INYO COUNTY, CALIFORNIA

YUCCA MOUNTAIN NUCLEAR WASTE REPOSITORY OVERSIGHT PROGRAM

PROGRAM FUNCTIONS

Yucca Mountain is the site of the only proposed high-level nuclear repository in the United States. The repository was designed using the philosophy of multiple barriers, both engineered and natural, each of which impede the movement of contaminants. The proposed repository will be in the unsaturated zone above the water table in Tertiary tuffaceous rocks. The principal transporting mechanism for radionuclide is moving groundwater. The primary potential radionuclide transport path would be through the Tertiary-age tuffaceous aquifer system through Amargosa Valley terminating at Franklin Lake Playa in Inyo County. Underlying the repository at a depth of approximately 4250 ft (1.3 km) is an extensive Lower Carbonate Aquifer that is known to be highly permeable. Inyo County's oversight and U.S. Department of Energy (DOE) Cooperative Agreement research, and a number of other investigators research indicate that there is groundwater flow between the alluvial and carbonate aquifers both at Yucca Mountain and in Inyo County.

The overall goal of Inyo County's Yucca Mountain research program is the evaluation of far-field issues related to potential transport, by ground water, of radionuclide into Inyo County, including Death Valley, and the evaluation of a connection between the Lower Carbonate Aquifer (LCA) and the biosphere.

Inyo County Yucca Mountain Program
Inyo County has participated in oversight activities associated with the Yucca Mountain Nuclear Waste Repository since 1987. The Inyo County Yucca Mountain Repository Assessment program provides oversight and impact assessment to the Department of Energy for the proposed high-level radioactive waste repository at Yucca Mountain. As part of these duties, the program:

- Monitors and responds to Yucca Mountain Project developments.
- Reviews scientific studies pertaining to the Yucca Mountain Project.
- Conducts independent investigations of potential impacts of the repository on County water resources and of risks associated with the transportation of high-level waste and spent nuclear fuel through the County.
- Identifies potential environmental, economic, and social impacts of the repository on Inyo County.
- Provides information to the residents of Inyo County and encourages public participation.

Inyo County Technical Research Program

Inyo County's primary concern for high-level nuclear waste disposal at the Yucca Mountain repository, as previously indicated, is the far-field issues related to potential transport, by ground water, of radionuclide into Inyo County, including Franklin Lake Playa and Death Valley, and the potential connection between the Upper Tertiary-age aquifer system and the Lower Carbonate Aquifer (LCA) to the biosphere. The relationship between carbonate spring waters in Death Valley (within Inyo County) and the groundwater flowing under Yucca Mountain has yet to be conclusively demonstrated. The understanding of the potential hydraulic connection between Yucca Mountain and the Death Valley LCA springs and groundwater travel times are critical to assessing the impacts of a Yucca Mountain high -evel nuclear waste repository on Inyo County.

In addition, the "peak-dose" time frame, radionuclide from the proposed repository will reach Franklin Lake Playa, where they may be released to the environment through wind transport. Ground-water flow velocity along Fortymile Wash is estimated to be about 4 meters per year and decreases to about 1 meter per year or less in the alluvium because of much larger porosity. A transit time from the repository to Franklin Lake Playa may be 50,000 to 100,000 years.

The specific purpose of Inyo County's Yucca Mountain Hydrologic Research Program and DOE Cooperative Agreement drilling program is to acquire geological, subsurface geology, and hydrologic data to:

1. Establish the existence of inter-basin flow between the Amargosa Basin and Death Valley Basin,
2. Characterize groundwater flow paths in the LCA through Southern Funeral Mountain Range, and
3. Evaluate the hydraulic connection between the Yucca Mountain repository and the major springs in Death Valley through the LCA.

The hydraulic characterization of the LCA is of critical interest to Inyo County and the U.S. Department of Energy because:

1. The upward gradient in the LCA at Yucca Mountain provides a natural barrier to radionuclide transport,
2. The LCA is a necessary habitat resource for the endangered Devil's Hole pup fish, and
3. The LCA is the primary water supply and source of water to the major springs in Death Valley National Park.

Current Hydrologic Program Research include:

1. Exploratory drilling in Death Valley to Characterize the LCA system.
2. Geological mapping of the Southern Funeral Mountain range.
3. Geophysical surveys to characterize the geology and hydrology of the LCA system.
4. Geochemical sampling and analysis to determine the source of LCA waters.
5. Numerical groundwater modeling to simulate groundwater flow through the LCA system.