Review of West Valley Erosion Analysis
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Presentation to WV CTF
June 27, 2007

West Valley Erosion Analysis

Objectives

- Summary of erosion modeling at West Valley
- Summary of comments on 2005 analysis

Topics

Site Erosion Processes

January 1996 DEIS Analysis
December 1999 Analysis
September 2005 Analysis

Comments on 2005 Erosion Analysis

Erosion Processes

- Sheet and Rill
- Mass Wasting-Slumping
- Stream Downcutting
- Fluvial Transport
- Gully Advancement

Buttermilk Creek Slump, East of SDA

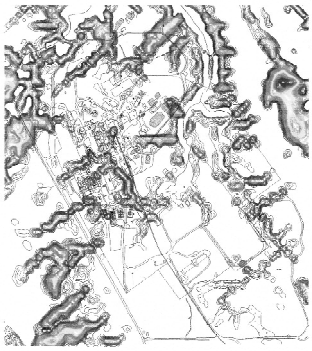
January 1996 DEIS Analysis

- **Prediction**
  - Based on assumption of constant channel downcutting rate calculated from probabilistic combination of individual storm events analyzed using Hydraulic Engineering Center code (HEC-6)
  - Sheet and rill erosion estimated to be negligible
  - Gully advancement not estimated
- **Assessment**
  - SAIC considered the analysis to be conservative
  - Recognized the need to improve the analysis if onsite management was to be seriously evaluated
- **Presented to CTF April 1997**

December 1999 Analysis

- SIBERIA Calibration:
  - Universal Soil Loss Equation (USLE) soil loss for hillslopes
  - Downcutting at historical average rate for Buttermilk Creek
- Results:
  - Widening and extensions of gullies
  - Low rate of loss from plateaus
- Presented to CTF September 2001

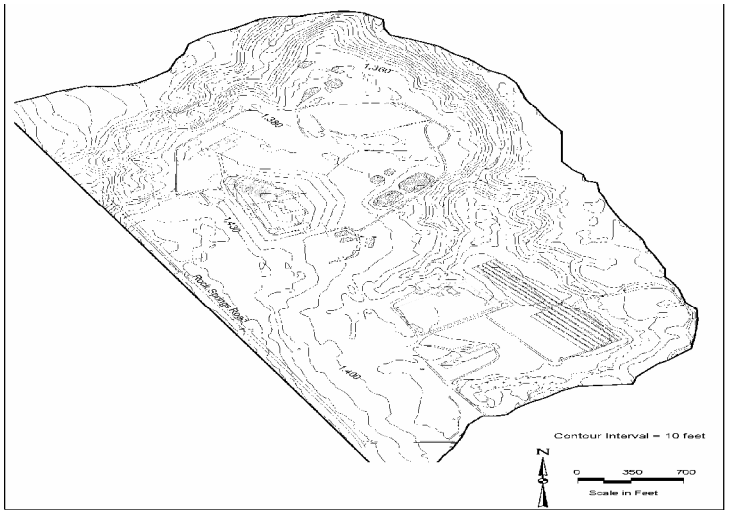
Example 1999 Result



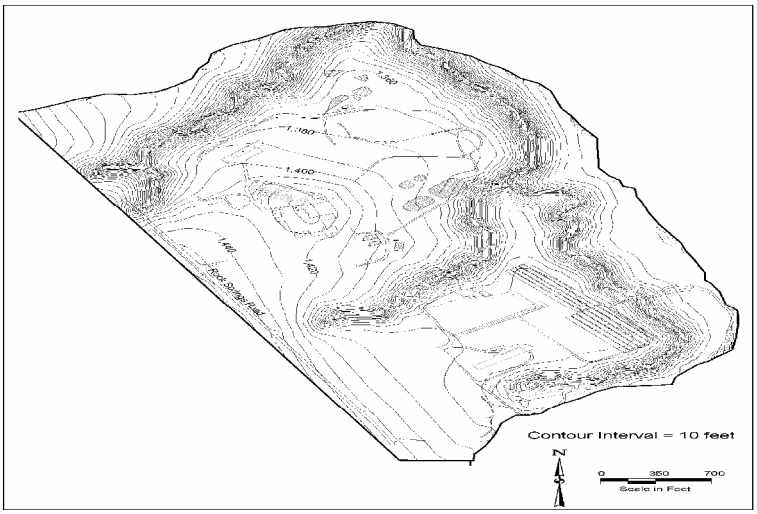
September 2005 Erosion Analysis

- SIBERIA Calibration:
  - Sediment loss from hillslopes from Watershed Erosion Prediction Project (WEPP)
  - Downcutting in stream channels from WEPP
- Results:
  - High rate of downcutting produced high rate of soil loss
  - North Plateau more stable than South Plateau

Example 2005 Initial Condition



Example 2005 Result



Comments on 2005 Erosion Analysis

- Erosion predictions show rounding of plateaus
- Performance assessment uncertainties merit a comprehensive analysis
- Science behind landscape evolution models is not mature enough to justify long-term predictions. Less sophisticated but more credible alternative would be to judiciously extrapolate observed patterns.
- Might be possible to support more realistic future landscapes by calibrating against patterns developed over 10,000 - 15,000 years
- Analysis of the effect of erosion on groundwater release scenarios is not considered

Comments on 2005 Erosion Analysis (continued)

- Assuming erosion controls fail at the same time as institutional controls is overly conservative
- Make sure all the available site data is used to support calibration
- Reference new erosion models and concepts

Note: This listing does not include comments not directly related to erosion rate analysis including erosion control design features, receptors, analysis of contaminant fate following erosion release.