DOE/NV/11718--439-ABS

ENGINEERED COVERS FOR MUD PIT CLOSURES CENTRAL NEVADA TEST AREA NEVADA

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Abstract

Two abandoned drilling mud pits impacted with petroleum hydrocarbons were determined to require closure action at the Central Nevada Test Area. The UC-4 Mud Pit C is approximately 0.12 hectares (0.3 acres) and 1.2 meters (4 feet) in depth. The UC-1 Central Mud Pit (CMP) is approximately 1.54 hectares (3.8 acres) and 2.4 meters (8 feet) in depth. Both mud pits contain bentonite drilling muds with a thin dry crust, low shear strength, low permeability, and high moisture content. The following closure methodologies were evaluated: stabilization by mixing/injection with soil, fly ash, and lime; excavation and disposal; on-site drying; thermal destruction; wick drains; administrative closure (postings and land-use restrictions); and engineered covers. Based upon regulatory closure criteria, implementation, and cost considerations, the selected remedial alternative was the construction of an engineered cover.

A multilayered cover with a geo-grid and geo-synthetic clay liner (GCL) was designed and constructed over the UC-4 Mud Pit C to evaluate the constructability and applicability of the design for the CMP cover. The geo-grid provided structural strength for equipment and material loads during cover construction, and the GCL was used as a moisture infiltration barrier. The design was determined to be constructable and applicable. To reduce project costs for the CMP cover, a vegetative cover was designed with drainage toward the center of the cover rather than the perimeter. The vegetative cover with the internal drainage design resulted in a fill volume reduction of approximately 63 percent compared to the multilayered cover design with a GCL.

This work was supported by the U.S. Department of Energy, Nevada Operations Office, under Contract No. DE-AC08-96NV11718.