

**THE IMPORTANCE OF VEGETATION FOR ALTERNATIVE COVER SUCCESS
IN NORTHERN CALIFORNIA**

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Two alternative final cover test sections were constructed in 1999 at the Kiefer Landfill near Sacramento, California to test their hydraulic performance in large drainage lysimeters. The two evapotranspiration (ET) covers were designed to include loosely placed cover soils of two thicknesses vegetated with grasses and shrubs. The construction and monitoring of the test sections was performed under the U.S. Environmental Protection Agency (EPA) funded Alternative Cover Assessment Program (ACAP). Detailed hydrologic performance monitoring of the covers from 1999 through 2005 provided a significant amount of information in support of a final design for the site. However, at the end of this test period, only one of the test sections met the performance criteria for percolation of < 3 mm/year. The ACAP test pads were exhumed in the summer of 2005 to investigate changes in soil hydraulic properties and geomorphology and vegetation stand composition that have contributed to suboptimal hydraulic performance. An UNSATH model was built using field data from six years of hydrologic monitoring and the exhumation studies to estimate the performance of an improved cover system. Important conclusions from this work were: 1) Test section soils performed as anticipated and no significant preferential flow was observed; 2) Failure to establish the target perennial vegetation contributed to inadequate hydraulic performance; and 3) With improved attention to soil/vegetation interactions and requirements for successful establishment of perennial vegetation, target hydraulic performance can be achieved. In 2008, a vegetation pilot test study was initiated to field test alternative cover construction and vegetation establishment procedures that could achieve the type of vegetation stand necessary to meet the hydraulic performance criteria. This presentation will summarize the project from beginning to end, starting with the ACAP pilot test in 1999 and continuing through presentation of initial vegetation pilot test results from 2009. Key findings of the work will be highlighted, which are applicable to design of other ET covers.

BIOGRAPHY

Jason Smesrud is a senior soil scientist and agricultural engineer with CH2M HILL in Portland, Oregon. His work with over 12 alternative vegetated landfill cover projects in 8 states has encompassed all phases of permitting, design, and construction.