Standards and GCAP Requirements

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Overview

• What are the groundwater contaminants of concern and what is the regulatory driver?

• What are the surface/groundwater clean-up standards?

• What are the potential implications?

• How will the final compliance action plan be determined?
Regulatory Drivers

• 40 CFR 192 - Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings
• DOE Order 458.1 Radiation Protection of the Public and the Environment
• Endangered Species Act Critical Habitat
• FEIS - relocation of tailings pile from the Colorado River
## Contaminants of Concern and Standards

<table>
<thead>
<tr>
<th>PCOC</th>
<th>Standard (mg/L)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia</td>
<td>3</td>
<td>Proposed in EIS</td>
</tr>
<tr>
<td>Arsenic</td>
<td>0.01</td>
<td>40 CFR 192 Sub A, Table 1</td>
</tr>
<tr>
<td>Copper</td>
<td>1.3</td>
<td>EPA Action Level</td>
</tr>
<tr>
<td>Manganese</td>
<td>0.05</td>
<td>EPA Secondary Drinking Water Regulation</td>
</tr>
<tr>
<td>Selenium</td>
<td>0.05</td>
<td>40 CFR 192 Sub A, Table 1</td>
</tr>
<tr>
<td>Sulfate</td>
<td>250</td>
<td>EPA Secondary Drinking Water Regulation</td>
</tr>
<tr>
<td>Uranium</td>
<td>0.044</td>
<td>40 CFR 192 Sub A, Table 1 (assumes U-234 and U-238 are in equilibrium, converted to mg/L)</td>
</tr>
</tbody>
</table>
Ammonia

• No regulatory groundwater standard
• A target goal of 3 mg/L in groundwater was proposed in the FEIS based on a 10-fold dilution
• High toxicity to aquatic life
• EPA Acute and chronic criteria
Uranium

- Exceeds the EPA standard in the groundwater (0.044 mg/L)
- Highest concentrations associated with the millsite plume
- No surface water regulations
Copper, Manganese, Selenium, Sulfate

- Copper and manganese have EPA acute and chronic criteria for aquatic life. Background manganese is also high at Matheson Wetlands.
- Selenium was identified with potential impacts to piscivore mammals and birds and EPA acute and chronic criteria for aquatic life. Background selenium is also elevated.
- Sulfate is elevated but there are no established wildlife benchmarks. Background sulfate is also high due to dissolution of the Paradox Formation.
- Elevated arsenic associated with the former millsite area.
Challenges

• Complex Site:
  • Freshwater/Brine Interface
  • Surface water/groundwater interactions
  • Two separate contaminant plumes
  • Adjacent critical habitat
Approaching Site Closure...
Groundwater Compliance Action Plan (GCAP)

- Prioritizes
  - Containing the spread of contaminants
  - Mitigating the threat to public health

- Contains:
  - Site Characterization
  - Groundwater Protection Standards
  - Hazard Assessment
  - Groundwater Corrective Action and Compliance Monitoring
  - Long-term Surveillance Plan

- Nuclear Regulatory Commission approval
- NUREG 1724/GCAP PEIS
Acceptable Strategies

- No Remediation
- Natural Flushing (within 100 years)
- Active Remediation
- Active Remediation/Natural Flushing

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Proposed action</th>
<th>No action</th>
<th>Active remediation to background levels</th>
<th>Passive remediation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active ground water remediation methods</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Natural flushing</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>No ground water remediation</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>- Sites that qualify for supplemental standards or alternate concentration limits.</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>- Sites that meet maximum concentration limits or background levels (no impacts).</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Other Potential Strategies

• Supplemental Standards/Alternate Concentration Limits
  • Concentration of total dissolved solids >10,000 mg/L
  • Limited use aquifer
  • Must ensure projected uses of groundwater are preserved

• Institutional Controls
  • Protect public health and environmental

• Alternate Concentration Limits
  • No excessive health or environmental risks
Compliance Strategy Selection Process
Closing

• The Groundwater Compliance Action Plan will:
  • Account for the constituents of concern and the impact on ecology and human health.
  • Determine the best remedial strategy, which may vary between the two contaminant plumes.
  • Involve stakeholder engagement.
  • Follow the requirements in 40 CFR 192 and NUREG 1724.
QUESTIONS?