Part III
Attachment III-D
Appendix III-D.9

FINAL COVER QUALITY CONTROL PLAN

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

PESCADITO
ENVIRONMENTAL RESOURCE CENTER

8-4-2016

STATE OF TEXAS
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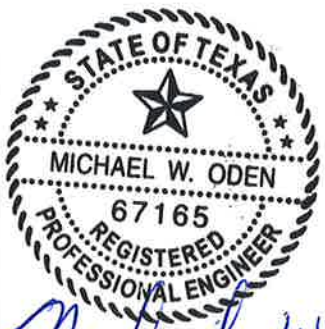

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1.0 INTRODUCTION

The Pescadito Environmental Resource Center (PERC) is located in Webb County east of Laredo Texas. Webb County is an arid area of the state. Climate information from the *Texas Water Atlas* (Estaville & Earl, 2008) includes:

- Average annual precipitation (period from1971 to 2000) is in the range of 20 to 24 inches and Annual Potential Evaporation. The PERC site receives about 22 inches annually.
- Annual Potential Evapotranspiration (Priestly Taylor method) is approximately 75 inches.
- Annual Potential Evapotranspiration (Penman method) is in the range of 100 to 110 inches.
- Gross Lake Surface Evaporation (average annual rate from 1950-1979) is in the range of 71 to 81 inches.

It is clear that there is a very significant precipitation deficit (negative water balance) in Webb County. A water-balance alternative final cover (AFC) should perform extremely well without relying on an exotic design, select soil materials, critical construction, establishment of vegetative cover, or other factors.

Further exacerbating the negative water balance for this project is the increase in surface runoff associated with a significant percentage (approximately 89%) of the landfill area being constructed with twenty-five percent slopes (4H:1V).

Cells containing Class 1 non-hazardous industrial waste will be constructed with an alternate final cover with a flexible membrane liner as discussed in Part III, Appendix III-D.8.

2.0 FINAL COVER DESIGN

The AFC design for the project consists of a seven-inch erosion cover underlain by a thirty-inch, low-permeability infiltration layer, followed by a geosynthetic drain and a 40 mil Linear Low Density Polyethylene (LLDPE) geomembrane. The geosynthetic drain and 40 mil LLDPE are required only over cells that contain Class 1 waste. Both soil layers can be constructed from the predominantly (>>90%) fine-grained, poorly permeable clayey soils resulting from the required excavation. Because of the arid conditions, i.e., the significant precipitation deficits, and the characteristics of available soils, the design of the AFC is not particularly sensitive to permeability variation or establishment of vegetation. A permeability of 1×10^{-5} cm/sec or less is the only significant requirement for both soil layers.

Special selection of material and/or material placement is not critical to achieve the required permeability. That opinion is based on multiple observations:

- Predominantly fine-grained soils, such as those present at the site, typically exhibit permeabilities less than 1×10^{-5} cm/sec without special preparation and/or placement.
- Most materials to be produced from the excavation are intensely fissured and/or blocky and excavation and stockpiling quickly reduces these materials to a uniform clayey soil.
- There are a number of dams and drainage diversion levees currently within the Applicant's property that were constructed with a dragline with no attempt at controlled placement that have performed well without seepage problems, etc.
- Two large test pits excavated in 2012 (Appendix III-E.2 - *Subsurface Investigation Report*) and subsequent observations of dumped backfill demonstrate that natural poorly pervious soil conditions quickly develop.

3.0 QUALITY ASSURANCE/QUALITY CONTROL

The LLDPE geomembrane installation will be observed by a qualified technician. Non-destructive tests will be performed by the installer, and peel and shear seam tests will be conducted by an independent laboratory as well as conformance sample testing. Geomembrane quality assurance/quality control for HDPE liner installation is addressed in detail in Attachment III-D, Appendix III-D.7, Liner Quality Control Plan. LLDPE material requirements are provided in GRI Test Method GM17 (GM17), and requirements for seam strength and seam testing are specified in GRI Test Method GM19 (GM19). Quality assurance/quality control procedures for the final cover LLDPE geomembrane will follow Section 5.0 – Geomembrane Liner (Option 2) of the approved Liner Quality Control Plan, LLDPE material specifications will follow GM17, and seam test strength requirements will follow GM19.

Placement of the AFC soils is a fairly simple operation requiring little documentation beyond assuring that the soil materials have been placed to the proper thickness and that the berms and downchute structures have been constructed as designed. Survey documentation of thickness will be performed at a frequency no greater than 1 per 10,000 square feet of constructed cover. In an abundance of caution, laboratory permeability testing will also be conducted on samples of as-placed soils at a frequency of no less than one test per surface acre as specified in 30 TAC §330.457(c) for the infiltration layer in prescriptive final covers. Areas with failing tests will be disked, sprinkled with water, lightly compacted and retested.

Soil material shall be spread over the geosynthetics using low ground pressure equipment with less than approximately 5 psi ground contact pressure (e.g., a Caterpillar D6N LGP dozer). During spreading operations, the lift thickness (between tracks and geosynthetics shall not be less than 12 inches. The minimum cover over geosynthetics for heavy, rubber tired earth hauling equipment shall be approximately 3 feet unless it can be demonstrated that less cover will not result in excessive stress on the geosynthetics. The CQA Monitor shall continuously monitor the soil installation when it is placed directly on the geosynthetics, and shall verify the following:

- The soil layer is spread using low ground pressure equipment and that underlying geosynthetics are not damaged during placement.

- The soil is spread with a minimum of 12 inches between the spreading equipment and the installed geosynthetics. Under no circumstances shall construction equipment come in direct contact with the installed geosynthetics.
- Soil being used is free of rocks, sticks, roots, or debris of any kind that may damage the geosynthetics.
- Soils placed over geosynthetics on slopes shall be spread by pushing up the slope.
- Spreading of the soil does not result in excessive wrinkles in the geocomposite or underlying FM liner. The wrinkling may be reduced by raising the blade when pushing soil onto the geosynthetics, placing soil over small wrinkles to prevent material accumulation, or spreading soil in "fingers" or different directions.

4.0 DOCUMENTATION

Completion of the Alternative Final Cover (AFC) will be certified by a Texas-licensed Professional Engineer. The certification will document that all quality assurance / quality control requirements have been met and that the constructed AFC complies with the permitted design. The certification will also be signed by the site operator and submitted to the executive director, or the Municipal Solid Waste Permits Section of the Permits Division of the Texas Commission on Environmental Quality (TCEQ). The AFC completion certification will include the following as applicable:

- The latest edition of any required TCEQ Report Forms completed with appropriate attachments
- A summary of all cover construction activities
- Drawings illustrating thickness survey locations and permeability sampling locations
- Geosynthetics Manufacturer's certifications and quality control tests results
- Third Party conformance testing and seam testing for welded geomembrane seams
- Field logs documenting the geomembrane installation
- Laboratory permeability test results for infiltration layer soil
- Records of any retesting and reworking of the AFC
- Thickness verification documentation
- As-built record drawings