Summary of Changes to Moab Disposal Cell Calculations

The following is compilation of the revisions performed on five Moab Disposal Cell cover calculations. These revisions were done in part from a comment from the NRC on the original calculations utilizing a 10 ft cover thickness in lieu of the final design thickness of 9 ft. The original calculations were performed as the cell was configured at the time the calculations were done to verify that the design concepts did not have any major weaknesses and did not require modifications. Subsequently, as the design progressed, the cell geometry changed and the changes in geometry affected some of the calculations. Other calculations were not affected by the changes. In order to address the initial comment and to provide calculations that reflect the final design features of the cell, the following revisions were made. In addition, an independent review of all of the Moab calculations by Golder Associates required updating the frost penetration calculation.

Calculation C-10 Slope Stability Rev. 2

Location of slope selected for analysis --- cross section selected at centermost section of the cell
Top of dike: elevation 4967' instead of 4964'
Cover thickness: 9 ft instead of 10 ft

Time Frame	TAD Min. Factor of Safety (FS) reqr'd	Previous Calc. FS	Revised Calc. FS
End of Const. static	1.3	1.82	2.15
End of Const. seismic	1.0	1.17	1.31
Long Term Static	1.5	2.35	2.78
Long Term Seismic	1.0	1.33	1.51

Calculation C-11 Settlement Analysis Rev.1

Location of cross-section analyzed --- cross section selected at centermost portion of the cell.
Tailings thickness: 46.7 ft instead of 38ft
Cover thickness: 9 ft instead of 10 ft
Total thickness: 55.7 ft instead of 48ft
Primary settlement: 11 in. (same as previous 11in.)
Secondary settlement: 8 in. instead of 6 in.
Total settlement: 19 in. instead of 17 in.

Calculation C-12 Liquefaction Rev. 2

Tailings thickness: 46.7 ft instead of 38 ft
Cover thickness: 9 ft instead of 10 ft
Total soil thickness 55.7 ft instead of 48 ft
Saturated soil thickness: 46.7 ft instead of 38 ft.

Calculated factor of safety range:
17% fines 1.37 - 2.38

Calculated factor of safety range:
46% fines 1.74 – 3.04

The ranges remained the same. (Note that in the calculation that was originally issued in the Final RAP, the wrong values for the upper range number were pulled off the table incorrectly and included in the text.)

Calculation C-13 Frost Penetration Depth Rev. 1

Added description of calculation made to extrapolate frost depth vs. recurrence interval to 1000 years instead of to 200 years as used in the original analysis.

Conclusion: "Based on Gumbel probability functions…, designing for recurrence interval of 1,000 years verses 200 years does not add any significant value of risk reduction. In view of this, we recommend a maximum frost dept of 45 inches for a recurrence interval of 200 years should be used in the design of the cover."

Original calculation had 43 inches for recurrence interval of 200 years.

Calculation C-15 Cover Cracking Rev. 1

Total settlement of 19 in. instead of 17 in.
Thickness of tailings: 46.7 ft instead of 38 ft
Cover thickness: 9 ft instead of 10 ft.
Length between differential settlement 114 ft instead of 96 ft

Distortion: 0.014 instead of 0.015 (much less than 0.1 limit)