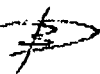


MEMORANDUM

TO: George O'Cana
Mingo Villarreal
Mona Parras

FROM: Brian Dudley, P.E. 

DATE: October 29, 2009

SUBJECT: Penitas Landfill – Final Cover Clay

Three sources of soil were observed on October 27 and 28, for possible use as landfill final cover clay. The primary soil requirement is that it is classified as a clay and can act as a barrier to stormwater infiltrating the landfilled waste. Specific hydraulic conductivity characteristics must be met by the soil. A secondary consideration is the time and expense that is required to import the clay to the landfill. About 30,000 cubic yards of clay will be needed at the landfill.

A summary of the three soils is as follows:

Location	Clay Content	Distance from Landfill	Estimated Roundtrip + Load/Dump Time
1. Benson and 4 mile Drainage Canal, Edinburg	Non- clay	18 miles	80 min.
2. Curve Rd Detention Pond, Elsa	Light to heavy clay	34 miles	120 min.
3. FM886 @ Military Rd, Los Ebanos	Heavy clay	8.5-10 miles	50 min.

The Elsa or Los Ebanos soil is expected to meet clay specifications required for the landfill cover. The Elsa site will not require a loader since Drainage District equipment will load trucks. Soil from Los Ebanos, however, can be imported 2.4 times more quickly with significantly less fuel and labor cost.

If clay can be economically obtained from Los Ebanos, then soil from this site is recommended because of lower hauling costs and less disruption to other Precinct projects while the trucks are in use at the landfill.

Clay from different sources should be kept separate during construction, because separate laboratory tests must be conducted on each type of clay used in the project.