December 9, 2024

San Patricio County Economic Development Corporation
801 E. Broadway Blvd., Augusta Suite
Portland, Texas 78374

Attention: Mr. Adam Gawarecki

SUBJECT: **GEOTECHNICAL DESKTOP STUDY**
Esperanza Site – 1100 Acres
FM 136
Gregory, Texas
UES Project No. – G124467

Dear Mr. Gawarecki,

In accordance with our agreement, UES Professional Solutions 45, LLC., (hereinafter "UES") has conducted a geotechnical desktop study for the above referenced site. The results of this study are presented in this report, an electronic copy of which is being transmitted herewith.

Authorization

The work for this project was performed in accordance with UES proposal number CGP111521A dated December 3, 2024. The scope of work and fee was approved by Mr. Adam Gawarecki, President and CEO representing San Patricio County Economic Development Corporation (SPCEDC) by the signing of our proposal on December 3, 2024. The signed proposal was sent to UES via email transmission.

Purpose and Scope

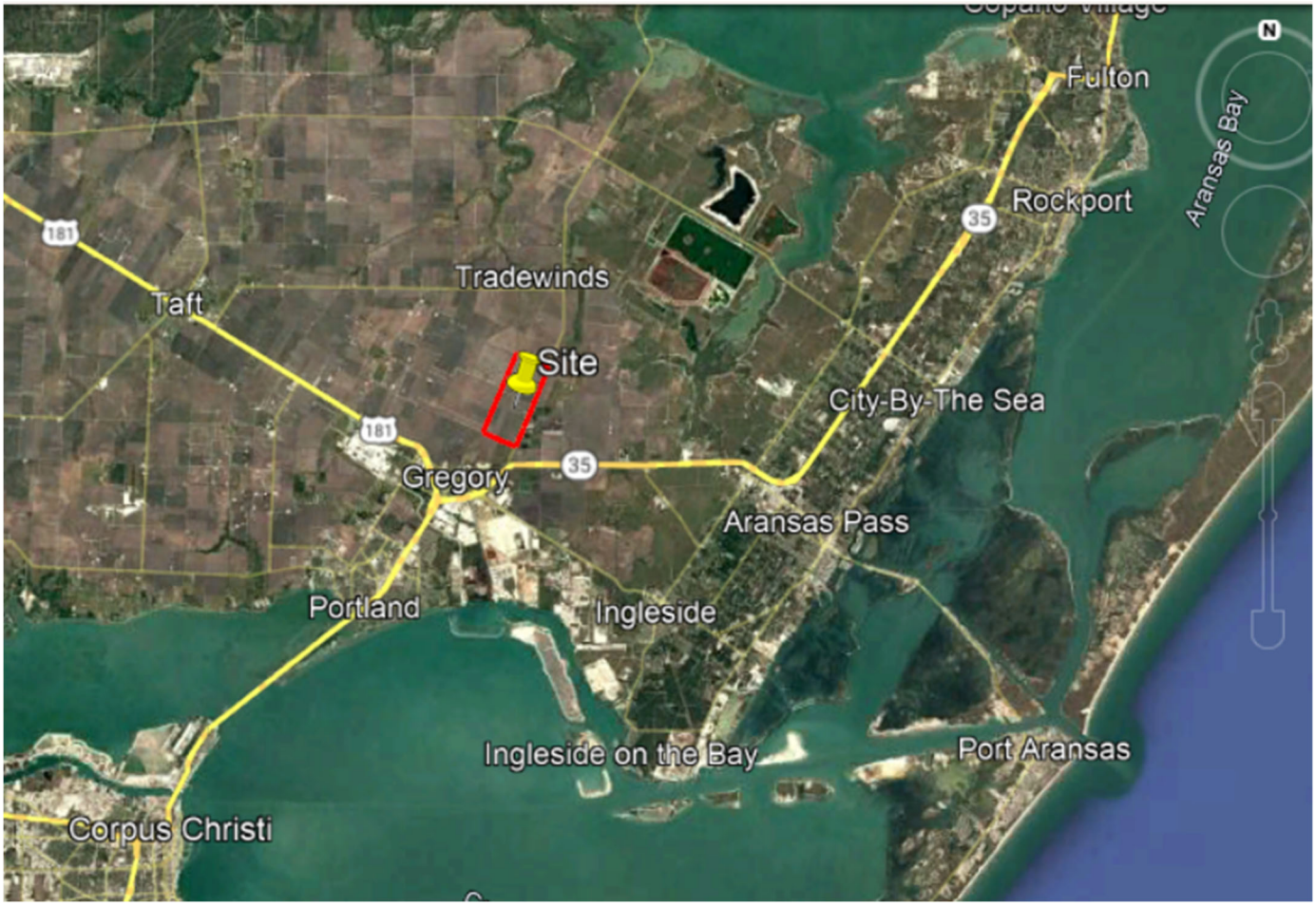
The purpose of this geotechnical desktop study was to obtain preliminary information regarding the subsurface soil and groundwater conditions in the general site area based upon UES's reference materials, historical data and previous geotechnical studies performed in or near the vicinity of the site in order to provide an estimate of the subsurface conditions that are likely to be present at the site.

As requested by our client, the scope of services did not include actual soil borings at the specific site location; therefore, the information provided in this report should only be considered an estimate based on available and reviewed information. This report has been prepared for the exclusive use of SPCEDC for the specific application of estimating soil conditions at the 1100-acre Esperanza Site located off FM 136 in Gregory, Texas.

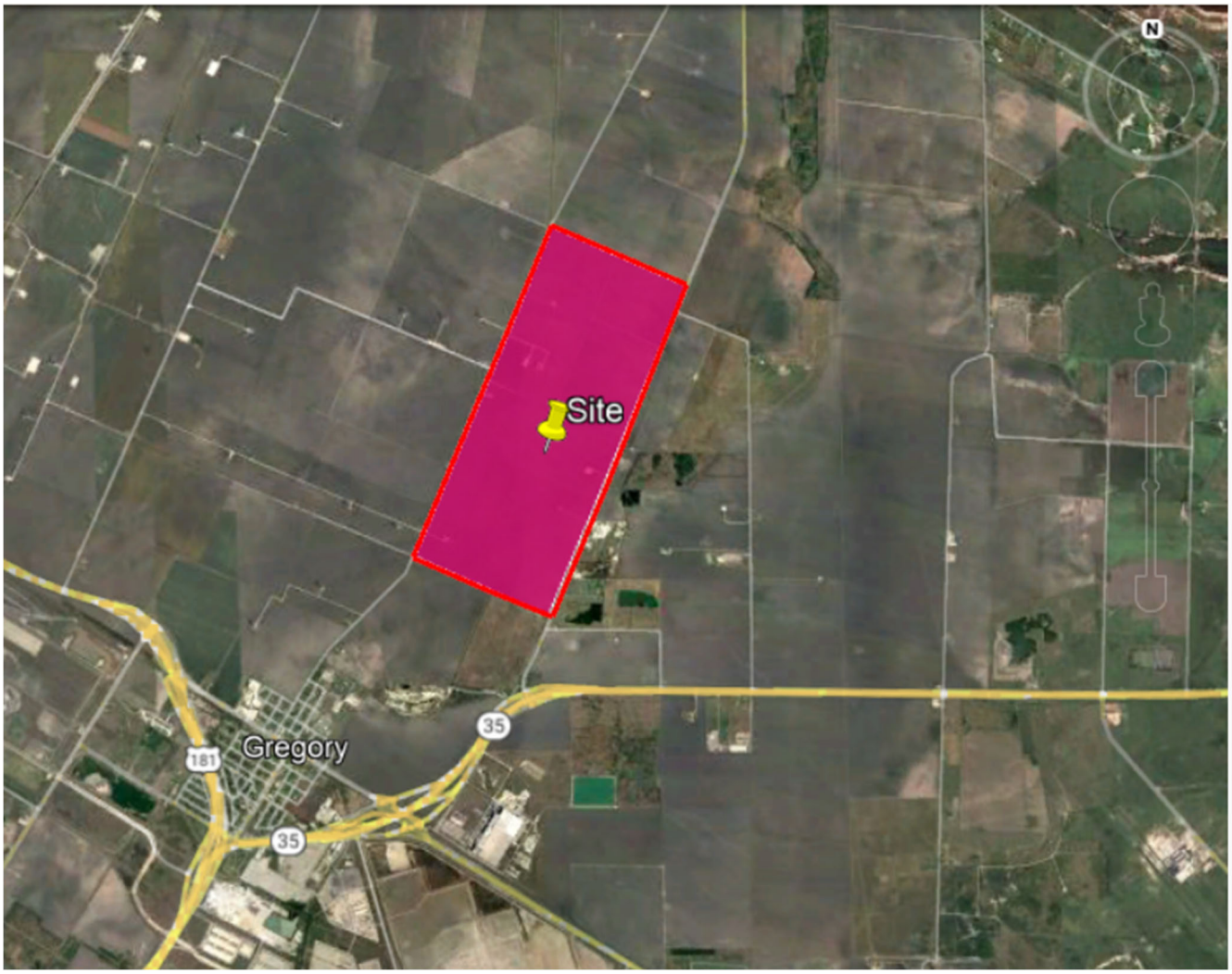
Site Location and Description

The 1100-acre site is located off FM 136 in Gregory, Texas. Specifically, the site is situated along the south side of Highway 181, approximately 0.5 miles west of its intersection with Davis Road. The site is relatively flat and level and is currently undeveloped. Overhead utilities exist along the western side of the site, as well as the south portion of the site. A Site Vicinity Plan and a Site Location Plan are provided below.

SITE VICINITY PLAN



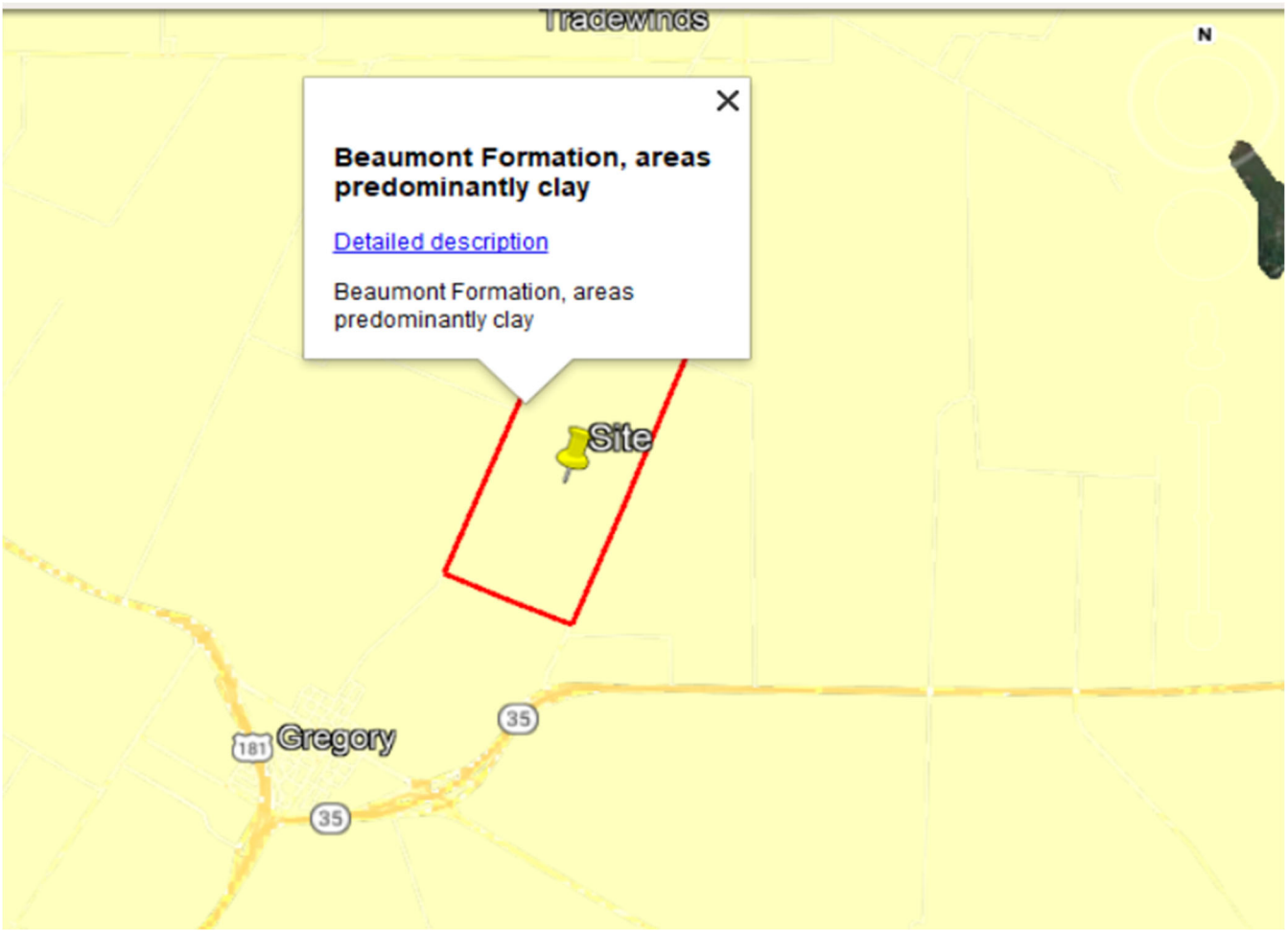
SITE LOCATION PLAN



Regional Geology

The Geologic Atlas of Texas, prepared by The University of Texas at Austin Bureau of Economic Geology, provides geologic mapping for the state of Texas. The 1100-acre site is mapped as being located within the Beaumont Clay Formation (Qb). The Site Geology Map is provided below.

SITE GEOLOGY MAP



The Beaumont Formation (Qb) is a sedimentary non-marine Pleistocene period deposit. The Beaumont Formation generally is a heterogeneous geologic formation containing relatively thick interbedded layers of clays, sands, silts and interbedded clay/sand soil strata. These soils were deposited as fluvio-deltaic sediments by the ancestral equivalents of the Nueces River, augmented by strong run-off during interglacial periods.

The clay portion of the Beaumont formation primarily consists of montmorillonite, illite, kaolinite and finely ground quartz. The clays have been pre-consolidated by the process of desiccation (over-consolidated clays). In addition, there have been numerous wetting and drying cycles over time, which have generated a network of randomly oriented joints. The joints are normally closely spaced and are sometimes slickensided; the latter denotes existing fracture and failure planes within the soil stratigraphy.

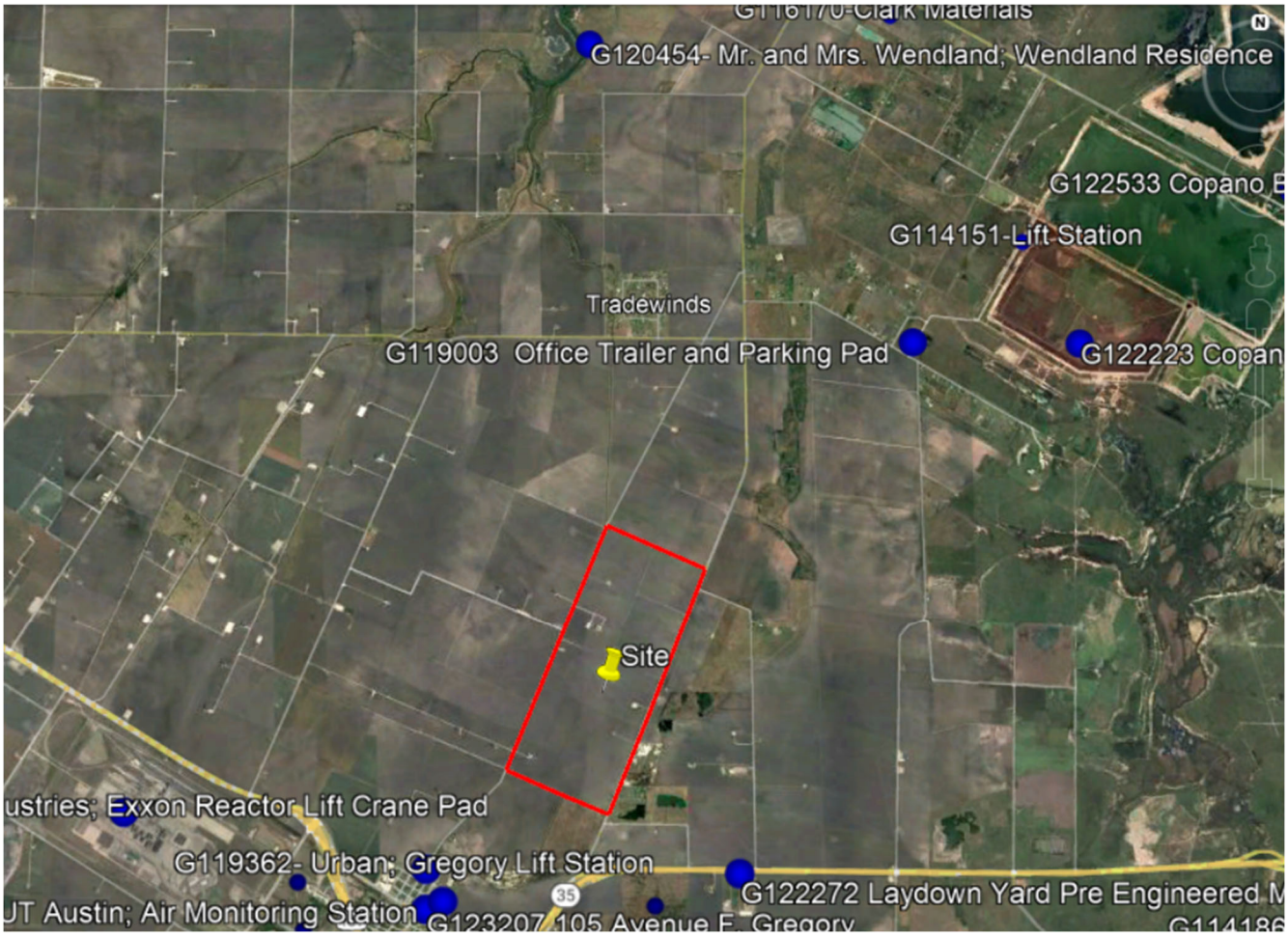
Clays within the Beaumont Formation typically exhibit low permeability, high water-holding capacity, high compressibility, high to very high shrink-swell potential, high plasticity and low shear strength.

The sands and silts of the Beaumont formation vary in density and compactness from very loose to medium dense and very dense. These soils are composed of quartz, feldspars and relatively large particles of kaolinite, calcite and occasional hornblende.

Review of Nearby Soil Borings

UES maintains records of previous geotechnical studies performed in and around the South Texas area. Historical soil borings and geotechnical reports in or near the general vicinity of the 1100-acre site were reviewed for this geotechnical desktop study. Multiple geotechnical projects were reviewed to provide the preliminary information and are shown below as blue dots on the Nearby Project Location Map.

NEARBY PROJECT LOCATION MAP



Estimated Soil and Groundwater Conditions

Based upon review of the geologic formation and the UES soil borings performed in or near the vicinity of the 1,100-acre site, the soil profile at the site is consist of expansive fat and/or lean clay soils with some interbedded layers of sand soils below depths of approximately 20 to 30 feet. The near surface clay soils are considered moderate to high in expansive potential and are firm to stiff in consistency while the clay soils below a depth of 20 to 30 feet become very stiff to hard in consistency. The interbedded sand layers are typically 5 feet in thickness on average and are considered medium dense in consistency.

Groundwater within soil borings near the site was present at depths between approximately 10 and 22 feet below the existing grade elevations, with a typical and average groundwater depth of approximately 15 to 20 feet.

Estimated Design and Construction Considerations

Based upon review of the UES's calculated soil properties and the associated soil-related design and construction recommendations provided for the reviewed projects in and near the vicinity of the 1,100-acre site, the following table has been prepared to represent the generally expected requirements and considerations for design and construction at the site.

Typical Design Considerations	Range of Researched Values for Nearby Sites	Typical Researched Value for Nearby Sites
Approximate Potential Vertical Rise (PVR)	2 inches – 5 inches	4 inches
Undercut Depth and Select Fill Thickness to Achieve a PVR of Approximately 1 Inch	3 feet – 7 feet	5 feet
Shallow Grade-Beam Bearing Depths	2 feet – 2½ feet	2 feet
Shallow Grade-Beam Allowable Bearing Capacity Values	1,300 - 2,500 psf	2,000 psf
Underreamed Drilled Pier Founding Depths	10 - 13	10
Underreamed Drilled Pier Allowable Bearing Capacity Values	3,000 psf – 5,000 psf	3,800 psf
Straight Shaft Drilled Pier Allowable Skin Friction Resistance (5' to 25')	150 psf – 600 psf	300 psf
Straight Shaft Drilled Pier Allowable Skin Friction Resistance (25' to 40')	500 psf – 750 psf	600 psf

The range of values provided in the above table generally represent the spectrum of reviewed information from the nearby sites, while the typical value represents the most common condition for the reviewed project sites. The values are not specific to the 1,100-acre site and should only be considered in estimating the conditions that may be present on the site. In no case should the information or values provided be relied upon or used for design purposes.

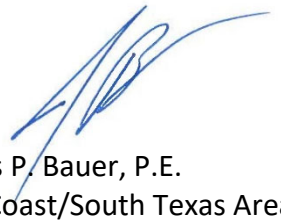
Limitations

As previously stated, the purpose of this geotechnical desktop study was to obtain preliminary information regarding the subsurface soil and groundwater conditions in the general site area based upon UES's reference materials, historical data and previous geotechnical studies performed near the vicinity of the site. The information obtained from our review of this data is intended to provide a reasonable estimate of the probable subsurface conditions that are likely to be present at the site. However, the geologic process is erratic, and variations can occur across relatively small distances. Accordingly, the estimated information provided herein may or may not represent the actual conditions on the project site. If it is desired to obtain actual soil and groundwater information at the site, UES should be contacted and soil borings at the specific site location can be performed.

Closing

UES appreciates the opportunity to assist you by performing this Desktop Geotechnical Study. If you have any questions pertaining to this report, or if we can be of further assistance, please contact us at (361) 883-4555.

Sincerely,



James P. Bauer, P.E.
Gulf Coast/South Texas Area Manager