



Long Mott Generating Station

Construction Permit Application Part VI Supplemental Information



Copyright © 2026 Long Mott Energy, LLC
Subject to U.S. Department of Energy Office of Nuclear Energy
Agreement Number DE-NE0009040



CONTENTS

- VI-A** **X Energy, LLC, "Xe-100 Technical Report, Preliminary Plume Exposure Pathway Emergency Planning Zone Analysis," Revision 4, August 31, 2026 (unrestricted; public)**
- VI-B** **X Energy, LLC, "Cultural Historic Survey for Project Long Mott Service Receipt Inspection Report," Revision 2, March 26, 2025 (unrestricted; public)**
- VI-C** **X Energy, LLC, "Phase I Intensive Archaeological Survey for Project Long Mott - Negative Finding Report Service Receipt Inspection Report," Revision 2, March 26, 2025 (unrestricted; public)**
- VI-D** **X Energy, LLC, "Xe-100 Dow Seadrift Site Phase I Intensive Archeological Survey, Calhoun County, Texas - Negative Findings Short Report," Revision 1, February 19, 2024 (unrestricted; public)**
- VI-E** **X Energy, LLC, "Project Long Mott Ecological Resources Technical Report," Revision 1, August 5, 2024 (unrestricted; public)**



VI-A

**X Energy, LLC, "Xe-100 Technical Report, Preliminary Plume
Exposure Pathway Emergency Planning Zone Analysis,"
Revision 4, August 31, 2026 (unrestricted; public)**

|



Xe-100 Technical Report

Preliminary Plume Exposure Pathway

Emergency Planning Zone Analysis

Document ID Number: 010810 Revision: 4
Status: Approved
Date Created: 8/31/2026
Security Classification: Non-Proprietary
Project: Xe-100
Configuration Classification: XE00-GL-GL-GL-GL-L

This document is the property of X Energy, LLC. The content may not be reproduced, disclosed, or used without the Company's prior written approval.



E-SIGNATURES



DOCUMENT APPROVAL SIGNEES

Action	Designation	(First and Last) Name	Signature	Date
Preparer	Licensing Engineer III	Ben Chen	Maintained in Teamcenter	September 3, 2026
Reviewer	Technical Fellow, Risk-informed Safety Analysis	Robert Wolfgang	Maintained in Teamcenter	September 3, 2026
Reviewer	Manager, Probabilistic Risk Assessment	Luke McSweeney	Maintained in Teamcenter	September 3, 2026
Approver	Manager, Risk- informed Safety Analysis	Erick Ball	Maintained in Teamcenter	September 3, 2026



Copyright Notice

This document is the property of X Energy LLC (X-energy) and was prepared for review by the U.S. Nuclear Regulatory Commission (NRC) and use by X-energy, its contractors, its customers, and other stakeholders as part of regulatory engagements for the Long Mott Generating Station Construction Permit Application (LMGS CPA). Other than by the NRC and its contractors as part of such regulatory reviews, the content herein may not be reproduced, disclosed, or used without prior written approval of X-energy.

10 CFR 810 Export-Controlled Information Disclaimer

This document was reviewed for information containing technology subject to U.S. export controls governed by the Export Administration regulations (15 CFR Part 730 et seq.) and/or the Department of Energy regulations (10 CFR Part 810) and does not contain information classified as Export Controlled Information. For specific information, contact X-energy at (301) 358-5600.

Department of Energy Acknowledgement and Disclaimer

This material is based upon work supported by the Department of Energy under Award Number DE-NE0009040.

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.



SYNOPSIS

This report documents the results from following the Plume Exposure Pathway Emergency Planning Zone (EPZ) Sizing Methodology for the Long Mott Generating Station. The results of this preliminary analysis show that the dose consequences of events associated with Long Mott Generating Station meet the criteria established within the PEP EPZ Sizing Methodology and demonstrates the boundary of the EPZ can be set at the exclusion area boundary (EAB) of 400m.



CONFIGURATION CONTROL/DOCUMENT CHANGE HISTORY

Document Change History

Rev.	Date	(First and Last Name) Preparer	Page/Section Revised	Description
1	19-Dec-2024	Ben Chen	N/A	Original Revision
2	28-Feb-2025	Ben Chen	All	Updated proprietary markings
3	19-Mar-2025	Ben Chen	All	Updated proprietary markings
4	31-Aug-2026	Ben Chen	All	Updated to reflect R2 of PEP EPZ Sizing LTR and CPA Audit Changes



Table of Contents

Abbreviations/Acronyms.....	ix
Glossary	xi
1. Introduction.....	1
1.1 Purpose	1
1.2 Scope	1
1.3 Interfacing Documents	1
1.4 Document Layout	2
1.5 Quality Assurance	2
1.6 Freeze Date	3
2. Background.....	4
3. Precautions, Assumptions, and Limitations	5
3.1 Precautions and Limitations	5
3.2 Assumptions.....	5
4. Inputs	8
4.1 Design Inputs	8
4.2 Discussion	10
5. Results	12
5.1 Spectrum of Events	12
5.2 Probabilistic Dose Aggregation	15
5.3 Event Evaluation and Assessment	16
5.4 Assessment for Seismic Hazards	19
5.5 Protective Measures Evaluation	21
6. Conclusion	34
7. Cross References and References	35
7.1 Cross References and References	35

Appendices

Appendix A. Derivation of Release Profile Distributions	37
Appendix B. Derivation of Mean X/Q from ARCON96 Cumulative Frequency Data.....	39
Appendix C. Electronic File Information.....	42



List of Tables

Table 1: Verification Tasks	2
Table 2: Non-Seismic LBEs for EPZ Evaluation	12
Table 3: Protective Measure Evaluations – Within the EAB	22
Table 4: PEP EPZ Determination Results	34
Table 5: [[]] ^{LME}	37
Table 6: Electronic File Records	42

List of Figures

Figure 1: XSTERM Activity Correction Ratios [19]	8
Figure 2: Frequency vs Consequence Curve of Screened in LBEs	14
Figure 3: LBE 1 Rem Dose Exceedance Frequency-versus-Distance Curves	17
Figure 4: LBE 200 Rem Dose Exceedance Frequency-versus-Distance Curves	18
Figure 5: LBE Cumulative Dose Exceedance Frequency-versus-Distance Curves	19
Figure 6: Seismic Event Dose-versus-Distance Curve	21



Abbreviations/Acronyms

Abbreviations/Acronyms

Short Form	Phrase
ANS	American Nuclear Society
AOO	Anticipated Operational Occurrence
ASME	American Society of Mechanical Engineers
BDBE	Beyond Design Basis Event
CFR	Code of Federal Regulations
DBA	Design Basis Accident
DBE	Design Basis Event
DBHL	Design Basis Hazard Level
DID	Defense-in-Depth
DLOFC	Depressurized Loss of Forced Circulation
EAB	Exclusion Area Boundary
EP	Emergency Preparedness
EPA	Environmental Protection Agency
EPZ	Emergency Planning Zone
GMRS	Ground Motion Response Spectra
HPB	Helium-Pressure Boundary
JFD	Joint Frequency Distribution
LBE	Licensing Basis Event
LMP	Licensing Modernization Project
LMGS	Long Mott Generating Station
LTR	Licensing Topical Report
MST	Mechanistic Source Term
MACCS	MELCOR Accident Consequence Code System
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NUREG	U.S. Nuclear Regulatory Commission technical report designation
PAG	Protective Action Guides
PEP	Plume Exposure Pathway
PGA	Peak Ground Acceleration
PKPIRT	Phenomena and Key Parameter Identification and Ranking Tables



Xe-100 Technical Report
Preliminary Plume Exposure Pathway Emergency Planning
Zone Analysis

Doc ID No: 010810
Revision: 4
Date: 8/31/2026

PLOFC	Pressurized Loss of Forced Circulation
PRA	Probabilistic Risk Assessment
PSAR	Preliminary Safety Analysis Report
QA	Quality Assurance
rem	Roentgen equivalent man
RCCS	Reactor Cavity Cooling System
RG	Regulatory Guide
RIPB	Risk-Informed Performance-Based
SAR	Safety Analysis Report
SB	Site Boundary
SB-DLOFC	Small Break DLOFC
SGTR	Steam Generator Tube Rupture
SMR	Small Modular Reactor
SG	Steam Generator
SSC	Structures, Systems, and Components
SSS	Startup/Shutdown System
STP	South Texas Project
TAP	Technical Analysis Package
TEDE	Total Effective Dose Equivalent
XDIS	Radionuclide dispersion module within XSTERM



Glossary

Phrase	Definition	Source
Anticipated Operational Occurrence	Anticipated event sequences expected to occur one or more times during the life of a nuclear power plant, which may include one or more reactor modules. Event sequences with mean frequencies of 1×10^{-2} /plant-year and greater are classified as AOOs. AOOs take into account the expected response of all SSCs within the plant, regardless of safety classification.	LMP (NEI 18-04)
Beyond Design Basis Event	Rare event sequences that are not expected to occur in the life of a nuclear power plant, which may include one or more reactor modules, but are less likely than a DBE. Event sequences with frequencies of 5×10^{-7} /plant-year to 1×10^{-4} /plant-year are classified as BDBEs. BDBEs take into account the expected response of all SSCs within the plant regardless of safety classification.	LMP (NEI 18-04)
Defense-in-Depth	An approach to designing and operating nuclear facilities that prevents and mitigates accidents that release radiation or hazardous materials. The key is creating multiple independent and redundant layers of defense to compensate for potential human and mechanical failures so that no single layer, no matter how robust, is exclusively relied upon. Defense-in-depth includes the use of access controls, physical barriers, redundant and diverse key safety functions, and emergency response measures.	NRC Glossary
Design Basis Accident	Postulated accidents that are used to set design criteria and performance objectives for the design of Safety-Related SSCs. DBAs are derived from DBEs based on the capabilities and reliabilities of Safety-Related SSCs needed to mitigate and prevent accidents, respectively. DBAs are derived from the DBEs by prescriptively assuming that only SR SSCs classified are available to mitigate postulated accident consequences to within the 10 CFR 50.34 dose limits.	LMP (NEI 18-04)
Design Basis Event	Infrequent event sequences that are not expected to occur in the life of a nuclear power plant, which may include one or more reactor modules, but are less likely than AOOs. Event sequences with mean frequencies of 1×10^{-4} /plant-year to 1×10^{-2} /plant-year are classified as DBEs. DBEs take into account the expected response of all SSCs within the plant regardless of safety classification. The objective and scope of DBEs form the safety design basis of the plant	LMP (NEI 18-04)
Design Basis (External) Hazard Level	A design specification of the level of severity or intensity of an (external) hazard for which the SR SSCs are designed to withstand with no adverse impact on their capability to perform their RSFs	LMP/TICAP (NEI 18-04, NEI 21-07)
Event Sequence Family	A grouping of event sequences with similar challenges to the plant safety functions, response of the plant in the performance of each safety function, response of each radionuclide transport barrier, and end state. An event sequence family may involve a single event sequence or several event sequences grouped together. Each release category may include one or more event sequence families. When event sequence models are developed in great detail, identification of families of event sequences with common or similar source, initiating event and plant response facilitates application of the event sequence modeling requirements in this Standard and development of useful risk insights in the identification of risk contributors. Each event sequence family involving a release is associated with one and only one release category.	ASME/ANS-RA-S-1.4-2021



Phrase	Definition	Source
Exclusionary Area Boundary	The boundary of the area surrounding the reactor for which the reactor licensee has the authority to determine all activities, including exclusion or removal of personnel and property from the area.	NRC Glossary
Frequency-Consequence Target	A target line on a frequency-consequence chart that is used to evaluate the risk significance of LBEs and to evaluate risk margins that contribute to evidence of adequate defense-in-depth.	LMP (NEI 18-04)
Integrated Decision-Making Process	Risk-informed and performance-based integrated decision-making (RIPB-DM) process used for establishing special treatments and evaluating the adequacy of DID.	LMP (NEI 18-04)
Licensing Basis Event	The entire collection of event sequences considered in the design and licensing basis of the plant, which may include one or more reactor modules. LBEs include AOOs, DBEs, BDBEs, and DBAs	LMP (NEI 18-04)
Mechanistic Source Term	The characteristics of a radionuclide release at a particular location, including the physical and chemical properties of released material, release magnitude, heat content (or energy) of the carrier fluid, and location relative to local obstacles that would affect transport away from the release point and the temporal variations in these parameters (e.g., time of release duration) that are calculated using models and supporting scientific data that simulate the physical and chemical processes that describe the radionuclide inventories and the time-dependent radionuclide transport mechanisms that are necessary and sufficient to predict the source term.	ASME/ANS-RA-S-1.4-2021
Non-Safety-Related with Special Treatment SSC	Non-safety-related SSCs that perform risk-significant functions or perform functions that are necessary for defense-in-depth adequacy.	LMP (NEI 18-04)
Performance-Based	An approach to decision-making that focuses on desired objective, calculable or measurable, observable outcomes, rather than prescriptive processes, techniques, or procedures. Performance-based decisions lead to defined results without specific direction regarding how those results are to be obtained. At the NRC, performance-based regulatory actions focus on identifying performance measures that ensure an adequate safety margin and offer incentives and flexibility for licensees to improve safety without formal regulatory intervention by the agency. For EP, the performance-based approach focuses on licensee demonstration of required emergency response functions.	Adapted from NRC Glossary definition of performance-based regulation (page updated March 9, 2021) in order to apply to both design decisions and regulatory decision-making
Plant	The collection of site, buildings, radionuclide sources, and SSCs seeking a single design certification or one or more operating licenses under the LMP framework. The plant may include a single reactor unit or multiple reactor modules as well as non-reactor radionuclide sources.	LMP (NEI 18-04)
Plume Exposure Pathway EPZ	As defined in 10 CFR 50.33(g)(2), the area within which: (A) Public dose, as defined in 10 CFR 20.1003, is projected to exceed 10 mSv (1 rem) total effective dose equivalent over 96 hours from the release of radioactive materials from the facility considering accident likelihood and source term, timing of the accident sequence, and meteorology; and (B) Pre-determined, prompt protective measures are necessary.	10 CFR 50.33(g)(2)



Phrase	Definition	Source
PRA Safety Function	Reactor design specific SSC functions modeled in a PRA that serve to prevent and/or mitigate a release of radioactive material or to protect one or more barriers to release. In ASME/ANS-Ra-S-1.4-2013 these are referred to as "safety functions." The modifier PRA is used in the LMP GD to avoid confusion with safety functions performed by Safety- Related SSCs.	LMP (NEI 18-04), ASME/ANS-RA-S-1.4-2021
Required Functional Design Criteria	Reactor design-specific functional criteria that are necessary and sufficient to meet the RSFs.	LMP (NEI 18-04)
Required Safety Function	A PRA Safety Function that is required to be fulfilled to maintain the consequence of one or more DBEs or the frequency of one or more high-consequence BDBEs inside the F-C Target.	LMP (NEI 18-04)
Risk-Informed	An approach to decision-making in which insights from probabilistic risk assessments are considered with other sources of insights.	Adapted from NRC Glossary definition of risk-informed regulation (page updated March 9, 2021) in order to apply to both design decisions and regulatory decision-making
Safety-Related Design Criteria	Design criteria for SR SSCs that are necessary and sufficient to fulfill the RFDCs for those SSCs selected to perform the RSFs.	LMP (NEI 18-04)
Safety-Related SSCs	SSCs that are credited in the fulfillment of RSFs and are capable to perform their RSFs in response to any Design Basis External Hazard Level.	LMP (NEI 18-04)
Site Boundary	The line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee.	10 CFR 20.1003
Technology-Inclusive	The principle of establishing performance requirements developed using methods of evaluation that are flexible and practicable for application to a variety of power reactor and nonpower production or utilization facilities technologies.	LMP (NEI 18-04)
Total Effective Dose Equivalent	The sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).	NRC Glossary



1. Introduction

1.1 Purpose

The purpose of this technical report is to apply the methodology outlined in the X-energy Xe-100 Licensing Topical Report "Plume Exposure Pathway Emergency Planning Zone Sizing Methodology" [1] and the criteria within Regulatory Guide (RG) 1.242, "Performance-Based Emergency Preparedness for Small Modular Reactors, Non-Light-Water Reactors, and Non-Power Production or Utilization Facilities" [2] to establish the site-specific plume exposure pathway (PEP) emergency planning zone (EPZ) size for the Long Mott Generating Station (LMGS) site. The referenced topical report [1] contains the PEP EPZ sizing methodology for which U.S. Nuclear Regulatory Commission (NRC) approval is sought. The methodology provides an approach for determining a PEP EPZ size based on the area within which public dose, as defined in Title 10 of the Code of Federal Regulations (10 CFR) 20.1003, "Definitions", is projected to exceed 10 mSv (1 rem) total effective dose equivalent (TEDE) over 4 days (96 hours) from the release of radioactive materials from the facility, considering accident likelihood and source term, timing of the release sequence, and meteorology. Additionally, the methodology addresses the area in which predetermined, prompt protective measures are necessary.

1.2 Scope

The PEP EPZ methodology employed in this report follows the approach described in Appendix A, "General Methodology for Establishing Plume Exposure Pathway Emergency Planning Zone Size," of RG 1.242 and the risk-informed performance-based approach outlined in Licensing Topical Report "Plume Exposure Pathway Emergency Planning Zone Sizing Methodology" [1]. Supporting information is drawn from NUREG-0396, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants" [4]. This report is based on the following technical considerations:

- Methodology is designed to be structured and repeatable.
- Risk-informed methods are used to determine the spectrum of release sequences to be evaluated, including internal, external, and seismic events.
- Analysis of uncertainties.

The PEP EPZ methodology utilizes inputs from probabilistic risk assessment (PRA) methodologies, source term assessment, and radiological consequence analysis to determine appropriate EPZ sizing. Uncertainties associated with these inputs are addressed in their respective assessments, while overall uncertainty is considered in the final PEP EPZ analysis to be submitted for licensing.

1.3 Interfacing Documents

This technical report is one of several reports covering key regulatory issues and provided to the NRC staff as part of the Xe-100 pre-application process. This is an independent report and does not provide inputs to other preapplication documents. This technical report uses information from the Radiological Consequence Analysis Report [5], Risk Integration Report [6], LBE Bounding Atmospheric Dispersion Factors Report [7], XDIS Preliminary Dose Methodology Report [8], Final PSAR Safety Analysis Dose Summary Report [9], Xe-100 Preliminary Long Term Dose Calculation [10], Xe-100 Mechanistic Source Term for Long-Term Consequences Report [12], Xe-100 Transient and Safety Analysis Methodology [20], and Atmospheric Dispersion and Dose Methodology LTR [15].



1.4 Document Layout

The document is organized as follows:

- Section 2 provides a brief background on the approach.
- Section 3 provides a summary of the assumptions used in the technical report.
- Section 4 discusses the various inputs into the analysis.
- Section 5 goes over the analysis steps following the PEP EPZ methodology and presents the results.
- Section 6 summarizes the conclusions of the technical report and describes the findings.
- Section 7 lists the references and cross references used in this technical report.

1.5 Quality Assurance

1.5.1 Quality Assurance Compliance

The work documented in this report is part of the basic design process and uses the best available design inputs at the time. This work is categorized as a Preliminary in accordance with QAP 3.2 [17]. As the designs have continued to evolve, some of the inputs and assumptions may require updating. This work will need to be revised once the design has matured.

1.5.2 Verification Plan

Analysis verification was performed using the design review method via (1) technical review, (2) checking of specific technical aspects of the deliverable, and (3) editorial checking. Table 1 lists verification tasks and the individuals who performed these tasks. Reviewers are responsible for the whole document.

Table 1: Verification Tasks

Task #	Verification Task Description	Reviewers	Verification
1	The appropriateness of the methodology, suitability and completeness of the assumptions, the reasonableness of the results, completeness of the presentation of results, adequacy of the treatment of uncertainties, whether the analysis results as presented support the conclusions and whether any limitations on the conclusions are adequately described	R. Wolfgang	Results were checked against reference values for frequency and consequence.
2	Supporting files are identified in document and their location is specified	L. McSweeney	Teamcenter is specified as the archive location.
3	For hand calculations (e.g., 4 day dose), the supporting calculations are provided and justified.	R. Wolfgang	Risk integration spreadsheet calculations were verified.
4	Results are useable by downstream stakeholders	R. Wolfgang E. Ball	Emergency planning zone results are useable for Xe-100 licensing in support of the Preliminary Safety Analysis Report.



Task #	Verification Task Description	Reviewers	Verification
5	Editorial Verification	L McSweeney	Spelling, grammar, and formatting was checked.

1.6 Freeze Date

Dates and revision numbers are listed in Section 7, References. These dates and revision numbers represent the freeze dates and state of the input information that was used to produce and revise this document. Design changes and analysis results published after this date may not be reflected in this report. Where deemed necessary, changes documented after this date are stated as assumptions in this document.



2. Background

Regulatory Guide (RG) 1.242 identifies one acceptable method for establishing the EPZ boundary. The Xe-100 PEP EPZ Sizing Methodology uses this guidance to create a methodology that meets the regulatory requirements and guidance; the report was submitted to the NRC for approval. The methodology aims to ensure public safety while optimizing the emergency response planning zone to the unique design features of the Xe-100.



3. Precautions, Assumptions, and Limitations

3.1 Precautions and Limitations

Currently, meteorological data is treated in a prescriptive and conservative manner rather than a probabilistic best estimate manner. Hourly weather data from a specific site is not used. Instead, meteorological conditions are conservatively assumed, i.e., [[
]]^{LME} and a 1 m/s wind speed. These assumptions [[

]]^{LME} Site-specific meteorology collected in the future are expected to result in more dispersion (and therefore lower doses). Further detail on this approach is documented in the Dose & Dispersion LTR [15] as well as the following individual reports:

- “Radiological Consequence Analysis – Preliminary Scoping”
- “LBE Bounding Atmospheric Dispersion Factors Report”, and
- “XDIS Preliminary Dose Calculation Report” [8], for LBEs.

[[

]]^{LME} Per the Licensing Topical Report for Atmospheric Dispersion and Dose Calculation Methodology [15] Section 5.3, radioactive decay in the released plume is not credited as a means of source depletion which results in a calculated dose whose conservatism increases with time.

Presently no parametric uncertainty or modeling uncertainty has been evaluated for the exposure pathway analysis, and quantified uncertainty bounds (e.g. 95th percentiles) are not associated with any acceptance criteria. The PKPIRT assessments performed to date (e.g., Reference [11]) follows the methodology outlined in Section 9.3 of the Transient and Safety Analysis Methodology Topical Report [20] to calculate the representative 95th percentile consequence values, but have not considered exposure pathways. Reasonable alternatives related to modeling associated with other site data have not yet been compiled.

3.2 Assumptions

Assumptions With a Basis:

To account for the various parametric uncertainties to support the calculation of dose exceedance probabilities as prescribed in the EPZ Sizing methodology, [[

]]^{LME} These Mechanistic Source Term results were obtained using thermal-hydraulic models based on DBA conditions. The MST report details the released activity, i.e., MST, from the total inventory of fuel pebbles in the Xe-100 core for the depressurized loss of forced circulation (DLOFC), small break DLOFC (SBDLOFC), pressurized loss of forced circulation (PLOFC), and steam generator tube rupture (SGTR)



accident scenarios. Specifically, [[

detail can be found in Appendix A.

]]^{LME} Further

Even under the current simplified and conservative modeling approach—where meteorological conditions are fixed to minimize dispersion and processes like wet deposition, groundshine, resuspension, skin absorption, and ingestion pathways are not explicitly modeled—there remains a wide range of potential uncertainties that are not fully captured. While these omissions lead to conservative estimates rather than a best-estimate probabilistic treatment, the underlying dose result is still influenced by various multiplicative factors. These include uncertainties in the source term characteristics, environmental transfer parameters, dose conversion factors, and assumptions about receptor exposure scenarios. [[

]]^{LME} it is acknowledged that the current model does not explicitly incorporate the full spectrum of processes and conditions—particularly those that could shift doses significantly over time and distance. This approach serves as a practical placeholder, reflecting the reality that if these factors (e.g., deposition mechanisms, groundshine over longer periods, and resuspension inhalation) were fully implemented with parametric uncertainty, the resulting distribution of doses would likely exhibit broader variability and differing skewness. In essence, this step anticipates that once a more comprehensive and probabilistic assessment is performed—potentially using codes like MACCS with detailed deposition modeling, and with site-specific meteorological data for the final EPZ sizing calculation—the final estimates will align with the broader uncertainty profiles consistent with these distributions while being less conservative.

1. To account for the conservatively bounding meteorological assumptions in lieu of site specific data, the doses are assumed to [[

]]^{LME} with data from “ARCON96 Meteorological Data Process and Preliminary Results, Xe-100 – Long Mott “ [13] and calculated in the “Xe-100 Preliminary Long Mott Atmospheric Dispersion Factors Calculation” report [24], which uses [[

]]^{LME}
[[
]]^{LME} This assumed correction is applied to more accurately represent



the meteorological data of the Long Mott Generating Station site until site-specific meteorological data becomes available. Long Mott Energy (LME) is committed to confirming the final Emergency Planning Zone (EPZ) analysis using site-specific meteorological data by the Operating License Application (OLA) stage.

2. Further assumptions underlying this report are detailed in the supporting assessments and their respective technical documents.



4. Inputs

4.1 Design Inputs

The inputs required for the PEP EPZ sizing methodology are based on the results provided by the LMGS design and site-specific Probabilistic Risk Assessment (PRA) as reported in the PSAR.[5] [6] The PRA informs the selection of Licensing Basis Events (LBEs) that are necessary for the development of the spectrum of events for the EPZ analysis. These inputs also include quantified source terms, which are essential for accurately assessing the radiological doses resulting from potential accident scenarios. [12] The radiological source terms are used directly in the radiological consequence model, which is applied to evaluate doses in compliance with Regulatory Guide 1.242 and the EPZ Sizing Methodology outlined in the LTR. [5][6][1] Further detail can be found below.

4.1.1 96-Hour Doses

Although the 96-hour doses are not reported within the dose calculation reports, the calculation of the 96-hour dose values can be found in the Technical Analysis Package (TAP) of the Preliminary Long Term Dose Calculation Report. [10] The calculation takes the isotope release activity results from the MST report [12] and calculates the DBA and non-DBA doses after 96 hours. [[

]]^{LME} The method in which the 30 day doses are calculated can be found in its respective TAP. [9] The isotopic correction factors used is reproduced below in Figure 1.

v1.8.2-VS-v1.8.3	Ag-109	Ag-110m	Cs-133	Cs-134	Xe-137	Cs-137	Eu-151	Eu-152	Eu-153	Eu-154	Eu-155	Te-132	Ia-140	Kr-90	Sr-90	Kr-83m
Production	1.000E+00	1.000E+00	9.999E-01	1.000E+00	9.997E-01	1.000E+00	9.999E-01	9.999E-01	9.999E-01	1.000E+00	9.999E-01	1.000E+00	9.998E-01	9.998E-01	1.000E+00	1.000E+00
U Cont Prod	1.986E+00	0.000E+00	1.986E+00	1.983E+00	1.986E+00	1.987E+00	1.986E+00	0.000E+00	0.000E+00	0.000E+00	1.986E+00	1.986E+00	1.986E+00	1.986E+00	1.986E+00	1.986E+00
Sphere	1.000E+00	1.000E+00	9.999E-01	1.000E+00	0.000E+00	1.000E+00	9.999E-01	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.998E-01	0.000E+00	9.999E-01
Particle	1.000E+00	9.999E-01	9.999E-01	1.000E+00	0.000E+00	1.000E+00	1.000E+00	1.000E+00	9.999E-01	9.999E-01	1.000E+00	1.000E+00	9.998E-01	0.000E+00	1.000E+00	1.000E+00
FZ Matrix	1.000E+00	1.000E+00	1.169E+00	1.168E+00	0.000E+00	1.169E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.169E+00	1.169E+00	0.000E+00	1.000E+00	2.001E+00
Shell	1.000E+00	1.000E+00	1.169E+00	1.169E+00	0.000E+00	1.169E+00	1.000E+00	1.000E+00	1.000E+00	9.998E-01	1.000E+00	1.170E+00	1.170E+00	0.000E+00	1.000E+00	2.001E+00
Sphere Leakage	1.000E+00	1.001E+00	1.535E+00	1.513E+00	1.390E+00	1.536E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.724E+00	1.755E+00	1.027E+00	1.000E+00	1.876E+00
Particle Leakage	1.000E+00	1.000E+00	1.493E+00	1.516E+00	6.613E+00	1.492E+00	1.000E+00	9.999E-01	1.000E+00	1.000E+00	1.000E+00	1.239E+00	1.203E+00	3.475E+01	1.000E+00	2.162E+00
Decayed	0.999E-01	1.000E+00	1.000E+00	1.000E+00	9.997E-01	1.000E+00	1.000E+00	9.999E-01	0.000E+00	9.998E-01	1.000E+00	1.000E+00	9.999E-01	1.000E+00	1.000E+00	1.000E+00
Removed	9.999E-01	1.000E+00	1.000E+00	1.000E+00	0.000E+00	1.000E+00	1.000E+00	9.997E-01	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.999E-01	0.000E+00
Balance [%]	5.372E-02	5.789E-02	5.962E-03	6.160E-03	3.877E-04	5.957E-03	-1.037E-02	4.111E-01	9.874E-01	9.732E-01	1.072E+00	4.398E-03	-1.005E+15	8.862E-03	9.753E-01	4.434E-05
Fractional Leakage	1.000E+00	1.000E+00	1.535E+00	1.513E+00	1.389E+00	1.536E+00	1.000E+00	1.000E+00	9.999E-01	1.000E+00	9.999E-01	1.725E+00	1.755E+00	1.027E+00	1.000E+00	1.876E+00
Rel. Activity [Bq]	1.000E+00	1.000E+00	1.513E+00	1.389E+00	1.536E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.725E+00	1.755E+00	1.027E+00	1.000E+00	1.877E+00

v1.8.2-VS-v1.8.3	Kr-85	Kr-85m	Kr-87	Kr-88	Kr-89	I-131	I-132	I-133	I-134	I-135	I-136	Xe-131m	Xe-133	Xe-133m	Xe-135	Xe-135m	Xe-138
Production	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	2.052E+00	9.998E-01	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.998E-01	1.000E+00	1.000E+00	9.999E-01	1.000E+00	1.000E+00
U Cont Prod	1.986E+00	1.986E+00	1.986E+00	1.986E+00	1.986E+00	1.986E+00	1.986E+00	1.986E+00	1.987E+00	1.986E+00	1.986E+00	1.986E+00	1.986E+00	1.986E+00	1.986E+00	1.986E+00	1.987E+00
Sphere	1.000E+00	1.000E+00	9.999E-01	9.999E-01	0.000E+00	9.997E-01	1.734E+12	9.999E-01	9.999E-01	1.000E+00	0.000E+00	9.998E-01	9.999E-01	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Particle	1.000E+00	1.000E+00	9.999E-01	9.999E-01	0.000E+00	9.997E-01	1.734E+12	9.999E-01	9.999E-01	1.000E+00	0.000E+00	9.998E-01	9.999E-01	1.000E+00	9.999E-01	1.000E+00	1.000E+00
FZ Matrix	2.001E+00	2.001E+00	2.001E+00	2.001E+00	0.000E+00	2.002E+00	1.567E+14	2.002E+00	2.002E+00	2.002E+00	0.000E+00	2.002E+00	2.002E+00	2.002E+00	2.002E+00	2.000E+00	2.000E+00
Shell	2.001E+00	2.001E+00	2.000E+00	2.001E+00	0.000E+00	2.002E+00	1.541E+14	2.002E+00	2.002E+00	2.002E+00	0.000E+00	2.002E+00	2.001E+00	2.001E+00	2.002E+00	2.000E+00	2.000E+00
Sphere Leakage	1.995E+00	1.833E+00	1.891E+00	1.842E+00	1.471E+00	1.762E+00	3.898E+00	1.731E+00	1.755E+00	1.734E+00	1.098E+00	1.795E+00	1.756E+00	1.739E+00	1.741E+00	1.801E+00	1.783E+00
Particle Leakage	2.001E+00	2.066E+00	2.234E+00	2.104E+00	7.574E+00	2.002E+00	3.354E+00	2.014E+00	2.339E+00	2.045E+00	1.452E+01	2.002E+00	2.003E+00	2.003E+00	2.005E+00	2.070E+00	3.162E+00
Decayed	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	2.052E+00	9.999E-01	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.998E-01	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Removed	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.999E-01	0.000E+00	1.000E+00	0.000E+00	0.000E+00	0.000E+00	9.999E-01	1.000E+00	1.000E+00	9.995E-01	0.000E+00	0.000E+00
Balance [%]	4.111E-03	3.044E-04	1.509E-04	9.624E-05	9.814E-04	7.624E-04	2.028E-03	4.633E-04	-8.320E-05	2.245E-04	-7.562E-03	1.596E-03	1.052E-03	1.082E-03	2.468E-04	-4.578E-05	6.646E-06
Fractional Leakage	1.995E+00	1.833E+00	1.891E+00	1.842E+00	1.470E+00	1.763E+00	3.899E+00	1.732E+00	1.755E+00	1.735E+00	1.098E+00	1.795E+00	1.756E+00	1.739E+00	1.741E+00	1.802E+00	1.782E+00
Rel. Activity [Bq]	1.995E+00	1.834E+00	1.891E+00	1.842E+00	1.470E+00	1.762E+00	3.897E+00	1.732E+00	1.754E+00	1.735E+00	1.098E+00	1.795E+00	1.756E+00	1.739E+00	1.741E+00	1.802E+00	1.782E+00

Figure 1: XSTERM Activity Correction Ratios [19]



The associated calculations and summary dose tables can be found within the TAP and are further detailed in Appendix C.

4.1.2 24-Hour Red Bone Marrow Doses

Similarly to the 96-hour doses, the 24-hour red bone marrow doses are also not reported within the dose calculation reports, but the calculation of the 24-hour red bone marrow dose values can be found in this Technical Analysis Package (TAP). The calculation takes the isotope release activity results from the Preliminary Long Term Dose Calculation Report [10] for the long-term heatup dose constituent and Preliminary Safety Analysis Dose Summary Report [9] for the other release dose constituent components and calculates the DBA and non-DBA doses after 24 hours. [[

]]^{LME} Similar to the methodology where 30 day doses are calculated in the Dose Summary Report [9], these are then used when mapping to the corresponding LBEs and respective event profiles on a per reactor basis.

[[

]]^{LME}

The red bone marrow is used as a surrogate for acute whole body dose per NUREG-0396 Section III, Subsection D, as it typically represents the highest effective acute organ dose and provides a conservative basis for assessing early health effects potential. The complete calculation details, including isotope-by-isotope breakdowns, are documented in the TAP for Document 010810, retained as an electronic record per Appendix C.



4.1.3 PRA LBEs Characteristics

The list of LBEs and their associated characteristic (frequency, consequence) are taken from the PRA, and the full list can be found within the Risk Integration – Preliminary Scoping Report. [6] Further details on how the LBEs are mapped to certain dose sequences can be found in the Radiological Consequence Analysis – Preliminary Scoping Report. [5] This mapping was maintained when changing the PRA LBEs to represent a 4-day TEDE or 1-day red bone marrow vs a 30-day TEDE for the purposes of the EPZ sizing analysis. The associated calculations and mapping tables can be found within the TAP and is further detailed in Appendix C.

4.1.4 Mechanistic Source Term Information

The mechanistic source term data from the MST for Long-Term Consequences Report [12] are used to provide input into the Preliminary Long Term Dose Calculation Report's [10] TAP, where the values for the 4-day and 1 day dose calculation are derived from. The TAP from the MST for Long-Term Consequences Report [12] also contains worksheets that has the dose distributions and uncertainty analysis for each release profile to justify the dose profile distributions, as detailed further in Appendix A.

4.2 Discussion

The primary analysis for the quantification of radiological consequences was performed using the methodology outlined in the PEP EPZ Sizing Methodology. [1]

[[

]]^{LME}

The LMGS's preliminary PEP EPZ technical basis provides that security-initiated events are most likely bounded by LBE events. The safety and security analysis considers events across all operating states, including events that could be initiated by the design basis threat (DBT) adversary and accounts for potential failures of multiple barriers, which provides reasonable assurance that the consequences from all events would not exceed 25 rem at the site boundary.

1. Inherent Safety and Design Attributes: The Xe-100 reactor incorporates several inherent safety and design attributes that enhance its ability to mitigate security events, including:
 - Passive decay heat removal capabilities that function without operator action or external power
 - Robust building design that provides protection against external threats
 - Limited reliance on active systems or external infrastructure during accident conditions
 - TRISO fuel that retains fission products within the fuel particle under extreme conditions
2. Regulatory Compliance: The Xe-100 will comply with all applicable regulatory requirements to protect against the Design Basis Threat (DBT) of Radiological Sabotage. A security-initiated event analysis will be performed and documented as part of the final PEP EPZ sizing calculation



to support the implementation of Alternative Physical Security Requirements found in 10 CFR 73.55(s) for the physical protection program.

3. **Beyond-Design-Basis Capabilities:** The Xe-100 design incorporates features to mitigate beyond-design-basis events and threats, further reducing the potential consequences of security events. The Shield Structure's substantial wall thickness (2.3 meters) provides robust physical protection that resists penetration. The reactor's low power density reduces stored thermal energy and mitigates thermal challenges. Most significantly, TRISO fuel particles provide a fundamental barrier to radiological release through multiple ceramic layers, including a silicon carbide barrier that maintains fission product retention under extreme conditions. Short of compromising individual fuel particles at the microscopic scale, there is no credible mechanism for a malicious actor to produce a large radiological release.

4.2.1 Security Events Conclusion

Based on the qualitative assessment presented above, security-initiated events are properly accounted for in the PEP EPZ technical basis. The comprehensive nature of the LBE spectrum, combined with the inherent safety features of the Xe-100 design and compliance with applicable security regulations, provides reasonable assurance that security events would not result in consequences exceeding those already evaluated for the purposes of EPZ sizing.

The security-initiated event analysis is an essential component to support the implementation of Alternative Physical Security Requirements in accordance with 10 CFR 73.55, and the calculation will be completed and supplemented in the final PEP EPZ sizing calculation to demonstrate compliance with emergency planning requirements.



5. Results

5.1 Spectrum of Events

To prepare for the PEP EPZ determination process, a set of LBEs was identified using the PRA. The events cover the full spectrum of likely accident scenarios that can occur from the specific reactor design. Following the preliminary screening criteria established in the methodology of [[

]]^{LME} The list of the spectrum of events screened in for the PEP EPZ sizing analysis is listed below in Table 2. Figure 2 shows the screened in EPZ LBEs plotted on the LMP Frequency vs Consequence curve.

Table 2: Non-Seismic LBEs for EPZ Evaluation

Event Sequence	Mean Frequency (/plant year)	30-day Mean Dose ¹ (rem)	4-day Mean Dose (rem)	1-day Mean Red Bone Marrow Dose (rem)
LD-01	1.85E-05	3.60E-01	6.83E-02	8.28E-03
MD-64	1.69E-06	8.50E-04	2.33E-04	1.29E-04
MD-65	1.32E-06	3.07E-01	6.44E-02	7.46E-03
MD-77	5.67E-07	8.50E-04	2.33E-04	1.29E-04
SD-073	1.90E-05	2.48E-01	5.45E-03	6.79E-04
SD-074	1.55E-06	2.48E-01	5.45E-03	6.79E-04
SD-088	1.30E-06	3.01E-01	9.44E-03	1.49E-03
SD-131	1.27E-06	9.16E+00	1.51E-01	6.30E-03
SFLLBRB-01	9.20E-05	3.07E-01	6.43E-02	7.46E-03
SFLLBRB-04	1.73E-05	3.07E-01	6.43E-02	7.46E-03
SFLMBRB-04	2.83E-05	3.07E-01	6.44E-02	7.46E-03
SRT-006	7.61E-07	1.44E+01	1.73E+00	5.35E-01
SRT-021	1.46E-06	1.44E+01	1.73E+00	5.35E-01
SRT-027	8.97E-06	9.16E+00	1.51E-01	6.30E-03

¹ Reported doses are on a per-plant basis, accounting for multi-unit considerations, 30-day or 4-day TEDE or 1-day red bone marrow dose at EAB



Event Sequence	Mean Frequency (/plant year)	30-day Mean Dose ¹ (rem)	4-day Mean Dose (rem)	1-day Mean Red Bone Marrow Dose (rem)
SRT-032	8.57E-07	1.42E+01	1.22E+00	5.06E-01
SSGTL-06	4.28E-06	1.44E+01	1.73E+00	5.35E-01
SSGTL-17	1.29E-06	1.44E+01	1.73E+00	5.35E-01
SSGTL-25	7.01E-06	3.61E+00	4.37E-01	1.55E-01
SLLBRB-01	1.42E-05	3.07E-01	6.43E-02	7.46E-03
SLLBRB-04	2.72E-06	3.07E-01	6.43E-02	7.46E-03
SSLMBRB-01	2.84E-05	3.07E-01	6.43E-02	7.46E-03
SSLMBRB-04	5.46E-06	3.07E-01	6.43E-02	7.46E-03
STLPF-10	3.34E-06	1.44E+01	1.73E+00	5.35E-01
STLPF-25	9.85E-07	1.44E+01	1.73E+00	5.35E-01
STLPF-31	5.94E-06	9.16E+00	1.51E-01	6.30E-03
STLPF-36	5.94E-07	1.42E+01	1.22E+00	5.06E-01
MD-63	8.35E-04	8.50E-04	2.33E-04	1.29E-04
MD-68	8.44E-04	8.50E-04	2.33E-04	1.29E-04
MD-73	1.66E-04	8.50E-04	2.33E-04	1.29E-04
SFLMBRB-01	1.49E-04	3.07E-01	6.44E-02	7.46E-03
MD-74	3.04E-07	3.60E-01	6.84E-02	8.28E-03
MD-81	2.52E-07	1.44E+01	1.22E+00	5.06E-01
MD-84	1.83E-07	1.44E+01	1.73E+00	5.35E-01
MLOIA-05	5.59E-07	1.44E+01	1.73E+00	5.35E-01
MPRT-11	2.29E-07	1.44E+01	1.73E+00	5.35E-01
MTLFW-11	2.46E-07	9.16E+00	1.51E-01	6.30E-03
MTLHS-05	2.25E-07	1.44E+01	1.73E+00	5.35E-01
MTLPF-31	1.47E-07	9.16E+00	1.51E-01	6.30E-03
SPLPF-28	4.80E-07	9.16E+00	1.51E-01	6.30E-03



Event Sequence	Mean Frequency (/plant year)	30-day Mean Dose ¹ (rem)	4-day Mean Dose (rem)	1-day Mean Red Bone Marrow Dose (rem)
SSGTR-06	3.77E-07	1.44E+01	1.73E+00	5.35E-01
MTRBC-04	1.90E-06	1.44E+01	1.73E+00	5.35E-01
SD-103	2.22E-07	2.48E-01	5.45E-03	6.79E-04
SSGTL-33	2.47E-07	1.44E+01	1.73E+00	5.35E-01

[[

]]^{LME}

Figure 2: Frequency vs Consequence Curve of Screened in LBEs

[[

]]^{LME} As prescribed in the PEP EPZ sizing methodology, the treatment of seismic hazards will be addressed in an alternative hazards approach.



5.2 Probabilistic Dose Aggregation

For the PEP EPZ sizing analysis, assumptions were made regarding the degree of uncertainty in consequence space and dispersion factors, as discussed in Section 3.1, to develop associated dose-versus-distance curves for each LBE.

[[

]]LME



[[

]]^{LME}

5.3 Event Evaluation and Assessment

As noted above, this assessment utilizes the mean values for frequency and consequence when considering a 96-hour TEDE for criterion A, and 24-hour red bone marrow dose for criterion B for evaluation. There are notable modeling assumptions at this stage of analysis, as discussed in Section 3. It is important to note that not all LBEs with radionuclide release have resulting 1 rem and 200 rem curves. This is due to the very low likelihood of certain LBEs resulting in a release of that magnitude. The following Figure 3 shows all of the LBEs that have corresponding 1 rem curves, and Figure 3 shows all the LBEs that have corresponding 200 rem curves. [[

]]^{LME}



[[

]] LME

Figure 3: LBE 1 Rem Dose Exceedance Frequency-versus-Distance Curves



[[

]]^{LME}

Figure 4: LBE 200 Rem Dose Exceedance Frequency-versus-Distance Curves

Next, the individual LBE dose exceedance frequency vs distance curves are then summed to develop the cumulative dose exceedance frequency vs distance curves, as shown in Figure 5. The aggregation process sums the LBE frequencies to develop the cumulative curves. The 1 rem cumulative curve is then compared to the 1E-5 per plant frequency metric in criterion A shown in the red dotted line. This results in a distance of approximately [[]]^{LME}. Next, the 200 rem curve is compared to the 1E-6 per plant year frequency metric outlined in criterion B shown in the blue dotted line. This assessment derives a distance of approximately [[]]^{LME}.

A 5 rem exceedance curve is also included as part of the uncertainty assessment. This curve intersects the criterion A threshold of 1E-5 at [[]]^{LME}, which is still well below the proposed EPZ size of 400m, and provides additional assurance that the EPA PAGs will not be exceeded outside of the EAB. For the cliff-edge assessment, only a qualitative evaluation of the shape of the cumulative dose-versus-distance curves was performed. Neither curve demonstrates behavior regarding a potential cliff-edge near the frequency evaluation criteria (i.e., a flat slope). Therefore, based on the findings of the uncertainty and cliff-edge assessments, the limiting derived distance from the 1 rem curve is around [[]]^{LME}.



[[

]]LME

Figure 5: LBE Cumulative Dose Exceedance Frequency-versus-Distance Curves

5.4 Assessment for Seismic Hazards

[[

]]LME



Xe-100 Technical Report
Preliminary Plume Exposure Pathway Emergency Planning
Zone Analysis

Doc ID No: 010810
Revision: 4
Date: 8/31/2026

[[

]] LME



[[

]]^{LME}

Figure 6: Seismic Event Dose-versus-Distance Curve

The analysis shows that, even under these conservative assumptions, the projected dose remains below the regulatory threshold of 10 mSv (1 rem) over 96 hours at the proposed EPZ size at the EAB as outlined in RG 1.242. When compared to the 1 rem criterion, the dose vs distance curve crosses 1 rem line at about [[]]^{LME}. Since this derived distance is lower than the distance derived from the 1 rem curve as shown in Figure 5, that remains the limiting derived PEP EPZ distance.

5.5 Protective Measures Evaluation

Since the event evaluation and dose assessment found that doses do not exceed the EPA PAGs beyond the exclusion area boundary, it can be concluded that the PEP EPZ size can be established at the exclusion area boundary. The protective measures evaluation then focuses on those LBEs that result in doses exceeding the EPA PAGs for onsite personnel, in alignment with §50.160(b)(1)(iii)(B). The protective measures evaluation centers on the LBEs that resulted in 1 rem curves, highlighted in Figure 3,



and outlined in Table 3. It is important to convey that these are based on preliminary bounding results and final protective measures and emergency plans are subject to change, and the following is a preliminary analysis. For example, emergency operating procedures that will be developed as part of plant operations in future, handled by on site radiation plant workers, are not considered at this point. A full analysis would incorporate the insights from the IDPP to make the final evaluation determination.

Table 3: Protective Measure Evaluations – Within the EAB

Event Sequence	Event Description	Protective Measures Evaluation
LD-01	Modules 1-4 dampers open, modules 1-4 trip, and then Passive RCCS cooling is maintained in modules 1-4 until the plant reaches a safe stable state	Given extended nature of the release, evacuation of onsite personnel ² from the site is recommended for dose savings.
MD-65	Unsuccessful HPB break isolation in module 1, modules 1-4 dampers open, module 1 trips, Main steam header isolates in module 1, modules 2-4 do not trip after successful plant rebalance with main feedwater pump running, forced cooling for module 1 is not maintained by main feedwater pumps with the main steam header bypassed by a flow path through SSS to the condenser, Unsuccessful SSS cooling in module 1, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
SD-073	Unsuccessful HPB break isolation in module 1, module 1 shuts down, Main steam header isolates in module 1, modules 2-4 do not trip after successful plant rebalance with main feedwater pump running, forced cooling for module 1 is not maintained by main feedwater pumps with the main steam header bypassed by a flow path through SSS to the condenser, Unsuccessful SSS cooling in module 1, Primary system pumpdown not credited in module 1, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01

² Onsite personnel includes nonessential workers and members of the public.



Event Sequence	Event Description	Protective Measures Evaluation
SD-074	Unsuccessful HPB break isolation in module 1, module 1 shuts down, Main steam header isolates in module 1, modules 2-4 do not trip after successful plant rebalance with main feedwater pump running, forced cooling for module 1 is not maintained by main feedwater pumps with the main steam header bypassed by a flow path through SSS to the condenser, Unsuccessful SSS cooling in module 1, Primary system pumpdown not credited in module 1, Unsuccessful Active RCCS cooling in module 1, and then Passive RCCS cooling is maintained in module 1 until the plant reaches a safe stable state	Possible protective measures similar to LD-01
SD-088	Unsuccessful HPB break isolation in module 1, module 1 shuts down, Main steam header isolates in module 1, Unsuccessful plant rebalance requires modules 2-4 to trip with main feedwater pump running, forced cooling after the initiating event is not maintained by main feedwater pumps via steam generator main steam header and condenser for modules 1-4, Unsuccessful SSS cooling in modules 1-4, Primary system pumpdown not credited in modules 1-4, and then Active RCCS cooling in modules 1-4 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
SD-131	Unsuccessful HPB break isolation in module 1, module 1 fails to shut down, module 1 fails to trip, Primary system pumpdown not credited in module 1, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
SFLLBRB-01	Modules 1-4 shut down, SG isolation valves close for module 1, modules 1-4 dampers open, forced cooling for modules 2-4 is maintained by main feedwater pumps via steam generator main steam header and condenser, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01



Event Sequence	Event Description	Protective Measures Evaluation
SFLLBRB-04	Modules 1-4 shut down, SG isolation valves close for module 1, modules 1-4 dampers open, forced cooling after the initiating event is not maintained by main feedwater pumps via steam generator main steam header and condenser for modules 2-4, Successful SSS cooling in modules 2-4 is established and maintained, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
SFLMBRB-04	Modules 1-4 shut down, SG isolation valves close for module 1, modules 1-4 dampers open, forced cooling after the initiating event is not maintained by main feedwater pumps via steam generator main steam header and condenser for modules 2-4, Successful SSS cooling in modules 2-4 is established and maintained, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
SRT-006	Main steam header isolates in module 1, modules 2-4 do not trip after successful plant rebalance with main feedwater pump running, forced cooling for module 1 is not maintained by main feedwater pumps with the main steam header bypassed by a flow path through SSS to the condenser, Unsuccessful SSS cooling in module 1, Unsuccessful RCCS cooling in module 1, and then Intentional module 1 vessel depressurization not credited	Possible protective measures similar to LD-01. In the future, the PRA will be refined to realistically credit additional event mitigation that prevents RCCS failure, such as multiple means of refilling the RCCS, additional tank inventory available below the top of the RPV to support cooling, and more realistic failure probabilities for the driving risk contributors. Furthermore, additional analysis is needed to confirm the long-term plant response and associated mechanistic source terms for various RCCS failure modes.



Event Sequence	Event Description	Protective Measures Evaluation
SRT-021	Main steam header isolates in module 1, Unsuccessful plant rebalance requires modules 2-4 to trip with main feedwater pump running, modules 2-4 fail to trip, Unsuccessful RCCS cooling in modules 1-4, and then Intentional modules 1-4 vessel depressurization not credited	Possible protective measures similar to LD-01. In the future, the PRA will be refined to realistically credit additional event mitigation that prevents RCCS failure, such as multiple means of refilling the RCCS, additional tank inventory available below the top of the RPV to support cooling, and more realistic failure probabilities for the driving risk contributors. Furthermore, additional analysis is needed to confirm the long-term plant response and associated mechanistic source terms for various RCCS failure modes.
SRT-027	Unsuccessful isolation of main steam header in module 1, modules 2-4 fail to trip, Primary Pressure Relief Valves open in modules 1-4, Primary Relief Valves reclose in modules 1-4, modules 1-4 HPB integrity maintained, and then Active RCCS cooling in modules 1-4 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
SRT-032	Unsuccessful isolation of main steam header in module 1, modules 2-4 fail to trip, Primary Pressure Relief Valves open in modules 1-4, Primary Relief Valves stay Open in modules 1-4, and then Active RCCS cooling in modules 1-4 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01



Event Sequence	Event Description	Protective Measures Evaluation
SSGTL-06	Module 1 shuts down, SG isolation valves close for module 1, SG dump path opens for module 1, SG dump path isolates for module 1, modules 2-4 do not trip after successful plant rebalance with main feedwater pump running, forced cooling for module 1 is not maintained by main feedwater pumps with the main steam header bypassed by a flow path through SSS to the condenser, Unsuccessful SSS cooling in module 1, Unsuccessful RCCS cooling in module 1, and then Intentional module 1 vessel depressurization not credited	Possible protective measures similar to LD-01. In the future, the PRA will be refined to realistically credit additional event mitigation that prevents RCCS failure, such as multiple means of refilling the RCCS, additional tank inventory available below the top of the RPV to support cooling, and more realistic failure probabilities for the driving risk contributors. Furthermore, additional analysis is needed to confirm the long-term plant response and associated mechanistic source terms for various RCCS failure modes.
SSGTL-17	Module 1 shuts down, SG isolation valves close for module 1, SG dump path opens for module 1, SG dump path isolates for module 1, Unsuccessful plant rebalance requires modules 2-4 to trip with main feedwater pump running, forced cooling after the initiating event is not maintained by main feedwater pumps via steam generator main steam header and condenser for modules 1-4, Unsuccessful SSS cooling in modules 1-4, Unsuccessful RCCS cooling in modules 1-4, and then Intentional modules 1-4 vessel depressurization not credited	Possible protective measures similar to LD-01. In the future, the PRA will be refined to realistically credit additional event mitigation that prevents RCCS failure, such as multiple means of refilling the RCCS, additional tank inventory available below the top of the RPV to support cooling, and more realistic failure probabilities for the driving risk contributors. Furthermore, additional analysis is needed to confirm the long-term plant response and associated mechanistic source terms for various RCCS failure modes.
SSLLBRB-01	Modules 1-4 shut down, SG isolation valves close for module 1, modules 1-4 dampers open, forced cooling for modules 2-4 is maintained by main feedwater pumps via steam generator main steam header and condenser, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01



Event Sequence	Event Description	Protective Measures Evaluation
SSLLBRB-04	Modules 1-4 shut down, SG isolation valves close for module 1, modules 1-4 dampers open, forced cooling after the initiating event is not maintained by main feedwater pumps via steam generator main steam header and condenser for modules 2-4, Successful SSS cooling in modules 2-4 is established and maintained, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
SSLMBRB-01	Modules 1-4 shut down, SG isolation valves close for module 1, modules 1-4 dampers open, forced cooling for modules 2-4 is maintained by main feedwater pumps via steam generator main steam header and condenser, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
SSLMBRB-04	Modules 1-4 shut down, SG isolation valves close for module 1, modules 1-4 dampers open, forced cooling after the initiating event is not maintained by main feedwater pumps via steam generator main steam header and condenser for modules 2-4, Successful SSS cooling in modules 2-4 is established and maintained, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
STLPF-10	Module 1 shuts down, Main steam header isolates in module 1, modules 2-4 do not trip after successful plant rebalance with main feedwater pump running, Unsuccessful circulator restoration in module 1, Unsuccessful RCCS cooling in module 1, and then Intentional module 1 vessel depressurization not credited	Possible protective measures similar to LD-01. In the future, the PRA will be refined to realistically credit additional event mitigation that prevents RCCS failure, such as multiple means of refilling the RCCS, additional tank inventory available below the top of the RPV to support cooling, and more realistic failure probabilities for the driving risk contributors. Furthermore, additional analysis is needed to confirm the long-term plant response



Event Sequence	Event Description	Protective Measures Evaluation
		and associated mechanistic source terms for various RCCS failure modes.
STLPF-25	Module 1 shuts down, Main steam header isolates in module 1, Unsuccessful plant rebalance requires modules 2-4 to trip with main feedwater pump running, Unsuccessful circulator restoration in module 1, Unsuccessful RCCS cooling in module 1, and then Intentional module 1 vessel depressurization not credited	Possible protective measures similar to LD-01. In the future, the PRA will be refined to realistically credit additional event mitigation that prevents RCCS failure, such as multiple means of refilling the RCCS, additional tank inventory available below the top of the RPV to support cooling, and more realistic failure probabilities for the driving risk contributors. Furthermore, additional analysis is needed to confirm the long-term plant response and associated mechanistic source terms for various RCCS failure modes.
STLPF-31	Module 1 shuts down, Unsuccessful isolation of main steam header in module 1, Unsuccessful circulator restoration in module 1, Primary Pressure Relief Valves open in modules 1-4, Primary Relief Valves reclose in modules 1-4, modules 1-4 HPB integrity maintained, and then Active RCCS cooling in modules 1-4 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
STLPF-36	Module 1 shuts down, Unsuccessful isolation of main steam header in module 1, Unsuccessful circulator restoration in module 1, Primary Pressure Relief Valves open in modules 1-4, Primary Relief Valves stay Open in modules 1-4, and then Active RCCS cooling in modules 1-4 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
MD-63	Unsuccessful HPB break isolation in module 1, modules 1-4 dampers open, module 1 trips, Main steam header isolates in module 1, modules 2-4 do not trip after successful plant rebalance with main feedwater pump running, and then forced cooling for module 1 is maintained by main feedwater pumps with the main steam header bypassed by a flow	Possible protective measures similar to LD-01



Event Sequence	Event Description	Protective Measures Evaluation
	path through SSS to the condenser until the plant reaches a safe stable state	
MD-68	Unsuccessful HPB break isolation in module 1, modules 1-4 dampers open, module 1 trips, Main steam header isolates in module 1, Unsuccessful plant rebalance requires modules 2-4 to trip with main feedwater pump running, and then forced cooling for modules 1-4 is maintained by main feedwater pumps via steam generator main steam header and condenser until the plant reaches a safe stable state	Possible protective measures similar to LD-01
MD-73	Unsuccessful HPB break isolation in module 1, modules 1-4 dampers open, module 1 trips, Main steam header isolates in module 1, Unsuccessful plant rebalance requires modules 2-4 to trip with main feedwater pump running, forced cooling after the initiating event is not maintained by main feedwater pumps via steam generator main steam header and condenser for modules 1-4, and then Successful SSS cooling in modules 1-4 is established and maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
SFLMBRB-01	Modules 1-4 shut down, SG isolation valves close for module 1, modules 1-4 dampers open, forced cooling for modules 2-4 is maintained by main feedwater pumps via steam generator main steam header and condenser, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01
MD-74	Unsuccessful HPB break isolation in Module 1, Module 1-4 Dampers open, Module 1 trips, Main steam header isolates in Module 1, No consequential trip in Module 2-4, Main feedwater forced cooling without SSS for Module 1-4, Unsuccessful SSS cooling in Module 1/Module 1-4, Successful Passive RCCS cooling in Module 1/Module 1-4, and	Possible protective measures similar to LD-01



Event Sequence	Event Description	Protective Measures Evaluation
	then Successful Active RCCS cooling in Module 1/Module 1-4	
MD-81	Unsuccessful HPB break isolation in Module 1, Module 1-4 Dampers open, Module 1 fails to trip, Successful Passive RCCS cooling in Module 1/Module 1-4, and then Successful Active RCCS cooling in Module 1/Module 1-4	Possible protective measures similar to LD-01
MD-84	Unsuccessful HPB break isolation in Module 1, Module 1-4 Dampers stay closed, and then Module 1 trips	Possible protective measures similar to LD-01
MLOIA-05	Module 1-4 shuts down, Main feedwater forced cooling without SSS for Module 1-4, Unsuccessful SSS cooling in Module 1-4, Unsuccessful Passive RCCS cooling in Module 1-4, and then Unsuccessful intentional Module 1-4 vessel depressurization	Possible protective measures similar to LD-01. In the future, the PRA will be refined to realistically credit additional event mitigation that prevents RCCS failure, such as multiple means of refilling the RCCS, additional tank inventory available below the top of the RPV to support cooling, and more realistic failure probabilities for the driving risk contributors. Furthermore, additional analysis is needed to confirm the long-term plant response and associated mechanistic source terms for various RCCS failure modes.
MPRT-11	Main feedwater forced cooling without SSS for Module 1-4, Unsuccessful SSS cooling in Module 1/Module 1-4, Unsuccessful Passive RCCS cooling in Module 1/Module 1-4, and then Unsuccessful intentional Module 1/Module 1-4 vessel depressurization	Possible protective measures similar to LD-01. In the future, the PRA will be refined to realistically credit additional event mitigation that prevents RCCS failure, such as multiple means of refilling the RCCS, additional tank inventory available below the top of the RPV to support cooling, and more realistic failure probabilities for the driving risk contributors. Furthermore, additional analysis is needed to confirm the long-term plant response and associated mechanistic source terms for various RCCS failure modes.
MTLFW-11	Module 1-4 fails to shut down, Module 1-4 fails to trip, Primary Relief Valves open in	Possible protective measures similar to LD-01



Event Sequence	Event Description	Protective Measures Evaluation
	Module 1-4, Primary Relief Valves reclose in Module 1-4, Module 1-4 HPB integrity maintained, Successful Passive RCCS cooling in Module 1-4, and then Successful Active RCCS cooling in Module 1-4	
MTLHS-05	Module 1-4 shuts down, Main feedwater forced cooling without SSS for Module 1-4, Unsuccessful SSS cooling in Module 1/Module 1-4, Unsuccessful Passive RCCS cooling in Module 1/Module 1-4, and then Unsuccessful intentional Module 1/Module 1-4 vessel depressurization	Possible protective measures similar to LD-01. In the future, the PRA will be refined to realistically credit additional event mitigation that prevents RCCS failure, such as multiple means of refilling the RCCS, additional tank inventory available below the top of the RPV to support cooling, and more realistic failure probabilities for the driving risk contributors. Furthermore, additional analysis is needed to confirm the long-term plant response and associated mechanistic source terms for various RCCS failure modes.
MTLPF-31	Module 1 & 2 shuts down, Unsuccessful isolation of main steam header in Module 1 & 2, Unsuccessful circulator restoration in Module 1 & 2, Primary Relief Valves open in Module 1-4, Primary Relief Valves reclose in Module 1-4, Module 1-4 HPB integrity maintained, Successful Passive RCCS cooling in Module 1 & 2/Module 1-4, and then Successful Active RCCS cooling in Module 1 & 2/Module 1-4	Possible protective measures similar to LD-01
SPLPF-28	Unsuccessful plant power runback, Module 1 shuts down, Unsuccessful isolation of main steam header in Module 1, Module 2-4 fails to trip, Primary Relief Valves open in Module 1-4, Primary Relief Valves reclose in Module 1-4, Module 1-4 HPB integrity maintained, Successful Passive RCCS cooling in Module 1/Module 1-4, and then Successful Active RCCS cooling in Module 1/Module 1-4	Possible protective measures similar to LD-01
SSGTR-06	Module 1 shuts down, SG Isolation Valves close for Module 1, SG Dump Valves open for Module 1, SG Dump Valves reclose for Module	Possible protective measures similar to LD-01. In the future, the PRA will be refined to realistically credit additional



Event Sequence	Event Description	Protective Measures Evaluation
	1, Consequential trip in Module 2-4, Unsuccessful main feedwater forced cooling with SSS for Module 1, Unsuccessful SSS cooling in Module 1/Module 1-4, Unsuccessful Passive RCCS cooling in Module 1/Module 1-4, and then Unsuccessful intentional Module 1/Module 1-4 vessel depressurization	event mitigation that prevents RCCS failure, such as multiple means of refilling the RCCS, additional tank inventory available below the top of the RPV to support cooling, and more realistic failure probabilities for the driving risk contributors. Furthermore, additional analysis is needed to confirm the long-term plant response and associated mechanistic source terms for various RCCS failure modes.
MTRBC-04	Module 1-4 shuts down, Unsuccessful Passive RCCS cooling in Module 1-4, and then Unsuccessful intentional Module 1-4 vessel depressurization	Possible protective measures similar to LD-01. In the future, the PRA will be refined to realistically credit additional event mitigation that prevents RCCS failure, such as multiple means of refilling the RCCS, additional tank inventory available below the top of the RPV to support cooling, and more realistic failure probabilities for the driving risk contributors. Furthermore, additional analysis is needed to confirm the long-term plant response and associated mechanistic source terms for various RCCS failure modes.
SD-103	Unsuccessful HPB break isolation in Module 1, Module 1 fails to shut down, Module 1 trips, Main steam header isolates in Module 1, Consequential trip in Module 2-4, Unsuccessful main feedwater forced cooling with SSS for Module 1, Unsuccessful SSS cooling in Module 1/Module 1-4, Unsuccessful primary system pumpdown in Module 1/Module 1-4, Successful Passive RCCS cooling in Module 1/Module 1-4, and then Successful Active RCCS cooling in Module 1/Module 1-4	Possible protective measures similar to LD-01
SSGTL-33	Module 1 shuts down, SG Isolation Valves stay open for Module 1, Primary Relief Valves open in Module 1/Module 1-4, Primary Relief	Possible protective measures similar to LD-01



Event Sequence	Event Description	Protective Measures Evaluation
	Valves reclose in Module 1/Module 1-4, and then Module 1/Module 1-4 HPB integrity lost	
SSGTL-25	Module 1 shuts down, SG isolation valves close for module 1, SG dump fails to open for module 1, Primary Pressure Relief Valves open in module 1, Primary Relief Valves stay Open in module 1, and then Active RCCS cooling in module 1 is maintained until the plant reaches a safe stable state	Possible protective measures similar to LD-01

Given that all of these LBEs are related to either a depressurization or a loss of forced cooling and consequential fuel heat-up that results in an extended release of radioactivity, evacuation of onsite personnel from the site would be warranted for dose savings. Based on the evaluation, protective measures of evacuation for onsite personnel within the EAB are determined to be warranted to address different accident conditions. The resultant protective actions are to be developed, described in the emergency plan, and evaluated in the future.



6. Conclusion

The results of the Long Mott Generating Station PEP EPZ determination process are summarized in Table 4. First, a spectrum of events was established using the LBEs identified through the LMP approach. An alternative hazard event selection was utilized for seismic hazards in accordance with the procedure in the PEP EPZ methodology. Next, the event evaluation and dose assessment were performed utilizing the set of LBEs. The comparison to criterion A (1 rem curve) found that doses exceeding 1 rem over 96 hours were possible at a distance of []^{LME} from the facility. The comparison to criterion B (200 rem curve) found that doses exceeding 200 rem red bone marrow dose over 24 hours were possible at a maximum distance of []^{LME} from the facility. The uncertainty and cliff-edge assessments determined that the 5 rem curve may extend to []^{LME} based on a comparison to criterion A (1 rem curve). The alternative hazard assessment for the bounding seismic scenario resulted in a distance of []^{LME} when compared to the 1 rem criteria. A protective measures evaluation was performed for the []^{LME} LBEs that are the primary contributors to the 1 rem curve. The evaluation centered on protective measures within the EAB, as there were no derived distances that exceeded the EAB. The preliminary evaluation found that protective measures were warranted within the EAB; a full evaluation would require input from the IDPP.

Based on these findings, the PEP EPZ is established at the EAB (400m) for the Long Mott Generating Station.

Table 4: PEP EPZ Determination Results

Analysis Step	Assessment
Spectrum of Events	LBEs identified through LMP approach, used alternative hazard event selection considerations for seismic hazard.
Event Evaluation and Dose Assessment	The LBE assessment resulted in the following findings: • Criterion A: 1 rem curve – Distance of []^{LME} • Criterion B: 200 rem curve – Distance of []^{LME} • Uncertainty/Cliff-Edge Assessment: 5 rem curve against Criterion A of 1E-5/yr- Distance of []^{LME} • Seismic Hazard: Dose vs Distance @ 1 rem – Distance of []^{LME}
Protective Measures Evaluation	Beyond the EAB: • Predetermined, prompt protective measures are not warranted. Within the EAB: • 41 LBEs contribute to the 1 rem curve within the EAB. • Protective measures were developed for onsite personnel, given the nature of the releases.
PEP EPZ Determination	The analysis determined that doses exceeding the EPA PAGs were not possible beyond the EAB and predetermined, prompt protective measures are not warranted. Within the EAB, protective measures are warranted. Therefore, the PEP EPZ is established at the EAB (400m).



7. Cross References and References

7.1 Cross References and References

Document Title Cross References: X-energy documents that <u>may</u> impact the content of this document. References: X-energy or other documents that <u>will not</u> impact the content of this document	Document No.	Rev./ Date of Issuance	Cross Reference/ Reference
[1] Plume Exposure Pathway Emergency Planning Zone Sizing Methodology	010229	2	Cross Reference
[2] Performance-Based Emergency Preparedness for Small Modular Reactors, Non-Light-Water Reactors, and Non-Power Production or Utilization Facilities	RG 1.242	0	Reference
[3] An Approach for Risk-Informed Performance-Based Emergency Planning	NEI 24-05	August 2025	Reference
[4] Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plant	NUREG-0396	December 1978	Reference
[5] Probabilistic Risk Assessment: Radiological Consequence Analysis – Preliminary Scoping	006870	5	Cross Reference
[6] Probabilistic Risk Assessment: Risk Integration – Preliminary Scoping	002200	6	Cross Reference
[7] Xe-100 LBE Bounding Atmospheric Dispersion Factors Report	003393	5	Cross Reference
[8] Xe-100 XDIS Preliminary Dose Methodology Report	003724	4	Cross Reference
[9] Xe-100 Preliminary Safety Analysis Dose Summary Report	008078	3	Cross Reference
[10] Xe-100 Preliminary Long Term Dose Calculation	007330	6	Cross Reference
[11] Xe-100 Safety Analysis Phenomena and Key Parameter Identification and Ranking Tables	007086	1	Cross Reference
[12] Xe-100 Mechanistic Source Term for Long-Term Consequences Report – Preliminary	004130	6	Cross Reference
[13] ARCON96 Meteorological Data Process and Preliminary Results, Xe-100 – Long Mott	013366	1	Cross Reference
[14] @RISK Risk and Decision Analysis Platform for Microsoft Excel	S/N: 8140423	Ver. 8.4.0 (Build 281)	Reference
[15] Xe-100 Licensing Topical Report Atmospheric Dispersion and Dose Calculation Methodology	007116	2	Cross Reference
[16] Xe-100 Figure of Merit Uncertainty Methods	006177	1	Cross Reference
[17] Technical Analysis Procedure	QAP 3.2	8	Reference



Xe-100 Technical Report
Preliminary Plume Exposure Pathway Emergency Planning
Zone Analysis

Doc ID No: 010810
Revision: 4
Date: 8/31/2026

Document Title Cross References: X-energy documents that <u>may</u> impact the content of this document. References: X-energy or other documents that <u>will not</u> impact the content of this document	Document No.	Rev./ Date of Issuance	Cross Reference/ Reference
[18] Software Procedure	QAP 3.6	5	Reference
[19] XSTERM v1.8.3 vs v1.8.2 Impact Assessment Report	007713	2	Cross Reference
[20] Xe-100 Licensing Topical Report Transient and Safety Analysis Methodology	007834	2	Cross Reference
[21] External Exposure to Radionuclides in Air, Water, and Soil	FGR No. 12	September 1993	Reference
[22] Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion	FGR No. 11	September 1988	Reference
[23] Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors	RG 1.183	July 2000	Reference
[24] Xe-100 Preliminary Long Mott Atmospheric Dispersion Factors Calculation	014188	2	Cross Reference
[25] Atmospheric Relative Concentrations in Building Wakes	NUREG/C R-6331	May 1997	Reference
[26] Use Of ARCON Methodology for Calculation of Accident-Related Offsite Atmospheric Dispersion Factors	RG 1.249	September 2023	Reference
[27] PCRAMMET User's Guide, U.S. Environmental Protection Agency.	EPA-454/B-96-001	June 1999	Reference



Appendix A. Derivation of Release Profile Distributions

[[

]]^{LME}

Table 5: [[

]]^{LME}

[[

]]^{LME}

³ [[

]]^{LME}



[[

]]^{LME}

⁵ [[

]]^{LME}



Appendix B. Derivation of Mean X/Q from ARCON96 Cumulative Frequency Data

[[

]]^{LME}



Xe-100 Technical Report
Preliminary Plume Exposure Pathway Emergency Planning
Zone Analysis

Doc ID No: 010810
Revision: 4
Date: 8/31/2026

[[

]]^{LME}

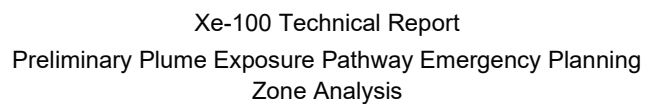


Xe-100 Technical Report
Preliminary Plume Exposure Pathway Emergency Planning
Zone Analysis

Doc ID No: 010810
Revision: 4
Date: 8/31/2026

[[

]]^{LME}

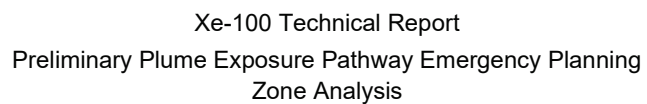


[[

]]LME

Table 6: Electronic File Records

File	Description and MD5-checksum Values
[[	
[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
[REDACTED]	[REDACTED] [REDACTED] [REDACTED]]LME





Xe-100 Technical Report
Preliminary Plume Exposure Pathway Emergency Planning
Zone Analysis

Doc ID No: 010810
Revision: 4
Date: 8/31/2026

File	Description and MD5-checksum Values
[[	
	]]LME



VI-B

**X Energy, LLC, "Cultural Historic Survey for Project Long Mott
Service Receipt Inspection Report," Revision 2, March 26, 2025
(unrestricted; public)**



Cultural Historic Survey for Project Long Mott Service Receipt Inspection Report

Document ID Number	:	008729
Configuration Classification	:	XE00-GL-GL-GL-GL-GL-G
Revision	:	2
Security Classification	:	Unrestricted
Status	:	Approved
Date Created	:	3/26/2025
Project	:	Long Mott Generating Station

This document is the property of X Energy, LLC. The content may not be reproduced, disclosed, or used without the Company's prior written approval.



Cultural Historic Survey for Project Long Mott
Service Receipt Inspection Report

Doc ID No: 008729

Revision: 2

Date: 3/26/2025

E-SIGNATURES

Preparer:
Electronically signed by Jessa Hultgren
26-Mar-2025 12:41

Approver:
Electronically signed by Milton Gorden
26-Mar-2025 14:19



Cultural Historic Survey for Project Long Mott
Service Receipt Inspection Report

Doc ID No: 008729

Revision: 2

Date: 3/26/2025

Document Approval Signees

Action	Designation	Name	Signature	Date
Preparer	Licensing Project Manager	Jessa Hultgren		
Approver	Licensing Manager	Milton Gorden		



CONFIGURATION CONTROL/DOCUMENT CHANGE HISTORY

Document Change History

Rev.	Date	Preparer	Page/Section Revised	Description
1	3/19/2025	Jessa Hultgren	All	Document Generated
2	3/26/2025	Jessa Hultgren	All	Changed Security Classification from Proprietary to Unrestricted. Attached is a letter from S&L stating the following: "Sargent & Lundy, LLC (S&L) understands that X Energy, LLC (XE) would like to include the reports listed below as part of the Long Mott Energy, LLC (LME) Construction Permit application to the U.S. Nuclear Regulatory Commission (NRC)...sOur confidential/proprietary statement on the transmittal of those documents requires written permission for release of same. This email serves as our permission for those reports."



Cultural Historic Survey for Project Long Mott
Service Receipt Inspection Report

Doc ID No: 008729

Revision: 2

Date: 3/26/2025

SERVICE RECEIPT INSPECTION REPORT

Provide title, number and revision of contractor document and corresponding title, number and revision assigned by X-energy from Teamcenter.

Company	Document Title	Document Number	Rev.
X-energy	Cultural Historic Survey for Project Long Mott	008729	2
Supplier	Cultural Historic Survey for the Proposed Project Long Mott, Calhoun County, Texas	WSP-XES-07	1

Disposition	
☒	Accepted
☐	Rejected (Deliverable must re-submitted after comments are incorporated.)

If deliverable is rejected, rationale for disposition

This record provides evidence that the deliverable was reviewed in accordance with QAP 7.1.

The Responsible Engineer's signature above confirms that contract requirements including Quality Assurance requirements are satisfied as documented in Question #1 of the Owner Acceptance (OAR) form (QAP-7.1-F03) and that appropriate technical reviews have been completed as documented in Questions #2 through #17 of the OAR form in accordance with QAP 7.1.

If a document is rejected, all non-conformances shall be documented in a non-conformance report (XEFORM-0059).

From: [Pressburger, Maury A](#)
To: [Milton Gorden](#); [Jessa Hultgren](#)
Cc: [Jannetty, Sandra J](#); [Boswell, Greg](#)
Subject: SL-XEN-2025-078 - Authorization to release reports
Date: Wednesday, March 26, 2025 9:59:47 AM

Notice: This email originated from outside of the organization. *Do not click links or open attachments unless you recognize the sender and know the content is safe.*

Milton,

Sargent & Lundy, LLC (S&L) understands that X Energy, LLC (XE) would like to include the reports listed below as part of the Long Mott Energy, LLC (LME) Construction Permit application to the U.S. Nuclear Regulatory Commission (NRC).

- Transmittal No. SL-XEN-2024-192; Phase I Intensive Archaeological Survey for the Proposed Long Mott Project, Calhoun County, Texas – Negative Finding Report; WSPDC#: WSP-XES-08; Rev. 1; Dated 19-Feb-2024
- Transmittal No. SL-XEN-2024-193; Cultural Historic Survey for the Proposed Project Long Mott, Calhoun County, Texas; WSPDC#: WSP-XES-07; Rev. 3; Dated 10-Jan-2024

Our confidential/proprietary statement on the transmittal of those documents requires written permission for release of same. This email serves as our permission for those reports.

Very Best Regards,

Maury

Maury Pressburger

Director, Nuclear Siting

Sargent & Lundy

1-312-269-3111 | 1-224-565-1983 (mobile) | 1-312-269-1913 (fax)

maury.a.pressburger@sargentlundy.com

www.sargentlundy.com

55 E. Monroe | Chicago, IL 60603



ISSUE SUMMARY AND APPROVAL PAGE

Project No. A13766.119
Transmittal No. SL-XEN-2024-193
November 7, 2024

X-energy LLC
Cultural Historic Survey for the Proposed Project Long Mott, Calhoun County, Texas

This Cultural Historic Survey for the Proposed Long Mott Project, Calhoun County, Texas at the Union Carbide Corporation (UCC) Seadrift Operations site (the Dow Chemical Corporation [Dow] Facility) in Seadrift, Texas has been reviewed for compliance with applicable technical and contractual documents and is approved for use.

The report was prepared by WSP USA Environment and Infrastructure, Inc. (WSP) under WSP project number 325223319.

Document No.	Rev.	Purpose	Date	Sections Affected
TC#: 008729 WSPDC#: WSP-XES-07	3	Final Report	01/10/2024	All

Reviewed by

Julianna Crumlish
Senior Environmental
Associate

Julianna
Crumlish

Digitally signed by
Julianna Crumlish
Date: 2024.11.11
14:27:44 -05'00'

Approved by

Greg Boswell
Consultant I

Digitally signed by
Greg Boswell
Date: 2024.11.11
17:26:37 -05'00'



Cultural Historic Survey for the Proposed Project Long Mott, Calhoun County, Texas

FINAL REPORT

THC Tracking Number: 202308205

TC No.: 008729

WSP Project No.: 325223319

WSP Cultural Report of Investigations No.: 2023-044

WSPDC-XES-07



Prepared for:
X-energy

January 2024

**WSP USA Environment & Infrastructure, Inc.
11003 Bluegrass Parkway, 690 Commonwealth Business Center
Louisville, Kentucky 40299
T: 502-267-0700
www.wsp.com**

Cultural Historic Survey for the Proposed Project Long Mott, Calhoun County, Texas

Main contributors

Mekenzie R Davis, BA
Carolyn E Andrews, MArch(HP).

Approved by



Carolyn E. Andrews, MArch(HP)
Principal Investigator

January 10, 2024

WSP Environment & Infrastructure USA

11003 Bluegrass Parkway
Suite 690
Louisville, KY 40299
Tel +502-267-0700

Document revisions

No.	Details	Date
1	HM	8.18.2023
2	CEA	10.25.2023
3	CEA	12.07.2023

ABSTRACT

On July 11-13, 2023, at the request of X-energy, LLC (X-energy), WSP Environment and Infrastructure, Inc. (WSP) architectural historians conducted an aboveground cultural resource eligibility and effects survey for the proposed Project Long Mott in Calhoun County, Texas (THC Tracking No. 202308205). The purpose of the survey was to identify aboveground historic resources over 50 years of age located within the Area of Potential Effect (APE); to evaluate these resources relative to their eligibility for listing in the National Register of Historic Places (NRHP); and to assess the potential direct and indirect visual effects of the proposed undertaking upon these resources.

The APE for aboveground cultural historic resource survey was determined in consultation with X-energy and the Texas Historical Commission (THC), the State Historic Preservation Office (SHPO). The project area is in the vicinity of the Dow Seadrift Operations Property, encompassing the northeast corner of the existing facility and adjacent Dow-owned land to the northeast, near the intersection of State Highways 185 and 35 in Calhoun County, Texas. The proposed project area is largely comprised of open fields and some wooded terrain. The APE for cultural historic resources includes an additional 0.5-mile buffer radiating out from the proposed project limits to account for potential impacts to aboveground historic architectural resources that are adjacent to the project area. This area consists of a largely rural landscape, made up of single-family residences and associated outbuildings, several industrial buildings, ruins, and many agricultural storage structures. Along with structures located within the APE, WSP also documented all historic structures located on a parcel intersected by the project APE, even if the structure is located outside of the half-mile APE buffer.

A total of ten resources over 50 years old—including four residential buildings, two outbuildings, one utility site, two operating industrial or agricultural facilities, and one defunct industrial facility—were identified within the APE (**Table A.1**). Of the ten resources, a total of seven were previously surveyed by Sara McLaughlin, Sandy Shannon, Amy E. Dase, Mitch Ford, Adrienne Vaughan, and Campbell (among others) of Stantec in 2021-2022 (Hinder, Rinaldi-Williams, et al. 2023) as part of a county-wide historic resources survey. All seven of these previously surveyed resources were recommended as not eligible for listing in the NRHP by McLaughlin et al. Of the ten resources surveyed and revisited in this study, WSP recommends none as eligible for listing in the NRHP. Therefore, WSP recommends that there would be **No Historic Properties Affected** by the undertaking.

Table A.1. Historic Resources in APE and NRHP Recommendations

Resource Number	Address	Style/Form	NRHP Recommendation
AR 1	7501 TX-185, Calhoun County, TX	Mid-20 th Century Industrial Complex	Not eligible due to a lack of integrity.
AR 2	NE of TX-185, Port Lavaca, TX	Industrial Ruins	Not eligible due to a lack of historic and architectural significance.
AR 3	NE of TX-185, Port Lavaca, TX	20 th Century Utility Structures	Not eligible due to a lack of historic and architectural significance.
AR 4	Jesse Rigby Rd, Port Lavaca, TX	20 th Century Agricultural Outbuildings	Not eligible due to a lack of historic and architectural significance.
AR 5	11525 TX-35, Port Lavaca, TX	Ranch	Not eligible due to a lack of historic and architectural significance.
AR 6	10622 TX-35, Port Lavaca, TX	Transitional Ranch	Not eligible due to a lack of historic and architectural significance.
AR 7	10548 TX-35, Port Lavaca, TX	20 th Century Residential Outbuilding	Not eligible due to a lack of historic and architectural significance.
AR 8	10237 TX-35, Port Lavaca, TX	Ranch	Not eligible due to a lack of historic and architectural significance.
AR 9	10211 HWY 35, Port Lavaca, TX	20 th Century Vernacular	Not eligible due to a lack of historic and architectural significance.
AR 10	10254 TX-35, Port Lavaca, TX	Mid-20 th Century Cotton Gin Facility	Not eligible due to a lack of integrity.

Table A.1: Please note that precise situs data could not be determined beyond adjacent road name for ARs 2-4. For these resources, see corresponding results chapters for more robust descriptions of location.

TABLE OF CONTENTS

ABSTRACT	i
1.0 INTRODUCTION	1
2.0 PROJECT AREA PHYSICAL SETTING	5
2.1 Physiographic Region.....	5
2.2 Area of Potential Effect	5
3.0 BACKGROUND RESEARCH	11
3.1 Previous Sites and Surveys	11
3.2 Archival Research	14
4.0 NRHP CRITERIA AND METHODS	15
4.1 NRHP Criteria for Eligibility	15
4.2 NRHP Criteria for Integrity	15
5.0 HISTORIC CONTEXT	17
5.1 History of Calhoun County, Texas.....	17
5.2 Port Lavaca, Texas.....	20
5.3 Union Carbide Company and Dow Seadrift Facility	22
5.4 Regional Architecture	24
6.0 SITE DESCRIPTION AND EVALUATION	27
7.0 AR 1: 7501 TX-185 (DOW SEADRIFT FACILITY)	31
7.1 AR 1a	31
7.2 AR 1b	33
7.3 AR 1 NRHP Recommendation.....	34
8.0 AR 2: NORTHEAST OF TX-185	49
9.0 AR 3: NORTHEAST OF TX- 185.....	55
10.0 AR 4: JESSE RIGBY RD	61
11.0 AR 5: 11525 TX- 35.....	67
12.0 AR 6: 10622 TX-35.....	75
13.0 AR 7: 10548 TX-35.....	83
14.0 AR 8: 10237 TX-35.....	89
15.0 AR 9: 10211 TX-35.....	95
16.0 AR 10: 10254 TX-35 (MOREMAN COMMUNITY COTTON GIN)	101
17.0 CONCLUSIONS AND RECOMMENDATIONS	111
19.0 REFERENCES CITED	113

FIGURES

Figure 1.1. Location of Calhoun County, Texas.....	1
Figure 1.2. Project Area Location and Proposed Project Limits in Calhoun County, Texas.....	3
Figure 1.3. Project Area and APE in Calhoun County, Texas.....	4

Figure 2.1. Texas Physiographic Map Depicting Project Area (EPA, 2023).....	5
Figure 2.2. APE for the Proposed Undertaking at Dow Seadrift (USGS, Green Lake, 1973).....	7
Figure 2.3. 1911 Calhoun County Map Depicting Green Lake and Surrounding Lot Owners (Texas General Land Office, 1911).	8
Figure 2.4. The Project Area Showing Mixed Characteristics and Land Uses.....	8
Figure 2.5. Industrial Elements (AR 1a) within the APE.....	9
Figure 2.6. Foundations of Historic Industrial Structures and Modern Industrial Construction (AR 10) within the APE.....	9
Figure 2.7. Abandoned Residential Structure (AR 9) within the APE.....	10
Figure 2.8. Typical Agricultural/ Residential Outbuilding and Vegetation Overgrowth (AR 4) within the APE.	10
Figure 3.1. View of Previously Surveyed Resources within the APE and Surrounding 1-Mile Buffer.	13
Figure 5.2. Port Lavaca Main Street Theater Marquee and Welcome Sign.....	21
Figure 5.3. View of Alcoa Plant beyond the Causeway between Port Lavaca and Point Comfort.	21
Figure 5.5. An Example of the Simple and Unornamented Character of Many Residences and Non-Residential Buildings (AR 9) in and around the APE.	25
Figure 5.6. An Example of a Transitional Ranch House (AR 6) within the APE.....	26
Figure 6.1. Aerial Showing the APE and the Documented Historic Resources.....	29
Figure 7.1. Aerial Image Showing the Location of AR 1a.....	36
Figure 7.2. AR 1a Shown on the 1973 Green Lake Historic Topographic Map.....	37
Figure 7.3. Overview of AR 1a, facing Southeast.....	37
Figure 7.4. View of Signage Associated with AR 1a.....	38
Figure 7.5. Oblique Aerial of AR 1a, facing North (The Center for Land Use Interpretation, 2009).	38
Figure 7.6. AR 1a, View of Southeast Elevation of Building 1, facing North.....	39
Figure 7.7. AR 1a, View of Southwest Elevation of Building 1, facing Northeast.....	39
Figure 7.8. AR 1a, View of Northwest Elevation of Building 1, facing Southeast.....	40
Figure 7.9. AR 1a, View of Southeast Elevation of Building 2, facing Northeast.....	40
Figure 7.10. AR 1a, Partial View of Southwest Elevation of Building 2, facing East.	41
Figure 7.11. AR 1a, View of Southwest Elevation of Buildings 13 & 14, facing East.....	41
Figure 7.12. AR 1a, View of Southwest Elevation of Building 13, facing East.....	42
Figure 7.13. AR 1a, View of Southwest and Northwest Elevations of Building 14, facing East.....	42
Figure 7.14. AR 1a, Partial View of Southwest and Southeast Elevations of Building 140, facing Southeast.	43
Figure 7.15. AR 1a, View of Northwest and Southwest Elevations of Building 380, facing East. ...	43
Figure 7.16. AR 1a, Partial View of Northeast and Southeast Elevations of Building 140, facing West.	44
Figure 7.17. Aerial Image Showing the Location of AR 1b.....	45
Figure 7.18. AR 1b Shown on the 1956 Historic Aerial Image.	46
Figure 7.19. AR 1b Shown on the 1973 Austwell Historic Topographic Map.	46
Figure 7.20. The East Elevation of AR 1b, Facing Southwest.....	47
Figure 7.21. The North and East Elevations of AR 1b, facing Southwest.....	47
Figure 7.22. View of Rusting and Mixed Condition of AR 1b Elements, facing Northwest.....	48

Figure 8.1. Aerial Image Showing the Location of AR 2.....	51
Figure 8.2. Location of AR 2 on the 1973 Green Lake USGS Topographic Map.....	52
Figure 8.3. View of AR 2 Prior to Deconstruction on the 1983 Historic Aerial Image.....	52
Figure 8.4. View of Vegetation Obscuring AR 2, facing Northeast.....	53
Figure 8.5. View of No Trespassing Sign at Gravel Road Leading to AR 2.....	53
Figure 9.1. Aerial Image Showing the Location of AR 3.....	57
Figure 9.2. Location of AR 3 on the 1973 Green Lake USGS Topographic Map.....	58
Figure 9.3. Overview of AR 3, facing East.....	58
Figure 9.4. View of Storage Shed, facing West; Note the Piping and Receiver Surrounding the Structure.....	59
Figure 9.5. View of the Second Structure Comprising AR 3, facing East; Note Surrounding Piping and Power Line Pole.....	59
Figure 9.6. View of South Elevation of Northwestern Structure, facing North.....	60
Figure 10.1. Aerial Image Showing the Location of AR 4.....	63
Figure 10.2. Location of AR 4 on the 1973 Green Lake USGS Topographic Map.....	64
Figure 10.3. View of Southeast and Northeast Elevations of Larger Structure, facing West.....	64
Figure 10.4. View of Southeast Elevation of Larger Structure, facing Northwest.....	65
Figure 10.5. View of Southeast and Southwest Elevations of Larger Structure, facing Northeast.....	65
Figure 10.6. View of Southeast and Southwest Elevations of Smaller Structure, facing Northeast.....	66
Figure 10.7. View of Southeast Elevation of Smaller Structure, facing Northwest.....	66
Figure 11.1. Aerial Image Showing the Location of AR 5 with its Outbuilding.....	70
Figure 11.2. Location of AR 5 on the 1969 Port Lavaca USGS Topographic Map.....	71
Figure 11.3. View of AR 5 and Outbuilding, facing South; Note Vegetation Overgrowth.....	71
Figure 11.4. View of the Northwest (Main) Elevation of AR 5, facing South; Note the Significant Overgrowth of Vegetation.....	72
Figure 11.5. View of the Southwest Elevation of AR 5, facing South.....	72
Figure 11.6. View of Southeast (Rear) Elevation of Cross-gable Section, facing North.....	73
Figure 11.7. View of Southeast (Rear) Elevation of Central Block, facing Northwest.....	73
Figure 11.8. View of Northwest and Northeast Elevations of Outbuilding, facing South.....	74
Figure 12.1. Aerial Image Showing the Location of AR 6.....	77
Figure 12.2. Location of AR 6 on the 1953 Green Lake USGS Topographic Map.....	78
Figure 12.3. View of the Southeast (Main) Elevation of AR 6, facing Northwest.....	78
Figure 12.4. View of the Southeast (Main) Elevation of AR 6, facing Northwest.....	79
Figure 12.5. View of the Southwest Elevation of AR 6, facing Southwest.....	79
Figure 12.6. View of the Northeast Elevation of AR 6, facing Northeast.....	80
Figure 12.7. View of AR 6 and an Outbuilding, facing North.....	80
Figure 12.8. View of the East and North Elevations of Storage Building Associated with AR 6, facing West.....	81
Figure 12.9. View of the East and North Elevations of Storage Building Associated with AR 6, facing West.....	81
Figure 12.10. View of the East and North Elevations of Vehicle Shed Associated with AR 6, facing West.....	82
Figure 13.1. Aerial Image Showing the Location of AR 7.....	85

Figure 13.2. Location of Original House Associated with AR 7 on the 1973 Green Lake USGS Topographic Map.....	86
Figure 13.3. View of Southeast (Main) and Southwest Elevations of AR 7, facing North; Note Associated Modern Residence.....	86
Figure 13.4. View of the Southeast (Main) and Northeast Elevations of AR 7, facing East.....	87
Figure 13.5. View of Southeast and Northeast Elevations of AR 7, facing West.....	87
Figure 14.1. Aerial Image Showing the Location of AR 8.....	91
Figure 14.2. Location of AR 8 on the 1973 Green Lake USGS Topographic Map.....	92
Figure 14.3. View of the Northwest (Main) Elevation of AR 8, facing Southeast.....	92
Figure 14.4. View of the Northwest (Main) Elevation of AR 8, facing Southeast.....	93
Figure 14.5. View of the Northwest (Main) and Northeast Elevations of AR 8, facing South.....	93
Figure 14.6. View of the Southeast and Southwest Elevations of AR 8, facing North.....	94
Figure 15.1. Aerial Image Showing the Location of AR 9.....	97
Figure 15.2. Location of AR 9 on the 1973 Green Lake USGS Quadrangle Topographic Map.....	98
Figure 15.3. View of the Northwest (Main) Elevation of AR 9, facing Southeast.....	98
Figure 15.4. View of the Northwest (Main) and Northeast Elevations of AR 9, facing South.....	99
Figure 15.5. View of the Northwest (Main) and Southwest Elevations of AR 9, facing East.....	99
Figure 16.1. Aerial Image Showing the Location of AR 10.....	104
Figure 16.2. Location of AR 10 on the 1953 Green Lake USGS Topographic Map.....	105
Figure 16.3. Overview of AR 10, facing Northwest.....	105
Figure 16.4. View of South and East (Main) Elevations of Office Building, facing Northwest.....	106
Figure 16.5. View of the South Elevation of Office Building, facing North.....	106
Figure 16.6. View of West Elevations of Quonset Hut and Nearby Barn, facing East.....	107
Figure 16.7. View East and South Elevations of Quonset Hut, facing Northwest.....	107
Figure 16.8. View North Elevation of Quonset Hut, facing South.....	108
Figure 16.9. View of Earlier Complex Remnants, facing Southwest.....	108
Figure 16.10. View of Grain Bin Approaching Historic Age, facing West.....	109
Figure 16.11. View of Grain Bin Foundations, facing South.....	109
Figure 16.12. View of Processing Machinery, facing West; Note the Cotton Littered around the Ground Outside of the Ginning Building.....	110

TABLES

Table A.1. Historic Resources in APE and NRHP Recommendations	ii
Table 1.1. Survey Personnel and Project Roles	2
Table 3.1. Previously Surveyed Resources within the APE.....	11
Table 3.2. Previously Surveyed Resources within the 1-mile Buffer around the APE.....	12
Table 3.3. Archival Resources Researched for the Project.....	14
Table 6.1. Historic Resources in APE and NRHP Recommendations.....	27
Table 7.1. Summary of AR 1a.....	31
Table 7.2. Overview of AR 1a Historic Buildings.....	32
Table 7.3. Summary of AR 1b	34
Table 8.1. Summary of AR 2	49
Table 9.1 Summary of AR 3	55
Table 10.1. Summary of AR 4.....	61
Table 11.1 Summary of AR 5.....	67
Table 12.1. Summary of AR 6.....	75
Table 13.1. Summary of AR 7.....	83
Table 14.1. Summary of AR 8.....	89
Table 15.1. Summary of AR 9.....	95
Table 16.1. Summary of AR 10	101
Table 16.2. Overview of AR 10 Historic Buildings and Structures.....	102
Table 17.1. NRHP Recommendations and Determinations of Effect.....	112



THIS PAGE LEFT BLANK INTENTIONALLY

1.0 INTRODUCTION

At the request of X-energy, LLC (X-energy), WSP Environment and Infrastructure, Inc. (WSP) conducted an aboveground cultural resources survey for the proposed Project Long Mott in Calhoun County, Texas (THC Tracking No. 202308205) (**Figure 1.1**). This survey was conducted in order to meet the requirements of Section 106 of the National Historic Preservation Act of 1966 (36 CFR 400.4, as amended through 2000), as well as the guidelines developed by the Texas Heritage Council (THC), the State Historic Preservation Office (SHPO).

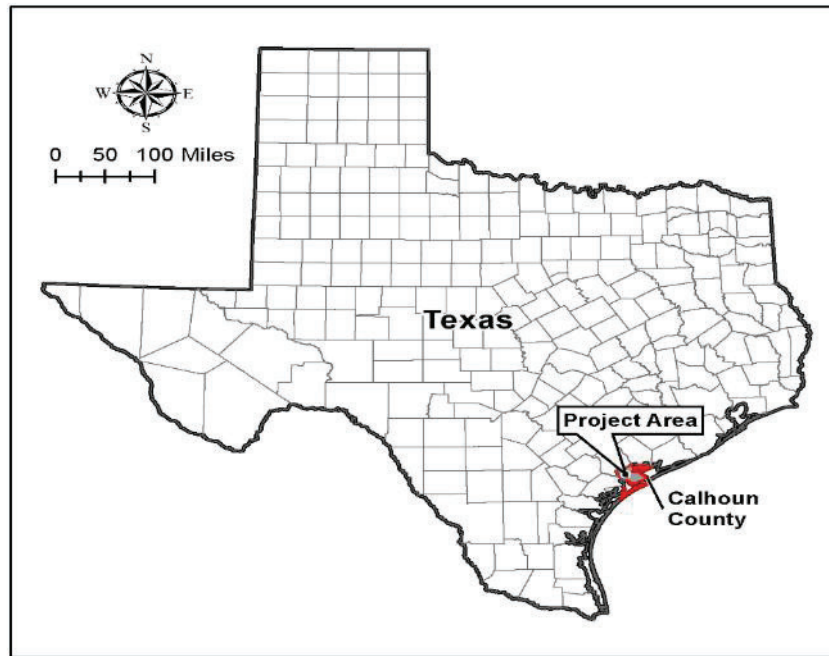


Figure 1.1. Location of Calhoun County, Texas

The survey was conducted to identify aboveground historic resources over 50 years of age located within the Area of Potential Effect (APE); to evaluate these resources relative to their eligibility for listing in the National Register of Historic Places (NRHP); and to assess the potential direct and indirect visual effects of the proposed undertaking upon these resources. Due to trespassing concerns, unless permission was granted from the property owner, photographs were taken only from the public right-of-way. The project area is in the vicinity of the Dow Seadrift Operations Property, encompassing the northeast corner of the existing facility and adjacent Dow-owned land to the northeast, near the intersection of State Highways 185 and 35 in Calhoun County, Texas. The proposed project area is comprised largely of open fields and some wooded terrain. The APE for cultural historic resources includes an additional 0.5-mile buffer radiating out from the proposed project limits to account for impacts to aboveground historic architectural resources that are adjacent to the project area. This area consists of a largely rural landscape, made up of single-family residences and associated outbuildings, several industrial buildings, ruins, and many agricultural storage structures. The APE also includes all buildings and structures located within any parcels the viewshed buffer encounters, regardless of distance. As such, the

survey includes a few resources that lay outside the 0.5-mile buffer (**Figure 2.2**). The APE for aboveground cultural resources was determined in consultation with X-energy and THC.

Table 1.1. Survey Personnel and Project Roles

Name	Title	Role
Carolyn E Andrews, MArch(HP)	Senior Architectural Historian	Background Research, Fieldwork, Principal Investigator, QA/QC, Oversight of deliverables and recommendations
Mekenzie R Davis, BA	Architectural Historian	Background Research, Fieldwork, Survey deliverables and recommendations

Architectural fieldwork was conducted on July 11-13, 2023, by Carolyn E Andrews and Mekenzie R Davis (**Table 1.1**). A total of ten resources over 50 years old—including four residential buildings, two outbuildings, one utility site, two operating industrial or agricultural facilities, and one defunct industrial facility—were identified within the APE (**Figure 2.2**). Of the resources recorded, a total of seven were previously surveyed by Sara McLaughlin, Sandy Shannon, Amy E. Dase, Mitch Ford, Adrienne Vaughan, and Campbell (among others) of Stantec in 2021-2022 (Hinder, Rinaldi-Williams, et al. 2023). All seven of these previously surveyed resources were recommended as not eligible for listing in the NRHP by McLaughlin et al. Of the ten resources surveyed and revisited in this study, WSP recommends none as eligible for listing in the NRHP. Therefore, WSP recommends that there will be **No Historic Properties Affected** for the remaining cultural historic resources.

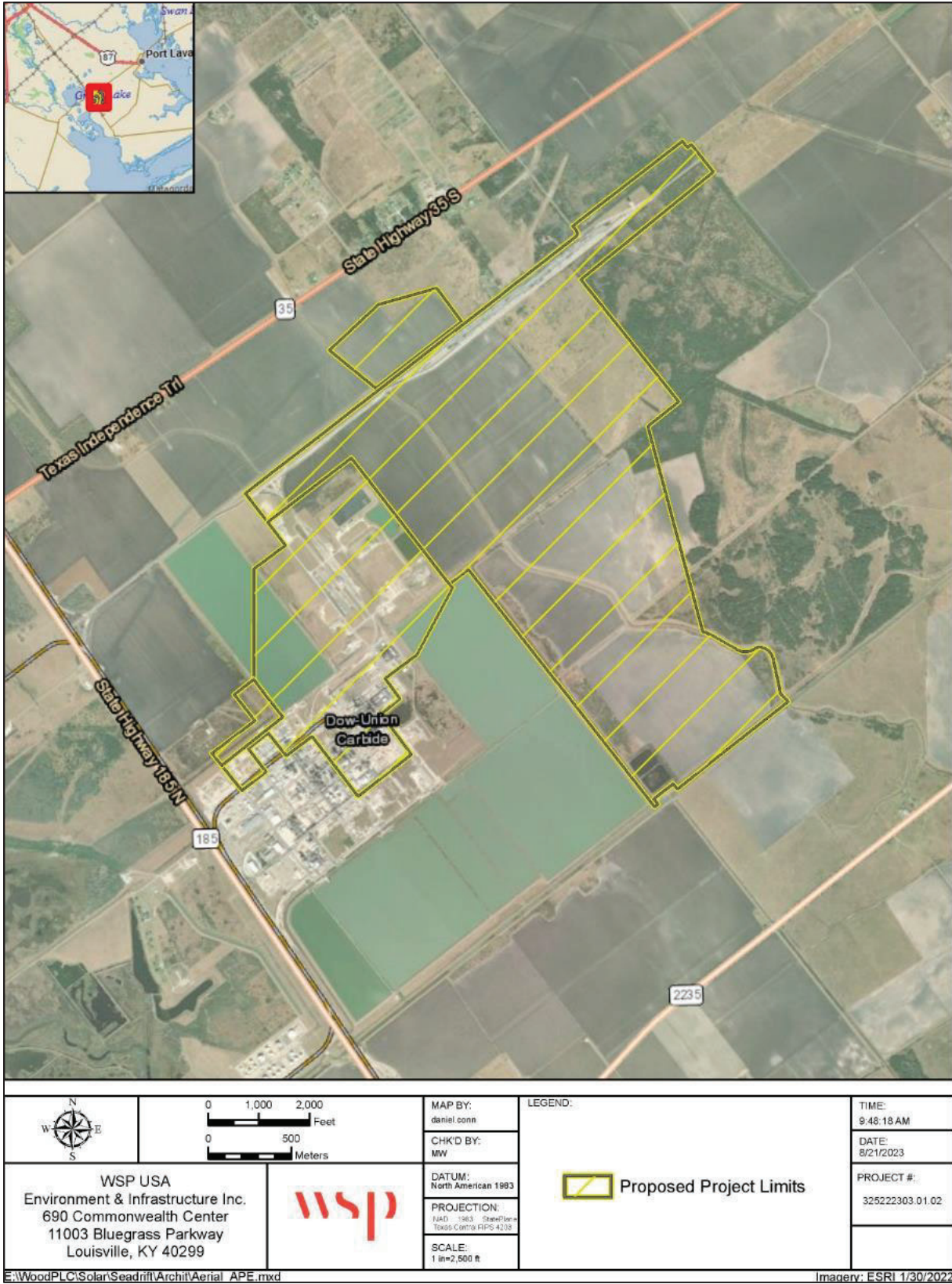


Figure 1.2. Project Area Location and Proposed Project Limits in Calhoun County, Texas.

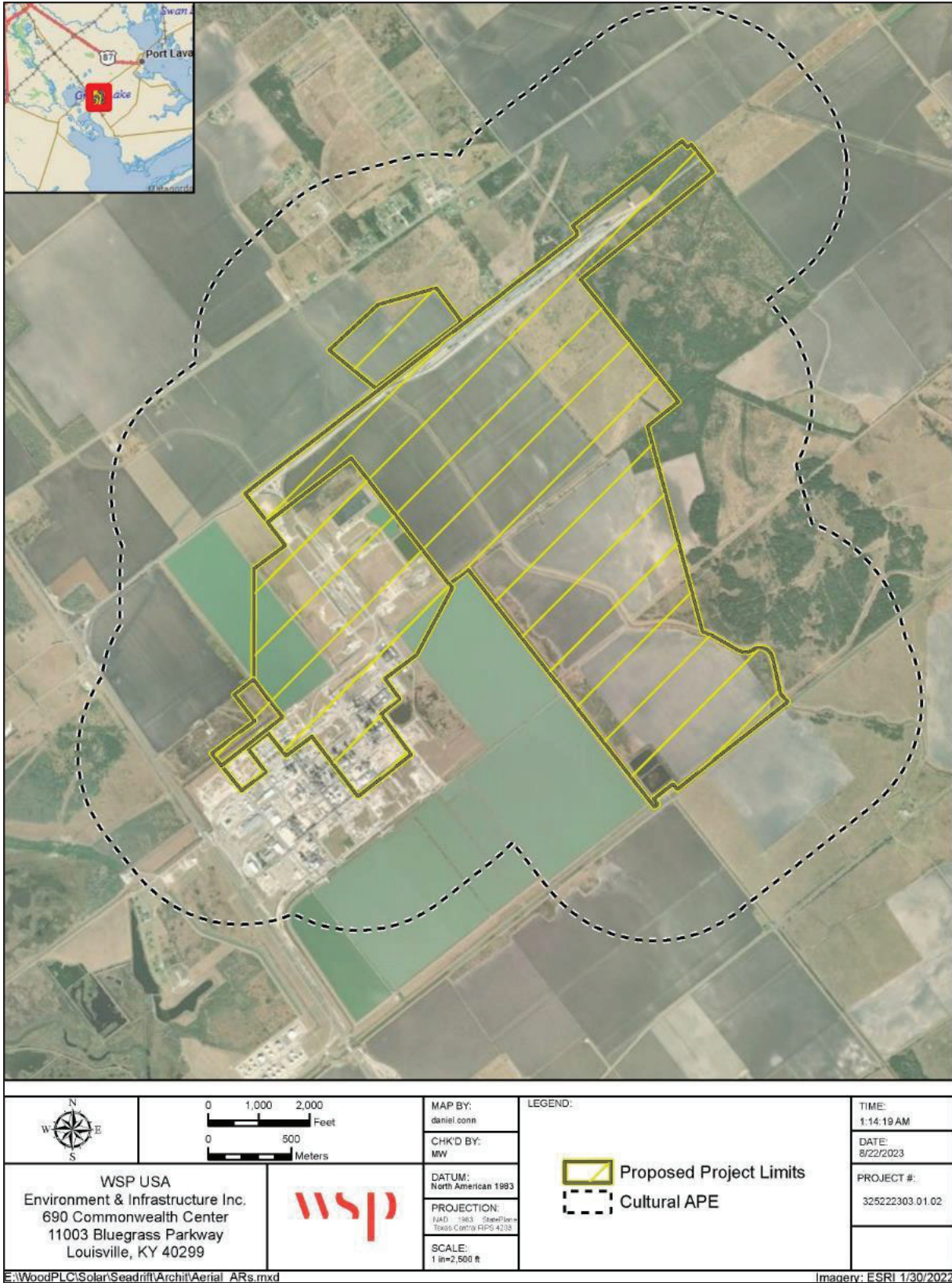


Figure 1.3. Project Area and APE in Calhoun County, Texas.

2.0 PROJECT AREA PHYSICAL SETTING

2.1 Physiographic Region

Calhoun County, Texas, encompasses 540 square miles located in the southwestern part of the Gulf Coast Prairie. The county is bordered by Refugio, Jackson, Victoria, Matagorda, and Aransas Counties. The Gulf of Mexico serves as the southwestern border of the county and Matagorda Island is included in the county's total area. The terrain is characterized as a broad, nearly uninterrupted plain punctuated infrequently by sloping areas adjacent to drains and inland bays, with elevations only ranging from sea level to 56 feet above sea level. The highest points in the county are located in the northeastern region of the county, near Bloomington and along the border with Victoria County (Mowery and Bower 1978). The low elevations of the county are consistent with other areas along the northeastern extent of Texas' Gulf coast which comprise the Northern Humid Gulf Coastal Prairies physiographic region (**Figure 2.1**). Calhoun County soil is comprised of loams underlain by cracking, clayey subsoils, including deep black soils and sandy clay; and Matagorda Island is chiefly deep shell sand. Twenty-one to thirty percent of the land in Calhoun County is considered prime farmland and is drained by the Guadalupe River, Chocolate Bayou, and many creeks (Kleiner 2020).

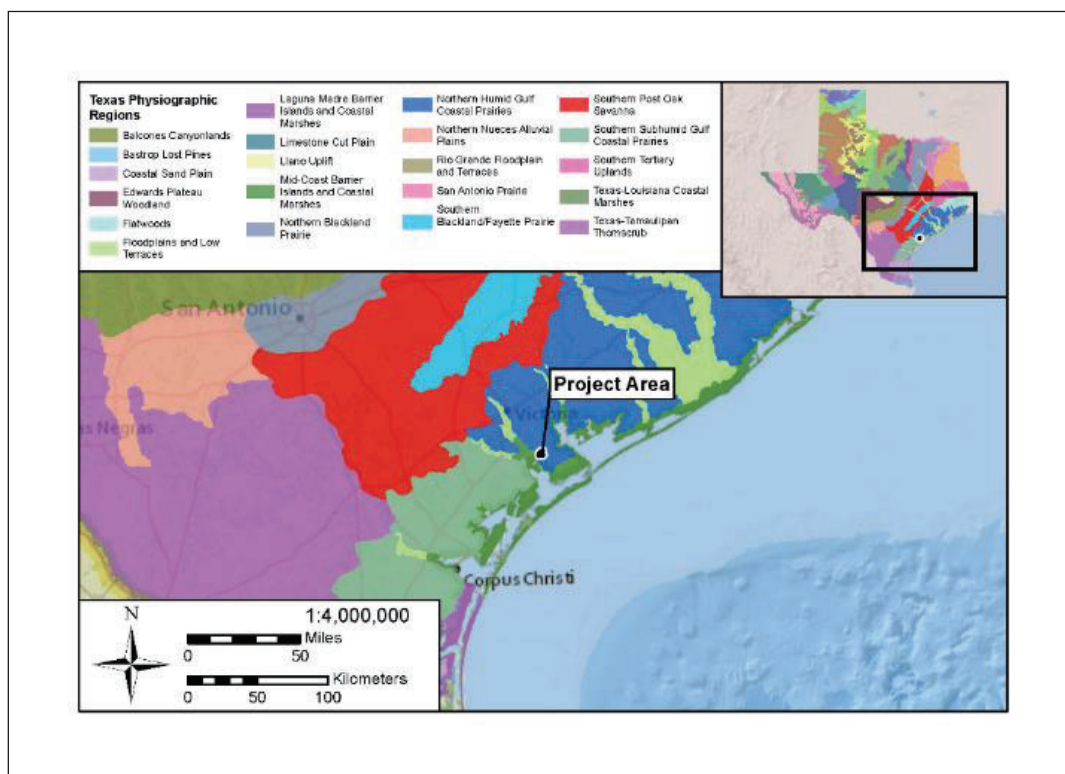


Figure 2.1. Texas Physiographic Map Depicting Project Area (EPA, 2023).

2.2 Area of Potential Effect

The APE for the aboveground cultural resources survey, determined through consultations with X-energy and THC, is based upon the project's potential direct and visual effects upon historic resources. The APE is based on the project area, which encompasses the northeast corner of

the existing Dow Seadrift Operations Property and adjacent land to the northeast, southwest of State Highway 35 in Port Lavaca, Texas (**Figure 2.2**). The proposed project area is comprised largely of open fields and some wooded terrain. The APE for cultural historic resources includes an additional 0.5-mile buffer radiating out from the proposed project limits to account for impacts to aboveground historic architectural resources that are adjacent to the project area.

Along with historic resources located within the APE, WSP documented all historic resources located on a parcel intersected by the project APE, even if the structure is located outside of the 0.5-mile APE buffer. Entire parcels that touch the APE were surveyed and buildings located within those parcels that were over 50 years old were considered to be inside the APE. The APE consists of a largely rural landscape, made up of single-family residences and associated outbuildings, several industrial buildings, ruins, and many agricultural storage structures.

Historically the APE contained a primarily rural character with many large farms dominating the landscape. Beginning in the mid-20th century, an influx of industrial development in Calhoun County marked the area with large industrial plants, resulting in the variety of land uses within the APE seen today. On the 1911 Calhoun County map, the project area is shown just east of Green Lake, an inland tidal lake, from which a 19th century settlement derived its name (**Figure 2.3**). Texas Historical Marker # 2268 indicates that the community was established in the late 1840s and was comprised of wealthy cotton plantation owners from Texas as well as an extensive enslaved population. The Green Lake settlement declined following the Civil War and was all but abandoned by 1875. There is no extant evidence of the settlement in the landscape and Calhoun County currently owns the lake and surrounding area which is being developed as a proposed Green Lake Park (Calhoun County Historical Commission 1988; Venable 2022). Today the mixed character of the APE landscape is reflected in the expanses of farmland, sprawling industrial complexes, and residential buildings and structures dotting the landscape (**Figures 2.4 - 2.8**).

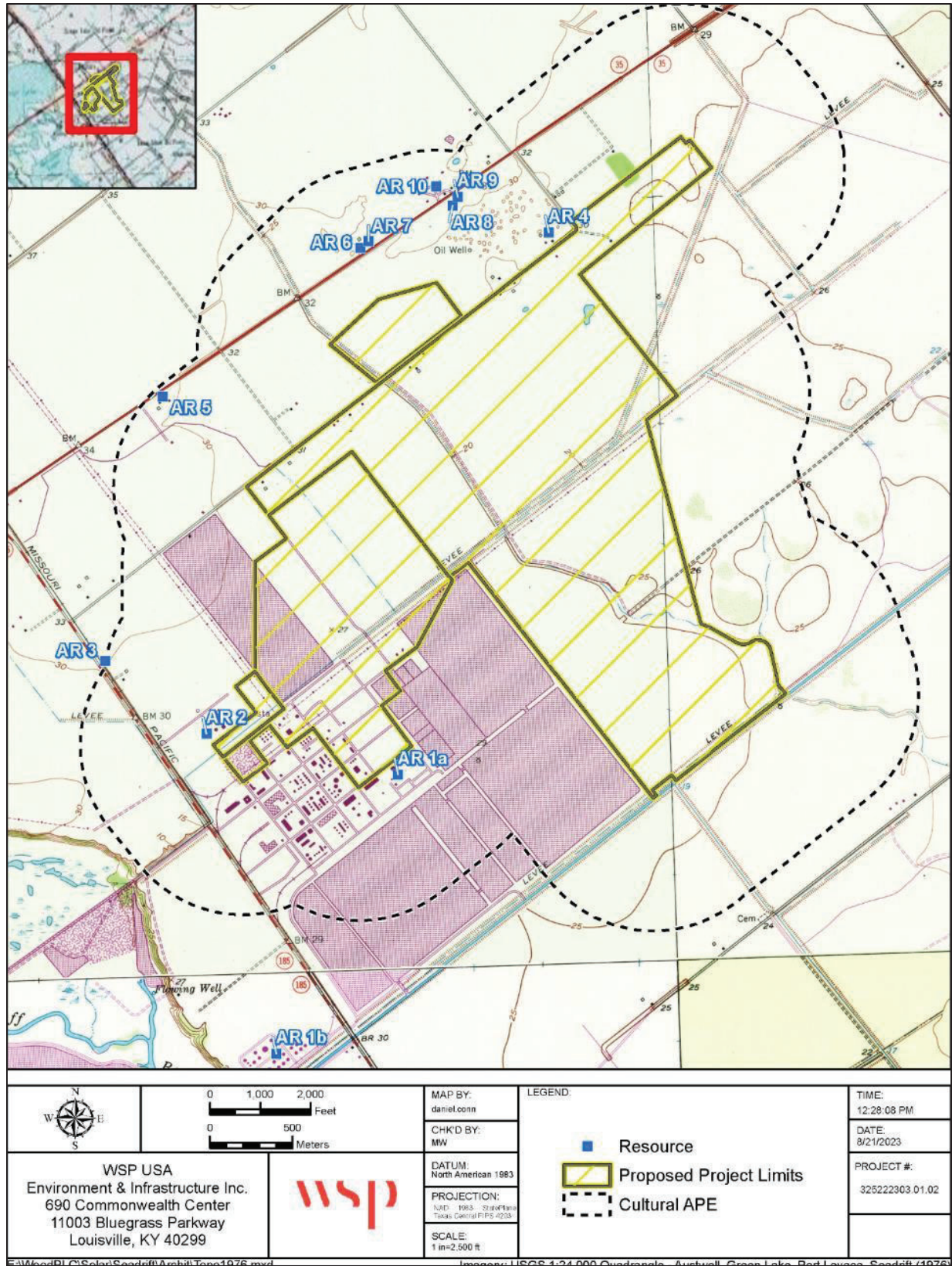


Figure 2.2. APE for the Proposed Undertaking at Dow Seadrift (USGS, Green Lake, 1973).

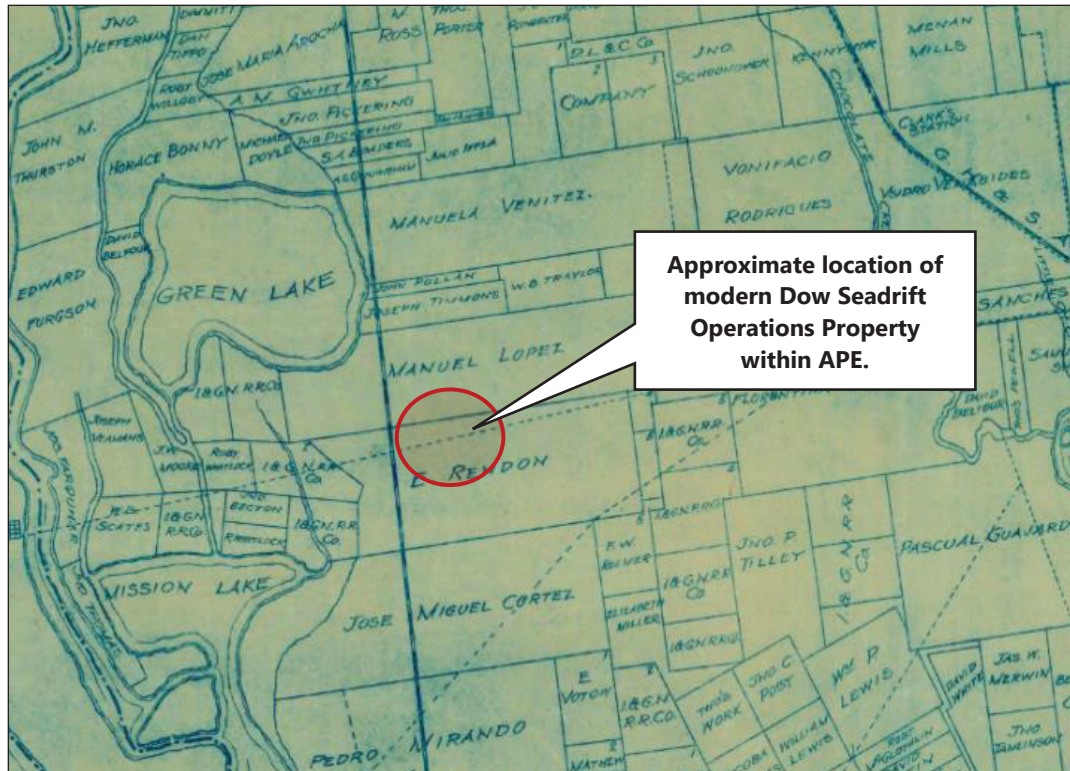


Figure 2.3. 1911 Calhoun County Map Depicting Green Lake and Surrounding Lot Owners (Texas General Land Office, 1911).



Figure 2.4. The Project Area Showing Mixed Characteristics and Land Uses.



Figure 2.5. Industrial Elements (AR 1a) within the APE.



Figure 2.6. Foundations of Historic Industrial Structures and Modern Industrial Construction (AR 10) within the APE.



Figure 2.7. Abandoned Residential Structure (AR 9) within the APE.



Figure 2.8. Typical Agricultural/ Residential Outbuilding and Vegetation Overgrowth (AR 4) within the APE.

3.0 BACKGROUND RESEARCH

3.1 Previous Sites and Surveys

Prior to commencing fieldwork, WSP conducted a thorough literature review of several resources to identify what architectural resources were previously surveyed and recorded within the APE and within a 1-mile buffer around the APE to inform historic context. The NRHP was checked to determine if any resources in the APE were already listed. Site file and database checks for architectural resources were searched via the THC Texas Historic Sites Atlas on July 24, 2023. Based on the site file and database check, there are 7 previously surveyed resources within the APE (**Table 3.1** and **Figure 3.1**).

It should be noted, however, that a total of 2,973 resources within Calhoun County were previously surveyed by Sara McLaughlin, Sandy Shannon, Amy E. Dase, Mitch Ford, Adrienne Vaughan, and Campbell (among others) of *Stantec* in 2021-2022 as recorded in *Historic Resources Survey of Aransas, Refugio, and Calhoun Counties: Calhoun County Survey Report* (Hinder, Rinaldi-Williams, et al. 2023). Of the 2,973 resources recorded by McLaughlin et al., 7 are within the APE and 20 sites are located within the additional 1-mile buffer around the APE. Of the 27 previously surveyed resources, a total of 26 were recommended not eligible for listing in the NRHP, and one resource, the historic Victoria Barge Canal (Site #3300074805), was recommended eligible for listing in the National Register under Criterion A by McLaughlin et al. for association with transportation industry, and maritime history (**Table 3.2** and see **Figure 3.1**). Site #3300074805 is located outside of the APE and its period of significance of 1954-1958 corresponds to the canal's original construction period. Although the Union Carbide Chemical Company is historically associated with Site #3300074805, this association is best embodied by resources outside of the APE, indicating that the ten resources evaluated in this survey are not significantly associated with the Victoria Barge Canal.

Table 3.1. Previously Surveyed Resources within the APE

Site #	THC Atlas Number	Historic Name	Location	Previous Recommendation
AR 1	3300077702/ 3300077703	Union Carbide Facility	7501 TX-185	Not Eligible
AR 4	3300076586	NA	Jesse Rigby Rd	Not Eligible
AR 5	3300076612	NA	11525 TX-35	Not Eligible
AR 6	3300076611	NA	10622 HWY 35	Not Eligible
AR 8	3300076613	NA	10237 HWY 35	Not Eligible
AR 9	3300076614	NA	10211 HWY 35	Not Eligible
AR 10	3300076587	Moreman Community Cotton Gin	10254 HWY 35	Not Eligible

Table 3.2. Previously Surveyed Resources within the 1-mile Buffer around the APE

Texas Atlas #	Historic Name	Location	NRHP Eligibility
3300076602	NA	216 Farik Rd	Not Eligible
3300076603	NA	188 Farik Rd	Not Eligible
3300076606	NA	1623 Whatley Rd	Not Eligible
3300076607	NA	2898 Whatley Rd	Not Eligible
3300076608	NA	Whatley Rd	Not Eligible
3300076609	NA	163 Whatley Rd	Not Eligible
3300076610	NA	241 Whatley Rd	Not Eligible
3300076615	NA	144 Crober Rd	Not Eligible
3300076616	NA	8260 TX-35	Not Eligible
3300076617	NA	150 Sikes Rd	Not Eligible
3300076618	NA	778 Sikes Rd	Not Eligible
3300076621	NA	373 Woods Rd	Not Eligible
3300076622	NA	281 Woods Rd	Not Eligible
3300076623	NA	147 Woods Rd	Not Eligible
3300076624	NA	109 Woods Rd	Not Eligible
3300076625	NA	39 Woods Rd	Not Eligible
3300076626	NA	3698 FM2235	Not Eligible
3300076627	NA	3698 FM2235	Not Eligible
3300074796	Morales Cemetery	FM2235	Not Eligible
3300074805	Victoria Barge Canal	Long Mott Vicinity	Criterion A

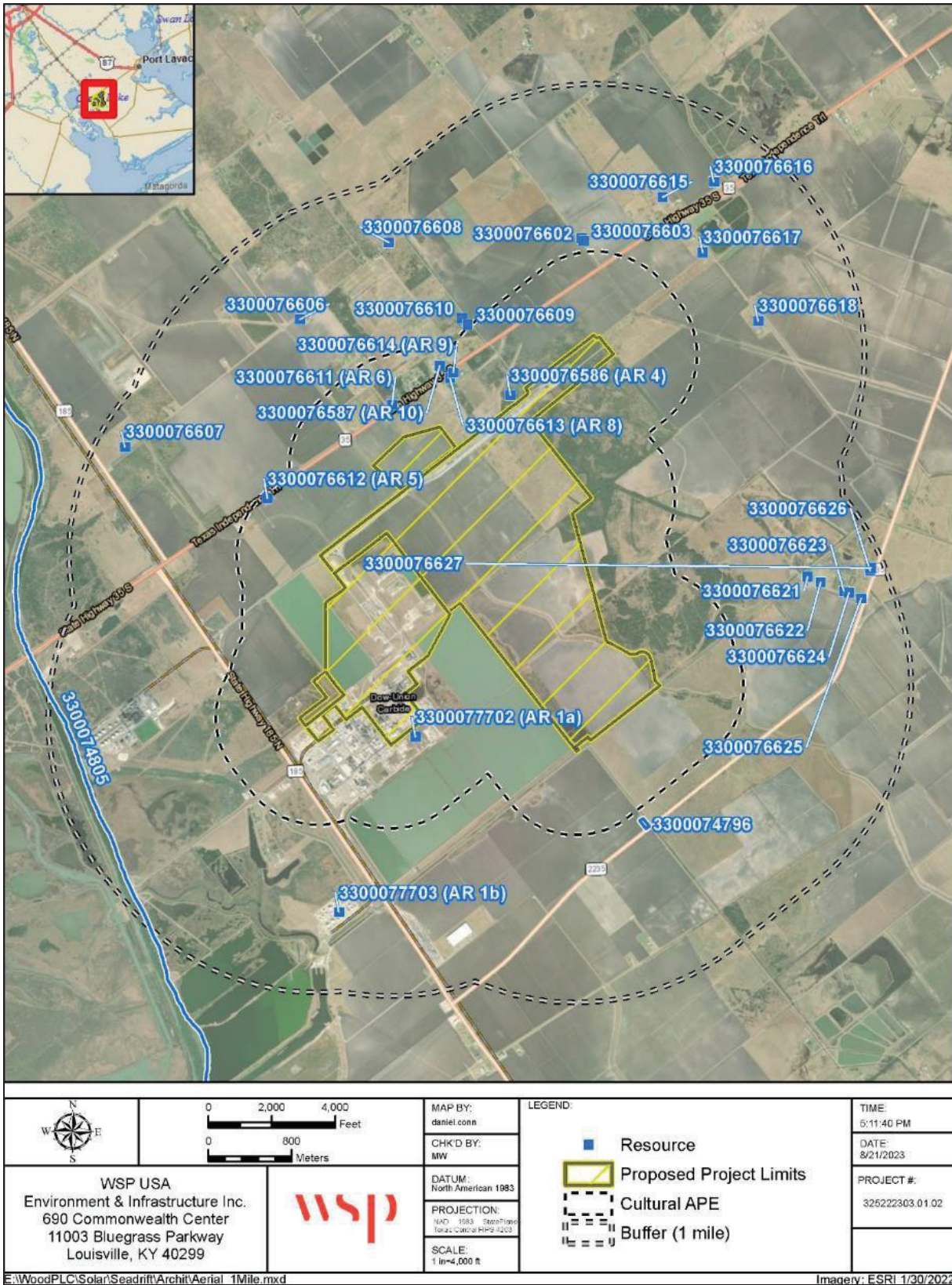


Figure 3.1. View of Previously Surveyed Resources within the APE and Surrounding 1-Mile Buffer.

3.2 Archival Research

In addition to the literature review, detailed archival research was also conducted. Archival research, which included local histories, Texas Historic Sites Atlas, historic maps, primary source collections, aerial photographs, and the Calhoun County Appraisal District (CAD) records, and other pertinent information, was conducted to identify specifications of existing buildings and to gain a better understanding of the history and development of the project area (**Table 3.3**).

Table 3.3. Archival Resources Researched for the Project

Resource	Date	Topographer/ Author	Information
Calhoun County Appraisal District (CAD) Property Search	2022	Calhoun County	Current Owners, Building Specifications and Materials, Property Valuation Appraisal (PVA), and Construction Dates
Texas Historic Sites Atlas	2020	Texas Historical Commission	Previously identified historic sites, Texas Historic Markers, and historic cemeteries
The Portal to Texas History	2023	University of North Texas	Primary source materials including maps, photographs, articles, etc. from or about Texas
Calhoun County Museum	2023	Calhoun County Historical Commission	Artifacts relating to the history, natural history, and maritime history of Calhoun County
Calhoun County Cadastral map (1:80,000)	1911	Unknown	Development of the local area
USGS 15-minute Topographic Maps	1953	U.S. Geological Survey	Development of the local area and location of buildings
USGS 15-minute Topographic Maps	1973	U.S. Geological Survey	Development of the local area and location of buildings
USGS Historic Single Frame Aerial Imagery	1981	U.S. Geological Survey	Development of the local area and location of buildings

4.0 NRHP CRITERIA AND METHODS

WSP staff utilized NRHP Bulletin #15, *How to Apply the National Register Criteria for Evaluation* (United States Department of the Interior 2002), to assess the buildings over 50 years of age for NRHP eligibility. Moreover, the methodology for the architectural field survey follows the standards established by THC. Fieldwork entails inspection and documentation of buildings, cemeteries, or structures over 50 years of age within the architectural survey areas. Fieldwork includes written and photographic documentation of resources with digital photographs, for the purposes of determining the architectural and historic details of each structure or building.

During the fieldwork, WSP staff attempted to contact every homeowner while on site, by knocking on doors; however, surveys are typically conducted during regular business hours, when most property owners are at work. While each resource was individually photographed, if consent to photograph all elevations of the house could not be fully obtained, that resource could not be fully documented due to trespassing concerns. In these instances, photographs were taken from publicly accessible points, such as roads and sidewalks, to ensure that the surveyor was not trespassing on private property. This limited what portions of some of the resources were accessible for documentation during the fieldwork.

4.1 NRHP Criteria for Eligibility

According to 36 CFR 60.4 (CFR 2004; United States Department of the Interior 2002), cultural resources eligible for listing in the NRHP are defined as buildings, structures, objects, sites, and districts that have “integrity,” and that meet one or more of the criteria. The evaluation criteria for extant structures and buildings, as detailed in National Register Bulletin #15, are as follows:

- Criterion A (Event): Association with one or more events that have made a significant contribution to the broad patterns of national, state, or local history.
- Criterion B (Person): Association with the lives of persons significant in the past.
- Criterion C (Design/Construction): Embodiment of distinctive characteristics of a type, period, or method of construction; or representation of the work of a master; or possession of high artistic values; or representation of a significant and distinguishable entity whose components may lack individual distinction.
- Criterion D (Information Potential): Properties that yield, or are likely to yield, information important in prehistory or history. Criterion D is most often (but not exclusively) associated with archaeological resources. To be considered eligible under Criterion D, sites must be associated with specific or general patterns in the development of the region. Therefore, sites become significant when they are seen within the larger framework of local or regional development. This criterion is typically used to assess the significance of archaeological sites.

4.2 NRHP Criteria for Integrity

In addition to identifying if a structure or archaeological site is potentially eligible for NRHP listing according to these four criteria, a structure or property’s integrity must be identified. As stated in the National Register Bulletin #15 *How to Apply the National Register Criteria for Evaluation*, “Integrity is the ability of a property to convey significance” (United States Department of the Interior 2002). Integrity of a building must be judged in accordance with the three criteria, and while it is “. . . sometimes a subjective judgment, . . . it must always be grounded in an

understanding of a property's physical features and how they relate to its significance" (United States Department of the Interior 2002). There are seven aspects of integrity as identified by NPS:

- **Location:** Location is the physical setting where a building was built, or a historic event occurred. It is important in understanding the how and why of a building or property and in helping recapture the historic event. If a property is moved, it can affect the historic associations of the building.
- **Design:** Design is the form, plan, space, structure, and style of a property. It results from the decisions made during the original conception of the property or during its alteration. Design applies to function and technology as much as it applies to aesthetics. It includes the decisions that made the plan of the property, including use of space, fenestration (windows), ornamentation, and layout.
- **Setting:** Setting should not be mistaken with location. It is the physical environment of the property and involves how the character of the property was created. It includes the actual physical setting of the property - topographic features, vegetation, and manmade features. The relationship between the property and these features defines setting.
- **Materials:** Materials are the physical elements used or deposited during a specific period of time and in a particular pattern to create the building or property. Materials not only show the preference of the person who created the building but can also indicate what materials were available or popular at the time of construction or alteration. If a building has been altered, the original materials as identified within the building's period of significance, must have been saved. Materials must be original, not recreations.
- **Workmanship:** Workmanship is the evidence of the technology of a particular culture or a group of people during a particular period of time as deemed significant. It provides evidence on the craftsmanship of the age, the aesthetic styling, and the methodology of design. Workmanship in historic buildings includes carving, painting, joinery, tooling, and graining.
- **Feeling:** Feeling is defined in the bulletin as "a property's expression of the aesthetic or historic sense of a particular period of time" (United States Department of the Interior 2002). It conveys the property's historic significance through the presence of physical features.
- **Association:** Association is the direct association between a historic event or person with the building or property. To have integrity of association, the building must retain its original location and the presence of physical features that convey the historic significance of the property.

To properly assess integrity, a series of steps must be followed. First, the physical features must be defined and determined if visible enough to convey historic significance. Second, it must be determined if the property is the lone example of its kind, or if it needs to be compared with other, similar properties. Finally, the aspects of integrity must be identified and established as essential to the historic significance of a property.

5.0 HISTORIC CONTEXT

5.1 History of Calhoun County, Texas

Located along the coast of the Gulf of Mexico, Calhoun County encompasses 540 square miles including over 560 linear miles of coastline (Calhoun County 2023). This coastal position has historically presented residents with both prosperity and adversity. Perhaps the most significant events in shaping the character of Calhoun County's buildings, structures, and objects have been devastating weather events that periodically stripped the county of precedent elements of the built environment (Hinder, Rinaldi-Williams, et al. 2023; **Figure 5.1**). On April 4, 1846, Calhoun County was formed from parts of Victoria, Jackson, and Matagorda counties and named for John C. Calhoun of South Carolina, who had advocated for Texas statehood amid the annexation of the Republic of Texas. Port Lavaca (population, 12,281) is the seat of government and the county's largest town (Kleiner 2020).

Evidence such as stone tools and projectile points, shelter sites, and shell middens reflect the early presence of indigenous communities in the land that comprises Calhoun County. Karankawa tribes and subgroups such as the Tonkawa populated the shoreline and inland across the Coastal Plain until the mid-19th century, when permanent European settlements began to take root. Although there is evidence of early 16th century documentation of the area by the Spanish, exploration of the area that would become Calhoun County is widely attributed to the 1685 expedition of Frenchman Robert Cavalier de La Salle. La Salle is believed to have landed near Powderhorn Lake. A monument was erected by the Texas Centennial Commission in 1936 to mark the site (Kleiner 2020).

The colony established by La Salle at Fort St. Louis failed, and settlement of the area did not begin in earnest until the 1820-1830s, when European settlers established the first towns in the area, including Port Lavaca, Linnville, Cox's Point, and Indianola. Early tribulations for these communities included disease, conflict with indigenous populations, and weather events. A serious conflict with Comanche tribes in 1840 at Linnville led to the collapse of the earliest Anglo settlement and is often credited as the inciting incident for the growth of the nearby Lavaca settlement (Kleiner 2020; Travel South Texas 2023). A settlement of 100 German families brought to the land of Calhoun County by Prince Carl of Solms-Braunfels in 1844 became known as Indianola and quickly became a major seaport. By 1846 it had become the county seat, defeating nearby Port Lavaca for the title after the annexation of the Republic of Texas, until it was destroyed by a hurricane in 1875. Alongside these settlers, native Tejanos, a mixture of European communities, and Black and White migrants from the southern United States developed robust networks of trade and commerce rooted in industries such as cattle ranching, shipping, plantation agriculture, and manufacturing (Kleiner 2020).

Railroad expansion weaved through Calhoun County in the antebellum period, and centralized population and commerce at Indianola, which replaced Lavaca as the county seat in 1852. Both Lavaca and Indianola remained important trade centers until 1861, but a series of epidemics, natural disasters, and drops in population at Indianola resulted in reinstating the renamed "Port Lavaca" as county seat in 1887. The network of rail and shipping lines which incited Union troops to blockade and occupy the valuable port cities of Calhoun County continued to proliferate following the Civil War. The Morgan Lines, San Antonio and Mexican Gulf, and Indianola Railways were completed by 1872 and incorporated into the Southern Pacific Railroad by the onset of the following century (Kleiner 2020; Travel South Texas 2023).

At the turn of the 20th century, investments by land companies stimulated agricultural production, especially of cotton. Over the course of this transition, improved technology and farming techniques spurred the construction of agricultural processing complexes by cotton and grain farmers. Many local ranching operations turned to cotton as the cattle industry began to shrink, and the resultant complexes typically featured a gin house, trash burners and hoppers, and storage buildings. Cotton gins and gin complexes at Port Lavaca were founded as early as 1902 and include the Farmer's Ginning Company, Planter's Gin, Citizen's Light & Water Company Gin, Blue Gin, and Farmer's Gin. In the rural areas surrounding the shipping center, complexes included the 1913 Long Mott Gin and the 1934 Moreman Gin, the latter of which is located within the project APE. To preserve functionality, the few extant complexes in the region have undergone alterations and new construction (Calhoun County Historical Commission 2023; Hinder, Rinaldi-Williams, et al. 2023).

New developments such as Port O'Connor and Olivia served to establish communities of Irish, Scottish, German, and Czech immigrants. The county population increased gradually and reached 4,325 inhabitants by 1920 including 584 Black residents. A decade later, approximately a quarter of the county residents were described as "Mexican." Transportation continued to improve with the construction of the St. Louis, Brownsville, and Mexico Railway, which terminated at Port O'Connor. The growth of railway trade reduced the prominence of former shipping centers such as Port Lavaca, which was reduced to a small fishing town which maintaining its status as county seat (Kleiner 2020; Travel South Texas 2023; Hinder, Rinaldi-Williams, et al. 2023).

The World War and Cold War periods brought improvements to the county economy, but growth was punctuated by the Great Depression and natural disasters. However, construction of the Lavaca Bay causeway in 1931, discoveries of natural gas and oil in 1934- 1935, and the opening of several petrochemical plants (Alcoa, Union Carbide Company, etc.) encouraged steady population growth after the 1950s. Other major industries during the late 20th century included shipping, cold storage, and fishing and shrimping. By 1958 eleven manufacturers and seventy-seven mineral-related enterprises operated out of Calhoun County. Agricultural production at the end of the 20th century included cattle, sorghum, rice, corn, pecans, and soybeans but, along with the ranching industry, contended with inefficient irrigation, soil compaction, poor drainage, and shoreline erosion. Other important industries included oil and gas extraction, fish packaging, heavy construction, and industrial chemical production, tourism, and recreation (Klein 2020; Hinder, Rinaldi-Williams, et al. 2023).

Today, Calhoun County draws tourists to the area with its popular costal destinations including Port Lavaca, Port O'Connor, and Seadrift which are among the oldest settlements in the county. Matagorda Island sits along the coast, apart from the inland section of the county and serves as a National Wildlife Refuge and State Natural Area. It is home to 19 state or federally listed threatened or endangered species, a large herd of white-tailed deer, alligators, and other wildlife, demonstrating the important role of conservationist land use in Calhoun County (Travel South Texas 2023). In 2020 the census counted 20,106 people living in Calhoun County, a 2 percent drop from the 2010 population. Estimates for 2022 suggest further population decline in the early decades of the 21st century. Approximately 50.5% of residents were Hispanic, with White (40.8%), Asian (5.2%), Black (3.2%), and mixed ancestry and indigenous (2.6%) residents comprising the remainder of the population (United States Census Bureau 2023). Aluminum manufacturing, plastics, and other manufacturing concerns were key elements of the county's economy. Cotton, cattle, corn, and grain sorghum are the chief agricultural products (Klein 2020).



Figure 5.1. View of Damage in the Aftermath of a Hurricane in 1942 (Calhoun County Historical Commission).

5.2 Port Lavaca, Texas

Calhoun County's communities vary in scale but follow common patterns of development characteristic of Texan towns. Small communities like Green Lake and Long Mott, located just outside of the APE, emerged from the 1850s through the 1890s as a result of migrant and immigrant families seeking land and opportunity. Aside from this formative pattern, these and larger communities like Port Lavaca have common attributes. People met at centralized nodes to trade goods or participate in institutional or social activities with most communities revolving around a school or church, during the earliest periods of settlement. Growing communities would then institute additional services and diversify property types which included retail stores, cotton gins, religious buildings and cemeteries, and post offices. Coastal communities ballooned rapidly in Calhoun County as they seized commercial opportunity and economic security offered by access to water-related transportation. These communities subsequently diversified further, developing additional commercial and community properties, such as offices, a variety of retail stores, hospitals, theaters, and libraries (Ficklen Maywald 2020; Hinder, Rinaldi-Williams, et al. 2023).

The town of Lavaca (later, Port Lavaca) originated in large part due to the flight of settlers from nearby Linnville, which burned in 1840 during a significant attack by Comanche warriors. Port Lavaca serves as the county seat and throughout the nineteenth century the community operated as a major shipping hub, despite economic blows meted out during the Civil War and regular hurricane damage (**Figure 5.2**). The town was laid out by 1845 and rose as the county's economic center over the 19th and 20th century, supported by its beef-shipping, seafood, shipbuilding, and dredging industries. With the establishment of Calhoun County in 1846, Lavaca received a post office, became the county seat, and supported many newspapers, shipping activities, and a district school. During the Civil War, Lavaca's importance as a port city resulted in its occupation by Union troops and it became a center of military activity. After the federal occupation and associated wartime damage, railroad companies resurged across the nation and, the San Antonio and Mexican Gulf Railway connection between Lavaca and Victoria was restored in 1887. Around this time, Lavaca became known as Port Lavaca, or "cow port" which nods both to the importance of the shipping and ranching industries in the community.

Port Lavaca was incorporated in 1909, and the turn of the 20th century brought major infrastructure improvements and economic troubles. After going bankrupt in 1916 and reincorporating in 1919, the dredging industry restored economic viability to the town's shipping channel, a seawall was constructed to protect the area from further hurricane damage, improvements to roadways, and the construction of a causeway connected Port Lavaca and the nearby community of Point Comfort. The second half of the 20th century brought an influx of residents to the area, as discoveries of oil and natural gas drew gas and petrochemical companies into the area. Large facilities such as the Union Carbide Corporation (Dow), Du Pont and Alcoa plants currently dominate both the economy and much of the landscape (**Figure 5.3**). Additional industries that make up the economy of Port Lavaca today include agriculture and livestock, construction, mineral extraction, and tourism. Conservation also characterizes the landscape of modern Port Lavaca, as parks, wildlife reserves, and historic buildings and districts are identified, established, and maintained by local and state entities as well as Port Lavaca's community members (Ficklen Maywald 2020; Hinder, Rinaldi-Williams, et al. 2023).



Figure 5.2. Port Lavaca Main Street Theater Marquee and Welcome Sign.



Figure 5.3. View of Alcoa Plant beyond the Causeway between Port Lavaca and Point Comfort.

5.3 Union Carbide Company and Dow Seadrift Facility

The industrial character of Calhoun County's landscape has changed dramatically from the early industries of processing raw material for primarily local use. Beginning in the 20th century, industrial undertakings expanded to include municipal utilities, wholesale seafood, shipbuilding, and dredging. The discovery of oil and gas in fields near improved waterways attracted large corporations to the county in the mid-1930s. With this discovery, the petrochemical industry exploded in Calhoun County. By 1956, 22 small oil fields were in the area and by 1982 the county exported more than 850 thousand barrels of crude oil, over 310,000 barrels of condensates, and myriad manufactured petrochemical products and consumer goods out of plants such as the Union Carbide Corporation (UCC) Seadrift Facility. The UCC facility at Seadrift currently operates under the ownership of the Dow Chemical Company. Prior to becoming a subsidiary of Dow in 2001, UCC was the second largest company to take advantage of minerals in Calhoun County, after ALCOA (Hinder, Rinaldi-Williams, et al. 2023).

The UCC focuses on the manufacture of building-block chemicals such as ethylene and propylene, which are converted into widely used plastics resins, primarily polyethylene. It also produces ethylene oxide and ethylene glycol, solvents and intermediates, vinyl acetate monomer, water-soluble polymers, and polyolefin-based compounds. The Union Carbide and Carbon Corporation was formed in 1917 from the combination of four existing companies and in 1920, the company set up its chemicals division. The company continued to acquire related chemical producers, and the resultant need to restructure the UCC was addressed in 1950's with the establishment of the Metals Division a food casings business.

The company decided to change its name to the UCC in 1957, by that time having established about 400 plants in the United States and abroad. Rising demands for consumer products such as batteries and anti-freeze resulted in the creation of another division strictly for consumer products in 1959. From 1952 to 1954, the prominent construction firm Brown & Root out of Alabama built the UCC Seadrift plant near Green Lake in Port Lavaca, Texas (**Figure 5.4**). From 1956 through the 1970s, the plant was expanded upon to include a variety of processing units, utilities, and the world's largest styrene plant (Kleiner 2020). The UCC Seadrift facility played a significant role in the demographic and economic growth of the surrounding area during the latter half of the 20th century and continues to provide jobs for residents of many nearby communities.

Because of their later construction dates, the UCC/Dow Seadrift Facility and other complexes associated with petrochemical manufacturing have survived the effects of hurricanes (Hinder, Rinaldi-Williams, et al. 2023). Seadrift Dow is the 5th oldest UCC/Dow facility, the 3rd oldest of the gulf coast operations, the second largest Dow facility in Texas, and employs over 1,200 people (Dow 2023). Despite withstanding the hurricane damage that marked so much of the local built environment through history, an explosion and fire at the Seadrift campus occurred in 1991, destroying and damaging many of the structures surrounding the ethylene oxide process unit (Journal of Commerce 1991). This, along with continuous updates to the facility structures has affected the integrity of the few remaining structures associated with the original construction of the complex.

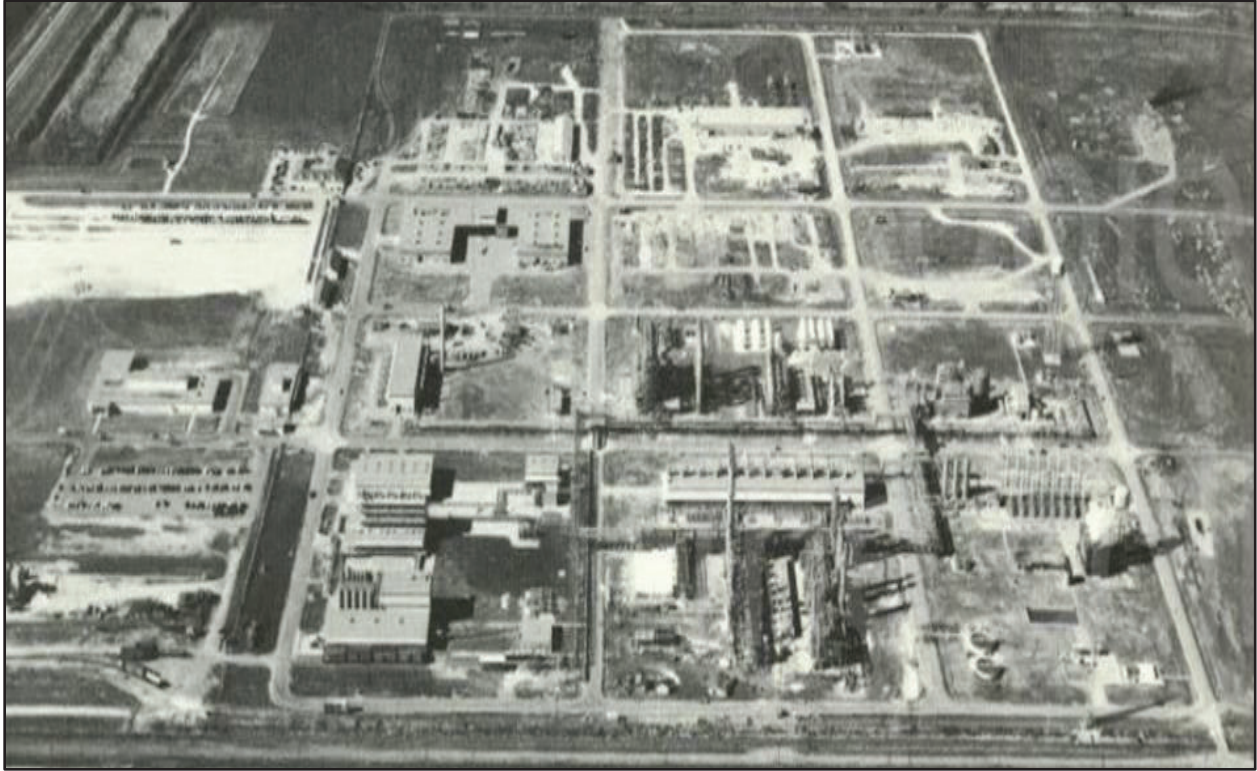


Figure 5.4. Union Carbide Seadrift Facility in 1954 (Hinder, Rinaldi-Williams, et al. 2023).

5.4 Regional Architecture

Within and surrounding the APE, national trends and major weather events dictated the development and preservation of regional architecture. Within the APE, structures and buildings are characteristic of post-war and modern construction, with all constructed during the period between c. 1950 and 1973. Hurricane Carla punctuated this era of architectural development in 1961, causing significant damage to many buildings in the region and the subsequent redevelopment of the area. This redevelopment resulted in the primarily modern character of extant structures. The impact of natural disasters such as hurricanes, however, is not confined to the 20th century. Surviving structures from earlier period of development in Calhoun County are often rare and extensively damaged. Those that have been maintained, typically present with unsympathetic modifications or repairs. While generally following national trends, buildings in the rural parts of the county—such as the residential and non-residential buildings identified within the APE—are more often modest in character with little stylistic ornamentation (Hinder, Rinaldi-Williams, et al. 2023).

Permanent dwellings in Calhoun County were constructed with local materials and reflected individualized construction trends of their inhabitants prior to the construction of railroads. When railroads appeared locally, buildings, and their construction was based on availability of inexpensive materials imported from distant mills and factories (McAlester 2015, 135). This period is associated with the varieties of residential forms that are broadly described as National Folk houses and emerged in Calhoun County after 1861, with the arrival of the rail line connecting Port Lavaca to Victoria. This trend lasted in Calhoun County and other rural areas well into the 20th century, and can also be seen in more urban areas, such as Port Lavaca, due to the slow development of municipal infrastructure. Victorian-era houses, more complex buildings following the simplistic construction of National Folk buildings, were introduced to rural areas such as the project APE through the publication and dissemination of pattern books. Of these several architectural styles associated with this period, Queen Anne and Folk Victorian structures are the most common extant examples in Calhoun County, though none were identified within the APE. This period persisted into the 1910s, overlapping with the Eclectic era of residential architecture. Eclectic style construction occurred in the region between 1880 and 1940; residences were constructed in the style of historic domestic buildings in Europe. Though elements of this stylistic trend appear on vernacular buildings throughout the region, no extant examples of this architectural period have been identified in Calhoun County. Hinder, Rinaldi-Williams, et al. (2023) present a thorough description of the architectural trends in the county, as well as the challenges that have reduced the historic building stock in the area.

Modern architecture in the area is a combination of styles, with storm and flood prevention resulting in instances of brick or concrete-block construction lifted with pilings, piers, stilts, or concrete-masonry-unit blocks in low-land areas. Rural houses typically do not exhibit a clear style or historical form and often embody modest, one-story house forms lacking complexity and non-essential stylistic features (**Figure 5.5**). Minimal Traditional houses reflect the mid-20th century FHA principles of austere construction are common in Calhoun County. However, because of their simplicity and frequency in the landscape, individual Minimal Traditional-style residences are typically found ineligible for individual NRHP designation. Ranch style houses are also ubiquitous in Calhoun County. The Ranch style residence, promoted as modern on the inside and traditional on the outside, became the most common style across the nation in the 1950s and 1960s. Ranch-style houses date from about 1935 to 1975 and the ubiquity of these houses means that they are typically found ineligible for listing in the NRHP as individual resources. Variations of the Ranch include the Minimal Ranch or Transitional Ranch, which is exemplified by AR 6 (**Figure 5.6**). These buildings are small in scale; lack overhanging roof eaves and other elaborations; may have

a broader profile than Minimal Traditional residences; and may be devoid of character defining details including a picture window, horizontal-sash double-hung windows, eaves, brick skirting, or an attached garage (McAlester 2015, 602). Transitional Ranch houses rarely possess sufficient architectural distinction and are consequently found individually ineligible for listing in the NRHP in most cases.

Agricultural and industrial resources are often devoid of architectural influences. Most of these resources evolved to reflect new technology and practices and are restricted to necessary structural components and exterior materials. These utilitarian forms are often a reflection of the development of different building and structure types for storage needs, production, protection of interior equipment, and processing of material. However, in some instances, industrial and agricultural facilities embody architectural significance in the design of features such as barns, public spaces, processing plants, and office buildings (Dase 2003; Moorhead et al. 2012). These resources dominate much of the APE, the surrounding areas of Port Lavaca and Seadrift, and Calhoun County generally.



Figure 5.5. An Example of the Simple and Unornamented Character of Many Residences and Non-Residential Buildings (AR 9) in and around the APE.



Figure 5.6. An Example of a Transitional Ranch House (AR 6) within the APE.

6.0 SITE DESCRIPTION AND EVALUATION

The architectural survey area was developed in consultation with X-energy and THC and was based on a review of the density of the setting, the project's direct and visual effects upon historic resources, as well as an understanding of the specifications of the proposed undertaking. The architectural survey area consisted of 0.5-mile buffer radiating out from the proposed project limits to account for impacts to aboveground historic architectural resources that are adjacent to the project area, and included all buildings and structures located within any parcels the viewshed buffer encountered, regardless of distance (**Figure 6.1**).

A total of 10 resources over 50 years of age were identified within the architectural survey area and recorded during the survey: four residential buildings, two outbuildings, one utility site, two operating industrial or agricultural facilities, and one defunct agricultural facility (**Table 6.1**). Of these resources, seven were previously recorded. These seven resources were revisited, and the three additional resources were newly surveyed for this study. As part of the fieldwork, all resources were individually photographed. When permission was not granted to enter the property, photographs were taken from the publicly accessible points.

WSP staff assessed the buildings and structures individually, according to several overarching themes developed with three NRHP criteria, applicable specifically to architecture and defined by research used to develop the historic context. These themes included the development of the area (Criterion A), the association with early settlers in Calhoun County, Port Lavaca, Seadrift, and other nearby areas (Criterion B), and the evaluation of architecture within the region (Criterion C).

Of the 10 resources over 50 years of age surveyed, none were previously recommended eligible for listing in the NRHP. Two of these resources, AR 1 and AR 10, were closely examined under Criterion A for significance at a local level for association with early settlement in Calhoun County. Survey revealed that these two resources have undergone significant alterations, including the modification and replacement of the majority of historic-age industrial and agricultural elements and buildings, resulting in a substantial loss of integrity of design, materials, and workmanship. In summary, WSP recommends none of the 10 resources over 50 years of age surveyed for this project as eligible for listing in the NRHP due to lack of historic and architectural significance and/or loss of integrity. Based on these findings, WSP recommends that there would be **No Historic Properties Affected** by the proposed undertaking.

Table 6.1. Historic Resources in APE and NRHP Recommendations

Resource Number	Address	Style/Form	NRHP Recommendation	Determination of Effect
AR 1	7501 TX-185, Calhoun County, TX	Mid-20th Century Industrial Complex	Not eligible due to a loss of integrity.	No Historic Property Affected

Resource Number	Address	Style/Form	NRHP Recommendation	Determination of Effect
AR 2	NE of TX-185, Port Lavaca, TX	Industrial Ruins	Not eligible due to a lack of historic and architectural significance.	No Historic Property Affected
AR 3	NE of TX-185, Port Lavaca, TX	20th Century Utility Structures	Not eligible due to a lack of historic and architectural significance.	No Historic Property Affected
AR 4	Jesse Rigby Rd, Port Lavaca, TX	20th Century Agricultural Outbuildings	Not eligible due to a lack of historic and architectural significance.	No Historic Property Affected
AR 5	11525 TX-35, Port Lavaca, TX	Ranch	Not eligible due to a lack of historic and architectural significance.	No Historic Property Affected
AR 6	10622 TX-35, Port Lavaca, TX	Transitional Ranch	Not eligible due to a lack of historic and architectural significance.	No Historic Property Affected
AR 7	10548 TX-35, Port Lavaca, TX	20th Century Residential Outbuilding	Not eligible due to a lack of historic and architectural significance.	No Historic Property Affected
AR 8	10237 TX-35, Port Lavaca, TX	Ranch	Not eligible due to a lack of historic and architectural significance.	No Historic Property Affected
AR 9	10211 TX-35, Port Lavaca, TX	20th Century Vernacular	Not eligible due to a lack of historic and architectural significance.	No Historic Property Affected
AR 10	10254 TX-35, Port Lavaca, TX	Mid-20th Century Cotton Gin Facility	Not eligible due to a lack of integrity.	No Historic Property Affected

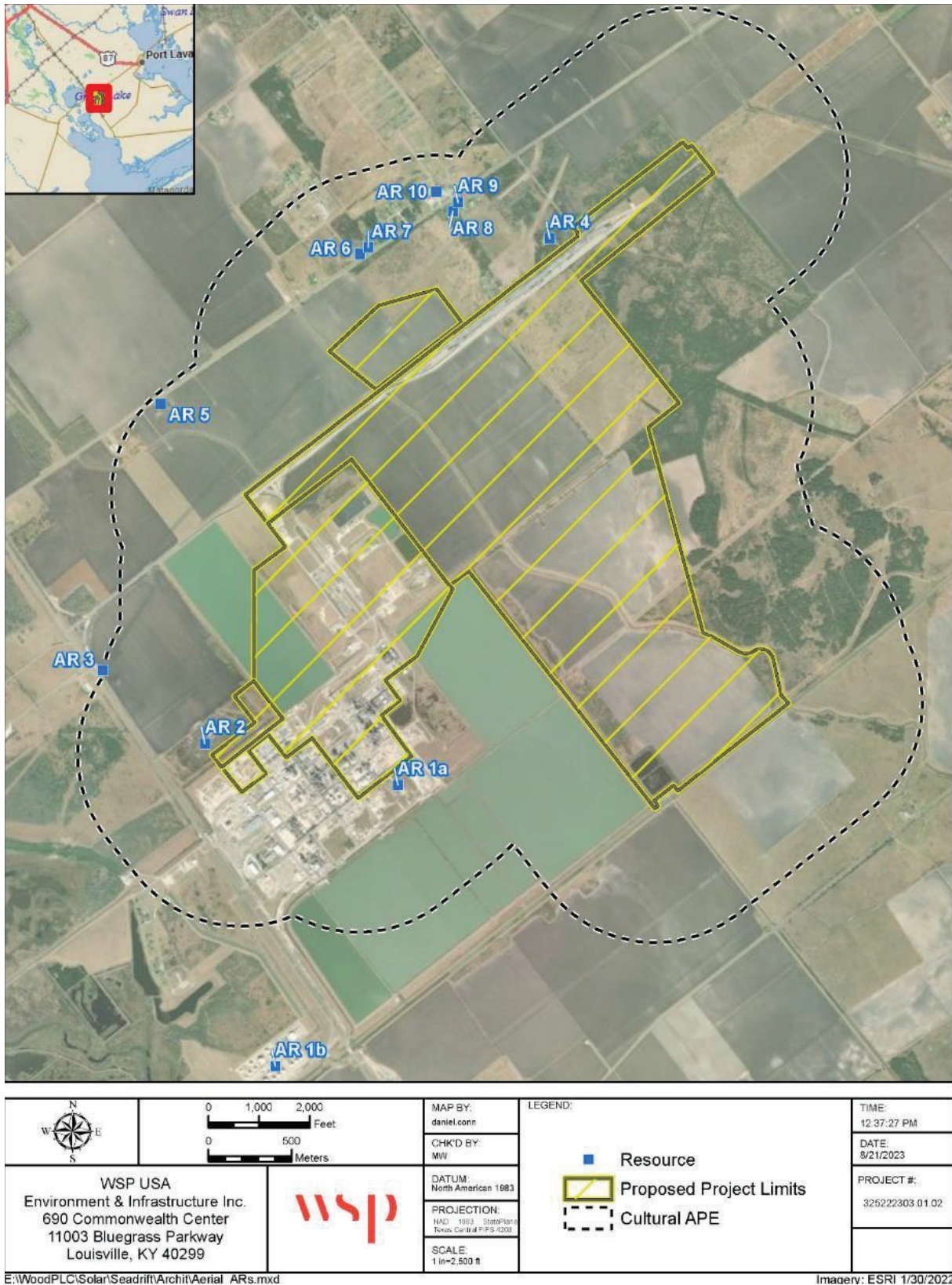


Figure 6.1. Aerial Showing the APE and the Documented Historic Resources.

THIS PAGE LEFT BLANK INTENTIONALLY

7.0 AR 1: 7501 TX-185 (DOW SEADRIFT FACILITY)

7.1 AR 1a

AR 1a is a southwest facing, 20th century industrial facility located at 7501 TX-185, Calhoun County, Texas (**Table 7.1**). The facility is bound on the southwest by TX-185 and by agricultural fields along all remaining elevations. The property sits on level ground which is primarily covered by concrete parking areas, walkways, and roadways. The building is accessed via a series of paved roads and gated entrances that extend from the nearby major roadways (**Figure 7.1**). Union Pacific Railroad (UPRR) and BNSF Railway lines extend northwest, southeast, and northeast from AR 1a. The facility is comprised of a variety of modern, modified, and historic age structures and buildings that serve the functions necessary to petrochemical plant operations.

According to the Calhoun County, TX PVA, AR 1a sits on a lot encompassing 998.63 acres of industrial-zoned land and is currently owned by the UCC, a subsidiary of the Dow Chemical Company (**Table 7.1**). The PVA records no construction date for the facility. AR 1a is illustrated in a 1954 aerial, the earliest image available (see **Figure 5.4**). The 1973 Green Lake topographic map shows a complex in the current location of AR 1a, which does not appear on the 1953 Green Lake topographic map (**Figure 7.2**). These maps, along with archival research indicate that the plant was constructed between 1952-1954 and subsequent expansions and modifications took place in the early 1960s, early 1970s, and early 1990s.

Table 7.1. Summary of AR 1a

Address	7501 TX-185 (28.507226, -96.775422)
County	Calhoun County
Date of Construction	1952-1954
Square Footage (Living Area)	NA
Acreage	998.63
Owner	Union Carbide Corporation (Dow)
Architectural Type	Mid-20 th Century Industrial Complex
Integrity	AR 1a is in good condition but has undergone significant modifications and additions.
NRHP Recommendation	AR 1a is recommended not eligible listing in the NRHP due to diminished integrity.

Building Description

AR 1a is a southwest facing, 20th century industrial facility. Located in the vicinities of Seadrift and Port Lavaca, the plant is comprised of a combination of modern and historic age structures which retain varying levels of integrity (**Figures 7.3-7.5**). The historic age buildings that comprise AR 1a are generally utilitarian in appearance with few or no stylistic elements. The buildings have generally continued to serve their functions, aside from Buildings 13 and 14, which are former administrative buildings currently slated for demolition through a separate project (**Table 7.2**). Though the plant technology and many of the supporting structures have changed over time, the general function and feeling of the Seadrift facility has remained consistent as a site of petrochemical processing and manufacturing. Observation was conducted from outside of the facility fence line to comply with Dow/ UCC safety protocols.

Table 7.2. Overview of AR 1a Historic Buildings

Internal Building No.	Current Function	Historic Function	Year Built	Year Modified
1	Administration	Administration	1953	NA
2	Laboratory	Laboratory	1953	NA
13	—	Administration	c.1960	NA
14	—	Administration	c. 1960	NA
140	Warehouse	Warehouse	1953	c.1991
380	Warehouse	Warehouse	1962-1963	NA

Building 1 is the most ornamented of the historic-age structures that comprise AR 1a and displays contemporary stylistic elements but is nonetheless consistent with the rest of the facility in its overall utilitarian design. The building is one-story, covered by a flat metal roof with wide eave overhangs, and has an L-shaped floor plan with a wing extending northwest from the main block. The southeast (main) elevation, from west to east, features the main entrance; a secondary entrance covered by a flat entryway roof; a row of four pairs of four-light, fixed, aluminum windows; a third entrance similar to the second, featuring a flat roof supported by two cylindrical metal supports and accessed via a low-pitch concrete ramp embedded with a metal handrail; a row of five pairs of four-light, fixed, aluminum windows; a fourth entryway of consistent character; and a fifth entryway featuring a set of double doors, each inset with a single light, which features a concrete ramp and metal handrail, but no entryway roof or supports. The main entrance is comprised of a set of metal double doors inset with two large panes which access a vestibule enclosed on the northeast and southwest sides by six fixed windows and covered by a flat, metal roof extending from the elevation below the principal roofline. The eaves of the roof overhang the enclosed vestibule which features a wide metal fascia (**Figure 7.6**). The southwest elevation features a row of sixteen wall openings—pairs of four-light, fixed, aluminum windows—followed by three wall openings of the same configuration to the north (**Figure 7.7**). The northwest elevation of the wing features one wall opening: a set of two abutted rectangular vents inset within an aluminum frame (**Figure 7.8**). The northwest and northeast elevations of the main portion of Building 1 were not visible from the facility fence line.

Building 2 is largely obscured from view by a non-historic, front-gable secondary roof structure. A partial view of the southeast (main) elevation reveals wide overhanging eaves; corrugated metal siding; a flat porch roof over the main entrance; and at least two additional wall openings to the west: a second entrance and a window of unknown sash operation. A partial view of the southwest elevation suggests there are additional entrances (**Figures 7.9-7.10**).

Buildings 13 and 14 are two-story, southwest-facing industrial buildings connected along their northwest (Building No. 13) and southeast (Building No. 14) sides via a two-story, enclosed walkway (**Figure 7.11-7.13**). The southwest elevations of both buildings feature linear wall openings extending from the roofline to grade. Building 13 features two columns of six fixed, aluminum windows on either side of a central window configuration: two columns of six fixed, aluminum windows on either side of a 12-light rectangular, fixed, aluminum window. Below the most central wall opening, a flat roof extends over the main entryway of the building. The entrance is comprised of a set of metal framed double doors inset with large lights. Building 14 features two columns of six fixed windows along the same elevation. A partial view of an addition along the northwest elevation of Building 14 reveals an unornamented entrance and a vent.

Building 140 is a one-story, southeast-facing industrial warehouse clad in non-historic corrugated metal siding that is covered by a low-pitched front-gable roof. A significant portion of Building 140

was destroyed during an on-site explosion in 1991 and consequently is not historic. However, the portion below the metal, gable roof was constructed as part of the original UCC facility. Along the southeast elevation, the historic portion of the building features two overhead garage doors. Along the southwest elevation, two additional overhead garages and a possible entrance are located beneath a flat, metal roof which extends from below the principal roofline and is supported by suspension cables (**Figure 7.14**).

Building 380 is a 1.5-story, northwest-facing industrial warehouse clad in non-historic corrugated metal siding covered by a flat roof and rests on a concrete foundation. The building measures approximately 12,860 square feet, and a second story of approximately 912 sq. ft. rises from the northwest corner of the roof. Along the northwest elevation of the first story, the building displays two entrances, accessed by metal staircases affixed with metal handrails, and two vents extending from the exterior wall, approximately halfway between the roofline and grade. Along the northeast elevation, no wall openings are visible, but modern aeriels suggest an outbuilding covered by a low-pitched, gable roof is located parallel to this elevation. The southeast elevation features four slatted, square vents. The southwest elevation features three overhead garages and an entrance accessed via metal stairs affixed with metal handrails. The second story features one entrance, accessed via a metal staircase along the northwest elevation and a rolling metal garage door along the southwest elevation (**Figures 7.15-7.16**). Archival research indicates that building 380 was constructed as part of the facility expansions in the early 1960s. Documentation of this building was provided by Dow personnel, as it is not visible from the fence line along any elevation of the facility.

Current Condition

AR 1a is in good condition but has undergone significant alterations, including the modification and replacement of many industrial elements and buildings, leaving little original material remaining. Still, the historic-age structures identified in this survey retain overall integrity of location, setting, feeling, and association.

7.2 AR 1b

AR 1b consists of 21 industrial aboveground storage tanks located at 7501 TX-185, Port Lavaca, Calhoun County, Texas (**Table 7.3**). The structures are bound on the north by an open field, on the east by TX-185, on the west by a port along the Victoria Barge Canal, and on the south by agricultural fields. The property sits on level ground covered in a well-maintained lawn and accessed via a gated entry and gravel road that extends from TX-185 along the south boundary of the property. A railroad line also cuts through the property, parallel to the entryway (**Figure 7.17**).

According to the Calhoun County, TX PVA, AR 1b is currently owned by Union Carbide Corporation, a subsidiary of the Dow Chemical Company (**Table 7.3**). The PVA records have no construction date for the structures but indicate that AR 1b sits on a parcel encompassing 256.24 acres, 56.24 of which is industrial acreage. Eight elements of AR 1b are depicted as early as 1956 on historical aerial images, the earliest image available (**Figure 7.18**). All extant elements of AR 1b are seen in the 1981 aerial image. The 1976 Austwell topographic map shows a group of structures in the location of AR 1b, and the 1963 Austwell topographic map, the next earliest available, does not depict the resource (**Figure 7.19**). These maps, along with archival research indicate that AR 1b was built in two phases: the first occurred in 1954 as part of the original construction of the nearby Union Carbide facility (AR 1a) and the second occurred between 1963

and 1973, when the remainder of the extant storage tanks were constructed to expand the resource.

Table 7.3. Summary of AR 1b

Address	7501 TX-185 (28.4954959, -96.7763641)
County	Calhoun County
Date of Construction	1954; 1963-1973
Square Footage (Living Area)	NA
Acreage	56.24
Owner	Union Carbide Corporation (Dow)
Architectural Type	Mid-20th Century Industrial Complex
Integrity	AR 1b is in fair condition but displays some signs of weathering and deterioration.
NRHP Recommendation	AR 1b is recommended not eligible for listing in the NRHP due to diminished integrity.

Building Description

AR 1b consists of 21 industrial aboveground storage tanks which are part of a larger 20th century Industrial facility (**Figures 7.20-7.22**). Located on the southwest side of TX-185, the structures are cylindrical in shape and vary in circumference from approximately 100 ft to 450 ft. Each tank is painted or finished with a white coating and are organized in a rough grid. The fencing around the resource obscures the view of AR 1b from the public right of way, but partial views of the resource and modern aerial imagery indicate that at least four of the earliest built tanks display slight to moderate surface rust (see **Figure 7.22**). Above ground storage tanks of this variety are considered bulk storage containers and are often used to store oil and oil products before and during the use or distribution of these chemicals. This type of storage is common to petrochemical facilities, and necessary for production and distribution operations.

Current Condition

AR 1b is in fair condition, but displays some signs of deterioration, including rust and superficial damage.

7.3 AR 1 NRHP Recommendation

AR 1, including AR 1a and AR 1b, was evaluated for National Register eligibility using the three NRHP criteria identified in this research. AR 1 was closely considered for eligibility for listing in the NRHP at the local level under Criterion A based on its effect on the development and history of the local regional area and its association with the UCC and the local petrochemical industry. UCC opened the Seadrift facility in 1954 and was a major employer in the area, generating development at Port Lavaca, Seadrift, and other nearby communities in the late 20th century. UCC currently operates at the plant as a subsidiary of the Dow Chemical Company, and the facility continues to provide economic and industrial opportunities to local populations as the second largest Dow facility in Texas. But while AR 1 retains integrity of location, setting, feeling, and association, it severely lacks integrity of design, materials, and workmanship. The overall footprint of the facility is in the same location as it was originally, but it has expanded and been altered over many iterations of redesign. Only six of the approximately 50 existing buildings on the facility are of historic age, and of those, one was significantly altered c. 1991 and two will be

demolished through a separate project. Several storage tanks within the footprint of AR 1b are of historic age but their significance is dependent upon that of AR 1a.

Under Criterion B, the resource lacks significance, as it cannot be linked to anyone of historic relevance in the region, state, or nation. Under Criterion C, the resource is not eligible due to a lack of architectural significance and material integrity. AR 1 consists of elements from the original construction of the plant, as well as subsequent expansions in the late 20th century. Construction methods, materials, and details of AR 1 are not unique architectural elements that would constitute a distinguished example of a Mid-20th Century Industrial complex, and the existing structures have been altered to an extent that the resource lacks material integrity. Additionally, the buildings and other industrial elements do not represent the work of a master architect or builder.

In summary, AR 1 is recommended as not eligible for listing in the NRHP. No further work is recommended.

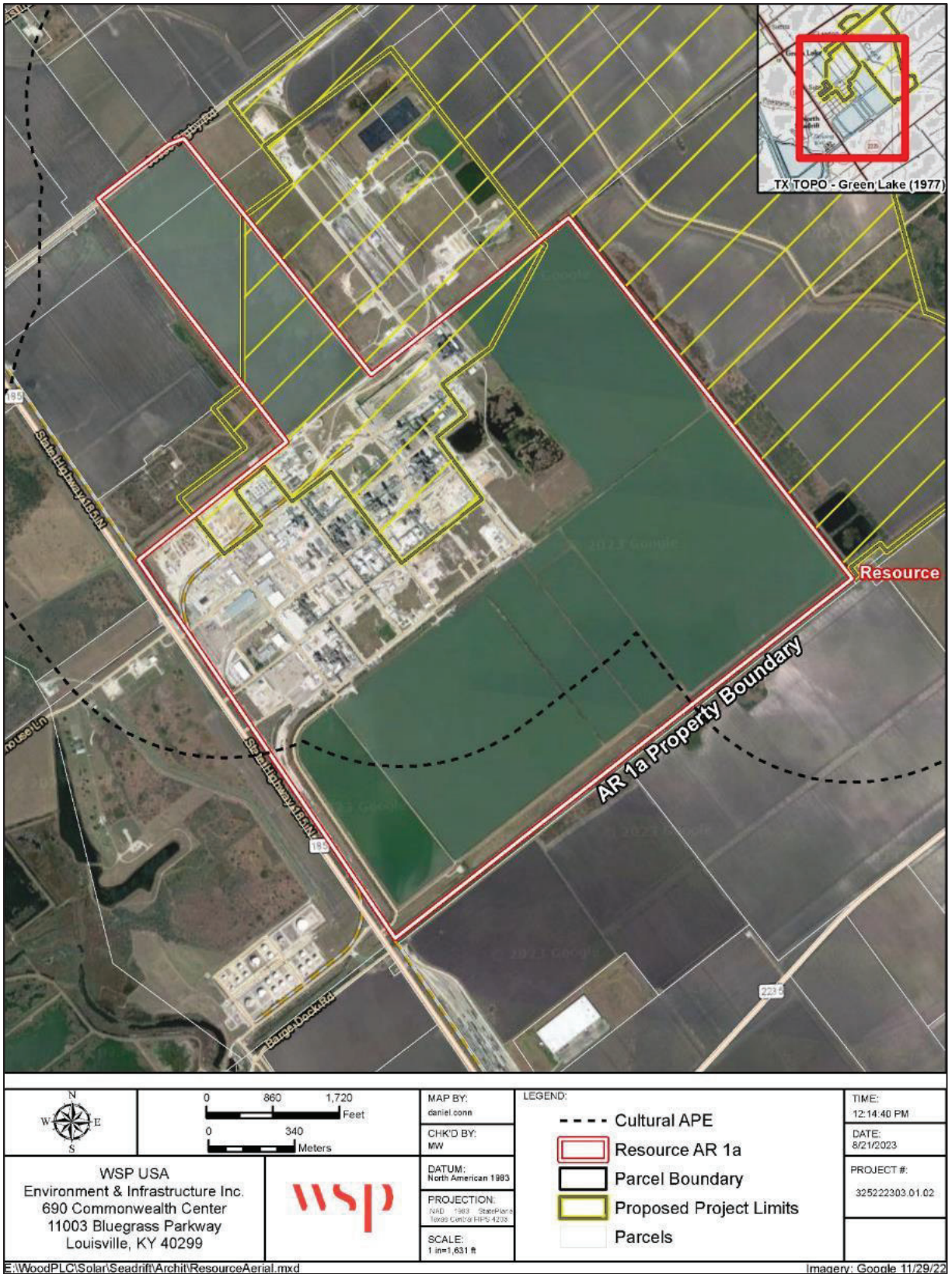


Figure 7.1. Aerial Image Showing the Location of AR 1a.

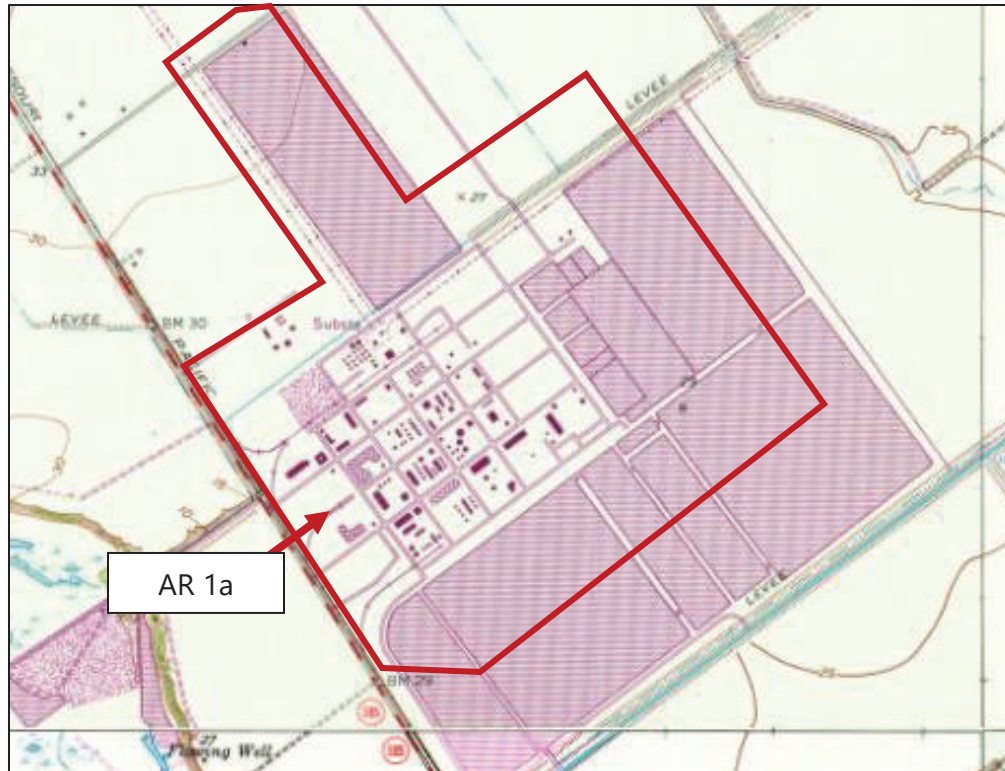


Figure 7.2. AR 1a Shown on the 1973 Green Lake Historic Topographic Map.



Figure 7.3. Overview of AR 1a, facing Southeast.



Figure 7.4. View of Signage Associated with AR 1a.



Figure 7.5. Oblique Aerial of AR 1a, facing North (The Center for Land Use Interpretation, 2009).



Figure 7.6. AR 1a, View of Southeast Elevation of Building 1, facing North.



Figure 7.7. AR 1a, View of Southwest Elevation of Building 1, facing Northeast.



Figure 7.8. AR 1a, View of Northwest Elevation of Building 1, facing Southeast.



Figure 7.9. AR 1a, View of Southeast Elevation of Building 2, facing Northeast.



Figure 7.10. AR 1a, Partial View of Southwest Elevation of Building 2, facing East.



Figure 7.11. AR 1a, View of Southwest Elevation of Buildings 13 & 14, facing East.



Figure 7.12. AR 1a, View of Southwest Elevation of Building 13, facing East.



Figure 7.13. AR 1a, View of Southwest and Northwest Elevations of Building 14, facing East.



Figure 7.14. AR 1a, Partial View of Southwest and Southeast Elevations of Building 140, facing Southeast.



Figure 7.15. AR 1a, View of Northwest and Southwest Elevations of Building 380, facing East.



Figure 7.16. AR 1a, Partial View of Northeast and Southeast Elevations of Building 140, facing West.



Figure 7.17. Aerial Image Showing the Location of AR 1b.



Figure 7.18. AR 1b Shown on the 1956 Historic Aerial Image.

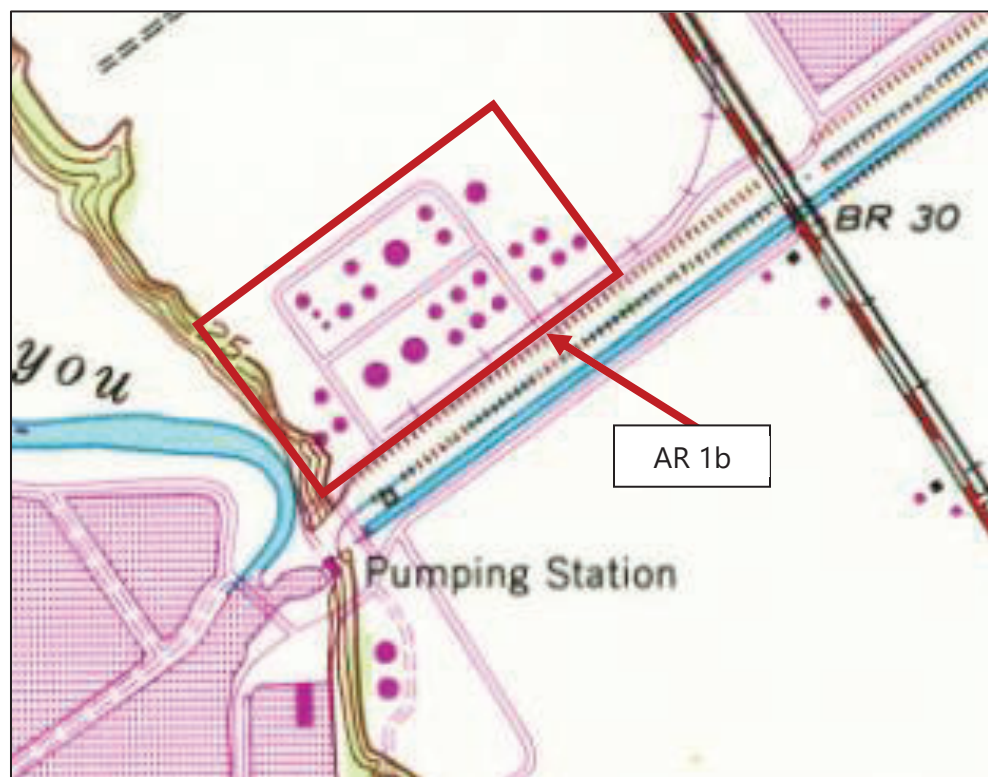


Figure 7.19. AR 1b Shown on the 1973 Austwell Historic Topographic Map.



Figure 7.20. The East Elevation of AR 1b, Facing Southwest.



Figure 7.21. The North and East Elevations of AR 1b, facing Southwest.



Figure 7.22. View of Rusting and Mixed Condition of AR 1b Elements, facing Northwest.

8.0 AR 2: NORTHEAST OF TX-185

AR 2 consists of remnants of an industrial facility located northeast of TX-185, Port Lavaca, Calhoun County, Texas (**Table 8.1; Figure 8.1**). The resource is bound on the southwest by TX-185, on the northeast and southwest by the Dow Seadrift facility, and on the northwest by fallow agricultural fields. The structures sit on level terrain covered by an unmaintained field and obscured from the public right of way by overgrown trees and foliage. A gravel road extends northeast along the northwest lot boundary from TX-185 and features a security gate approximately 250 ft from the highway. A UPRR line runs along the southwest boundary of the property from the neighboring Dow facility. The overall condition of the facility and lot suggest that the property is currently abandoned.

According to the Calhoun County, TX PVA, AR 2 is owned by ISP Technologies LLC, but the date of construction is not listed. The PVA lists GAF Chemicals Corporation as the owner of AR 2 prior to 1991, the corporate entity that is today ISP Technologies LLC, reflecting continued ownership. The structure first appears in publicly available aerial imagery in 1981, and in USGS topographic maps in 1973 for Green Lake, TX (**Figure 8.2**). These maps suggest the facility was built before 1973. Archival research indicates that ISP Technologies LLC adopted the “GAF Chemical Corporation” name in 1968, suggesting that AR 2 was constructed between 1968 and 1973 (GAF 2023). Historic aerial images also indicate that the plant was deconstructed to its foundations between 2004 and 2008, likely following significant changes in the company focus and shareholders during the 1990s (**Figure 8.3**).

Table 8.1. Summary of AR 2

Address	Northeast of TX- 185 (28.51382, -96.77892)
County	Calhoun County
Date of Construction	1968-1973
Square Footage (Living Area)	Approximately 2,300 sq. ft.
Acreage	42.0
Architectural Type	20 th Century Industrial Ruins
Owner	ISP Technologies LLC
Integrity	AR 2 is in poor condition and has been deconstructed to its foundations, which has significantly diminished integrity.
NRHP Recommendation	AR 2 is not eligible for the NRHP due to a lack of architectural significance and integrity.

Building Description

AR 2 consists of remnants of an industrial facility located northeast of TX-185. AR 2 consists of structure foundations, which can be seen in modern aeriels of the site, and one extant structure. The single remaining structure, seen from modern aerial images, features a gable roof inset with 10 openings, which may have contained glass lights in the past. The metal roof is highly corroded and extends over approximately 2,300 sq. ft. The remaining building appears to be a former storage structure, workshop, or machinery garage. Several gravel or asphalt roads are aligned in a roughly gridded pattern among the extant structure and remaining building foundations. The site is overgrown with vegetation and not visible from the public right-of-way, preventing further assessment of remaining and remnant features (**Figures 8.4-8.5**).

Current Condition

AR 2 is in poor condition and has been razed to structures' foundations, aside from one structure, resulting in diminished integrity.

NRHP Recommendation

AR 2 was evaluated for National Register eligibility using the three NRHP criteria identified in this research. AR 2 is recommended not eligible for listing on the NRHP due to a lack of architectural significance and material integrity. Although AR 2 is associated with the local petrochemical industry which generated development at Port Lavaca, Seadrift, and other nearby communities in the late 20th century, AR 2 no longer conveys this association. Hence, under Criterion A, AR 2 is recommended as not eligible. Under Criterion B, AR 2 is recommended as not eligible because no links were found between the building and person or persons with cultural or historic significance. Under Criterion C, the resource is recommended as not eligible because it has no elements that make it a unique example of twentieth century industrial architecture. Therefore, the resource is recommended as not eligible for listing in the NRHP. No further work is recommended.

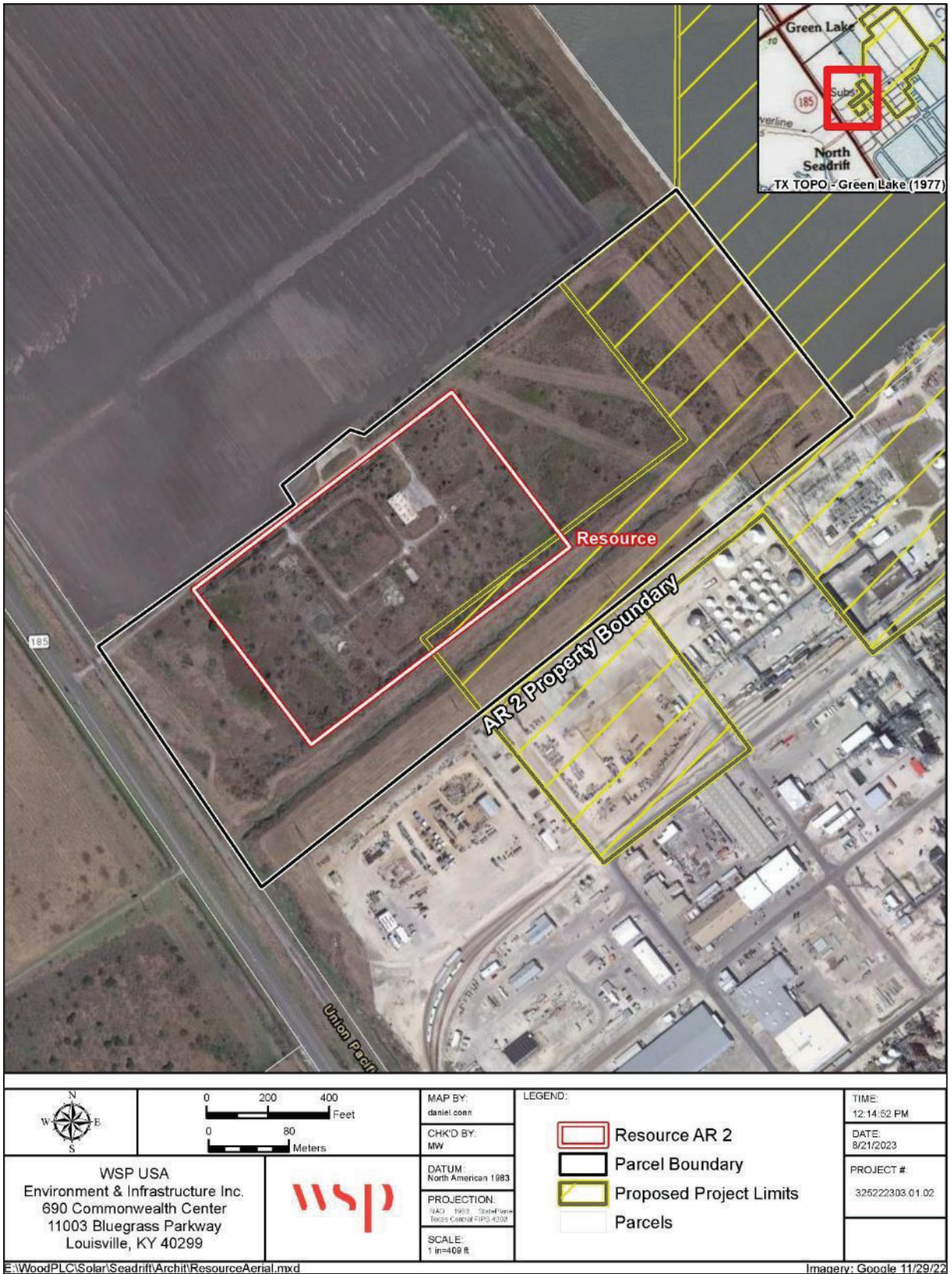


Figure 8.1. Aerial Image Showing the Location of AR 2.

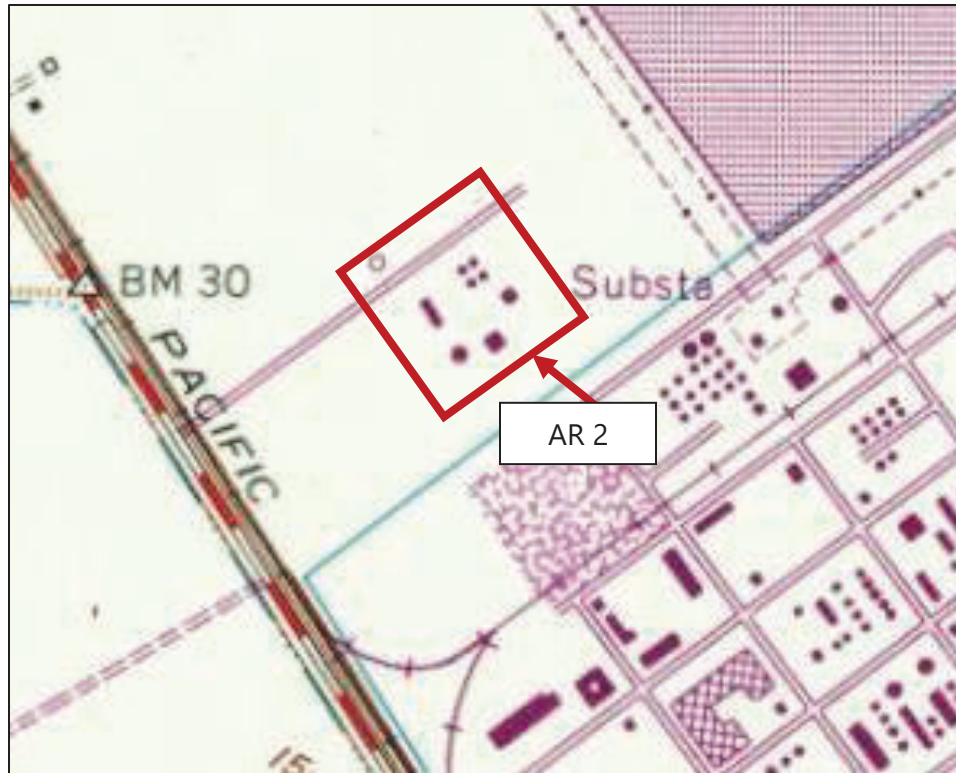


Figure 8.2. Location of AR 2 on the 1973 Green Lake USGS Topographic Map.



Figure 8.3. View of AR 2 Prior to Deconstruction on the 1983 Historic Aerial Image.



Figure 8.4. View of Vegetation Obscuring AR 2, facing Northeast.



Figure 8.5. View of No Trespassing Sign at Gravel Road Leading to AR 2.

THIS PAGE LEFT BLANK INTENTIONALLY

9.0 AR 3: NORTHEAST OF TX- 185

AR 3 consists of two utility structures located northeast of TX- 185, Port Lavaca, Calhoun County, Texas (**Table 9.1; Figure 9.1**). The property is bound on the southwest by TX-185 and a Union Pacific Railroad (UPRR) line, and on all remaining elevations by agricultural fields. The two structures sit on a leveled area of approximately 0.17 acres that is surfaced with gravel; the graveled area is part of a parcel totaling 126 acres of agricultural land. AR 3 is accessed via a gravel turnoff that extends northeast from TX-185 across the railroad lines and terminates at the southwestern extent of the graveled area. Several other utility-related elements surround the structures, including piping, signage, and a power supply line. Signs posted in the surrounding area indicate that flammable materials at AR 3 should be treated with caution.

According to the Calhoun County, TX PVA, AR 3 is currently owned by ISP Technologies LLC. The PVA lists GAF Chemicals Corporation as the owner of AR 3 prior to 1991, the corporate entity that is today ISP Technologies LLC, reflecting continued ownership. The structure first appears in publicly available aerial imagery in 1981 but does not appear on topographic maps (**Figure 9.2**). The aerial image suggests the facility was built before 1981. Archival research indicates that ISP Technologies LLC adopted the “GAF Chemical Corporation” name in 1968, suggesting that AR 3 was constructed between 1968 and 1973 as part of the nearby GAF Facility (GAF 2023; see Chapter 8).

Table 9.1 Summary of AR 3

Address	Northeast of TX- 185 (28.51760, -96.78507)
County	Calhoun County
Date of Construction	1968-1973
Square Footage (Living Area)	NA
Acreage	Approximately 126.0
Owner	ISP Technologies LLC
Architectural Type	20 th Century Utilities
Integrity	AR 3 is in fair condition, but shows signs of disuse and neglect, such as rust and surface damage.
NRHP Recommendation	AR 3 is not eligible for the NRHP due to lack of architectural significance and integrity.

Building Description

AR 3 consists of two utility structures: a storage structure clad in corrugated metal siding and covered by a front gable roof, and a control or maintenance structure covered by a flat roof and clad in metal sheet siding (**Figure 9.3**). The storage building is located near the southwest corner of the gravel area and the second structure sits at the northwest extent of the gravel area. Both structures rest on concrete slab foundations and display signs of neglect and disuse. The storage shed features an entryway along its southwest (front) elevation and a small rectangular vent along the foundation line of the northwest elevation (**Figure 9.4**). The second structure features a whirlybird roof vent extending centrally from the roof; an entryway featuring a solid metal door with a padlock latch along the south (main) elevation; and a metal, double-hung window along with a rectangular vent along the foundation line located along the west elevation (**Figures 9.5 and 9.6**). The roof features aluminum box-style gutters and a radio receiver and antenna are

attached to the east elevation of the building. Additional elevations of either structure were not visible from the public right of way.

Current Condition

AR 3 is in fair condition but shows signs of disuse and neglect, such as rust and surface damage. Additionally, the storage structure appears to be missing a door and the site appears to be unmaintained overall.

NRHP Recommendation

AR 3 was evaluated for National Register eligibility using the three NRHP criteria identified in this research. AR 3 is recommended not eligible for the National Register due to a lack of architectural significance. Although AR 3 is associated with the local petrochemical industry which generated development at Port Lavaca, Seadrift, and other nearby communities in the late 20th century, AR 3 does not individually convey this association. Hence, under Criterion A, AR 3 is recommended as not eligible. Under Criterion B, AR 3 is recommended as not eligible because no links were found between the building and person or persons with cultural or historic significance. Under Criterion C, the resource is recommended as not eligible because it has no elements that make it a unique example of its architectural style or form. Therefore, the resource is recommended as not eligible for listing in the NRHP. No further work is recommended.



Figure 9.1. Aerial Image Showing the Location of AR 3.

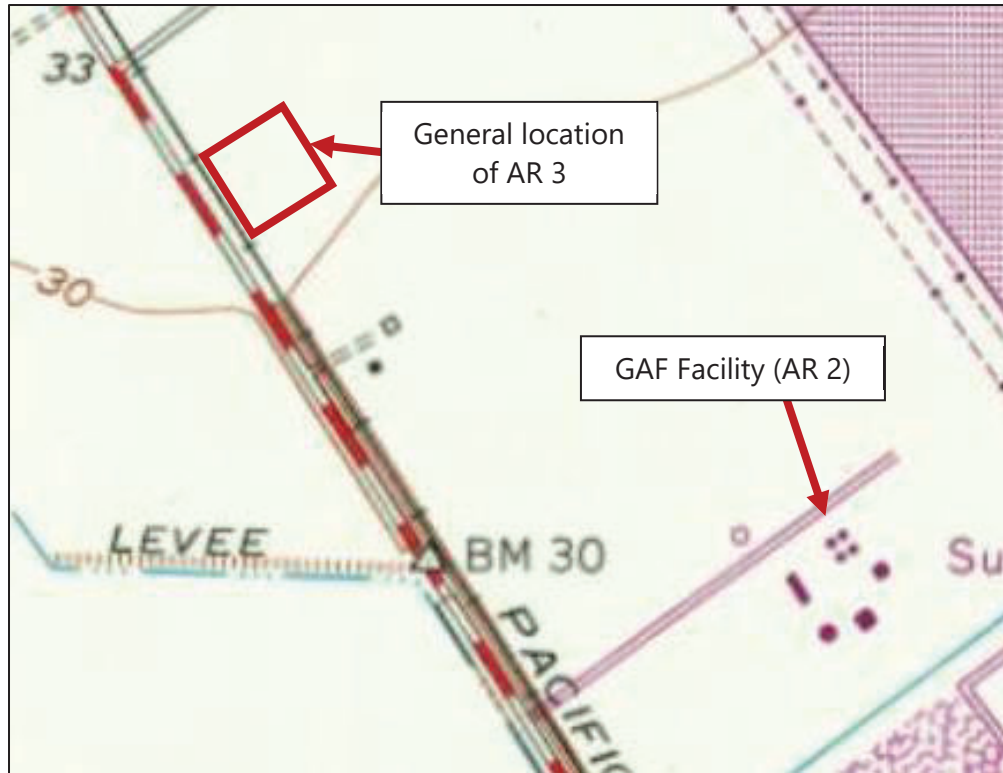


Figure 9.2. Location of AR 3 on the 1973 Green Lake USGS Topographic Map.



Figure 9.3. Overview of AR 3, facing East.



Figure 9.4. View of Storage Shed, facing West; Note the Piping and Receiver Surrounding the Structure.



Figure 9.5. View of the Second Structure Comprising AR 3, facing East; Note Surrounding Piping and Power Line Pole.



Figure 9.6. View of South Elevation of Northwestern Structure, facing North.

10.0 AR 4: JESSE RIGBY RD

AR 4 consists of two southeast-facing agricultural storage buildings located at approximately 213 Jesse Rigby Rd, Port Lavaca, Calhoun County, Texas (**Table 10.1; Figure 10.1**). The buildings are bound by unused lots on the north- and south-west, Jesse Rigby Road on the northeast, and Jesse Rigby Road and a railroad interchange on the southeast. The resource sits on 165.74 acres of grassy, level terrain overgrown with shrubbery and trees which appears to be abandoned. AR 4 is accessible via a gravel drive that extends northwest from Jesse Rigby Road to AR 4. There is evidence in the vegetation patterns and archival research of additional structures which stood on the lot containing AR 4, however these are no longer extant.

According to the Calhoun County, TX PVA, AR 4 is currently owned by the Union Carbide Corporation, a subsidiary of the Dow Chemical Company, and was constructed in 1965. The PVA also details a residential building, a garage, and a storage building constructed in 1951, along with a grain bin constructed in 1965, which are no longer extant. AR 4, consisting of two Quonset huts, first appears in publicly available aerial imagery in 1981 and in USGS topographic maps in 1973 for Green Lake, TX (**Figure 10.2**). These maps corroborate the 1965 construction date listed in the PVA.

Table 10.1. Summary of AR 4

Address	Jesse Rigby Rd (28.54011, -96.75685)
County	Calhoun County
Date of Construction	1965
Square Footage (Living Area)	NA
Acreage	165.74 acres
Owner	Union Carbide Corporation (Dow)
Architectural Type	20 th Century Agricultural Outbuildings
Integrity	AR 4 is in poor condition, showing signs of damage, disuse, and neglect.
NRHP Recommendation	AR 4 is not eligible for the NRHP due to lack of architectural and historic significance.

Building Description

AR 4 consists of two southeast-facing agricultural storage buildings that are consistent with the typical design of Quonset huts. Both elements of AR 4 are clad in corrugated metal siding and are covered by semi-circular corrugated metal roofs that extend to grade, supported by arched steel frames. The Quonset huts feature sliding corrugated metal doors hung from the front and rear elevations. Both structures are rusted and damaged, each missing the western door panel along its front elevation (**Figure 10.3-10.7**). The southeastern element of the resources is the larger of the two structures that comprise AR 4. The rear elevation of the larger of the two structures could only be seen through the opening along the front elevation, and appears to feature two wall openings; however, it is not clear if these openings are aspects of the original design or a result of deterioration (see **Figure 10.4**). A small square vent featuring metal slats is located along the top extent of the entryway to the larger Quonset hut. No other wall openings are visible on either structure.

Current Condition

AR 4 is in poor condition and shows signs of damage, disuse, and neglect.

NRHP Recommendation

AR 4 was evaluated for National Register eligibility using the three NRHP criteria identified in this research. AR 4 is recommended not eligible for listing on the NRHP due to a lack of historic and architectural significance. Under Criterion A, AR 4 is not associated with any historically significant events or patterns that have affected the region, state, or nation. AR 4 is recommended not eligible under Criterion B because it cannot be linked to any person or persons who are historically significant to the region, state, or nation. Under Criterion C, the resource is not eligible because the structures are not the work of a master builder or craftsman. Also, the resource does not embody distinguishing characteristics that would make it a unique example of its architectural type. No further work is recommended.

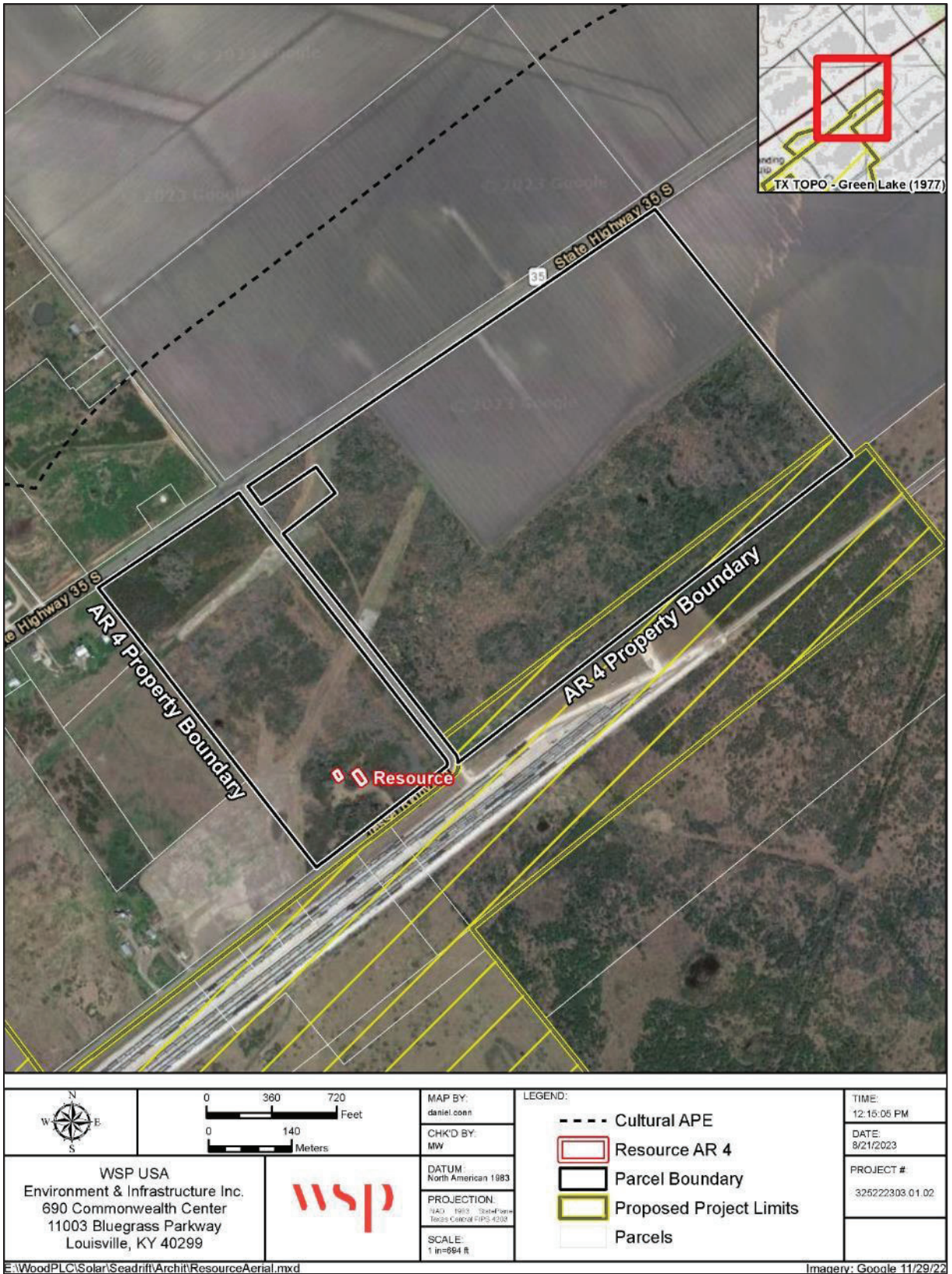


Figure 10.1. Aerial Image Showing the Location of AR 4.



Figure 10.2. Location of AR 4 on the 1973 Green Lake USGS Topographic Map.



Figure 10.3. View of Southeast and Northeast Elevations of Larger Structure, facing West.



Figure 10.4. View of Southeast Elevation of Larger Structure, facing Northwest.



Figure 10.5. View of Southeast and Southwest Elevations of Larger Structure, facing Northeast.



Figure 10.6. View of Southeast and Southwest Elevations of Smaller Structure, facing Northeast.



Figure 10.7. View of Southeast Elevation of Smaller Structure, facing Northwest.

11.0 AR 5: 11525 TX- 35

AR 5 is a northwest facing, one-story, single-family, Ranch located at 11525 TX- 35 Port Lavaca, Calhoun County, Texas (**Table 11.1; Figure 11.1**). The building is bound on the north by TX-35, and all other elevations by agricultural fields. The building sits on level terrain covered by an overgrown lawn and dotted with deciduous trees. Most of the lot is overgrown with thick patches of foliage littered with trash and degraded storage drums and tanks. The property is accessed via an overgrown gravel driveway, which extends northwest from TX-35 west of the main house and curves around the rear elevation to connect back to TX-35 northeast of AR 5.

According to the Calhoun County, TX PVA, AR 5 is currently owned by Carl E Kimbriel. The PVA lists a date of construction for AR 5 as 1959 and lists 1,934 sq. ft as the total living area of the main house. AR 5 is illustrated as early as 1981 on historical aerial images and appears in its current location on the 1953 Green Lake topographic map (**Figure 11.2**). The presence of the house on the 1953 Green Lake topographic map, the earliest available, suggests that AR 5 was constructed by 1953, contrary to the information listed in the PVA. AR 5 is associated with one outbuilding (**Figure 11.3**). The outbuilding first appears on the 1973 Green Lake Topographic map, indicating the outbuilding was constructed between 1952-1973. Historic aerial images and topographic maps also reveal that a covered stable and barn were built at the same time as the main house. The barn was razed between 2014 and 2016; the stable was dilapidated and inaccessible at the time of this survey.

Table 11.1 Summary of AR 5

Address	11525 TX- 35 (28.53193, -96.78092)
County	Calhoun County
Date of Construction	c. 1953
Square Footage (Living Area)	1,934 sq. ft.
Acreage	1.00
Owner	Carl E Kimbriel
Architectural Type	Ranch
Integrity	AR 5 is in poor condition, appears to be abandoned, and displays significant damage.
NRHP Recommendation	AR 5 is not eligible for the NRHP due to loss of integrity and lack of architectural and historic significance.

Building Description

AR 5 is a northwest facing, one-story, single-family, Ranch which is covered by a cross-gable, asphalt shingle roof and displays extreme signs of neglect and deterioration. AR 5 appears to be abandoned (**Figure 11.4**). Along the northwest elevation, the roofline features two cross-gable roofs alongside a central shed roof, presumably covering a porch which is obscured from view by vegetation. The house is clad in a combination of painted brick, stone veneer, and brick veneer. AR 5 features aluminum, sliding and double-hung windows. The main entrance of the house not visible from the public right-of-way. An interior brick chimney is located centrally along the northwest slope of the side-gable (principal) roof. A second and potential third entrance are located along the southeast (rear) elevation but are partially obscured from view. The secondary

entrance is located along the central block of the house and is covered by a deteriorated shed roof supported by painted wood posts. There is one outbuilding associated with AR 5, a wood barn that sits at the southwest corner of the property (see **Figure 11.3**). Many partial or full elevations were not accessible from the public right-of-way, and historic images of the property varied in quality and completeness, limiting the assessment of wall openings and stylistic elements.

The northwest (main) elevation is significantly obscured from the public right-of-way by vegetation overgrowth. Historic images of the house and modern aerial images reveal that the façade is comprised of three sections: a central block covered by a side-gable roof; a southwestern section beneath a cross-gable roof; and northeastern section beneath a small cross-gable projection extending from the principal roofline, which covers a garage. Both cross-gable sections feature a single, double-hung aluminum window. A shed roof extending from the principal roofline of the central section likely comprises a porch, however, wall openings along this portion could not be seen from the public right-of-way. The southwestern cross-gable projection features a solid metal door along its northwestern elevation and beneath the shed roof of the presumed porch. No additional entryways, wall openings, or stylistic elements were visible along this elevation.

The southwest elevation was obscured from view by significant vegetation overgrowth, but historic images of the home and partial views of the wall openings reveal at least three wall openings. From north to south, the elevation contains one wood, double-hung window, a small aluminum, fixed window, and another aluminum, double-hung window (**Figure 11.5**).

The southeast (rear) elevation was only partially visible, due to vegetation overgrowth, and the southwest half of the house could not be assessed from any angle along this elevation. Along the visible portion, a secondary entrance was located beneath a badly degraded porch featuring a shed roof extending from the principal roof line and supported by two wood posts. The entryway features a metal frame storm door inset with four lights and an additional exterior door which could not be assessed from outside of the property. To the west of the secondary entrance is a small sliding, aluminum window and an aluminum, double-hung window, and a garage door partially obscured from view (**Figure 11.6-11.7**).

The northeast elevation was not visible from the public right-of-way preventing the assessment of features or wall openings. Historic images of the home suggest that there are at least two wall openings along this elevation with either sliding or fixed sash operations.

Associated Outbuildings

AR 5 has one associated building: an agricultural storage building covered by a side-gable, asphalt shingle roof. The building is clad in wood board siding that displays peeling red paint and is accessed via openings along the northeast and southwest elevations. The roof shows signs of damage along the southeast elevation and vegetation overgrowth obscures most of the structure from the public right-of-way (**Figure 11.8**).

Current Condition

AR 5 is in poor condition and appears abandoned. The visible stylistic elements of the resource appear to be original to the house; however, extensive structural damage and neglect has resulted in diminished integrity.

NRHP Recommendation

AR 5 was evaluated for National Register eligibility using the three NRHP criteria identified in this research. AR 5 is recommended not eligible for listing in the National Register because it lacks



architectural significance and integrity. Under Criterion A, AR 5 lacks historic significance because there is no evidence that suggests that any events of historic significance to the region, state, or nation occurred in or around the property. Under Criterion B, AR 5 lacks historic significance and cannot be associated with any person or persons of historic significance that may have used, designed, or constructed the house. Under Criterion C, AR 5 lacks architectural significance and material integrity. It is not the work of a master builder or craftsman and has no elements that make it a unique example of its architectural type. Furthermore, the building is in poor condition and displays significant structural damage and neglect, resulting in diminished integrity. No further work is recommended.

The outbuilding is not individually eligible for the NRHP and does not contribute to the overall eligibility of AR 5.



Figure 11.1. Aerial Image Showing the Location of AR 5 with its Outbuilding.



Figure 11.2. Location of AR 5 on the 1969 Port Lavaca USGS Topographic Map.



Figure 11.3. View of AR 5 and Outbuilding, facing South; Note Vegetation Overgrowth.



Figure 11.4. View of the Northwest (Main) Elevation of AR 5, facing South; Note the Significant Overgrowth of Vegetation.

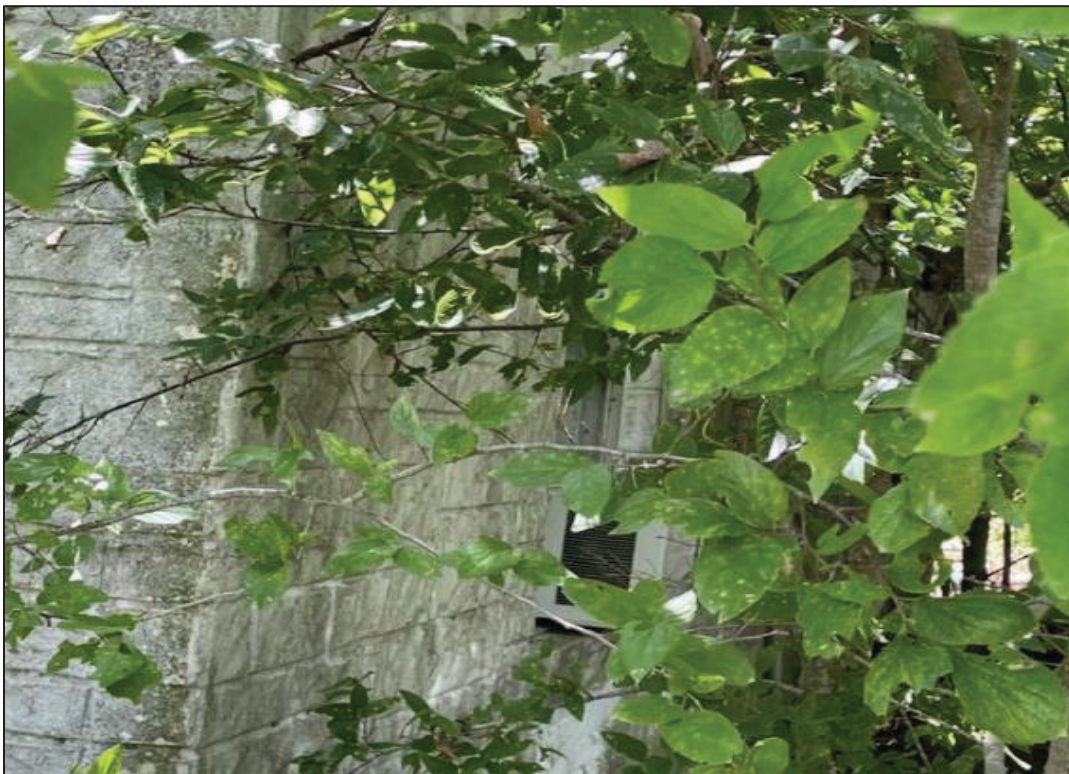


Figure 11.5. View of the Southwest Elevation of AR 5, facing South.



Figure 11.6. View of Southeast (Rear) Elevation of Cross-gable Section, facing North.



Figure 11.7. View of Southeast (Rear) Elevation of Central Block, facing Northwest.



Figure 11.8. View of Northwest and Northeast Elevations of Outbuilding, facing South.

12.0 AR 6: 10622 TX-35

AR 6 is a southeast facing, one-story, single-family, Transitional Ranch located at 10622 TX-35, Port Lavaca, Calhoun County, Texas (**Table 12.1; Figure 12.1**). The building is located in a rural area and is bound on the east by residential buildings, on the south by TX-35, on the west by Garza Road, and on the north by agricultural fields. The building sits on flat, grassy terrain surrounded by several deciduous trees. The property is accessed via two unimproved driveways, which extend northwest from TX-35.

According to the Calhoun County, TX PVA, AR 6 is currently owned by Richard Clyde Able. The PVA records 1951 as the date of construction for AR 6, with 1.63 acres listed as the acreage and 2,220 sq. ft. listed as the living area. AR 6 is illustrated on the 1953 Green Lake topographic map, corroborating the 1951 construction date listed in the PVA record (**Figure 12.2**). AR 6 is associated with two outbuildings: a vehicle shed and a storage building. A 1981 aerial image of the property shows that the two outbuildings were not present at this time, indicating that the two outbuildings are under 50 years old and are not associated with the original construction of the residence.

Table 12.1. Summary of AR 6

Address	10622 TX-35 (28.5396391, -96.7683991)
County	Calhoun County
Date of Construction	1951
Square Footage (Living Area)	Approximately 2,220 sq. ft.
Acreage	Approximately 1.63 acres
Owner	Richard Clyde Able
Architectural Type	Transitional Ranch
Integrity	AR 6 is in good condition.
NRHP Recommendation	AR 6 is not eligible for the NRHP due to loss of material integrity and lack of architectural and historic significance.

Building Description

AR 6 is a southeast facing, one-story, single-family, Transitional Ranch with a side gable, asphalt shingle roof and a front gable wing extending from the southeast elevation. The house is clad in horizontal replacement vinyl siding with contrasting vertical wood siding in upper gable ends, and features vinyl, double-hung replacement windows. The southeast (main) elevation features a partial-width porch covered by a shed, standing seam metal roof supported by wood posts with a wood deck and railing. The raised foundation is covered by a wood lattice on the southeast and northeast elevations. The northwest (rear) elevation was not accessible from the public right-of-way, which prevented any determination regarding the presence of wall openings or other distinguishing characteristics along this elevation.

The southeast (main) elevation features four wall openings. Underneath the shed roof porch, there are two pairs of double-hung vinyl windows, one of which contains a window air conditioning unit. The main entryway is situated underneath the porch roof and consists of a paneled wood door covered by a metal storm door with an inset lite. On the front gable wing of the southeast elevation, there is a pair of double-hung, two-over-two vinyl windows (**Figure 12.3-12.4**).

The southwest elevation features two wall openings: a sliding glass side door and a double-hung window containing a window air conditioning unit (**Figure 12.5**).

The northwest (rear) elevation was not visible from the public right-of-way preventing the assessment of features or wall openings.

The northeast elevation features three window openings that are partially covered by particle board, two of which contain window air conditioning units (**Figure 12.6**).

Associated Outbuildings

AR 6 is associated with two non-historic outbuildings: a metal storage building, and a vehicle shed. The storage building is on a concrete slab foundation with a low-pitch front gable standing seam metal roof and is clad in vertical standing seam metal siding (**Figure 12.7-12.9**). The southeast (main) elevation of the storage building contains a metal overhead garage door and a solid metal door. The vehicle shed is topped with a corrugated metal shed roof supported by a wood frame (**Figure 12.10**). The vehicle shed is open to the exterior aside from corrugated metal siding on the northwest (rear) elevation.

Current Condition

AR 6 is in good condition but has undergone moderate alteration, including the replacement of siding, windows, and roofing material. Additionally, the northeast elevation contains multiple wall openings that are covered by particle board, making condition assessment of these windows difficult.

NRHP Recommendation

AR 6 was evaluated for National Register eligibility using the three NRHP criteria identified in this research. AR 6 is recommended not eligible for listing on the NRHP due to loss of material integrity and a lack of historic and architectural significance. Under Criterion A, AR 6 is not associated with any historically significant events or patterns that have affected the region, state, or nation. AR 6 is recommended not eligible under Criterion B because it cannot be linked to any person or persons who are historically significant to the region, state, or nation. Under Criterion C, the building does not embody distinguishing characteristics that would make it a unique example of its architectural type, and it is not the work of a master builder or craftsman. Additionally, the house has undergone alteration, including the replacement of exterior wall materials, roofing material, and windows, which has diminished its material integrity. No further work is recommended.



Figure 12.1. Aerial Image Showing the Location of AR 6.

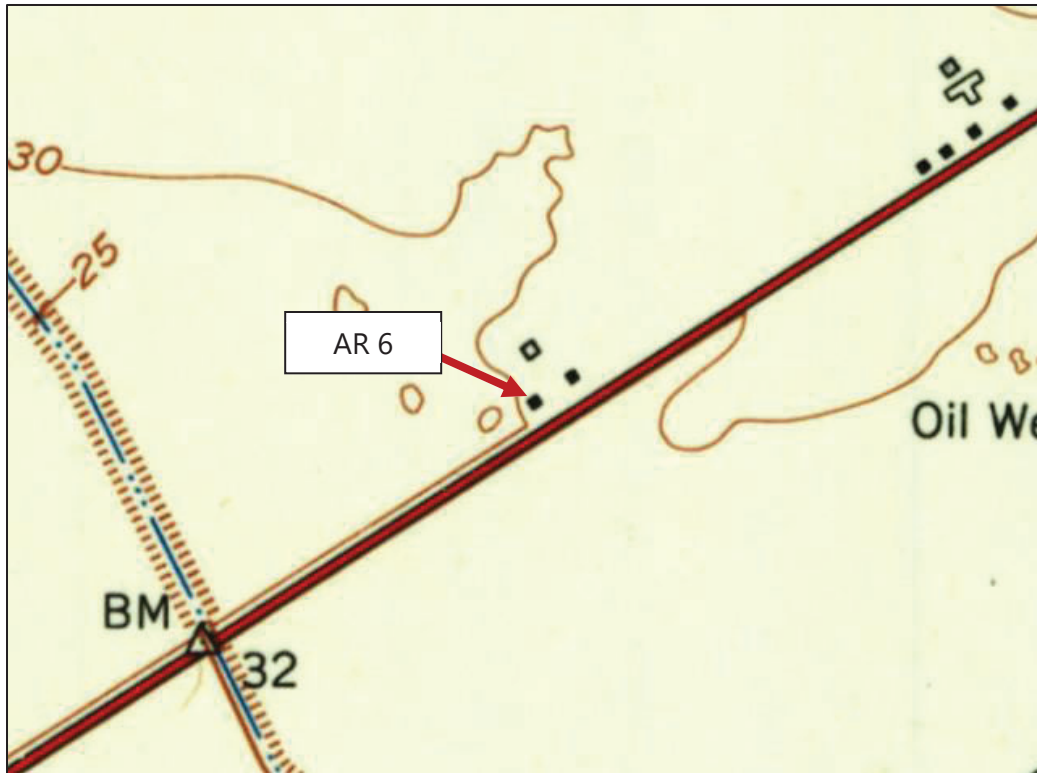


Figure 12.2. Location of AR 6 on the 1953 Green Lake USGS Topographic Map.



Figure 12.3. View of the Southeast (Main) Elevation of AR 6, facing Northwest.



Figure 12.4. View of the Southeast (Main) Elevation of AR 6, facing Northwest.



Figure 12.5. View of the Southwest Elevation of AR 6, facing Southwest.



Figure 12.6. View of the Northeast Elevation of AR 6, facing Northeast.



Figure 12.7. View of AR 6 and an Outbuilding, facing North.



Figure 12.8. View of the East and North Elevations of Storage Building Associated with AR 6, facing West.



Figure 12.9. View of the East and North Elevations of Storage Building Associated with AR 6, facing West.



Figure 12.10. View of the East and North Elevations of Vehicle Shed Associated with AR 6, facing West.

13.0 AR 7: 10548 TX-35

AR 7 is a southeast facing residential outbuilding located at 10548 TX-35, Port Lavaca, Calhoun County, Texas (**Table 13.1; Figure 13.1**). The outbuilding is bound on the southeast by TX-35, on the northwest by homestead land and associated non-historic structures, on the southwest by the main residential building on the lot, and on the northeast by non-historic residential properties. The building sits on level, grassy terrain that is covered by slightly overgrown trees and shrubbery. The side and rear boundaries of the lot are lined with thick patches of foliage and the property is accessed via gravel driveway, which extends northwest from TX-35 to the southeast elevation of AR 7.

According to the Calhoun County, TX PVA, AR 7 is currently owned by Esiquiel Saenz. The PVA records a construction date of 1965 and a square footage of 288 for the outbuilding. AR 7 is illustrated as early as 1981 on historical aerial images but does not appear on the 1953 or 1973 Green Lake topographic maps (**Figure 13.2**). The 1981 historic aerial image, the earliest available, shows AR 7 in its current location and configuration as well as the original main house associated with the outbuilding, which is no longer extant. The PVA and historic aerials indicate that the new main house on the property is modern construction and was built in 2014. AR 7 does not appear on any USGS topographic map, indicating the structure was not symbolized by the USGS in association with the original main house on the property. These maps suggest that AR 7 was constructed prior to 1981, corroborating the 1965 construction date listed on the PVA. It is likely the garage was associated with the construction of the original house but does not appear on topographic maps due to its dimensions or character.

Table 13.1. Summary of AR 7

Address	10548 TX-35 (28.540018, -96.767896)
County	Calhoun County
Date of Construction	1965
Square Footage	288.00 sq. ft.
Acreage	1.00
Owner	Esiquiel Saenz
Architectural Type	Residential Outbuilding
Integrity	AR 7 is in poor condition and displays signs of deterioration.
NRHP Recommendation	AR 7 is not eligible for the NRHP due to lack of architectural and historic significance.

Building Description

AR 7 is a southeast facing residential outbuilding covered by a front gable, corrugated metal roof and clad in corrugated metal siding (**Figure 13.3**). AR 7 features one wall opening visible from the public right-of-way: a multi-panel, metal overhead garage door along the southeast (main) elevation. The southwest and northeast elevations have no wall openings, and the northwest (rear) elevation is not visible from the public right-of-way (**Figure 13.4-13.5**). Although not visible, there are no indications of wall openings along the rear elevation from the right-of-way or in modern aerial images of the structure.

Current Condition

AR 7 is in poor condition and displays signs of damage and neglect including extensive corrosion.

NRHP Recommendation

AR 7 was evaluated for National Register eligibility using the three NRHP criteria identified in this research. AR 7 is recommended not eligible for listing on the NRHP due to lack of historic and architectural significance. Under Criterion A, AR 7 is not associated with any historically significant events or patterns that have affected the region, state, or nation. AR 7 is recommended not eligible under Criterion B because it cannot be linked to any person or persons who are historically significant to the region, state, or nation. Under Criterion C, the resource is not eligible because the structure is not the work of a master builder or craftsman. Also, the building does not embody distinguishing characteristics that would make it a unique example of its architectural type. No further work is recommended.



Figure 13.1. Aerial Image Showing the Location of AR 7.



Figure 13.2. Location of Original House Associated with AR 7 on the 1973 Green Lake USGS Topographic Map.



Figure 13.3. View of Southeast (Main) and Southwest Elevations of AR 7, facing North; Note Associated Modern Residence.



Figure 13.4. View of the Southeast (Main) and Northeast Elevations of AR 7, facing East.



Figure 13.5. View of Southeast and Northeast Elevations of AR 7, facing West.

THIS PAGE LEFT BLANK INTENTIONALLY

14.0 AR 8: 10237 TX-35

AR 8 is a northwest facing, one-story, single-family, Ranch residence located at 10237TX-35, Port Lavaca, Calhoun County, Texas (**Table 14.1; Figure 14.1**). The building is located in a rural area and is bound on the north by TX-35, on the east by residential buildings and agricultural fields, on the south and west by agricultural fields. The building sits on flat, grassy terrain surrounded by several deciduous trees. The property is accessed via a dirt driveway that extends southeast from TX-35.

According to the Calhoun County, TX PVA, AR 8 is currently owned by Moreman Community Gin Association. The PVA lists 1955 as the date of construction for AR 8, 1 acre listed as the acreage, and 1,813.20 sq. ft. listed as the living area. AR 8 is not depicted on the 1953 Green Lake topographic map, but it is visible on the 1973 Green Lake topographic map, corroborating the PVA construction date of 1955 (**Figure 14.2**). AR 8 is not associated with any outbuildings.

Table 14.1. Summary of AR 8

Address	10237TX-35 (28.5418226, -96.7626179)
County	Calhoun County
Date of Construction	1955
Square Footage (Living Area)	Approximately 1,813.20 sq. ft.
Acreage	Approximately 1 acre
Owner	Moreman Community Gin Association
Architectural Type	Ranch
Integrity	AR 8 is in good condition.
NRHP Recommendation	AR 8 is not eligible for the NRHP due to loss of material integrity and lack of architectural and historic significance.

Building Description

AR 8 is a northwest facing, one-story, single-family, Ranch residence on a concrete foundation, with a side gable, standing seam metal roof and a front gable wing off of the southeast (rear) elevation. The house is clad in replacement vinyl siding and features metal double-hung windows. The rear wing is clad in vertical wood board. The northwest (main) elevation features a partial-width porch covered by an extension of the side gable roof supported by wood posts on a concrete slab.

The northwest (main) elevation contains five wall openings. East of the partial-width porch, the northwest elevation contains a double-hung window containing a window air conditioning unit. The window is set within a portion of the exterior wall clad in vertical wood board, which appears to have infilled a garage door opening. Underneath the partial width porch, there is a set of three two-over-two, double-hung windows containing one air conditioning unit with decorative shutters on either end. The entrance is a six-panel wood door that is accessed from the porch. West of the porch is a double-hung window and a pair of two-over-two, double-hung windows containing a window air conditioning unit with a single decorative shutter (**Figure 14.3-14.4**).

The northeast elevation features a double-hung widow containing a window air conditioning unit (**Figure 14.5**).

The southeast (rear) elevation contains three wall openings. On the main portion of the house, there is a pair of two-over-two, double-hung windows and a double-hung window containing a window air conditioning unit. On the front gable wing, there is a wood door (**Figure 14.6**).

The southwest elevation contains three wall openings. On the main portion of the house, there are two two-over-two, double-hung windows, with one containing a window air conditioning unit. On the wing, there is a double-hung window (**Figure 14.6**).

Current Condition

AR 8 is in good condition but has undergone moderate alteration, including the replacement of siding and roofing material.

NRHP Recommendation

AR 8 was evaluated for National Register eligibility using the three NRHP criteria identified in this research. AR 8 is recommended not eligible for listing on the NRHP due to loss of material integrity and a lack of historic and architectural significance. Under Criterion A, AR 8 is not associated with any historically significant events or patterns that have affected the region, state, or nation. AR 8 is recommended not eligible under Criterion B because it cannot be linked to any person or persons who are historically significant to the region, state, or nation. Under Criterion C, the building does not embody distinguishing characteristics that would make it a unique example of its architectural type, and it is not the work of a master builder or craftsman. Additionally, the house has undergone alteration, including the replacement of exterior wall materials, roofing material, and windows, that has diminished its material integrity. No further work is recommended.

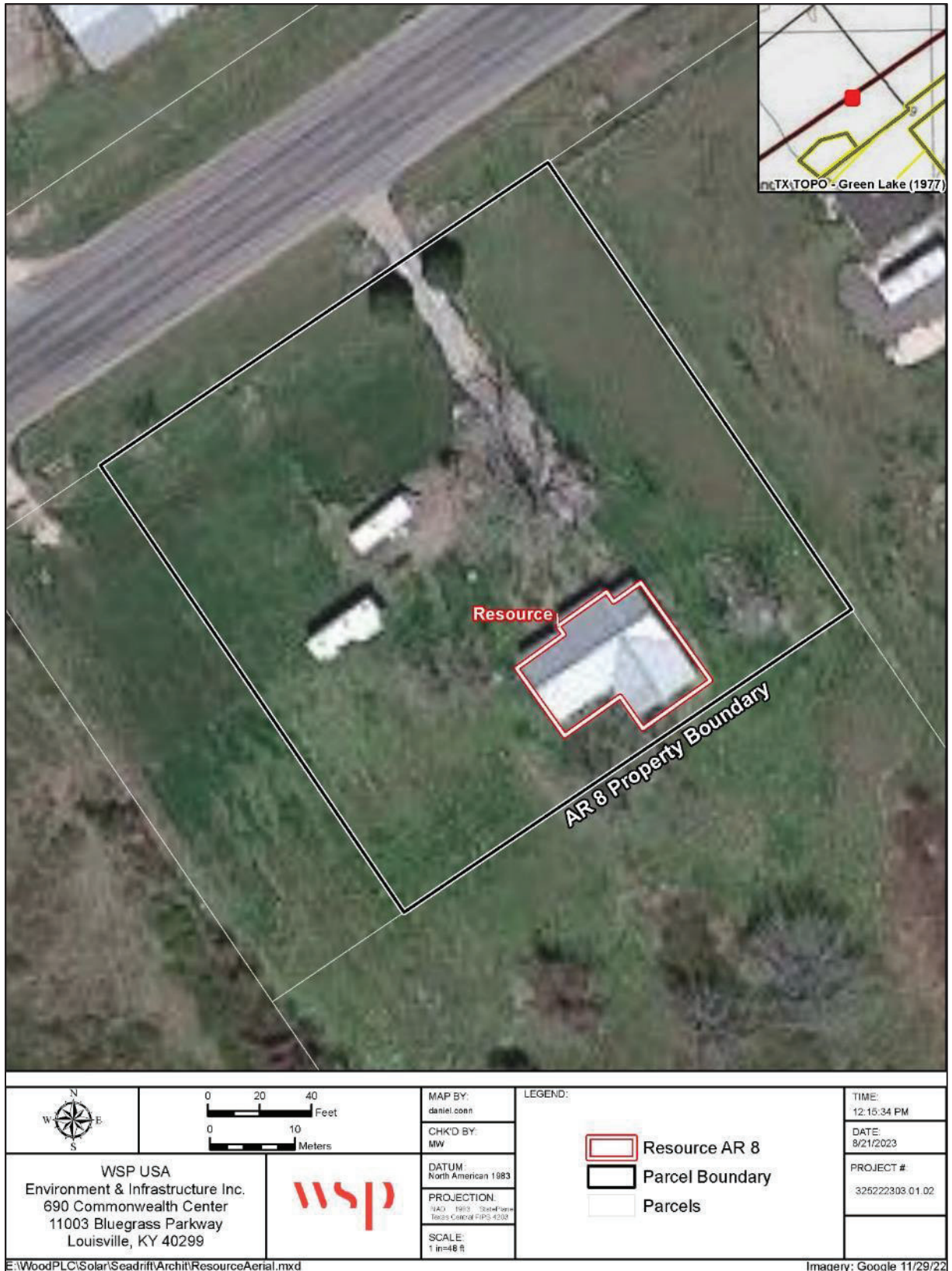


Figure 14.1. Aerial Image Showing the Location of AR 8.



Figure 14.2. Location of AR 8 on the 1973 Green Lake USGS Topographic Map.



Figure 14.3. View of the Northwest (Main) Elevation of AR 8, facing Southeast.



Figure 14.4. View of the Northwest (Main) Elevation of AR 8, facing Southeast.



Figure 14.5. View of the Northwest (Main) and Northeast Elevations of AR 8, facing South.



Figure 14.6. View of the Southeast and Southwest Elevations of AR 8, facing North.

15.0 AR 9: 10211 TX-35

AR 9 is a northwest facing, one-story, Mid-20th Century Vernacular building located at 10211 TX-35, Port Lavaca, Calhoun County, Texas (**Table 15.1; Figure 15.1**). The building is located in a rural area and is bound on the north by TX-35, and on the east, south, and west by agricultural fields and a few residential and agricultural buildings. The building sits on flat, grassy terrain. AR 9 sits on a lot shared by a modern residential building and several outbuildings. The property is accessed via a dirt driveway that extends southeast from TX-35.

According to the Calhoun County, TX PVA, AR 9 is currently owned by Jimmy Miller. The PVA records 1969 as the date of construction for AR 9, with 2.6 acres listed as the residential acreage and 3.9 acres listed as pasture. The PVA also lists 630 sq. ft. as the living area with a 560 sq. ft. attached garage. AR 9 is not depicted on the 1953 Green Lake topographic map, but it is visible on the 1973 Green Lake topographic map. These maps corroborate the PVA construction date of 1969 (**Figure 15.2**). AR 9 is presently associated with a non-historic main residence constructed between 2004-2008. Various outbuildings are extant surrounding the non-historic main residence which were constructed post-2010. The non-historic main residence and its associated outbuildings are under 50 years old and are not associated with the original construction of AR 9.

Table 15.1. Summary of AR 9

Address	10211 TX-393 (28.5422996, -96.7623054)
County	Calhoun County
Date of Construction	1969
Square Footage	Approximately 630 sq. ft.
Acreage	6.5 acres (residential and pasture)
Owner	Jimmy Miller
Architectural Type	Mid-20th Century Vernacular
Integrity	AR 9 is in fair condition.
NRHP Recommendation	AR 9 is not eligible for the NRHP due to loss of material integrity and lack of architectural and historic significance.

Building Description

AR 9 is a Mid-20th Century Vernacular northwest facing brick and concrete block building topped with a low-pitched hipped asphalt shingle roof. Exterior wall openings include metal and wood double-hung and fixed windows, and wood doors. The southeast (rear) elevation was not visible from the public right-of-way, which prevented any determination regarding the presence of additional wall openings or other distinguishing characteristics along this elevation.

The northwest (main) elevation of AR 9 is symmetrical in plan, containing large, single-lite fixed windows on either side of the six-paneled wood door (**Figure 15.3**).

The northeast elevation contains two double-hung, metal windows and a single-lite fixed window. There is also evidence of a previous wall opening on the northeast elevation, which has been covered by a patch of standing seam metal siding (**Figure 15.4**).

The southeast (rear) elevation was not accessible from the public right-of-way, which prevented any determination regarding the presence or character of additional wall openings along this elevation.

The southwest elevation contains a wall mounted HVAC unit, two double-hung windows, and a garage door opening with wood double doors (**Figure 15.5**).

Current Condition

AR 9 is in poor condition, with signs of exterior deterioration including weathered and peeling paint on the exterior brick and concrete block and missing and deteriorated wood fascia. Alterations to the building include the infill of wall openings, including the standing seam metal infill on the east elevation and the infill material at various window surrounds.

NRHP Recommendation

AR 9 was evaluated for National Register eligibility using the three NRHP criteria identified in this research. AR 9 is recommended not eligible for listing on the NRHP due to a loss of material integrity and lack of historic and architectural significance. Under Criterion A, AR 9 is recommended as not eligible because it has no association with any historic events or pattern of events significant to the region, state, or nation. Under Criterion B, AR 9 is recommended as not eligible because no links were found between the building and person or persons with cultural or historic significance. Under Criterion C, the building is recommended as not eligible because it has no elements that make it a unique example of a twentieth century building. In addition, the building lacks integrity because materials have been altered over time, such as the infill of various wall openings. Because the building is recommended as not eligible, no further work is required.

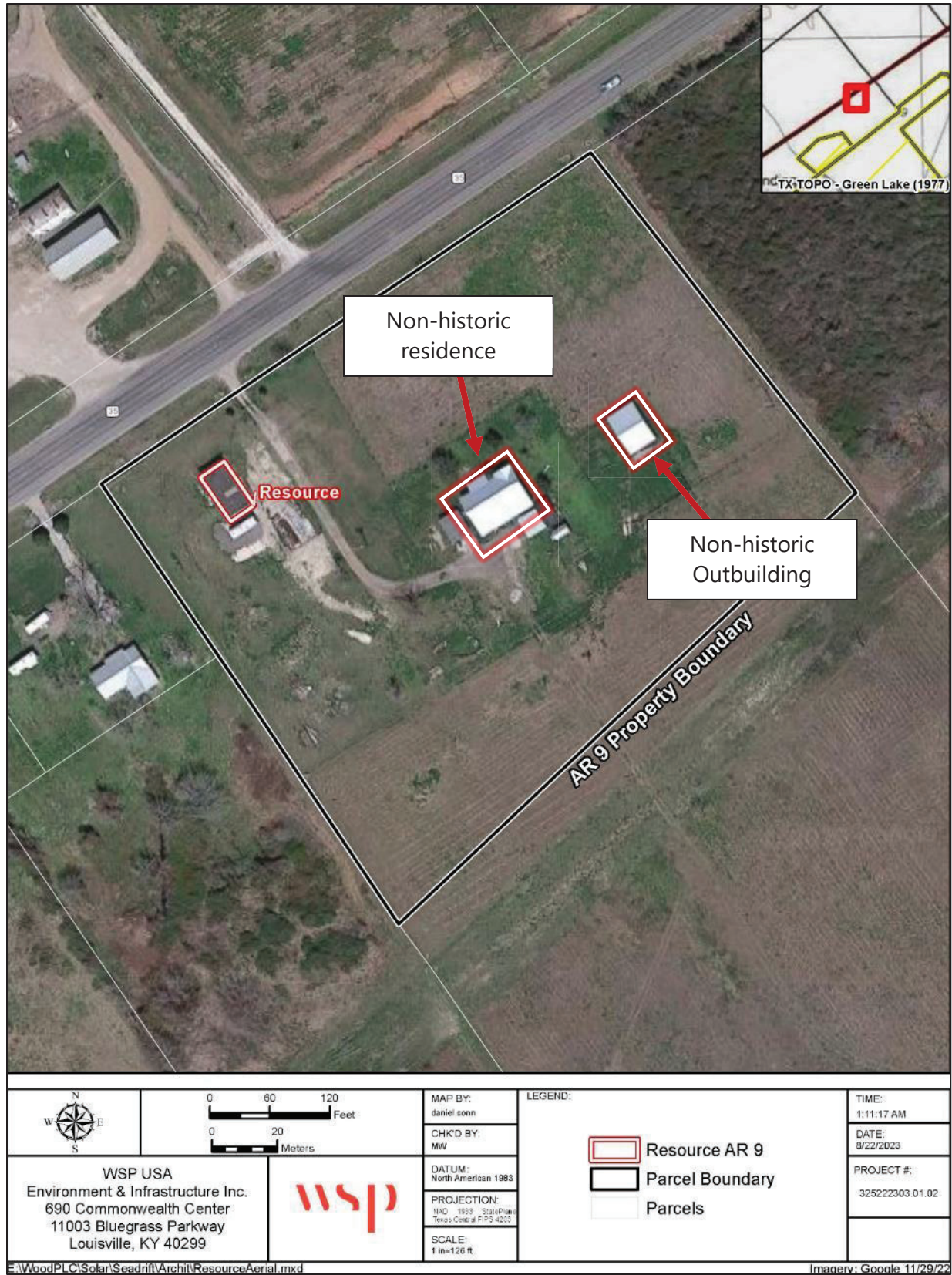


Figure 15.1. Aerial Image Showing the Location of AR 9.



Figure 15.2. Location of AR 9 on the 1973 Green Lake USGS Quadrangle Topographic Map.



Figure 15.3. View of the Northwest (Main) Elevation of AR 9, facing Southeast.



Figure 15.4. View of the Northwest (Main) and Northeast Elevations of AR 9, facing South.



Figure 15.5. View of the Northwest (Main) and Southwest Elevations of AR 9, facing East.

THIS PAGE LEFT BLANK INTENTIONALLY

16.0 AR 10: 10254 TX-35 (MOREMAN COMMUNITY COTTON GIN)

AR 10 is a southeast facing, Mid-20th Century Cotton Gin Facility located at 10254 TX-35 in Port Lavaca, Calhoun County, Texas (**Table 16.1**; **Figure 16.1**). The complex is bound on the southeast by TX-35, on the northwest and northeast by fallow agricultural fields, and on the southwest by residential buildings. AR 10 sits on level terrain covered by a large gravel lot and dotted with small areas of grass or vegetation encroaching from the surrounding areas. Four gravel driveways extend from TX-35 to evenly spaced access points along the southeast elevation of the gravel lot.

According to the Calhoun County, TX PVA, AR 10 is currently owned by Moreman Community Gin Association and sits on a parcel totaling 21.3 acres (**Table 16.1**). The PVA lists a construction date of 1954 for buildings that are over 50 years of age on the property, and three additional buildings and structures listed are approaching historic age. AR 10 first appears on the 1981 historic aerial image, the earliest available. The 1953 Green Lake USGS Topographic Map, the earliest available, shows a facility in the general location and alignment of AR 10 (**Figure 16.2**). These maps corroborate the date of construction listed in the PVA; however, along with archival research, they indicate that extant historic structures were built as part of a pre-existing complex dating to 1934 (Hinder, Rinaldi-Williams, et al. 2023). Historic aerial images indicate that the complex was modified via the removal and construction of structures to achieve its current state as recently as 2018-2020.

Table 16.1. Summary of AR 10

Address	10254 TX-35 (38.384847, -85.431712)
County	Calhoun County
Date of Construction	1954
Square Footage (Living Area)	Approximately 1,087.2 sq. ft.
Acreage	21.3 acres
Owner	Moreman Community Gin Association
Architectural Type	Mid-20th Century Cotton Gin Facility
Integrity	AR 10 is in good condition though it has undergone moderate alteration.
NRHP Recommendation	AR 10 is recommended not eligible for listing in the NRHP due to diminished integrity.

Building Description

AR 10 is a southeast facing, Mid-20th Century Cotton Gin Facility which includes a combination of historic and non-historic processing, administration, and remnant structures (**Figure 16.3**). Of seven buildings on the property, three are historic and, along with additional remnants of the original gin complex constitute AR 10. The historic age buildings that comprise AR 10 are generally utilitarian in appearance with few or no stylistic elements. The buildings have generally continued to serve their historic functions and are representative of many basic elements of historic cotton gins in Calhoun County (**Table 16.2**).

Table 16.2. Overview of AR 10 Historic Buildings and Structures

Building/Structure	Current Use	Historic Use	Year Built
Office	Commercial	Commercial	1954
Storage Building (Quonset)	Storage	Storage	1954
Tank	Chemical Storage	Unknown	1969
Tank	Chemical Storage	Unknown	1969
Foundation Remnants	NA	NA	By 1981

Two historic age buildings were identified as extant elements of the modern complex: the gin office building and an agricultural storage building. The office building is consistent with the rest of the facility in its overall utilitarian design. The building is one-story, covered by a low-pitched, standing metal seam roof, and clad in corrugated metal siding. Wall openings include two casement and one double-hung, aluminum windows along the west elevation; three double-hung, aluminum windows along the south elevation; and an overhead garage door, an entrance covered by a flat roof, and a fixed, aluminum picture window (**Figures 16.4-16.5**). The agricultural storage building is a Quonset hut located along the northwest extent of the facility. The structure is clad in corrugated metal siding and is covered by a semi-circular corrugated metal roof that extends to grade, supported by arched steel frames. The Quonset hut features a pair of sliding corrugated metal doors hung from the front and rear elevations and two square vents along the remaining elevations. The vents display signs of damage (**Figures 16.6-16.8**). In addition to the principal historic-aged buildings, several structures including building foundations and storage tanks that exist across the property are representative of the materials and location of elements constructed during earlier phases of facility development and are interspersed among the new construction, creating a layered resource (**Figures 16.9-16.12**).

Current Condition

AR 10 is in fair condition though it has undergone significant alteration in the form of new construction, modification of extant structures, and removal of historic and non-historic structures and buildings.

NRHP Recommendation

AR 10 was evaluated for National Register eligibility using the three NRHP criteria identified in this research. AR 10 was closely considered for listing in the NRHP at the local level under Criterion A for a significant association with the Moreman Community Association Cotton Gin and the local cotton ginning industry of Port Lavaca. The original Moreman Community Association Cotton Gin is recognized as one of the earliest gins in the area surrounding Port Lavaca. Early cotton gins and the cotton ginning industry served as community centers and nodes of economic development at Port Lavaca, Seadrift, and other nearby communities beginning at the start of the 20th century. The Moreman Community Association Cotton Gin constructed its original gin complex in 1934 and continued to update the facility through the later decades of the 20th century. The gin continues to operate providing economic and industrial opportunity to local populations, specifically local cotton farmers. While AR 10 retains integrity of location, setting, feeling, and association, it severely lacks integrity of design, materials, and workmanship. AR 10 does not retain extant buildings from the original 1934 construction of the gin and, of the approximately 10 existing structures, only two buildings and two tanks are of historic age. The two historic age buildings are an office and Quonset hut, neither of which currently embody the character defining features of the historic-age facility.

Under Criterion B, the resource lacks significance, as it cannot be linked to anyone of historic relevance in the region, state, or nation. Under Criterion C, the resource is not eligible due to a lack of architectural significance. The facility does not embody distinguishing characteristics that



make it a unique example of its architectural type and these types of structures are common across the region, state, and nation. The facility has been significantly modified, but remaining historic age buildings retain overall integrity of location, design, setting, feeling, and association. In summary, AR 10 is recommended as not eligible for listing in the NRHP. No further work is recommended.

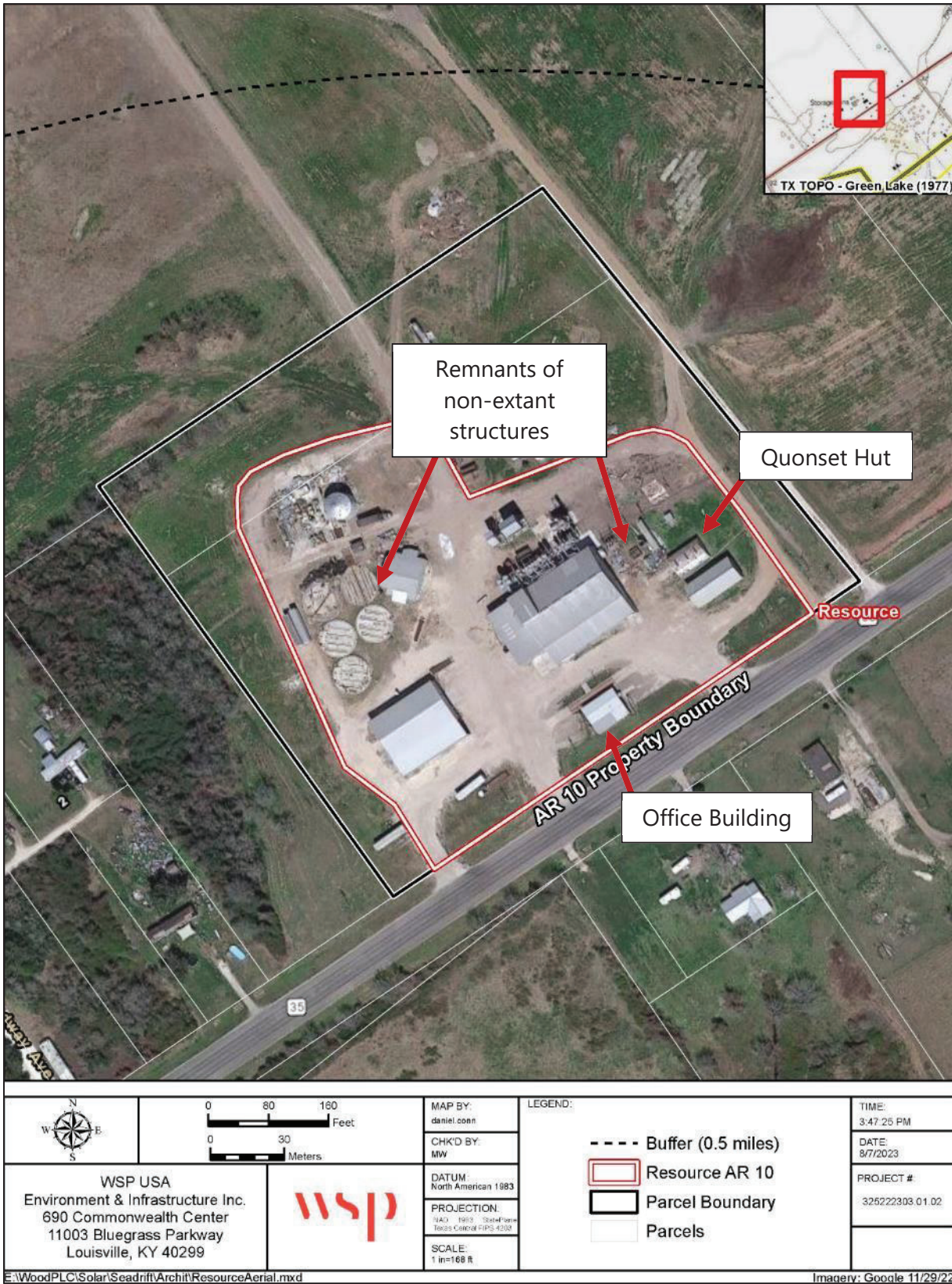


Figure 16.1. Aerial Image Showing the Location of AR 10.

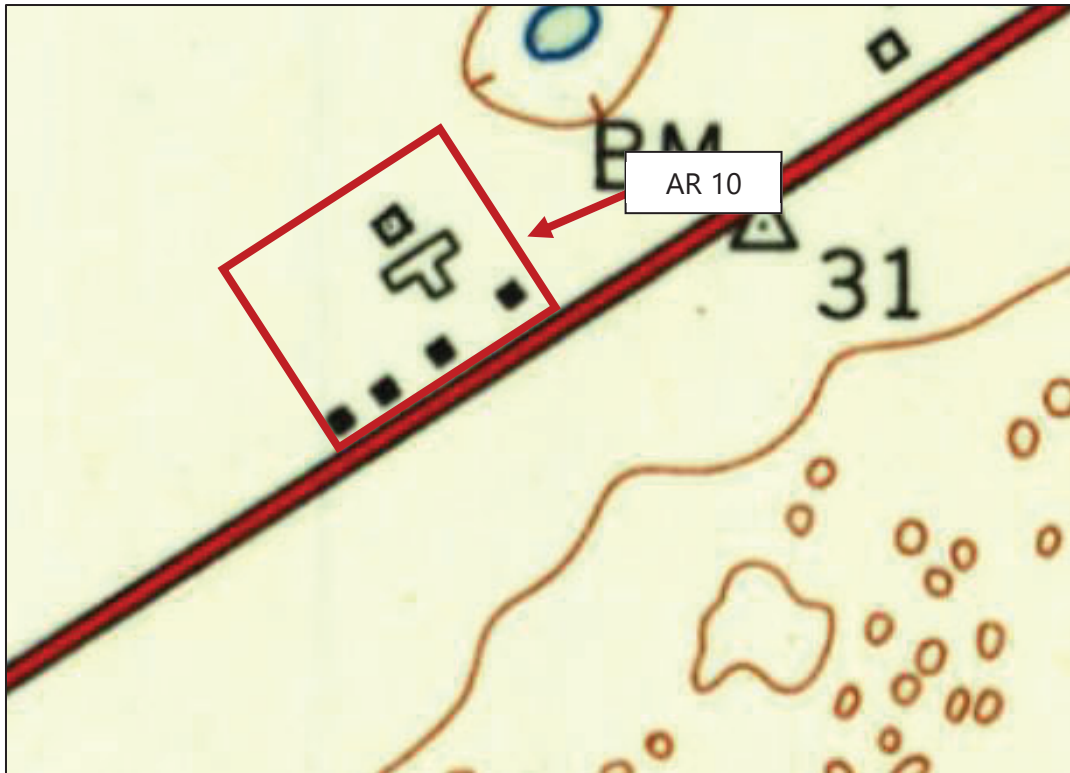


Figure 16.2. Location of AR 10 on the 1953 Green Lake USGS Topographic Map.



Figure 16.3. Overview of AR 10, facing Northwest.



Figure 16.4. View of South and East (Main) Elevations of Office Building, facing Northwest.



Figure 16.5. View of the South Elevation of Office Building, facing North.



Figure 16.6. View of West Elevations of Quonset Hut and Nearby Barn, facing East.



Figure 16.7. View East and South Elevations of Quonset Hut, facing Northwest.



Figure 16.8. View North Elevation of Quonset Hut, facing South.



Figure 16.9. View of Earlier Complex Remnants, facing Southwest.



Figure 16.10. View of Grain Bin Approaching Historic Age, facing West.



Figure 16.11. View of Grain Bin Foundations, facing South.



Figure 16.12. View of Processing Machinery, facing West; Note the Cotton Littered around the Ground Outside of the Ginning Building.

17.0 CONCLUSIONS AND RECOMMENDATIONS

On July 11-13, 2023, at the request of X-energy, WSP architectural historians conducted an aboveground cultural resource eligibility and effects survey for the proposed Project Long Mott in Calhoun County, Texas. The purpose of the survey was to identify aboveground historic resources over 50 years of age located within the APE; to evaluate these resources relative to their eligibility for listing in the NRHP; and to assess the potential direct and indirect visual effects of the proposed undertaking upon these resources.

The APE for aboveground cultural historic resource survey was determined in consultation with X-energy and the THC, the Texas SHPO. The project area is in the vicinity of the Dow Seadrift Operations Property, encompassing the northeast corner of the existing facility and adjacent Dow-owned land to the northeast, near the intersection of State Highways 185 and 35 in Calhoun County, Texas. The APE for cultural historic resources includes an additional 0.5-mile buffer radiating out from the proposed project limits to account for impacts to aboveground historic architectural resources that are adjacent to the project area.

A total of ten resources over 50 years old—including four residential buildings, two outbuildings, one utility site, two operating industrial or agricultural facilities, and one defunct industrial facility—were identified within the APE (**Table 17.1**). Of the ten resources, a total of seven were previously surveyed by Sara McLaughlin, Sandy Shannon, Amy E. Dase, Mitch Ford, Adrienne Vaughan, and Campbell (among others) of Stantec in 2021-2022 (Hinder, Rinaldi-Williams, et al. 2023) as part of a county-wide historic resources survey. All seven of these previously surveyed resources were recommended as not eligible for listing in the NRHP by McLaughlin et al.

Of the ten resources newly surveyed and revisited in this study, WSP Environment and Infrastructure recommends none as eligible for listing in the NRHP due to lack of historic and architectural significance and/or loss of integrity. Based on these findings, WSP recommends that there would be **No Historic Properties Affected** by the proposed undertaking.

Table 17.1. NRHP Recommendations and Determinations of Effect

Resource Number	Style/Form	NRHP Recommendation	Determination of Effect
AR 1	Mid-20 th Century Industrial Complex	Not eligible	No Historic Properties Affected
AR 2	Industrial Ruins	Not eligible	No Historic Properties Affected
AR 3	20 th Century Utility Structures	Not eligible	No Historic Properties Affected
AR 4	20 th Century Agricultural Outbuildings	Not eligible	No Historic Properties Affected
AR 5	Ranch	Not eligible	No Historic Properties Affected
AR 6	Transitional Ranch	Not eligible	No Historic Properties Affected
AR 7	20 th Century Residential Outbuilding	Not eligible	No Historic Properties Affected
AR 8	Ranch	Not eligible	No Historic Properties Affected
AR 9	20 th Century Vernacular	Not eligible	No Historic Properties Affected
AR 10	Mid-20 th Century Cotton Gin Facility	Not eligible	No Historic Properties Affected

19.0 REFERENCES CITED

Calhoun County

- 2023 "About." Calhoun County Texas. Electronic document, <https://www.calhouncotx.org/about/>, accessed July 27, 2023.

Calhoun County Historical Commission

- 1988 *Historical Marker # 2268: Green Lake*. Texas Historical Sites Atlas. Electronic document, <https://atlas.thc.state.tx.us/Details/5057002268>, accessed July 25, 2023.
- 2015 *Cotton Gins of Calhoun County*. Texas Historical Markers. Electronic document, https://www.calhouncountyhc.org/Marker_Cotton_Gins.pdf, accessed August 7, 2023.

Center for Land Use Interpretation, The

- 2009 "Texas Oil: Landscape of an Industry." Programs & Projects. Electronic Document, <https://clui.org/projects/texas-oil>, accessed August 3, 2023.

Dase, Amy E.

- 2003 *A Field Guide to Industrial Properties in Texas*. Texas Department of Transportation (TxDOT). Electric document, <https://www.thc.texas.gov/public/upload/preserve/survey/survey/Industrial%20Props.pdf>, accessed July 21, 2023.

Dow Chemical Company

- 2023 "Seadrift Operations." Dow Corporate Home: Locations. Electronic document, <https://corporate.dow.com/en-us/locations/seadrift>, accessed July 26, 2023.

Environmental Protection Agency

- 2023 Ecoregion Download Files by State – Region 6. Electronic document, [Ecoregion Download Files by State - Region 6 | US EPA](https://www.epa.gov/ecoregion/ecoregion-download-files-by-state-region-6), accessed August 22, 2023.

Ficklen Maywald, Lonnie

- 2020 Port Lavaca, TX. The Handbook of Texas Online Texas State Historical Association. Electronic document, <https://www.tshaonline.org/handbook/entries/port-lavaca-tx>, accessed July 21, 2023.

GAF

- 2023 "History." About Us. Electronic Document, <https://www.gaf.com/en-us/about-us/history>, accessed August 3, 2023.

Hinder, Kimberly, Rinaldi-Williams, Emily et al.

- 2023 *Calhoun County Survey Report* Historic Resources Survey of Aransas, Refugio, and Calhoun Counties. Texas Historical Commission. Electronic document, https://www.thc.texas.gov/public/upload/preserve/harvey/HarveySurvey/DRAFTS_May-2023/DRAFT_Calhoun_Historic-Resources-Survey-Report_05-18-2023.pdf, accessed July 20, 2023.

Journal of Commerce

- 1991 "Blast Knocks Out Carbide's Seadrift Unit." *Journal of Commerce*. Electronic document, https://www.joc.com/article/blast-knocks-out-carbides-seadrift-unit_19910312.html, accessed July 26, 2023.

Kleiner, Diana J.

2020 Calhoun County. *The Handbook of Texas Online* Texas State Historical Association. Electronic document, <https://www.tshaonline.org/handbook/entries/calhoun-county>, accessed July 20, 2023.

Maywald, Lonnie F

2021 Port Lavaca, TX. *The Handbook of Texas Online* Texas State Historical Association. Electronic document, <https://www.tshaonline.org/handbook/entries/port-lavaca-tx>, accessed July 20, 2023.

McAlester, Virginia

2015 *A Field Guide to American Houses*. Alfred A. Knopf, New York.

Moorhead, Gerald et al.,

2012 "Port Lavaca (Calhoun County)," Texas: Central, South, and Gulf Coast. Electronic document, <http://sah-archipedia.org/essays/TX-01-0004-0009-0005>, accessed August 7, 2023.

Mowery, Irvin C. and Bower, James E.

1978 *Soil Survey of Calhoun County, Texas*. United States Department of Agriculture Soil Conservation Service in cooperation with Texas Agricultural Experiment Station. Electronic document, <https://ttu-ir.tdl.org/handle/2346/47654>, accessed July 20, 2023.

Travel South Texas

2023 "Calhoun County: Including Port Lavaca, Seadrift and Port O'Connor." Texmaps and Carson Map Company, Inc. Electronic document, <http://www.stxmaps.com/go/calhoun-county.html>, accessed July 26, 2023

United States Department of the Interior

2002 *National Register Bulletin #15: Guidelines for Local Surveys: A Basis for Preservation Planning*. United States Department of the Interior, Washington D.C.

Texas General Land Office

1911 *Map of Calhoun County Texas*. The Portal to Texas History. Electronic document, <https://texashistory.unt.edu/ark:/67531/metaph89116/m1/1/zoom/?resolution=12&lat=53.71.620752426219&lon=84.67.731063223779>, accessed July 25, 2023.

United States Census Bureau

2023 *Calhoun County, Texas*. QuickFacts. Electronic Document. <https://www.census.gov/quickfacts/calhouncountytexas>, accessed July 26, 2023.

United States Geological Survey (USGS)

1953 Green Lake, TX topographic quadrangle map (1953 ed.).

1953 Austwell, TX topographic quadrangle map (1953 ed.).

1973 Green Lake, TX 7.5-minute series topographic quadrangle map (1973 ed.).

1973 Austwell, TX 7.5-minute series topographic quadrangle map (1973 ed.).

Venable, Kali

2022 "Calhoun County moves forward with development of Green Lake," *Victoria Advocate*. Electronic document, <https://www.victoriaadvocate.com/premium/calhoun-county->

[moves-forward-with-development-of-green-lake/article_2703a9d4-c301-11eb-8bc2-e79feba7c66b.html](https://www.wsp.com/moves-forward-with-development-of-green-lake/article_2703a9d4-c301-11eb-8bc2-e79feba7c66b.html), accessed July 25, 2023.



VI-C

**X Energy, LLC, "Phase I Intensive Archaeological Survey for
Project Long Mott - Negative Finding Report Service
Receipt Inspection Report," Revision 2, March 26, 2025
(unrestricted; public)**



Phase I Intensive Archaeological Survey for Project Long Mott –
Negative Finding Report
Service Receipt Inspection Report

Doc ID No: 008728
Revision: 2
Date: 3/26/2025



**Phase I Intensive Archaeological Survey for
Project Long Mott – Negative Finding Report
Service Receipt Inspection Report**

Document ID Number	:	008728 Configuration
Classification	:	Quality Documentation
Revision	:	2
Security Classification	:	Unrestricted
Status	:	Approved
Date Created	:	3/26/2025
Project	:	Long Mott Generating Station

This document is the property of X Energy, LLC. The content may not be reproduced, disclosed, or used without the Company’s prior written approval.



Phase I Intensive Archaeological Survey for Project Long Mott –
Negative Finding Report
Service Receipt Inspection Report

Doc ID No: 008728

Revision: 2

Date: 3/26/2025

E-SIGNATURES



Phase I Intensive Archaeological Survey for Project Long Mott –
Negative Finding Report
Service Receipt Inspection Report

Doc ID No: 008728
Revision: 2
Date: 3/26/2025

Document Approval Signees

Action	Designation	Name	Signature	Date
Preparer	Licensing Project Manager	Jessa Hultgren	Signed by: 173092D997244BC...	March 28, 2025
Approver	Licensing Manager	Milton Gorden	Signed by: 32B3ED0F7B5D419...	March 28, 2025

11:13 AM ED
11:14 AM ED



Phase I Intensive Archaeological Survey for Project Long Mott –
Negative Finding Report
Service Receipt Inspection Report

Doc ID No: 008728
Revision: 2
Date: 3/26/2025

CONFIGURATION CONTROL/DOCUMENT CHANGE HISTORY

Document Change History

Rev.	Date	Preparer	Page/Section Revised	Description
1	3/19/25	Jessa Hultgren	All	Document Creation
2	3/26/2025	Jessa Hultgren	All	Changed Security Classification from Proprietary to Unrestricted. Attached is a letter from S&L stating the following: "Sargent & Lundy, LLC (S&L) understands that X Energy, LLC (XE) would like to include the reports listed below as part of the Long Mott Energy, LLC (LME) Construction Permit application to the U.S. Nuclear Regulatory Commission (NRC)... Our confidential/proprietary statement on the transmittal of those documents requires written permission for release of same. This email serves as our permission for those reports."



Phase I Intensive Archaeological Survey for Project Long Mott –
Negative Finding Report
Service Receipt Inspection Report

Doc ID No: 008728
Revision: 2
Date: 3/26/2025

SERVICE RECEIPT INSPECTION REPORT

Provide title, number and revision of contractor document and corresponding title, number and revision assigned by X-energy from Teamcenter.

Company	Document Title	Document Number	Rev.
X-energy	Phase I Intensive Archaeological Survey for Project Long Mott – Negative Finding Report	008728	2
Supplier	Phase I Intensive Archaeological Survey for the Proposed Project Long Mott, Calhoun County, Texas – Negative Finding Report	WSP-XES-08	1

Disposition	
☒	Accepted
☐	Rejected (Deliverable must re-submitted after comments are incorporated.)

If deliverable is rejected, rationale for disposition

This record provides evidence that the deliverable was reviewed in accordance with QAP 7.1.

The Responsible Engineer’s signature above confirms that contract requirements including Quality Assurance requirements are satisfied as documented in Question #1 of the Owner Acceptance (OAR) form (QAP-7.1-F03) and that appropriate technical reviews have been completed as documented in Questions #2 through #17 of the OAR form in accordance with QAP 7.1.

If a document is rejected, all non-conformances shall be documented in a non-conformance report (XEFORM-0059).

From: [Pressburger, Maury A](#)
To: [Milton Gorden](#); [Jessa Hultgren](#)
Cc: [Jannetty, Sandra J](#); [Boswell, Greg](#)
Subject: SL-XEN-2025-078 - Authorization to release reports
Date: Wednesday, March 26, 2025 9:59:47 AM

Notice: This email originated from outside of the organization. *Do not click links or open attachments unless you recognize the sender and know the content is safe.*

Milton,

Sargent & Lundy, LLC (S&L) understands that X Energy, LLC (XE) would like to include the reports listed below as part of the Long Mott Energy, LLC (LME) Construction Permit application to the U.S. Nuclear Regulatory Commission (NRC).

- Transmittal No. SL-XEN-2024-192; Phase I Intensive Archaeological Survey for the Proposed Long Mott Project, Calhoun County, Texas – Negative Finding Report; WSPDC#: WSP-XES-08; Rev. 1; Dated 19-Feb-2024
- Transmittal No. SL-XEN-2024-193; Cultural Historic Survey for the Proposed Project Long Mott, Calhoun County, Texas; WSPDC#: WSP-XES-07; Rev. 3; Dated 10-Jan-2024

Our confidential/proprietary statement on the transmittal of those documents requires written permission for release of same. This email serves as our permission for those reports.

Very Best Regards,

Maury

Maury Pressburger

Director, Nuclear Siting

Sargent & Lundy

1-312-269-3111 | 1-224-565-1983 (mobile) | 1-312-269-1913 (fax)

maury.a.pressburger@sargentlundy.com

www.sargentlundy.com

55 E. Monroe | Chicago, IL 60603



ISSUE SUMMARY AND APPROVAL PAGE

Project No. A13766.119
Transmittal No. SL-XEN-2024-192
November 7, 2024

X-energy LLC
Phase I Intensive Archaeological Survey for the Proposed Long Mott Project, Calhoun County, Texas –
Negative Finding Report

This Phase I Intensive Archaeological Survey for the Proposed Long Mott Project, Calhoun County, Texas – Negative Finding Report at the Union Carbide Corporation (UCC) Seadrift Operations site (the Dow Chemical Corporation [Dow] Facility) in Seadrift, Texas has been reviewed for compliance with applicable technical and contractual documents and is approved for use.

The report was prepared by WSP USA Environment and Infrastructure, Inc. (WSP) under WSP project number 325223319.

Document No.	Rev.	Purpose	Date	Sections Affected
TC#: 008728 WSPDC#: WSP-XES-08	1	Final Report	02/19/2024	All

Reviewed by

Julianna Crumlish
Senior Environmental
Associate

Approved by

Greg Boswell
Consultant I



Phase I Intensive Archaeological Survey for the Proposed Project Long Mott, Calhoun County, Texas – Negative Finding Report

Final Report

WSP Project No.: 325223319

WSP Cultural Report of Investigations No.: 2023-046

WSPDC - XES-08

TC#: 008728



Prepared for:

X-Energy

February 19, 2024

This Page Left Intentionally Blank

Phase I Intensive Archaeological Survey for the Proposed Project Long Mott, Calhoun County, Texas – Negative Finding Report

Final Report

Prepared for:
X-Energy

WSP Project No.: 325223319
WSP Cultural Report of Investigations No.: 2023-046
WSPDC-XES-08
TC#: 008728

Prepared by:



WSP Environment & Infrastructure Solutions

A handwritten signature in black ink, appearing to read 'John A. Hunter', written over a solid black horizontal line.

John A. Hunter, MA, RPA
Principal Investigator

Authored by:
John A. Hunter MA, RPA, and Clay Cantrell

February 2024

This Page Left Intentionally Blank

MANAGEMENT SUMMARY

From July 10 to 19, 2023, WSP USA Environment & Infrastructure, Inc. (WSP) conducted a Phase I intensive archaeological survey of 930.6 acres in support of the Environmental Report (ER) for the proposed Project Long Mott in Calhoun County, TX. The survey was conducted under contract with X-Energy to facilitate compliance with Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas (Natural Resources Code, Title 9, Chapter 191, Subchapter A). Per the provisions of the Texas Cultural Resources Code, Title 9, Chapter 191, WSP initiated a review of the Scope of Work (SOW) with the Texas Historical Commission (THC) on May 12, 2023, with the concurrence of the proposed SOW from the THC on June 7, 2023 (THC Tracking No. 202308205).

This report details the 930.6-acre portion (1.45 square miles or 376.6 hectares) portion of the Long Mott Project that has not been previously submitted for consultation. The 617.4-acre portion (0.96 square miles or 249.85 hectares) of the project (Hunter and Cantrell 2023) was consulted on previously (submitted on August 1, 2023, THC Tracking No. 202312012) by the Department of Energy (DOE) in support of the Environmental Report (ER) for the Xe-100 Dow Seadrift Site in Calhoun County, Texas.

The APE consists of portions of agricultural fields containing unharvested and harvested corn, disturbances from extant infrastructure (plant facilities, paved areas, and holding ponds), as well as portions of open scrub growth, railroad tracks, and a portion of a railyard. The ground surface visibility varied across the APE and as such the Phase I intensive survey was completed over the entire APE using a combination of systematic shovel test probe excavation (STPs) coupled with pedestrian survey.

A total of 179 STPs were excavated across the APE. None of the excavated STPs contained cultural material. Additionally, no evidence of deeply buried cultural deposits suggesting buried A-horizons or cultural artifacts were identified in any of the excavations. As a result of the intensive archaeological survey, no archaeological sites or cultural materials were identified. WSP recommends that the proposed project will have no effect on historic properties and that no additional archaeological work is required within the APE.

This Page Left Intentionally Blank

TABLE OF CONTENTS

CHAPTER	PAGE NO.
1 INTRODUCTION	1
1.1 Overview.....	1
1.2 Intensive Archaeological Survey Summary.....	4
2 ENVIRONMENTAL SETTING	5
2.1 Physiography, Geology, and Soils	5
2.2 Geoarchaeological Assessment	7
2.3 Prehistoric and Historic Environment	7
3 CULTURAL AND ARCHAEOLOGICAL BACKGROUND.....	9
3.1 Prehistoric Context.....	9
3.1.1 Paleoindian	9
3.1.2 Archaic (7,500 – 950 BP).....	9
3.1.3 Late Prehistoric (950 – 250 BP).....	10
3.1.4 Protohistoric/Early Historic.....	10
3.2 Historic Context.....	10
3.3 Archaeological Background Research	11
3.4 Historic Map Review	11
4 METHODS	15
5 RESULTS.....	17
5.1 APE Survey Results.....	17
5.2 High Probability Areas	23
6 SUMMARY AND RECOMMENDATIONS	25
7 REFERENCES CITED	27
Appendix A	29

FIGURES

Figure 1.1. Project Location in Calhoun County, Texas	1
Figure 1.2. The APE Shown on the 1977 Port Lavaca West and Green Lake 7.5-minute Quadrangles.....	2
Figure 1.3. The APE Shown on a Current Aerial Photograph	3
Figure 2.1. A Physiographic Map of Texas Showing the Project Area Location.....	5
Figure 2.2. Soils Located Within and Surrounding the APE	6
Figure 3.1. Texas Site Atlas Background Data within 1-km of the APE.....	12
Figure 3.2. APE Shown on the 1953 24k Topographic Quadrangles	13
Figure 5.1. Overview of APE Showing Corn, Facing Southwest	17
Figure 5.2. Overview of the APE Showing Scrub Growth, Facing North.	18
Figure 5.3. Overview of the APE Showing Railroad Tracks, Facing North.....	18
Figure 5.4. Overview of the APE Showing Railyard, Facing Northeast.....	19

Figure 5.5. Overview of the Ground Surface, Facing West19

Figure 5.6. View of the APE South, Showing Drainage and Utility, Facing Northeast20

Figure 5.7. Access Road in Central APE, Facing North.20

Figure 5.8. Survey Results, Showing STP Locations.....21

Figure 5.9. Observed Soil Profile22

Figure 5.10. Observed Soil Profile22

Figure 5.11. Observed Soil Profile23

TABLES

Table 2.1. Summary of Soil Types Found within the APE.....7

1 INTRODUCTION

1.1 Overview

X-Energy contracted with WSP USA Environment & Infrastructure, Inc. (WSP) to conduct a Phase I intensive archaeological survey in support of the Environmental Report (ER) for the proposed Project Long Mott in Calhoun County, Texas (**Figures 1.1 – 1.3**). The survey was conducted under contract with X-Energy to facilitate compliance with Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas (Natural Resources Code, Title 9, Chapter 191, Subchapter A). Per the provisions of the Texas Cultural Resources Code, Title 9, Chapter 191, WSP initiated a review of the Scope of Work (SOW) with the Texas Historical Commission (THC) on May 12, 2023, with the concurrence of the proposed SOW from the THC on June 7, 2023 (THC Tracking No. 202308205). The purpose of the survey was to determine if any archaeological resources would be impacted by the proposed undertaking.

The archaeological survey was completed between July 10 to 19, 2023. John A. Hunter, MA, RPA served as the project principal investigator for the project. He was assisted in the field by archaeologists Patrick Cantrell, Steve Lucas, Nickolas Brown, and Gideon Hoekstra. Report graphics were produced by Daniel Conn.



Figure 1.1. Project Location in Calhoun County, Texas.

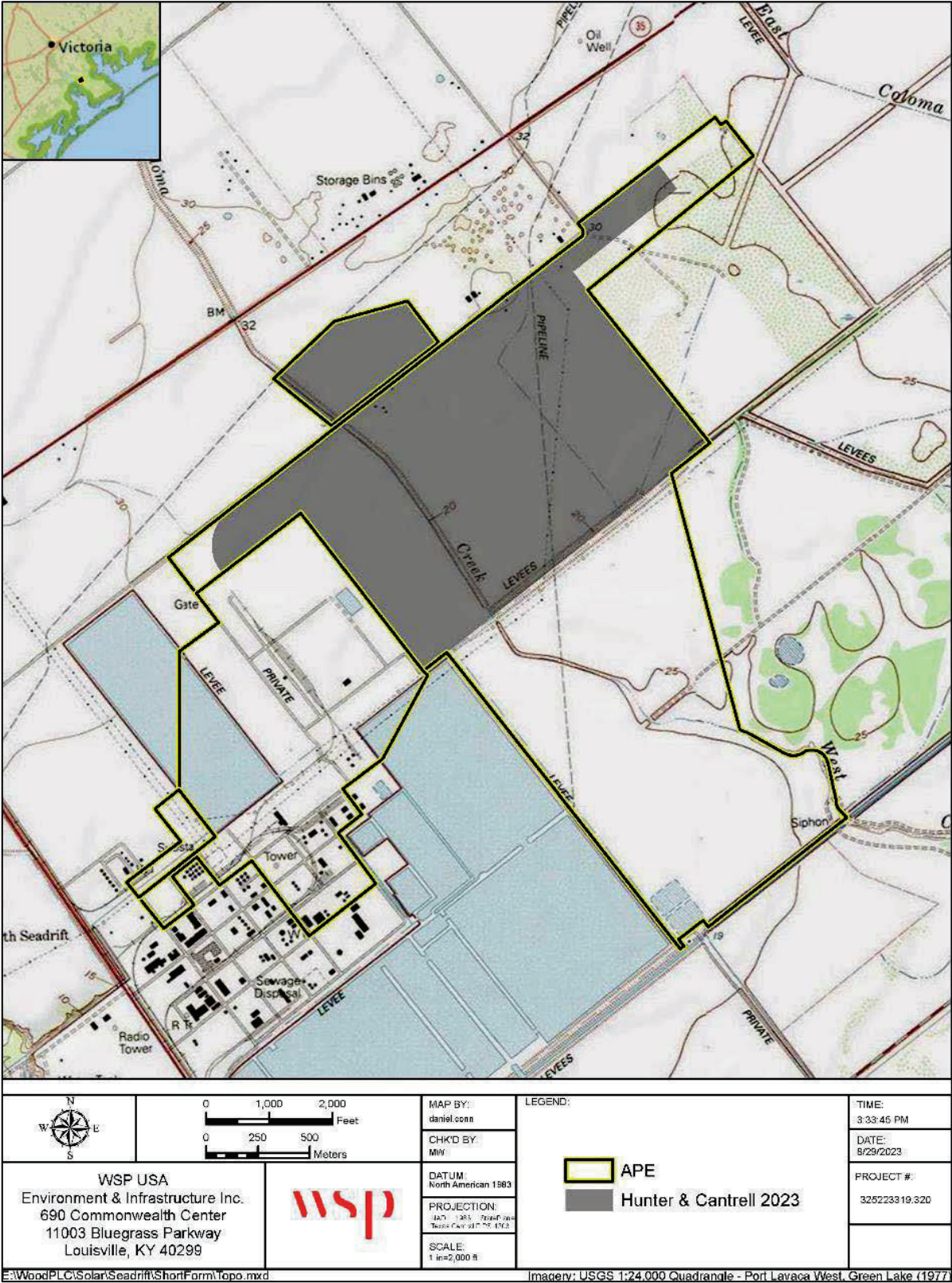


Figure 1.2. The APE Shown on the 1977 Port Lavaca West and Green Lake 7.5-minute Quadrangles.

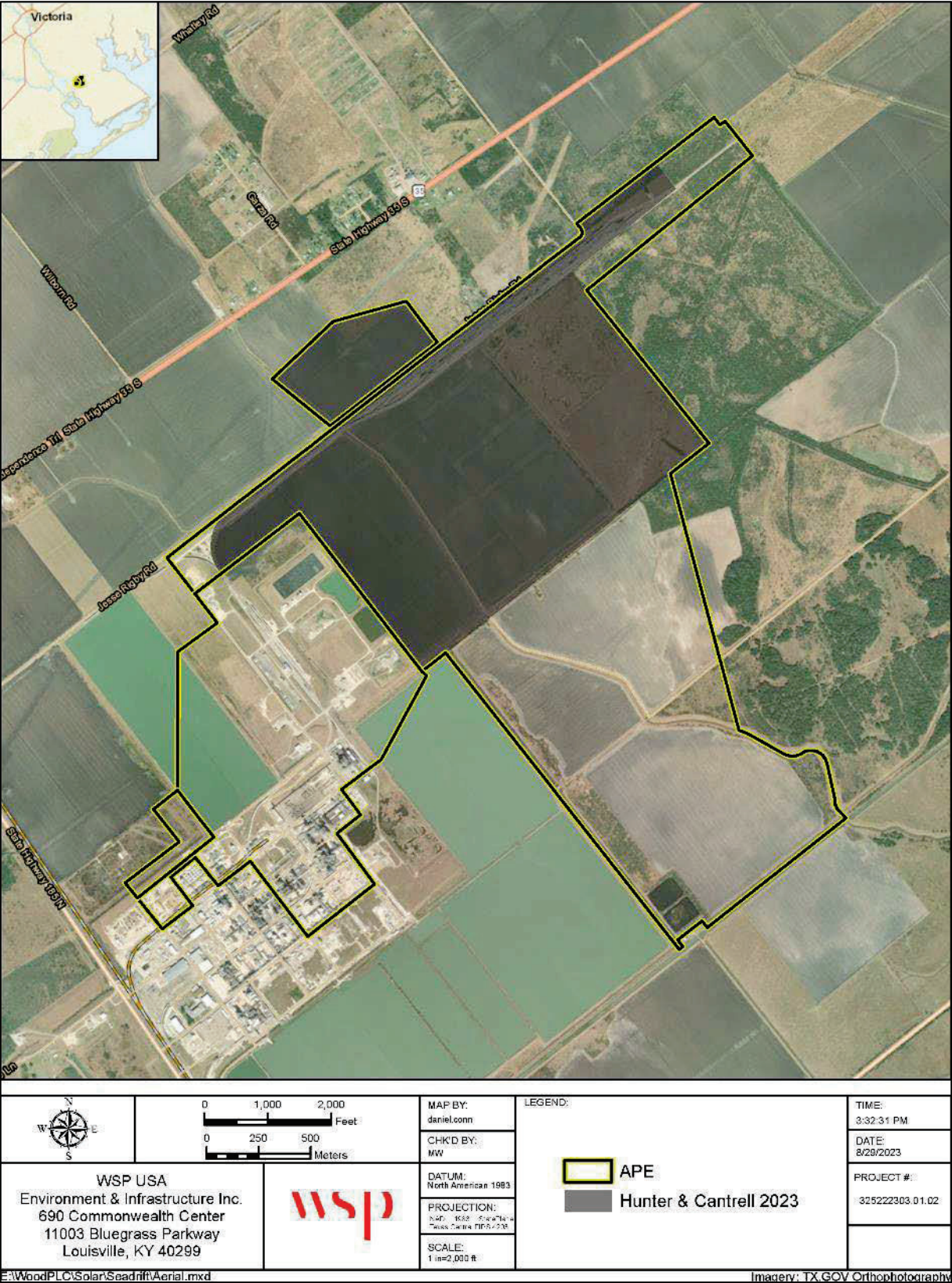


Figure 1.3. The APE Shown on a Current Aerial Photograph.

1.2 Intensive Archaeological Survey Summary

From July 10 to 19, 2023, WSP conducted a Phase I intensive archaeological survey for the proposed Project Long Mott in Calhoun County, Texas. This report details the 930.6-acre portion (1.45 square miles or 376.6 hectares) portion of the Long Mott project that has not been previously submitted for consultation. The 617.4-acre portion (0.96 square miles or 249.85 hectares) of the project (Hunter and Cantrell 2023) was consulted on previously (submitted on August 1, 2023, THC Tracking No. 202312012) by the DOE in support of the ER for the Xe-100 Dow Seadrift Site in Calhoun County, Texas.

The APE consists of portions of agricultural fields containing unharvested and harvested corn, disturbances from extant infrastructure (plant facilities, paved areas, and holding ponds), as well as portions of open scrub growth, railroad tracks, and a portion of a railyard. The ground surface visibility varied across the APE and as such the Phase I intensive survey was completed over the entire APE using a combination of systematic shovel test probe excavation (STPs) coupled with pedestrian survey.

Prior to fieldwork, a desktop geomorphological assessment of the APE was conducted. Two broad soil associations are mapped within the survey area: Dacosta-Contee Complex with 0 to 1 percent slopes and Laewest clay with 0 to 1 percent slopes (USDA/NRCS 2023). Overall, the defined soil horizons, coupled with the project location along a relatively straight portion of a low-level waterway (West Coloma Creek) and relatively flat topographic landform, suggest the area is unlikely to contain deeply buried archaeological deposits. The A-Bt upper soil horizon suggests a fairly stable landform allowing for pedogenesis, not one subjected to frequent, large depositional events such as flooding. While the occurrence of the Bt-horizon deposits does not preclude cultural materials, the shallow nature of these deposits suggests any buried cultural deposits can be reached during shovel test excavations.

A total of 176 STPs were excavated within the APE. None of the excavated STPs contained cultural material. Additionally, no evidence of deeply buried cultural deposits suggesting buried A-horizons or cultural artifacts were identified in any of the excavations. As a result of the intensive archaeological survey, no archaeological sites or cultural materials were identified. WSP recommends that the proposed project will have no effect on historic properties and that no additional archaeological work is required within the APE.

2 ENVIRONMENTAL SETTING

2.1 Physiography, Geology, and Soils

The project area falls within the Coastal Plains physiographic region. This Coastal Plain is an extension of the Coastal Plain region lining the Atlantic Ocean in the eastern United States (Bureau of Economic Geology 1996). More specially, the APE is located within the Northern Humid Gulf Coastal Prairies (**Figure 2-1**). This physiographic region is characterized by its association with the ocean and wind and rain associated with the ocean. This region contains shallow bays, estuaries, salt marshes, dunes, and tidal flats (TSHA 2023).

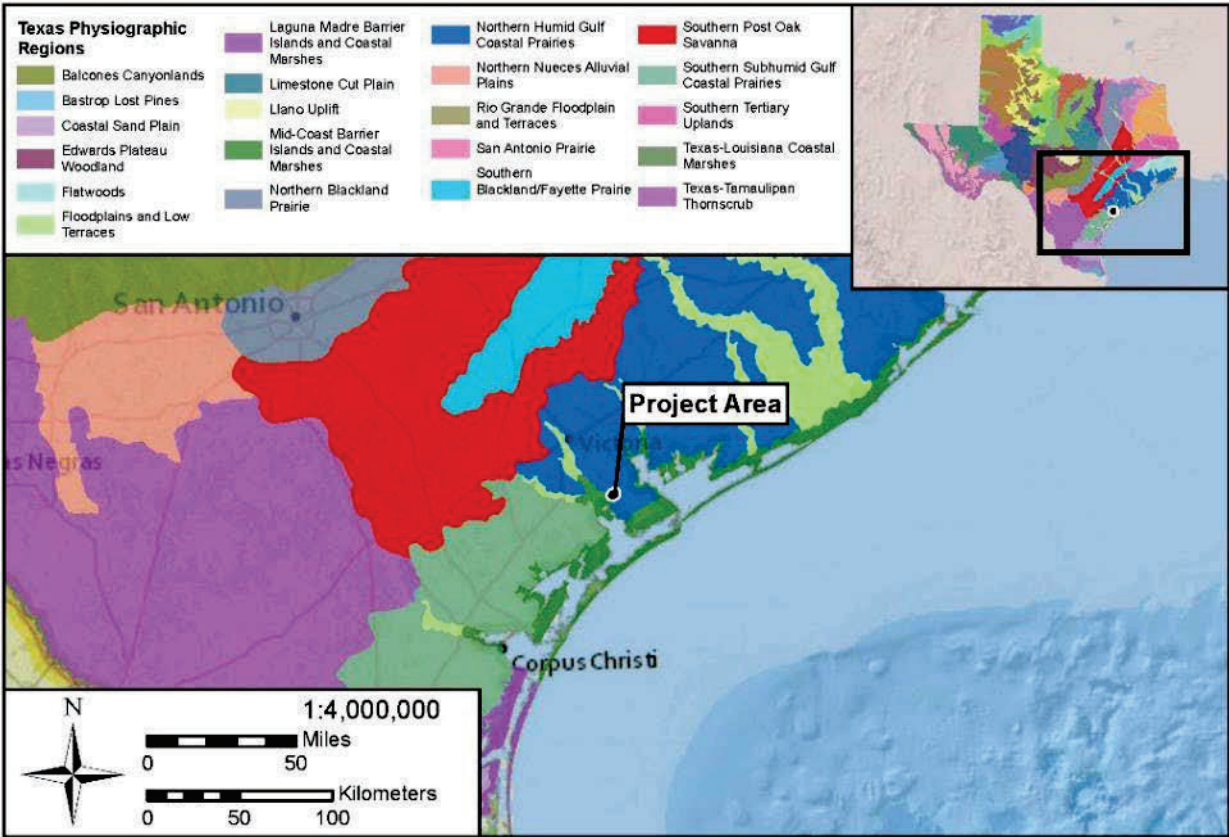


Figure 2.1. A Physiographic Map of Texas Showing the Project Area Location.

Three soil associations, encompassing three soils are defined within the APE: Dacosta – Contee complex 0 – 1 percent slopes (Dc), Edna loam 0 -1 percent slopes (Ed), and Laewest clay 0 – 1 percent slopes (La) (**Figure 2.2**). Common traits attributed to these soil types are summarized below in **Table 2.1**, including texture, soil horizon designation of a typical soil profile, parent material (material from which the soil type has formed), and drainage. Information concerning the soil type was compiled using the information available on the United States Department of Agriculture (USDA), National Resource Conservation Service (NRCS) Web Soil Survey (USDA/NRCS 2023).

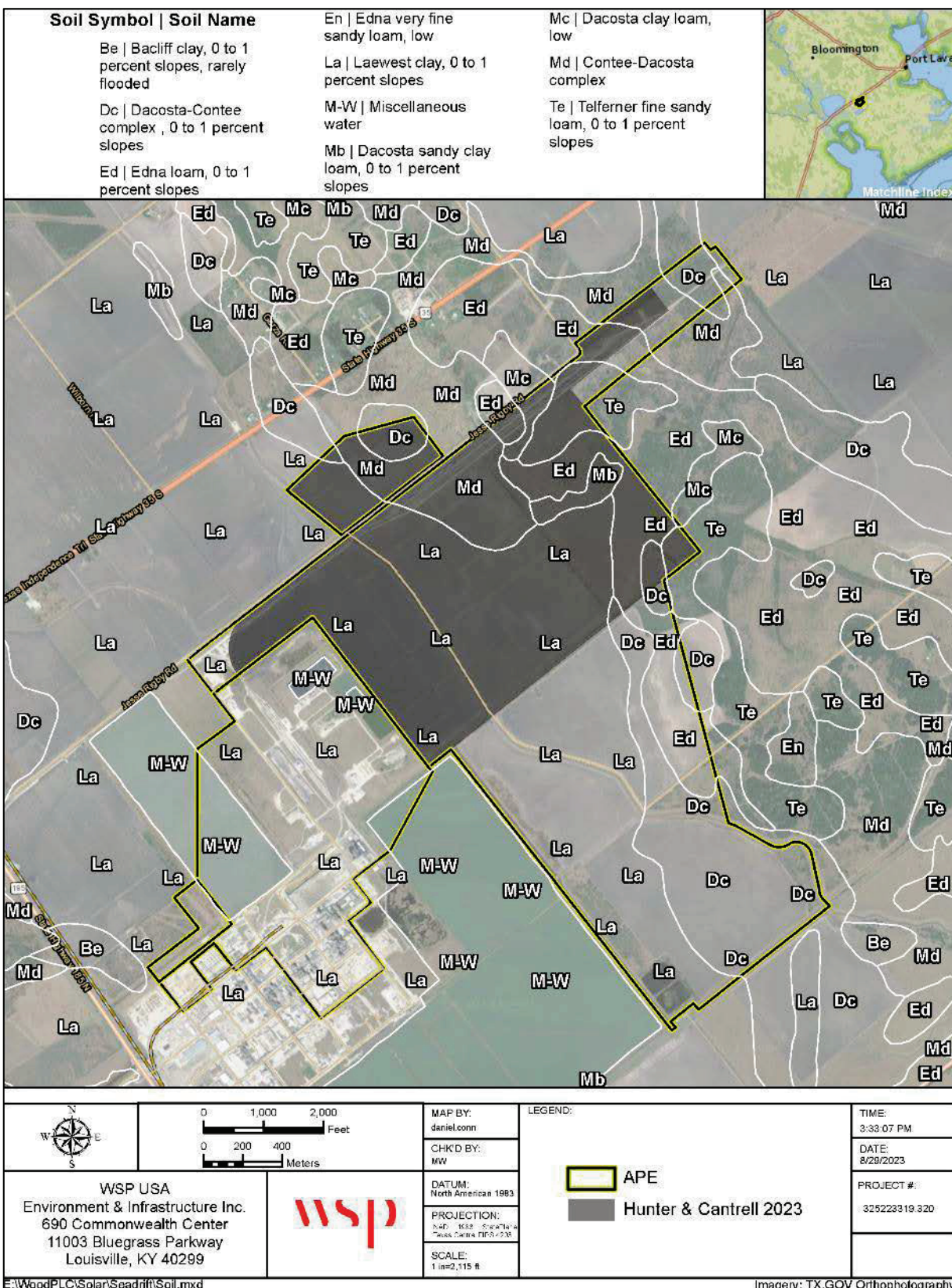


Figure 2.2. Soils Located Within and Surrounding the APE.

Table 2.1. Summary of Soil Types Found within the APE.					
Soil Type	Typical Soil Profile	Drainage	Parent Material	Landform	% of APE
Dacosta – Contee complex (Dc)	A - 0 to 9 inches: sandy clay loam Bt1 - 9 to 13 inches: sandy clay loam Bt2 - 13 to 47 inches: clay Btk - 47 to 74 inches: sandy clay 2BCt - 74 to 80 inches: sandy clay loam	Moderately well drained	Clayey fluviomarine deposits	Flats	3.6
Edna loam (Ed)	A - 0 to 9 inches: loam Bt1 - 9 to 38 inches: clay Bt2 - 38 to 50 inches: clay Btk - 50 to 80 inches: sandy clay loam	Poorly drained	Loamy fluviomarine deposits	Flats	12.4
Laewest clay (La)	A - 0 to 17 inches: clay Bss1 - 17 to 40 inches: clay Bss2 - 40 to 59 inches: clay Bkss - 59 to 80 inches: clay	Moderately well drained	Clayey fluviomarine deposits	Flats	60.6

* Soil horizon sequence inferred from national soil series descriptions (USDA/NRCS Web Soil Staff 2023)

2.2 Geoarchaeological Assessment

Before conducting fieldwork, WSP conducted a geomorphological assessment of the APE. Two soil associations are mapped within the survey area: Dacosta-Contee Complex with 0 to 1 percent slopes and Laewest clay with 0 to 1 percent slopes. Overall, the defined soil horizons, coupled with the project location along a relatively straight portion of a low-level waterway (West Coloma Creek) and relatively flat topographic landform, suggest an area is unlikely to contain deeply buried archaeological deposits. The A-Bt upper soil horizon suggests a fairly stable landform allowing for pedogenesis, not one subjected to frequent, large depositional events such as flooding. While the occurrence of the Bt-horizon deposits does not preclude cultural materials, the shallow nature of these deposits suggests any buried cultural deposits can be reached during shovel test excavations.

The notation of slickensides (ss) in the soil horizon profile speaks to the general environment of the landform. Slickensides in soil are defined as well-worn (smoothed) sides on soil peds that form in clay soils that have significant amounts of shrinking and swelling. Such traits are often attributed to frequently flooded or poorly drained soils, ones which are heavily inundated, then left to dry causing the shrinking and swelling activity. This suggests that the landform was likely frequently wet or inundated before the construction of the numerous ponds and drainage canals currently present in the area.

2.3 Prehistoric and Historic Environment

The central coast of Texas (the shoreline and coastal plain 40-50 km inland) is unified by the presence of five similar, major bay estuarine systems inside a continuous barrier chain (Ricklis 2004). The coastal plain is composed of sandy clays and clayey sands deposited by major fluvial-

deltaic systems during the Pleistocene interglacials and rises very gradually toward the interior. During the last glacial maximum, the sea level was as much as 100 m lower than today, thus human encampments and activity areas along the coast are deeply submerged. By about 9000 years ago the melted waters formed bays comparable to those presently in existence, and they reached their present elevations by 3000 years ago. The barrier islands probably reached their present form about 2500-2000 years ago. The resource-rich shallow water estuaries were protected from strong wave activity by these islands and were increasingly suitable for exploitation by the aboriginal populations.

Calhoun County is located in the southwestern section of the Gulf Coast Prairie and encompasses a broad flat plain that is broken up by natural rain and inland bays. Elevation in the county ranges from sea level to approximately 55 feet amsl. The average rainfall is approximately 39 inches (Mowery and Bower 1978).

3 CULTURAL AND ARCHAEOLOGICAL BACKGROUND

The history of human activity in Calhoun County and the surrounding region spans thousands of years. The earliest groups to leave a definitive material record of their presence were early Paleoindians who entered the region during the Late Pleistocene glacial epoch, more than 11,000 years ago. Their descendants and the descendants of other Native American groups who migrated to the region lived in the region until the arrival of the first European explorers.

While cultural change is a slow and continual process, archaeologists and other researchers divide the human history of a region into distinct cultural periods. Archaeologists and historians recognize four broadly defined periods, Paleoindian, Archaic, Late Prehistoric, Protohistoric, and Historic. Due to the lack of cultural material identified during the current investigations, the following sections have been abbreviated.

3.1 Prehistoric Context

Previous archaeological research in the project region has defined five distinct time periods that include, Paleoindian: 11,500 BP to 8,800 BP, Archaic: 8,800 BP to 1,200 BP, Late Prehistoric/Protohistoric: 1,200 BP to 500 BP, and Historic: 500 BP to present. The distinction between these periods relies heavily on the different types of subsistence practices utilized and the cultural traits present. However, it should be noted that discussion of the prehistory of Coastal Texas is largely restricted to the Central Texas Coast because the Lower Texas coast is relatively unknown (Ricklis 2004).

3.1.1 Paleoindian

The Paleoindian of Coastal Texas is not discussed by Ricklis (2004) because it is known only from scattered surface finds of diagnostic projectile points. No intact subsurface components have been explored. Because of the significantly lower water levels at the time, the Pleistocene coastline is deeply submerged. The cultural material that is present on land is related to terrestrial riverine environments.

3.1.2 Archaic (7,500 – 950 BP)

Early Archaic (7,500 – 4,200 BP)

Despite the lower and rapidly rising sea levels during the initial part of the Early Archaic period, the period is well represented in Coastal Texas. Ricklis (2004) divides the period into two segments: 7,500-6,800 BP and 5,800-4,200 BP, with a gap of about a millennium when there was little use of the shoreline, perhaps because of rapid rises in the water level that upset the ecology of the shoreline. The earlier portion of the period is represented by several sites in the Nueces Bay area that yielded radiocarbon dates but little cultural material. Surface finds of projectile points, particularly Uvalde-like points, are common. Distinctive edge-flaked shell scrapers/knives have been identified in good context. Estuarine shellfish were exploited, but it remains to be determined whether fishing was a significant part of the economy.

The second portion of the period is much better represented; sites are considerably more numerous, and a comparatively large number of radiocarbon dates have been obtained. Most of the deposits consist of shell middens with very few lithic items present. [[

]]^{ASI} A variety of saltwater and freshwater fish compose the limited faunal assemblage from the various sites.

Middle Archaic (4,200 – 3,100 BP)

There are virtually no components and dates attributable to this time span despite investigations of earlier and later sites. It is feasible that there was minimal use of the shoreline during this period (Ricklis 2004).

Late Archaic (3,100 – 950 BP)

The Late Archaic began at about the time the sea level stabilized. There are dates from shoreline sites that span this period, and the sites are more numerous and larger, and deposits are thicker and have larger quantities of cultural material and more diverse assemblages (Ricklis 2004). This seems to indicate a larger population and more numerous and more intensive occupations. There is evidence of more concentrated exploitation of estuarine shellfish, in addition to hunting of white-tailed deer. The earlier deposits are marked by the presence of Kent points, and later deposits have Ensor points, and Catan and Matamoros points typify the terminal Archaic at about 950 BP. The shoreline sites show a diverse array of shell tools, perhaps necessitated by the distance from chert sources. The shell middens promoted the preservation of bone tools and non-functional items, which were found at many sites. By 2,000 BP there is evidence of much more intensive fishing, and moderate to high salinity mollusks were found in massive middens at the seaward end of bays. [[

]]^{ASI} It is possible that the shoreline was occupied during cold weather and interior riverine areas were used during warmer months. Cemeteries are documented for the first time in the area, perhaps as a response to more established territories and increased populations.

3.1.3 Late Prehistoric (950 – 250 BP)

The advent of the Late Prehistoric is marked by the shift to the bow and arrow and the associated subsistence changes, and the period is divided into two segments on the bases of the changes in diagnostic tools and economic patterns (Ricklis 2004). The Initial Late Prehistoric (950-700/650 BP) is indicated by the presence of Scallorn points and by pottery with sandy paste at some locales. The Final Late Prehistoric (700/650-250 BP) is marked by Perdiz and other arrowheads, unifacial end scrapers, thin bifacial knives, small drills, and prismatic blade-core technology and Rockport pottery--ceramics with bowls, jars, and ollas often coated or decorated with asphaltum, incised rims, or notched lips. Fishing became an even more important subsistence source, while shellfish declined in importance. Bison provided the majority of the meat and white-tailed deer was secondary. The Rockport phase parallels the Toyah phase of the interior of the state in many aspects and appears to have adopted the same lithic technology at the same time, perhaps to facilitate the exploitation of bison. The subsistence system seems to continue the practice of occupying the interior lands to hunt during the warm months and movement to the shoreline during the winter but may add group aggregation to the system during the fishing season and dispersal into small camps for gathering plants and hunting (Ricklis 1996).

3.1.4 Protohistoric/Early Historic

In the sixteenth and seventeenth centuries, before the Spanish explorers and mission system impacted the economy of native groups, trade goods appeared in the region. The native groups of this area became culturally extinct in the eighteenth century because of diseases introduced by the Spanish and the movement of people into missions and the adoption of farming livelihoods (Hester 1989).

3.2 Historic Context

Calhoun County is located on the Gulf Coast, between Corpus Christi and Houston. In 1846, the Texas legislature established Calhoun County from portions of Victoria and Jackson Counties

(McCarty 1910). The bodies of water that surround and drain from the county include Espiritu Santo Bay, Lavaca Bay, Matagorda Bay, and the San Antonio and Guadalupe Rivers.

Calhoun County's economy and significance are directly related to its position along the coast. The area is low-lying, flat, and, historically, has been used for cattle grazing. In 1875, a large gulf storm destroyed much of the county seat—Indianola—and its port (McCarty 1910). As a result, a decline in commerce and population occurred, lasting into the twentieth century. In the 1880s, the San Antonio and Mexican Gulf Railway was constructed, which connected the port towns to Victoria to the north and other centers of commerce (McCarty 1910). Its county seat, now, is Port Lavaca, on Lavaca Bay.

Matagorda Island, just south of the county, is mostly comprised of deep shell sand. The area's climate is mild, with an average rainfall of approximately 40 inches; the growing season, likewise, lasts most of the year. Native flora include grasses, coastal scrub, live oak, and sedges, while local fauna includes game birds, deer, jackrabbits, raccoons, and coyotes (Kleiner 1952).

3.3 Archaeological Background Research

Archaeological background research was compiled by reviewing the Texas Archaeological Sites Atlas. This review included the APE and a 1 km (0.6 miles) buffer surrounding the APE. The purpose of the research was to identify previous archaeological surveys and recorded archaeological sites within or near the APE. Reports of prior investigations are reviewed to gain an understanding of the archaeological research in the project area and vicinity. According to the review, no archaeological sites are located within the APE or the 1-km buffer surrounding the APE. No previously conducted surveys are located within the APE; however, two previously conducted archaeological surveys (8400009819 and 8400009824) are located within the 1-km buffer surrounding the APE (**Figure 3.1**). Little information regarding surveys 8400009819 and 8400009824 was available, except that they were conducted in May 2001. No archaeological sites were associated with these surveys within the 1-km buffer surrounding the APE.

3.4 Historic Map Review

The reviewed historic maps included the 1953 USGS Seadrift, Port Lavaca West, Green Lake, and Austwell, Texas 7.5' topographic quadrangles (**Figure 3.2**). [[

]]^{ASI} The areas surrounding these identified historic structures were treated as high-probability areas to contain historic cultural deposits.

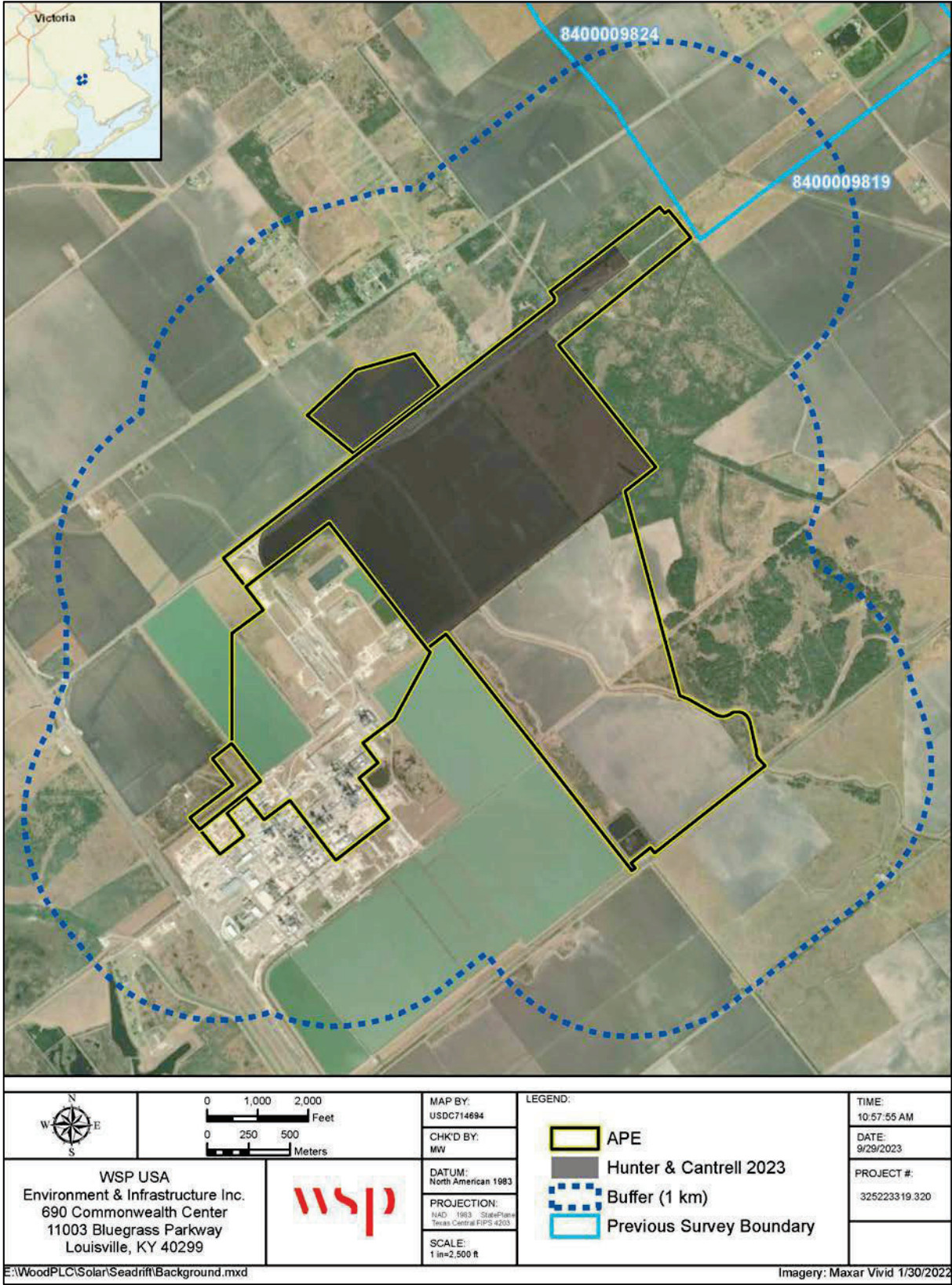


Figure 3.1. Texas Site Atlas Background Data within 1-km of the APE.

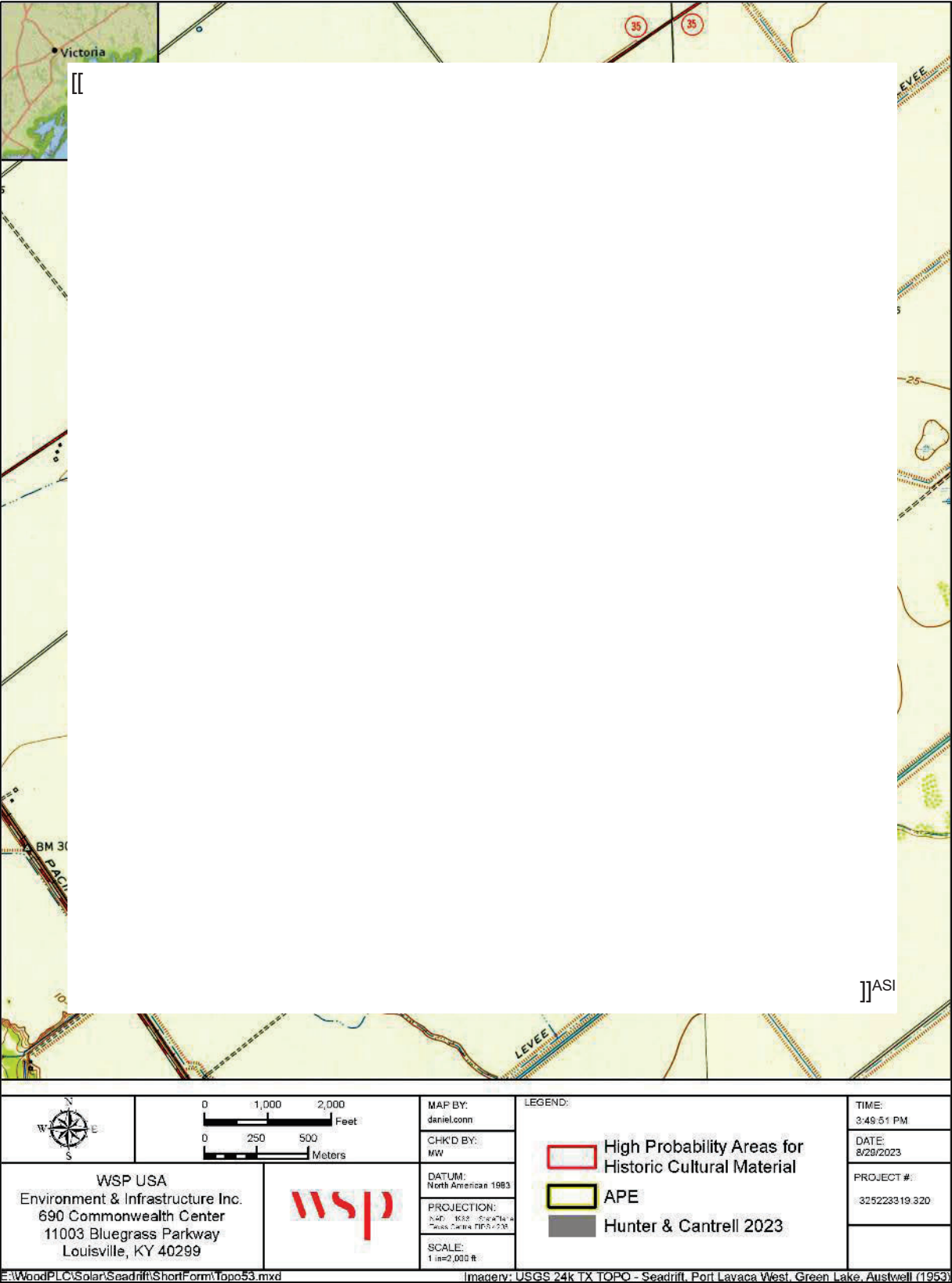


Figure 3.2. APE Shown on the 1953 24k Topographic Quadrangles.

This Page Left Intentionally Blank

4 METHODS

Field investigations were conducted according to guidelines established by the Council of Texas Archaeologists Standards and Guidelines Committee Intensive Terrestrial Survey Guidelines (2020). The goals of the project were to:

- Identify the presence of previously unrecorded archaeological sites;
- Identify the presence of any deeply buried cultural deposits; and
- Establish recommendations regarding the potential for sites within the APE to be eligible for listing on the National Register of Historic Places (NRHP), as well as for designation as State Antiquities Landmarks.

The APE consists of portions of agricultural fields containing unharvested and harvested corn, disturbances from extant infrastructure (plant facilities, paved areas, and holding ponds), as well as portions of open scrub growth, railroad tracks, and a portion of a railyard. The ground surface visibility varied across the APE and as such the Phase I intensive survey was completed over the entire APE using a combination of systematic STPs coupled with pedestrian survey. The entire APE was visually inspected (pedestrian survey at 10-meter intervals) for above-ground historic or prehistoric features or other surface areas of cultural interest that may be present in the area.

Shovel tests were offset from ditches, utilities, or other obvious areas of surface disturbance. All STPs were 30 cm in diameter and were excavated at least 10 cm into the sterile subsoil, to bedrock, or a maximum of 90 centimeters below ground surface (cmbs). Soil from the STPs was screened through a 0.25-in hardware cloth. Measurements were recorded using the metric system, and shovel test forms and soil profile information was recorded for each test. Soils were described using the Munsell color chart and appropriate terminology. Photographs were taken of representative soil profiles throughout the APE to document the general conditions within the APE.

Mapping for the project was completed using a hand-held submeter Geographic Positioning System (GPS). Location data was collected for all STPs. Detailed notes were maintained daily regarding methods employed and environmental conditions within the APE. Digital photographs showing general views, survey conditions, and specific areas of interest within the survey area were taken as needed. It should be noted that photography of the entire APE was limited based on the rules and regulations of the Dow Seadrift Operations facility. Photography was not permitted within the APE facing any of the infrastructure of Dow Seadrift Operations facility. As such, every effort was made to adequately document the APE facing away from the facility.

This Page Left Intentionally Blank

5 RESULTS

From July 10 to 19, 2023, WSP conducted a Phase I intensive archaeological survey in support of the ER for the Proposed Project Long Mott in Calhoun County, Texas. This report details the 930.6-acre portion (1.45 square miles or 376.6 hectares) portion of the Long Mott project that has not been previously submitted for consultation. The 617.4-acre portion (0.96 square miles or 249.85 hectares) of the project (Hunter and Cantrell 2023) was consulted on previously (submitted on August 1, 2023, THC Tracking No. 202312012) by the DOE in support of the ER for the Xe-100 Dow Seadrift Site in Calhoun County, Texas. As a result of the investigation, no archaeological sites, cultural material, or buried cultural deposits were identified. No additional archaeological work is recommended for the APE.

5.1 APE Survey Results

The APE consists of portions of agricultural fields containing unharvested corn (**Figure 5.1**) as well as portions of open scrub growth (**Figure 5.2**), railroad tracks (**Figure 5.3**), and a portion of a railyard (**Figure 5.4**). Due to photography restrictions associated with the DOW Seadrift facility, disturbance associated with disturbances from extant infrastructure (plant facilities, paved areas, and holding ponds) were not photo documented. The ground surface visibility varied across the APE (**Figures 5.5 – 5.7**) and as such the Phase I intensive survey was completed over the entire APE using a combination of systematic STPs coupled with pedestrian survey.

A total of 176 shovel tests were excavated within the APE (see **Appendix A**), all of which were void of cultural material (**Figure 5.8**). All observed soils within the APE were similar and consisted of very compact 10YR 3/1 silt clay loam Zone I, from the ground surface down to approximately 10 – 25 cmbs, underlain by a 10YR 4/1 clay Zone II, from 10/25 – 50 cmbs (**Figures 5.9 – 5.11**).



Figure 5.1. Overview of APE Showing Corn, Facing Southwest.



Figure 5.2. Overview of the APE Showing Scrub Growth, Facing North.



Figure 5.3. Overview of the APE Showing Railroad Tracks, Facing North.



Figure 5.4. Overview of the APE Showing Railyard, Facing Northeast.



Figure 5.5. Overview of the Ground Surface, Facing West.



Figure 5.6. View of the APE South, Showing Drainage and Utility, Facing Northeast.



Figure 5.7. Access Road in Central APE, Facing North.



Figure 5.8. Survey Results, Showing STP Locations.



Figure 5.9. Observed Soil Profile.



Figure 5.10. Observed Soil Profile.



Figure 5.11. Observed Soil Profile.

5.2 High Probability Areas

Based on the historic map research (see **Section 3.4**) three locations were determined to be a high probability to contain historic cultural material (see **Figure 3.1**). Field investigations revealed that the construction and subsequent maintenance [[

]]^{ASI} have severely disturbed the area surrounding all three of the high probably areas within the APE. No historic cultural material was identified in any of these high- probability locations.

This Page Left Intentionally Blank

6 SUMMARY AND RECOMMENDATIONS

From July 10 to 19, 2023, WSP conducted a Phase I intensive archaeological survey of 930.6 acres in support of the ER for the proposed Project Long Mott in Calhoun County, TX. The survey was conducted under contract with X-Energy to facilitate compliance with Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas (Natural Resources Code, Title 9, Chapter 191, Subchapter A). Per the provisions of the Texas Cultural Resources Code, Title 9, Chapter 191, WSP initiated a review of the SOW with the THC on May 12, 2023, with the concurrence of the proposed SOW from the THC on June 7, 2023 (THC Tracking No. 202308205).

This report details the 930.6-acre portion (1.45 square miles or 376.6 hectares) portion of the Long Mott project that has not been previously submitted for consultation. The 617.4-acre portion (0.96 square miles or 249.85 hectares) of the project (Hunter and Cantrell 2023) was consulted on previously (submitted on August 1, 2023, THC Tracking No. 202312012) by the DOE in support of the ER for the Xe-100 Dow Seadrift Site in Calhoun County, Texas.

The APE consists of portions of agricultural fields containing unharvested and harvested corn, disturbances from extant infrastructure (plant facilities, paved areas, and holding ponds), as well as portions of open scrub growth, railroad tracks, and a portion of a railyard. The ground surface visibility varied across the APE and as such the Phase I intensive survey was completed over the entire APE using a combination of systematic STPs coupled with pedestrian survey.

A total of 179 STPs were excavated across the APE. None of the excavated STPs contained cultural material. Additionally, no evidence of deeply buried cultural deposits suggesting buried A-horizons or cultural artifacts were identified in any of the excavations. As a result of the intensive archaeological survey, no archaeological sites or cultural materials were identified. WSP recommends that the proposed project will have no effect on historic properties and that no additional archaeological work is required within the APE.

This Page Left Intentionally Blank

7 REFERENCES CITED

Bureau of Economic Geology

1996 Physiographic Map of Texas. Bureau of Economic Geology, the University of Texas at Austin. Electronic document, <http://www.beg.utexas.edu/UTopia/images/pagesizemaps/physiography.pdf>, accessed 2023.

Council of Texas Archaeologists

2020 Standards and Guidelines Committee Intensive Terrestrial Survey Guidelines. Texas Historical Commission, Austin.

Hester, Thomas R.

1989 Historic Native American Populations. In *From the Gulf to the Rio Grande: Human Adaptation in Central, South, and Lower Pecos Texas*, by T. R. Hester, S. L. Black, D. G. Steele, B. W. Oliver, A. A. Fox, K. Reinhard, and L. C. Bement, pp. 77-84. Research Series No. 33, Arkansas Archaeological Survey, Fayetteville.

Hunter, John A. and Patrick C. Cantrell

2023 Xe-100 Dow Seadrift Site Phase I Intensive Archaeological Survey, Calhoun County, Texas. Negative Finding Short Report. WSP Report 2023-039, Lexington, Kentucky.

Kleiner, Diana J.

1952 Calhoun County. Electronic document <https://www.tshaonline.org/handbook/entries/calhoun-county>, accessed July 7, 2023.

McCarty, Jackie

1910 Calhoun County, Texas. Electronic document, http://genealogytrails.com/tex/gulfcoast/calhoun/history_county.htm, accessed July 7, 2023.

Mowery, Irvin C. and James E. Bower

1978 *Soil Survey of Calhoun County, Texas*. United States Department of Agriculture, Natural Resources Conservation Service, Washington D.C.

National Park Service (NPS)

2019 National Register of Historic Places. National Park Service, U.S. Department of the Interior. Electronic document, <https://www.nps.gov/subjects/nationalregister/index.htm>.

Ricklis, Robert A.

1994 Limited Testing at the Mustang Lake Site, 41CL3, under Special-Use Permit 73683 & ARPA Permit Aransas-94. Corpus Christi, Texas. Coastal Archaeological Studies.

1996 *The Karankawa Indians of the Texas Coast: An Ecological Study of Cultural Tradition and Change*. University of Texas Press, Austin.

2004 Prehistoric Occupation of the Central and Lower Texas Coast: a Regional Overview. In *The Prehistory of Texas*, edited by Timothy K. Pertulla, pp. 155-180. Texas A&M Press, College Station, Texas.

TSHA (Texas State Historical Association)

2018 Physical Regions of Texas. Electronic document,
<https://texasalmanac.com/topics/environment/physical-regions-texas>, accessed 2023.

United States Department of the Interior, National Parks Service (USDOI, NPS)

1983 The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716). United States Department of the Interior, Washington, D.C.

United States Department of Agriculture (USDA) and Natural Resource Conservation Service (NRCS)

2023 Web Soil Survey. Electronic document, <http://websoilsurvey.nrcs.usda.gov/app/>, accessed 2023.

Appendix A

Shovel Test Probe (STP) Log and STP Location Map

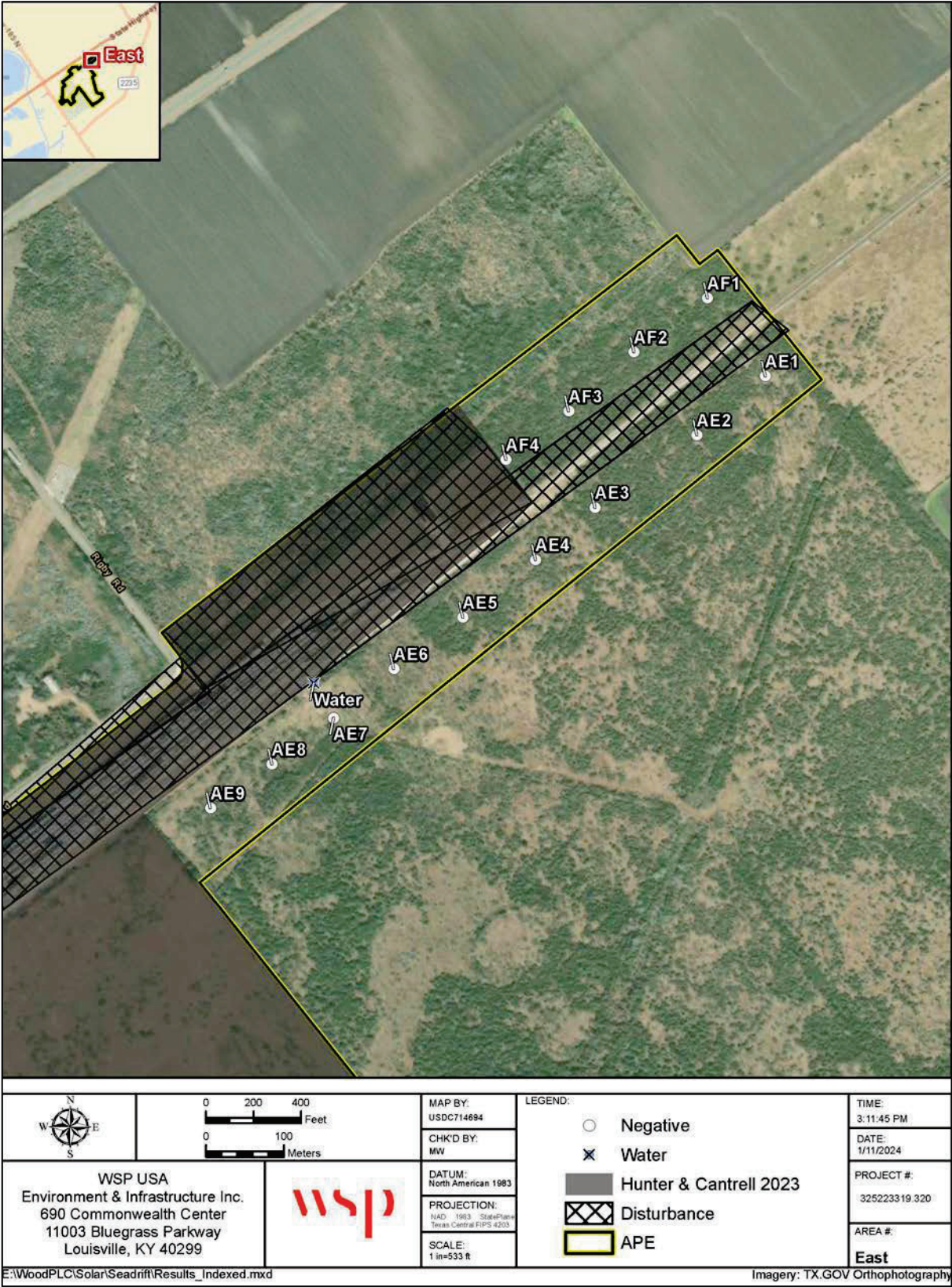
This Page Left Intentionally Blank

STP #	Total STP Depth (cmbs)	Artifacts (Pos/Neg)	Date	Recorder
L1	40	Negative	7/14/23	PCC/ NB/ GH
L2	40	Negative	7/14/23	PCC/ NB/ GH
L3	40	Negative	7/14/23	PCC/ NB/ GH
L4	40	Negative	7/14/23	PCC/ NB/ GH
L5	40	Negative	7/14/23	PCC/ NB/ GH
L6	40	Negative	7/14/23	PCC/ NB/ GH
L7	40	Negative	7/13/23	PCC/ NB/ GH
L8	40	Negative	7/13/23	PCC/ NB/ GH
L9	40	Negative	7/13/23	PCC/ NB/ GH
M1	35	Negative	7/14/23	PCC/ SWL
M2	30	Negative	7/14/23	PCC/ SWL
M3	30	Negative	7/14/23	PCC/ SWL
M4	25	Negative	7/14/23	PCC/ SWL
M5	25	Negative	7/14/23	PCC/ SWL
M6	25	Negative	7/14/23	PCC/ SWL
M7	30	Negative	7/14/23	PCC/ SWL
M8	30	Negative	7/14/23	PCC/ SWL
N1	31	Negative	7/14/23	PCC/ SWL
N2	34	Negative	7/14/23	PCC/ SWL
N3	32	Negative	7/14/23	PCC/ SWL
O1	30	Negative	7/14/23	PCC/ NB
O2	30	Negative	7/14/23	PCC/ NB
O3	30	Negative	7/14/23	PCC/ NB
O4	30	Negative	7/14/23	PCC/ NB
O5	23	Negative	7/14/23	PCC/ SWL
O6	30	Negative	7/14/23	PCC/ NB
O7	30	Negative	7/14/23	PCC/ NB
O8	30	Negative	7/14/23	PCC/ NB
Q1	25	Negative	7/14/23	PCC/ SWL
Q2	33	Negative	7/14/23	PCC/ SWL
Q3	30	Negative	7/14/23	PCC/ SWL
Y1	30	Negative	7/14/23	PCC/ SWL
Y3	30	Negative	7/14/23	PCC/ SWL
Y4	30	Negative	7/14/23	PCC/ SWL
Y5	30	Negative	7/14/23	PCC/ SWL
Z1	31	Negative	7/15/23	PCC/ SWL
Z2	28	Negative	7/15/23	PCC/ SWL
Z3	23	Negative	7/15/23	PCC/ SWL
Z4	26	Negative	7/15/23	PCC/ SWL
Z5	19	Negative	7/15/23	PCC/ SWL
AA1	30	Negative	7/14/23	PCC/ GH
AA2	30	Negative	7/14/23	PCC/ GH
AA3	30	Negative	7/14/23	PCC/ GH
AA4	30	Negative	7/14/23	PCC/ GH
AA5	30	Negative	7/14/23	PCC/ GH
AA6	30	Negative	7/14/23	PCC/ GH
BB1	30	Negative	7/15/23	PCC/ SWL
BB2	30	Negative	7/15/23	PCC/ SWL
BB3	30	Negative	7/15/23	PCC/ SWL
BB4	30	Negative	7/15/23	PCC/ SWL
BB5	25	Negative	7/15/23	PCC/ SWL
BB6	25	Negative	7/15/23	PCC/ SWL
CC1	26	Negative	7/14/23	PCC
CC2	29	Negative	7/14/23	PCC
CC3	31	Negative	7/14/23	PCC
CC4	30	Negative	7/14/23	PCC
CC5	40	Negative	7/14/23	PCC

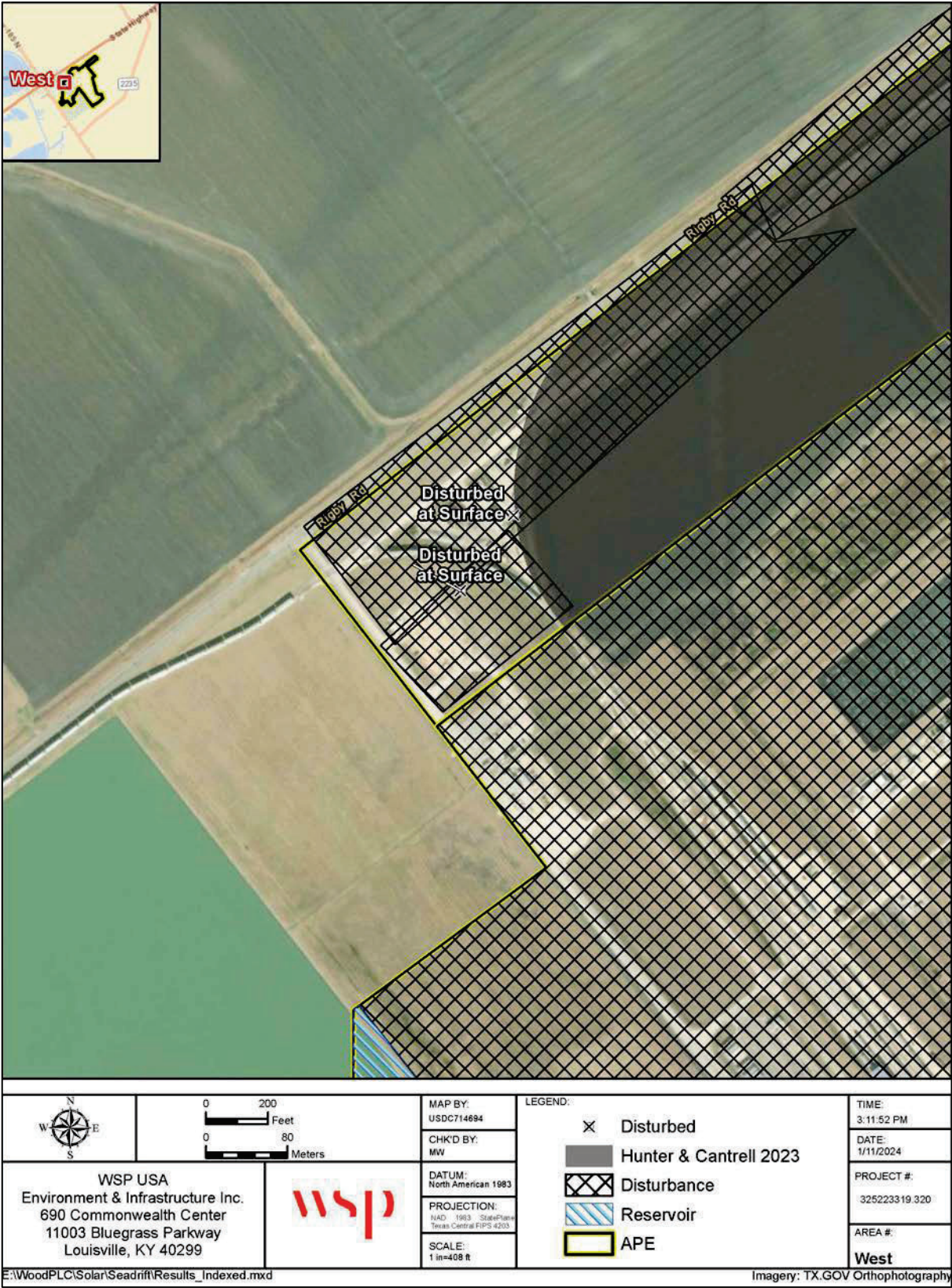
STP #	Total STP Depth (cmbs)	Artifacts (Pos/Neg)	Date	Recorder
CC6	40	Negative	7/14/23	PCC
DD1	25	Negative	7/15/23	PCC/ SWL
DD2	25	Negative	7/15/23	PCC/ SWL
DD3	30	Negative	7/15/23	PCC/ SWL
DD4	25	Negative	7/15/23	PCC/ SWL
DD5	25	Negative	7/15/23	PCC/ SWL
EE1	13	Negative	7/16/23	PCC/ SWL
EE2	27	Negative	7/16/23	PCC/ SWL
EE3	31	Negative	7/16/23	PCC/ SWL
FF1	30	Negative	7/15/23	PCC/ GH
FF2	30	Negative	7/15/23	PCC/ GH
FF3	30	Negative	7/15/23	PCC/ GH
GG1	30	Negative	7/15/23	PCC
GG2	28	Negative	7/15/23	PCC
GG3	27	Negative	7/15/23	PCC
HH1	30	Negative	7/15/23	PCC
HH2	30	Negative	7/15/23	PCC
II1	28	Negative	7/15/23	PCC/ SWL
II2	30	Negative	7/15/23	PCC/ SWL
II3	30	Negative	7/15/23	PCC/ GH
II5	30	Negative	7/15/23	PCC/ GH
II6	30	Negative	7/15/23	PCC/ SWL
II8	38	Negative	7/16/23	PCC/ SWL
JJ1	30	Negative	7/15/23	PCC/ GH
JJ2	25	Negative	7/15/23	PCC/SWL
JJ3	30	Negative	7/15/23	PCC/ GH
JJ4	25	Negative	7/15/23	PCC/ SWL
JJ5	30	Negative	7/15/23	PCC/ GH
KK1	33	Negative	7/15/23	PCC/ NB
KK2	39	Negative	7/15/23	PCC/ NB
KK3	40	Negative	7/15/23	PCC/ NB
KK4	28	Negative	7/15/23	PCC/ NB
LL1	30	Negative	7/15/23	PCC
LL2	30	Negative	7/15/23	PCC
LL3	25	Negative	7/15/23	PCC/ SWL
LL4	30	Negative	7/15/23	PCC/ SWL
LL5	30	Negative	7/15/23	PCC
LL6	30	Negative	7/15/23	PCC
LL7	25	Negative	7/15/23	PCC/ SWL
MM1	30	Negative	7/15/23	PCC/ NB
MM2	30	Negative	7/15/23	PCC/ GH
MM3	20	Negative	7/15/23	PCC/ SWL
MM4	28	Negative	7/15/23	PCC/ SWL
NN1	32	Negative	7/15/23	PCC/ NB
NN2	42	Negative	7/16/23	PCC/ NB
NN3	34	Negative	7/16/23	PCC/ NB
NN4	37	Negative	7/16/23	PCC/ NB
NN5	45	Negative	7/16/23	PCC/ NB
NN6	28	Negative	7/16/23	PCC/ NB
MW1-1	50	Negative	7/13/23	PCC/ SWL
MW1-2	50	Negative	7/13/23	PCC/ SWL
MW1-3	50	Negative	7/13/23	PCC/ SWL
MW1-4	50	Negative	7/13/23	PCC/ SWL
MW1-5	50	Negative	7/13/23	PCC/ SWL
MW1-6	50	Negative	7/13/23	PCC/ SWL
OO1	30	Negative	7/16/23	PCC/ SWL
OO2	30	Negative	7/16/23	PCC/ SWL

STP #	Total STP Depth (cmbs)	Artifacts (Pos/Neg)	Date	Recorder
OO3	30	Negative	7/16/23	PCC/ SWL
OO4	30	Negative	7/16/23	PCC/ SWL
OO5	30	Negative	7/16/23	PCC/ SWL
OO6	30	Negative	7/16/23	PCC/ SWL
OO7	30	Negative	7/16/23	PCC/ SWL
OO8	30	Negative	7/16/23	PCC/ SWL
PP1	40	Negative	7/14/23	PCC/ SWL
PP2	30	Negative	7/14/23	PCC/ SWL
PP3	30	Negative	7/14/23	PCC/ SWL
PP4	30	Negative	7/14/23	GH
PP5	30	Negative	7/14/23	GH
PP6	30	Negative	7/14/23	GH
PP7	30	Negative	7/14/23	GH
PP8	30	Negative	7/14/23	GH
PP9	30	Negative	7/14/23	GH
QQ1	28	Negative	7/16/23	PCC
QQ2	30	Negative	7/16/23	PCC
QQ3	40	Negative	7/16/23	PCC
QQ4	30	Negative	7/16/23	PCC
QQ5	26	Negative	7/16/23	PCC
QQ6	31	Negative	7/16/23	PCC
QQ7	27	Negative	7/16/23	PCC
QQ8	35	Negative	7/16/23	PCC
QQ9	30	Negative	7/16/23	PCC
RR1	48	Negative	7/16/23	PCC/ NB
RR2	33	Negative	7/16/23	PCC/ NB
RR3	32	Negative	7/16/23	PCC/ NB
RR4	35	Negative	7/16/23	PCC/ NB
RR5	39	Negative	7/16/23	PCC/ NB
RR6	51	Negative	7/16/23	PCC/ NB
RR7	35	Negative	7/16/23	PCC/ NB
RR8	35	Negative	7/16/23	PCC/ NB
SS1	30	Negative	7/16/23	GH
SS2	30	Negative	7/16/23	GH
SS3	30	Negative	7/16/23	GH
SS4	30	Negative	7/16/23	GH
SS5	30	Negative	7/16/23	GH
SS6	30	Negative	7/16/23	PCC/ SWL
SS7	30	Negative	7/16/23	GH
TT1	25	Negative	7/16/23	PCC/ SWL
TT2	30	Negative	7/16/23	PCC/ SWL
TT3	30	Negative	7/16/23	PCC/ SWL
TT4	30	Negative	7/16/23	PCC/ SWL
TT5	30	Negative	7/16/23	PCC/ SWL
TT6	30	Negative	7/16/23	PCC/ SWL
UU1	30	Negative	7/16/23	PCC
UU2	26	Negative	7/16/23	PCC
UU3	30	Negative	7/16/23	PCC
UU4	30	Negative	7/16/23	PCC
WW1	25	Negative	7/16/23	PCC/ SWL
WW3	15	Negative	7/16/23	PCC/ SWL
WW4	38	Negative	7/16/23	PCC/ SWL
WW5	25	Negative	7/16/23	PCC/ SWL
WW6	23	Negative	7/16/23	PCC/ SWL
XX1	25	Negative	7/16/23	PCC/ SWL
XX2	30	Negative	7/16/23	PCC
AE8	30	Negative	7/17/23	SWL

STP #	Total STP Depth (cmbs)	Artifacts (Pos/Neg)	Date	Recorder
AE9	25	Negative	7/17/23	SWL
AF1	26	Negative	7/17/23	PCC/ SWL
AF2	25	Negative	7/17/23	PCC/ SWL
AF3	25	Negative	7/17/23	PCC/ SWL
AF4	28	Negative	7/17/23	PCC/ SWL



STP locations within the APE.



STP locations within the APE.

This Page Left Intentionally Blank



VI-D

**X Energy, LLC, “Xe-100 Dow Seadrift Site Phase I Intensive
Archeological Survey, Calhoun County, Texas - Negative Findings
Short Report,” Revision 1, February 19, 2024 (unrestricted;
public)**



Xe-100 Dow Seadrift Site Phase I Intensive Archaeological Survey, Calhoun County, Texas Negative Finding Short Report.

FINAL REPORT

WSP Project No.: 325223319
WSP Cultural Report of Investigations No.: 2023-039
WSPDC - XES04
TC# - 008122



Prepared for:

X-Energy

This is a publicly available version of this document. Sensitive archaeological information has been redacted per 10 CFR 2.390(a)(3). Redactions appear as black boxes.

February 19, 2024

This Page Left Intentionally Blank

Xe-100 Dow Seadrift Site Phase I Intensive Archaeological Survey, Calhoun County, Texas Negative Finding Short Report.

FINAL REPORT

Prepared for:
X-Energy

WSP Project No.: 325223319
WSP Cultural Report of Investigations No.: 2023-039
WSPDC-XES04
TC# - 008122

Prepared by:



WSP USA Environment & Infrastructure, Inc.

A handwritten signature in black ink, which appears to read 'John A. Hunter', is written over a solid black horizontal line.

John A. Hunter, MA, RPA
Principal Investigator

Authored by:
John A. Hunter MA, RPA, and Clay Cantrell

February 2024

This Page Left Intentionally Blank

MANAGEMENT SUMMARY

From July 10 to 19, 2023, WSP USA Environment & Infrastructure, Inc. (WSP) conducted a Phase I intensive archaeological survey of 1,277 acres in support of the Environmental Report (ER) for the Xe-100 Dow Seadrift Site in Calhoun County, Texas. This report details a 617.4-acre portion (0.96 square miles or 249.85 hectares) of the larger 1,277-acre (1.99 square miles or 516.78 hectares) survey area to support requirements identified in the Department of Energy's (DOE) National Environmental Policy Act (NEPA) Implementing Regulations (10 CFR Part 1021) to support DOE's NEPA review of siting activities for the Xe-100 advanced nuclear reactor. For this report, the 617.4-acre portion is the Area of Potential Effect (APE). The remaining 659.6 acres of the entire survey area will be consulted on with the Texas Historical Commission (THC) at a later date.

The survey was conducted under contract with X-Energy, LLC (X-Energy) to facilitate compliance with Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas (Natural Resources Code, Title 9, Chapter 191, Subchapter A). Per the provisions of the Texas Cultural Resources Code, Title 9, Chapter 191, WSP initiated a review of the Scope of Work (SOW) with the THC on May 12, 2023, with the concurrence of the proposed SOW received from the THC on June 7, 2023 (THC Tracking No. 202308205).

The APE consists of portions of agricultural fields containing unharvested corn as well as portions of open scrub growth, railroad tracks, and a railyard. The ground surface visibility varied across the APE, and as such the Phase I intensive survey was completed over the entire APE using a combination of systematic shovel test probe excavation (STPs) coupled with pedestrian survey.

A total of 203 STPs were excavated across the APE. None of the excavated STPs contained cultural material. Additionally, no evidence of deeply buried cultural deposits suggesting buried A-horizons or cultural artifacts were identified in any of the excavations. As a result of the intensive archaeological survey, no archaeological sites or cultural materials were identified. It is recommended that the project will have no effect on historic properties and that no additional archaeological work is required within the APE.

Additionally, WSP conducted an aboveground cultural resource eligibility and effects survey to support the requirements identified in the DOE's NEPA Implementing Regulations (10 CFR Part 1021) to support DOE's NEPA review of siting activities for the Xe-100 advanced nuclear reactor. The APE for aboveground cultural historic resources includes an additional 0.5-mile buffer from the project area boundary to account for impacts to aboveground historic architectural resources. Based upon the nature of work addressed by this report, there is no potential for direct or indirect visual effects of the undertaking on historic resources within the project APE. A report detailing the complete survey of architectural resources related to the full scope of work of the proposed undertaking will follow this report of findings.

This Page Left Intentionally Blank

TABLE OF CONTENTS

CHAPTER	PAGE NO.
MANAGEMENT SUMMARY	i
1.0 INTRODUCTION	1
1.1 Overview.....	1
1.2 Intensive Archaeological Survey Summary.....	4
2.0 ENVIRONMENTAL SETTING	5
2.1 Physiography, Geology, and Soils.....	5
2.2 Geoarchaeological Assessment.....	7
2.3 Prehistoric and Historic Environment.....	8
3.0 CULTURAL AND ARCHAEOLOGICAL BACKGROUND	9
3.1 Prehistoric Context.....	9
3.1.1 Paleoindian.....	9
3.1.2 Archaic (7,500 – 950 BP).....	9
3.1.3 Late Prehistoric (950 – 250 BP).....	10
3.1.4 Protohistoric/Early Historic.....	10
3.2 Historic Context.....	10
3.3 Archaeological Background Research.....	11
3.4 Historic Map Review.....	11
4.0 METHODS	15
5.0 RESULTS	17
5.1 APE Survey Results.....	17
5.2 High probability areas.....	22
5.3 Offsite surface water monitoring station.....	22
5.4 Aboveground Cultural Resource Survey.....	24
6.0 SUMMARY AND RECOMMENDATIONS	25
7.0 REFERENCES CITED	27
Appendix A	29

FIGURES

Figure 1-1. Project Location in Calhoun County, Texas.....	1
Figure 1-2. The APE shown on the 1977 Port Lavaca West 7.5-minute quadrangle.	2
Figure 1-3. The APE shown on a 2020 modern aerial photograph.	3
Figure 2-1. A physiographic map of Texas showing the project area location.	5
Figure 2-2. Soils located within and surrounding the APE.	6

Figure 3-1. Texas Site Atlas background data within 1-km of the APE.....	12
Figure 3-2. APE shown on the 1953 24k topographic quadrangles.	13
Figure 5-1. Overview of APE showing corn, facing southwest.....	17
Figure 5-2. Overview of the APE showing scrub growth, facing north.	18
Figure 5-3. Overview of the APE showing railroad tracks, facing north.	18
Figure 5-4. Overview of the APE showing railyard, facing northeast.	19
Figure 5-5. Overview of the ground surface, facing west.....	19
Figure 5-6. Survey Results, showing STP locations.	20
Figure 5-7. Observed soil profile.	21
Figure 5-8. Observed soil profile.	21
Figure 5-9. Observed soil profile.	22
Figure 5-10. Offsite surface water monitoring (WCC-3) location.....	23
Figure 5-11. Offsite surface water monitoring (WCC-3); facing southeast.	24

TABLES

Table 2-1. Summary of Soil Types Found within the APE.....	7
--	---

1.0 INTRODUCTION

1.1 Overview

X-Energy, LLC (X-Energy) contracted with WSP USA Environment & Infrastructure, Inc. (WSP) to conduct a Phase I intensive archaeological survey in support of the Environmental Report (ER) for the Proposed Xe-100 advanced nuclear reactor project at the Xe-100 Dow Seadrift Site in Calhoun County, Texas (**Figures 1-1 – 1-3**). This report details a 617.4-acre portion (0.96 square miles or 249.85 hectares) of the larger 1,277-acre (1.99 square miles or 516.78 hectares) survey area to support requirements identified in the Department of Energy's (DOE) National Environmental Policy Act (NEPA) Implementing Regulations (10 CFR Part 1021) to support DOE's NEPA review of siting activities for the Xe-100 advanced nuclear reactor. For this report, the 617.4-acre portion is the Area of Potential Effect (APE). The results of the survey of the remaining 659.6 acres of the entire survey area will be submitted to the Texas Historical Commission (THC) at a later date.

The survey was conducted under contract with X-Energy to facilitate compliance with Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas (Natural Resources Code, Title 9, Chapter 191, Subchapter A). Per the provisions of the Texas Cultural Resources Code, Title 9, Chapter 191, WSP initiated a review of the Scope of Work (SOW) with the THC on May 12, 2023, with the concurrence of the proposed SOW received from the THC on June 7, 2023 (THC Tracking No. 202308205). The purpose of the survey was to determine if archaeological resources would be impacted by the proposed undertaking.

The archaeological survey was completed between July 10 to 19, 2023. John A. Hunter, MA, RPA served as the project principal investigator for the project. He was assisted in the field by archaeologists Patrick Cantrell, Steve Lucas, Nickolas Brown, and Gideon Hoekstra. Report graphics were produced by Daniel Conn. The architectural viewshed survey was completed between July 10 to 14, 2023. Carolyn Andrews, RA, AIA served at the architectural lead and was assisted in the field by Mekenzie Davis.



Figure 1-1. Project Location in Calhoun County, Texas.

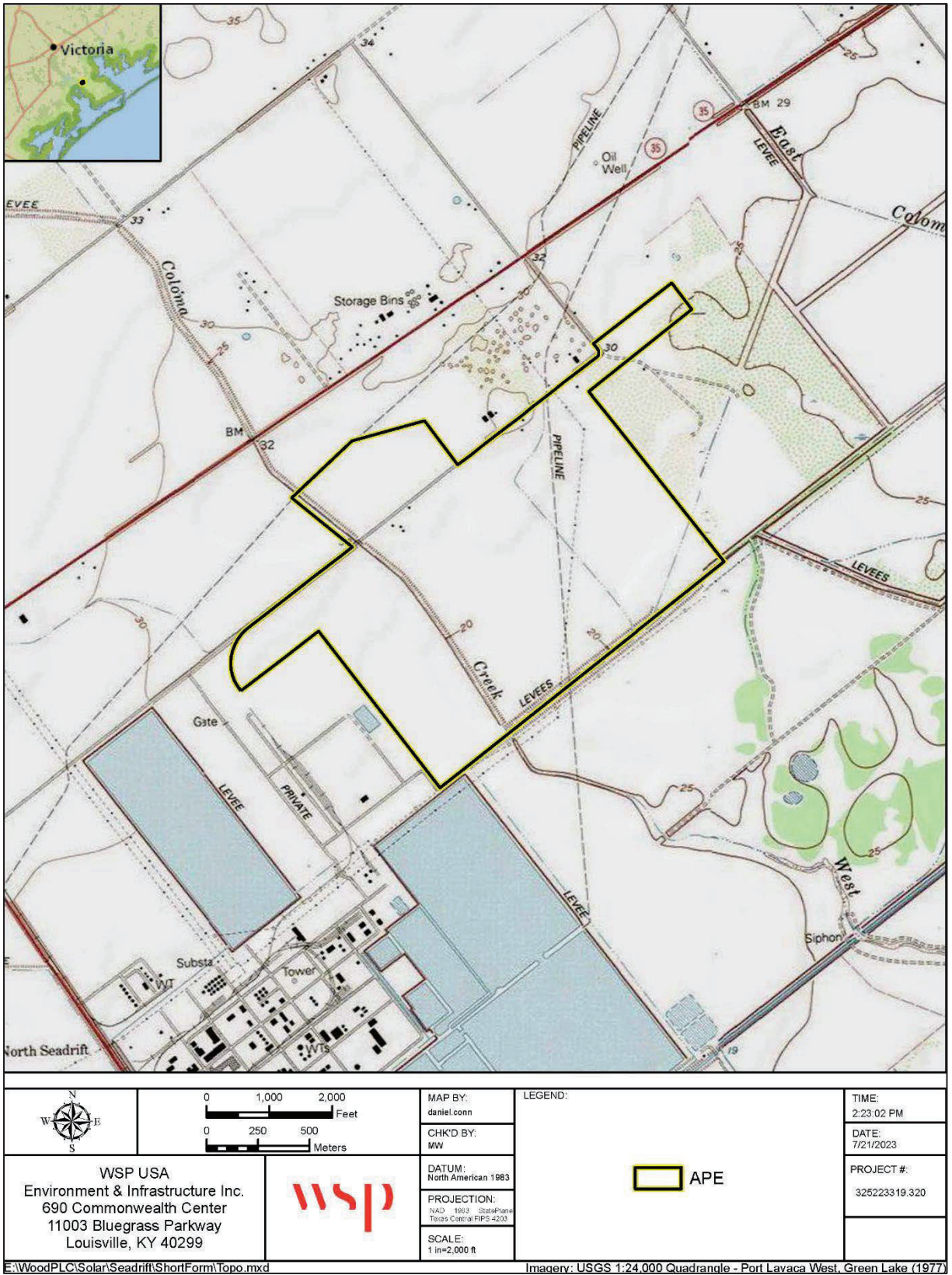


Figure 1-2. The APE shown on the 1977 Port Lavaca West 7.5-minute quadrangle.

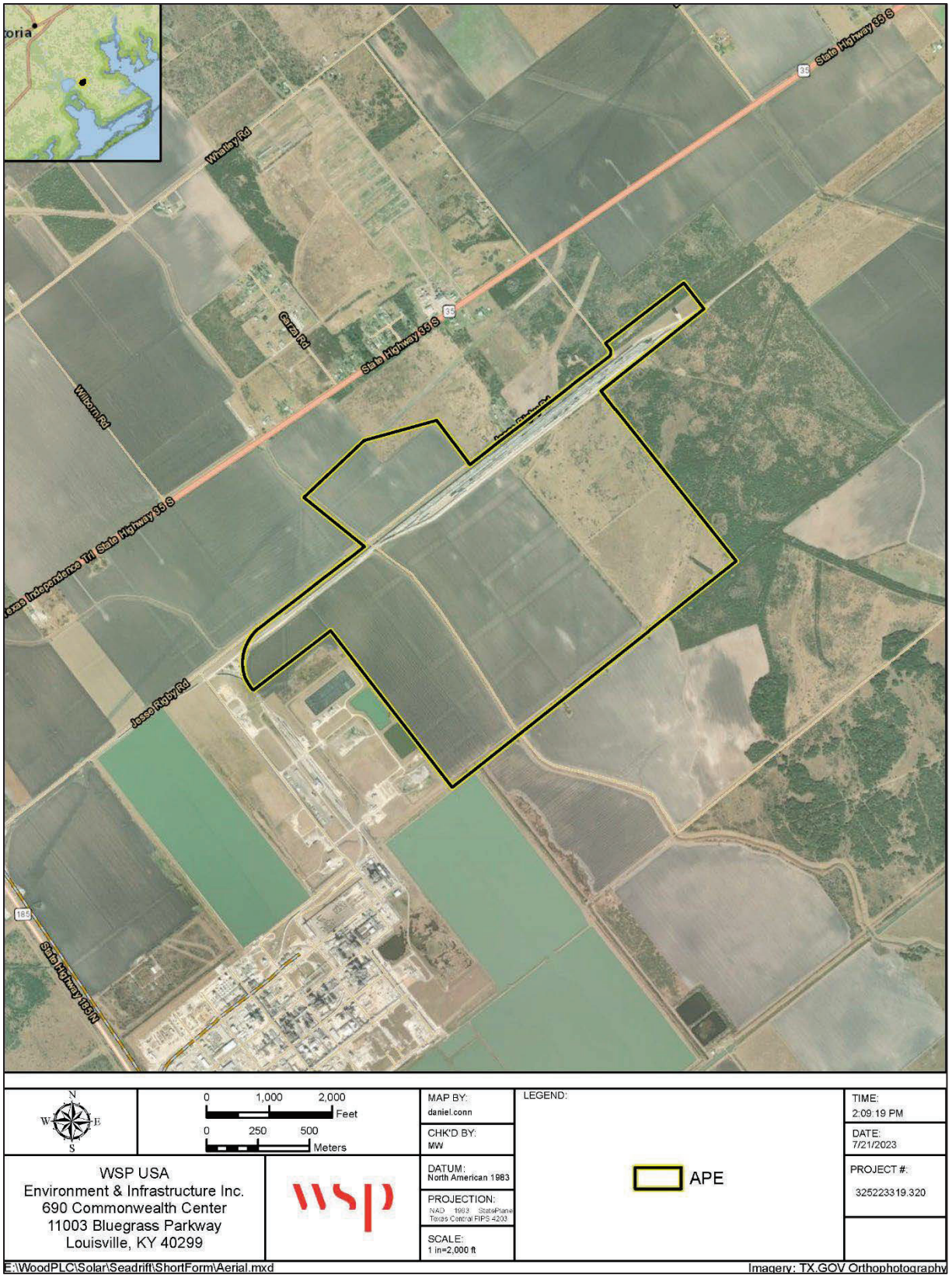


Figure 1-3. The APE shown on a 2020 aerial photograph.

1.2 Intensive Archaeological Survey Summary

From July 10 to 19, 2023, WSP conducted a Phase I intensive archaeological survey for the Proposed Xe-100 Dow Seadrift Site in Calhoun County, Texas. This report details a 617.4-acre portion (0.96 square miles or 249.85 hectares) of the larger 1,277 acres (1.99 square miles or 516.78 hectares) survey area to support DOE's NEPA Implementing Regulations (10 CFR Part 1021) to support DOE's NEPA review of initial ground disturbance activities. For this report, the 617.4-acre portion is the APE. For this report, the 617.4-acre portion is the Area of Potential Effect (APE). The results of the survey of the remaining 659.6 acres of the project site will be submitted to the Texas Historical Commission (THC) at a later date.

The APE consists of portions of agricultural fields which contained unharvested corn at the time of the survey, as well as portions of open scrub growth, railroad tracks, and a railyard. The ground surface visibility varied across the APE and as such the Phase I intensive survey was completed over the entire APE using a combination of systematic shovel test probe excavation (STPs) coupled with pedestrian survey. No archaeological sites or cultural material was identified during the investigation.

Prior to fieldwork, a desktop geomorphological assessment of the APE was conducted. Three soil associations, encompassing seven soils are mapped within the survey area: Dacosta-Contee Complex with 0 to 1 percent slopes, Laewest clay with 0 to 1 percent slopes, and Contee-Dacosta complex (USDA/NRCS 2023). Overall, the soil's defined horizons, coupled with the project's location along a relatively straight portion of a low-level waterway (West Coloma Creek) and relatively flat topographic landform, suggest the area is unlikely to contain deeply buried archaeological deposits. The A-Bt upper soil horizon suggests a fairly stable landform allowing for pedogenesis, not one subjected to frequent, large depositional events such as flooding. While the occurrence of the Bt-horizon deposits does not preclude cultural materials, the shallow nature of these deposits suggests any buried cultural deposits can be reached during shovel test excavations.

A total of 203 STPs were excavated within the APE. None of the excavated STPs contained cultural material. Additionally, no evidence of deeply buried cultural deposits suggesting buried A-horizons or cultural artifacts were identified in any of the excavations. As a result of the intensive archaeological survey, no archaeological sites or cultural materials were identified. It is recommended that the project will have no effect on historic properties and that no additional archaeological work is required within the APE.

2.0 ENVIRONMENTAL SETTING

2.1 Physiography, Geology, and Soils

The project area falls within the Coastal Plains physiographic region. This Coastal Plain is an extension of the Coastal Plain region lining the Atlantic Ocean in the eastern United States (Bureau of Economic Geology 1996). More specially, the APE is located within the Northern Humid Gulf Coastal Prairies (**Figure 2-1**). The characteristics of this physiographic region is characterized by its association with the ocean and wind and rain associated with the ocean. This region contains shallow bays, estuaries, salt marshes, dunes, and tidal flats (TSHA 2023).

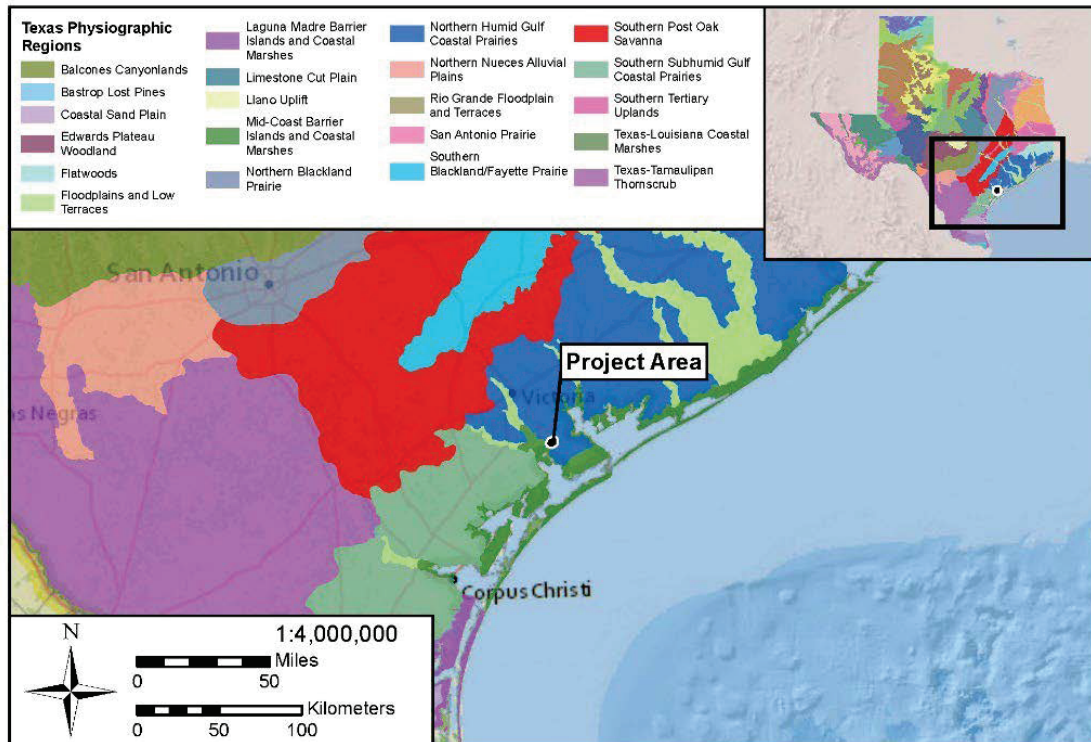


Figure 2-1. A physiographic map of Texas showing the project area location.

Three soil associations, encompassing seven soils are defined within the APE: Dacosta – Contee complex 0 – 1 percent slopes (Dc), Edna loam 0 -1 percent slopes (ed), Laewest clay 0 – 1 percent slopes (La), Dacosta sandy clay loam 0 – 1 percent slopes (Mb), Dacosta clay loam 0 – 1 percent slopes (Mc), Contee-Dacosta complex 0 – 1 percent slopes (Md), and Telferner fine sandy loam 0 – 1 percent slopes (Te) (**Figure 2-2**). Common traits attributed to these soil types are summarized below in **Table 2-1**, including texture, soil horizon designation of a typical soil profile, parent material (material from which the soil type has formed), and drainage. Information concerning the soil type was compiled using the information available on the United States Department of Agriculture (USDA), National Resource Conservation Service (NRCS) Web Soil Survey (USDA/NRCS 2023).

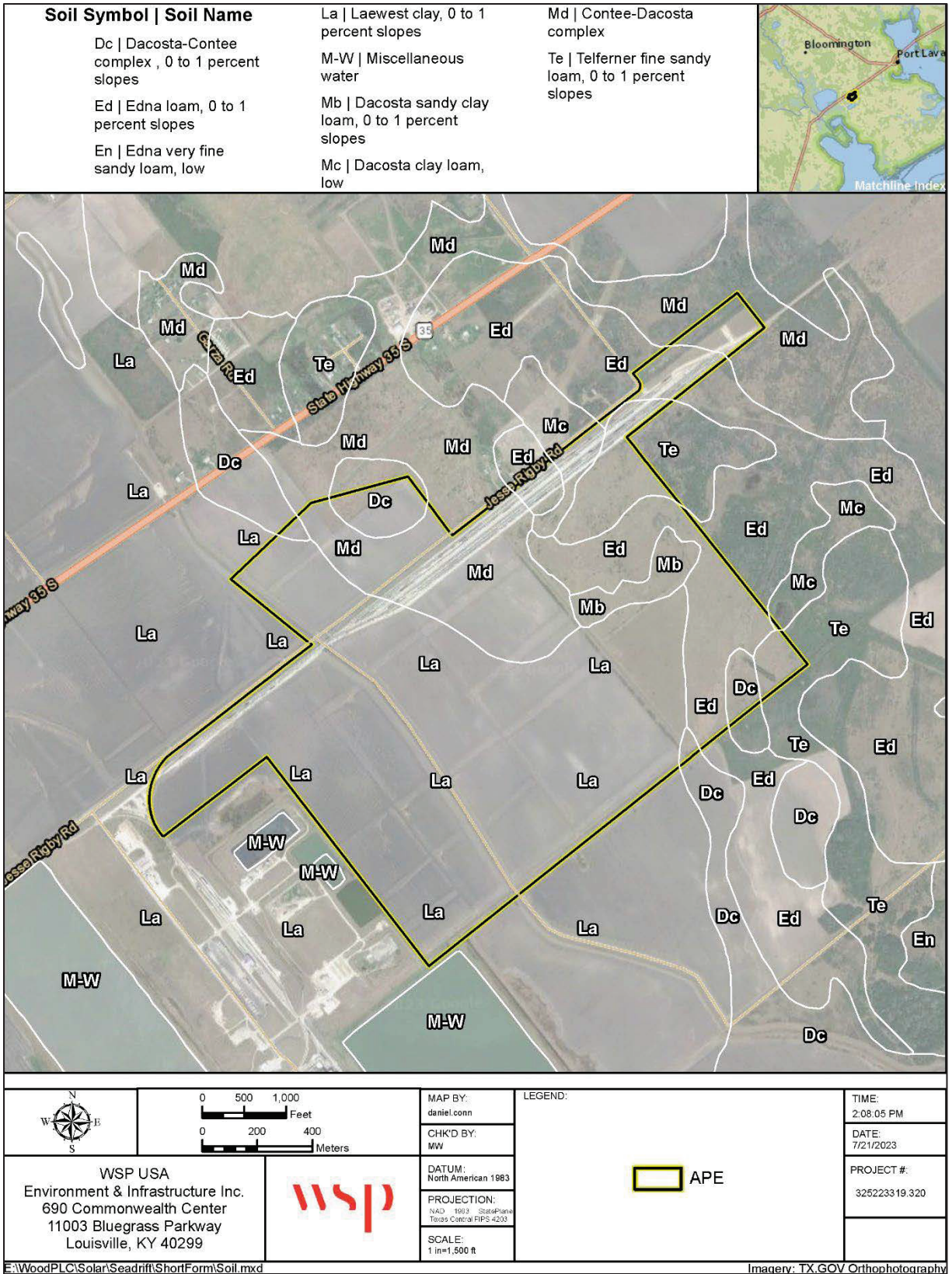


Figure 2-2. Soils located within and surrounding the APE.

Table 2-1. Summary of Soil Types Found within the APE.					
Soil Type	Typical Soil Profile	Drainage	Parent Material	Landform	% of APE
Dacosta - Contee complex (Dc)	A - 0 to 9 inches: sandy clay loam Bt1 - 9 to 13 inches: sandy clay loam Bt2 - 13 to 47 inches: clay Btk - 47 to 74 inches: sandy clay 2Bct - 74 to 80 inches: sandy clay loam	Moderately well drained	Clayey fluviomarine deposits	Flats	3.6
Edna loam (Ed)	A - 0 to 9 inches: loam Bt1 - 9 to 38 inches: clay Bt2 - 38 to 50 inches: clay Btk - 50 to 80 inches: sandy clay loam	Poorly drained	Loamy fluviomarine deposits	Flats	12.4
Laewest clay (La)	A - 0 to 17 inches: clay Bss1 - 17 to 40 inches: clay Bss2 - 40 to 59 inches: clay Bkss - 59 to 80 inches: clay	Moderately well drained	Clayey fluviomarine deposits	Flats	60.6
Dacosta sandy clay loam (Mb)	A - 0 to 10 inches: sandy clay loam Bt1 - 10 to 22 inches: sandy clay loam Bt2 - 22 to 43 inches: clay Btk - 43 to 74 inches: sandy clay 2Bct - 74 to 80 inches: sandy clay loam	Moderately well drained	Loamy fluviomarine deposits	Flats	2.3
Dacosta clay loam (Mc)	A - 0 to 4 inches: clay loam Bt1 - 4 to 15 inches: sandy clay loam Bt2 - 15 to 36 inches: clay Btk - 36 to 50 inches: sandy clay 2Bct - 50 to 80 inches: sandy clay loam	Moderately well drained	Loamy fluviomarine deposits	Flats	1.5
Contee-Dacosta complex (Md)	H1 - 0 to 8 inches: clay loam H2 - 8 to 62 inches: clay H3 - 62 to 80 inches: clay	Poorly drained	Clayey fluviomarine deposits	Flats	14.5
Telferner fine sandy loam (Te)	A - 0 to 14 inches: fine sandy loam E - 14 to 18 inches: fine sandy loam Bt - 18 to 55 inches: clay Bk - 55 to 80 inches: sandy clay loam	Moderately well drained	Loamy fluviomarine deposits	Meander scrolls	5.1

* Soil horizon sequence inferred from national soil series descriptions (USDA/NRCS Web Soil Staff 2023)

2.2 Geoarchaeological Assessment

Before conducting fieldwork, WSP conducted a geomorphological assessment of the APE. Three soil associations, encompassing seven soils are mapped within the survey area: Dacosta-Contee Complex with 0 to 1 percent slopes, Laewest clay with 0 to 1 percent slopes, and Contee-Dacosta complex (USDA/NRCS 2023). Overall, the soil's defined horizons, coupled with the APE location along a relatively straight portion of a low-level waterway (West Coloma Creek) and relatively flat topographic landform, suggest an area is unlikely to contain deeply buried archaeological

deposits. The A-Bt upper soil horizon suggests a fairly stable landform allowing for pedogenesis, not one subjected to frequent, large depositional events such as flooding. While the occurrence of the Bt-horizon deposits does not preclude cultural materials, the shallow nature of these deposits suggests any buried cultural deposits can be reached during shovel test excavations.

The notation of slickenslides (ss) in the soil horizon profile speaks to the general environment of the landform. Slickenslides in soil are defined as well-worn (smoothed) sides on soil peds that form in clay soils that have significant amounts of shrinking and swelling. Such traits are often attributed to frequently flooded or poorly drained soils, ones which are heavily inundated, then left to dry causing the shrinking and swelling activity. This suggests that the landform was likely frequently wet or inundated before the construction of the numerous ponds and drainage canals currently present in the region.

2.3 Prehistoric and Historic Environment

The central coast of Texas (the shoreline and coastal plain 40-50 km inland) is unified by the presence of five similar, major bay estuarine systems inside a continuous barrier chain (Ricklis 2004). The coastal plain is composed of sandy clays and clayey sands deposited by major fluvial-deltaic systems during the Pleistocene interglacials and rises very gradually toward the interior. During the last glacial maximum, the sea level was as much as 100 m lower than current sea levels, thus human encampments and activity areas along the coast are deeply submerged. By about 9000 years ago the melted waters formed bays comparable to those presently in existence, and they reached their present elevations by 3000 years ago. The barrier islands probably reached their present form about 2500-2000 years ago. The resource-rich shallow water estuaries were protected from strong wave activity by these islands and were increasingly suitable for exploitation by the aboriginal populations.

Calhoun County is located in the southwestern section of the Gulf Coast Prairie and encompasses a broad flat plain that is broken up by natural rain and inland bays. Elevation in the county ranges from sea level to approximately 55 feet above mean sea level (amsl). The average rainfall is approximately 39 inches (Mowery and Bower 1978).

3.0 CULTURAL AND ARCHAEOLOGICAL BACKGROUND

The history of human activity in Calhoun County and the surrounding region spans thousands of years. The earliest groups to leave a definitive material record of their presence were early Paleoindians who entered the region during the Late Pleistocene glacial epoch, more than 11,000 years ago. Their descendants and the descendants of other Native American groups who migrated to the region lived in the region until the arrival of the first European explorers.

While cultural change is a slow and continual process, archaeologists and other researchers divide the human history of a region into distinct cultural periods. Archaeologists and historians recognize four broadly defined periods, Paleoindian, Archaic, Late Prehistoric, Protohistoric, and Historic. Due to the lack of cultural material identified during the current investigations, the following sections have been abbreviated.

3.1 Prehistoric Context

Previous archaeological research in the project region has defined five distinct time periods that include, Paleoindian: 11,500 BP to 8,800 BP, Archaic: 8,800 BP to 1,200 BP, Late Prehistoric/Protohistoric: 1,200 BP to 500 BP, and Historic: 500 BP to present. The distinction between these periods relies heavily on the different types of subsistence practices utilized and the cultural traits present. However, it should be noted that discussion of the prehistory of Coastal Texas is largely restricted to the Central Texas Coast because the Lower Texas coast is relatively unknown (Ricklis 2004).

3.1.1 Paleoindian

The Paleoindian of Coastal Texas is not discussed by Ricklis (2004) because it is known only from scattered surface finds of diagnostic projectile points. No intact subsurface components have been explored. Because of the significantly lower water levels at the time, the Pleistocene coastline is deeply submerged. The cultural material that is present on land is related to terrestrial riverine environments.

3.1.2 Archaic (7,500 – 950 BP)

Early Archaic (7,500 – 4,200 BP)

Despite the lower and rapidly rising sea levels during the initial part of the Early Archaic period, the period is well represented in Coastal Texas. Ricklis (2004) divides the period into two segments: 7,500-6,800 BP and 5,800-4,200 BP, with a gap of about a millennium when there was little use of the shoreline, perhaps because of rapid rises in the water level that upset the ecology of the shoreline. The earlier portion of the period is represented by several sites in the Nueces Bay area that yielded radiocarbon dates but little cultural material. Surface finds of projectile points, particularly Uvalde-like points, are common. Distinctive edge-flaked shell scrapers/knives have been identified in good context. Estuarine shellfish were exploited, but it remains to be determined whether fishing was a significant part of the economy.

The second portion of the period is much better represented; sites are considerably more numerous, and a comparatively large number of radiocarbon dates have been obtained. Most of the deposits consist of shell middens with very few lithic items present. Deposits at one site [REDACTED] spanned about 600 years and produced a variety of diagnostic projectile points (Bell, Tortugas, early triangular, and round-based) and several shell tools; another site [REDACTED] had deposits built up over several hundred years and a sizable number of early triangular points, as well as an arc of postmolds from a structure. A variety of saltwater and freshwater fish compose the limited faunal assemblage from the various sites.

Middle Archaic (4,200 – 3,100 BP)

There are virtually no components and dates attributable to this time span despite investigations of earlier and later sites. It is feasible that there was minimal use of the shoreline during this period (Ricklis 2004).

Late Archaic (3,100 – 950 BP)

The Late Archaic began at about the time the sea level stabilized. There are dates from shoreline sites that span this period, and the sites are more numerous and larger, and deposits are thicker and have larger quantities of cultural material and more diverse assemblages (Ricklis 2004). This seems to indicate a larger population and more numerous and more intensive occupations. There is evidence of more concentrated exploitation of estuarine shellfish, in addition to hunting of white-tailed deer. The earlier deposits are marked by the presence of Kent points, and later deposits have Ensor points, and Catan and Matamoros points typify the terminal Archaic at about 950 BP. The shoreline sites show a diverse array of shell tools, perhaps necessitated by the distance from chert sources. The shell middens promoted the preservation of bone tools and non-functional items, which were found at many sites. By 2,000 BP there is evidence of much more intensive fishing, and moderate to high salinity mollusks were found in massive middens at the seaward end of bays. At least one site [REDACTED] showed relatively steady deposition of shell for about 1,300 years (Ricklis 1994). It is possible that the shoreline was occupied during cold weather and interior riverine areas were used during warmer months. Cemeteries are documented for the first time in the area, perhaps as a response to more established territories and increased populations.

3.1.3 Late Prehistoric (950 – 250 BP)

The advent of the Late Prehistoric is marked by the shift to the bow and arrow and the associated subsistence changes, and the period is divided into two segments on the bases of the changes in diagnostic tools and economic patterns (Ricklis 2004). The Initial Late Prehistoric (950-700/650 BP) is indicated by the presence of Scallorn points and by pottery with sandy paste at some locales. The Final Late Prehistoric (700/650-250 BP) is marked by Perdiz and other arrowheads, unifacial end scrapers, thin bifacial knives, small drills, and prismatic blade-core technology and Rockport pottery--ceramics with bowls, jars, and ollas often coated or decorated with asphaltum, incised rims, or notched lips. Fishing became an even more important subsistence source, while shellfish declined in importance. Bison provided the majority of the meat and white-tailed deer was secondary. The Rockport phase parallels the Toyah phase of the interior of the state in many aspects and appears to have adopted the same lithic technology at the same time, perhaps to facilitate the exploitation of bison. The subsistence system seems to continue the practice of occupying the interior lands to hunt during the warm months and movement to the shoreline during the winter but may add group aggregation to the system during the fishing season and dispersal into small camps for gathering plants and hunting (Ricklis 1996).

3.1.4 Protohistoric/Early Historic

In the sixteenth and seventeenth centuries, before the Spanish explorers and mission system impacted the economy of native groups, trade goods appeared in the region. The native groups of this area became culturally extinct in the eighteenth century because of diseases introduced by the Spanish and the movement of people into missions and the adoption of farming livelihoods (Hester 1989).

3.2 Historic Context

Calhoun County is located on the Gulf Coast, between Corpus Christi and Houston. In 1846, the Texas legislature established Calhoun County from portions of Victoria and Jackson Counties (McCarty 1910). The bodies of water that surround and drain from the county include Espiritu Santo Bay, Lavaca Bay, Matagorda Bay, and the San Antonio and Guadalupe Rivers.

Calhoun County's economy and significance are directly related to its position along the coast. The area is low-lying, flat, and, historically, has been used for cattle grazing. In 1875, a large gulf storm destroyed much of the county seat—Indianola—and its port (McCarty 1910). As a result, a decline in commerce and population occurred, lasting into the twentieth century. In the 1880s, the San Antonio and Mexican Gulf Railway was constructed, which connected the port towns to Victoria to the north and other centers of commerce (McCarty 1910). Its county seat, now, is Port Lavaca, on Lavaca Bay.

Matagorda Island, just south of the county, is mostly comprised of deep shell sand. The area's climate is mild, with an average rainfall of approximately 40 inches; the growing season, likewise, lasts most of the year. Native flora include grasses, coastal scrub, live oak, and sedges, while local fauna includes game birds, deer, jackrabbits, raccoons, and coyotes (Kleiner 1952).

3.3 Archaeological Background Research

Archaeological background research was compiled by reviewing the Texas Archaeological Sites Atlas. This review included the APE and a 1-km (0.6 miles) buffer surrounding the APE. The purpose of the research was to identify previous archaeological surveys and recorded archaeological sites within or near the APE. Reports of prior investigations are reviewed to gain an understanding of the archaeological research in the project area and vicinity. According to the review, no archaeological sites are located within the APE or the 1-km buffer surrounding the APE. No previously conducted surveys are located within the APE; however, two previously conducted archaeological surveys [REDACTED] are located within the 1-km buffer surrounding the APE (**Figure 3-1**). Little information regarding surveys [REDACTED] and [REDACTED] was available, except that they were conducted in May 2001. No archaeological sites were associated with these surveys within the 1-km buffer surrounding the APE.

3.4 Historic Map Review

The reviewed historic maps included the 1953 USGS 7.5' Seadrift, Port Lavaca West, Green Lake, and Austwell, Texas topographic quadrangles (**Figure 3-2**). A review of these historic maps revealed nine likely residential and outbuildings observed along Jesse Rigby Road. The areas surrounding these identified historic structures were treated as high-probability areas to contain historic cultural deposits.

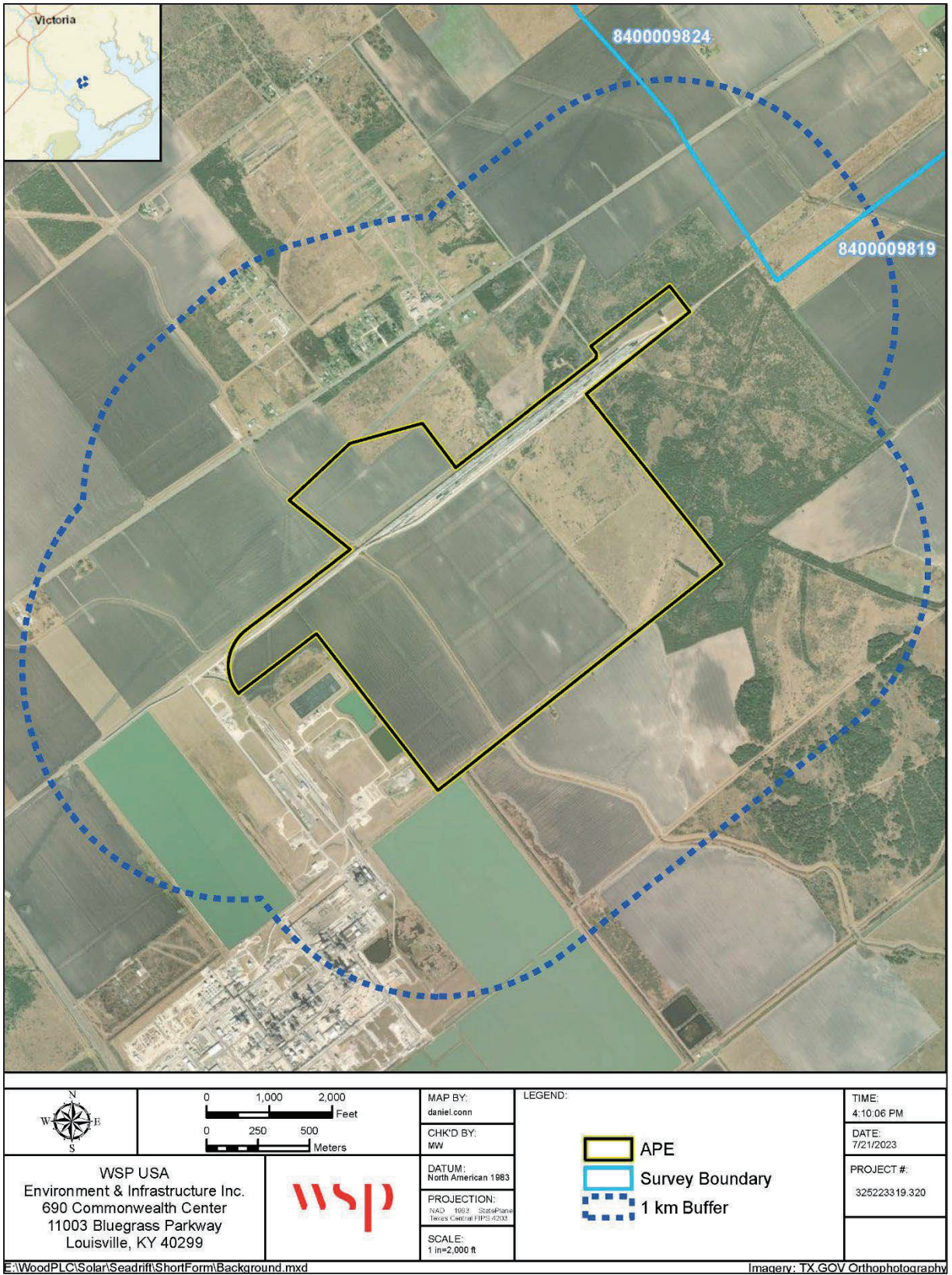


Figure 3-1. Texas Site Atlas background data within 1-km of the APE.

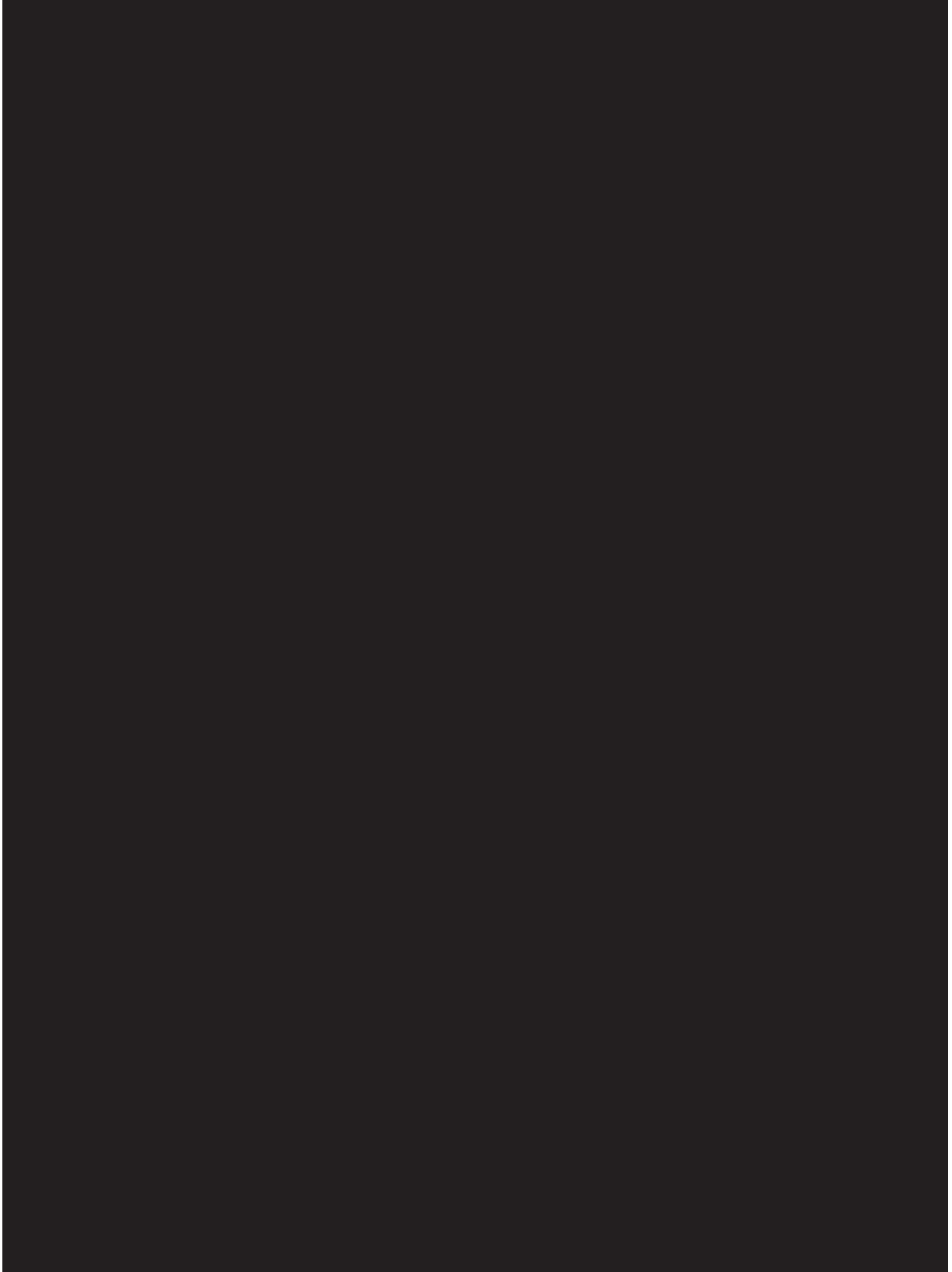


Figure 3-2. APE shown on the 1953 24k topographic quadrangles.

This Page Left Intentionally Blank

4.0 METHODS

Field investigations were conducted according to guidelines established by the Council of Texas Archaeologists Standards and Guidelines Committee Intensive Terrestrial Survey Guidelines (2020). The goals of the project were to:

- Identify the presence of previously unrecorded archaeological sites;
- Identify the presence of any deeply buried cultural deposits; and
- Establish recommendations regarding the potential for sites within the APE to be eligible for listing on the National Register of Historic Places (NRHP), as well as for designation as State Antiquities Landmarks.

The APE consists of portions of agricultural fields containing unharvested corn (at the time of the survey), as well as portions of open scrub growth, railroad tracks, and a railyard. The ground surface visibility varied across the APE and as such the Phase I intensive survey was completed over the entire APE using a combination of systematic shovel test probe excavation (STPs) coupled with pedestrian survey. The entire APE was visually inspected (pedestrian survey at 10-meter intervals) for above-ground historic or prehistoric features or other surface areas of cultural interest that may be present in the area. The entire APE was visually inspected for above-ground historic or prehistoric features or other surface areas of cultural interest that may be present in the area.

Shovel tests were excavated at intervals ranging between 75 – 100 meters, based on the surface conditions, and were offset from ditches, utilities, or other obvious areas of surface disturbance. Opportunistic STPs were excavated to further explore for cultural deposits, at the field director's discretion. All STPs were 30 cm in diameter and were excavated at least 10 cm into the sterile subsoil, to bedrock, or a maximum of 90 centimeters below the ground surface (cmbs). Soil from the STPs was screened through a 0.25- in hardware cloth. Measurements were recorded using the metric system, and shovel test forms and soil profile information was recorded for each test. Soils were described using the Munsell color chart and appropriate terminology. Photographs were taken of representative soil profiles throughout the APE to document the general conditions within the APE.

Mapping for the project was completed using a hand-held submeter Geographic Positioning System (GPS). Location data was collected for all STPs. Detailed notes were maintained daily regarding methods employed and environmental conditions within the APE. Digital photographs showing general views, survey conditions, and specific areas of interest within the survey area were taken as needed. It should be noted that photography of the entire APE was limited based on the rules and regulations of the Dow Seadrift Operations facility. The entire APE is located on Dow property. Photography was not permitted within the APE facing any of the infrastructure of the Dow Seadrift Operations facility. As such, every effort was made to adequately document the APE facing away from the facility.

This Page Left Intentionally Blank

5.0 RESULTS

From July 10 to 19, 2023, WSP conducted a Phase I intensive archaeological survey in support of the ER for the Proposed Xe-100 SMR project in Calhoun County, Texas. This report details a 617.4-acre portion (0.96 square miles or 249.85 hectares) of the larger 1,277 acres (1.99 square miles or 516.78 hectares) survey area to support requirements identified in the DOE's NEPA Implementing Regulations (10 CFR Part 1021) to support DOE's NEPA review of siting activities for the Xe-100 Sow Seadrift Site. For this report, the 617.4-acre portion is the APE. As a result of the investigation, no archaeological sites, cultural material, or buried cultural deposits were identified. No additional archaeological work is recommended for the APE.

5.1 APE Survey Results

The APE consists of portions of agricultural fields containing unharvested corn (**Figure 5-1**) as well as portions of open scrub growth (**Figure 5-2**), railroad tracks, and a railyard (**Figures 5-3 – 5-4**). The ground surface visibility varied across the APE (**Figure 5-5**) and as such the Phase I intensive survey was completed over the entire APE using a combination of systematic STPs coupled with pedestrian survey.

A total of 203 shovel tests were excavated within the APE (see **Appendix A**), all of which were void of cultural material (**Figure 5-6**). All observed soils within the APE were similar and consisted of very compact 10YR 3/1 silt clay loam Zone I, from the ground surface down to approximately 10 – 25 cmbs, underlain by a 10YR 4/1 clay Zone II, from 10/25 – 50 cmbs (**Figures 5-7 – 5-9**).



Figure 5-1. Overview of APE showing corn, facing southwest.



Figure 5-2. Overview of the APE showing scrub growth, facing north.



Figure 5-3. Overview of the APE showing railroad tracks, facing north.



Figure 5-4. Overview of the APE showing railyard, facing northeast.



Figure 5-5. Overview of the ground surface, facing west.

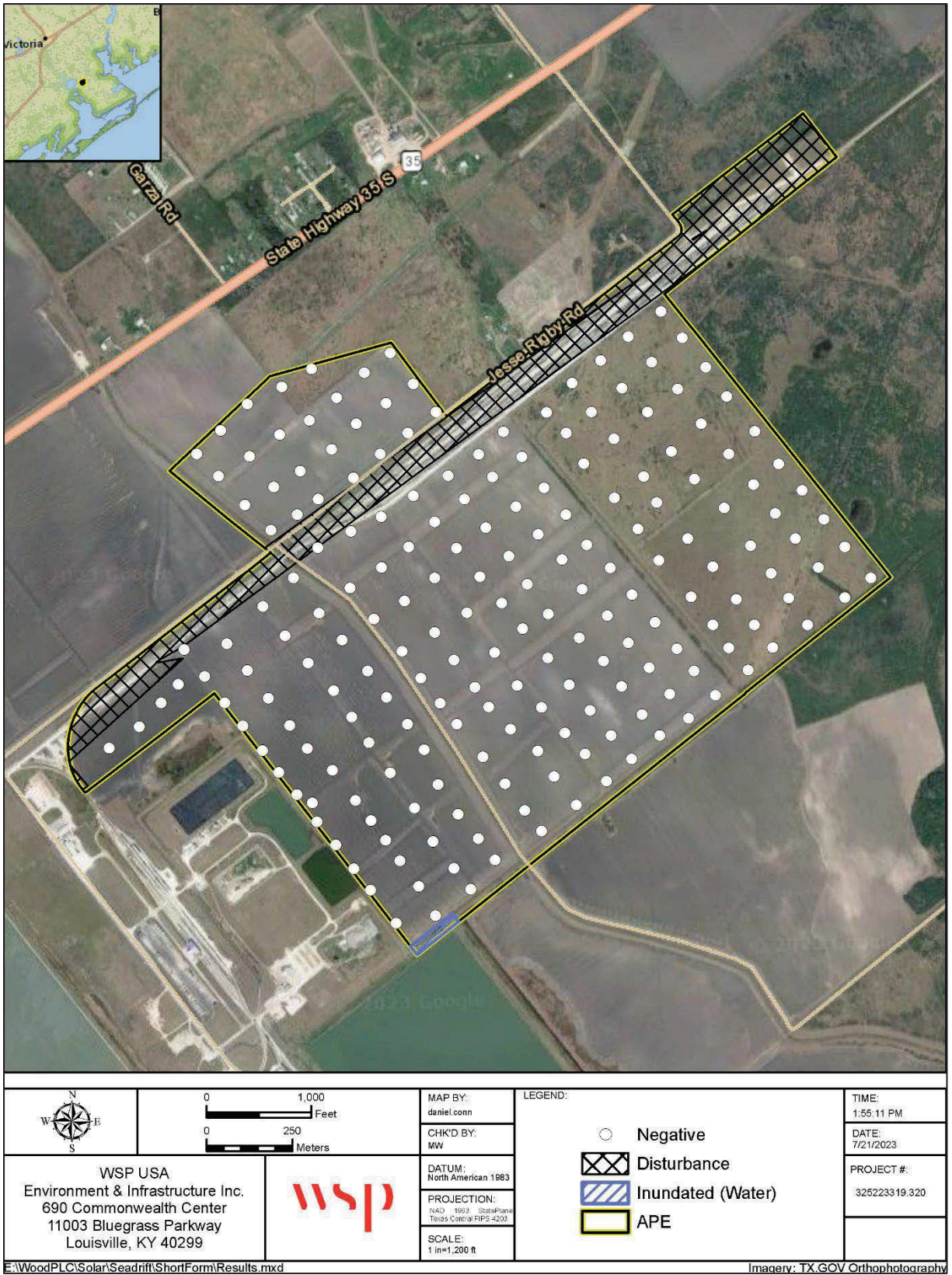


Figure 5-6. Survey Results, showing STP locations.



Figure 5-7. Observed soil profile.



Figure 5-8. Observed soil profile.



Figure 5-9. Observed soil profile.

5.2 High probability areas

Based on the historic map research (see **Section 3.4**), nine locations were determined to be a high probability to contain historic cultural material (see **Figure 3-2**). Field investigations revealed that the construction and subsequent maintenance of the railroad and railyard along Jesse Rigby Road (see **Figures 5-3 – 5-4**) have severely disturbed the area surrounding all nine of the high probably areas within the APE. No historic cultural material was identified in any of these high-probability locations.

5.3 Offsite surface water monitoring station

A proposed offsite stream gage (WCC-3), located in West Coloma Creek, along FM 2235, was also investigated for cultural resources (**Figures 5-10 – 5-11**). A surface water level monitoring station will be installed at this location to assist in the characterization of water level fluctuations. A pressure transducer and data logger will be installed within a 2-in diameter well casing that will be mounted in the stream channel, either attached to the existing culvert or the stream bottom via temporary support. The survey of the offsite stream gage included visual inspection, as the offsite stream gage will be installed within the stream. No cultural resources were identified.

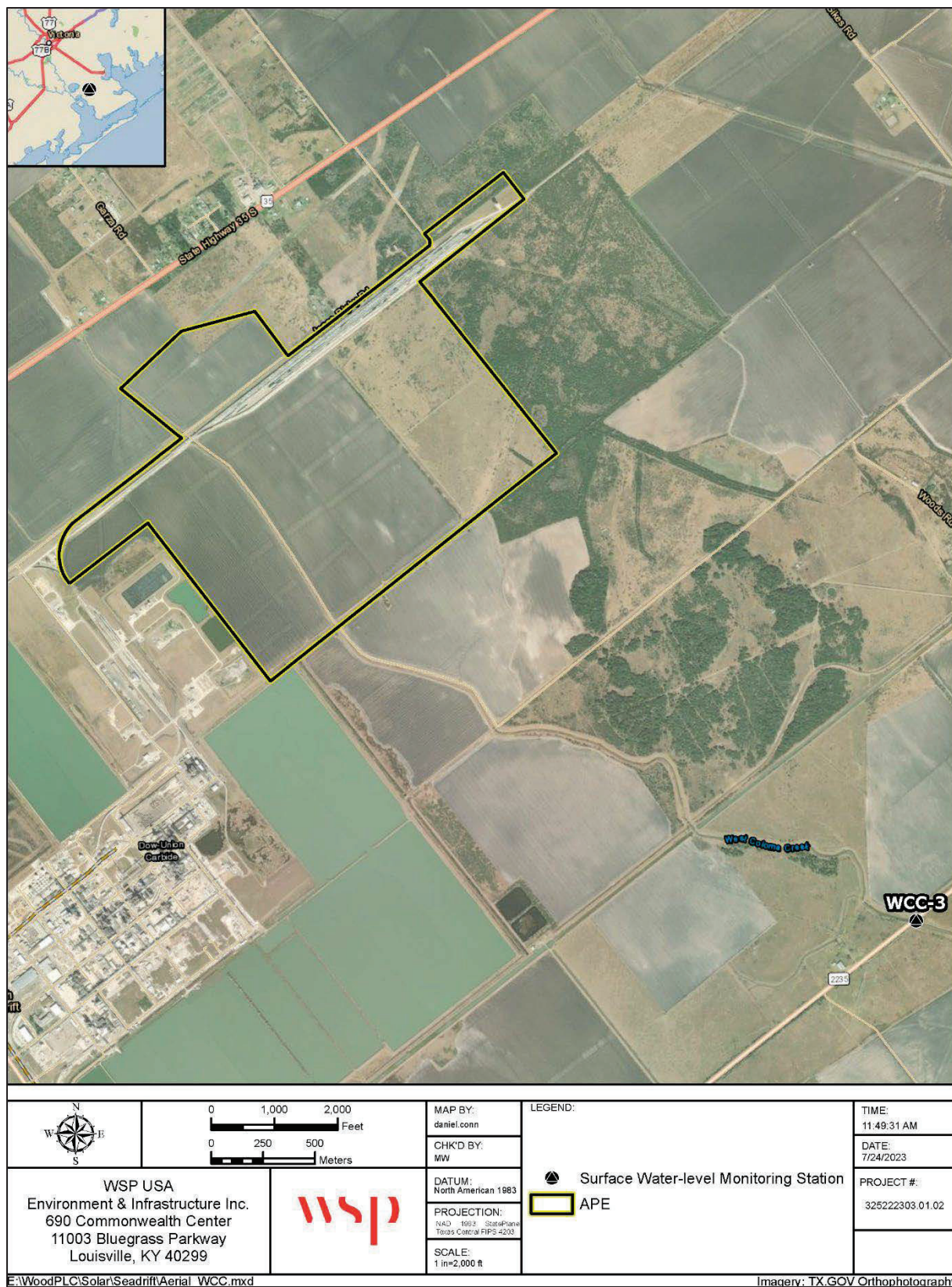


Figure 5-10. Offsite surface water monitoring (WCC-3) location.



Figure 5-11. Offsite surface water monitoring (WCC-3); facing southeast.

5.4 Aboveground Cultural Resource Survey

Additionally, WSP conducted an aboveground cultural resource eligibility and effects survey to support the requirements identified in the DOE's NEPA Implementing Regulations (10CFR Part 1021) to support DOE's NEPA review of siting activities for the Xe-100 DOW Seadrift Site. The purpose of the survey was to identify aboveground historic resources over 50 years of age within the APE, to evaluate these resources relative to their eligibility for listing in the NRHP, and to assess the potential direct and indirect visual effects of the proposed undertaking upon these resources.

The APE for the aboveground cultural historic resource survey was determined in consultation with X-Energy, the THC, and the State Historic Preservation Office. The APE includes an additional 0.5-mile buffer radiating out from the project area extents to account for impacts to aboveground historic architectural resources that are adjacent to the project area.

Based upon the nature of work addressed by this report, there is no potential for direct or indirect visual effects of the undertaking on historic resources within the project APE. A report detailing the complete survey of architectural resources related to the full scope of work of the proposed undertaking will follow this report of findings.

6.0 SUMMARY AND RECOMMENDATIONS

From July 10 to 19, 2023, WSP conducted a Phase I intensive archaeological survey of 1,277 acres in support of the ER for the Proposed Xe-100 SMR project in Calhoun County, Texas. This report details a 617.4-acre portion (0.96 square miles or 249.85 hectares) of the larger 1,277 acres (1.99 square miles or 516.78 hectares) survey area to support requirements identified in the DOE's NEPA Implementing Regulations (10 CFR 1021) to support DOE's NEPA review of siting activities for the Xe-100 Dow Seadrift Site. For this report, the 617.4-acre portion is the APE. The remaining 659.6 acres of the entire survey area will be submitted to the THC at a later date.

The survey was conducted under contract with X-Energy to facilitate compliance with Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas (Natural Resources Code, Title 9, Chapter 191, Subchapter A). Per the provisions of the Texas Cultural Resources Code, Title 9, Chapter 191, WSP initiated a review of the SOW with the THC on May 12, 2023, with the concurrence of the proposed SOW from the THC on June 7, 2023 (THC Tracking No. 202308205).

The APE consists of portions of agricultural fields containing unharvested corn as well as portions of open scrub growth, railroad tracks, and a railyard. The ground surface visibility varied across the APE and as such the Phase I intensive survey was completed over the entire APE using a combination of systematic STPs coupled with pedestrian survey.

Before fieldwork, WSP conducted a geomorphological desktop assessment of the APE. Overall, the soil's defined horizons, coupled with the project's location along a relatively straight portion of a low-level waterway (West Coloma Creek) and relatively flat topographic landform, suggest the area is unlikely to contain deeply buried archaeological deposits. The shallow nature of these deposits suggests any buried cultural deposits can be reached during shovel test probe excavations.

A total of 203 STPs were excavated across the APE. None of the excavated STPs contained cultural material. Additionally, no evidence of deeply buried cultural deposits suggesting buried A-horizons or cultural artifacts were identified in any of the excavations. As a result of the intensive archaeological survey, no archaeological sites or cultural materials were identified. It is recommended that the project will have no effect on historic properties and that no additional archaeological work is required within the APE.

Additionally, WSP conducted an aboveground cultural resource eligibility and effects survey to support the requirements identified in the DOE's NEPA Implementing Regulations (10 CFR 1021) to support DOE's NEPA review of siting activities for the Xe-100 Dow Seadrift Site. The purpose of the survey was to identify aboveground historic resources over 50 years of age within the APE, to evaluate these resources relative to their eligibility for listing in the NRHP, and to assess the potential direct and indirect visual effects of the proposed undertaking upon these resources.

The APE for the aboveground cultural historic resource survey was determined in consultation with X-Energy, the THC, and the State Historic Preservation Office. The APE includes an additional 0.5-mile buffer radiating out from the project area extents to account for impacts to aboveground historic architectural resources that are adjacent to the project area. Based upon the nature of work addressed by this report, there is no potential for direct or indirect visual effects of the undertaking on historic resources within the project APE. A report detailing the complete survey of architectural resources related to the full scope of work of the proposed undertaking will follow this report of findings.

This Page Left Intentionally Blank

7.0 REFERENCES CITED

Bureau of Economic Geology

- 1996 Physiographic Map of Texas. Bureau of Economic Geology, the University of Texas at Austin. Electronic document, <http://www.beg.utexas.edu/UTopia/images/pagesizemaps/physiography.pdf>, accessed 2023.

Council of Texas Archaeologists

- 2020 *Standards and Guidelines Committee Intensive Terrestrial Survey Guidelines*. Texas Historical Commission, Austin.

Hester, Thomas R.

- 1989 Historic Native American Populations. In *From the Gulf to the Rio Grande: Human Adaptation in Central, South, and Lower Pecos Texas*, by T. R. Hester, S. L. Black, D. G. Steele, B. W. Oliver, A. A. Fox, K. Reinhard, and L. C. Bement, pp. 77-84. Research Series No. 33, Arkansas Archaeological Survey, Fayetteville.

Kleiner, Diana J.

- 1952 Calhoun County. Electronic document, <https://www.tshaonline.org/handbook/entries/calhoun-county>, accessed July 7, 2023.

McCarty, Jackie

- 1910 Calhoun County, Texas. Electronic document, http://genealogytrails.com/tex/gulfcoast/calhoun/history_county.htm, accessed July 7, 2023.

Mowery, Irvin C. and James E. Bower

- 1978 *Soil Survey of Calhoun County, Texas*. United States Department of Agriculture, Natural Resources Conservation Service, Washington D.C.

Ricklis, Robert A.

- 1994 Limited Testing at the Mustang Lake Site, 41CL3, under Special-Use Permit 73683 & ARPA Permit Aransas-94. Corpus Christi, Texas. Coastal Archaeological Studies.
- 1996 *The Karankawa Indians of the Texas Coast: An Ecological Study of Cultural Tradition and Change*. University of Texas Press, Austin.
- 2004 Prehistoric Occupation of the Central and Lower Texas Coast: a Regional Overview. In *The Prehistory of Texas*, edited by Timothy K. Pertulla, pp. 155-180. Texas A&M Press, College Station.

TSHA (Texas State Historical Association)

- 2023 Physical Regions of Texas. Electronic document, <https://texasalmanac.com/topics/environment/physical-regions-texas>, accessed July 2023.

United States Department of Agriculture (USDA) and Natural Resource Conservation Service (NRCS)

- 2023 Web Soil Survey. Soil Mapping and Official Soil Series Descriptions. Electronic document, <http://websoilsurvey.nrcs.usda.gov/app/>, accessed July 2023.

This Page Left Intentionally Blank

Appendix A

Shovel Test Probe (STP) Log and STP Location Map

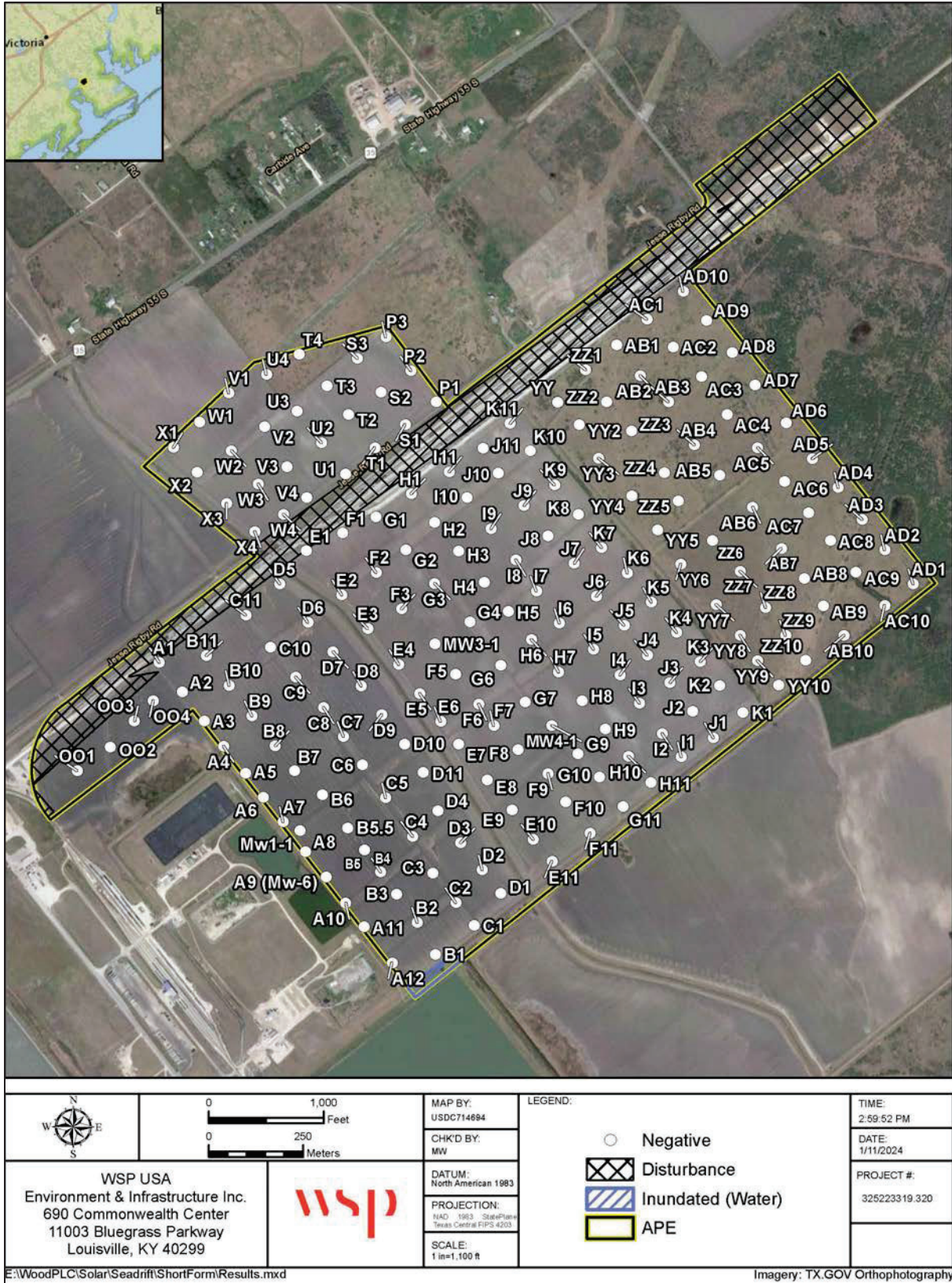
This Page Left Intentionally Blank

STP #	Total STP Depth (cmbs)	Artifacts (Pos/Neg)	Date	Recorder
A1	50	Negative	7/12/23	PCC/ SL /GH / NB
A2	49	Negative	7/12/23	PCC/ SL /GH / NB
A3	50	Negative	7/12/23	PCC/ SL /GH / NB
A4	50	Negative	7/12/23	PCC/ SL /GH / NB
A5	30	Negative	7/12/23	PCC/ SL /GH / NB
A6	28	Negative	7/12/23	PCC/ SL /GH / NB
A7	50	Negative	7/12/23	PCC/ SL /GH / NB
A8	36	Negative	7/12/23	PCC/ SL /GH / NB
A9	50	Negative	7/12/23	PCC/ SL /GH / NB
A10	21	Negative	7/12/23	PCC/ SL /GH / NB
A11	50	Negative	7/12/23	PCC/ SL /GH / NB
A12	40	Negative	7/12/23	PCC/ SWL
B1	30	Negative	7/12/23	PCC/ SWL
B2	34	Negative	7/12/23	PCC/ SWL
B3	40	Negative	7/12/23	PCC/ SWL
B4	30	Negative	7/12/23	PCC/ SWL
B5	40	Negative	7/12/23	PCC/ SWL
B5.5	40	Negative	7/12/23	PCC/SWL
B6	30	Negative	7/12/23	PCC/ SWL
C1	35	Negative	7/12/23	PCC/ SWL
C2	30	Negative	7/12/23	PCC/ SWL
C3	27	Negative	7/12/23	PCC/ SWL
C4	32	Negative	7/12/23	PCC/ SWL
C5	30	Negative	7/12/23	PCC/ SWL
C6	30	Negative	7/12/23	PCC/ SWL
C7	28	Negative	7/12/23	PCC/ SWL
C8	31	Negative	7/12/23	PCC/ SWL
C9	31	Negative	7/12/23	PCC/ SWL
C10	30	Negative	7/12/23	PCC/ SWL
C11	30	Negative	7/12/23	PCC/ SWL
D1	30	Negative	7/12/23	PCC/ SWL
D2	40	Negative	7/12/23	PCC/ SWL
D3	30	Negative	7/12/23	PCC/ SWL
D4	30	Negative	7/12/23	PCC/ SWL
D5	20	Negative	7/13/23	PCC/ SWL
D6	40	Negative	7/13/23	PCC/ SWL
D7	30	Negative	7/13/23	PCC/ SWL
D8	30	Negative	7/13/23	PCC/ SWL
D9	40	Negative	7/13/23	PCC/ SWL
D11	36	Negative	7/13/23	PCC/ SWL
E1	40	Negative	7/13/23	PCC/ SWL
E2	40	Negative	7/13/23	PCC/ SWL
E3	40	Negative	7/13/23	PCC/ SWL
E4	40	Negative	7/13/23	PCC/ SWL
E5	50	Negative	7/13/23	PCC/ SWL
E6	40	Negative	7/13/23	PCC/ SWL
E7	40	Negative	7/13/23	PCC/ SWL
E8	40	Negative	7/13/23	PCC/ SWL
E9	40	Negative	7/13/23	PCC/ SWL
E10	40	Negative	7/13/23	PCC/ SWL
E11	40	Negative	7/13/23	PCC/ SWL
F1	28	Negative	7/13/23	PCC/ SWL
F2	32	Negative	7/13/23	PCC/ SWL
F3	36	Negative	7/12/23	PCC/ SWL

STP #	Total STP Depth (cmbs)	Artifacts (Pos/Neg)	Date	Recorder
F4	30	Negative	7/12/23	PCC/ SWL
F5	30	Negative	7/12/23	PCC/ SWL
F6	35	Negative	7/12/23	PCC/ SWL
F7	38	Negative	7/12/23	PCC/ SWL
F8	33	Negative	7/12/23	PCC/ SWL
F9	31	Negative	7/12/23	PCC/ SWL
F10	34	Negative	7/12/23	PCC/ SWL
F11	31	Negative	7/12/23	PCC/ SWL
G1	30	Negative	7/13/23	PCC/ SWL
G2	30	Negative	7/13/23	PCC/ SWL
G3	37	Negative	7/13/23	PCC/ SWL
G4	40	Negative	7/13/23	PCC/ SWL
G5	30	Negative	7/13/23	PCC/ SWL
G6	30	Negative	7/13/23	PCC/ SWL
G7	30	Negative	7/13/23	PCC/ SWL
G8	30	Negative	7/13/23	PCC/ SWL
G9	30	Negative	7/13/23	PCC/ SWL
G10	30	Negative	7/13/23	PCC/ SWL
G11	30	Negative	7/13/23	PCC/ SWL
H1	30	Negative	7/14/23	PCC/ SWL
H2	27	Negative	7/14/23	PCC/ SWL
H3	25	Negative	7/14/23	PCC/ SWL
H4	31	Negative	7/14/23	PCC/ SWL
H5	30	Negative	7/14/23	PCC/ SWL
H6	30	Negative	7/14/23	PCC/ SWL
H7	25	Negative	7/14/23	PCC/ SWL
H8	28	Negative	7/14/23	PCC/ SWL
H9	30	Negative	7/14/23	PCC/ SWL
H10	30	Negative	7/14/23	PCC/ SWL
H11	30	Negative	7/14/23	PCC/ SWL
I1	29	Negative	7/13/23	SWL/ NB
I2	32	Negative	7/13/23	SWL/ NB
I3	30	Negative	7/13/23	SWL/ NB
I4	31	Negative	7/13/23	SWL/ NB
I5	30	Negative	7/13/23	PCC/ SWL
I6	35	Negative	7/13/23	PCC/ SWL
I7	31	Negative	7/13/23	PCC/ SWL
I8	30	Negative	7/13/23	PCC/ SWL
I9	30	Negative	7/13/23	PCC/ SWL
I10	31	Negative	7/13/23	PCC/ SWL
I11	34	Negative	7/13/23	PCC/ SWL
J1	40	Negative	7/13/23	PCC/ SWL
J2	40	Negative	7/13/23	PCC/ SWL
J3	40	Negative	7/13/23	PCC/ SWL
J4	40	Negative	7/13/23	PCC/ SWL
J5	40	Negative	7/13/23	PCC/ SWL
J6	40	Negative	7/13/23	PCC/ SWL
J7	40	Negative	7/13/23	PCC/ SWL
J8	40	Negative	7/13/23	PCC/ SWL
J9	40	Negative	7/13/23	PCC/ SWL
J10	40	Negative	7/13/23	PCC/ NB/ GH
J11	40	Negative	7/13/23	PCC/ NB/ GH
K1	35	Negative	7/13/23	PCC/ SWL/ NB
K2	40	Negative	7/13/23	PCC/ SWL/ NB

STP #	Total STP Depth (cmbs)	Artifacts (Pos/Neg)	Date	Recorder
K2.5	30	Negative	7/13/23	PCC/ SWL/ NB
K3	30	Negative	7/13/23	PCC/ SWL/ NB
K4	30	Negative	7/13/23	PCC/ SWL/ NB
K5	30	Negative	7/13/23	PCC/ SWL/ NB
K6	30	Negative	7/13/23	PCC/ SWL/ NB
K7	30	Negative	7/13/23	PCC/ SWL/ NB
K8	30	Negative	7/13/23	PCC/ SWL/ NB
K9	30	Negative	7/13/23	PCC/ SWL/ NB
K10	30	Negative	7/13/23	PCC/ SWL/ NB
K11	30	Negative	7/13/23	PCC/ SWL/ NB
P1	35	Negative	7/14/23	PCC/ SWL
P2	32	Negative	7/14/23	PCC/ SWL
P3	27	Negative	7/14/23	PCC/ SWL
S1	30	Negative	7/14/23	PCC/ SWL
S2	25	Negative	7/14/23	PCC/ SWL
S3	25	Negative	7/14/23	PCC/ SWL
T1	40	Negative	7/14/23	PCC/ GH
T2	40	Negative	7/14/23	PCC/ GH
T3	40	Negative	7/14/23	PCC/ GH
U1	22	Negative	7/14/23	PCC
U2	30	Negative	7/14/23	PCC
U3	25	Negative	7/14/23	PCC
U4	30	Negative	7/14/23	PCC
V1	33	Negative	7/14/23	PCC/ SWL
V2	17	Negative	7/14/23	PCC/ SWL
V3	19	Negative	7/14/23	PCC/ SWL
V4	30	Negative	7/14/23	PCC
W1	30	Negative	7/14/23	PCC/ SWL
W2	30	Negative	7/14/23	PCC/ SWL
W3	30	Negative	7/14/23	PCC/ SWL
W4	30	Negative	7/14/23	PCC/ SWL
X1	25	Negative	7/14/23	PCC/ SWL
X2	30	Negative	7/14/23	PCC/ SWL
X3	25	Negative	7/14/23	PCC/ SWL
X4	25	Negative	7/14/23	PCC/ SWL
OO1	35	Negative	7/16/23	PCC/ SWL
OO1.5	35	Negative	7/16/23	PCC/ SWL
OO2	32	Negative	7/16/23	PCC/ SWL
OO2.5	35	Negative	7/16/23	PCC/ SWL
OO3	40	Negative	7/14/23	PCC/ GH
OO3.5	30	Negative	7/16/23	PCC/ SWL
OO4	28	Negative	7/16/23	PCC/ SWL
OO4.5	32	Negative	7/16/23	PCC/ SWL
YY1	5	Negative	7/17/23	PCC/ SWL
YY2	31	Negative	7/17/23	PCC/ SWL
YY3	26	Negative	7/17/23	PCC/ SWL
YY4	36	Negative	7/17/23	PCC/ SWL
YY5	28	Negative	7/17/23	PCC/ SWL
YY6	25	Negative	7/17/23	PCC/ SWL
YY7	27	Negative	7/17/23	PCC/ SWL
YY8	34	Negative	7/17/23	PCC/ SWL
YY9	34	Negative	7/17/23	PCC/ SWL
YY10	37	Negative	7/17/23	PCC/ SWL
ZZ1	30	Negative	7/17/23	GH

STP #	Total STP Depth (cmbs)	Artifacts (Pos/Neg)	Date	Recorder
ZZ2	40	Negative	7/17/23	GH
ZZ3	30	Negative	7/17/23	GH
ZZ4	30	Negative	7/17/23	GH
ZZ5	30	Negative	7/17/23	GH
ZZ6	30	Negative	7/17/23	GH
ZZ7	30	Negative	7/17/23	GH
ZZ8	30	Negative	7/17/23	GH
ZZ9	30	Negative	7/17/23	GH
ZZ10	30	Negative	7/17/23	GH
AB1	25	Negative	7/17/23	SWL
AB2	20	Negative	7/17/23	SWL
AB3	25	Negative	7/17/23	SWL
AB4	25	Negative	7/17/23	SWL
AB5	30	Negative	7/17/23	SWL
AB6	30	Negative	7/17/23	SWL
AB7	30	Negative	7/17/23	SWL
AB8	30	Negative	7/17/23	SWL
AB9	30	Negative	7/17/23	SWL
AB10	30	Negative	7/17/23	SWL
AB11	30	Negative	7/17/23	SWL
AC1	30	Negative	7/17/23	PCC
AC2	27	Negative	7/17/23	PCC
AC3	31	Negative	7/17/23	PCC
AC4	25	Negative	7/17/23	PCC
AC5	28	Negative	7/17/23	PCC
AC6	25	Negative	7/17/23	PCC
AC7	30	Negative	7/17/23	PCC
AC8	30	Negative	7/17/23	PCC
AC9	28	Negative	7/17/23	PCC
AC10	25	Negative	7/17/23	PCC
AD1	27	Negative	7/17/23	PCC/ SWL
AD2	39	Negative	7/17/23	PCC/ SWL
AD3	50	Negative	7/17/23	GH
AD4	25	Negative	7/17/23	SWL
AD5	25	Negative	7/17/23	PCC/ SWL
AD6	26	Negative	7/17/23	PCC/ SWL
AD7	30	Negative	7/17/23	GH
AD8	25	Negative	7/17/23	PCC/ SWL
AD9	30	Negative	7/17/23	PCC/ SWL
AD10	31	Negative	7/17/23	PCC/ SWL
AE1	15	Negative	7/17/23	SWL
AE2	15	Negative	7/17/23	SWL
AE3	25	Negative	7/17/23	SWL
AE4	30	Negative	7/17/23	SWL
AE5	30	Negative	7/17/23	SWL
AE6	30	Negative	7/17/23	SWL
AE7	30	Negative	7/17/23	SWL
Disturbed at Surface	N/A	N/A	7/15/23	PCC
Disturbed at Surface	N/A	N/A	7/15/23	PCC
Water at Surface	N/A	N/A	7/15/23	PCC



STP locations within the APE.

This Page Left Intentionally Blank



VI-E

**X Energy, LLC, “Project Long Mott Ecological Resources
Technical Report,”, Revision 1, August 5, 2024 (unrestricted;
public)**



Long Mott Energy, LLC
221 H. H. Dow Way
Midland, MI 48674

2 February 2026

2026-PLM-NRC-002

Docket No. 50-0614

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 2055-0001

**Subject: Release of the Project Long Mott Ecological Resources Technical Report,
Revision 1 to the Docket**

References:

- 1) Long Mott Energy, LLC 2025, "Long Mott Generating Station Construction Permit Application," 2025-PLM-NRC-003, March 31, 2025 (ML25090A057)
- 2) U.S. Nuclear Regulatory Commission, 2025, "Acceptance for Docketing of the Long Mott Generating Station Construction Permit Application", May 12, 2025 (ML25115A247)
- 3) U.S. Nuclear Regulatory Commission, 2025, "Long Mott Generating Station Environmental Report Audit Plan", August 28, 2025 (ML25240B607)

Under formal oath and affirmation, Long Mott Energy, LLC (LME) is releasing the Ecological Resources Technical Report, Revision 1 for addition to the Docket. This report is referenced in the Environmental Report of the Long Mott Generating Station Construction Permit Application (Reference 1). LME has duly reviewed the report and affirms that it contains no information that is subject to withholding under 10 CFR 2.390, notwithstanding the confidentiality statement in the report.

If there are any questions regarding these commitments, please contact Mark Feltner (MFeltner@dow.com).

Sincerely,

DocuSigned by:

7DB1A2114768476...

Charles O'Connor
Sr. Director, Engineering and Projects
Long Mott Energy, LLC



Long Mott Energy, LLC
221 H. H. Dow Way
Midland, MI 48674

Enclosures: None

Cc:

Long Mott Energy, LLC:

Kreshka Young
Charles O'Connor
Mark Feltner
Wayne Blaylock
Edward Stones
Evan Blankenau

X Energy, LLC:

David Bannister
Dragan Popovich
Steve Miller
Rob Taylor
David Royer
Steve Vaughn
Jessica Maddocks
Milton Gorden

U.S. Department of Energy:

Tim Beville
David Yarwood

U.S. Nuclear Regulatory Commission:

Alissa Neuhausen
Adrian Muñoz
Ondra Dukes
Denise McGovern
Richard Rivera
Joe O'Hara
John Monninger, NRC Region IV



ISSUE SUMMARY AND APPROVAL PAGE

Project No. A13766.119
Transmittal No. SL-XEN-2024-135
August 20, 2024

X-energy LLC
Proposed Long Mott Ecological Resources Technical Report
August 2024

This Project Long Mott Ecological Resources Technical Report, Rev. 1 for the proposed site at the Union Carbide Corporation Seadrift Operations site (the Dow Chemical Corporation Facility) in Seadrift, Calhoun County, Texas has been reviewed for compliance with applicable technical and contractual documents and is approved for use.

The report was prepared by WSP USA Environment and Infrastructure, Inc. (WSP) under WSP project number 325223319.

Document No.	Rev.	Purpose	Date	Sections Affected
TC#: 009793 WSPDC#: WSP-XES-09	1	Updated with Spring 2024 aquatics survey data	08/05/2024	All

Reviewed by **Julianna
Crumlish**
Julianna Crumlish
Senior Environmental
Associate

Digitally signed by
Julianna Crumlish
Date: 2024.08.20
11:51:31 -05'00'

Approved by **Greg Boswell**
Greg Boswell
Consultant I

Digitally signed by Greg
Boswell
Date: 2024.08.20 13:26:06
-04'00'

Project Long Mott Ecological Resources Technical Report

Revision 1

Prepared for:



X-energy, LLC

Submitted to:



Sargent & Lundy, LLC

Prepared by:



WSP USA Environment & Infrastructure Inc.
15933 Clayton Road
Suite 110
Ballwin, Missouri 63011

WSPDC# WSP-XES-09

August 2024



REPORT APPROVAL

Project Name: Project Long Mott Licensing Project

Project Number: 325223319

Site: Long Mott

Site Location: Calhoun County, Texas

We have reviewed and approve of the Ecological Resources Technical Report for the above referenced project. Changes to this technical memorandum shall be documented in writing and approved.

WSP Subject
Matter Technical
Lead


Matthew Basler

Date: 8/5/2024

WSP ER Project
Manager


William Elzinga

Date: 8/5/2024



REVISION LOG

Project Name: Project Long Mott Licensing Project

Project Number: 325223319

Site: Long Mott

Site Location: Calhoun County, Texas

Revision Number	Revision Date	Nature of Revision	Approved by
0	3/25/2024	Issued for use	W. Elzinga
1	8/5/2024	Inclusion of spring 2024 aquatics survey data and updated 2024 IPac/TPWD lists	W. Elzinga

TABLE OF CONTENTS

REVISION LOG	ii
Abbreviations and Acronyms	viii
1 Introduction	9
1.1 Project Site	9
1.2 Purpose	10
1.3 Regulatory Basis	10
1.4 Scope	10
2 Methods and Technical Approach	12
2.1 Desktop Analysis	12
2.2 Terrestrial Resources	12
2.2.1 Vegetation Assessment	12
2.2.2 Terrestrial Wildlife Assessment	12
2.3 Aquatic Resources	14
2.3.1 Fish Sampling	14
2.3.2 Macroinvertebrate Sampling	14
2.4 Important Species and Habitats	14
3 Results	16
3.1 Terrestrial Resources	16
3.1.1 Vegetation	16
3.1.2 Wildlife	28
3.2 Aquatic Resources	41
3.2.1 Fish	41
3.3 Important Species and Habitats	51
3.3.1 State and Federally Listed Species	51
3.3.2 Additional Important Species and Habitats	56



4	Summary	59
5	References	61



TABLES

Table 3-1 Land Cover within the Project Long Mott Project Site and Vicinity	16
Table 3-2 Vascular Plant Species of the Project Long Mott Project Site	18
Table 3-3 Avifaunal Species Observed in or near the Project Long Mott Project Site, Winter 2023	31
Table 3-4 Avifaunal Species Observed in or near the Project Long Mott Project Site, Spring 2023	33
Table 3-5 Avifaunal Species Observed in or near the Project Long Mott Project Site, Summer 2023	35
Table 3-6 Avifaunal Species Observed in or near the Project Long Mott Project Site, Fall 2023	37
Table 3-7 Mammal Species Observed in or near the Project Long Mott Project Site, Winter 2023	39
Table 3-8 Mammal Species Observed in or near the Project Long Mott Project Site, Spring 2023	39
Table 3-9 Mammal Species Observed in or near the Project Long Mott Project Site, Summer 2023	39
Table 3-10 Mammal Species Observed in or near the Project Long Mott Project Site, Fall 2023	40
Table 3-11 Herpetofauna Species Observed in or near the Project Long Mott Project Site, Spring 2023	40
Table 3-12 Herpetofauna Species Observed in or near the Project Long Mott Project Site, Summer 2023	41
Table 3-13 Herpetofauna Species Observed in or near the Project Long Mott Project Site, Fall 2023.....	41
Table 3-14 Fish Species Observed in or near the Project Long Mott Project Site, Summer 2023	42
Table 3-15 Fish Species Observed in or near the Project Long Mott Project Site, Fall 2023	43
Table 3-16 Fish Species Observed in or near the Long Mott Project Site, Winter 2024	44
Table 3-17 Fish Species Observed in or near the Long Mott Project Site, Spring 2024	46
Table 3-18 Macroinvertebrates Encountered in the Vicinity of the Long Mott Project Site by Water Body, Fall 2023	47
Table 3-19 Macroinvertebrates Encountered in the Vicinity of the Long Mott Project Site by Water Body, Spring 2024	49
Table 3-20 Shellfish Species Encountered in Aquatic Ecology Sampling	51



Table 3-21 Protected Species Potentially Occurring within or near the Project Long Mott Project Site	51
Table 3-22: Species for which Essential Fish Habitat Exists in Guadalupe Bay within the Vicinity of the Long Mott Project Site	56



FIGURES

Figure 1-1 Project Site

Figure 2-1 Land Cover within the Project Area

Figure 2-2 Ecological Resources Survey Routes

Figure 2-3 Aquatic Ecology Resource Survey Locations

Figure 3-1 Land Cover within the Project Vicinity

Figure 3-2 Delineated WOTUS Features within the Project Area

APPENDICES

Appendix A Figures

Appendix B Photographic Log



ABBREVIATIONS AND ACRONYMS

CFR	Code of Federal Regulations
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ER	Environmental Report
ESA	Endangered Species Act
GBRA	Guadalupe-Blanco River Authority
IPaC	Information for Planning and Conservation
NEPA	National Environmental Policy Act
NLCD	National Landcover Database
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRC	U.S Nuclear Regulatory Commission
Project Site	Project Long Mott Site
QAPD	Quality Assurance Project Document
RPCT	Rare Plant Communities of Texas
SDO	Dow Seadrift Operations
SOP	Standard Operating Procedure
TPWD	Texas Parks and Wildlife Department
TCEQ	Texas Commission on Environmental Quality
µm	micrometer
USFWS	U.S. Fish and Wildlife Service
WOTUS	Waters of the U.S.
WSP	WSP USA Environment & Infrastructure Inc.
X-energy	X energy, LLC

1 Introduction

WSP USA Environment & Infrastructure Inc. (WSP), was contracted by X-energy, LLC (X-energy) to perform a series of studies in support of the Environmental Report (ER) for the Proposed Project Long Mott. Project Long Mott is applying for a construction permit under Title 10 of the Code of Federal Regulations (CFR) Part 50 to construct a 4-unit Xe-100 plant configured for cogeneration of steam and electricity. The U.S Nuclear Regulatory Commission (NRC) is expected to prepare an Environmental Impact Statement (EIS) in support of the NRC's decision to issue a license for the proposed facility.

The technical analyses summarized in this report were conducted in support of the preparation of the ER for Project Long Mott. This report summarizes analyses and measurements to document terrestrial and aquatic vegetation and wildlife at the proposed facility. Field investigations conducted within the Project Site were performed in accordance with the requirements of the following guiding documents:

Project Long Mott Environmental Report, Standard Operating Procedures for Field Data Collection Revision 2 (WSP 2023a).

Project Long Mott Environmental Report, Quality Assurance Project Document Revision 2. (WSP 2023b).

WSP field studies included in the ER standard operating procedures intend to sufficiently characterize baseline conditions for certain resources to allow for a complete and thorough environmental review relevant to the proposed action, as outlined in NUREG-1555 and Regulatory Guide 4.2, Revision 3 - "Preparation of Environmental Reports for Nuclear Power Stations".

1.1 Project Site

The Project Long Mott Site (Project Site) consists of approximately 1,548 acres in Calhoun County, Texas and is adjacent to the existing Dow Seadrift Operations (SDO) site (Figure 1-1). The Project Site is located within the Northern Humid Gulf Coastal Prairies Ecoregion within the Western Gulf Coastal Plain of southeast Texas. Northern Humid Gulf Coastal Prairies include gently sloping coastal plain underlaid by quaternary-aged deltaic clays, silts, and sands. Originally, dominant vegetation consisted of maritime woodlands and grasslands supporting switchgrass, brownseed paspalum, little bluestem, yellow Indiangrass, and gulf muhly. However, much of the area is currently dominated by farmland (Griffith *et al.*, 2007).

Much of the Project Site was in corn production at the time of the field review. The western portion of the Project Site included areas within the existing Dow SDO site, and the eastern portion of the Project Site consists of cultivated crops.

NUREG-1555 defines "vicinity" as a radius of 6 miles from the site, and "Region" as a 50-mile radius of the site, excluding the "the site and vicinity." For the purposes of the field ecology investigations and the resulting ER, the vicinity constitutes the area within a 6-mile radius from

the site center point, and the region will consist of the area within a 50-mile radius from the site center point.

1.2 Purpose

The purpose of this report is to summarize the methodologies and results of the studies undertaken in the Project Site and Project Vicinity in conjunction with the preparation of the ER for Project Long Mott. Specifically, surveys were conducted to document terrestrial vegetation and wildlife, including threatened and endangered species and the potential occurrence of their preferred habitats, resident plant communities, and wildlife populations (including important species and their habitats).

1.3 Regulatory Basis

The National Environmental Policy Act (NEPA) requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. The NRC Staff is required by portions of 10 CFR 51 (Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions) Subpart A (NEPA – Regulations Implementing Section) to assess project environmental impacts.

Project Long Mott is applying for a Construction Permit from the NRC for construction and operation of the proposed commercial Xe-100 small Modular Reactor Regulatory Guide 4.2 Revision 3. Revision 3 provides guidance to applicants for the format and content of ERs that are submitted as part of an application for a permit, license, or other authorization to site, construct, and/or operate a new nuclear power plant. NUREG-1555, “Environmental Standard Review Plan: Standard Review Plans for Environmental Reviews for Nuclear Power Plants”, is used by applicants to further inform the content of the ER and provides the criteria used by the NRC staff for reviewing ERs submitted with nuclear power plant license applications. Pursuant to the NRC’s review of the ER, NRC may prepare an EIS in support of the agency’s decision to issue a permit for the proposed facility.

1.4 Scope

Ecological work elements performed are required to satisfy regulatory requirements for documenting and characterizing environmental conditions of the Project Area and Project Vicinity, and in evaluating potential construction, operational, and decommissioning phase effects.

Work conducted consisted of the collection of seasonal ecological field data descriptive of threatened and endangered species and the potential occurrence of their preferred habitats, resident plant communities and wildlife populations (including important species and habitats as defined in NUREG-1555 Section 2.4). The results of the field surveys will be used to characterize terrestrial and aquatic wildlife and terrestrial vegetative communities in the Project Site and Project Vicinity to provide a basis for evaluating potential project impacts due to construction and operation of Project Long Mott.



This report presents the findings of terrestrial field surveys from winter, spring, summer, and fall 2023. To support the timely submittal of the ER, aquatic ecology field surveys included in Revision 0 of this report were findings from summer 2023 and a portion of fall 2023. This version, Revision 1, includes the remaining results from fall 2023, winter 2024, and spring 2024 aquatic ecology surveys.

2 Methods and Technical Approach

2.1 Desktop Analysis

Prior to the terrestrial ecological field surveys, biologists reviewed existing literature including the Victoria Early Site Permit ER, and information from the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) system, Texas Parks and Wildlife Department (TPWD) Calhoun County rare species list, USFWS National Wetland Inventory, National Oceanic and Atmospheric Administration (NOAA), and National Landcover Database (NLCD).

2.2 Terrestrial Resources

2.2.1 Vegetation Assessment

The vegetation assessment included pedestrian surveys to record plant species encountered in the Project Site, characterize plant communities present, and verify land cover. To account for seasonal variability of the vegetation within the site, surveys were conducted in the spring (May 22-25, 2023), summer (August 15-17, 2023), and fall (November 7-8, 2023). No vegetation surveys were conducted during the dormant winter months.

In order to effectively characterize plant communities in the Project Site, the relative abundance of each species occurring within each distinctive NLCD landcover type was assessed. Within individual landcover types, each unique plant community observed was described. Plant community descriptions were based on dominant and characteristic species observed. Landcover types and parcels assessed as part of the vegetation assessment are illustrated in Figure 2-1. Relative abundance of each species recorded through a terrestrial meandering approach within the Project Site was assessed qualitatively. The terrestrial meandering approach provided characterization of plant communities within available on-site habitats. Plant species abundance was visually scored for each vegetation layer (overstory, midstory, herbaceous, woody vine) based on the professional judgement of the field biology team using the following commonly used relative abundance:

- A: abundant (the dominant plants throughout the study area)
- C: common (locally abundant or frequently encountered)
- O: occasional (occasionally encountered, or locally common but absent or infrequent across much of the study area)
- U: uncommon (infrequently encountered)
- R: rare (very few plants encountered)

Qualitative characteristics of habitats near the Project Site and their associated flora were also recorded opportunistically via windshield surveys where accessible. Particular attention was given to identifying important species and habitats as defined in NUREG-1555 Section 2.4.

2.2.2 Terrestrial Wildlife Assessment

Seasonal wildlife surveys are prescribed herein to document bird, mammal, and herpetofauna use of the Project Site to satisfy NUREG-1555 and NRC Regulatory Guide 4.2 requirements.

The desktop analysis conducted prior to field investigations identified twenty-two migratory birds of conservation concern that have the potential to occur within the Project Site: American golden plover (*Pluvialis dominica*), bald eagle (*Haliaeetus leucocephalus*), black skimmer (*Rynchops niger*), chimney swift (*Chaetura pelagica*), dickcissel (*Spiza americana*), Forster's tern (*Sterna forsteri*), gull-billed tern (*Gelochelidon nilotica*), king rail (*Rallus elegans*), least tern (*Sternula antillarum antillarum*), lesser yellowlegs (*Tringa flabipes*), long-billed curlew (*Numenius americanus*), marbled godwit (*Limosa fedoa*), painted bunting (*Passerina ciris*), pectoral sandpiper (*Calidris melanotos*), prairie loggerhead shrike (*Lanius ludovicianus excubitorides*), prothonotary warbler (*Protonotaria citrea*), reddish egret (*Egretta rufescens*), sandwich tern (*Thalasseus sandvicensis*), swallow-tailed kite (*Elanoides forficatus*), short-billed dowitcher (*Limnodromus griseus*), whimbrel (*Numenius phaeopus hudsonicus*), and willet (*Tringa semipalmata*) (USFWS, 2024). Of these migratory birds of conservation concern, bald eagle, chimney swift, dickcissel, lesser yellowlegs, painted bunting, prothonotary warbler, and short-billed dowitcher were previously documented in the vicinity as part of the Victoria Early Site Permit ER (Exelon, 2012) and are likely to inhabit or use nearby habitats of the Project Site during migration and/or the breeding season. As such, these species and their habitat requirements have been given special consideration during the implementation of seasonal field surveys in the Project Site.

To document seasonal wildlife use of the Project Site and the immediate Project Vicinity, seasonal pedestrian surveys were conducted during winter (February 13-15, 2023), spring (May 22-25, 2023), summer (August 15-17, 2023), and fall (November 6-9, 2023). Pedestrian surveys were conducted using a semi-quantitative meandering approach along an established walking route to record encountered terrestrial faunal species presence (visual, audible, or other signs such as tracks, scat, nests) within each of the on-site habitats (Figure 2-2). The established walking route was selected to document wildlife use across the site within each of the on-site habitats near proposed construction activities. A general pedestrian site reconnaissance was also conducted each season for other portions of the Project Site outside of the established walking routes. The field studies for wildlife included surveys for avifauna, mammals, and herpetofauna.

Additionally, a semi-quantitative roadside survey approach was used to make observations of terrestrial faunal species along prescribed stops of existing roads within the Project Vicinity (Figure 2-2). At each of the 41 stops, field biologists recorded birds observed (visible and audible cues) during a 3-minute period for two mornings per seasonal survey period with observations initiated within one hour of sunrise each day. The distances between prescribed stops were generally 0.5 miles with some stopping points focused on potential habitat features (i.e., vegetation changes, stream corridors, waterbodies) and ranged from 1,701 to 4,108 feet. Notable wildlife travel corridors (if any) were also documented.

Incidental observations of wildlife species and habitats outside the Project Site were also recorded opportunistically through general reconnaissance within the vicinity. Climatic conditions for each survey event were recorded, such as estimated wind intensity (no wind, slight, gusty, strong wind), temperature (degrees Fahrenheit), and cloud cover.

2.3 Aquatic Resources

Seasonal aquatic surveys were conducted to document aquatic resources and associated ecological communities at the Project Site and in the Project Vicinity. Fish surveys were conducted during summer (August 15 to 17) and fall (November 6 to 10) 2023 as well as winter (January 9 to 11) and spring (May 21 to 23) 2024. Macroinvertebrate surveys were conducted during fall (November 6 to 10) 2023 and spring (May 21 to 23) 2024. Sampling was conducted at locations identified in Figure 2-3.

2.3.1 Fish Sampling

Fish sampling occurred at nine aquatic ecology sampling locations indicated in Figure 2-3. Semi-qualitative seining or backpack electrofishing techniques were employed for fish sampling in wadable streams. In those locations that are non-wadable or in which seining or backpack electrofishing was not possible, boat electrofishing methodology was employed.

2.3.2 Macroinvertebrate Sampling

Qualitative macroinvertebrate samples were collected at the nine aquatic ecology sampling locations using a D-frame kicknet with 500 micrometer (μm) mesh or an Ekman or petite ponar dredge, as determined by field conditions. Samples were field sieved through a 500 μm mesh and preserved for laboratory identification. Macroinvertebrate sampling was conducted in fall 2023 and spring 2024.

2.4 Important Species and Habitats

NUREG-1555 defines important species as:

- Species listed as threatened or endangered in 50 CFR 17.11 (fish and wildlife) and 50 CFR 17.12 (plants) by the USFWS.
- Species proposed for listing as threatened or endangered or is a candidate for listing in the most current list of such species as published in the *Federal Register*.
- Species listed as threatened, endangered, or other species of concern by the State in which the proposed facility is located.
- Commercially or recreationally valuable species.
- Species essential to the maintenance and survival of rare or commercially or recreationally valuable species.
- Species critical to the structure and function of local terrestrial ecosystems.
- Species that could serve as biological indicators to monitor the effects of the facilities on the terrestrial environment.

NUREG-1555 defines important habitats as:

- Wildlife sanctuaries, refuges, or preserves.
- Habitats identified by State or Federal agencies as unique, rare, or of priority for protection.
- Wetlands (Executive Order 11990), floodplains (Executive Order 11988), or other resources specifically protected by Federal regulations or Executive Orders.

- Land areas identified as “critical habitat” for species listed as threatened or endangered by the USFWS.

Based on these definitions, these species can include those that are popular for hunting and fishing, the main predators and prey of those species, and other species that are sensitive to changes in the environment. During the pedestrian surveys, any observations of such plant or wildlife species considered important and the habitat that supports them were noted.

A desktop analysis (see Section 2.1.2) was performed prior to field surveys to identify important species and habitats that may be present in the Project Site. These include state and federal listed species and critical habitats in addition to the NUREG-1555 defined important species and habitats identified above.

3 Results

3.1 Terrestrial Resources

3.1.1 Vegetation

Results of supplemental field studies are used in part to characterize the assemblage of terrestrial plant species and to aid in the identification of federally listed threatened or endangered species or Texas-listed threatened, endangered, or special concern species potentially occurring within and in proximity to the Project Site.

The land cover in the approximately 1,548-acre Project Site is characterized predominantly by cultivated crops (730 acres), which is the most prevalent land cover type, followed by herbaceous (428 acres), developed, medium intensity land (192 acres), and shrub-scrub (91 acres) (Table 3-1 and Figure 2-1). As depicted on Figure 3-1 and Table 3-1, the NLCD indicates that the most prevalent land cover type found within the Project Vicinity is cultivated crops (34,863 acres), followed by hay/pasture (19,496 acres), open water (11,567 acres), and emergent herbaceous wetlands (9,716 acres). The NLCD mapped landcover within the 6-mile Project Vicinity, as identified in Figure 3-1, was ground-verified utilizing drive-by and selected pedestrian surveys.

The dominant land cover type within the Project Site is cultivated crops (regularly planted in corn), which comprise the majority of lands within the interior of the site. These areas lack natural vegetation, except for agricultural weeds with some resistance to herbicides and an affinity for disturbance which are typically only found along the field margins. Herbaceous lands, which are the next most prevalent landcover, are a mix of pasture lands, infrequently maintained old fields, and maintained turfgrass found around the developed SDO Property, roadsides, and along canal levees. Vegetation within on-site herbaceous lands is dominated by non-native old world bluestem species (*Dichanthium* spp. and *Bothriochloa ischaemum*) and Bermuda grass (*Cynodon dactylon*). Developed, medium intensity lands are found within the SDO Property and are largely unvegetated except for small patches of maintained Bermuda grass turf. Shrub-scrub is typically found along fencelines or in heavily grazed cattle and goat pastures and includes species typical of Texas-Louisiana Coastal Prairie (NatureServe 2022b) systems where natural disturbance regimes have been disrupted and non-native species have invaded.

Table 3-1
Land Cover within the Project Long Mott Project Site and Vicinity

Land Cover Class	Project Site ^(a) (acres)	6-mile Vicinity ^(b) (acres)
Barren Land		123.0
Deciduous Forest	0.5	281.3
Herbaceous	428.1	352.5
Evergreen Forest	0.7	426.6
Developed, High Intensity		430.8

Land Cover Class	Project Site ^(a) (acres)	6-mile Vicinity ^(b) (acres)
Woody Wetlands	3.3	479.0
Developed, Medium Intensity ^(c)	192.1	572.4
Mixed Forest		754.8
Developed, Low Intensity		1,159.8
Developed, Open Space		1,832.5
Shrub/Scrub	91.1	2,886.2
Emergent Herbaceous Wetlands	23.5	9,715.7
Open Water	78.5	11,566.7
Hay/Pasture		19,496.2
Cultivated Crops	730.3	34,862.7
Total	1,548.1	84,940.2

a) Source: NLCD data (Dewitz, 2021) modified based on field observations.

b) Source: NLCD data (Dewitz, 2021).

c) Medium Intensity Developed land cover types occur in the Project Area but have no associated vegetation.

The plant communities found throughout the Project Site are common and well represented throughout the local region. These communities contain substantial populations of non-native plant species and successional communities, which indicate significant past anthropogenic disturbance, non-native species invasion, and a disruption to natural disturbance patterns (i.e., fire). Vegetation in the Project Site is contained within the Texas-Louisiana Coastal Prairie (CES203.550) (NatureServe 2022b) ecological system concept. This system is typical of the Pleistocene aged Beaumont Formation which underlies the local region, and in its natural state, is tall grass prairie. While remnant indicator species of intact coastal prairie structure remain in some cases within the Project Site to a very limited extent, existing vegetation reflects significant human-driven land use change and habitat degradation. While significantly disturbed and invaded by non-native species, the rectangular pasture south of the railyard in the east portion of the Project Site represents the most intact natural vegetation community on-site (Figure 2-1).

Vegetation descriptions are contextualized within NLCD land cover types of the Project Site modified based on field observations (Table 3-1). Representative photographs of vegetation communities are included in Appendix B. Species observed during the pedestrian surveys are summarized in Table 3-2. Qualitative descriptions of plant communities are included below, including dominant (abundant or common relative abundance) species occurring in any of the strata (tree, shrub, and herb layers).



Table 3-2
Vascular Plant Species of the Project Long Mott Project Site

Scientific Name	Relative Abundance ^(a) within Landcover Types ^(b)							Project Site Overall
	1	2	3	4	5	6	7	
Tree Layer								
<i>Celtis laevigata</i>		C		R	C	U		O
<i>Fraxinus berlandieriana</i>						R		R
<i>Gleditsia triacanthos</i>					U			R
<i>Melia azerbach</i>				U	R			R
<i>Prosopis glandulosa</i>					U			U
<i>Quercus fusiformis</i>			U		U			U
<i>Salix interior</i>						U		R
<i>Salix nigra</i>						U		U
<i>Triadica sebifera</i>							R	R
<i>Vachellia farnesiana</i>				O				U
Shrub Layer								
<i>Baccharis halimifolia</i>				U	O	U	C	O
<i>Broussonetia papyrifera</i>						U		R
<i>Callicarpa americana</i>					R			R
<i>Celtis ehrenbergia</i>					R			R
<i>Celtis laevigata</i>		C		R	C	U		O
<i>Cephalanthus occidentalis</i>						R		R
<i>Forestiera angustifolia</i>					U	U		R
<i>Gleditsia triacanthos</i>					U			R
<i>Ilex decidua</i>						R		R
<i>Ilex vomitoria</i>		C	C	R	C			C
<i>Melia azerbach</i>				R				R
<i>Morus alba</i>						U		R
<i>Prosopis glandulosa</i>				U				U
<i>Quercus fusiformis</i>								O
<i>Rosa bracteata</i>		C	O	O	A	U	C	A
<i>Salix interior</i>						U		R
<i>Salix nigra</i>						U		U
<i>Sideroxylon lanuginosum</i>				U				R
<i>Smilax bona-nox</i>		U						U
<i>Smilax rotundifolia</i>		U	O					U



Relative Abundance ^(a) within Landcover Types ^(b)									
Scientific Name	Common Name	1	2	3	4	5	6	7	Project Site Overall
<i>Toxicodendron radicans</i>	poison ivy						U		R
<i>Triadica sebifera</i>	Chinese tallow				R		O		U
<i>Ulmus crassifolia</i>	cedar elm					R			R
<i>Vachellia farnesiana</i>	huisache				O	O	R	U	O
<i>Zanthoxylum clava-herculis</i>	Hercules' club				R	R			R
<i>Zanthoxylum fagara</i>	lime prickly ash				R	R			R
Herbaceous Layer									
<i>Agalinis heterophylla</i>	prairie false foxglove					U			U
<i>Agalinis strictifolia</i>	stiffleaf false foxglove				R				R
<i>Amaranthus palmeri</i>	Palmer amaranth				R				R
<i>Ambrosia psilostachya</i>	western ragweed	O			O	U		O	O
<i>Ampelopsis arborea</i>	peppervine						A		U
<i>Amphicaryis dracunculoides</i>	prairie broomweed				R				R
<i>Anagallis arvensis</i>	false pimpernell				U				R
<i>Andropogon glomeratus</i>	bushy bluestem				U	R	U	U	U
<i>Aristida oligantha</i>	prairie three awn				U				R
<i>Asclepias viridis</i>	green antelopehorn				U				R
<i>Baccharis halimifolia</i>	groundsel tree	O				O		C	O
<i>Bacopa monnieri</i>	water hyssop						C	U	O
<i>Borrchia frutescens</i>	sea oxeye							U	U
<i>Bothriochloa bladhii</i>	Caucasian bluestem				R				R
<i>Bothriochloa ischaemum</i>	yellow bluestem				O	R			U
<i>Bothriochloa laguroides</i>	silver bluestem				U				U
<i>Bothriochloa longipaniculata</i>	longspike beardgrass				O	R		U	U
<i>Bouteloua rigidiseta</i>	Texas grama				U				R
<i>Bromus catharticus</i>	rescuegrass				U				U
<i>Callicarpa americana</i>	beautyberry				O	R			R
<i>Callirhoe involucrata</i>	winecup				U				U
<i>Calyptocarpus vialis</i>	straggler daisy				U				U
<i>Caperonia palustris</i>	Texasweed				R		U		U
<i>Cardiospermum halicacabum</i>	balloon vine				U		O		U
<i>Carex tetrastrachya</i>	Britton's sedge					R			R
<i>Chenopodium album</i>	lambsquarters				R				R
<i>Chloris canterae</i>	Paraguayan windmill grass					U			U
<i>Chloris cucullata</i>	hooded windmill grass	O			U				U



Scientific Name	Common Name	Relative Abundance ^(a) within Landcover Types ^(b)										Project Site Overall
		1	2	3	4	5	6	7				
<i>Chromolaena odorata</i>	blue mistflower			U	U							R
<i>Cirsium horridulum</i>	yellow thistle				R							R
<i>Cooperia</i> sp.					R							R
<i>Coreopsis tinctoria</i>	plains coreopsis	C										O
<i>Croton lindheimeri</i>	Woolly croton	O	C		U	O						O
<i>Croton monanthogynus</i>	prairie tea			U	U							U
<i>Cucumis melo</i>	musk melon			R	R		R					U
<i>Cyclospermum leptophyllum</i>	marsh parsley			R	R	U						R
<i>Cynanchum racemosum</i>	talayote			R	R	U						U
<i>Cynodon dactylon</i>	scutch			C	C	O	C	C				C
<i>Cyperus articulatus</i>	jointed flatsedge			U	U		O					U
<i>Cyperus enterianus</i>	deeprooted sedge			U	O		U					O
<i>Cyperus retrorsus</i>	pine barren flatsedge			U	U	R						U
<i>Cyperus rotundus</i>	purple nutsedge			R	R							R
<i>Cyperus virens</i>	green flatsedge			U	U		U					U
<i>Diaperia verna</i>	spring pygmy cudweed					R						R
<i>Dichanthium annulatum</i>	Kleberg's bluestem		C		A	A						A
<i>Dichanthium aristatum</i>	angleton grass		U		C	C				O		C
<i>Dichanthium sericeum</i>	Queensland bluegrass				R							R
<i>Dichondra</i> sp.												R
<i>Dinebra nealleyi</i>	Nealley's sprangletop						R					R
<i>Dinebra panicea</i>	mucronate sprangletop						R					R
<i>Distichlis spicata</i>	inland saltgrass				U		O			U		U
<i>Dysphania pumilo</i>	clammy goosefoot			R	R							R
<i>Eleocharis cellulosa</i>	Gulf Coast spikerush						O					U
<i>Eleocharis montevidensis</i>	sand spikerush				U	U	O			A		O
<i>Elymus virginicus</i>	Virginia wildrye				R		O			R		R
<i>Eriochloa punctata</i>	Louisiana cupgrass				R	R	R					R
<i>Eryngium hookeri</i>	Hooker's eyngo				U	U						U
<i>Eupatorium serotinum</i>	late thoroughwort	U			U							U
<i>Euthamia gymnospermoides</i>	Texas goldenrop			R								R
<i>Evolvulus sericeus</i>	dwarf silver morning glory				R							R
<i>Fimbristylis puberula</i>	hairy fimbry				R	U						U
<i>Fraxinus berlandieriana</i>	Mexican ash						R					R
<i>Galium tinctorium</i>	stiff marsh bedstraw				R							R
<i>Gomphrena nealleyi</i>	Nealley's globe amaranth				U							R



Scientific Name	Common Name	Relative Abundance ^(a) within Landcover Types ^(b)							Project Site Overall
		1	2	3	4	5	6	7	
<i>Helenium amarum</i>	bitterweed	U			O	U			O
<i>Helianthus annuus</i>	annual sunflower				U	U			U
<i>Heliotropium curassavicum</i>	salt heliotrope				O		R		R
<i>Herbertia lahue</i>	prairie nymph								U
<i>Hibiscus laevis</i>	halberdleaf rosemallow						U		U
<i>Hordeum pusillum</i>	little barley				R	U			U
<i>Ipomoea heptaphylla</i>	Wright's morning glory						R		R
<i>Iva angustifolia</i>	narrowleaf marshelder					R	U		U
<i>Iva annua</i>	sumpweed				R	U	O	O	O
<i>Juncus interior</i>	inland rush				U	U			R
<i>Juncus marginatus</i>	grassleaf rush				U	U			U
<i>Kyllinga odorata</i>	fragrant spikesedge				U	U			R
<i>Lantana x strigocamara</i>	common lantana				R	U	R		U
<i>Leersia monandra</i>	bunch cutgrass					R			R
<i>Lepidium virginicum</i>	Virginia pepperweed				U	R			U
<i>Limnoscadium pumilum</i>	prairie dogshade				U	U			R
<i>Linum berlandieri</i>	Berlandier's yellow flax				U	U			U
<i>Ludwigia peploides</i>	floating primrose willow				U	U			U
<i>Lycium carolinianum</i>	Carolina wolfberry				U		R		R
<i>Lythrum alatum</i>	winged loosestrife						O	C	O
<i>Lythrum californicum</i>	California loosestrife				R				R
<i>Malachra capitata</i>	yellow leafbract						U	U	U
<i>Malviscus drummondii</i>	Turk's cap						U	U	R
<i>Marsilea sp.</i>					U				R
<i>Mecardonia procumbens</i>	baby jump-up				R				R
<i>Melochia pyramidata</i>	pyramidflower				R				R
<i>Mimosa strigilosa</i>	powderpuff				U				R
<i>Monarda punctata</i>	spotted beebalm				U				U
<i>Nassella leucotricha</i>	Texas wintergrass				O				U
<i>Neptunia lutea</i>	yellow sensitive flower				U				U
<i>Neptunia pubescens</i>	tropical puff						U		R
<i>Nothoscordum bivalve</i>	crow poison				U				U
<i>Oenothera curtiflora</i>	velvety gaura				R				R
<i>Oenothera laciniata</i>	cutleaf evening primrose	C							U
<i>Oenothera speciosa</i>	pink ladies				U				R
<i>Oxalis corniculata</i>	creeping woodsorell	C			U				U



Relative Abundance ^(a) within Landcover Types ^(b)													
Scientific Name	Common Name	1234567							Project Site Overall				
		1	2	3	4	5	6	7					
<i>Panicum dichotomiflorum</i>	fall witchgrass					U							U
<i>Panicum hallii</i>	Hall's panicgrass				R	U							U
<i>Panicum virgatum</i>	switchgrass				U								U
<i>Parkinsonia aculeata</i>	Jerusalem thorn					R							R
<i>Parthenium hysterophorus</i>	Santa Maria feverfew				U								U
<i>Paspalum geminatum</i>	Egyptian panicgrass						U						U
<i>Paspalum denticulatum</i>	longtom				O		C	O					O
<i>Paspalum dilatatum</i>	dallisgrass							O					U
<i>Paspalum langei</i>	rustyseed paspalum			U									R
<i>Paspalum notatum</i>	bahia grass			U	U	U							U
<i>Paspalum pubiflorum</i>	hairyseed paspalum			U		R							U
<i>Paspalum setaceum</i>	hairy beadgrass					R							R
<i>Paspalum urvillei</i>	Vaseygrass				R								R
<i>Passiflora foetida</i>	stinking passionflower												R
<i>Pediomelum rhombifolium</i>	gulf indian breadroot			U	U								R
<i>Phalaris caroliniana</i>	Carolina canarygrass			U	U								U
<i>Phoradendron leucocarpum</i>	American mistletoe					U	R						R
<i>Phragmites australis</i>	common reed									U	U		U
<i>Phyla nodiflora</i>	Texas frogfruit							O					O
<i>Phyllanthus evenescens</i>	birdseed leaf									U	R		R
<i>Phyrophappus pauciflorus</i>	smallflower desert chicory				O								O
<i>Phytolacca americana</i>	pokeweed				R								R
<i>Plantago aristata</i>	bracted plantain				R								R
<i>Pluchea odorata</i>	marsh fleabane								U			R	R
<i>Polypremum procumbens</i>	juniper leaf				R								R
<i>Polytaenia texana</i>	Texas prairie parsley				R								R
<i>Ratibida columnifera</i>	Mexican hat				R								R
<i>Rhynchosia minima</i>	least snoutbean				U								U
<i>Rhynchospora cauduca</i>	anglestem beaksedge					R							R
<i>Rhynchospora indianolensis*</i>	Indianola beaksedge				R	U							R
<i>Rivina humilis</i>	pigeonberry				U								R
<i>Rosa bracteata</i>	McCartney rose	O									C		O
<i>Rubus trivialis</i>	southern dewberry				C	O			O		U		O
<i>Rudbeckia hirta</i>	black eyed Susan	O			U								U
<i>Ruellia nudiflora</i>	violet ruellia				U								R
<i>Rumex chrysocarpus</i>	amamastla				U								R



Scientific Name	Common Name	Relative Abundance ^(a) within Landcover Types ^(b)										Project Site Overall
		1	2	3	4	5	6	7	7	7	7	
<i>Rumex pulcher</i>	fiddle dock	O			R	U						U
<i>Sabal minor</i>	dwarf palmetto	R					R					R
<i>Sabatia campestris</i>	Texas star				O	U						O
<i>Sagittaria longiloba</i>	longbarb arrowhead				R	R						R
<i>Schizachyrium scoparium</i>	little bluestem				R	U						U
<i>Schoenoplectus tabernaemontani</i>	softstem bulrush				R							R
<i>Sesbania drummondii</i>	rattlebox	U			U	U						O
<i>Sesbania herbacea</i>	coffeeweed				U	U		O				O
<i>Setaria magna</i>	giant bristleglass						R					R
<i>Setaria parviflora</i>	marsh bristleglass				O	O	R					O
<i>Sida ciliaris</i>	bracted fanpetals				R							R
<i>Solanum elaeagnifolium</i>	silverleaf nightshade				U	U						U
<i>Solanum ptycanthum</i>	eastern black nightshade				R							R
<i>Solanum triquetrum</i>	Texas nightshade				R							R
<i>Solidago altissima</i>	tall goldenrod				O	U	R	O	U			O
<i>Solidago sempervirens</i>	seaside goldenrod						R	O	U			U
<i>Sorghum halepense</i>	Johnsongrass	O			O	U						O
<i>Spartina spartinae</i>	Gulf cordgrass				R	U						U
<i>Sporobolus indicus</i>	smutgrass				U							U
<i>Stachys crenata</i>	mouseear				R							R
<i>Steinchisma hians</i>	gaping grass	U			O	O						O
<i>Symphotrichum divaricatum</i>	southern annual saltmarsh aster											O
<i>Teucrium cubense</i>	small coastal germander				R		C	O				R
<i>Torilis nodosa</i>	knotted hedgeparsley											R
<i>Toxicodendron radicans</i>	poison ivy					R						R
<i>Triadica sebifera</i>	Chinese tallow											R
<i>Tridens strictus</i>	longspike tridens					R		R				R
<i>Typha domingensis</i>	Southern cattail						C	O				O
<i>Urochloa fusca</i>	browntop signalgrass	O			U	U						U
<i>Urochloa platyphylla</i>	broadleaf signalgrass	A			U							O
<i>Vachellia farnesiana</i>	huisache	U			O							U
<i>Verbena brasiliensis</i>	Brazilian vervain	A			U	U						O
<i>Verbena halei</i>	Texas vervain				O							O
<i>Vigna luteola</i>	hairy cowpea						R					R
<i>Xanthium strumarium</i>	cocklebur				R							R
<i>Zea mays</i>	corn	A										A



Scientific Name	Common Name	Relative Abundance ^(a) within Landcover Types ^(b)							Project Site Overall
		1	2	3	4	5	6	7	
Woody Vine Layer									
<i>Ampelopsis arborea</i>	peppervine				U	U	A	U	C
<i>Smilax bona-nox</i>	saw greenbriar			U	O	O			O
<i>Smilax rotundifolia</i>	common greenbriar			U					U
<i>Vitis mustangensis</i>	mustang grape					U	O		U

a) Relative abundance (qualitative) for occurrence in the Project Site:

A = Abundant; C = Common; O = Occasional; U = Uncommon; R = Rare

b) Landcover Types: 1 = Cultivated Crops; 2 = Deciduous Forest; 3 = Evergreen Forest; 4 = Herbaceous; 5 = Shrub/Scrub; 6 = Emergent Herbaceous Wetlands; 7 = Woody Wetlands

* State Vulnerable (S3) (TPWD 2011)

The key characteristics of landcover types and the diversity of plant associations found within each type identified within the site are described in the following:

Cultivated Crops:

Cropland (730.3 acres) is the most extensive landcover type found with the Project Site and is generally positioned within large open upland plains within the interior of the site. Row crops of corn occur as a monoculture within actively cropped areas of agricultural fields. However, along the fringes of cropped corn fields, a frequently disturbed ruderal herbaceous community can be sporadically found. Within these naturally vegetated areas, weedy species like Brazilian vervain (*Verbena brasiliensis*), broadleaf signalgrass (*Urochloa platyphylla*), browntop signalgrass (*Urochloa fusca*), Johnsongrass (*Sorghum halepense*), creeping woodsorrel (*Oxalis corniculata*), cutleaf evening primrose (*Oenothera laciniata*), and plains coreopsis (*Coreopsis tinctoria*) dominate.

Evergreen Forest:

Evergreen forest (0.7 acres) is present within portions of the southeastern corner of the Project Site where scattered patches of live oak (*Quercus fusiformis*) mottes are found within a scrub-shrub dominated matrix of cattle- and goat-grazed lands. This vegetation community is positioned along a low swale at the toe of West Coloma Creek's east flanking levee within a naturally vegetated scrub-scrub community. Live oak dominates the overstory and sugarberry (*Celtis laevigata*) can be found to a lesser extent, while the shrub layer is occupied by yaupon (*Ilex vomitoria*), beautyberry (*Callicarpa americana*), and McCartney rose (*Rosa bracteata*). The herb layer is sparsely occupied by angleton grass (*Dichanthium aristatum*), blue mistflower (*Chromolaena odorata*), Texas goldentop (*Euthamia gymnospermoides*), and rustyseed paspalum (*Paspalum langei*). Scrambling vines are found growing up into the mid-story, including saw greenbriar (*Smilax bona-nox*), common greenbriar (*Smilax rotundifolia*) and poison ivy (*Toxicodendron radicans*). This vegetation community seems to be associated with less disturbed, slightly wetter upland conditions underlain by Dacosta-Contee complex soils.

Deciduous Forest:

A small fringe of deciduous forest totaling 0.5 acres was identified along a hedgerow bordering the west levee of West Coloma Creek at the eastern edge of an actively cultivated crop field. The tree canopy is dominated by sugarberry, which grows over shrubs of McCartney rose, yaupon, saw greenbriar, and common greenbriar. The herb layer is influenced by vegetation found on the nearby levee and includes Kleberg's bluestem (*Dichanthium annulatum*) and angleton grass (*Dichanthium aristatum*).

Shrub-Scrub and Woody Wetlands:

NLCD shrub-scrub and woody wetland landcovers (94.4 acres) are found throughout the Project Site and are represented by several different vegetation types, varying by local disturbance, water availability, and soil conditions. Shrub-scrub (upland) (91.1 acres) is the most extensive type found within the site although woody wetland (3.3 acres) is also represented. Shrubs are evident in the woody wetlands of the Project Site. WOTUS-delineated wetlands and features are described below with emergent wetlands and in the project WOTUS report (WSP, 2023c).

Within actively or formerly grazed pasture in dry sites located within the hydric soil map series, Dacosta-Contee complex (NRCS 2023), shrub-scrub patches form around thickets of McCartney rose, sugarberry, yaupon, or huisache (*Vachellia farnesiana*). The herb layer can be crowded out by thickets of shrub-scrub, as seen north of the rail yard in the northeastern corner of the Project Site, but in areas still heavily grazed, it is typically dense where it grows between scrub thickets and is dominated by species that include Kleberg's bluestem, angleton grass, Bermuda grass, bitterweed (*Helenium amarum*), fiddle dock (*Rumex pulcher*), Santa Maria feverfew (*Parthenium hysterophorus*), and plains coreopsis. Within heavily grazed pasture in slightly wetter upland sites of the same soil map series, the same shrub species are found; however, huisache falls out to a large extent and is replaced by live oak. In the herb layer, dominant species found in dry shrub-scrub sites are also found, in addition to dallisgrass (*Paspalum dilatatum*), marsh bristlegrass (*Setaria parviflora*), gaping grass (*Steinchisma hians*), gulf cordgrass (*Spartina spartinae*), and the state sensitive S3 species, Indianola beaksedge (*Rhynchospora indianolensis*).

Shrub-scrub wetland and wetter upland sites found north of the two wetland basins (SD-WET-03 and SD-WET-04) between the wetland ditch (SD-WET-05) and crop fields along the southwestern edge of the Project Site represent another community assemblage found on-site. Hydric soils of Laewest clay, 0 to 1 percent slope (NRCS 2023) underlie low scrub thickets of groundseltree (*Baccharis halimifolia*) and McCartney rose that are interspersed by herbaceous vegetation dominated by Bermuda grass, winged loosestrife (*Lythrum alatum*), and groundseltree. Wetland basin and ditch features referenced above can be found in Figure 3-2 and the project WOTUS report (WSP, 2023c).

Bordered by crop field to the south and east, within a naturally vegetated parcel along the eastern edge, in the central part of the Project Site, a final shrub-scrub vegetation association is found within the hydric, Edna Loam, 0 to 1 percent slopes soil map series (NRCS 2023). A small pocket of honey locust (*Gleditsia triacanthos*) trees is found in the corner of the parcel, while the rest of the area is dominated by impenetrable thickets of shrub-scrub, except for a few paths created by cattle, deer, and brush-hogging which allow ingress. Thickets of McCartney rose, groundseltree, yaupon, and huisache grow over an herbaceous layer dominated by prairie agalinis (*Agalinis heterophylla*), western ragweed (*Ambrosia psilostachya*), Kleberg's bluestem, fall panicum (*Panicum dichotomiflorum*), coffeeweed (*Sesbania herbacea*), and Brazilian vervain. This vegetation community seems to be partially influenced by its proximity to agricultural fields, as several weedy species found along crop field margins were also found here.

Herbaceous:

Herbaceous landcover (428.1 acres) found throughout the Project Site can be classified as maintained turf, pasture, or ruderal old field.

Herbaceous landcover in the western part of the Project Site located around the Dow plant consists entirely of maintained turf dominated by Bermuda grass. Elsewhere, along the mowed or grazed canal and irrigation ditch berms, Bermuda grass can be found along the low slopes and longtom (*Paspalum denticulatum*) in dewatered portions of the channels, while Kleberg's bluestem, angleton grass, and broadleaf signalgrass dominate the upper slopes.

Overgrazed herbaceous pasture lands found in the southeastern portion of Project Site mixed with shrub-scrub and are dominated by mowed grasses including Kleberg's bluestem, angleton grass, Bermuda grass, Texas grama (*Bouteloua rigidiseta*), and hooded windmill grass (*Chloris cucullata*). Forbs are present to a lesser extent; plains coreopsis, prairie tea (*Croton monanthogynus*), Berlandier's yellow flax (*Linum berlandieri*), and Texas star (*Sabatia campestris*) were most commonly observed. A few stems of the state sensitive (S3) Indianola beaksedge were recorded here (TPWD 2011).

Herbaceous landcover found in the northeast portion of the Project Site north of the railyard is no longer grazed or maintained by mowing and has become overgrown, especially by weedy forbs. Within this ruderal, old field community, grasses including Bermuda grass, Kleberg's bluestem, and hairyseed paspalum (*Paspalum pubiflorum*) are still found but are often overtopped and shaded out by luxuriant growth of forbs and woody species including Santa Maria feverfew, Brazilian vervain, southern dewberry (*Rubus trivialis*), western ragweed (*Ambrosia psilostachya*), talayote (*Cynanchum racemosum*), balloonvine (*Cardiospermum halicacabum*), and rattlebox (*Sesbania drummondii*). Bermuda grass is dominant within lands underlain by Edna loam, while herbaceous vegetation growing in soils Contee-Dacosta and Dacosta-Contee complexes (NRCS 2023) is more diverse and possesses greater affinity here to upland conditions.

A large rectangular pasture south of the railyard, in the northeast portion of the Project Site represents the most diverse herbaceous community found within the Project Site (Figure 2-1). Although the presence of non-native species is abundant, partially intact short-grassland structure and some native coastal prairie species diversity here is likely maintained by occasional cattle grazing, at an intensity and periodicity that perhaps mimics the natural disturbance patterns historically maintained by native ungulate herbivory in the region. Common grass and forb species include bahia grass (*Paspalum notatum*), Kleberg's bluestem, angleton grass, Bermuda grass, rescuegrass (*Bromus catharticus*), Texas wintergrass (*Nassella leucotricha*), marsh bristlegrass, blackeyed Susan (*Rudbeckia hirta*), Texas star, western ragweed, green antelopehorn (*Asclepias viridis*), winecup (*Callirhoe involucrata*), pine barren flatsedge (*Cyperus retrorsus*), creeping woodsorell, Hooker's eryngo (*Eryngium hookeri*), prairie nymph (*Hebertia lahue*), fragrant spikesedge (*Kyllinga odorata*), and spotted beebalm (*Monarda punctata*). Scattered shrubs of McCartney rose, huisache, and honey mesquite (*Prosopis glandulosa*) are interspersed throughout.

Emergent Wetlands:

A total of 23.5 acres of emergent wetlands was identified during Waters of the United States (WOTUS) delineations in the spring and summer surveys (WSP, 2023c). WOTUS delineated features can be found in Figure 3-2.

Twin basin wetlands (SD-WET-03 and SD-WET-04) located in southwest corner of the Project Site include seasonally saturated/inundated wetlands around more permanently inundated areas that hold standing water for much of the year (WSP, 2023c). In the seasonally wet flats, Bermuda grass, longtom, desert saltgrass (*Distichlis spicata*), tropical puff (*Neptunia pubescens*), sand spikerush (*Eleocharis montevidensis*), jointed flatsedge (*Cyperus articulatus*), and Gulf Coast spikerush (*Eleocharis cellulosa*) are dominant. In or around the more

permanently inundated features, water hyssop (*Bacopa monnieri*) was found growing as a submerged aquatic and southern cattail (*Typha domingensis*) was found fringing the features as an emergent.

To the north of the SDO operating basins in the northwest corner of the Project Site, the emergent wetland SD-WET-11 is a depressional feature bordering the edge of an active crop field (Figure 3-2, WSP, 2023c). Small trees and shrubs including black willow, sandbar willow, Chinese tallow (*Triadica sebifera*), and Mexican ash (*Fraxinus berlandieriana*) are scattered throughout the depressional basin which is largely vegetated by ruderal herbaceous vegetation. Egyptian panicgrass (*Paspalidium geminatum*), yellow leafbract (*Malachra capitata*), Texasweed (*Caperonia palustris*), and winged loosestrife (*Lythrum alatum*) are found in the herbaceous layer along with scrambling and vining forbs and woody species including balloon vine (*Cardiospermum halicacabum*), peppervine (*Ampelopsis arborea*), and southern dewberry.

SD-WET-07 is a depressional emergent wetland that is supported by a low area located in the southwestern corner of the Project Site (Figure 3-2, WSP, 2023c). Common herbaceous species recorded within the wetland included sandspike rush, annual marsh elder (*Iva annua*), and bermudagrass. SD-WET-09 is another depressional emergent wetland that is supported by a depressional area which drains adjacent cropland (Figure 3-2, WSP, 2023c). Common herbaceous species recorded within the wetland included sandspike rush, winged loosestrife, and southern cattail. Both wetlands contained low plant diversity.

Emergent wetlands associated with ditch features were found throughout the site (Figure 3-2, WSP, 2023c). Ditches which hold water semi-permanently include hydrophytic species like southern cattail and water hyssop along with other hydrophytic terrestrial species, including black willow (*Salix nigra*), sandbar willow (*Salix interior*), common reed (*Phragmites australis*), possumhaw (*Ilex decidua*), halberdleaf rosemallow (*Hibiscus laevis*), winged loosestrife, dwarf palmetto, buttonbush (*Cephalanthus occidentalis*), and Chinese tallow. Ditches which remain dry for much of the year were typically less diverse and were largely dominated by longtom.

3.1.2 Wildlife

The terrestrial ecology of the Project Site and vicinity were characterized in a series of seasonal field studies. Seasonal surveys were conducted in the winter (February 13-15, 2023), spring (May 22-25, 2023), summer (August 15-17, 2023), and fall (November 6-9, 2023). The field studies for wildlife included surveys for avifauna, mammals and herpetofauna. In general, study methods within the Project Site included a review of available mapping and databases, information from the USFWS IPaC system, and TPWD Calhoun County rare species list. A map of the site with the ecological survey locations is provided in Figure 2-2. The subsections below summarize relevant information obtained from each of these surveys and provide other data and descriptions of the terrestrial ecology in the area.

3.1.2.1 Avifauna

Field studies for avian species included pedestrian meandering and general field reconnaissance and roadside survey methods. Figure 2-2 depicts the ecological survey locations during the seasonal surveys. Detailed methodology can be found in Section 2.2.2.

A total of 56 species were observed during the winter 2023 surveys, including 17 species as part of the surveys within the Project Site, 46 species observed along vicinity driving routes, and 27 species as part of the vicinity general reconnaissance (Table 3-3). Abundant and common bird species observed during the winter 2023 Project Site field surveys included red-winged blackbird (*Agelaius phoeniceus*) and turkey vulture (*Cathartes aura*).

A total of 72 bird species were observed during the spring 2023 surveys, including 36 species as part of the surveys within the Project Site, 58 species observed along vicinity driving routes, and 30 species as part of the vicinity general reconnaissance (Table 3-4). Abundant and common bird species observed during spring 2023 Project Site field surveys included red-winged blackbird, Northern cardinal (*Cardinalis cardinalis*), turkey vulture, Northern mockingbird (*Mimus polyglottos*), brown-headed cowbird (*Molothrus ater*), and cave swallow (*Petrochelidon fulva*).

A total of 60 species were observed during the summer 2023 surveys, including 33 species as part of the surveys within the Project Site, 42 species observed along vicinity driving routes, and 37 species as part of the vicinity general reconnaissance (Table 3-5). Abundant and common bird species observed during summer 2023 Project Site field surveys included red-winged blackbird, turkey vulture, and mourning dove (*Zenaidura macroura*).

A total of 57 bird species were observed during the fall 2023 surveys, including 20 species as part of the surveys within the Project Site, 46 species observed along vicinity driving routes, and 43 species as part of the vicinity general reconnaissance (Table 3-6). Abundant and common bird species observed during fall 2023 Project Site field surveys included red-winged blackbird, Northern cardinal, killdeer (*Charadrius vociferus*), black vulture (*Coragyps atratus*), brown-headed cowbird, savannah sparrow (*Passerculus sandwichensis*), great-tailed grackle (*Quiscalus mexicanus*), northern rough-winged swallow (*Stelgidopteryx serripennis*), European starling (*Sturnus vulgaris*), and mourning dove.

Large trees typically used for raptor nesting are limited within the Project Site; as such, no raptor nests were observed within the Project Site during seasonal ecology field surveys. Waterfowl and water dependent bird species were observed in close association with the vicinity wetland complexes near Green Lake and Mission Lake.

The complete list of birds observed within the Project Site and Project Vicinity for each seasonal survey are recorded in Tables 3-3, 3-4, 3-5, and 3-6. The white-tailed hawk (*Buteo albicaudatus*), state listed as threatened by TPWD, was observed on-site and within the vicinity during spring 2023 surveys and in the vicinity during summer and fall 2023. Since the white-tailed hawk was only observed perched on a transmission line tower and as a flyover to these areas and no raptor nests were observed, the white-tailed hawk likely uses the site and vicinity to forage. The wood stork (*Mycteria americana*), state listed as threatened by TPWD, was observed in the vicinity during summer 2023. The wood stork was not observed on-site. Bald eagle, identified by USFWS as a migratory bird of conservation concern and protected under the Bald and Golden Eagle Protection Act, was observed within the Project Vicinity during winter 2023, but no raptor nests were observed.

No federally listed bird species under the Endangered Species Act (ESA) were observed during field surveys in the Project Site or Project Vicinity. Northern bobwhite (*Colinus virginianus*), and mourning dove (*Zenaida macroura*) were species observed within the Project Site that are recreationally valuable since they are game species as listed by TPWD hunting regulations (2023a). Species observed in the Project Vicinity that are recreationally valuable as game species by TPWD hunting regulations (2023) include Northern pintail (*Anas acuta*), green-winged teal (*Anas crecca*), sandhill crane (*Antigone canadensis*), Northern bobwhite, black-bellied whistling-duck (*Dendrocygna autumnalis*), American coot (*Fulica americana*), Wilson's snipe (*Gallinago delicata*), common gallinule (*Gallinula galeata*), gadwall (*Mareca strepera*), wild turkey (*Meleagris gallopavo*), red-breasted merganser (*Mergus serrator*), Northern shoveler (*Spatula clypeata*), blue-winged teal (*Spatula discors*), and mourning dove.

Table 3-3
Avifaunal Species Observed in or near the Project Long Mott Project Site, Winter 2023

Scientific Name	Common Name	On-site Surveys Abundance ¹	Driving Route Abundance ²	Vicinity General Reconnaissance ³
<i>Agelaius phoeniceus</i>	Red-winged blackbird	A	A	X
<i>Anas acuta</i>	Northern pintail			X
<i>Anas crecca</i>	Green-winged teal			X
<i>Antigone canadensis</i>	Sandhill crane		U	
<i>Ardea alba</i>	Great egret	R	O	X
<i>Ardea herodias</i>	Great blue heron	U	U	
<i>Buteo jamaicensis</i>	Red-tailed hawk	U	O	
<i>Buteo lineatus</i>	Red-shouldered hawk		R	
<i>Butorides virescens</i>	Green heron		R	
<i>Caracara cheriway</i>	Crested caracara	U	O	X
<i>Cardinalis cardinalis</i>	Northern cardinal		C	X
<i>Cathartes aura</i>	Turkey vulture	C	C	X
<i>Charadrius vociferus</i>	Killdeer		O	
<i>Circus hudsonius</i>	Northern harrier	R	U	X
<i>Columba livia</i>	Rock pigeon		R	
<i>Coragyps atratus</i>	Black vulture		C	X
<i>Dumetella carolinensis</i>	Gray catbird		R	
<i>Egretta thula</i>	Snowy egret		R	
<i>Egretta tricolor</i>	Tricolored heron		R	
<i>Eudocimus albus</i>	White ibis		C	
<i>Falco sparverius</i>	American kestrel	R	C	X
<i>Fulica americana</i>	American coot		A	X
<i>Gallinago delicata</i>	Wilson's snipe		R	
<i>Gallinula galeata</i>	Common gallinule		R	
<i>Haemorhous mexicanus</i>	House finch	R		
<i>Haliaeetus leucocephalus</i>	Bald eagle		R	
<i>Himantopus mexicanus</i>	Black-necked stilt			X
<i>Hydroprogne caspia</i>	Caspian tern		R	
<i>Lanius ludovicianus</i>	Loggerhead shrike		U	X
<i>Leucophaeus atricilla</i>	Laughing gull		R	X
<i>Limnodromus griseus</i>	Short-billed dowitcher			X
<i>Mareca strepera</i>	Gadwall			X



Scientific Name	Common Name	On-site Surveys Abundance ¹	Driving Route Abundance ²	Vicinity General Reconnaissance ³
<i>Megaceryle alcyon</i>	Belted kingfisher		R	
<i>Melospiza melodia</i>	Song sparrow	O	O	
<i>Mimus polyglottos</i>	Northern mockingbird	O	O	X
<i>Molothrus ater</i>	Brown-headed cowbird		R	
<i>Nannopterum auritum</i>	Double-crested cormorant		R	
<i>Parkesia noveboracensis</i>	Northern waterthrush		R	
<i>Passerculus sandwichensis</i>	Savannah sparrow	O		
<i>Pelecanus occidentalis</i>	Brown pelican		R	X
<i>Pipilo erythrophthalmus</i>	Eastern towhee		R	
<i>Platalea ajaja</i>	Roseate spoonbill		R	
<i>Plegadis falcinellus</i>	Glossy ibis		R	X
<i>Podilymbus podiceps</i>	Pied-billed grebe		R	X
<i>Quiscalus mexicanus</i>	Great-tailed grackle	R	A	X
<i>Sayornis phoebe</i>	Eastern phoebe	R	R	
<i>Setophaga coronata</i>	Yellow-rumped warbler	R	R	
<i>Spatula clypeata</i>	Northern shoveler			X
<i>Spatula discors</i>	Blue-winged teal			X
<i>Streptopelia decaocto</i>	Eurasian collared-dove	O	A	X
<i>Sturnella magna</i>	Eastern meadowlark		C	
<i>Sturnus vulgaris</i>	European starling		U	X
<i>Tringa flavipes</i>	Lesser yellowlegs			X
<i>Vireo griseus</i>	White-eyed vireo		U	
<i>Zenaida macroura</i>	Mourning dove		R	X
<i>Zonotrichia albicollis</i>	White-throated sparrow	R	U	
Species Richness		17	46	27

¹Species identified during on-site pedestrian surveys.

²Species identified along the bird transect routes at designated vicinity stopping points.

³X = Observed during opportunistic field reconnaissance.

Abundance Categories: A=abundant; C=common; O=occasional; U=uncommon; R=rare

Table 3-4
Avifaunal Species Observed in or near the Project Long Mott Project Site, Spring 2023

Scientific Name	Common Name	On-site Surveys Abundance ¹	Driving Route Abundance ²	Vicinity General Reconnaissance ³
<i>Agelaius phoeniceus</i>	Red-winged blackbird	A	A	X
<i>Ardea alba</i>	Great egret	U	O	X
<i>Bubulcus ibis</i>	Cattle egret		U	
<i>Buteo jamaicensis</i>	Red-tailed hawk		R	X
<i>Butorides virescens</i>	Green heron		U	
<i>Calidris minutilla</i>	Least sandpiper	R	U	
<i>Caracara cheriway</i>	Crested caracara	U	U	
<i>Cardinalis cardinalis</i>	Northern cardinal	C	C	X
<i>Cathartes aura</i>	Turkey vulture	C	C	
<i>Charadrius vociferus</i>	Killdeer	O	C	X
<i>Chlidonias niger</i>	Black tern		U	
<i>Chordeiles minor</i>	Common nighthawk		R	X
<i>Coccyzus americanus</i>	Yellow-billed cuckoo	U	O	
<i>Colinus virginianus</i>	Northern bobwhite	U	O	
<i>Columba livia</i>	Rock pigeon	R	R	
<i>Contopus virens</i>	Eastern wood-pewee	U	R	
<i>Coragyps atratus</i>	Black vulture	R	C	
<i>Cyanocitta cristata</i>	Blue jay		U	
<i>Dendrocygna autumnalis</i>	Black-bellied whistling-duck		C	
<i>Egretta caerulea</i>	Little blue heron	U	U	X
<i>Egretta thula</i>	Snowy egret	U	A	
<i>Egretta tricolor</i>	Tricolored heron		U	X
<i>Eudocimus albus</i>	White ibis			X
<i>Fulica americana</i>	American coot		U	
<i>Gallinula galeata</i>	Common gallinule		U	
<i>Geothlypis trichas</i>	Common yellowthroat		U	
<i>Geranoaetus albicaudatus</i>	White-tailed hawk	R	U	
<i>Himantopus mexicanus</i>	Black-necked stilt			X
<i>Hirundo rustica</i>	Barn swallow			X
<i>Icteria virens</i>	Yellow-breasted chat	R		
<i>Lanius ludovicianus</i>	Loggerhead shrike	R	U	X
<i>Leucophaeus atricilla</i>	Laughing gull		U	X
<i>Melanerpes carolinus</i>	Red-bellied woodpecker		U	
<i>Meleagris gallopavo</i>	Wild turkey			X
<i>Mergus serrator</i>	Red-breasted merganser		C	X
<i>Mimus polyglottos</i>	Northern mockingbird	A	A	X
<i>Molothrus aeneus</i>	Bronzed cowbird		U	
<i>Molothrus ater</i>	Brown-headed cowbird	A	A	



Scientific Name	Common Name	On-site Surveys Abundance ¹	Driving Route Abundance ²	Vicinity General Reconnaissance ³
<i>Myiarchus crinitus</i>	Great crested flycatcher	U	U	X
<i>Myiarchus tyrannulus</i>	Brown-crested flycatcher		R	
<i>Nannopterum auritum</i>	Double-crested cormorant	R	U	X
<i>Nyctanassa violacea</i>	Yellow-crowned night-heron	R	U	
<i>Passer domesticus</i>	House sparrow	U		
<i>Passerina caerulea</i>	Blue grosbeak	R		
<i>Passerina ciris</i>	Painted bunting		U	
<i>Pelecanus occidentalis</i>	Brown pelican			X
<i>Petrochelidon fulva</i>	Cave swallow	A	A	X
<i>Petrochelidon pyrrhonota</i>	Cliff swallow			X
<i>Phalaropus tricolor</i>	Wilson's phalarope	R		
<i>Platalea ajaja</i>	Roseate spoonbill			X
<i>Plegadis falcinellus</i>	Glossy ibis		U	
<i>Podilymbus podiceps</i>	Pied-billed grebe	R		
<i>Poecile carolinensis</i>	Carolina chickadee		U	
<i>Progne subis</i>	Purple martin		R	
<i>Quiscalus mexicanus</i>	Great-tailed grackle	U	A	X
<i>Quiscalus quiscula</i>	Common grackle		R	
<i>Setophaga coronata</i>	Yellow-rumped warbler		R	
<i>Spinus tristis</i>	American goldfinch		U	
<i>Spiza americana</i>	Dickcissel	U	C	
<i>Sterna forsteri</i>	Forster's tern	R	R	
<i>Sterna hirundo</i>	Common tern	R	U	X
<i>Streptopelia decaocto</i>	Eurasian collared-dove	O	U	X
<i>Sturnella magna</i>	Eastern meadowlark	U	O	
<i>Sturnus vulgaris</i>	European starling	O	U	X
<i>Thalasseus maximus</i>	Royal tern			X
<i>Thryothorus ludovicianus</i>	Carolina wren		U	
<i>Tringa flavipes</i>	Lesser yellowlegs			X
<i>Tringa semipalmata</i>	Willet		R	X
<i>Tyrannus forficatus</i>	Scissor-tailed flycatcher	U	U	X
<i>Vireo griseus</i>	White-eyed vireo		U	
<i>Vireo olivaceus</i>	Red-eyed vireo		U	
<i>Zenaidura macroura</i>	Mourning dove	U	A	
Species Richness		36	58	30

¹Species identified during on-site pedestrian surveys.

²Species identified along the bird transect routes at designated vicinity stopping points.

³X = Observed during field reconnaissance.

Abundance Categories: A=abundant; C=common; O=occasional; U=uncommon; R=rare

Table 3-5
Avifaunal Species Observed in or near the Project Long Mott Project Site, Summer 2023

Scientific Name	Common Name	On-site Surveys Abundance ¹	Driving Route Abundance ²	Vicinity General Reconnaissance ³
<i>Agelaius phoeniceus</i>	Red-winged blackbird	A	A	X
<i>Ammodramus savannarum</i>	Grasshopper sparrow	R		
<i>Anhinga anhinga</i>	Anhinga		R	X
<i>Ardea alba</i>	Great egret	R	A	X
<i>Ardea herodias</i>	Great blue heron		C	X
<i>Bubulcus ibis</i>	Cattle egret	O	A	X
<i>Buteo jamaicensis</i>	Red-tailed hawk	R	R	
<i>Butorides virescens</i>	Green heron		R	X
<i>Caracara cheriway</i>	Crested caracara	U	U	X
<i>Cardinalis cardinalis</i>	Northern cardinal	O	C	
<i>Cathartes aura</i>	Turkey vulture	C	A	X
<i>Charadrius vociferus</i>	Killdeer	U	R	X
<i>Chlidonias niger</i>	Black tern		A	X
<i>Chordeiles minor</i>	Common nighthawk		O	X
<i>Circus hudsonius</i>	Northern harrier	R	R	
<i>Columba livia</i>	Rock pigeon	R		X
<i>Contopus virens</i>	Eastern wood-pewee		R	
<i>Coragyps atratus</i>	Black vulture	O	O	X
<i>Dendrocygna autumnalis</i>	Black-bellied whistling duck		C	X
<i>Dumetella carolinensis</i>	Gray catbird	U		
<i>Egretta caerulea</i>	Little blue heron		C	X
<i>Egretta thula</i>	Snowy egret	R	A	X
<i>Egretta tricolor</i>	Tricolored heron	U	U	X
<i>Eudocimus albus</i>	White ibis	U	A	X
<i>Fulica americana</i>	American coot		A	X
<i>Gallinula galeata</i>	Common gallinule		U	X
<i>Geranoaetus albicaudatus</i>	White-tailed hawk		R	
<i>Himantopus mexicanus</i>	Black-necked stilt	U	A	X
<i>Lanius ludovicianus</i>	Loggerhead shrike	R	O	X
<i>Leucophaeus atricilla</i>	Laughing gull			X
<i>Limnodromus griseus</i>	Short-billed dowitcher			X
<i>Megaceryle alcyon</i>	Belted kingfisher			X
<i>Melanerpes carolinus</i>	Red-bellied woodpecker	R		
<i>Mimus polyglottos</i>	Northern mockingbird	O	C	X
<i>Molothrus ater</i>	Brown-headed cowbird	R	C	X
<i>Mycteria americana</i>	Wood stork		U	
<i>Myiarchus crinitus</i>	Great crested flycatcher	R		
<i>Nannopterum auritum</i>	Double-crested cormorant	R	U	X



Scientific Name	Common Name	On-site Surveys Abundance ¹	Driving Route Abundance ²	Vicinity General Reconnaissance ³
<i>Pelecanus occidentalis</i>	Brown pelican			X
<i>Petrochelidon fulva</i>	Cave swallow		A	
<i>Petrochelidon pyrrhonota</i>	Cliff swallow	U	U	
<i>Piranga rubra</i>	Summer tanager		R	
<i>Platalea ajaja</i>	Roseate spoonbill		U	
<i>Plegadis falcinellus</i>	Glossy ibis		U	
<i>Podilymbus podiceps</i>	Pied-billed grebe			X
<i>Quiscalus mexicanus</i>	Great-tailed grackle	A	A	X
<i>Sayornis phoebe</i>	Eastern phoebe		R	
<i>Setophaga petechia</i>	Yellow warbler	R		
<i>Spinus tristis</i>	American goldfinch	U	O	
<i>Spiza americana</i>	Dickcissel	U		
<i>Spizelloides arborea</i>	American tree sparrow	U		
<i>Stelgidopteryx serripennis</i>	Northern rough-winged swallow	R		X
<i>Sterna forsteri</i>	Forster's tern			X
<i>Streptopelia decaocto</i>	Eurasian collared-dove	U	O	
<i>Sturnus vulgaris</i>	European starling	O		
<i>Thalasseus maximus</i>	Royal tern			X
<i>Thalasseus sandvicensis</i>	Sandwich tern		R	X
<i>Tringa semipalmata</i>	Willet			X
<i>Vireo griseus</i>	White-eyed vireo		U	
<i>Zenaida macroura</i>	Mourning dove	A	A	X
Species Richness		33	42	37

¹Species identified during on-site pedestrian surveys.

²Species identified along the bird transect routes at designated vicinity stopping points.

³X = Observed during field reconnaissance.

Abundance Categories: A=abundant; C=common; O=occasional; U=uncommon; R=rare

Table 3-6
Avifaunal Species Observed in or near the Project Long Mott Project Site, Fall 2023

Scientific Name	Common Name	On-site Surveys Abundance ¹	Driving Route Abundance ²	Vicinity General Reconnaissance ³
<i>Agelaius phoeniceus</i>	Red-winged blackbird	A	A	X
<i>Anas acuta</i>	Northern pintail		R	
<i>Anhinga anhinga</i>	Anhinga		R	X
<i>Antigone canadensis</i>	Sandhill crane		O	
<i>Ardea alba</i>	Great egret	R	O	X
<i>Ardea herodias</i>	Great blue heron		O	
<i>Botaurus lentiginosus</i>	American bittern			X
<i>Bubulcus ibis</i>	Cattle egret		C	
<i>Buteo jamaicensis</i>	Red-tailed hawk	R	C	X
<i>Buteo lineatus</i>	Red-shouldered hawk		R	
<i>Calidris minutilla</i>	Least sandpiper			X
<i>Caracara cheriway</i>	Crested caracara		U	X
<i>Cardinalis cardinalis</i>	Northern cardinal	C	U	X
<i>Cathartes aura</i>	Turkey vulture	U	A	X
<i>Charadrius vociferus</i>	Killdeer	C	C	X
<i>Chordeiles minor</i>	Common nighthawk		R	
<i>Circus hudsonius</i>	Northern harrier		R	X
<i>Coragyps atratus</i>	Black vulture	A	A	X
<i>Dumetella carolinensis</i>	Gray catbird		R	
<i>Egretta caerulea</i>	Little blue heron			X
<i>Egretta thula</i>	Snowy egret		C	X
<i>Egretta tricolor</i>	Tricolored heron		R	X
<i>Eudocimus albus</i>	White ibis		R	X
<i>Falco sparverius</i>	American kestrel		U	X
<i>Fulica americana</i>	American coot		A	X
<i>Geranoaetus albicaudatus</i>	White-tailed hawk		U	
<i>Hirundo rustica</i>	Barn swallow		R	
<i>Lanius ludovicianus</i>	Loggerhead shrike	U	C	X
<i>Leucophaeus atricilla</i>	Laughing gull			X
<i>Megaceryle alcyon</i>	Belted kingfisher		U	X
<i>Melanerpes carolinus</i>	Red-bellied woodpecker		R	
<i>Melospiza melodia</i>	Song sparrow	U		X
<i>Mimus polyglottos</i>	Northern mockingbird	U	U	X
<i>Molothrus ater</i>	Brown-headed cowbird	C	A	X
<i>Nannopterum auritum</i>	Double-crested cormorant	R	U	X
<i>Pandion haliaetus</i>	Osprey		R	X
<i>Passerculus sandwichensis</i>	Savannah sparrow	C	C	X
<i>Pelecanus occidentalis</i>	Brown pelican			X



Scientific Name	Common Name	On-site Surveys Abundance ¹	Driving Route Abundance ²	Vicinity General Reconnaissance ³
<i>Plegadis falcinellus</i>	Glossy ibis			X
<i>Podilymbus podiceps</i>	Pied-billed grebe			X
<i>Poliophtila caerulea</i>	Blue-gray gnatcatcher		R	X
<i>Quiscalus mexicanus</i>	Great-tailed grackle	A	A	X
<i>Sayornis phoebe</i>	Eastern phoebe	U	U	X
<i>Sialia sialis</i>	Eastern bluebird		R	
<i>Spatula clypeata</i>	Northern shoveler			X
<i>Spinus tristis</i>	American goldfinch		R	
<i>Stelgidopteryx serripennis</i>	Northern rough-winged swallow	A	A	
<i>Sterna forsteri</i>	Forster's tern	U	U	X
<i>Streptopelia decaocto</i>	Eurasian collared-dove		C	X
<i>Sturnella magna</i>	Eastern meadowlark		C	X
<i>Sturnella neglecta</i>	Western meadowlark			X
<i>Sturnus vulgaris</i>	European starling	C	A	X
<i>Tringa semipalmata</i>	Willet			X
<i>Troglodytes aedon</i>	House wren	U	O	X
<i>Tyrannus forficatus</i>	Scissor-tailed flycatcher		R	X
<i>Vireo griseus</i>	White-eyed Vireo		R	
<i>Zenaida macroura</i>	Mourning dove	C	A	X
Species Richness		20	46	43

¹Species identified during on-site pedestrian surveys.

²Species identified along the bird transect routes at designated vicinity stopping points.

³X = Observed during field reconnaissance.

Abundance Categories: A=abundant; C=common; O=occasional; U=uncommon; R=rare

3.1.2.2 Mammals

Field studies for mammal species included general field reconnaissance and incidental observations during pedestrian surveys. Figure 2-2 depicts the ecological survey locations during the seasonal surveys. Detailed methodology can be found in Section 2.2.2.

Mammal species observed in the Project Site included coyote (*Canis latrans*), opossum (*Didelphis virginiana*), white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), feral hog (*Sus scrofa*), eastern cottontail (*Sylvilagus floridanus*), groundhog (*Marmota monax*), and striped skunk (*Mephitis mephitis*). Mammal occurrence in the Project Site is likely driven by various habitats (developed lands, cultivated crops, herbaceous, scrub/shrub, open water, and fragmented forest) and previous disturbance within and surrounding the Project Site. Within the Project Vicinity, additional mammal species of beaver (*Castor canadensis*), armadillo (*Dasypus novemcinctus*), and nutria (*Myocastor coypus*), were observed. The list of mammals observed within and near the Project Site is recorded in Table 3-7 (winter 2023) Table 3-8 (spring 2023), Table 3-9 (summer 2023), and Table 3-10 (fall 2023). White-tailed deer are recreationally

valuable as game species, while coyotes and eastern cottontails are nongame species in Texas. Opossum, nutria, raccoon, and striped skunk are recreationally valuable as furbearers as listed by TPWD hunting regulations. Feral hogs and coyotes are also hunted in Texas (TPWD 2023a).

Tracks of wildlife species, such as white-tailed deer, raccoon, opossum, and coyote, were observed throughout much of the Project Site habitats during the seasonal field surveys. These common species do not appear to be impacted by the current level of human and industrial activities occurring near the site. These mobile species along with others observed on-site, such as eastern cottontail, groundhog, striped skunk, and feral hog and other terrestrial mammals not observed but likely to occur such as rodents, collectively create and use travel corridors across various biotic communities on the site and to and from adjacent properties. The longest and most complex travel corridors are typically established by white-tailed deer. Other species may use portions of these regularly traveled trails.

Table 3-7
Mammal Species Observed in or near the Project Long Mott Project Site, Winter 2023

Scientific Name	Common Name	On-site	Vicinity
<i>Canis latrans</i>	Coyote	X	
<i>Didelphis virginiana</i>	Opossum	X	
<i>Odocoileus virginianus</i>	White-tailed deer	X	X
<i>Procyon lotor</i>	Raccoon	X	X
<i>Sylvilagus floridanus</i>	Eastern cottontail		X
<i>Marmota monax</i>	Groundhog	X	X
<i>Mephitis mephitis</i>	Striped skunk	X	

Table 3-8
Mammal Species Observed in or near the Project Long Mott Project Site, Spring 2023

Scientific Name	Common Name	On-site	Vicinity
<i>Canis latrans</i>	Coyote	X	
<i>Castor canadensis</i>	Beaver		X
<i>Dasypus novemcinctus</i>	Armadillo		X
<i>Marmota monax</i>	Groundhog	X	
<i>Mephitis mephitis</i>	Striped skunk		X
<i>Odocoileus virginianus</i>	White-tailed deer	X	X
<i>Procyon lotor</i>	Raccoon	X	X
<i>Sus scrofa</i>	Feral hog	X	X
<i>Sylvilagus floridanus</i>	Eastern cottontail	X	X

Table 3-9
Mammal Species Observed in or near the Project Long Mott Project Site, Summer 2023

Scientific Name	Common Name	On-site	Vicinity
<i>Dasypus novemcinctus</i>	Armadillo		X

<i>Myocastor coypus</i>	Nutria		X
<i>Odocoileus virginianus</i>	White-tailed deer	X	X
<i>Procyon lotor</i>	Raccoon	X	X
<i>Sylvilagus floridanus</i>	Eastern cottontail	X	

Table 3-10
Mammal Species Observed in or near the Project Long Mott Project Site, Fall 2023

Scientific Name	Common Name	On-site	Vicinity
<i>Canis latrans</i>	Coyote	X	
<i>Didelphis virginiana</i>	Opossum		X
<i>Odocoileus virginianus</i>	White-tailed deer	X	X
<i>Procyon lotor</i>	Raccoon	X	X
<i>Sylvilagus floridanus</i>	Eastern cottontail	X	

3.1.2.3 Herpetofauna

Herpetofauna were recorded based on general field reconnaissance and incidental observations during the ecological surveys. Figure 2-2 depicts the ecological survey locations during the seasonal surveys. Detailed methodology can be found in Section 2.2.2.

Herpetofauna species encountered on the Project Site included American alligator (*Alligator mississippiensis*), gulf coast toad (*Incilius nebulifer*), American bullfrog (*Lithobates catesbeianus*), diamondback watersnake (*Nerodia rhombifer*), five-lined skink (*Plestiodon fasciatus*), Gulf Coast ribbon snake (*Thamnophis proximus orarius*), garter snake (*Thamnophis sirtalis*), and red-eared slider (*Trachemys scripta elegans*). Within the Project Vicinity, additional herpetofaunal species of water moccasin (*Agkistrodon piscivorus*), spiny softshell turtle (*Apalone spinifera*), Texas spiny lizard (*Sceloporus olivaceus*), and common snapping turtle (*Chelydra serpentina*) were observed. The list of herpetofauna observed within and near the Project Site is recorded in Table 3-11 (spring 2023), Table 3-12 (summer 2023), and Table 3-13 (fall 2023). Alligators, freshwater turtles (snapping turtles), and frogs (bullfrogs) are nongame species hunted and/or trapped in Texas (TPWD 2023a).

Table 3-11
Herpetofauna Species Observed in or near the Project Long Mott Project Site, Spring 2023

Scientific Name	Common Name	On-site	Vicinity
<i>Alligator mississippiensis</i>	American alligator	X	X
<i>Apalone spinifera</i>	Spiny softshell turtle		X
<i>Incilius nebulifer</i>	Gulf coast toad	X	
<i>Lithobates catesbeianus</i>	American bullfrog	X	X
<i>Nerodia rhombifer</i>	Diamondback watersnake	X	
<i>Plestiodon fasciatus</i>	Five-lined skink	X	
<i>Sceloporus olivaceus</i>	Texas spiny lizard		X
<i>Thamnophis sirtalis</i>	Garter snake	X	

<i>Trachemys scripta elegans</i>	Red-eared slider	X	X
----------------------------------	------------------	---	---

Table 3-12
Herpetafauna Species Observed in or near the Project Long Mott Project Site, Summer 2023

Scientific Name	Common Name	On-site	Vicinity
<i>Alligator mississippiensis</i>	American alligator	X	X
<i>Apalone spinifera</i>	Spiny softshell turtle		X
<i>Chelydra serpentina</i>	Common snapping turtle		X
<i>Incilius nebulifer</i>	Gulf coast toad		X
<i>Nerodia rhombifer</i>	Diamondback watersnake	X	
<i>Trachemys scripta elegans</i>	Red-eared slider		X

Table 3-13
Herpetafauna Species Observed in or near the Project Long Mott Project Site, Fall 2023

Scientific Name	Common Name	On-site	Vicinity
<i>Agkistrodon piscivorus</i>	Cottonmouth		X
<i>Alligator mississippiensis</i>	American alligator		X
<i>Apalone spinifera</i>	Spiny softshell turtle		X
<i>Nerodia rhombifer</i>	Diamondback watersnake		X
<i>Thamnophis proximus orarius</i>	Gulf Coast ribbon snake	X	

3.2 Aquatic Resources

3.2.1 Fish

In summer 2023, a total of 19 fish species were observed during fish surveys. Abundant species observed included sailfin molly (*Poecilia latipinna*), western mosquitofish (*Gambusia affinis*), and sheepshead minnow (*Cyprinodon variegatus*). A summary of fish species observed in summer surveys by waterbody is shown in Table 3-14. A total of 15 fish species were observed within West Coloma Creek during the summer survey, the most abundant of which was sailfin molly. Within the Guadalupe-Blanco River Authority (GBRA) canal, a total of 10 species were observed, with the most abundant species being western mosquitofish. In the drainage outfall, a total of 6 species were observed, with the most abundant species being sheepshead minnow. One site in West Coloma Creek (WCC-01) was not sampled as no water was present at this location during the summer sampling event.

Table 3-14
Fish Species Observed in or near the Project Long Mott Project Site, Summer 2023

Location	Common Name	Scientific Name	Number	Weight (g)	Collection Method*
Dow Drainage Canal	Sheepshead minnow	<i>Cyprinodon variegatus</i>	30	20.9	SE
	Striped mullet	<i>Mugil cephalus</i>	9	172.4	SE
	Western mosquitofish	<i>Gambusia affinis</i>	7	2.3	SE
	Threadfin shad	<i>Dorosoma petenense</i>	3	17.0	SE
	Plains killifish	<i>Fundulus zebrinus</i>	2	1.3	SE
	Sailfin molly	<i>Poecilia latipinna</i>	1	0.5	SE
Total			52	214.4	
GBRA Canal	Common carp	<i>Cyprinus carpio</i>	1	1,067	EFB, EFP
	Smallmouth buffalo	<i>Ictiobus bubalus</i>	4	2,714	EFB, EFP
	Gizzard shad	<i>Dorosoma cepedianum</i>	1	9	EFB, EFP
	Sheepshead minnow	<i>Cyprinodon variegatus</i>	2	2	EFB, EFP
	Western mosquitofish	<i>Gambusia affinis</i>	58	45.2	EFB, EFP
	Largemouth bass	<i>Micropterus salmoides</i>	1	1,322	EFB, EFP
	Spotted gar	<i>Lepisosteus oculatus</i>	4	3,813	EFB, EFP
	Channel catfish	<i>Ictalurus punctatus</i>	1	2,573	EFB, EFP
	Rio Grande cichlid	<i>Herichthys cyanoguttatus</i>	2	1.6	EFB, EFP
	Sailfin molly	<i>Poecilia latipinna</i>	4	0.6	EFB, EFP
Total			78	11,547.4	
West Coloma Creek	Rio Grande cichlid	<i>Herichthys cyanoguttatus</i>	1	1.9	EFP, SE
	Western mosquitofish	<i>Gambusia affinis</i>	17	7.4	EFP, SE
	Warmouth	<i>Lepomis gulosus</i>	3	40.7	EFP, SE
	Striped mullet	<i>Mugil cephalus</i>	5	63.4	EFP, SE
	Sheepshead minnow	<i>Cyprinodon variegatus</i>	1	0.6	EFP, SE
	Weed shiner	<i>Notropis texanus</i>	1	0.3	EFP, SE
	Sailfin molly	<i>Poecilia latipinna</i>	76	70.4	EFP, SE
	Spotted gar	<i>Lepisosteus oculatus</i>	5	1,456	EFP, SE
	Mirror shiner	<i>Notropis spectrunculus</i>	1	1.0	EFP, SE
	Smallmouth buffalo	<i>Ictiobus bubalus</i>	1	2,083	EFP, SE
	Channel catfish	<i>Ictalurus punctatus</i>	2	2.5	EFP, SE
	Largemouth bass	<i>Micropterus salmoides</i>	1	0.5	EFP, SE
	Bluegill	<i>Lepomis macrochirus</i>	1	1.5	EFP, SE
	Ladyfish	<i>Elops saurus</i>	1	3.1	EFP, SE
	Bay anchovy	<i>Anchoa mitchilli</i>	19	5.3	EFP, SE



Location	Common Name	Scientific Name	Number	Weight (g)	Collection Method*
	Total		135	3,737.6	

*Collection Method: SE = Seine, EFB = Electrofishing (boat), EFP = Electrofishing (backpack)

In fall 2023, a total of 23 fish species were observed during fish surveys. Abundant species observed included sailfin molly, western mosquitofish, and sheepshead minnow. A summary of fish species observed in fall surveys by waterbody is shown in Table 3-15. A total of 12 fish species were observed within West Coloma Creek during the fall survey, the most abundant of which was western mosquitofish. Within the GBRA canal, a total of 15 species were observed, with the most abundant species being sailfin molly and gizzard shad (*Dorosoma cepedianum*). In the drainage outfall, a total of 8 species were observed, with the most abundant species being sheepshead minnow. One site in West Coloma Creek (WCC-01) was not sampled as no water was present at this location during the fall sampling event.

Table 3-15
Fish Species Observed in or near the Project Long Mott Project Site, Fall 2023

Location	Common Name	Scientific Name	Number	Weight (g)	Collection Method*
Dow Drainage Canal	Striped mullet	<i>Mugil cephalus</i>	7	163	SE
	Rio Grande cichlid	<i>Herichthys cyanoguttatus</i>	10	9	SE
	Sailfin molly	<i>Poecilia latipinna</i>	127	82	SE
	Western mosquitofish	<i>Gambusia affinis</i>	17	6	SE
	Sheepshead minnow	<i>Cyprinodon variegatus</i>	458	183	SE
	Inland silverside	<i>Menidia beryllina</i>	2	4	SE
	Slough darter	<i>Etheostoma gracile</i>	8	5	SE
	Spotted gar	<i>Lepisosteus oculatus</i>	1	383	SE
	Total		630	835	
GBRA Canal	Smallmouth buffalo	<i>Ictiobus bubalus</i>	2	2,322	EFB, EFP
	Rio Grande cichlid	<i>Herichthys cyanoguttatus</i>	2	94	EFB, EFP
	Bullhead minnow	<i>Pimephales vigilax</i>	2	2	EFB, EFP
	Bluegill	<i>Lepomis macrochirus</i>	1	68	EFB, EFP
	Largemouth bass	<i>Micropterus salmoides</i>	1	135	EFB, EFP
	Channel catfish	<i>Ictalurus punctatus</i>	2	2,623	EFB, EFP
	Gizzard shad	<i>Dorosoma cepedianum</i>	11	40	EFB, EFP
	Longear sunfish	<i>Lepomis megalotis</i>	2	25	EFB, EFP
	Green sunfish	<i>Lepomis cyanellus</i>	3	22	EFB, EFP
	Sailfin molly	<i>Poecilia latipinna</i>	11	20	EFB, EFP
	Bluefin killifish	<i>Lucania goodei</i>	2	2	EFB, EFP



Location	Common Name	Scientific Name	Number	Weight (g)	Collection Method*
	Western mosquitofish	<i>Gambusia affinis</i>	5	2	EFB, EFP
	Gulf killifish	<i>Fundulus grandis</i>	1	2	EFB, EFP
	Common carp	<i>Cyprinus carpio</i>	1	1,306	EFB, EFP
	Spotted gar	<i>Lepisosteus oculatus</i>	1	422	EFB, EFP
	Total		47	7,085	
	Sailfin molly	<i>Poecilia latipinna</i>	48	21	EFB, SE
	Western mosquitofish	<i>Gambusia affinis</i>	79	19	EFB, SE
	Bluefin killifish	<i>Lucania goodei</i>	1	1	EFB, SE
	Bluegill	<i>Lepomis macrochirus</i>	3	11	EFB, SE
	Green sunfish	<i>Lepomis cyanellus</i>	1	7	EFB, SE
West Coloma Creek	Longear sunfish	<i>Lepomis megalotis</i>	1	2	EFB, SE
	Alligator gar	<i>Atractosteus spatula</i>	3	3,342	EFB, SE
	Spotted gar	<i>Lepisosteus oculatus</i>	1	520	EFB, SE
	Inland silverside	<i>Menidia beryllina</i>	1	1	EFB, SE
	Shortnose gar	<i>Lepisosteus platostomus</i>	6	0	EFB, SE
	Bay anchovy	<i>Anchoa mitchilli</i>	8	0	EFB, SE
	Red drum	<i>Sciaenops ocellatus</i>	12	2	EFB, SE
	Total		164	3,926	

*Collection Method: SE = Seine, EFB = Electrofishing (boat), EFP = Electrofishing (backpack)

In winter 2024, a total of 18 fish species were observed during fish surveys. Abundant species observed included sailfin molly, bay anchovy (*Anchoa mitchilli*), inland silverside (*Menidia beryllina*), and western mosquitofish. A summary of fish species observed in winter surveys by waterbody is provided in Table 3-16. A total of 11 fish species were observed within West Coloma Creek during the winter survey, the most abundant of which was sailfin molly. Within the GBRA canal, a total of 11 species were observed, with the most abundant species being common carp (*Cyprinus carpio*). In the drainage outfall, a total of 3 species were observed, with the most abundant species being sailfin molly.

Table 3-16
Fish Species Observed in or near the Long Mott Project Site, Winter 2024

Location	Common Name	Scientific Name	Number	Weight (g)	Collection Method*
Drainage Canal	Sheepshead Minnow	<i>Cyprinodon variegatus</i>	13	9.2	EFP
	Sailfin Molly	<i>Poecilia latipinna</i>	33	19.3	EFP
	Western Mosquitofish	<i>Gambusia affinis</i>	24	6.1	EFP
	Total		70	34.6	



Location	Common Name	Scientific Name	Number	Weight (g)	Collection Method*
GBRA Canal	Redear Sunfish	<i>Lepomis microlophus</i>	2	39	EFP
	Longear Sunfish	<i>Lepomis megalotis</i>	3	48	EFP
	Bluegill	<i>Lepomis macrochirus</i>	3	29	EFP
	Gizzard Shad	<i>Dorosoma cepedianum</i>	1	9	EFP
	Longnose Gar	<i>Lepisosteus osseus</i>	3	3299	EFP
	Smallmouth Buffalo	<i>Ictiobus bubalus</i>	3	2269	EFP
	Common Carp	<i>Cyprinus carpio</i>	5	5329	EFP
	Warmouth	<i>Lepomis gulosus</i>	1	81	EFP
	Channel Catfish	<i>Ictalurus punctatus</i>	2	1607	EFP
	Western Mosquitofish	<i>Gambusia affinis</i>	1	0.5	EFP
	Weed shiner	<i>Notropis texanus</i>	1	0.5	EFP
Total			25	12711	
West Coloma Creek	Sailfin Molly	<i>Poecilia latipinna</i>	69	46.6	EFP, SE
	Western Mosquitofish	<i>Gambusia affinis</i>	9	4.1	EFP, SE
	Bluefin Killifish	<i>Lucania goodei</i>	3	1.3	EFP, SE
	Gizzard Shad	<i>Dorosoma cepedianum</i>	1	265	EFP, SE
	Warmouth	<i>Lepomis gulosus</i>	5	55.9	EFP, SE
	Bluegill	<i>Lepomis macrochirus</i>	1	1.5	EFP, SE
	Plains Killifish	<i>Fundulus zebrinus</i>	3	5.1	EFP, SE
	Inland Silverside	<i>Menidia beryllina</i>	33	22.7	EFP, SE
	Bay Anchovy	<i>Anchoa mitchilli</i>	49	11.1	EFP, SE
	Sheepshead Minnow	<i>Cyprinodon variegatus</i>	17	11.3	EFP, SE
	Naked Goby	<i>Gobiosoma bosc</i>	1	1.1	EFP, SE
Total			191	425.7	

*Collection Method: SE = Seine, EFB = Electrofishing (boat), EFP = Electrofishing (backpack)

In spring 2024, a total of 17 fish species were observed during fish surveys. Abundant species observed included western mosquitofish, sailfin molly, and gizzard shad. A summary of fish species observed in spring surveys by waterbody is provided in Table 3-17. A total of 10 fish species were observed within West Coloma Creek during the spring survey, the most abundant of which was western mosquitofish. Within the GBRA canal, a total of 11 species were observed, with the most abundant species being western mosquitofish. In the drainage outfall, a total of five species were observed, with the most abundant species being sheepshead minnow.

Table 3-17
Fish Species Observed in or near the Long Mott Project Site, Spring 2024

Location	Common Name	Scientific Name	Number	Weight (g)	Collection Method*
Dow Drainage Canal	Sheepshead minnow	<i>Cyprinodon variegatus</i>	13	15.8	EFP
	Sailfin molly	<i>Poecilia latipinna</i>	5	1.1	EFP
	Western mosquitofish	<i>Gambusia affinis</i>	3	1.8	EFP
	Alligator gar	<i>Atractosteus spatula</i>	1	3584	EFP
	Bluefin killifish	<i>Lucania goodei</i>	1	0.02	EFP
	Total		23	3586.92	
GBRA Canal	Western mosquitofish	<i>Gambusia affinis</i>	46	3.5	EFB, EFP
	Common carp	<i>Cyprinus carpio</i>	6	9825	EFB, EFP
	Sailfin molly	<i>Poecilia latipinna</i>	6	1.3	EFB, EFP
	Spotted gar	<i>Lepisosteus oculatus</i>	5	4880	EFB, EFP
	Smallmouth buffalo	<i>Ictiobus bubalus</i>	5	2337	EFB, EFP
	Largemouth bass	<i>Micropterus salmoides</i>	4	3086	EFB, EFP
	Bluegill	<i>Lepomis macrochirus</i>	3	96	EFB, EFP
	Channel catfish	<i>Ictalurus punctatus</i>	3	4645	EFB, EFP
	Bluefin killifish	<i>Lucania goodei</i>	2	0.5	EFB, EFP
	Longnose gar	<i>Lepisosteus osseus</i>	2	3623	EFB, EFP
	Warmouth	<i>Lepomis gulosus</i>	1	93	EFB, EFP
	Total		83	28590.3	
West Coloma Creek	Western mosquitofish	<i>Gambusia affinis</i>	59	3.9	EFP, SE
	Sailfin molly	<i>Poecilia latipinna</i>	42	54.2	EFP, SE
	Gizzard shad	<i>Dorosoma cepedianum</i>	40	20.4	EFP, SE
	Red drum	<i>Sciaenops ocellatus</i>	3	1.7	EFP, SE
	Inland silverside	<i>Menidia beryllina</i>	2	2	EFP, SE
	Spotted gar	<i>Lepisosteus oculatus</i>	2	1261	EFP, SE
	Striped mullet	<i>Mugil cephalus</i>	2	101	EFP, SE
	Sheepshead minnow	<i>Cyprinodon variegatus</i>	1	4.1	EFP, SE
	Bluegill	<i>Lepomis macrochirus</i>	1	3.7	EFP, SE
	Warmouth	<i>Lepomis gulosus</i>	1	8.7	EFP, SE
	Total		153	1460.7	

*Collection Method: SE = Seine, EFB = Electrofishing (boat), EFP = Electrofishing (backpack)

Recreationally important fish species encountered included largemouth bass and channel catfish, which were encountered in the GBRA canal and West Coloma Creek. Additional game species encountered in West Coloma Creek include warmouth, bluegill, and red drum. Commercially important aquatic species encountered during aquatic ecology sampling include red drum and white shrimp.

The only non-native fish species observed were common carp and Rio Grande cichlid (*Herichthys cyanoguttatus*). Other non-native or nuisance species observed in aquatic ecology



sampling included apple snail (*Pomacea maculata*), water hyacinth (*Eichoria crassipes*), and Eurasian milfoil (*Myriophyllum spicatum*). Water hyacinth was present only in the GBRA Canal, while Eurasian milfoil was observed in both the GBRA Canal and West Coloma Creek.

No threatened or endangered fish species were identified at any location. The only state listed species of concern noted in seasonal aquatic ecology sampling was alligator gar (*Atractosteus spatula*), which was encountered in West Coloma Creek in fall 2023 seasonal survey.

3.2.2 Macroinvertebrates

In addition to fish, macroinvertebrates were sampled during the fall 2023 and spring 2024 aquatic ecology surveys. Fall macroinvertebrate sampling occurred on November 7-9, 2023. A total of 68 distinct taxa were encountered in macroinvertebrate sampling. A full list of taxa can be found in Table 3-18. The most individuals were encountered in West Coloma Creek (n=409) followed by the GBRA Calhoun Canal (n=338). Similarly, diversity was greatest in West Coloma Creek, with 41 distinct taxa encountered. The GBRA Calhoun Canal and Dow Drainage Canal had similar levels of macroinvertebrate diversity, with 25 and 23 distinct taxa, respectively. The most abundant taxa was a Chironomid (*Tanypus* sp., 20.86%) followed by a taxa of Lymnaeid snails (*Pyrgophorous* sp., 14.11%) and an annelid worm in the family Naididae (11.45%).

Table 3-18
Macroinvertebrates Encountered in the Vicinity of the Long Mott Project Site by
Water Body, Fall 2023

						Total	
Common Name	Family	Taxa (genus)	West Coloma Creek	GBRA Calhoun Canal	Dow Drainage Canal	Number	Percent of Total
Flies and Midges	Simuliidae		1			1	0.10
	Ceratopogonidae		4			4	0.41
		<i>Culicodes</i> sp.			1	1	0.10
		<i>Dasyhelea</i> sp.	17			17	1.73
	Chironomidae		2			2	0.20
		Suborder:					
		Chironaminae	1			1	0.10
		<i>Larsia</i> sp.	38			38	3.88
		<i>Tanypus</i> sp.	203	1	1	205	20.92
		<i>Dicrotendipes</i> sp.	4	1		5	0.51
		<i>Tanytarsus</i> sp.	7			7	0.71
		<i>Microtendipes</i> sp.	3			3	0.31
		<i>Chironomus</i> sp.	3			3	0.31
		<i>Polypedilum</i> sp.	1		1	2	0.20
		<i>Cryptochironomus</i> sp.		3		3	0.31
		<i>Coelotanypus</i> sp.		1	15	16	1.63
	Limoniidae	<i>Limonia</i> sp.	17			17	1.73
	Stratiomyidae	<i>Odontomyia</i> sp.	2			2	0.20
	Tanyderidae				1	1	0.10



						Total	
Common Name	Family	Taxa (genus)	West Coloma Creek	GBRA Calhoun Canal	Dow Drainage Canal	Number	Percent of Total
Annelid Worms	Naididae (Tubificidae)	Group II		4	1	5	0.51
		Group III		2		2	0.20
		Group V	1	7	104	112	11.43
		<i>Nais sp.</i>	2			2	0.20
		<i>Dero sp.</i>	1			1	0.10
		<i>Pristina sp.</i>	8			8	0.82
		<i>Branchiura sowerbyi</i>		2	1	3	0.31
		<i>Limnodrilus sp.</i>		2	71	73	7.45
		<i>Tubifex tubifex</i>		1		1	0.10
		<i>Aulodrilus sp.</i>			11	11	1.12
	Lumbriculidae				1	1	0.10
	Tipulidae	<i>Ormosia sp.</i>			1	1	0.10
	Corethrellidae	<i>Corethrella sp.</i>	1			1	0.10
Molluscs	Planorbidae	<i>Drepanotrema sp.</i>	6	1	2	9	0.92
		<i>Menetus sp.</i>	2	7	1	10	1.02
	Hydrobiidae		1		1	2	0.20
		<i>Pyrgulopsis sp.</i>		1		1	0.10
		<i>Pyrgophorus sp.</i>				0	0.00
	Thiaridae	<i>Melanoides sp.</i>		60		60	6.12
		<i>Melanoides tuberculata</i>		16		16	1.63
	Cyrenidae	<i>Corbicula sp.</i>		49	4	53	5.41
	Ampullaridae				1	1	0.10
	Ancylidae	<i>Hebetancylus sp.</i>		25		25	2.55
	Lymnaeidae	<i>Stagnicola sp.</i>	2			2	0.20
		<i>Lymnaea sp.</i>	1			1	0.10
		<i>Pseudosuccinea sp.</i>		1		1	0.10
		<i>Pyrgophorus sp.</i>	1	136	1	138	14.08
	Physidae	<i>Physa sp.</i>	16	8		24	2.45
	Unionidae			2		2	0.20
	Gastropoda			1		1	0.10
	Bivalvia	Pteriomorphia	1		3	4	0.41
		Unidentified Bivalvia			1	1	0.10
	Unidentified mollusca			1		6	7
Amphipods	Hyalellidae	<i>Hyallela sp.</i>	18	5		23	2.35
Mayflies	Caenidae	<i>Caenis sp.</i>	1			1	0.10
	Baetidae	<i>Callibaetis sp.</i>	5			5	0.51
Dragonflies/damselfies	Gomphidae		1			1	0.10
		<i>Arigomphus sp.</i>		1		1	0.10
	Coenagrionidae	<i>Acanthagrion sp.</i>	5			5	0.51



						Total	
Common Name	Family	Taxa (genus)	West Coloma Creek	GBRA Calhoun Canal	Dow Drainage Canal	Number	Percent of Total
Beetles	Elmidae	<i>Heterelmis sp.</i>		1		1	0.10
	Dysticidae					0	0.00
	Hydrophilidae	<i>Berosus sp.</i>	16			16	1.63
		<i>Tropisternus sp.</i>	1				0.00
		<i>Paracymus sp.</i>	1			1	0.10
True bugs	Naucoridae	<i>Pelocoris sp.</i>	2			2	0.20
	Notonectidae	<i>Buenoa sp.</i>	2			2	0.20
	Corixidae		3			3	0.31
		<i>Trichocorixa sp.</i>	8			8	0.82
	Gerridae		1			1	0.10
Collembola	Isotomidae	<i>Isotoma sp.</i>			1	1	0.10
Copepods	Cyclopidae		1			1	0.10
Leafhoppers	Cicadellidae				1	1	0.10
Total			412	338	231	980	100

Spring macroinvertebrate sampling occurred on May 21-23, 2024. A total of 50 distinct taxa were encountered in macroinvertebrate sampling, which was fewer taxa than observed in fall sampling. A full list of taxa can be found in Table 3-19. The most individuals were encountered in the Dow Discharge Canal (n=546) followed by West Coloma Creek (n=365). Diversity was greatest in the GBRA Calhoun Canal, with 30 distinct taxa encountered. Similarly, West Coloma Creek had relatively high diversity with 28 distinct taxa. In the Dow Drainage Canal, only 8 distinct taxa were observed. The most abundant taxa was in the Corixidae family (*Trichocorixa sp.*, 30.79%) followed by a taxa of hydrobid snails (*Stygopyrgus sp.*, 15.88%).

Table 3-19
Macroinvertebrates Encountered in the Vicinity of the Long Mott Project Site by
Water Body, Spring 2024

						Total	
Common Name	Family	Taxa (genus)	West Coloma Creek	GBRA Calhoun Canal	Dow Drainage Canal	Number	Percent of Total
Flies and Midges	Stratiomyidae	<i>Nemotelus sp.</i>	1			1	0.08
		<i>Heriodiscus sp.</i>		1		1	0.08
	Ceratopogonidae	<i>Forcipomyia sp.</i>	1			1	0.08
	Chironomidae				1	1	0.08
		<i>Tanytus sp.</i>	5			5	0.41
		<i>Dicrotendipes sp.</i>		4		4	0.32
		<i>Chironomus sp.</i>	5			5	0.41
		<i>Polypedilum sp.</i>	1	7		8	0.65
Annelid Worms	Naididae (Tubificidae)	Group IV	46	3		49	3.97
		<i>Dero sp.</i>	6	1		7	0.57



						Total	
Common Name	Family	Taxa (genus)	West Coloma Creek	GBRA Calhoun Canal	Dow Drainage Canal	Number	Percent of Total
Molluscs	Planorbidae	<i>Branchiura sowerbyi</i>		1		1	0.08
		<i>Limnodrilus sp.</i>	9	1		10	0.81
		<i>Drepanotrema sp.</i>		1		1	0.08
		<i>Helisoma sp.</i>	1	7		8	0.65
	Hydrobiidae			6		6	0.49
		<i>Pyrgophorus sp.</i>	5	146		151	12.24
		<i>Stygopyrgus sp.</i>		1	195	196	15.88
	Thiaridae	<i>Melanoides sp.</i>		44		44	3.57
	Cyrenidae	<i>Corbicula sp.</i>		6		6	0.49
	Ancylidae	<i>Hebetancylus sp.</i>		6		6	0.49
	Physidae	<i>Physa sp.</i>	6	35		41	3.32
Amphipods	Gastropoda		1			1	0.08
		Budyconidae		1		1	0.08
	Bivalvia	Pteriomorphia		4		4	0.32
	Amphipoda			1		1	0.08
	Hyalellidae	<i>Hyallela sp.</i>	38	19		57	4.62
		<i>Apocorophium lacustre</i>		1		1	0.08
	Corophiidae	<i>Gammarus sp.</i>		11		11	0.89
	Gammaridae	<i>Caenis sp.</i>	2	1		3	0.24
	Caenidae	<i>Callibaetis sp.</i>	135	41	6	182	14.75
	Baetidae			1		1	0.08
		Coenagrionidae	<i>Acanthagrion sp.</i>			3	3
Beetles		<i>Ischnura sp.</i>	8	5		13	1.05
	Elmidae	<i>Heterelmis sp.</i>				0	0.00
	Curculionidae				1	1	0.08
	Dytiscidae	<i>Dytiscus sp.</i>	1			1	0.08
		<i>Hydroporus sp.</i>	1			1	0.08
	Hydrophilidae	<i>Berosus sp.</i>	2	1	1	4	0.32
		<i>Cymbiodyta sp.</i>		1		1	0.08
		<i>Hydrophilus sp.</i>			1	1	0.08
	Helophoridae	<i>Helophorus sp.</i>	2			2	0.16
	Chrysomelidae		1			1	0.08
	True bugs	Scirtidae	<i>Prionocyphon sp.</i>	1			1
		<i>Scirtes sp.</i>	2			2	0.16
Naucoridae		<i>Pelocoris sp.</i>				0	0.00
Hemiptera			1			1	0.08
Belostomatidae		<i>Abedus sp.</i>	1	5		6	0.49
Saldidae			1			1	0.08
Corixidae		<i>Trichocorixa sp.</i>	39	3	338	380	30.79
Veliidae		<i>Microvelia sp.</i>	1			1	0.08
Total			323	365	546	1234	100

Shellfish were opportunistically sampled during fish sampling activities. A summary of shellfish encountered can be found in Table 3-20. The most abundant shellfish encountered was white shrimp.

Table 3-20
Shellfish Species Encountered in Aquatic Ecology Sampling

Water Body	Common Name	Scientific Name	Number, Fall 2023	Number, Spring 2024
West Coloma Creek	Red swamp crayfish	<i>Procambarus clarkii</i>	1	2
	White river crayfish	<i>Procambarus acutus</i>	1	
	Blue crab	<i>Callinectes sapidus</i>	29	1
	White shrimp	<i>Litopenaeus setiferus</i>	123	220
GBRA Canal	White shrimp	<i>Litopenaeus setiferus</i>	68	81
Dow Drainage Canal	White shrimp	<i>Litopenaeus setiferus</i>	287	5
	Blue crab	<i>Callinectes sapidus</i>	3	

Two non-native macroinvertebrates were encountered in sampling. These included the non-native aquatic worm, *Branchiura sowerbyi*, and one non-native snail, *Melanoides tuberculata*. Other non-native or nuisance species observed on-site during sampling activities, but not observed in samples included apple snail (*Pomacea maculata*). Commercially important macroinvertebrates encountered include white shrimp. Recreational species include blue crab, white shrimp, and red swamp crayfish (*Procambarus clarkia*).

3.3 Important Species and Habitats

Information from the USFWS IPaC, NOAA, and TPWD were reviewed to identify important species and habitats potentially occurring within or near the Project Site. Important species are summarized in the following sections.

3.3.1 State and Federally Listed Species

As part of the desktop analysis, a list of protected species potentially occurring within or near the Project Site was developed and is presented in Table 3-21 and summarized in the following paragraphs.

Table 3-21
Protected Species Potentially Occurring within or near the Project Long Mott Project Site

		Status		
Common Name	Scientific Name	Federal ^(a)	State ^(b)	Suitable Habitat Present in Project Area ^(c)
Fish				
Alligator gar	<i>Atractosteus spatula</i>		S	P
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	T	T	N
Saltmarsh topminnow	<i>Fundulus jenkinsi</i>		S	N
Shortfin mako shark	<i>Isurus oxyrinchus</i>		T	N



Common Name	Scientific Name	Status		
		Federal ^(a)	State ^(b)	Suitable Habitat Present in Project Area ^(c)
Opossum pipefish	<i>Microphis brachyurus</i>		S	N
Southern flounder	<i>Paralichthys lethostigma</i>		S	N
Birds				
Sprague's pipit	<i>Anthus spragueii</i>		S	P
Western burrowing owl	<i>Athene cunicularia hypugaea</i>		S	N
White-tailed hawk	<i>Buteo albicaudatus</i>		T	P
Red knot	<i>Calidris canutus rufa</i>	T	T	N
Piping plover	<i>Charadrius melodus</i>	T	T	N
Reddish egret	<i>Egretta rufescens</i>		T	N
Swallow-tailed kite	<i>Elanoides forficatus</i>		T	N
Northern aplomado falcon	<i>Falco femoralis septentrionalis</i>	E	E	N
Eastern black rail	<i>Laterallus jamaicensis</i>	T	T	N
Franklin's gull	<i>Leucophaeus pipixcan</i>		S	N
Whooping crane	<i>Grus americana</i>	E	E	N
Bald eagle	<i>Haliaeetus leucocephalus</i>		S	N
Wood stork	<i>Mycteria americana</i>		T	N
Black skimmer	<i>Rynchops niger</i>		S	N
White-faced ibis	<i>Plegadis chihi</i>		T	N
Reptiles and Amphibians				
Woodhouse's toad	<i>Anaxyrus woodhousii</i>		S	N
Loggerhead sea turtle	<i>Caretta caretta</i>	T	T	N
Texas scarlet snake	<i>Cemophora lineri</i>		T	P
Green sea turtle	<i>Chelonia mydas</i>	T	T	N
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E		N
Hawksbills sea turtle	<i>Eretmochelys imbricata</i>	E	E	N
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>	E	E	N
Southern crawfish frog	<i>Lithobates areolatus areolatus</i>		S	N
Texas diamondback terrapin	<i>Malaclemys terrapin littoralis</i>		S	N
Salt marsh snake	<i>Nerodia clarkii</i>		S	N
Black-spotted newt	<i>Notophthalmus meridionalis</i>		T	P
Slender glass lizard	<i>Ophisaurus attenuatus</i>		S	N
Texas horned lizard	<i>Phrynosoma cornutum</i>		T	N
Prairie skink	<i>Plestiodon septentrionalis</i>		S	N
Strecker's chorus frog	<i>Pseudacris streckeri</i>		S	N
Western massasauga	<i>Sistrurus tergeminus</i>		S	N
Eastern box turtle	<i>Terrapene carolina</i>		S	P
Western box turtle	<i>Terrapene ornata</i>		S	P
Insects				
American bumblebee	<i>Bombus pensylvanicus</i>		S	P
Monarch butterfly	<i>Danaus plexippus</i>	C		P
Mollusks				
Live oak glass	<i>Nesovitrea suzannae</i>		S	N



Common Name	Scientific Name	Status		Suitable Habitat Present in Project Area ^(c)
		Federal ^(a)	State ^(b)	
Mammals				
Sei whale	<i>Balaenoptera borealis</i>	E	E	N
Blue whale	<i>Balaenoptera musculus</i>	E	E	N
Gulf of Mexico Bryde's whale	<i>Balaenoptera ricei</i>	E	E	N
Western hog-nosed skunk	<i>Conepatus leuconotus</i>		S	N
Padre Island kangaroo rat	<i>Dipodomys compactus compactus</i>		S	N
North Atlantic right whale	<i>Eubalaena glacialis</i>	E	E	N
Eastern red bat	<i>Lasiurus borealis</i>		S	N
Hoary bat	<i>Lasiurus cinereus</i>		S	N
Northern yellow bat	<i>Lasiurus intermedius</i>		S	N
Humpback whale	<i>Megaptera novaeangliae</i>	E	S	N
Long-tailed weasel	<i>Mustela frenata</i>		S	P
White-nosed coati	<i>Nasua narica</i>		T	N
Big free-tailed bat	<i>Nyctinomops macrotis</i>		S	N
Tricolored bat	<i>Perimyotis subflavus</i>	PE	S	N
Sperm whale	<i>Physeter macrocephalus</i>	E	E	N
Mountain lion	<i>Puma concolor</i>		S	N
Eastern spotted skunk	<i>Spilogale putorius</i>		S	P
Swamp rabbit	<i>Sylvilagus aquaticus</i>		S	N
West Indian manatee	<i>Trichechus manatus</i>	T	T	N
Plants				
Sand brazos mint	<i>Brazoria arenaria</i>		S	N
Marsh-elder dodder	<i>Cuscuta attenuata</i>		S	N
Velvet spurge	<i>Euphorbia innocua</i>		S	N
Coastal gay-feather	<i>Liatris bracteata</i>		S	P
Seaside beebalm	<i>Monarda maritima</i>		S	N
Texas peachbush	<i>Prunus texana</i>		S	N
Indianola beakrush	<i>Rhynchospora indianolensis</i>		S	P
Threeflower broomweed	<i>Thurovia triflora</i>		S	P
Texas willkommia	<i>Willkommia texana</i> var. <i>texana</i>		S	N

Reference: USFWS 2024; TPWD 2024.

- a) Federal Status Codes:
T = Listed Threatened
E = Listed Endangered
C = Candidate
PE = Proposed Endangered
- b) State Status Codes:
E = Listed Endangered
T = Listed Threatened
S = Listed Sensitive
- c) Habitat Codes:
N = No records of species within the Project Site and no suitable habitat is present
P = Potentially suitable habitat is present

In order to inform X-energy of the potential for consultation in accordance with Section 7(c) of the ESA, as amended, a listing of federally threatened or endangered species currently listed or

candidate species proposed for listing that may occur within the Project Site was obtained from the USFWS IPaC website and TPWD Calhoun County list of rare species in July 2024 (USFWS 2024; TPWD 2024). The USFWS IPaC and TPWD Calhoun County list identified eleven endangered species: Northern aplomado falcon (*Falco femoralis septentrionalis*), whooping crane (*Grus americana*), leatherback sea turtle (*Dermochelys coriacea*), hawksbills sea turtle (*Eretmochelys imbricata*), Kemp's Ridley sea turtle (*Lepidochelys kempii*), sei whale (*Balaenoptera borealis*), blue whale (*Balaenoptera musculus*), Gulf of Mexico bryde's whale (*Balaenoptera ricei*), North Atlantic right whale (*Eubalaena glacialis*), Humpback whale (*Megaptera novaeangliae*), and sperm whale (*Physeter macrocephalus*); seven threatened species: Oceanic whitetip shark (*Carcharhinus longimanus*), red knot (*Calidris canutus rufa*), piping plover (*Charadrius melodus*), Eastern black rail (*Laterallus jamaicensis*), Loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), and West Indian manatee (*Trichechus manatus*); and one candidate species: monarch butterfly (*Danaus plexippus*). One species proposed as endangered was identified by the USFWS IPaC: tricolored bat (*Perimyotis subflavus*) (Table 3-21) (USFWS 2024). None of the federally threatened, endangered, or proposed species identified through IPaC were observed in the Project Site or have suitable habitat present in the Project Site. The federal candidate species monarch butterfly has suitable habitat within the Project Site due to the observed milkweed host plant species recorded in the northeast herbaceous portion of the Project Site. No critical habitat was identified on the IPaC system results. As discussed in Section 2.2.2, the USFWS IPaC also identified twenty-two migratory birds of conservation concern that have the potential to occur on the site. Three of these migratory birds (bald eagle, black skimmer, and swallow-tailed kite) are state sensitive species and are discussed in Table 3-21.

The National Marine Fisheries Service (NMFS) has established Essential Fish Habitat (EFH) as important habitat for aquatic species that may occur in Galveston Bay, Mission Lake, or Victoria Barge Canal in the Project Vicinity. Species with EFH identified within the vicinity of the project site are listed and discussed in Section 3.3.2 (NOAA 2023). No EFH exists within the Project Site or in the freshwater stream systems on-site or in the vicinity.

A review of the TPWD Calhoun County list of rare species in July 2024 identified nine state endangered species, seventeen state threatened species, and forty-two state sensitive species within Calhoun County (Table 3-21) (TPWD 2024).

Based on a review of habitat requirements for each of the wildlife species listed in Table 3-21, potentially suitable habitat is present within the Project Site for three state threatened species: white-tailed hawk, Texas scarlet snake (*Cemophora lineri*), and black-spotted newt (*Notophthalmus meridionalis*). The white-tailed hawk was observed on-site and within the vicinity during spring 2023 surveys and in the vicinity during summer and fall 2023. Since the white-tailed hawk was observed perched on a transmission line tower and as a flyover to these areas and no raptor nests were observed, the white-tailed hawk likely uses the site and the vicinity to forage and not breed. The Texas scarlet snake was not observed on-site but has the potential to occur within the Project Site based on the presence of preferred scrub habitat in the southern portion of the site and the herbaceous scrub habitat in northeast portion of site. The black-spotted newt was not observed on-site but has the potential to occur within the Project

Site based on the presence of preferred scrub-shrub and emergent wetlands in southwest corner of site.

Based on a review of habitat requirements for each of the wildlife and plant species listed in Table 3-21, potentially suitable habitat is present within the Project Site for ten state sensitive species: alligator gar (*Atractosteus spatula*), Sprague's pipit (*Anthus spragueii*), eastern box turtle (*Terrapene carolina*), western box turtle (*Terrapene ornata*), American bumblebee (*Bombus pensylvanicus*), long-tailed weasel (*Mustela frenata*), eastern spotted skunk (*Spilogale putorius*), coastal gay-feather (*Liatris bracteata*), Indianola beakrush (*Rhynchospora indianolensis*), and threeflower broomweed (*Thurovia triflora*). Alligator gar was not recorded within the Project Site during seasonal field surveys but was collected south of the site in West Coloma Creek. Sprague's pipit was not recorded on-site or within the vicinity but has the potential to occur within the Project Site based upon the presence of preferred weedy fields and herbaceous cover in northeast, west and southwest portions of the site. The eastern and western box turtles were not recorded on-site or within the vicinity but have the potential to occur within the Project Site based upon the presence of preferred fields throughout much of the site. The American bumblebee was not recorded on-site or within the vicinity but has the potential to occur within the Project Site based upon the presence of preferred farmlands and open fields throughout much of the site. Long-tailed weasel was not recorded on-site or within the vicinity but has the potential to occur within the Project Site based upon the presence of preferred brushlands and fence rows in the southern and northeast portions of the site. Eastern spotted skunk was not recorded on-site or within the vicinity but has the potential to occur within the Project Site based upon the presence of preferred croplands and fencerows throughout much of the site and brushy scrub-shrub in southern portion of site. Less than ten stems of Indianola beakrush were identified in low, wet areas of two heavily- to moderately-grazed upland cattle and goat pastures in the southeastern portion of the Project Site. No other state sensitive vascular plant species were identified during spring, summer, or fall surveys; however, marginal potential habitat does exist on-site for the coastal gay-feather and threeflower broomweed. Both species are historically found in coastal prairies, and while degradation to this habitat type is recognized as a potential threat to their survival, both species have been observed to possess some resilience to habitat disturbance and have been observed in converted prairie lands along roadsides, railroads, and pastures. Therefore, potential habitat likely exists in the open pastures herbaceous lands of the Project Site, in particular, within the large rectangular field south of the railyard in the northeast portion of the site (Figure 2-1).

3.3.2 Additional Important Species and Habitats

As stated in Section 3.1, recreationally valuable game species, based on TPWD hunting regulations (TPWD 2023a), observed within the Project Site included Northern bobwhite, mourning dove, white-tailed deer, and warmouth. Species observed in the Project Vicinity that are recreationally valuable as game species include Northern pintail, green-winged teal, sandhill crane, Northern bobwhite, black-bellied whistling-duck, American coot, Wilson's snipe, common gallinule, gadwall, wild turkey, red-breasted merganser, Northern shoveler, blue-winged teal, mourning dove, white-tailed deer, largemouth bass, channel catfish, warmouth, bluegill, and red drum. Commercially important aquatic species encountered during aquatic ecology sampling included red drum and white shrimp. Opossum, nutria, raccoon, and striped skunk are recreationally valuable as furbearers as listed by TPWD hunting regulations. Alligators, snapping turtles, feral hogs, and coyotes are non-game species also hunted in Texas (TPWD 2023a). No commercially valuable species, species essential to the maintenance and survival of rare or commercially or recreationally valuable species, species critical to the structure and function of local terrestrial ecosystems, or species that could serve as biological indicators of effects on local terrestrial ecosystems were observed in the Project Site.

The NMFS has established EFH, identified herein as important habitat for aquatic species that may occur in Guadalupe Bay or Mission Lake, including within the Victoria Barge Canal. Species for which EFH exists within the vicinity of the project site are listed in Table 3-22 (NOAA 2023). No EFH exists in freshwater stream systems in on-site or the vicinity of the Project Site. Other important aquatic habitats in the vicinity of the Project Site include marine oyster water. Oyster waters are located in estuarine areas within Guadalupe Bay and Mission Lake. These oyster waters are listed as impaired on the Texas Commission on Environmental Quality (TCEQ) 303(d) listed for presence of fecal coliform (TCEQ 2022).

Table 3-22:
Species for which Essential Fish Habitat Exists in Guadalupe Bay within the Vicinity of the Long Mott Project Site

Species/Management Unit	Scientific Name	Life Stage Potentially Found in Guadalupe Bay
Atlantic sharpnose shark (Gulf of Mexico Stock)	<i>Rhizoprionodon terraenovae</i>	Juvenile/Adult, Neonate
Blacktip shark (Gulf of Mexico stock)	<i>Carcharhinus limbatus</i>	Neonate
Bonnethead shark (Gulf of Mexico stock)	<i>Sphyrna tiburo</i>	Adult, Juvenile, Neonate
Bull shark	<i>Carcharhinus leucas</i>	Juvenile/Adult, Neonate
Coastal Migratory Pelagic Fishes	N/A	All



Species/Management Unit	Scientific Name	Life Stage Potentially Found in Guadalupe Bay
Lemon Shark	<i>Negaprion brevirostris</i>	Juvenile, Neonate
Red Drum	<i>Sciaenops ocellatus</i>	All
Reef fish (43 species)	N/A	All
Scalloped hammerhead shark	<i>Sphyrna lewini</i>	Neonate
Commercially Harvested Shrimp	Brown shrimp (<i>Penaeus aztecus</i>); White shrimp (<i>Penaeus setiferus</i>); Pink shrimp (<i>Penaeus duorarum</i>); Royal red shrimp (<i>Pleoticus robustus</i>)	All
Spinner Shark	<i>Carcharhinus brevipinna</i>	Neonate

Source: NOAA 2023

TPWD Rare Plant Communities of Texas (RPCT) report (TPWD 2011) identified five priority plant communities within Calhoun County: Black Mangrove Shrubland, Colima-Panadero-Chapote Matorral, Seacoast Bluestem-Gulfdune Crowngrass Herbaceous Vegetation, Texas Coastal Bend Interdune Swale Grassland, and Texas Coastal Bend Live Oak-Redbay Forest, none of which are located in the Project Site. During off-site reconnaissance of natural vegetation communities, a representative example of the Texas Coastal Bend Interdune Swale Grassland was identified approximately 13 miles to the southeast of the Project Site along Lane Road south of Seadrift, just east of the Welder Flats Wildlife Management Area. This community was found in sandy soils in the low swales between dunes and the dominant species observed were sharp clubbrush (*Schoenoplectus pungens*) and switchgrass (*Panicum virgatum*). Additional associates identified include Carolina fimbry (*Fimbristylis caroliniana*), saltmarsh umbrella sedge (*Fuirena breviseta*), Florida bluehearts (*Buchnera floridanum*), rosy palafox (*Palafoxia rosea*), torpedo grass (*Panicum repens*), Gulf coast swallowwort (*Patalias palustre*), starrush whitetop (*Rhynchospora colorata*), and southern beaksedge (*Rhynchospora microcarpa*). While the 2011 TPWD RPCT lists this community as State Imperiled (S2), according to NatureServe (2022a), from which this community concept is derived, this community is apparently no longer state-ranked but is still considered Globally Imperiled (G2).

Other than wetlands described in Section 3.1.1, there are no other important habitats as defined by NUREG-1555 (wildlife sanctuaries, refuges, or preserves, habitats identified by State or Federal agencies as unique, rare, or of priority for protection, land areas identified as “critical habitat” for species listed as threatened or endangered by the USFWS) within the Project Site.

A portion of the Guadalupe Delta Wildlife Management Area is within the Project Vicinity and located approximately 2.7mi west of the Project Site. It was identified by the USFWS and TPWD as a wetlands area that needs to be preserved to protect the wildlife habitat. It is a complex of natural and manmade wetlands and associated adjacent uplands in the vicinity of the delta of

the Guadalupe River. The area consists of four units, Mission Lake Unit (1,138 acres), Hynes Bay Unit (1,008 acres), Guadalupe River Unit (1,138 acres), and the San Antonio Unit (818 acres) (TPWD 2023b). The Mission Lake Unit is located within the Project Vicinity. The units of the Guadalupe Delta are freshwater marshes subject to flooding from the Guadalupe River and its adjacent bayous. Riparian areas along the numerous small bayous provide forage areas for neotropical songbirds. The Guadalupe Delta Wildlife Management Area has traditionally provided habitat for wetland-dependent wildlife, especially migratory waterfowl. Permitted waterfowl hunting is offered. The Guadalupe Delta Wildlife Management Area is depicted in Figure 3-3 and is considered important habitat in the Project Vicinity.

4 Summary

Pedestrian and general reconnaissance surveys were conducted within the Project Site to collect seasonal ecological field data descriptive of threatened and endangered species and the potential occurrence of their preferred habitats, resident plant communities, and wildlife populations (including important species and habitats).

To account for seasonal variability of wildlife use within the site, surveys were conducted in the winter (February 2023), spring (May 2023), summer (August 2023), and fall (November 2023). Aquatic resource surveys were conducted during summer (August 2023), fall (November 2023), winter (January 2024) and spring (May 2024). Seasonal surveys for vegetation were conducted in the spring, summer, and fall 2023. Vegetation habitat types within the Project Site primarily include cultivated crops, herbaceous, developed-medium intensity, and shrub-scrub. Avian observations during the winter 2023, spring 2023, summer 2023, and fall 2023 surveys included 17, 36, 33, and 20 avian species, respectively. Eight mammal species and eight herpetofaunal species were observed within the Project Site during seasonal surveys. A total of 15 fish species were observed within West Coloma Creek during the summer 2023 survey, 12 fish species during the fall 2023 survey, 11 fish species during the winter 2024 survey, and 10 fish species during the spring 2024 survey. Recreationally valuable game species observed within the Project Site included Northern bobwhite, mourning dove, white-tailed deer, and warmouth. Opossum, raccoon, and striped skunk are recreationally valuable as furbearers with alligators, snapping turtles, bullfrogs, feral hogs, and coyotes are nongame species also hunted and/or trapped in Texas. No commercially valuable species, species essential to the maintenance and survival of rare or commercially or recreationally valuable species, species critical to the structure and function of local terrestrial ecosystems, or species that could serve as biological indicators of effects on local terrestrial ecosystems were observed in the Project Site. The recreationally valuable species observed on-site would be considered common to the region and typical of the habitat types within the Project Site, vicinity, and region.

Field avian surveys include a characterization of relative abundance based upon occurrence during the field surveys and included those that were commonly encountered and those that were rarely or uncommonly encountered. However, the identified species are generally considered to be occasional or common within the region. The white-tailed hawk, state listed as threatened by TPWD, was observed within the Project Site and within the Project Vicinity. Since the white-tailed hawk was only observed perched on a transmission line tower and as a flyover to these areas and no raptor nests were observed, the white-tailed hawk likely uses the site and vicinity to forage. The wood stork, state listed as threatened by TPWD, was observed in the Project Vicinity during summer 2023. The wood stork was not observed within the Project Site. Bald eagle, identified by USFWS as a migratory bird of conservation concern and protected under the Bald and Golden Eagle Protection Act, was observed within the Project Vicinity but no raptor nests were observed. The federal candidate species monarch butterfly has suitable habitat within the Project Site due to the observed milkweed host plant species recorded in the northeast herbaceous portion of the Project Site. No other candidate, threatened, or endangered species (wildlife or plants) were observed as part of the seasonal field studies.

Potentially suitable habitat is present within the Project Site for two other state threatened species (Texas scarlet snake and black-spotted newt). The Texas scarlet snake and black-spotted newt were not observed during the 2023 field surveys, and none are known to occur in the Project Site.

Potentially suitable habitat is present within the Project Site for ten state sensitive species: alligator gar, Sprague's pipit, eastern box turtle, western box turtle, American bumblebee, long-tailed weasel, eastern spotted skunk, coastal gay-feather, Indianola beakrush, and threeflower broomweed. Alligator gar was not recorded within the Project Site during seasonal field surveys but was collected south and downstream of the Project Site in West Coloma Creek. Less than ten stems of Indianola beakrush were identified in low, wet areas of two heavily- to moderately-grazed upland cattle and goat pastures in the southeastern portion of the Project Site. No other state sensitive wildlife or vascular plant species were identified during seasonal surveys. Other than the WOTUS-delineated wetlands and features described in Section 3.1.1, field investigations have concluded that the Project Site is disturbed and does not include unique or sensitive habitat.

5 References

- Dewitz, J., and U.S. Geological Survey, 2021, National Land Cover Database (NLCD) 2019 Products (ver. 2.0, June 2021): U.S. Geological Survey data release. Available online at <https://doi.org/10.5066/P9KZCM54>. Accessed November 2023.
- Exelon Generation, 2012. Victoria County Station, Early Site Permit Application Part 03, Environmental Report. May 2012.
- Griffith, G., Bryce, S., Omernik, J., and Rogers, A. 2007. Ecoregions of Texas (text, map, summary tables, and photographs): Corvallis, Oregon, U.S. Geological Survey. Available online at http://www.ecologicalregions.info/data/tx/TXeco_Jan08_v8_Cmprsd.pdf. Accessed June 2023.
- NatureServe. 2022a. *Spartina patens* - *Fimbristylis (caroliniana, castanea)* - (*Panicum virgatum*) Marsh. Available online at [https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.688274/Spartina_patens_-_Fimbristylis_\(caroliniana_castanea\)_-\(Panicum_virgatum\)_Marsh](https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.688274/Spartina_patens_-_Fimbristylis_(caroliniana_castanea)_-(Panicum_virgatum)_Marsh). Accessed November 2023.
- NatureServe. 2022b. Texas-Louisiana Coastal Prairie. Available online at https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.723052/Texas-Louisiana_Coastal_Prairie. Accessed November 2023.
- NOAA. 2023. NOAA Fisheries Essential Fish Habitat Mapper, National Marine Fisheries Service. Website: https://www.habitat.noaa.gov/apps/efhmapper/?page=page_1, Date accessed: October 10, 2023.
- Soil Survey Staff, Natural Resources Conservation Service (NRCS). 2023 United States Department of Agriculture. Web Soil Survey. Available online: <https://websoilsurvey.nrcs.usda.gov/app/> Accessed November 2023.
- Texas Commission on Environmental Quality (TCEQ). 2022. 2022 Texas Integrated Report – Texas 303(d) List (Category 5). July 7, 2022.
- Texas Parks and Wildlife Department (TPWD). 2011. Species of Greatest Conservation Need. Available online at <https://tpwd.texas.gov/landwater/land/tcap/sgcn.phtml>. Accessed November 2023.
- Texas Parks and Wildlife Department (TPWD). 2023a. 2023-2024 Texas Parks and Wildlife Hunting Regulations. Available online at [pwd_bk_l2000_1170a.pdf \(texas.gov\)](http://tpwd.texas.gov/pwd_bk_l2000_1170a.pdf). Accessed November 2023.
- TPWD, 2023b. Texas Parks and Wildlife Department. Guadalupe Delta WMP. Website: https://tpwd.texas.gov/huntwild/hunt/wma/find_a_wma/list/?id=37, Date accessed November 2023.
- TPWD. 2024. Texas Parks & Wildlife Department Annotated County Lists of Rare Species, Calhoun County. Accessed July 2024.



United States Fish and Wildlife Service (USFWS). 2024. Information for Planning and Conservation for site in Calhoun County, Texas. Accessed July 2024.

WSP, 2023a. Project Long Mott Environmental Report, Standard Operating Procedures for Field Data Collection Revision 2.

WSP, 2023b. Project Long Mott Environmental Report, Quality Assurance Project Document Revision 2. (WSP 2023b).

WSP, 2023c. Long Mott Facility Waters of the U.S. Delineation Report. WSP USA Environment & Infrastructure Inc., Ballwin, Missouri, December 2023.

Appendix A

Figures

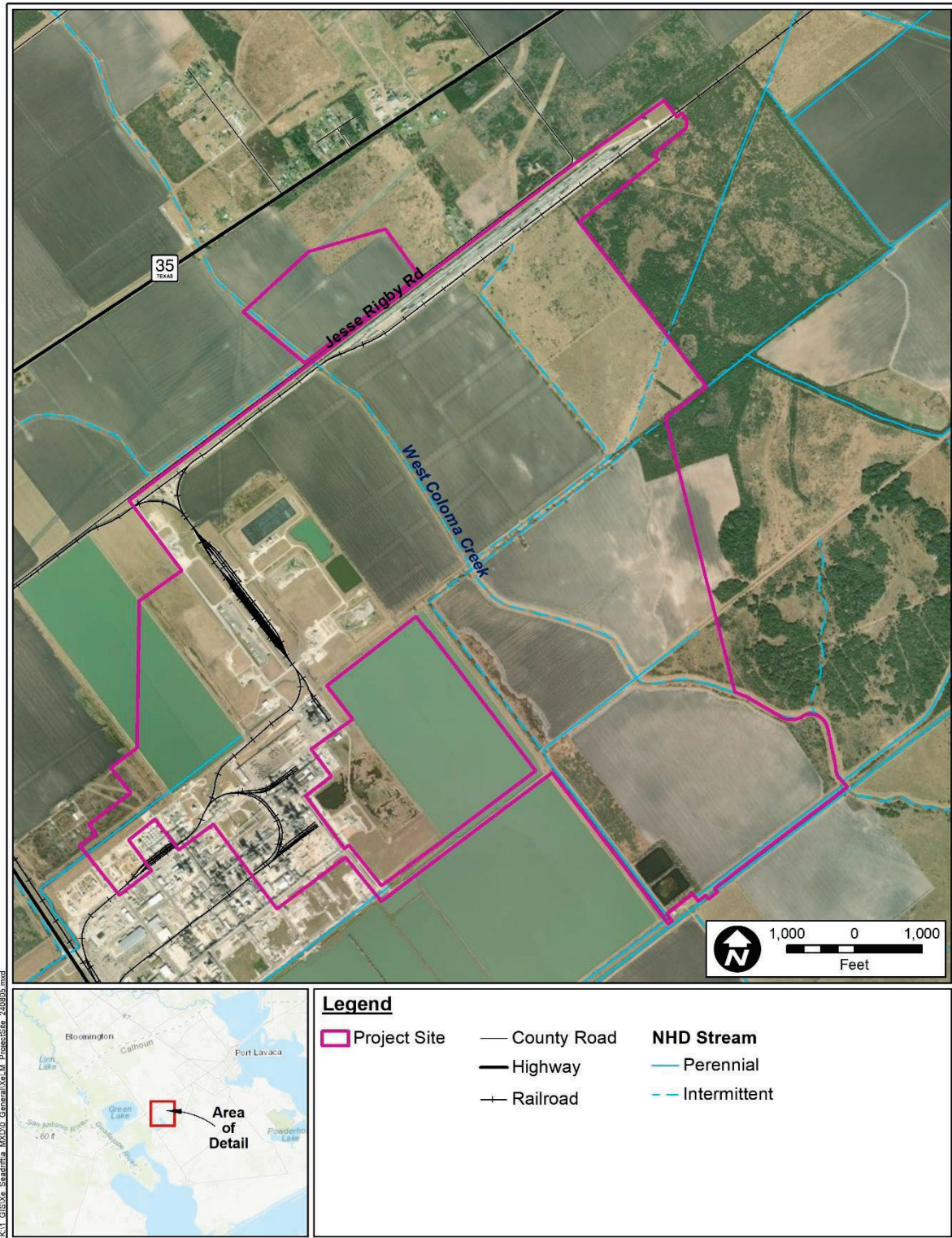


Figure 1-1 Project Site

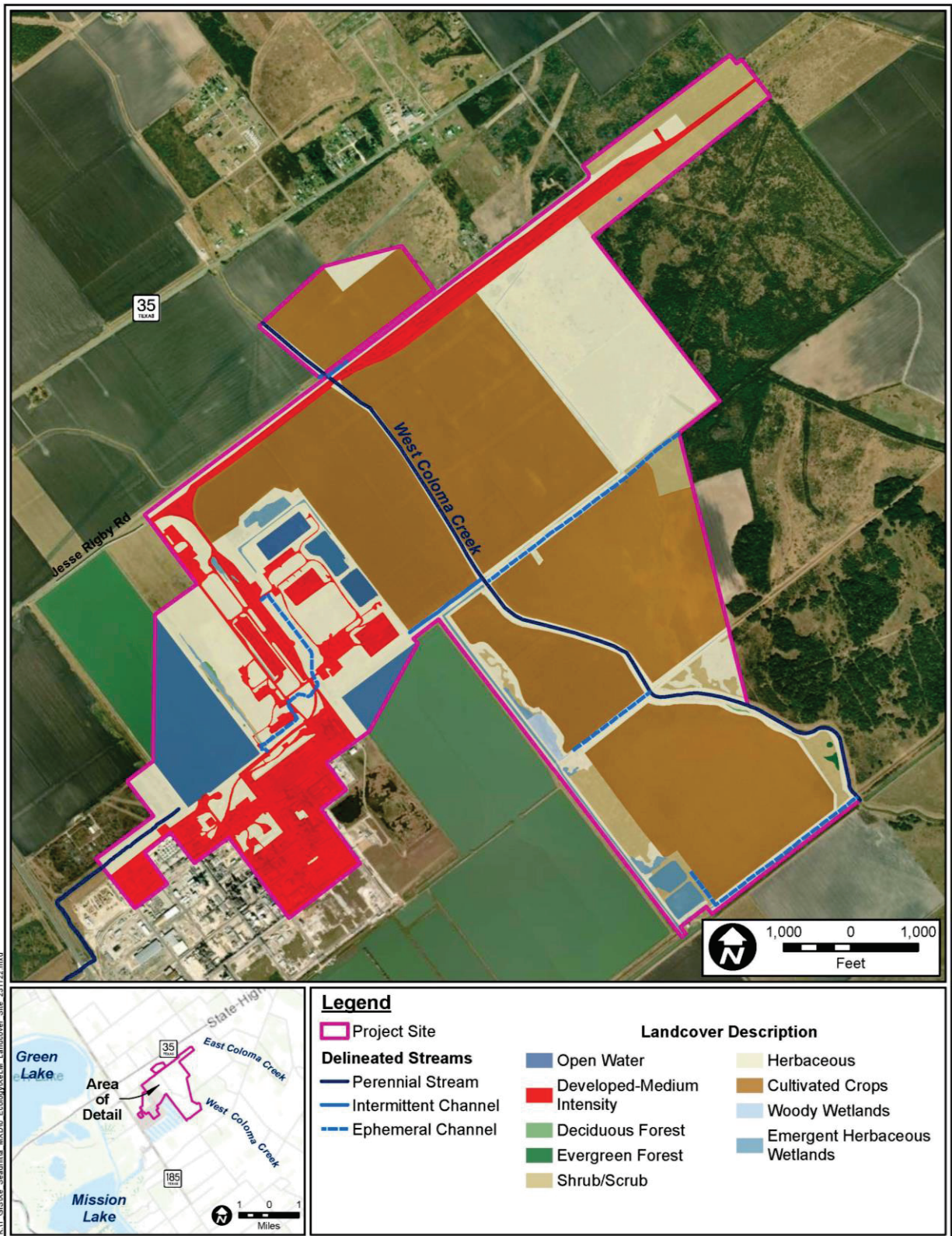


Figure 2-1 Land Cover within the Project Site

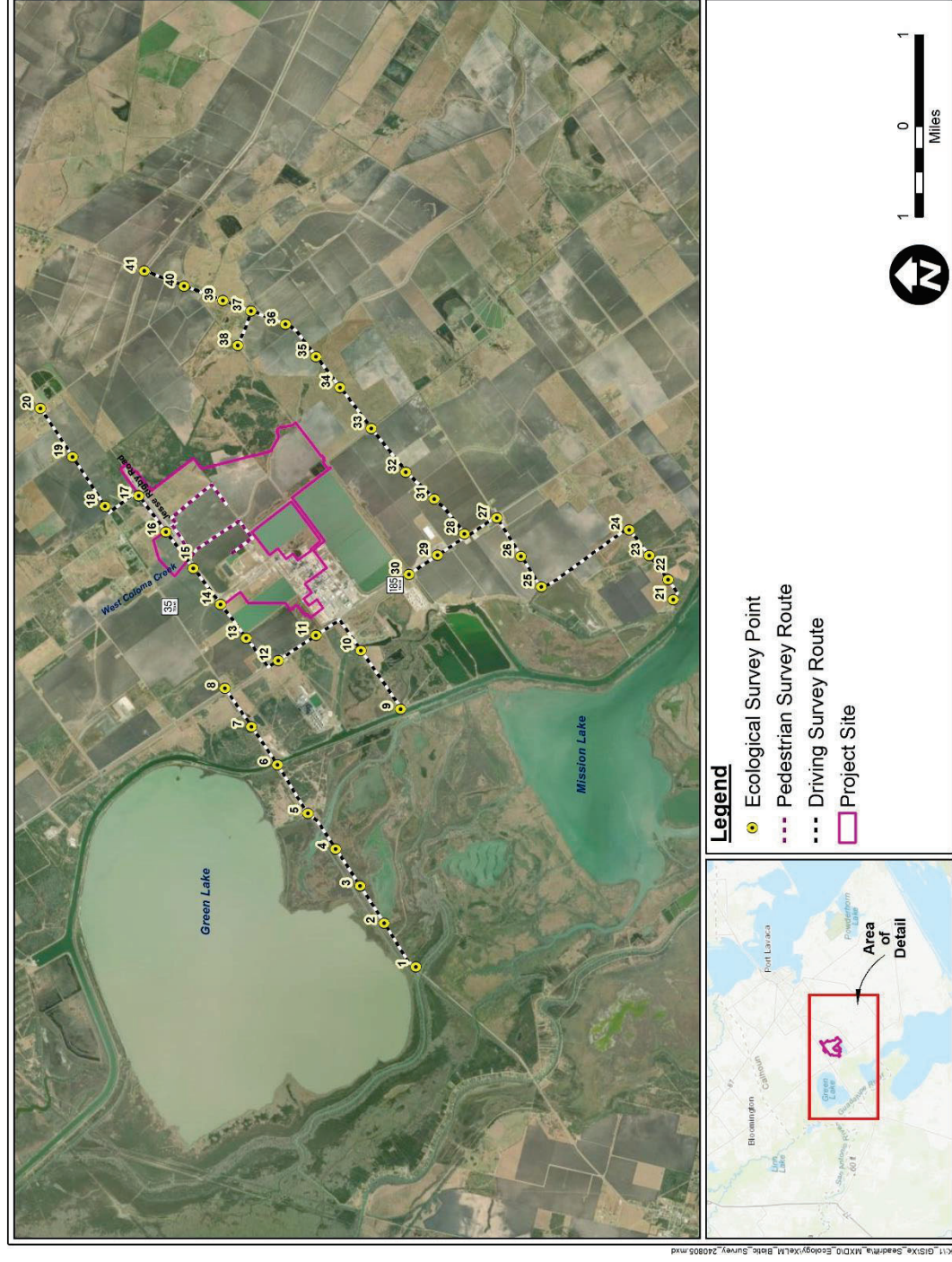


Figure 2-2 Ecological Resources Survey Routes

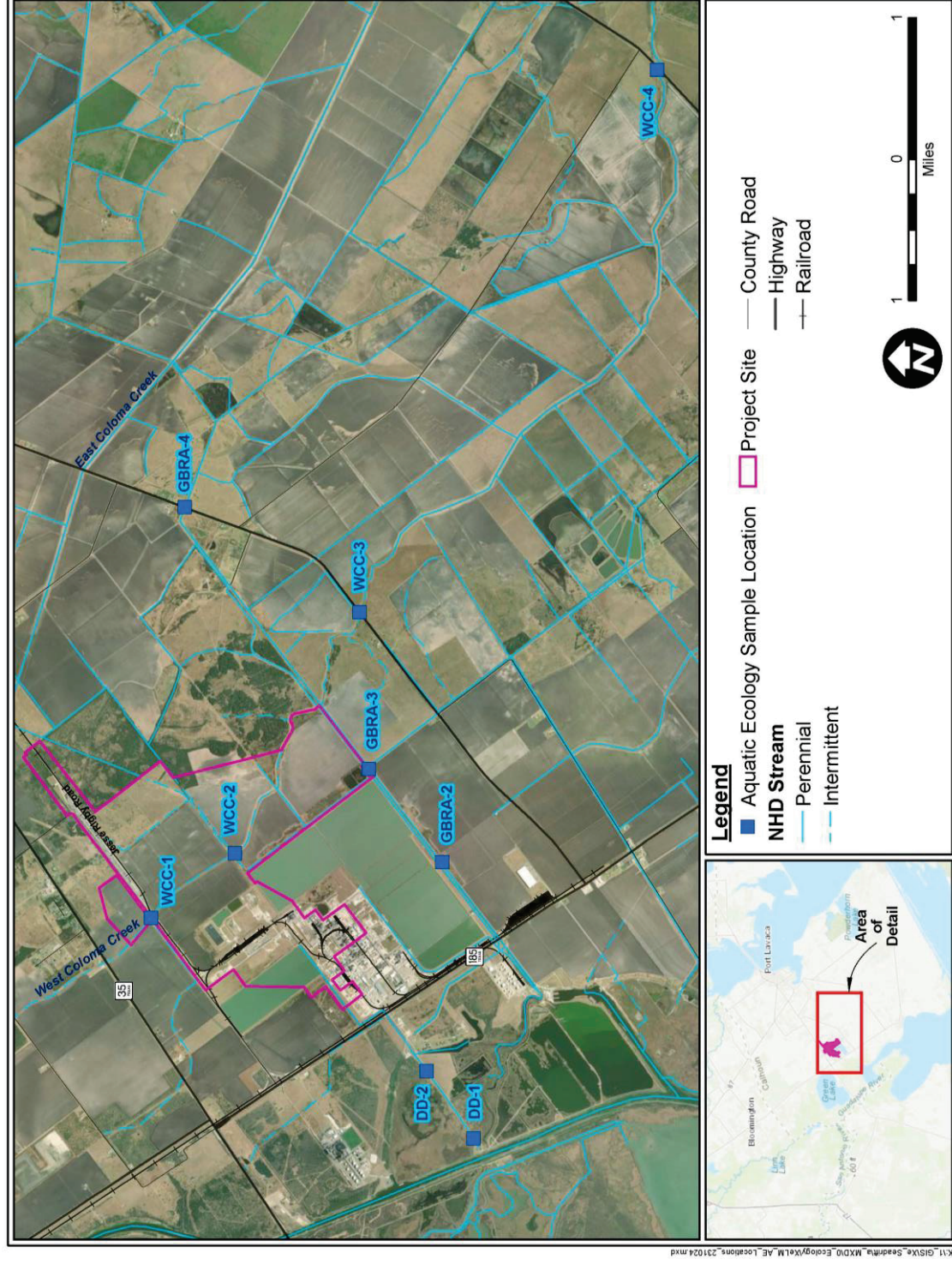


Figure 2-3 Aquatic Ecology Resource Survey Locations

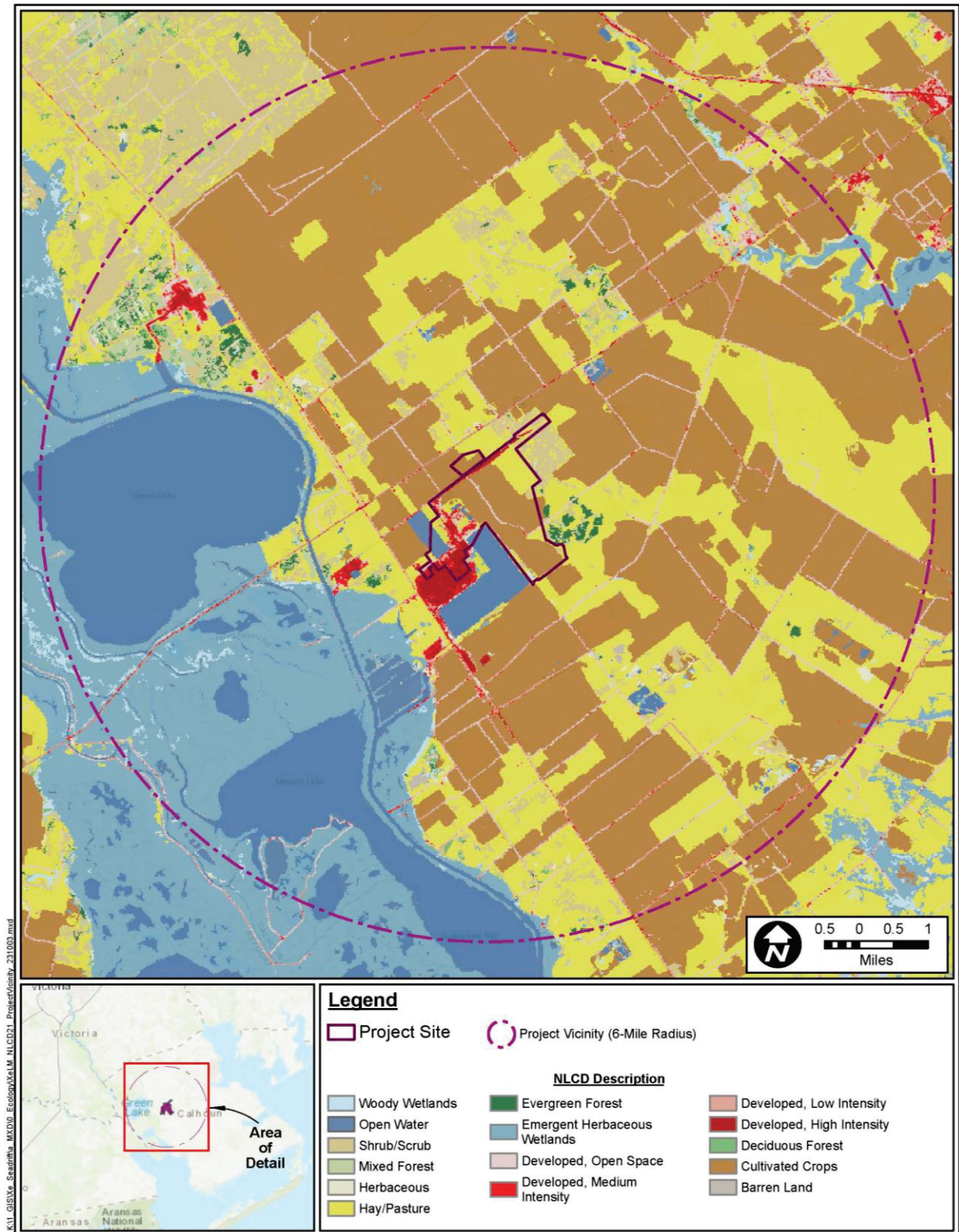


Figure 3-1 Land Cover within the Project Vicinity

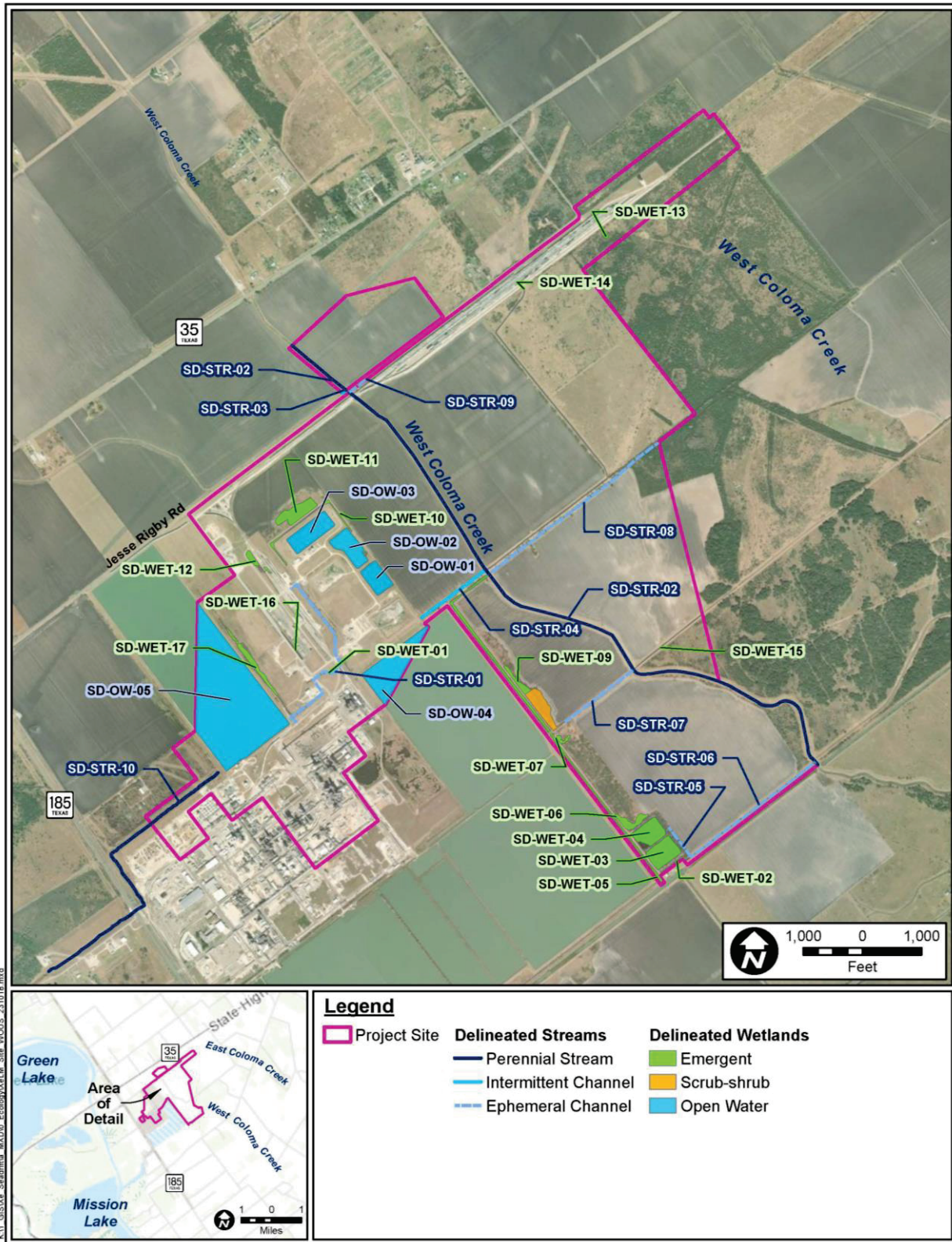


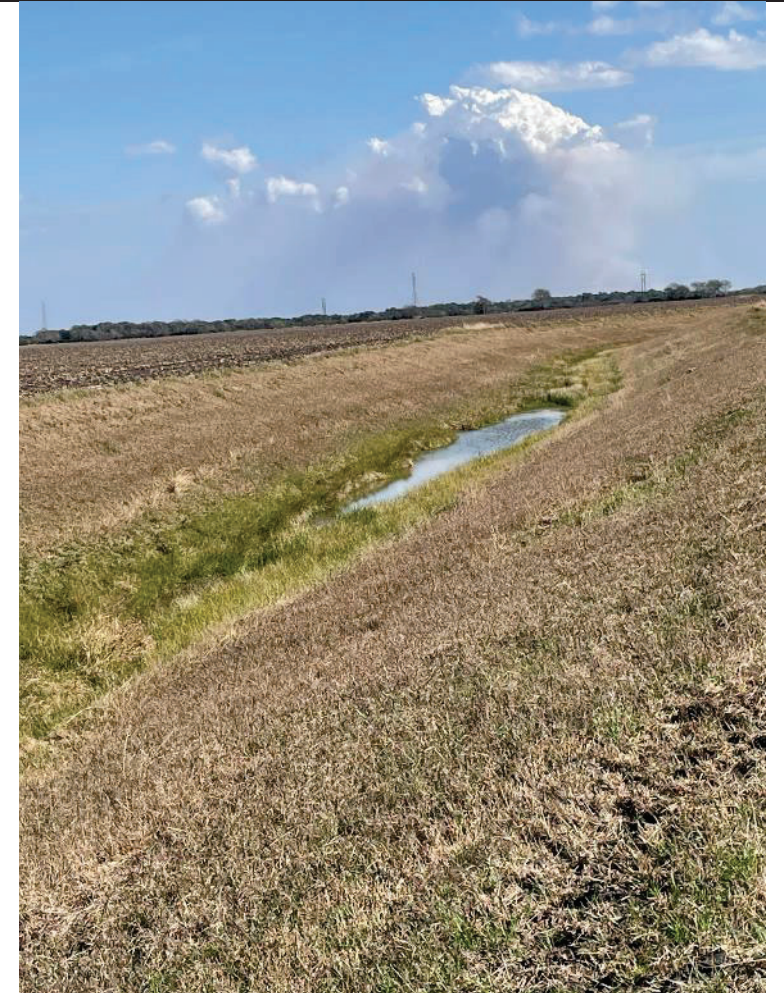


Figure 3-3 Wildlife Management Area within the Project Vicinity



Appendix B

Photographic Log

	2/14/2023 Photo 1. Cropped corn field in north portion of the Project Area.
	2/14/2023 Photo 2. West Coloma Creek in north portion of the Project Area.

	2/14/2023 Photo 3. West Coloma Creek in central portion of the Project Area.
	2/14/2023 Photo 4. Cultivated crops in central portion of the Project Area.

	2/15/2023 Photo 5. Alligators and snowy egret in Project Vicinity south of Green Lake.
	5/22/2023 Photo 6. West Coloma Creek and cultivated crops in north portion of the Project Area.

	5/23/2023 Photo 7. Yellow-crowned night-heron in Project Vicinity south of Green Lake.
	5/24/2023 Photo 8. GBRA Canal near pump station south of Project Area.



8/15/2023

Photo 9.

West Coloma Creek just upstream of Project Area.



8/15/2023

Photo 10.

Crested caracara in Project Vicinity west of Project Area.



8/16/2023

Photo 11.

Loggerhead shrike in Project Vicinity east of Project Area.



8/17/2023

Photo 12.

GBRA Canal near pump station south of Project Area.

	11/9/2023 Photo 13. Cultivated crops in central portion of the Project Area.
	11/9/2023 Photo 14. Black vultures in central portion of the Project Area.

	5/23/2023 Photo 15. Fallow edge of actively cropped corn field in the east-central portion of the Project Area.
	8/17/2023 Photo 16. Cattle and goat grazed gap in evergreen forest (Texas live oak motte) in southeastern portion of Project Area.

	11/7/2023 Photo 17. Deciduous forest (sugarberry tree hedgerow) between crop field and west levee of West Coloma Creek in southeastern Project Area.
	11/7/2023 Photo 18. Edge of dry shrub/scrub and herbaceous mosaic pasture as seen from the east levee of West Coloma Creek.

	11/7/2023 Photo 19. Edge of overgrown moist shrub/scrub upland thicket in north central portion of Project Area.
	11/7/2023 Photo 20. Groundseltree shrub/scrub association exemplifying both wetland shrub/scrub and upland shrub/scrub conditions in the southwestern portion of the Project Area.

	5/24/2023 Photo 21. Herbaceous pasture of grassland and shrub/scrub mosaic in southeastern Project Area.
	5/24/2023 Photo 22. Degraded herbaceous grassland pasture still retaining a few species indicative of former coastal prairie conditions. Large rectangular pasture in northeastern corner of Project Area south of railyard.

	11/8/2023 Photo 23. Herbaceous maintained turf within Dow facility, adjacent to operating basin.
	5/22/2023 Photo 24. Herbaceous overgrown abandoned pasture in northeastern portion of Project Area, north of railyard.

	5/23/2023 Photo 25. Emergent wetland SD-WET-06 north of depressional basin wetlands SD-WET-03 and SD-WET-04.
	5/23/2023 Photo 26. Man-made depressional basin (emergent wetland SD-WET-04) in southeastern portion of Project Area.

	11/8/2023 Photo 27. Ruderal depression (emergent wetland SD-WET-11) north of Dow facility operating basin in northwest corner of Project Area.
	5/23/2023 Photo 28. Regularly inundated, disconnected irrigation canal (emergent wetland SD-WET-05) located along southwest edge of Project Area.

	11/7/2023 Photo 29. Seasonally wet irrigation ditch (emergent wetland SD-WET-14) in large rectangular pasture south of railyard in northeast part of Project Area.
	Photo 30. State vulnerable (S3) sensitive species Indianola beakrush (<i>Rhynchospora Indianolensis</i>) observed in two locations in the southeast part of the Project Area.

	8/15/2023 Photo 31. Dow Drainage Canal. Aquatic ecology survey locations DD-01 and DD-02.
	11/7/2023 Photo 32. Aquatic ecology survey location WCC-01 on West Coloma Creek.



11/7/2023

Photo 33.

Aquatic ecology survey
location WCC—03 on West
Coloma Creek.



11/7/2023

Photo 34.

Aquatic ecology survey
location WCC-04 on West
Coloma Creek.

	8/16/2023 Photo 35. Aquatic ecology survey location GBRA-04 on GBRA Canal.
	11/7/2023 Photo 36. Rio Grande cichlid (<i>Herichthys cyanoguttatus</i>) collected in the GBRA Canal at GBRA-04.

	8/21/2023 Photo 37. Striped mullet (<i>Mugil cephalus</i>) individuals collected in the Dow Drainage Canal at DD-01.
	8/16/2023 Photo 38. Spotted gar (<i>Lepisosteus oculatus</i>) collected in West Coloma Creek at WCC-04.

	8/16/2023 Photo 39. Smallmouth buffalo (<i>Ictiobus bubalus</i>) collected in the GBRA Canal at GBRA-04.
	11/8/2023 Photo 40. Longear sunfish (<i>Lepomis megalotis</i>) collected in the GBRA Canal at GBRA-03.



11/8/2023

Photo 41.

Largemouth bass (*Micropterus salmoides*) collected in the GBRA Canal at GBRA-03.



11/8/2023

Photo 42.

Channel catfish (*Ictalurus punctatus*) collected in the GBRA Canal at GBRA-03.



8/15/2023

Photo 43.

Aquatic Ecology field crew
seining in the Dow Drainage
Canal.