INTEGRATING HAZARDS ASSESSMENT AND IMPACT ASSESSMENT: THE CASE OF THE CALIENTE RAIL CORRIDOR TO YUCCA MOUNTAIN

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Proposed Caliente Rail Route
US Dept. of Energy has decided to construct a rail spur to Yucca Mountain.

April 2004, the Department of Energy issued a Record of Decision and a Notice of Intent to construct a rail line connecting the Union Pacific mainline with Yucca Mountain.
Assessing Rail Impacts

- Using hazards data assists understanding the potential impact and costs of the rail line construction,
- The DOE should have integrated hazards assessment into the preparation of the EIS.
- Shipments of High-Level Waste (HLW) to Yucca Mountain may cause or exacerbate disruption of the Nevada rail system. The current rail system is inherently fragile in some places and has been so since its construction.
Disruption of Rail Line
Sample Data Model

- Measure of Effect: What locations potentially exceed regulatory cask limits
- Locations where floods occur
- Locations where dam failures could cause flooding
- Locations where existing water exceeds regulatory depth
- Interviews with ranchers, intermittent stream locations, alluvial fan soil types
- Areas downstream of dams and intermittent stream locations
- Rivers, lakes or flood control facilities

One of the regulatory standards for cask performance is that the cask withstand immersion in water. The data model depicts this data model.
## Data Collected

<table>
<thead>
<tr>
<th>Natural Hazard</th>
<th>Data required</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landslide (proxy)</td>
<td>Areas of cut and fill</td>
<td>DOE Microstation plot files</td>
</tr>
<tr>
<td>Wildfire</td>
<td>Land Cover inventory</td>
<td>US Fire Service</td>
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<tr>
<td>Flash floods (proxy)</td>
<td>Intermittent streams and dams</td>
<td>FEMA and Nevada DOT</td>
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<tr>
<td>Earthquake</td>
<td>Fault maps</td>
<td>Nevada Bureau of Mines</td>
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<tr>
<td>Drops from heights</td>
<td>US DEM</td>
<td>USGS</td>
</tr>
<tr>
<td>Wind</td>
<td>Wind Maps</td>
<td>National Severe Storms Lab</td>
</tr>
</tbody>
</table>
Slope Shading
Slope Shading and Profiling
Advanced Visualization

Cattle Migration Pattern
Drop Locations
Earthquake Fault Grid
Conclusion

- Integrating hazards research and impact assessment yields new insights on the proposed action.
- It is possible to identify locations where hazards occur that could disrupt the proposed Nevada rail system.
- Identifying these locations reveals more problems with the route.