

**Part III**

**Attachment III-E**

**No Redline Version for Figure III-E.0-1 - Not previously  
provided**

**Part III  
Attachment III-E**

**GEOLOGY REPORT**

**Pescadito Environmental Resource Center  
MSW No. 2374  
Webb County, Texas**

**PESCADITO**  
ENVIRONMENTAL RESOURCE CENTER

Initial Submittal March 2015  
Revised September 2015

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## 1.0 INTRODUCTION

The Geology Report for the Pescadito Environmental Resource Center is provided as a series of documents to meet the specific requirements of 30 TAC §330.63(e) and to provide additional information supporting the facility design and operation. Each of the documents has been prepared by a qualified groundwater scientist or professional engineer ~~with the exception of a Geotechnical Data Report (Appendix III-E.3) signed by a geotechnical engineer.~~

A description of the regional geology and hydrogeology and related information is provided in a document entitled *Regional Geology and Hydrogeology* prepared by H. C. Clark, PhD, P.G. A copy of Dr. Clark's report is included in Appendix III-E.1. This report is submitted to fulfill the requirements of 30 TAC §330.63(e)(1-3).

Site-specific subsurface investigation results and geotechnical data for the site are provided in two reports by Raba Kistner Environmental, Inc. and Raba-Kistner Consultants, Inc., respectively. The *Subsurface Investigation Report (SIR)* is included in Appendix III-E.2. The *Geotechnical Data Report (GDR)* is included in Appendix III-E.3. Those reports are submitted to fulfill the requirements of 30 TAC §330.63(e)(4)(A-H) and §330.63(e)(5)(A-E) and the requirements of the Soil Boring Plan (SBP<sup>22</sup>) approved by TCEQ on April 11, 2011 (Appendix III-E.2, – SIR Appendix A). It should be noted that subsequent to the approval of the SBP and preparation of the SIR and GDR, the permit boundaries was reduced. The revised boundary is enclosed entirely within the original boundary that was used when the SBP was approved. Figure III-E.0-1 within this Appendix shows the two permit boundaries.

The uppermost regional recognized aquifer at the facility is the Yegua-Jackson Aquifer which is found more than 600-feet beneath the deepest excavation and is isolated from the surface by more than 750 feet of predominantly clays of low permeability. Flow in the Yegua-Jackson is to the east and appears to coincide with the regional dip of the Yegua-Jackson, which is approximately 50 feet to the mile.

With respect to 30 TAC §330.63(e)(5)(F) requirements, and the definition in 30 TAC §330.3(168), the referenced reports indicate the regulatory uppermost aquifer is the shallow subsurface water, i.e., perched groundwater, associated with the relatively continuous contact

zone occurring at shallow depth between the Recent-Pleistocene soils and Eocene-age Yegua-Jackson group sediments. Based on information in the *Subsurface Investigation Report*, inferred flow direction for the shallow groundwater appears to mimic surface drainage patterns, i.e., to the south, with gradients ranging from 0.002 to 0.003. A maximum hydraulic conductivity (horizontal) of  $2.01 \times 10^{-6}$  cm/sec ( $5.7 \times 10^{-3}$  ft/day) is given in the *Geotechnical Data Report*. Using these inputs, and conservatively using an average value for effective porosity for a sandy clay of 7%, a groundwater velocity of  $5.94 \times 10^{-2}$  to  $8.92 \times 10^{-2}$  ft/year is calculated.

Additional information on subsurface conditions has been obtained to support facility design and operation. This information consists of hydraulic testing of previously-installed piezometers to obtain field estimates of horizontal hydraulic conductivity. A report, *Summary of Hydrogeologic Testing in Selected Piezometers*, was prepared by Pierce L. Chandler, Jr., P.E. and is included in Appendix III-E.4.

Additional subsurface investigation and testing has been performed to provide information useful for general landfill design. A report, *Supplemental Subsurface Investigation report – Phase V*, has been prepared by Michael W. Oden, P.E. and is included in Appendix III-E.5.