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Outline

- Recent Uranium Production Trends

- Play Elements
  - Source
  - Migration
  - Mineralization
  - Seal

- Catahoula Formation

- Oakville Sandstone

- Summary
Estimates of 21st century World energy supplies
Billion barrels oil equivalent
U. S. Uranium Deposits

**U₃O₈ reserves**, $85.00/lb.

- Wyoming: 301
- New Mexico: 289
- AZ, CO, UT: 128
- Texas: 17

*million pounds

Source: EIA (2006)

Spot Price, Sept. 24, 2007: $85.00/lb.

(Ux Consulting Company, LLC)
U. S. Uranium Production

Pounds U₃O₈


1st Quarter 2nd Quarter 3rd Quarter 4th Quarter

EIA (2007)
GOM Tertiary Uranium-Bearing Units

Modified from Galloway (1977)
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Oligocene Volcanic Source

Modified from Galloway (2007)
Migration

Oakville Transmissivity


Ash deposition 7-10 ppm+

Freshwater flushing

Pedogenesis

Surficial diagenesis

Water leach

Argillation

Open hydrologic system

Argillation, glass dissolution, and zeolitization

6 ppm

4 ppm bound 2 ppm accessible

Modified from Galloway and Kaiser (1980)
Mineralization: Roll Front Genesis

Modified from Hobday and Galloway (1999)


Roll Front Outcrop

Hematitic Core

U Mineralization

from Hobday and Galloway (1999)
Seals and Semi-Confined Aquifers

Serve to concentrate groundwater flow in transmissive intervals

Promote effective recharge and discharge of meteoric water

Leaky seals along fault promote upward migration of reducing fluids

Simulated Fault

Modified from Henry et al. (1982)
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Catahoula Net Sandstone
South Texas

Modified from Galloway (1977)

Holiday-El Mesquite

Bruni

Detailed Map Area

Map showing geographical features including outcrops, fault lines, and locations such as Holiday, El Mesquite, Bruni, Hebbronville, and others in South Texas. The map also includes symbols for surface and shallow subsurface fault, deep-seated fault, radioactivity anomaly or mineralization, and uranium mine or deposit mentioned in the text. The map is modified from Galloway (1977).
Catahoula Sandstone Geometry
Northeastern Duval County

Channel-fill facies
Channel-margin facies

Sand thickness
Fault trace
Bruni and Holiday-El Mesquite

600,000 lb. resources
0.070% grade (EIA, 2002)

Modified from Galloway and Kaiser (1980)
Contours: Weight-percent Iron Sulfide

Bruni Roll Front

Northwest

Southeast

Limonite

Dom. Marcasite

Dom. Pyrite

Modified from Goldhaber and Reynolds (1977)
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Oakville Fluvial Depocenters
South Texas

Modified from Galloway et al. (1982)
George West Uranium Mineralization

Modified from Galloway et al. (1982)
# Summary: Uranium Play Elements in South Texas

<table>
<thead>
<tr>
<th>Play Element</th>
<th>Adequacy and Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
<td>Felsic volcanic source adequate for all Tertiary plays</td>
</tr>
<tr>
<td><strong>Migration</strong></td>
<td>Primarily controlled by transmissive depositional axes</td>
</tr>
<tr>
<td><strong>Mineralization</strong></td>
<td>Geochemical gradients related to organic facies changes, ± faults</td>
</tr>
<tr>
<td><strong>Seal</strong></td>
<td>Impacts zones of hydraulic connectivity, transmissive zones</td>
</tr>
</tbody>
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