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#### Advanced Stage Uranium Development in Wyoming



International Atomic Energy Agency

## International Symposium on Uranium Raw Material for the Nuclear Fuel Cycle

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#### **IAEA URAM -2009**

#### Licensing Status of New and Expanding In-Situ Recovery Uranium Projects in the United States

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#### Background .....

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- In-Situ Recovery (ISR) Mining First Tested in the United States (US) in the Late 1960s
- Commercial ISR Mining Started in the US in Mid 1970s
- Today 28% of World Primary Uranium Production Comes from ISR Mining in Australia, Central Asia and the US
- Historically, Only Three States in the US have had Commercial Level ISR Uranium Mining; Nebraska, Texas and Wyoming
- Today, all Commercial ISR Production Comes from These Same Three States – Nebraska, Texas & Wyoming

World and US ISR Percentage of Primary Uranium Production (2008)

• World – 28%

• USA – 77% (of US Production)

Total US Production (approximate)
 3.9 million Pounds as U<sub>3</sub>O<sub>8</sub>
 (1,500 tU)

#### US ISR Uranium Production in 2008 (approximate)



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## History of ISR Production in the USA

• Some Testing in Wyoming in late 1960s

 Commencement of Commercial ISR Operations in Mid 1970s in Texas and Wyoming

 Some Test ISR Mining in Colorado and New Mexico in Late 1970s and Early 1980s





## **Nuclear (Uranium) Renaissance**

- 2002 2003 Uranium Sales Prices Start to Rise
- Renewed Interest in US to Locate & Develop Uranium Properties (primarily in the West)
- Many New Public & Private Companies Formed to Participate in the Boom (400 plus World Wide)
- Re-staking and Re-leasing Previously Known Properties
- Emphasis on Potential ISR Minable Properties but Conventional Also
- Some Serious Companies & Some Just Promotional Companies

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## Then the Air Went Out of the Balloon

- Spot Price Peaked in 2007 at ~\$138/lb. and Then Started Down
- Coupled with the Recession in the World Economy, Financing Uranium Projects Became Difficult and the Majority of the "New" Companies Went Out of Business or Went into Standby (Survival) Mode
- Those Companies with Good Properties, Strong Management and Sound Financial Base Proceeded to **Develop** Properties Towards Production
- Some Companies Were Successful In Selling Out at A Good Time – Fortunes were Made... and Lost

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## **Those That Remained in the US.....**

- Companies Already in ISR Production or with Properties on Standby Made Plans to Either Expand Production or Resume Production
- New Companies with Attractive Uranium Properties Moved Forward with Development Plans
- These Plans Included Preparing and Submitting Environmental License Application on Their Better Projects
- In the US it Typically Takes 15 to 18 Months to Gather the Data and Prepare the License Applications



#### Licensing Process for ISR Projects in the US

- Agreement State Only State License Needed
  - Texas, Colorado
- Non-Agreement State Both Federal & State Licenses Required
  - Nebraska, New Mexico, Wyoming
  - Federal Agency US Nuclear Regulatory Commission (NRC)
  - Duel Jurisdiction / GEIS



#### **Status of Existing ISR Projects** Source: US Energy Information Administration (EIA)

- Crow Butte (Cameco) Nebraska
- Alta Mesa (Mestena) Texas
- Hobson (S. Texas Mining Venture) Texas
- Kingsville Dome (URI) Texas
- Rosita (URI) Texas
- Vasquez (URI) Texas
- Smith Ranch-Highland (Cameco) Wyoming
- Christensen Ranch (Cogema) Wyoming

Producing Producing Standby Standby Standby Standby Producing Standby



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#### Other ISR Project Licensed or Partially Licensed But Not Constructed

- North Butte (Cameco)
- Ruth (Cameco)
- Gas Hills Peach (Cameco)
- Church Rock (HRI)
- Crownpoint

Wyoming Wyoming Wyoming New Mexico New Mexico





#### New Projects or Expansions with License Applications Under Review

- Crow Butte North Trend (Cameco) Nebraska (exp.)
- Crow Butte Plant (Cameco) Nebraska (exp.)
- Dewey-Burdock (Powertech) South Dakota (new)
- Goliad (Uranium Energy) Texas (new)
- La Palangana (Uranium One) Texas (new)
- Nichols Ranch-Hank (Uranerz) Wyoming (new)
- Moore Ranch (Uranium One) Wyoming (new)
- Jab-Antelope (Uranium One) Wyoming (new)
- Lost Creek (Ur Energy) Wyoming (new)

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• Christensen Ranch (Cogema) – Wyoming (restart)

#### NRC Letters of Intent for Planned New ISR Projects or Expansion of Existing Projects

| •                                    | Three Crow (Cameco) Crow Butte Exp.       | Nebraska |
|--------------------------------------|---|----------|
| •                                    | Marsland (Cameco) Crow Butte Exp.         | Nebraska |
| •                                    | Lost Creek (Ur Energy) Lost Creek Exp.    | Wyoming  |
| •                                    | Lost Soldier (Ur Energy) Lost Creek Exp.  | Wyoming  |
| •                                    | Allemand-Ross (Uranium One) Moore R. Exp. | Wyoming  |
| •                                    | Lud <mark>eman (Uran</mark> ium One) New  | Wyoming  |
| •                                    | Smith Ranch (Cameco) Plant Expansion      | Wyoming  |
| •                                    | Reno Creek (Strathmore) New               | Wyoming  |
| •                                    | West Alkali Cr. (Wildhorse) New           | Wyoming  |
| •                                    | Sweetwater (Wildhorse) New                | Wyoming  |
| ٠                                    | Ruby Ranch (Cameco) Smith Ranch Exp.      | Wyoming  |
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# **SUMMARY of ISR PROJECTS**

- Applications for New ISR Projects 10 or Expansion of Existing Projects
- NRC Letters of Intent for New ISR
  Projects or Expansion of Existing Projects
  (Texas & Colorado Not Included)
- <u>If All present and Planned ISR Projects in Production at</u> One Time Total US Production ~ 20 to 25 million lbs./yr (7,700 to 10,000 tU/yr)

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## **US ISR Licensing Issues**

- Staffing Size and Experience (catch-up)
- Duel Jurisdiction Non-agreement States (MOUs)
- NRC Distance Between Office and Projects
- GEIS (generic environmental impact statement)
- License Review/Approval Time Now Two Plus Years (not including time to gather data and prepare the application)

#### COMPARISON

 North Butte Project (Wyoming) Licensed in 1990 by Uranerz USA, Inc. took the NRC About One Year to Review & Approve the License Application, and It Took Six Months for the State of Wyoming to Do the Same. [EA, NRC Field Office]

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