent fire.

6.4 Electrical Hazards

Shielded electrical hazards at the BESS facility include battery cabinets, inverters, and transformers. Outer covers around the equipment eliminate casual contact and locks prevent access to energized areas.

Unshielded electrical hazards at the facility include exposed bus within a substation or overhead electrical connections to the surrounding grid. OSHA regulations require a minimum standoff distance of 10 feet from equipment and power lines. The minimum clearance should be increased by 4 inches for every 10kV over 50kV.

BESS products contain batteries that are ALWAYS energized and present an electrical hazard even when disconnected from an electrical source. The operation of breakers or E-Stops will serve to isolate trouble equipment. However, the operation of these devices will not remove stranded energy. Class C electrical hazards constantly exist at BESS facilities.

NFPA 1970 structural firefighting ensemble is not rated for arc flash hazards. Maintain a 10-foot standoff distance from any open doors on BESS cabinets.

E-field detectors are commonly used to identify potential AC hazards. These devices do not have the ability to detect DC voltage from battery cabinets. Do not use E-field detectors within a BESS facility.



7. RESPONSE

7.1 Recommended PPE

The recommended PPE is NFPA 1970 structural firefighting gear and the use of a self-contained breathing apparatus (SCBA) when exposed to respiratory hazards. All chemicals associated with the failure of BESS equipment and ancillary electrical components present dermal and respiratory hazards.

PPE decontamination should be done in accordance with NFPA 1581, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*.

Note: The PPE recommendation is for emergency response operations and life safety. PPE recommendations for the post-fire removal of damaged modules will be defined by conditions found at the time of decommissioning. In addition, structural firefighting ensembles are not designed to provide protection from arc flash hazards.

7.2 Responsibilities

Typically, a BESS SME is a person or group familiar with the MP3 BESS equipment, the site layout and equipment, installation guides and manuals, the BMS architecture, passive and active protection systems, notification sequencing, and this ERP.

7.2.1 BESS SME Responsibilities

The BESS SME, equipment owner, and site operator play a critical role guiding fire department personnel responding to a BESS emergency. The BESS SME is responsible for the following:

- Accountability:
 - Determine amount and location of non-fire department personnel inside the facility.
- Equipment Isolation:
 - Identify, locate and isolate involved equipment in coordination with the ROC.
- Monitor Alarm System:
 - Fire Alarm System: Smoke, Heat, Hydrogen Gas, Fire Alarm, and Trouble Signals.
 - BMS: Cell temperature alarms, number of affected cells, potential propagation, SOC.
 - Relay changing condition information to fire department incident commander.
- Exclusion zone:
 - Establish an exclusion zone around the affected equipment.
 - Convey the presence of heat alarms or cell temperature alarms in surrounding cabinets.
 - Expand the exclusion zone if surrounding battery cabinets experience alarms.
- Explosion system assessment:
 - Evaluate the status of the deflagration vent panels.
 - Evaluate the status of the combustible concentration reduction system.



7.2.2 Fire Department Responsibilities

The fire department plays a critical role in responding to a BESS emergency. The fire department is responsible for the following:

- Accountability:
 - Determine amount and location of non-fire department personnel inside the facility.
- Exclusion Zone:
 - Establish an exclusion zone around the affected equipment.
 - Expand the exclusion zone if surrounding battery cabinets experience alarms.
- Air Monitoring:
 - Utilize available air monitoring equipment to evaluate conditions outside the facility.
- Explosion system assessment:
 - Evaluate the status of the deflagration vent panels.
 - Evaluate the status of the combustible concentration reduction system.
- Condition Monitoring:
 - Visually and audibly evaluate conditions of affected equipment.
- Exposure Assessment:
 - Visually and audibly evaluate conditions of adjacent equipment.
- Exposure Protection:
 - Establish water supply.
 - Provide exposure cooling.

7.3 BESS Failure Response Tactics

DO NOT FORCE ENTRY

Fire department personnel should not encroach within 100 feet of the facility fence line or equipment until the affected battery cabinet has been identified by the BESS SME.

Upon arrival, the fire department incident commander should contact the ROC at [XXX.XXX.XXXX to be provided] to obtain preliminary information. Determine the following:

- Accountability
 - Amount and location of non-fire department personnel inside the facility.
- Affected equipment
 - Location
 - Type
 - Isolation status
 - Fire and BMS alarms
- Surrounding equipment conditions

The fire department should follow jurisdictional standard operating procedures (SOPs) to establish a continuous water supply.



7.3.1 Life Safety

BESS facilities are normally not staffed and are observed and controlled remotely. However, facility personnel may be on-site periodically for inspection, testing and maintenance of equipment. The fire department should confirm accountability with the BESS SME and the ROC.

Obvious line of sight rescues are the priority for responding fire department personnel. Fire department personnel shall not enter the facility for recovery operations. Fire department personnel should consider the risks associated with rescue of potential victims at BESS facilities utilizing a risk reward assessment based on equipment location as follows:

- Victim greater than 100 feet from affected equipment – Lower risk
- Victim less than 100 feet from affected equipment – Highest risk
- Victim in contact with equipment – Do not attempt

7.3.2 Community Air Monitoring

The fire department should establish air monitoring in accordance with the following guidelines:

- Overview: Decisions regarding shelter-in-place orders or evacuations should be guided by direct air monitoring data. Action thresholds for public displacement are established in accordance with the Environmental Protection Agency (EPA) Acute Exposure Guideline Levels (AEGLs) for airborne chemicals. This list emphasizes high-risk, volatile industrial chemicals known or suspected to cause significant health effects following short-term accidental exposure.
- Products of Combustion: Battery cells encased in plastic can release toxic gases such as hydrogen fluoride (HF) during fires due to thermal decomposition. Plastics and surfactants with fluoride compounds, freon, and electrolyte solutions containing LiPF₆ can all contribute to HF production. Acid gases like hydrogen cyanide (HCN) may result from burning nitrogen-containing materials, while hydrogen chloride (HCl) forms from chlorinated plastics, especially PVC.

Note: These hazards are not limited to battery fires; common household and commercial plastics and cellulose materials also produce HF, HCl, HCN, and similar combustion products.

- Process: Start air monitoring 100 feet downwind from the facility fence line during active fires. If readings exceed AEGL action thresholds, expand monitoring by 50-foot intervals until levels drop below threshold limits.
- Metering Devices: CO meters are commonly utilized by fire departments for gas detection. The capacity to identify various acid gases, as detailed below, is typically restricted to hazardous materials units within the fire service due to their specialized training and advanced equipment required for comprehensive air monitoring. During BESS fires, CO is the predominant gas encountered, often detected in substantial quantities—expressed as percentages—while acid gases generally appear only in trace concentrations, measured in parts per million (PPM). CO may serve as an early indicator to assess whether public evacuation is necessary.



- Action Levels: AEGL standards are designated at three threshold levels. Exposure at AEGL 1 presents no permanent health consequences; AEGL 2 may result in significant or prolonged effects; and AEGL 3 has the potential to cause life-threatening outcomes. AEGL 1 will determine public displacement.

Table 3: AEGL 1 Levels for Common Products of Combustion

AEGL 1	10 min (PPM)	30 min (PPM)	60 min (PPM)	4 hr (PPM)	8 hr (PPM)
Carbon Monoxide*	420	150	83	33	27
Carbon Dioxide	-	-	-	-	-
Hydrogen	-	-	-	-	-
Hydrogen Fluoride	1.0	1.0	1.0	1.0	1.0
Hydrogen Cyanide	2.5	2.5	2.0	1.3	1.0
Hydrogen Chloride	1.8	1.8	1.8	1.8	1.8

*CO follows AEGL 2 thresholds.

7.3.3 Exclusion Zone

Once the affected equipment is identified, the fire department in coordination with the BESS SME should establish a 100-foot exclusion zone from the affected equipment. Expand the exclusion zone if failure conditions spread to adjacent equipment.

Note: The exclusion zone is established as a conservative measure should the deflagration prevention system fail to operate as designed.

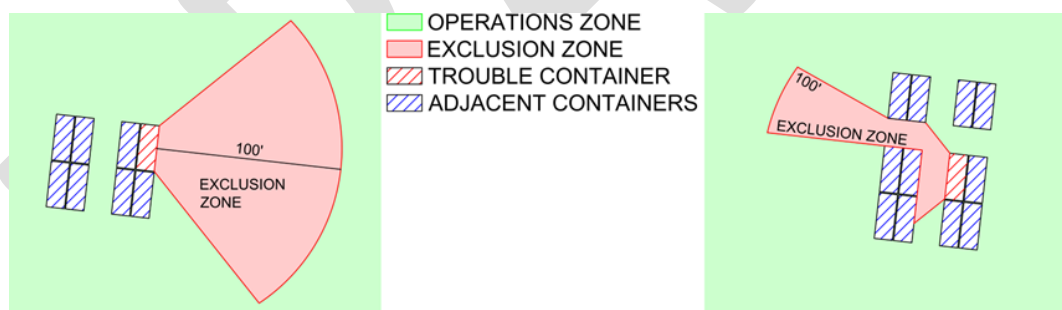


Figure 10: 100' Exclusion Zone

7.3.4 Alarm Monitoring

The BESS SME should monitor input alarms from the fire alarm system and the BMS for the affected equipment. Receipt of additional alarms can indicate deteriorating conditions within the affected equipment. A review of the BMS can indicate the possible origin location and further impacted internal equipment.

Note: BMS and Fire Alarm monitoring may not be functional. Be aware of the lack of BMS and alarm system data points will require the BESS SME and fire department to relay solely on observation of the affected equipment to make tactical decision during any incident that occurs.



7.3.5 Isolation of Affected Equipment

The BESS SME should confirm if affected equipment has been autonomously isolated. If equipment has not been autonomously isolated, the BESS SME should direct remote isolation of affected equipment.

Fire Department personnel should never operate equipment or controls within the site. The BESS SME will coordinate all operational requests.

7.3.6 Continuous Size-Up

From outside the exclusion zone, the BESS SME and fire department should visually and audibly monitor the conditions of the affected equipment regularly. Look for the presence of white gas, smoke, fire, and damage to the equipment. Even if there are no visible or audible indications of failure, hazards may still be present.

7.3.7 Exposure Assessment

The BESS SME and the fire department should assess the adjacent equipment to determine if exposure protection is necessary. Evaluate the following:

- Alarms in adjacent equipment.
 - Expand exclusion zone if alarms are generated in adjacent equipment.
- Radiant heat exposure measured by an increase in temperature on adjacent equipment based on thermal imaging camera readings.
 - Establish a baseline temperature reading for unaffected equipment.
 - Establish a baseline temperature reading for affected equipment.
- Direct flame impingement on adjacent equipment.

7.3.8 Exposure Protection

The fire department should consider exposure protection if conditions warrant or if recommended by the BESS SME. Conditions that warrant consideration of exposure protection are:

- New alarms in adjacent equipment.
- Upward temperature trend in adjacent equipment when compared to baseline readings.
- Direct flame impingement on adjacent equipment.

From outside the exclusion zone, establish a continuous water supply. Utilize a rain down method to apply water in a fog pattern to cool the exposure equipment. Do not use a solid or straight stream to ensure fire department personnel safety and limit water intrusion into uninvolved equipment.

7.4 Incident Stabilization

The incident may be considered “stabilized” or “under control” when all of the following conditions are met:

- Fire is contained to the equipment involved with no exposure concerns.
- No new alarms have been generated in unaffected equipment.



Once the incident has been placed “under control” at the discretion of the incident commander, site control and incident responsibility is transitioned to the owner/operator, who should establish continuous fire-watch for the facility until decommissioning is completed.

7.5 Additional Equipment Considerations

7.5.1 Transformer Fire

Following a transformer fire, the presence of sustained arcing is a sign that the fault condition has not cleared. This will present with a blue flame or electrical arc and may be a precursor to a catastrophic failure of the transformer. Oil insulated wet transformer fires are classified as Class B and C fires until power is disconnected. Once the electrical source is removed, a wet transformer fire can then be reclassified as a solely Class B fire. Dry insulated transformer fires are classified as Class C fires until power is disconnected. Once the electrical source is removed, dry transformer fires can then be reclassified as Class A fires.

The BESS SME should:

- Confirm the type of transformer involved (Wet or Dry).
- Confirm that the affected transformer is disconnected from the electrical source.
- Monitor for alarms in adjacent equipment.

The fire department should:

- Confirm that equipment is isolated with BESS SME.
- Evaluate exposure equipment utilizing the following:
 - Alarms in adjacent equipment.
 - Radiant heat exposure measured by an increase in temperature on adjacent equipment based on thermal imaging camera readings.
 - Establish a baseline temperature reading for unaffected equipment.
 - Establish a baseline temperature reading for exposed equipment.
 - Direct flame impingement on adjacent equipment.
- Intervention should be limited to scenarios where adjacent equipment is at risk.
 - If intervention is necessary, it should be focused on the following:
 - Protection of at-risk equipment.
 - Suppression should be limited to the use of carbon dioxide agent, which has a Class C rating.
- If BESS equipment becomes involved, utilize response tactics from Section 7.3.



8. RECOVERY

Once an incident has been brought under control, the process shifts from implementing the ERP to executing the decommissioning plan. As this transition occurs, it is important to carefully consider the necessary steps involved in ensuring safe and effective progression. Implementation of the recovery process is the responsibility of the facility owner/operator and should be overseen by the BESS SME. This section is provided for informational purposes only for the fire department.

Typical facility recovery process can include:

- Establish a continuous fire watch until the offsite transportation of damaged or defective cells has been completed.
- Conduct an assessment of site equipment to determine replacement, repair or restoration.
- Isolate and lock out / tag out any equipment identified for repair or replacement.
- Assess the following operational and safety features of equipment that is scheduled for restoration:
 - Grid connectivity
 - BMS
 - Fire alarm system
 - Central station connectivity
 - Equipment review and control through SCADA
 - Fire suppression system (as available)
 - Explosion control and prevention systems
- Implement decommissioning plan.



9. REVISIONS

Date	Revision	Reason for Issue	Developed By	Reviewed By	Approved By

Warning, this document is a preliminary draft.
Significant changes will occur once site design and
equipment decisions are provided.

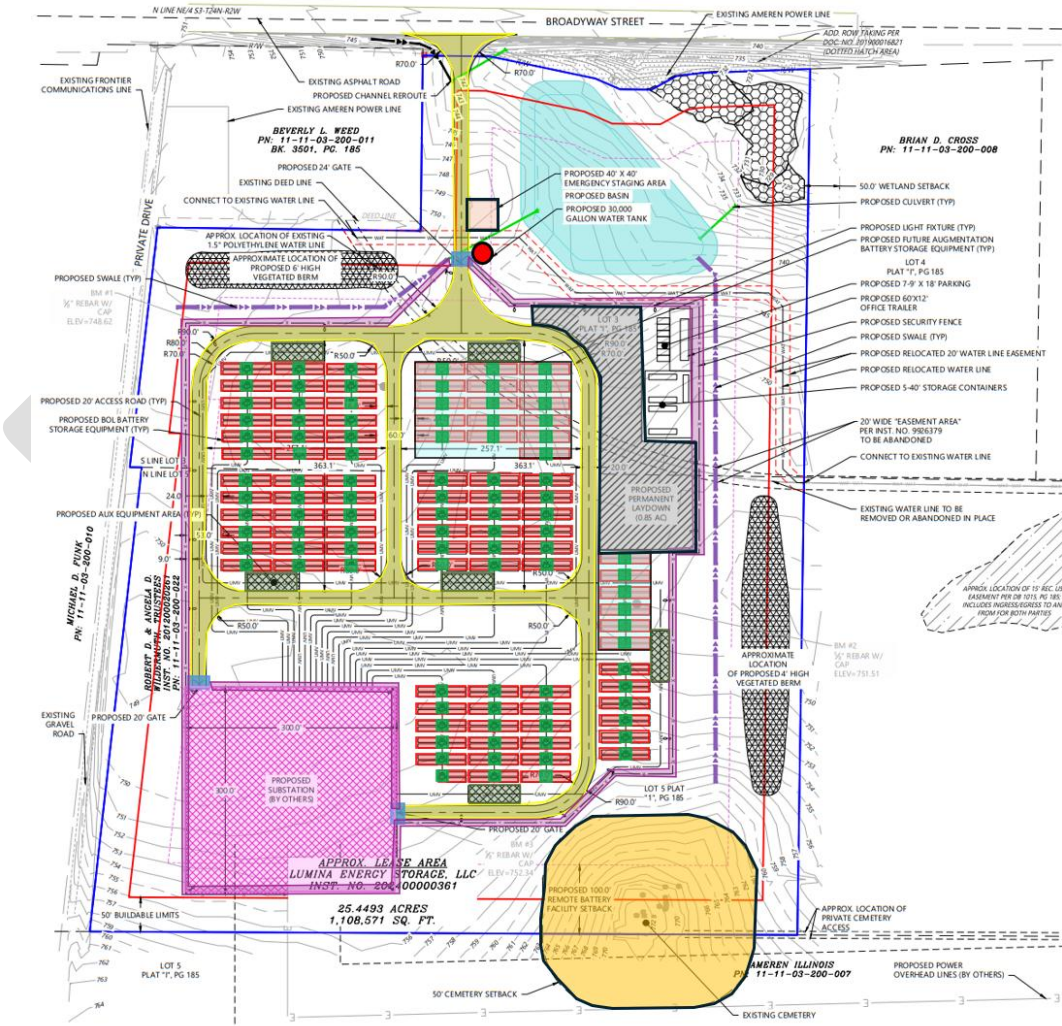


APPENDIX A: EMERGENCY RESPONSE ACTION PLAN

BESS	[ROC XXX.XXX.XXXX]	
Facility Name	Lumina BESS	
Type of Facility	Outdoor Stationary Battery Energy Storage System (BESS)	
Facility Address	TBD	
Facility Coordinates	40° 33' 56" N, 89° 32' 14" W	

LEGEND

- BESS Product
- PCS / Transformer
- Fence
- Future Augmentation
- Access Roads
- Gate
- Substation
- Auxiliary Equipment
- Laydown Area
- Existing Cemetery
- Emergency Staging Area
- Water Tank





General Information

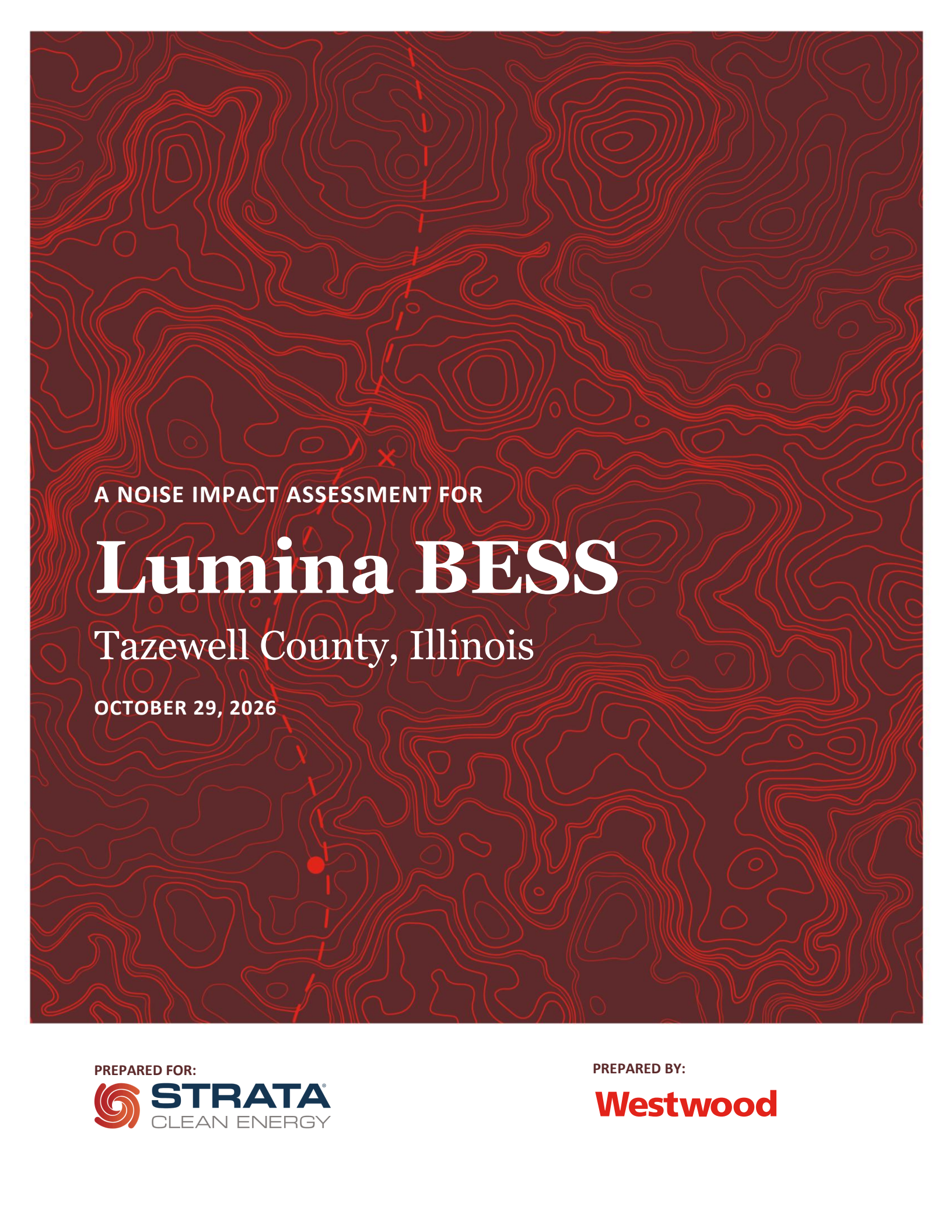
- **Site Information:** The Lumina BESS is a battery energy storage facility that contains MP3 BESS cabinets containing lithium iron phosphate (LFP) batteries, medium voltage skids, and other electrical infrastructure equipment.
- **Suppression-Detection:** A 30,000 gallon water tank will be provided on site. The MP3s have protection systems including a fire and gas detection, with local notification.
- **Explosion Control and Prevention:** The MP3 incorporates explosion prevention measures through sparkers and overpressure vents. The sparkers ignite combustible gases before they reach an explosive concentration, while the overpressure vents open to relieve the pressure inside the cabinet.

Hazards

- **Combustion Gases:** Thermal runaway can lead to the release of hot, flammable gases which can lead to **fire** or **explosion**.
 - Gases: hydrogen, carbon monoxide, carbon dioxide, hydrocarbons, and other toxic substances similar to the combustion of ordinary manufactured products.
 - Released gases are expected to be diluted by outdoor air, but exposure risk remains.
- **Deflagration or explosion:** Can occur when flammable gases accumulate in a battery cabinet.
- **Electrical Hazards:**
 - Batteries will maintain a state of charge presenting an energized electrical hazard, even after isolation.
 - Electrical conductors are shielded from casual contact.
 - Structural firefighting ensembles are not rated for **arc flash** hazards.

BESS Failure Response Tactics Checklist

- ☐ Do not force entry to facility entrance. Stage at the designated first responder staging area near the site entrance.
- ☐ If immediately available, coordinate with BESS SME to assist with response tactics
- ☐ Contact ROC at [XXX.XXX.XXXX to be provided] to determine:
 - ☐ Site personnel accountability
 - ☐ Affected equipment location and type
 - ☐ Equipment isolation status
 - ☐ Fire and battery management system (BMS) alarm status
- ☐ Make obvious, visual, line of sight rescues
 - Victim greater than 100 feet from affected equipment – Lower risk
 - Victim less than 100 feet from affected equipment – Highest risk
 - Victim in contact with equipment – Do not attempt
- ☐ Conduct air monitoring starting 100 ft downwind of fence line
- ☐ Establish a 100-foot exclusion zone around the affected equipment
 - ☐ Expand exclusion zone if conditions spread to adjacent equipment
- ☐ Confirm affected equipment has been isolated with BESS SME
- ☐ Consider exposure cooling for adjacent equipment using a rain down method, applying water in a fog pattern, based on the following:
 - ☐ Alarms in adjacent equipment
 - ☐ Radiant heat exposure measured by an increase in temperature
 - ☐ Direct flame impingement
- ☐ Continuously monitor equipment conditions from outside exclusion zone until incident is under control
- ☐ Evaluate fire and BMS alarms to determine if condition has stabilized or propagation is occurring



A NOISE IMPACT ASSESSMENT FOR

Lumina BESS

Tazewell County, Illinois

OCTOBER 29, 2026

PREPARED FOR:



PREPARED BY:

Westwood

Noise Impact Assessment

Lumina BESS

Tazewell County, Illinois

Prepared For:

Lumina Energy Storage, LLC
800 Taylor Street
Suite 200
Durham, NC 27701

Prepared By:

Westwood Professional Services
12701 Whitewater Drive
Suite 300
Minnetonka, MN 55343

Project Number: Ro080840.00
Date: October 29, 2026



Executive Summary

Westwood Professional Services, Inc. (Westwood) was contracted by Lumina Energy Storage, LLC (Client) to complete an operational noise impact assessment for Lumina BESS (Project) located in Tazewell County, Illinois. The Project is proposed to include a 300 MW nameplate capacity battery energy storage system (BESS) facility. This noise impact assessment was completed pursuant to the procedures set forth by the Illinois Pollution Control Board (IPCB).

An operational noise impact evaluation of the Project was conducted for the proposed Project layout. Noise propagation from the proposed equipment was modeled using manufacturer-provided noise data and NEMA standards. Project-generated noise levels were calculated at all noise sensitive receptors within $\frac{1}{4}$ mile of the proposed Project boundary. Noise level regulations include the Tazewell County Renewable Energy Ordinance which requires compliance with the noise level limits set forth by the IPCB within the Illinois Administrative Code (IAC). Given the equipment and layout assumptions stated herein, Project-generated noise levels do not exceed the limits set forth in the IAC.

Table of Contents

Executive Summary i

1.0 Project Background 1

2.0 Regulatory Setting & Noise Level Requirements 2

3.0 Modeling Methodology & Parameters 3

4.0 Noise Level Estimates 4

5.0 Design Flexibility 4

Tables

Table 1 Permissible Sound Levels, Class C to Class A (Leq) 2

Table 2 Project Equipment & Layout Configuration 3

Table 3 Project Equipment Spectral & Broadband Data 3

Figures

Figure 1 Project Overview 1

Appendices

Appendix A Noise Sensitive Receptor Locations & Coordinates

Appendix B Class A Receptor Octave Band Levels

Appendix C Receptor 1/3 Octave Band Levels

1.0 Project Background

1.1 Site Description

The proposed Project is located in Tazewell County, Illinois. Noise receptors in the Project vicinity include residences. Existing noise sources in the Project vicinity include an existing substation to the south and local road traffic. The primary land uses in the Project vicinity are residential and agricultural.

1.2 Project Description

The Project is proposed to include battery energy storage systems (BESS), a 25' solid fence/wall, and associated equipment/infrastructure (**Figure 1**).

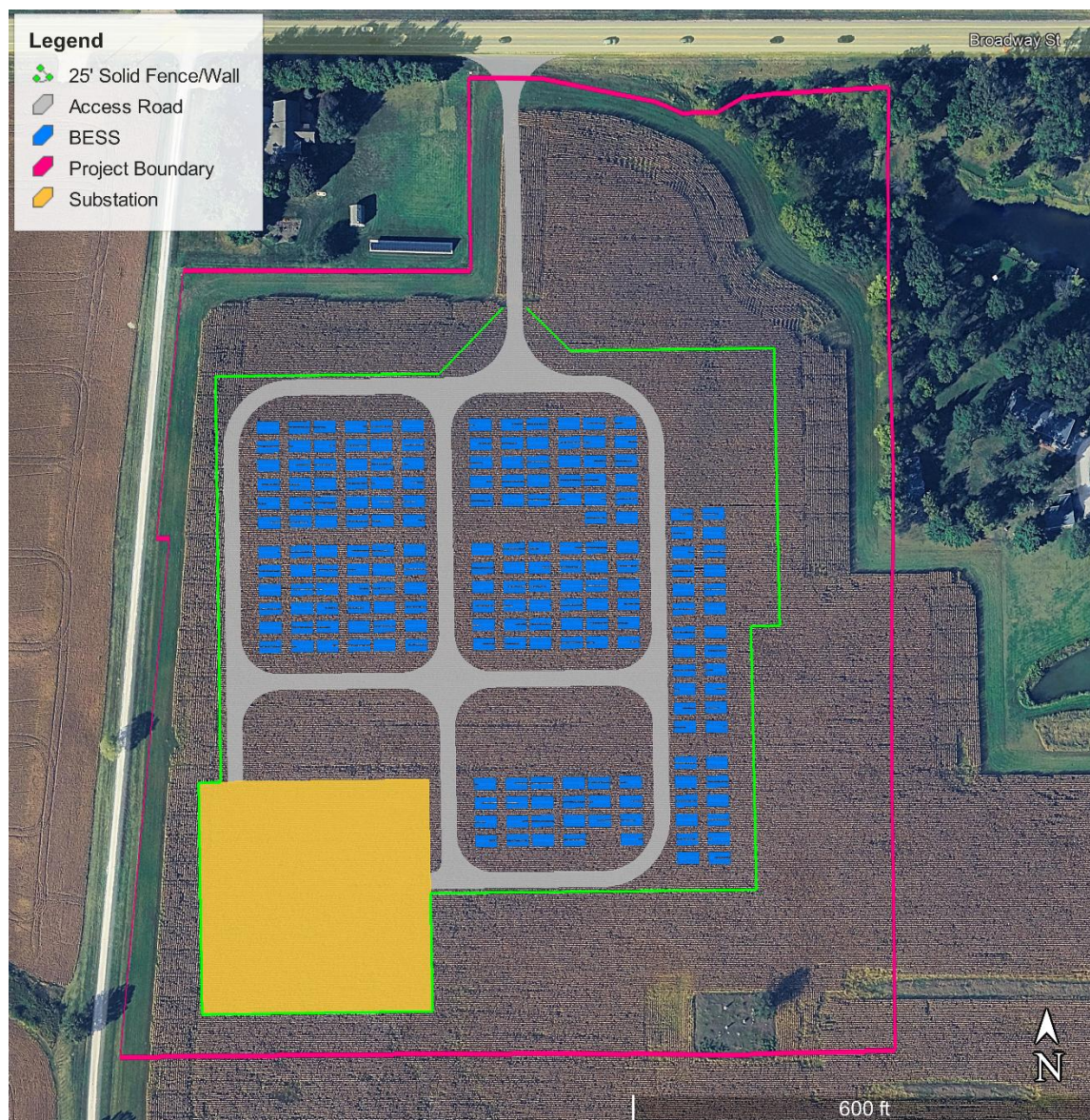


Figure 1 Project Overview

2.0 Regulatory Setting & Noise Level Requirements

The Tazewell County Renewable Energy Ordinance requires proof of compliance with the statewide IPCB limits, which are stated within IAC Title 35, Subtitle H, Chapter I, Part 901 *Sound Emissions Standards and Limitations for Property-Line Noise-Sources*. This regulation sets noise level limits according to the land use where the noise is produced and where the noise is received. Land uses are split into three classes: Class A refers to residences or equally sensitive areas, Class B land is of mixed use, and Class C refers to agricultural and industrial land uses. Class A noise sensitive receptors as defined by the IPCB include dwellings and occupied community buildings, even those on agricultural land. In the absence of field verification of receptor land classification, the most conservative limits were analyzed for this Project – those of noise produced on Class C land impacting Class A land. The daytime and nighttime octave band limits are listed in **Table 1**.

Table 1 Permissible Sound Levels, Class C to Class A (L_{eq})

Time of Day	Octave Band (Hz) Sound Pressure Level Limits (dB)								
	31.5	63	125	250	500	1000	2000	4000	8000
Daytime	75	74	69	64	58	52	47	43	40
Nighttime	69	67	62	54	47	41	36	32	32

Additionally, the IAC prohibits the emission of prominent discrete tones from any property-line noise source located on Class C land to receiving Class A land, when measured at any point within the receiving land at least 25' away from the property-line noise source. A discrete tone is defined as a one-third octave band sound level that exceeds the arithmetic average of the sound pressure levels of the two adjacent one-third octave bands by the following levels: 5 dB if the center frequency is between 500 and 10,000 Hz inclusive, by 8 dB if the center frequency is between 160 and 400 Hz inclusive, or by 15 dB if the center frequency is between 25 and 125 Hz inclusive. Discrete tones that have a one-third octave band sound pressure level 10 or more decibels below the allowable octave band sound pressure level specified in **Table 1** are not classified as prominent discrete tones.

3.0 Modeling Methodology & Parameters

A noise propagation model was developed and run for the Project using CadnaA noise modeling software in compliance with ISO 9613-2.

Model parameters were as follows:

- Ground absorption factor of $G=0.0$ over water and large areas of hard ground, $G=0.5$ everywhere else
- Receptor height of 1.5 m above ground level
- Solid fence/wall comprised of a solid outer face and a perforated, absorptive inner face rated minimum NRC-0.90 (e.g. Noise Barriers QuietLine, IAC Noishield, or Silentium PVC)
- Assumed meteorological conditions of 10°C (50°F) and 70% humidity
- No other model adjustments

The proposed substation transformer was modeled as an omnidirectional point source. Broadband noise source data was determined using NEMA maximum allowable transformer noise levels based on rated power, and octave band levels were estimated using Edison Electric Institute's Electric Power Plant Environmental Noise Guide. Proposed BESS units were modeled using manufacturer test report data, with source levels confirmed via single unit validation modeling. Detailed validation methodology and results are available upon request.

Project equipment and layout configuration details are shown below in **Table 2**. Unweighted octave-band sound power levels for Project equipment are listed in **Table 3** along with broadband A-weighted sound power level.

Table 2 Project Equipment & Layout Configuration

Noise Source	# of Units	Equipment Model/Reference	Est. Source Height Above Ground Level (AGL)
BESS	398	Prevalon HD5 AC	2.9 m
Substation Transformer	1	NEMA TP 80050-2013 (R2024)- 225 MVA	4.0 m

Table 3 Project Equipment Spectral & Broadband Data

Noise Source	Unweighted Octave Band (Hz) Sound Power Levels (dB L _w)									Broadband Sound Power Level
	31.5	63	125	250	500	1000	2000	4000	8000	
BESS*	76.0	89.6	87.4	81.4	77.2	74.0	71.2	67.5	62.5	80 dBA
Substation Transformer	100.0	106.0	108.0	103.0	103.0	97.0	92.0	87.0	80.0	103 dBA

*BESS source level represents average noise level for a single unit. Modeling included 2 validated sources at each unit; source levels varied at each point/vertical area according to validated source model.

4.0 Noise Level Estimates

Cumulative Project noise was calculated at all noise-sensitive receptors within $\frac{1}{4}$ mile of the proposed Project boundary. Note that the majority of receptor locations have not been field verified and are based upon aerial imagery only. A receptor location map as well as coordinates can be found in **Appendix A**.

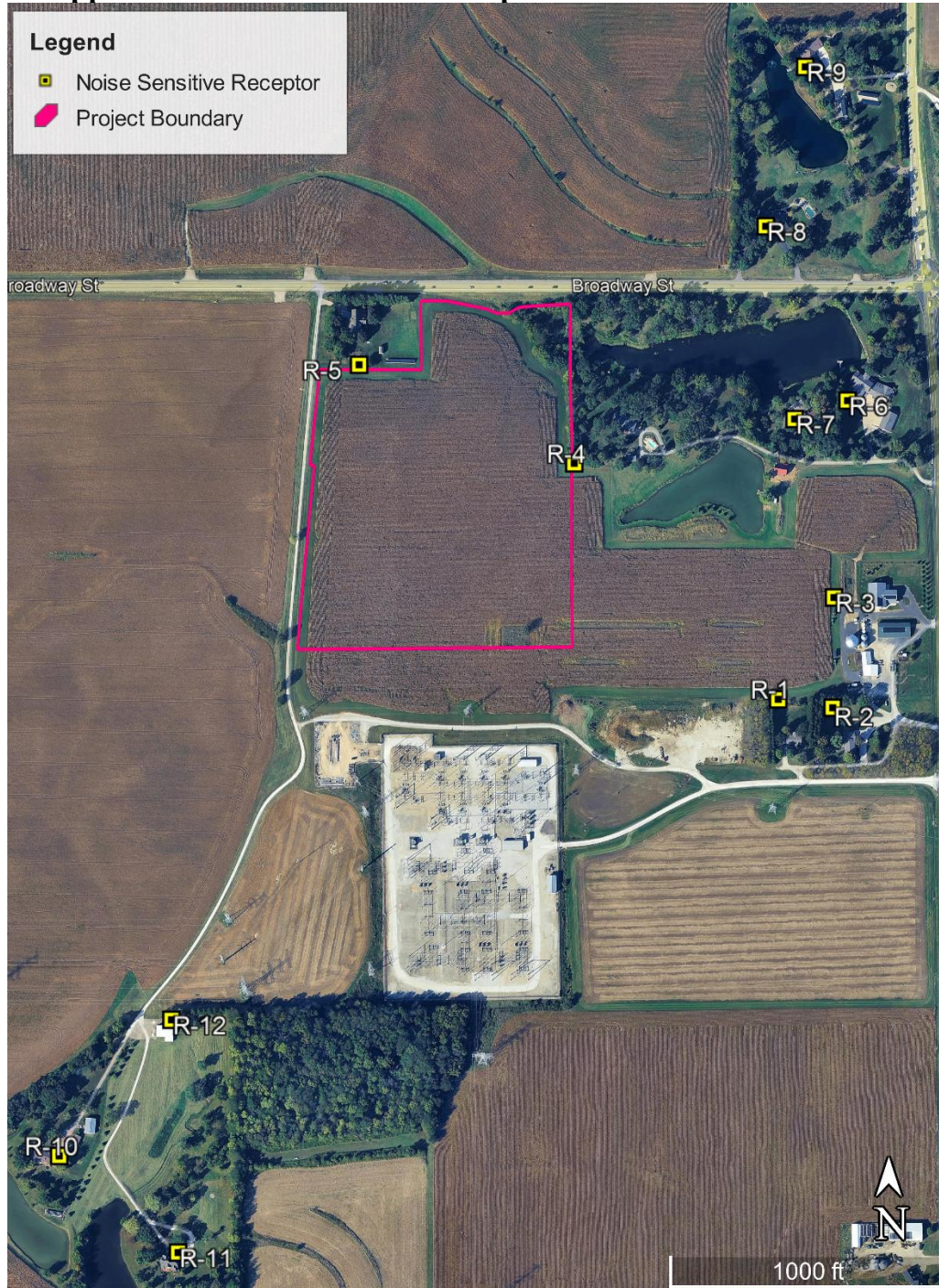
Octave band L_{eq} sound pressure levels were calculated for each receptor from 31.5 Hz to 8 kHz. The octave band levels were then compared to the nighttime regulation levels from **Table 1** above, as BESS operations may occur at any time of day or night. As the daytime limits are less stringent, complying with the nighttime limits ensures daytime compliance as well.

All noise sensitive receptors within $\frac{1}{4}$ mile of the proposed Project boundary modeled at or below the octave band noise level limits set forth in IAC *Title 35, Subtitle H, Chapter I, Part 901 Sound Emissions Standards and Limitations for Property-Line Noise-Sources*. Additionally, no discrete tones were determined to be present when analyzing the one-third octave band levels with regards to the IAC discrete tone criteria. Octave band and third-octave band levels at each receptor can be found in **Appendix B** and **Appendix C**, respectively.

5.0 Design Flexibility

Though the explicit numerical results herein are contingent upon the parameters described above, compliance may also be achieved with different equipment selection. The extent of necessary mitigation (e.g. solid fence/wall height) will be reassessed based on the sound power levels of any new equipment selections and an updated noise study will be provided during the building permit process.

Appendix A Noise Sensitive Receptor Locations & Coordinates



Receptor ID	UTM NAD83 Zone 16		Elevation AMSL (m)
	Easting (m)	Northing (m)	
R-1	285529.8	4493432.0	235.1
R-2	285590.0	4493420.9	234.1
R-3	285597.2	4493543.1	231.1
R-4	285312.6	4493700.5	230.6
R-5	285075.1	4493816.6	231.5
R-6	285620.0	4493761.5	228.1
R-7	285560.4	4493742.7	228.4
R-8	285533.2	4493957.4	230.1
R-9	285581.1	4494132.4	231.1
R-10	284716.0	4492948.0	229.5
R-11	284846.0	4492836.0	226.6
R-12	284845.0	4493096.0	231.5

Appendix B Class A Receptor Octave Band Levels

	31.5	63	125	250	500	1000	2000	4000	8000
<i>IPCB Class C to Class A Nighttime Limit</i>	69	67	62	54	47	41	36	32	32
R-1	45.6	57.6	49.1	41.5	36.8	33.2	26.8	12.8	0.0
R-2	44.6	56.6	47.9	40.4	35.8	32.1	25.4	10.7	0.0
R-3	45.1	57.1	48.3	40.6	35.9	32.1	25.4	11.2	0.0
R-4	52.5	63.9	56.7	47.5	41.5	36.7	31.1	23.0	9.8
R-5	53.7	65.8	59.2	50.5	44.8	40.4	34.9	26.0	11.7
R-6	44.8	56.7	47.7	39.9	35.1	31.1	24.4	9.9	0.0
R-7	45.8	57.6	48.9	40.9	36.0	32.1	25.6	12.1	0.0
R-8	45.0	57.2	48.6	41.0	36.1	32.5	25.9	11.7	0.0
R-9	43.1	55.5	46.9	39.6	34.7	31.3	24.2	7.9	0.0
R-10	40.6	52.8	44.3	37.3	32.9	29.0	21.0	2.1	0.0
R-11	39.9	52.2	43.6	36.4	31.7	27.6	19.1	0.0	0.0
R-12	42.2	54.2	45.6	38.1	33.1	28.5	20.5	3.2	0.0

Appendix C Receptor 1/3 Octave Band Levels

	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
R-1	41.1	40.8	40.4	53.2	52.8	52.4	44.8	44.3	43.8	37.2	36.7	36.1	32.5	32.0	31.7	29.1	28.5	27.6	23.6	21.9	19.4	11.6	6.1	0.0	0.0	0.0	0.0
R-2	40.1	39.8	39.5	52.3	51.8	51.4	43.6	43.1	42.6	36.1	35.6	35.1	31.4	30.9	30.6	28.0	27.3	26.5	22.4	20.6	17.8	9.6	3.4	0.0	0.0	0.0	0.0
R-3	40.7	40.4	40.0	52.8	52.3	51.8	44.0	43.5	43.0	36.4	35.8	35.3	31.5	31.2	30.7	28.0	27.3	26.4	22.3	20.6	17.9	10.0	4.2	0.0	0.0	0.0	0.0
R-4	48.2	47.7	47.1	59.9	59.2	58.4	52.7	51.9	51.1	43.4	42.7	41.8	37.4	36.7	35.9	32.7	31.9	31.0	27.4	26.3	25.1	19.8	18.1	15.8	8.0	4.0	0.0
R-5	49.3	48.9	48.5	61.5	61.0	60.5	55.0	54.4	53.8	46.3	45.7	45.1	40.6	40.0	39.3	36.4	35.6	34.7	31.3	30.1	28.6	23.1	20.9	18.3	10.0	5.8	0.4
R-6	40.4	40.0	39.6	52.4	51.9	51.4	43.5	43.0	42.3	35.7	35.1	34.5	30.8	30.3	29.8	27.1	26.4	25.5	21.3	19.6	16.9	8.8	2.9	0.0	0.0	0.0	0.0
R-7	41.4	41.1	40.6	53.4	52.9	52.3	44.7	44.1	43.5	36.7	36.1	35.5	31.7	31.3	30.7	28.1	27.4	26.5	22.4	20.8	18.4	10.8	5.5	0.0	0.0	0.0	0.0
R-8	40.6	40.3	39.9	52.8	52.4	52.0	44.2	43.8	43.3	36.7	36.2	35.7	31.8	31.3	30.8	28.5	27.7	26.8	22.9	21.1	18.5	10.6	4.7	0.0	0.0	0.0	0.0
R-9	38.6	38.3	38.0	51.0	50.7	50.4	42.4	42.1	41.7	35.2	34.8	34.4	30.4	30.0	29.5	27.3	26.5	25.5	21.5	19.3	16.0	7.2	0.0	0.0	0.0	0.0	0.0
R-10	36.0	35.8	35.6	48.3	48.0	47.7	39.9	39.6	39.2	32.9	32.5	32.1	28.6	28.2	27.7	25.1	24.3	23.1	18.5	15.9	11.9	1.6	0.0	0.0	0.0	0.0	0.0
R-11	35.3	35.1	34.9	47.6	47.4	47.1	39.2	38.9	38.5	32.1	31.6	31.2	27.5	27.0	26.3	23.8	22.8	21.5	16.9	13.9	9.5	0.0	0.0	0.0	0.0	0.0	0.0
R-12	37.7	37.5	37.2	49.8	49.4	49.1	41.3	40.8	40.3	33.9	33.3	32.7	29.0	28.3	27.5	24.8	23.7	22.4	17.9	15.4	11.8	2.5	0.0	0.0	0.0	0.0	0.0