

# Special GWPC Presentation

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## *Regulation of In Situ Mining in Texas*

*Presented by Susan Jablonski and David Murry,  
Texas Commission on Environmental Quality*



**Tuesday, October 28, 2008  
Austin, Texas**

# Overview of Presentation

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- ◆ **Recent Legislative Changes**
- ◆ **TCEQ's Role in Uranium Mining**
- ◆ **Current Regulatory Framework**
- ◆ **Implementing Responsibilities**
- ◆ **Rulemaking and Stakeholder Involvement**

# Changes Resulting from 2007 Texas Legislation

- ◆ **Senate Bill 1604, 80<sup>th</sup> Texas Legislature, transferred regulatory authority from the Texas Department of State Health Services (TDSHS) to the TCEQ for:**
  - **Source material recovery licensing (uranium mining surface activities);**
  - **Commercial radioactive waste storage and processing; and**
  - **By-product material disposal**



# Changes Resulting from 2007 Texas Legislation (Continued)

- ◆ **House Bill 3838, 80<sup>th</sup> Texas Legislature, requires TCEQ to establish a registration program for exploration wells permitted by the Texas Railroad Commission that are used for development of applications to the TCEQ for uranium mining**



# The New Division of Regulatory Authority in Texas

## ◆ Texas Commission on Environmental Quality

- Source Material Recovery (uranium mining) – both surface and sub-surface activities
- Commercial radioactive waste processing and storage
- Disposal of by-product material, including waste from in situ mining; low-level radioactive waste; and non-oil and gas NORM



# In Situ Source Material Recovery Regulatory Jurisdiction

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- ◆ **Texas Railroad Commission**: Responsible for permitting for exploration wells for uranium mining
- ◆ **TCEQ Waste Permits Division**: Responsible for Class III Underground Injection Control permitting for uranium mining area, Production Area Authorizations, and aquifer exemptions
- ◆ **TCEQ Radioactive Materials Division**: Responsible for radioactive materials licensing for uranium mining, processing, and disposal facilities

# Active In Situ Recovery Sites

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- ◆ Uranium Resources (URI):

  - Kingsville Dome in Kleberg Co.

  - Rosita in Duval Co.

  - Vasquez in Duval Co.

- ◆ Mesteña Uranium:

  - Alta Mesa in Brooks Co.

# Proposed In Situ Recovery Sites

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- ◆ South Texas Mining Ventures:

  - La Palangana in Duval Co.

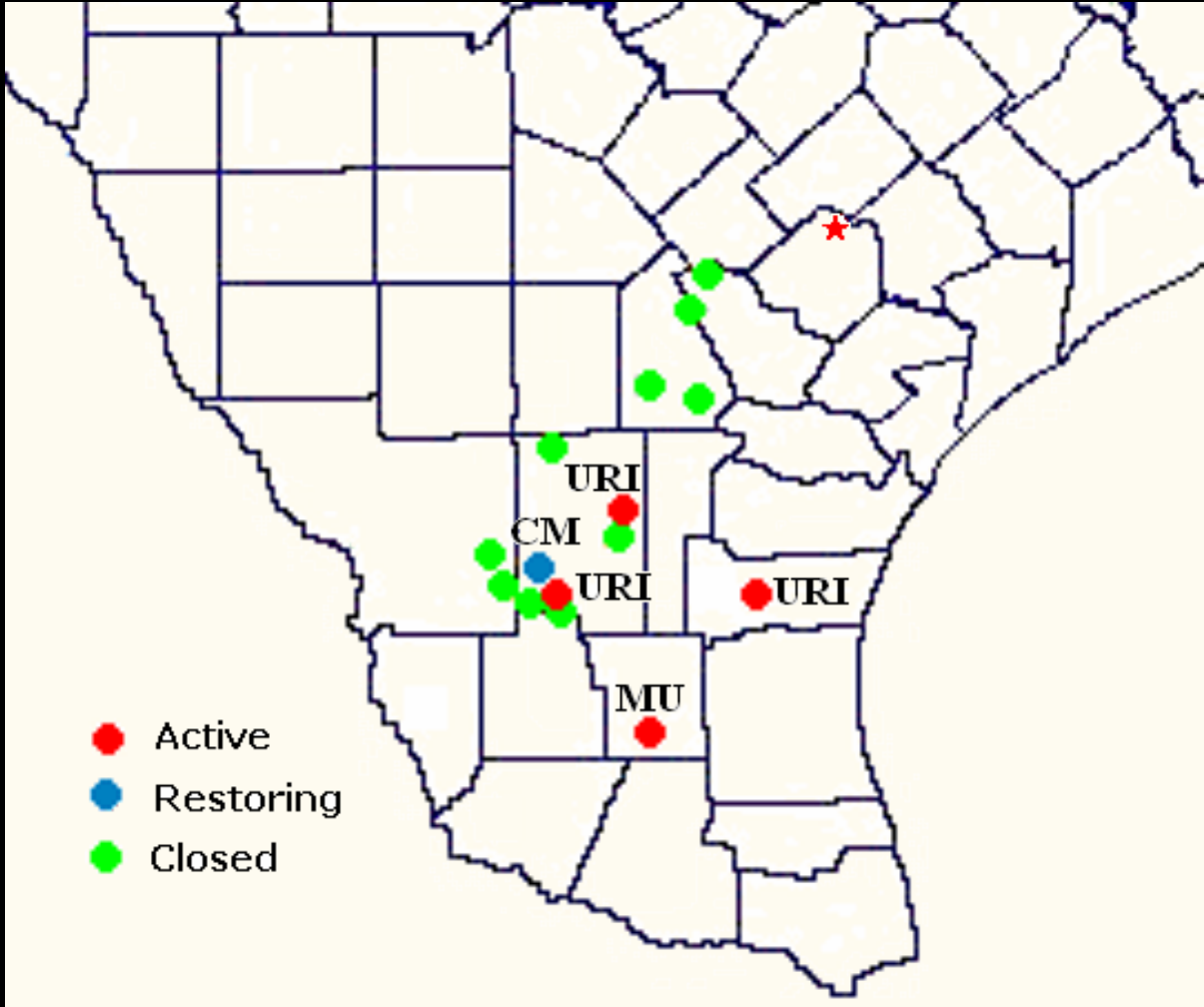
  - Processing site at Hobson in Karnes Co.

- ◆ Uranium Energy Corporation (UEC):

  - Goliad Project in Goliad Co.



# Map of In Situ Uranium Mining Sites



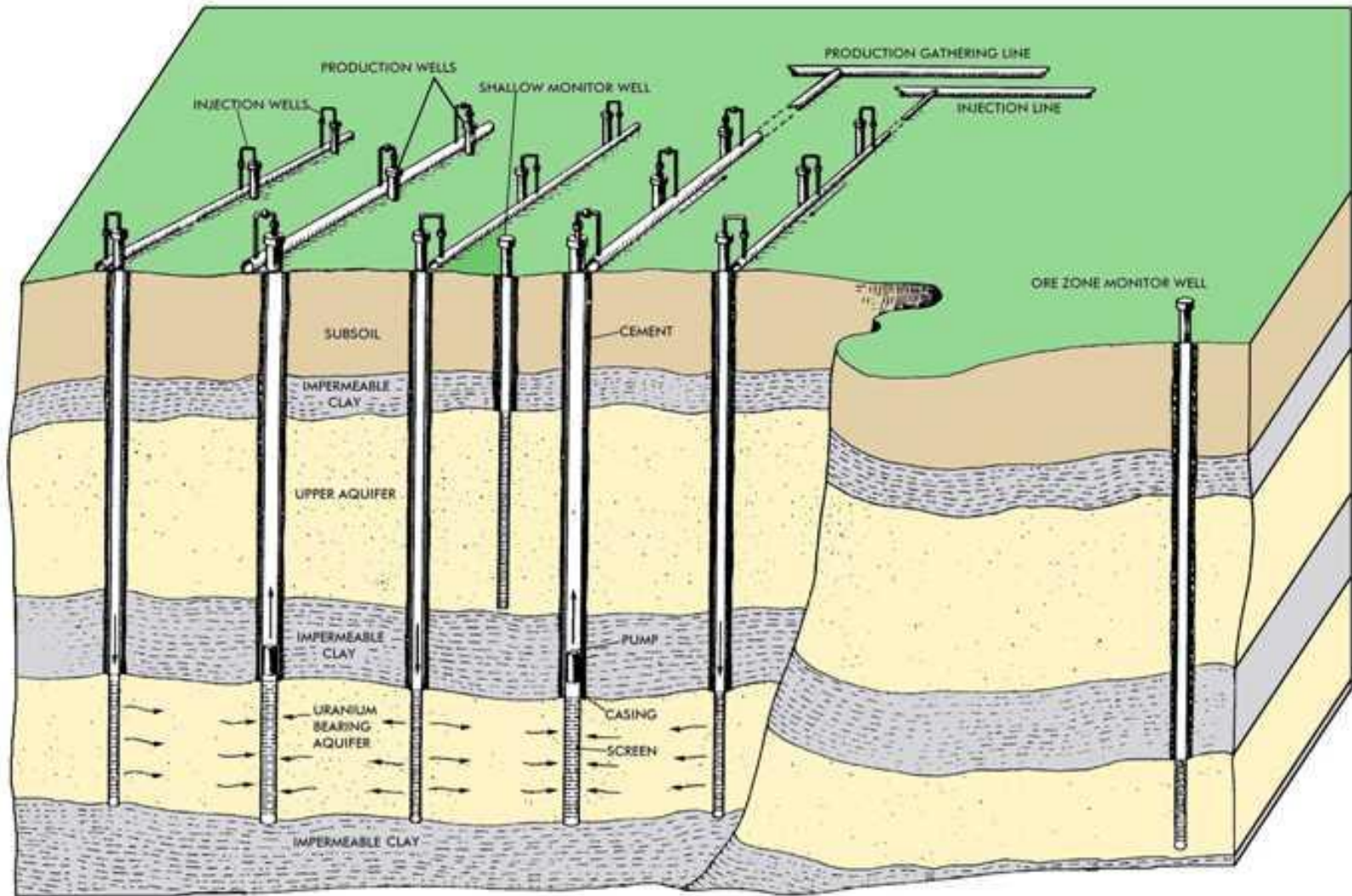
# Injection Well Classification

- ◆ Class I – wells used for injection of hazardous, non-hazardous, or radioactive waste
- ◆ Class II – wells used for oilfield salt water disposal, enhanced oil recovery, and storage of liquid hydrocarbons (these permits issued by RRC)
- ◆ **Class III – injection wells used for in-situ recovery of mineral**
- ◆ Class IV - wells use for injection of hazardous or radioactive waste into or above USDWs (Generally prohibited)
- ◆ Class V – miscellaneous wells, mostly shallow, for injection above or into a USDW
- ◆ Class VI – CO<sub>2</sub> sequestration (proposed)

# Description of In Situ Uranium Mining

- ◆ **Uses a network of injection and production wells completed in a subsurface ore zone**
- ◆ **Injects oxygenated water (sometimes with added sodium carbonate) into the ore zone to dissolve uranium**
- ◆ **Pumps the uranium-bearing solution to the land surface for recovery and processing into the product “yellow cake” ( $U_3O_8$ )**
- ◆ **Recycles the mining process water back into the ore zone for recovery of more uranium**

# Block Diagram of In Situ Uranium Mining Operations



# TCEQ Application Processing

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- ◆ **Administrative Review**
- ◆ **Technical Review**
- ◆ **Preliminary Executive Director Decision - Filing with Chief Clerk** (*for mailing of notices and receipt of mailed comment*)
- ◆ **Final Decision** (*by the Executive Director if uncontested or by the Commission if contested*)

# Highlights of Permitting Technical Review Process

- Regional and local geology & hydrogeology
- Proposed well design, completion, and testing
- Baseline wells
- Proposed Mine Plan
- Proposed restoration procedures
- Aquifer Exemption
- Production area geology & hydrogeology
- Monitor wells
- Update Mine Plan
- Proposed Restoration Table
- Production Area map
- Proposed control parameters for groundwater monitoring
- Financial Assurance

# Highlights of Licensing Technical Review Process

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- **Site Characteristics**
- **Radiation Dose Assessment**
- **Facility Design**
- **Facility Construction**
- **Facility Operations**
- **Waste Characterization**
- **Site Closure**
- **Financial Assurance**
- **Quality Assurance and Quality Control**
- **Qualifications and Personnel**
- **Environmental Analysis**

# Public Participation

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- ◆ **Notices of Completion of Administrative and Technical Review on Individual Actions**
- ◆ **Public Meeting for Formal Comment**
- ◆ **Public Agenda Meetings of the Commission**
- ◆ **Opportunity for Contested Case Hearing**
- ◆ **Motion to Reconsider Decision**



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# Production Area Authorization (PAA) Information

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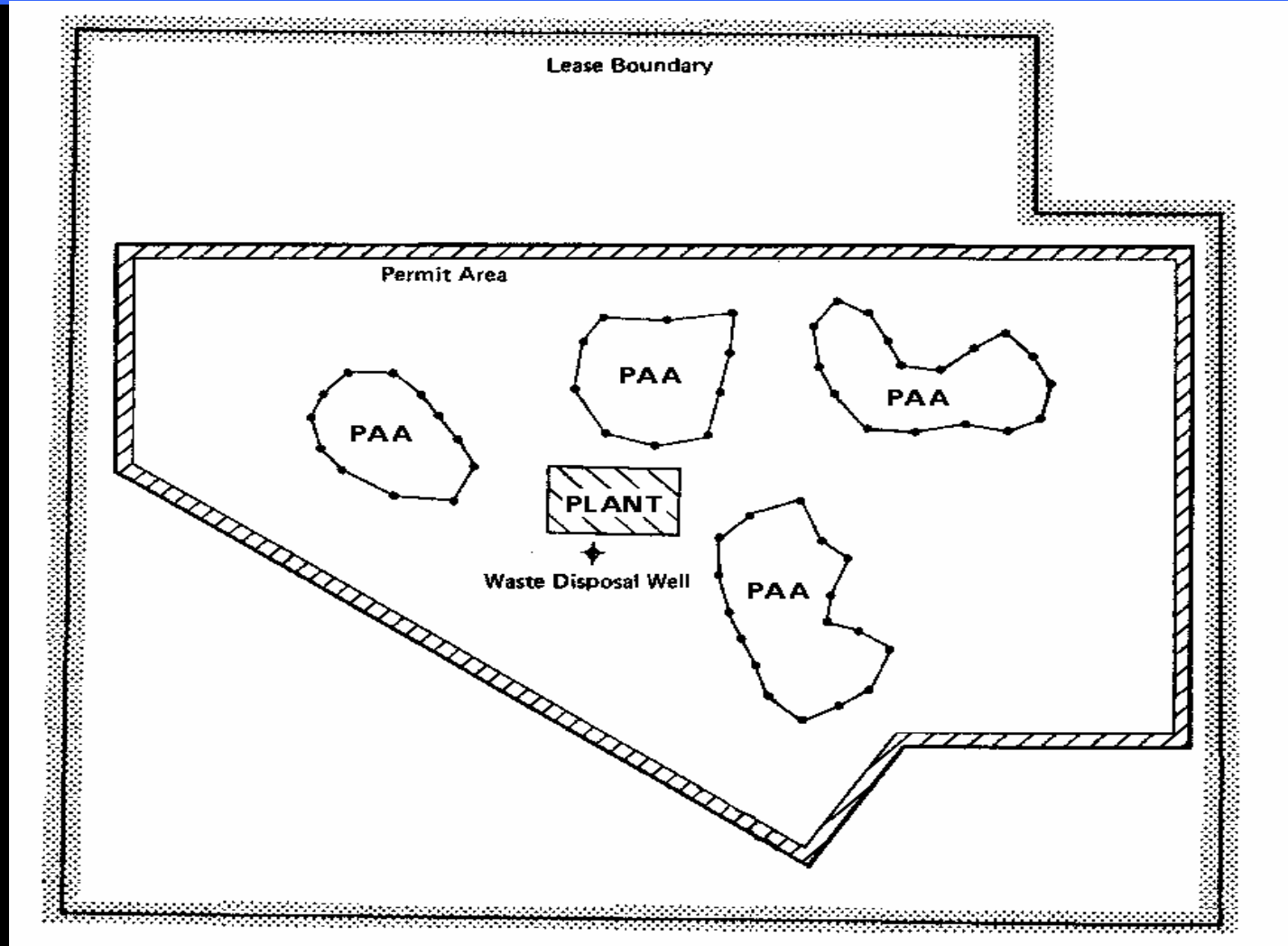
- ◆ Production area geology & hydrogeology
- ◆ Monitor wells
- ◆ Update Mine Plan
- ◆ Proposed Restoration Table
- ◆ Production Area map
- ◆ Proposed control parameters for groundwater monitoring
- ◆ Hydrologic Testing
- ◆ Financial Assurance

# Confinement of Mining Fluids

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- ◆ Mining fluids must be confined to production zone of mine area
- ◆ Operator pumps more water than is injected to direct flow of mining fluids from injection well to production wells
- ◆ Production zone and non-production zone monitor wells are sampled during mining and aquifer restoration to detect any excursions of mining fluids

# Schematic Plan View of In Situ Uranium Mine with Production Area Authorizations (PAA)

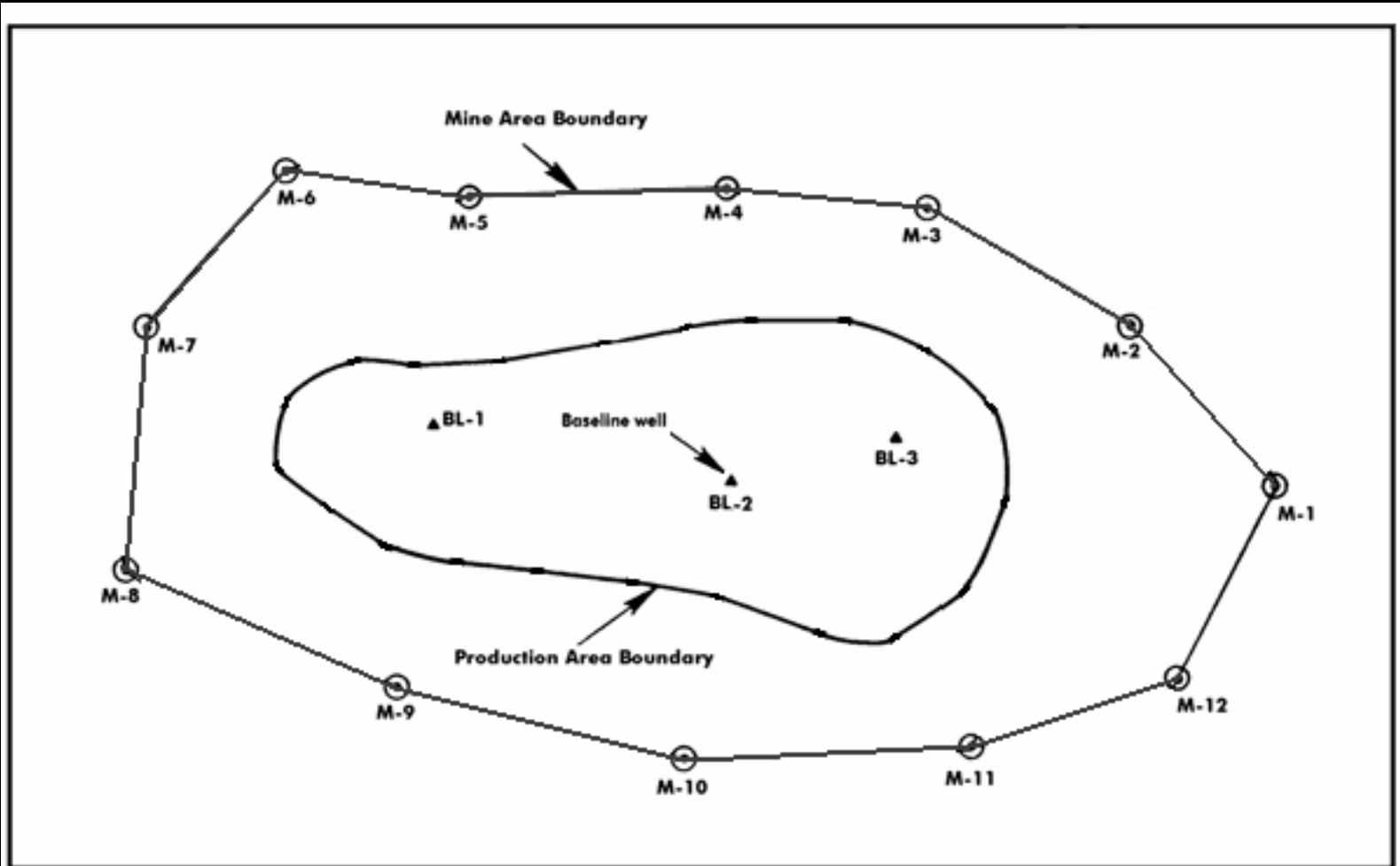


# Production Zone Monitor Wells

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- ◆ Completed in production zone, but outside of mineralization
- ◆ System of wells encircles production area
- ◆ Control parameter limits are established from groundwater sample analyses
- ◆ System of wells encircles production area
- ◆ Wells are monitored during mining and restoration to detect excursions of mining fluids from production zone of production area

# Plan View of PAA with Monitoring Wells



# Underground Source of Drinking Water

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**USDW:** An aquifer or a portion of an aquifer that supplies drinking water for human consumption; or in which the groundwater contains fewer than 10,000 milligrams per liter of total dissolved solids, and is not an exempted aquifer

# Uranium Deposits in South Texas

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- ◆ **To date, all uranium deposits mined in South Texas using in situ methods occur in USDWs, although the water within the mineralized zones does not meet primary drinking water standards untreated.**
- ◆ **Prior to mining, the area and zone to be mined must be exempted from being a USDW.**



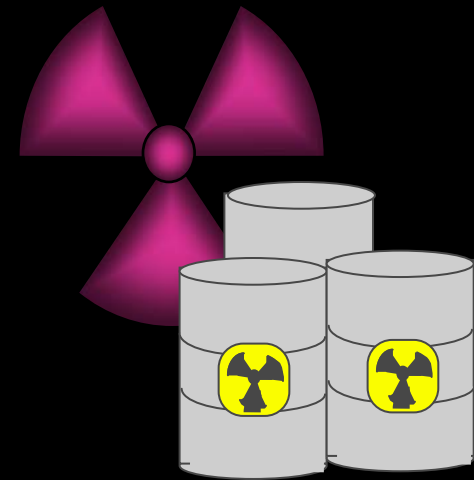
# Aquifer Exemption Criteria

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- ◆ **No one currently drinks the water, and**
- ◆ **Until the quality of the ground water is restored and the exempt status is removed, no one will drink the water because of its mineral or geothermal character, its depth or location, or its pre-existing contamination renders it impractical for treatment to make it fit for drinking.**

# Statutory Priorities Set for TCEQ

- ◆ (1) An application for the disposal of Compact low-level radioactive waste;
- ◆ (2) An application for the commercial disposal of by-product material;
- ◆ (3) An application for termination of a license to recover or process source material and dispose of associated by-product material; and
- ◆ (4) A new application for a permit/license to recover or process source material and dispose of associated by-product material



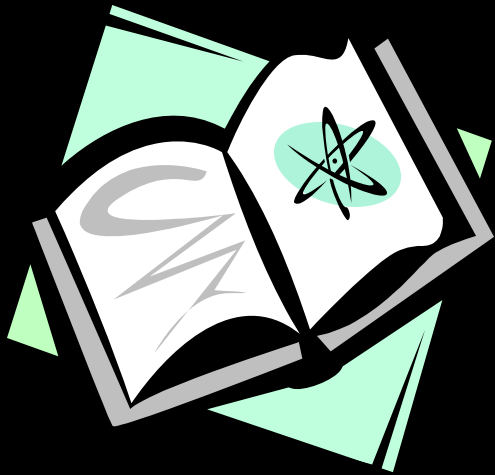
# Classification of Radioactive Material in The United States

- ◆ **By-product Material - Uranium and thorium tailings or waste produced from the extraction or concentration of ore (aka 11e.(2) waste)**
- ◆ **Naturally-Occurring Radioactive Material (NORM)**
- ◆ **High-Level Radioactive Waste  
(Spent fuel from nuclear reactors and weapons waste)**
- ◆ **Transuranic Waste  
(Department of Energy & Department of Defense)**
- ◆ **Low-Level Radioactive Waste**
  - **Class A (~ 97% of total)\***
  - **Class B (~ 2% of total)\***
  - **Class C (~ 1% of total)\***

\* based on national average



# Implementing New Legislation



- ◆ On January 30, 2008, the TCEQ Commissioners adopted Phase I of Senate Bill 1604 implementation to move technical requirements from the TDSHS to the TCEQ
- ◆ Phase I rules were effective on February 28, 2008
- ◆ Phase II rulemaking is underway at TCEQ to address pending requirements related to radioactive materials, including in situ mining

# TCEQ Phase II Rulemaking

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- ◆ **To address financial assurance requirements for transferred programs from the TDSHS to TCEQ**
- ◆ **To address new requirements in SB 1604, including new notice and opportunity for contested case hearings for permitting and new fees collection**
- ◆ **To address well registration requirements of HB 3838**
- ◆ **To address Commission-directed review and revision to the agency's in situ mining program**
- ◆ **To address disposal rate setting for low-level radioactive waste and fee collection**

# Schedule For Phase II Rulemaking

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- ◆ **Five separate stakeholder meetings to discuss rulemaking concepts and rule process**
- ◆ **August 20, 2008 –Commissioners’ Agenda for Proposal of Phase II Rules and acceptance of formal comment**
- ◆ **September 16, 2008 –Public Meeting on Proposed Rules**
- ◆ **January 28, 2008 – Planned Commissioners’ Agenda for Adoption of Rules**

# Updates on Phase II Rulemaking

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- ◆ TCEQ Stakeholder Page for posting information about this rulemaking, received comments and submissions by stakeholders, meeting notes and important dates in rulemaking schedule:

<http://www.tceq.state.tx.us/permitting/radmat/sb1604group.html>

# Need Help or Have Questions...

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