NRC’s Regulation of In-Situ Uranium Recovery Facilities

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U.S. NRC
ISR Safety Oversight – A Shared Responsibility

- Aquifer exemption (EPA/State)
- Permit to operate injection wells (EPA/State)
- Waste discharge permits (including storm water) (EPA/State)
- Federal/State land use (BLM/State)
- License commercial nuclear facilities (NRC/State)
ISR Licensing Process Phases

Application/Licensing
- Applicant
  - Project Manager
  - Technical Reviewers
  - Environmental Reviewers
- Time: 2 years

Operations
- Licensee
  - Project Manager
  - Technical Reviewers
  - Environmental Reviewers
  - Inspectors
- Time: Decades, with renewal Every 10 years

Decommissioning/Termination
- Licensee
  - Project Manager
  - Technical Reviewers
  - Environmental Reviewers
  - Inspectors
- Time: Up to several years for decommissioning
NRC Review Process-New Application

- Letter of intent
- Pre-licensing meetings (open to the public)
- Acceptance review
- Detailed Technical Review
  - Notice of opportunity for hearing
  - Safety review
  - Environmental review
- Work with stakeholders (e.g. States, EPA, BLM, FS, F & WS) and Indian Tribes
- Licensing Decision
- Inspections
Application Content – In-Situ Recovery Facility

- Proposed Activities
- Site Characteristics
- Description of Proposed Facility
- Effluent Control Systems
- Operations
- Groundwater Restoration and Decommissioning
- Financial Assurance
- Accidents
- Quality Assurance
- Alternatives
Health and Safety Focus Areas

• Health Physics/Radiation Safety
  – Radiation safety controls and monitoring
  – Effluent controls/monitoring
  – External radiation exposure monitoring
  – Airborne radiation monitoring
  – Bioassay program
  – Environmental monitoring
  – Radiological cleanup of lands, buildings and equipment

• Hydrogeology
  – Modeling of groundwater flow
  – Well-field groundwater monitoring
  – Groundwater restoration

• Engineering
  – Solid and liquid waste management
  – Design of evaporation ponds
Radiation Protection Regulations
10 CFR Part 20

• NRC Requirements:
  – Dose limits for radiation workers and members of the public
  – Monitoring and labeling radioactive materials
  – Environmental monitoring
  – Posting signs in and around radiation areas
  – Reporting the theft or loss of radioactive material

• Radioactive materials be used in a way that limits radiation exposure of individual members of the public to a dose that does not exceed 0.1 rem (100 mrem) in a year

• Adults working with radioactive material must be protected so as not to receive more than 5 rems (5,000 mrem) per year

• Workers are monitored with the use of dosimeters
ISR Ground Water Protection Regulations - 10 CFR Part 40

• 10 CFR Part 40 – Appendix A, Criterion 5B(5)
  – Based on EPA regulations – 40 CFR 192
  – Must be restored to Commission-approved background level or maximum contaminate level, whichever is higher
  – Licensees can apply for Alternate Concentration Limits

• 10 CFR Part 40, 42
  – Decommissioning (restoration) begins when principal activities cease
Current NRC UR Universe

- 38 Decommissioning sites
  - 22 Title I facilities (2 in WY)
  - 11 Title II facilities (licensed) (8 in WY)
  - 5 sites under general license to DOE (1 in WY)
- 3 Operating facilities (1 on standby) (2 in WY)
- 1 licensed but not yet constructed
- 25 expected applications by 2013
  - 9 received
    - 2 completed
    - 5 under review
    - 1 on hold (sage grouse)
    - 1 withdrawn
Title II Uranium Recovery Sites

- Pathfinder Lucky Mc
- ANC Gas Hills
- Umetco Gas Hills
- Sweetwater (conventional mill standby)
- UNC Church Rock
- Rio Algom
- Homestake
- Western Nuclear Split Rock
- Exxon Highland
- PRI SR-HUP and Reynolds Ranch (active ISL)
- Irigaray/Christiansen Ranch (possible ISL restart)
- Crow Butte (active ISL)
- Pathfinder Shirley Basin
- Shirley Basin South
- Union Pacific Bear Creek
- Sequoyah Fuels

Note: Colorado, Texas, and Utah are agreement states.
Expected Applications

- 8 New ISRs; 7 in WY
- 10 ISR Expansion; 6 in WY
- 2 New Heap Leach; 1 in WY
- 4 New Conventional; 1 in WY
- 1 ISR restart; 1 in WY
<table>
<thead>
<tr>
<th>Company</th>
<th>Site</th>
<th>Design type</th>
<th>Estimated Application Date</th>
<th>State</th>
<th>Letter of Intent</th>
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<td>ISR - Restart</td>
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<td>Dewey Burdock</td>
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Projected total reviews = 25

Total Uranium Recovery Applications Received = 9
Total New Uranium Recovery Applications = 14
Total Restart/Expansion Uranium Recovery Applications = 11

ISR = In Situ Recovery Facility
TBD = To Be Determined
Conv = Conventional Uranium Mill
FY = Fiscal Year