

Memorandum

Date: 21 November 2010
To: Tamara Zeier, P.E., Project Navigator
Copies to: Ken Fredianelli, Geosyntec Consultants
From: Neven Matasovic, Ph.D., P.E., G.E., Geosyntec Consultants
Alan Witthoeft, E.I.T., Geosyntec Consultants
Subject: **Stability Evaluation
Berm Between Lagoons 2 and 3
Ascon Landfill, Huntington Beach, California**

GENERAL

The excavation and disposal of material from Lagoons 1 and 2 of the Ascon Landfill (Site) is ongoing. The material is removed in accordance with the Interim Removal Measure (IRM) Workplan and is hauled off-site. The IRM Workplan does not provide for excavation and removal of material from Lagoon 3.

Lagoons 2 and 3 are separated by an approximately 18-ft high x 18-ft wide (measured at the crest) x approximately 200-ft long berm (Berm). This Berm was constructed as an embankment by dumping random soils and without compaction or fill placement control measures. Upon removal of material from Lagoon 2, the South Face of this Berm was left exposed, creating a potentially unstable condition.

Geosyntec Consultants (Geosyntec) performed engineering evaluations in order to: (i) assess the impact of the ongoing excavation on the global stability of the Berm; and (ii) evaluate measures for enhancement of the global stability of the Berm upon completion of material removal.

This Memorandum documents the results of Geosyntec's engineering analyses of the global stability of the Berm (not sloughing, that may locally occur) and provides recommendations for remedial measures required to improve global stability of the Berm.

ENGINEERING APPROACH

One representative cross-section, Cross-Section A-A', was analyzed using the slope stability software SLOPE/W [GSI, 2006; www.geoslope.com]. Figure 1 shows the location of the cross-section in plan view (i.e., passing through the approximate center of the Berm and approximately perpendicular to the Berm's long axis).

The Berm geometry (based on field observation before and during IRM activities) is illustrated in Figure 1 (plan view) and in Figures 2 through 4 (profile view). Figure 2 shows that the South Face of the Berm was initially inclined at approximately 1.0 H : 1.0 V (Horizontal : Vertical) before lagoon material removal and was subsequently graded to approximately 1.5 H : 1.0 V. The inclination of the North Face has not yet been established. To provide a conservative basis for evaluation, we assumed that this face is inclined at approximately 1.0 H : 1.0 V. Figure 2 also shows that before IRM activities, lagoon material existed along both faces of the Berm from the base of the Berm to approximately 2 ft below the crest of the Berm. During the ongoing work, lagoon material was removed from Lagoon 2, exposing the South Face of the Berm.

Approximate locations of soil strata (based on previous geotechnical investigations at the Site by Geosyntec [2006]) are shown in Figures 2 through 4. In particular, the figures show the lagoon bottoms and the Berm consisting of undocumented fill as well as an approximately 3-ft thick layer of soft clay extending below both lagoons.

It is also noted that stormwater from the vicinity of the lagoons drains into the lagoons, as discussed in the Ascon Interim Removal Measure General Permit Storm Water Pollution Prevention Plan (Construction SWPPP). Therefore, in order to provide a conservative basis for evaluation, Lagoons 1 and 2 were assumed to be saturated with water and to contain ponded water to a depth of approximately 1-ft.

RESULTS OF STABILITY ANALYSES

The stability evaluations were conducted in stages that roughly mimic completed and proposed construction sequencing. The first stage, schematically shown in the top part of Figure 2, represents the condition of the Berm prior to lagoon material removal. As the Berm is buttressed by lagoon material from both sides, there are no stability concerns. The results of the formal stability analysis, also shown in top part of Figure

2, indicate failure in a so-called bearing capacity mode, with calculated Factor of Safety, FS, of 5.7.

The second stage represents the Berm's condition upon removal of material from Lagoon 2. As shown in the bottom part of Figure 2, for this condition, calculated FS is 1.1. As FS greater than or equal to 1.3 is typically considered acceptable for temporary slopes, remedial measures against slope failure are required.

The third stage consists of two alternatives to increase stability the Berm. The first alternative is to remove material from Lagoon 3. Up to approximately 10 ft of material needs to be removed from Lagoon 3 to achieve FS greater than 1.3. The second alternative is to construct a buttress along the South Face. The results of this evaluation indicate that an approximately 20-ft wide, 5-ft tall soil buttress is required to achieve the same effect as removal of 10 ft of Lagoon 3 material.

Figure 4 presents a supplemental analysis performed in order to assess the impact of excavation from Lagoon 3 on the stability of the North Face. As indicated in the figure, calculations show a FS of 1.3 after excavation of material from Lagoon 3. This suggests that the North Face of the berm will not be adversely affected by the proposed excavation.

DISCUSSION AND RECOMMENDATIONS

Removal of material from Lagoon 2 resulted in a potentially unstable slope condition. The calculated Factor of Safety (FS) of Southern Face of the berm between Lagoons 2 and 3 (Berm) is on the order of 1.1, approximately 15 percent lower than a typically accepted value of 1.3 for this type of slope.

The results of our evaluations indicate that the stability of Berm can be increased by either removal of material from Lagoon 3 or by construction of a buttress at the toe of South Face. However, given the difficulties associated with construction of such a buttress at a toe of potentially unstable slope (health and safety concerns associated with construction/vibration at the toe of potentially unstable slope, difficulty to achieve required soil compaction when compacting over a soft Lagoon 2 floor subgrade, and long-term settlement of the buttress), we recommend removal of material from Lagoon 3 as the most viable option.

CLOSURE









Should you require additional information and/or explanation of material discussed in this memorandum, do not hesitate to contact Neven Matasovic at 714-465-1244 (nmatasovic@geosyntec.com)


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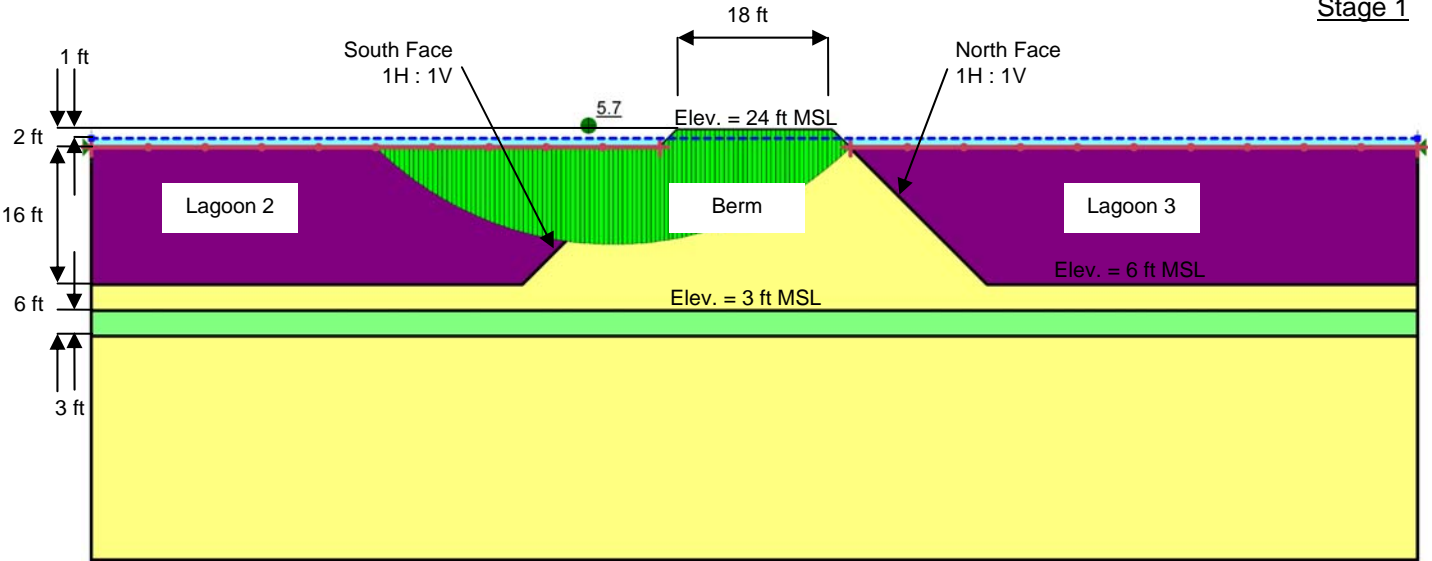


New hauler truck access road constructed along east side of Lagoon 3

- Key:
-  New or widened roadway with potential tarplant impacts
 -  Loading Area
 -  Trucking forward path
 -  Chain-link Fence or "Snow" Fence
 -  Chain-link Fence Removed
 -  General Area of Lagoon 3 Excavation
 -  General Area of Potentially Impacted Tarplant (other tarplant areas are not shown)
 -  Cross-Section Analyzed

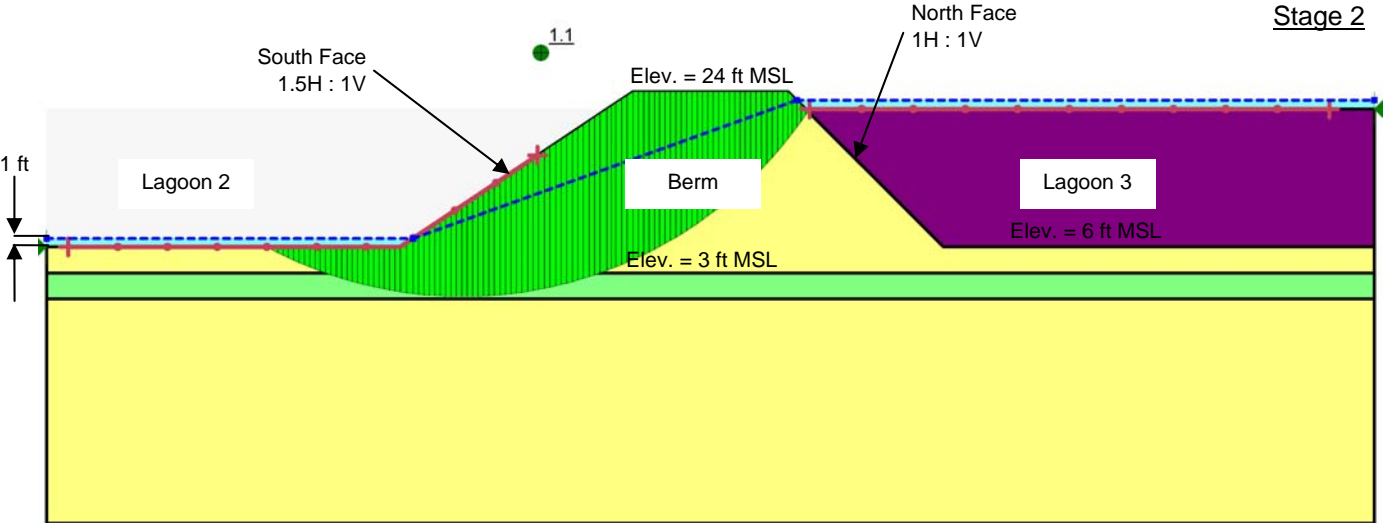
IRM Lagoon 3 Waste Removal Approach		Figure 1
Interim Removal Measure Ascon Landfill Site, Huntington Beach, California		November 2010
		

Stage 1



Pre-existing Conditions (FS = 5.7)

Stage 2

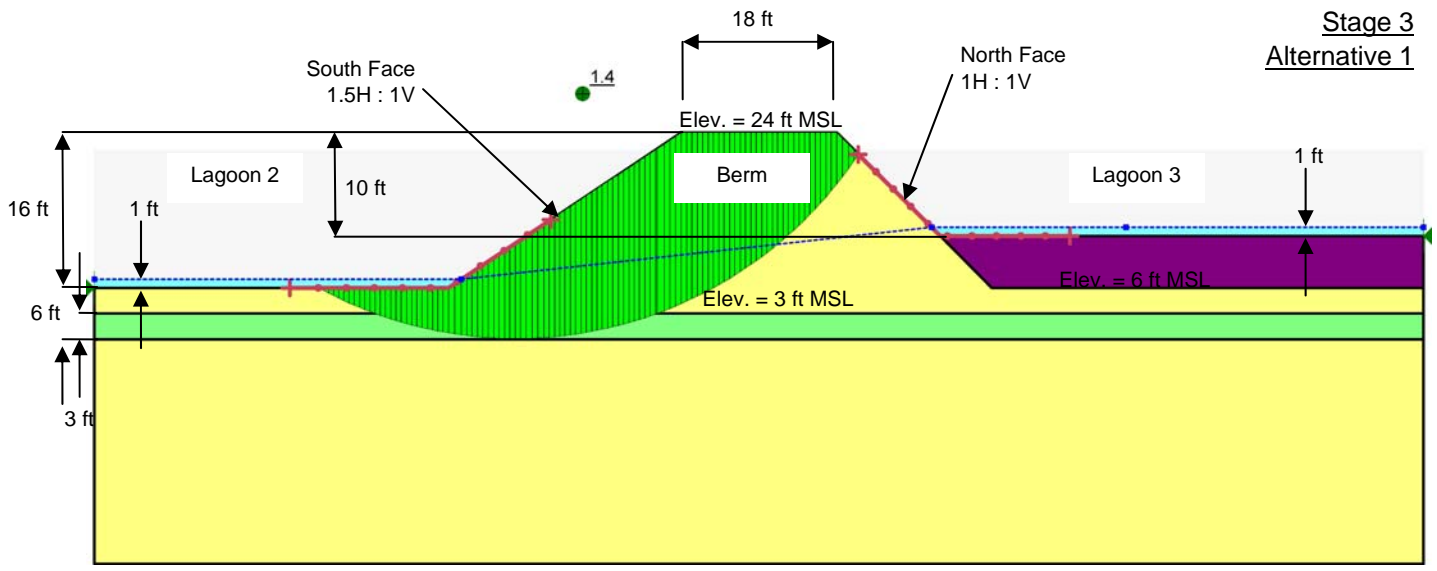


South Face Exposed (FS = 1.1)

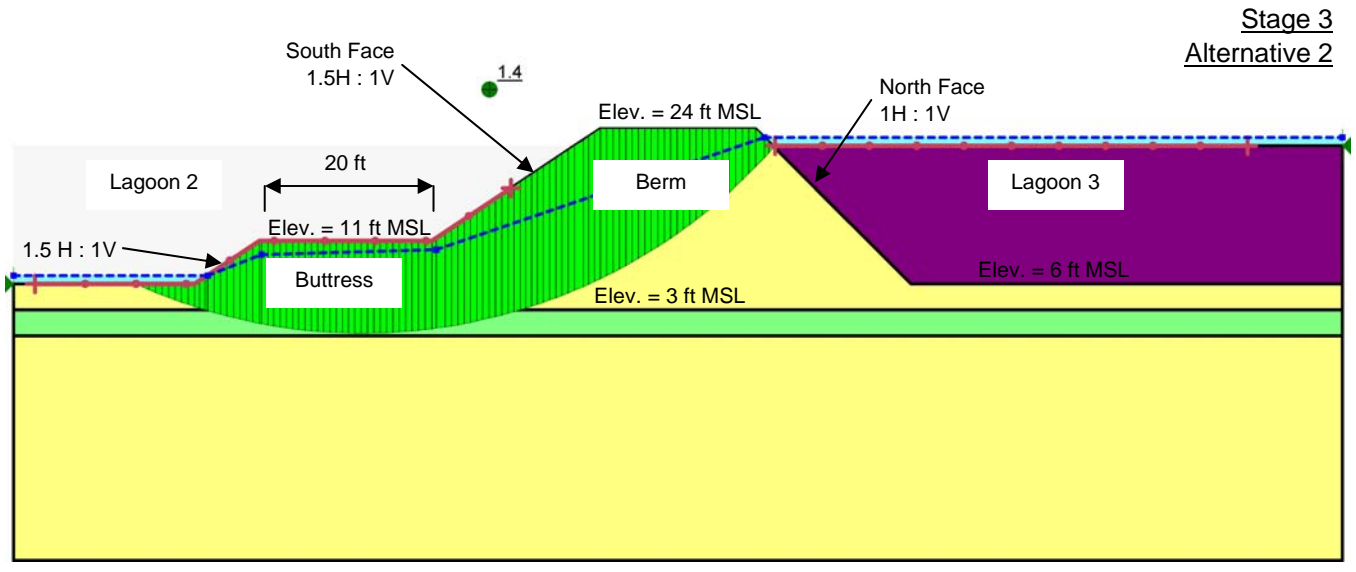
Legend

- = Berm Material (Clayey Sand)
- = Lagoon Material
- = Soft Clay
- = Calculated Failure Wedge
- = Assumed Seepage Surface
- MSL = Feet above Mean Sea Level

<p>Geosyntec consultants</p>	
<p>LAGOON 2 – LAGOON 3 BERM STABILITY ANALYSIS INTERIM REMOVAL MEASURE ASCON LANDFILL SITE, HUNTINGTON BEACH, CALIFORNIA</p>	
DATE: NOVEMBER 2010	FILE NO.
PROJECT NO. HG1131-01J	FIGURE NO. 2



North Face Partially Exposed (FS = 1.4)

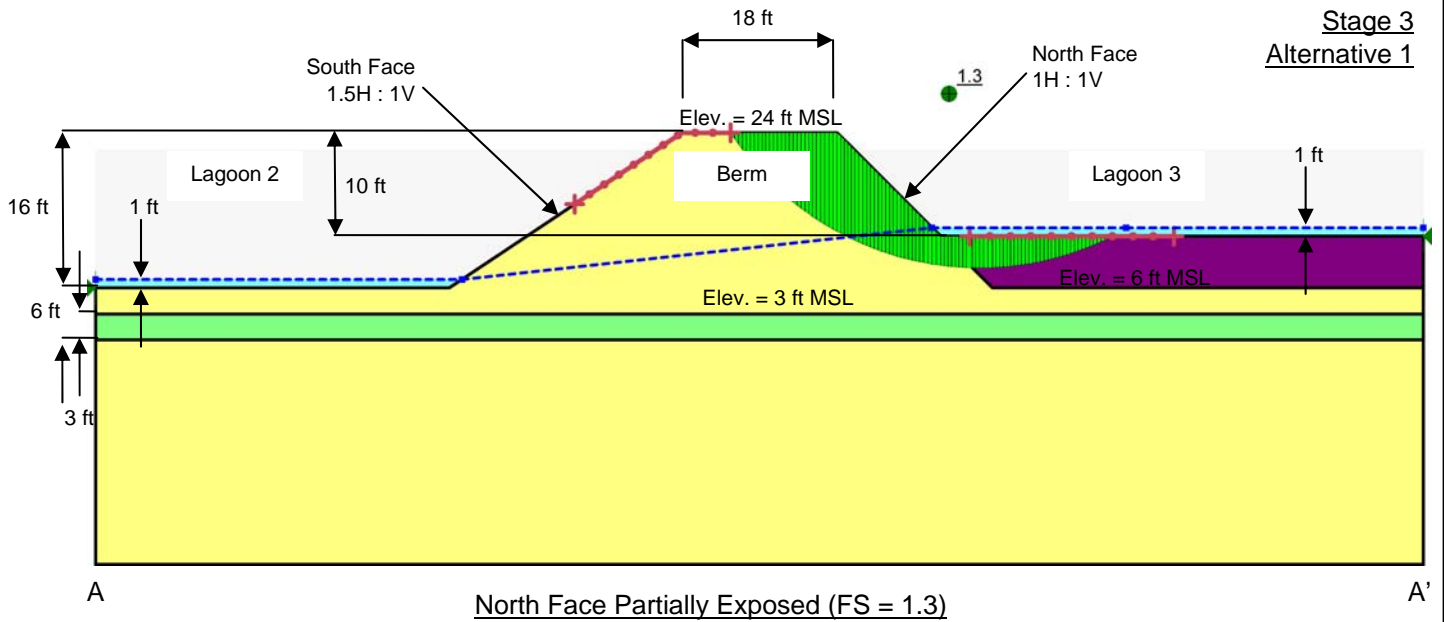


North Face Partially Exposed and South Face Butressed (FS = 1.4)

Legend

- = Berm Material (Clayey Sand)
- = Lagoon Material
- = Soft Clay
- = Calculated Failure Wedge
- = Assumed Seepage Surface
- MSL = Feet above Mean Sea Level

<h2 style="margin: 0;">Geosyntec[®]</h2> <p style="margin: 0;">consultants</p>	
<p style="margin: 0;">LAGOON 2 – LAGOON 3 BERM STABILITY ANALYSIS</p> <p style="margin: 0;">INTERIM REMOVAL MEASURE</p> <p style="margin: 0;">ASCON LANDFILL SITE, HUNTINGTON BEACH, CALIFORNIA</p>	
DATE: NOVEMBER 2010	FILE NO.
PROJECT NO. HG1131-01J	FIGURE NO. 3



Legend

- = Berm Material (Clayey Sand)
 - = Lagoon Material
 - = Soft Clay
 - = Calculated Failure Wedge
 - = Assumed Seepage Surface
- MSL = Feet above Mean Sea Level

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**LAGOON 2 – LAGOON 3 BERM STABILITY ANALYSIS
INTERIM REMOVAL MEASURE
ASCON LANDFILL SITE, HUNTINGTON BEACH, CALIFORNIA**

DATE: NOVEMBER 2010	FILE NO.
PROJECT NO. HG1131-01J	FIGURE NO. 4