

**Railroad Commission  
Oil and Gas Division  
July , 2011**



# Railroad Commission of Texas

## History

- 1891- Railroad Commission Created
- 1917 – Regulation of Pipelines;  
Conservation laws relating to oil and natural  
gas production

# RRC Organization

- Three Elected Commissioners
  - Chairman Elizabeth Ames Jones
  - Commissioner David Porter
  - Commissioner Barry T. Smitherman
- Five Energy Divisions
  - Oil and Gas Division
  - Safety Division
  - Gas Services Division
  - AFRED Division
  - Surface Mining Division

# Railroad Commission of Texas

Our Mission: We serve Texas by

- our stewardship of natural resources and the environment
- our concern for personal and community safety
- our support of enhanced development and economic vitality for the benefit of Texas

# Statutory Authority

- Texas Constitution – Created RRC
- Texas Natural Resources Code
- Texas Water Code
- Texas Health and Safety Code
- Safe Drinking Water Act
- Resource Conservation Recovery Act
- Clean Water Act

# Texas Natural Resources Code

- Chapter 81: General Jurisdiction
- Chapter 85: Waste Prevention, Rulemaking Authority, Penalties, etc.
- Chapter 87: Regulation of Sour Gas
- Chapter 88: Production Regulation
- Chapter 89: Well Plugging
- Chapter 91: Pollution Prevention, oilfield clean up fund, etc.

# Field Operations Responsibility

- 396,022 Total Wells (June 2011)
- Activity in 241 out of 254 Counties
- All facilities and activities associated with
  - Oil & Gas Exploration
  - Production
  - Processing
  - Transportation
  - Waste Handling and Disposal

# Field Operations Resources

- Staff of 236 in 9 District Offices
  - 88 Field Inspectors
  - 33 OFCU Fund Pluggers
  - 15 OFCU Fund Cleanup Coordinators
- Staff of 11 in Austin



# Requirements vs. Resources

- 396,022 Total Wells/88 Inspectors
  - Approx. 4,500 Wells/ Inspector
- 7148 Orphan Wells/33 Pluggers
- 15 Cleanup Coordinators

# Field Operations Activities

- Regulatory Activities:
  - Monitor Emergency Operations 24/7
    - Blowouts
    - Fires
    - Hydrocarbon Spills
  - Witness Industry Operations & Tests (Priority Jobs)
    - Surface Casing
    - Well Pluggings
    - Mechanical Integrity Tests of Injection and Disposal Wells
    - Fluid Level Tests of Inactive Wells
    - Operator Cleanups

# Field Operations Activities

## – Field Inspections

- Lease
- Drilling Rig
- Plant (Gas, H<sub>2</sub>S Processing, Reclamation, Cycling)
- Pit
- Commercial Waste and Saltwater Disposal Facilities

## – Complaint Investigations

- Conducted by the District Offices
- Monitored by Field Operations Austin

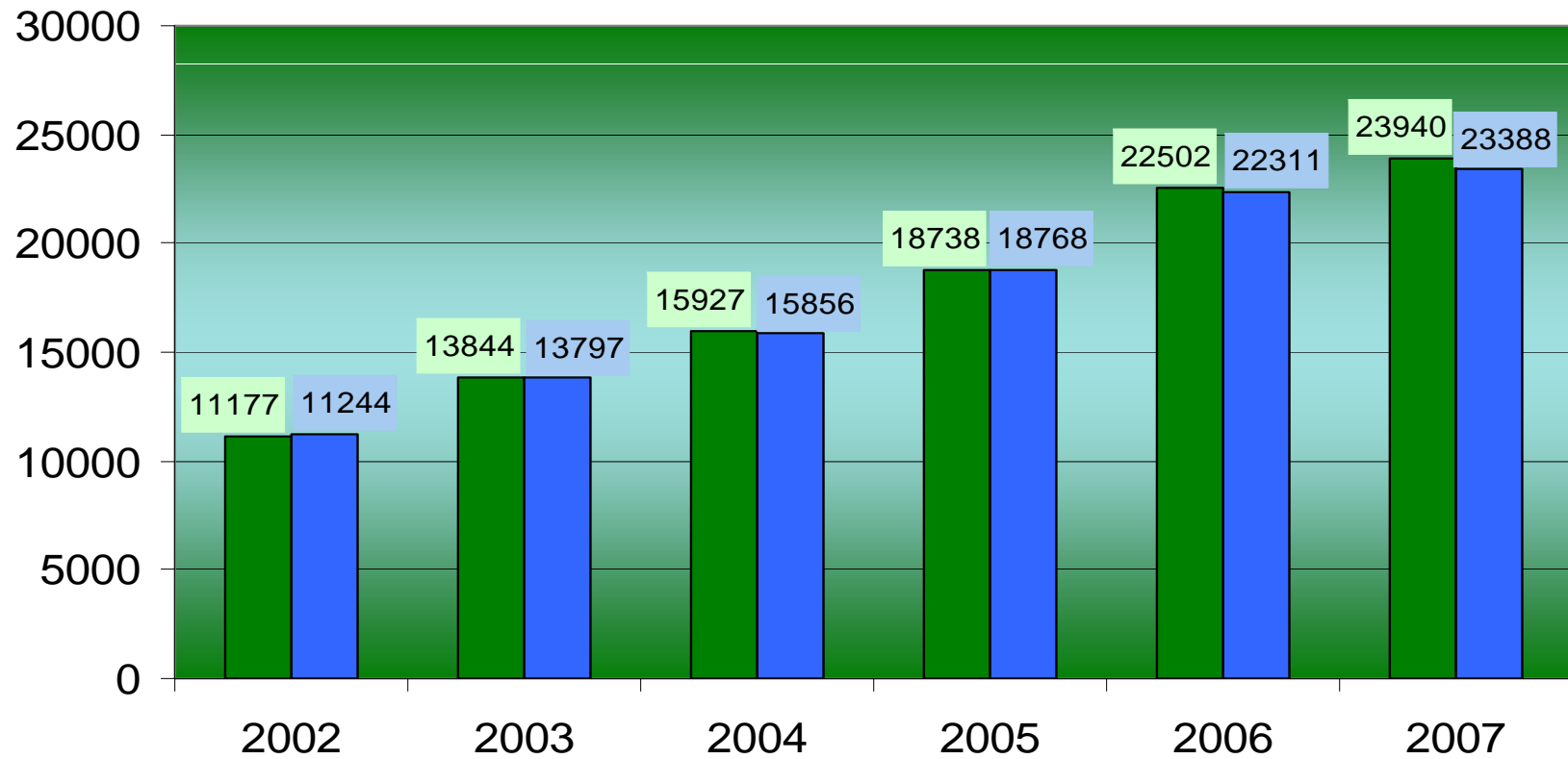
# Field Operations Activities

- **State Funded Plugging Activities:**
  - Plug Approx. 1,500 – 1,800 wells/year
  - Annual Budget of Approx. \$12MM - \$20MM
  - Sell Approx. \$1MM - \$1.5 MM in Salvageable Equipment and Hydrocarbons
  - FY 09: \$17.410 MM plugging; \$3.657 MM Cleanup
- **High Risk Well Testing Program:**

Submitted

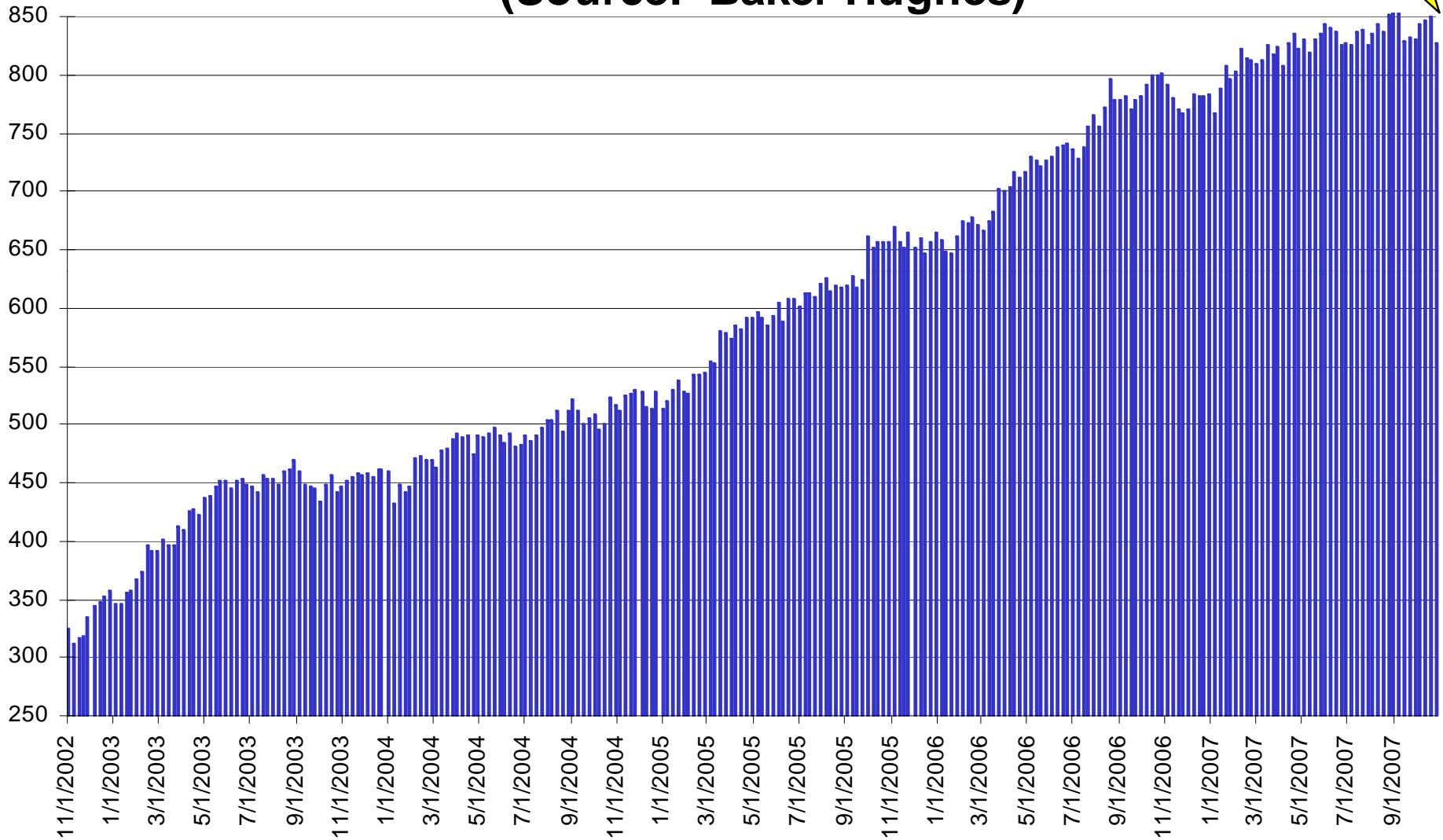
Approved

## Drilling Permits FY2002-FY2007



# Texas Active Rig Count Nov. 2002 -- Oct. 2007 (Source: Baker Hughes)

828 Texas Rigs  
(Oct. 26, 2007)



## **Newark, East (Barnett Shale) Field Wells and Permits**

- Discovery date : October 15, 1981
- As of June, 2011, there were a total of 15,208 gas wells entered on RRC records.
- 3,035 permitted locations
- This field produces in twenty-three (23) counties.

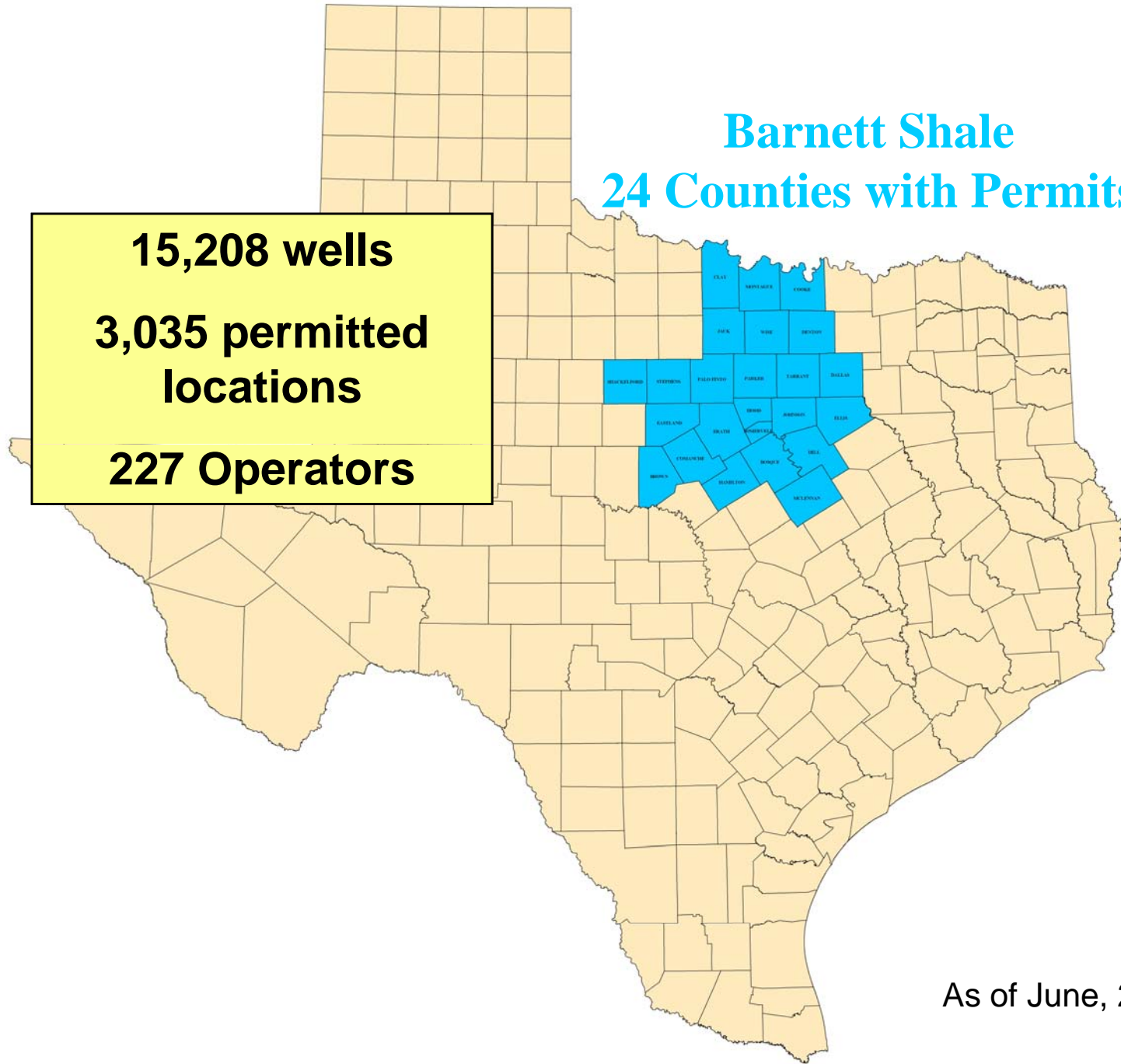
# Newark, East (Barnett Shale) Field Injection and Disposal 2011

- 130 injection wells, including commercial disposal wells
- 4 surface waste disposal facilities
-



## Barnett Shale 24 Counties with Permits

**15,208 wells**  
**3,035 permitted locations**  
**227 Operators**



As of June, 2011

# Barnett Shale Water Issues

**Society has growing need for quality water**

- Hydraulic fracture stimulation is required.  
Horizontal well fracs: > 3 million gallons H<sub>2</sub>O
- Increasing numbers of salt water disposal wells:
- Water Recycling Pilot Projects:
  1. Fountain Quail Water Management
  2. Devon Energy Production Company

**Potentially recycle up to 85% of frac water**

# Statewide Rule 13: Drilling, Casing, and Well Control

- SWR 13: Rule 13(b)(1)(B), “*Wellhead assemblies shall be used on wells to maintain surface control of the well...*”
- Rule 13(b)(1)(C), “*A blowout preventer or control head and other connections to keep the well under control at all times shall be installed as soon as surface casing is set...*”

# SWR 13: Blowouts

- Definition: intentional or unintentional loss of control of a well to the degree the well cannot be shut in or killed upon demand
- FY 03-08 there have been 139 well control incidents. At the same time 102,836 permits were issued and 44,625 wells were plugged. An unknown number of wells were also worked over.

# SWR 13: Public Safety:

- In the event of a release or blowout, public safety is the primary concern of the RRC
- RRC expects responsible party to take all steps necessary to accommodate and protect public
- 29 well control incidents in FY 2007 with 800-900 drilling rigs active on a daily basis, plus 1000s of workover rigs.
- If the operator fails to respond, the RRC will take over.

# SWR 13: Blowouts

- Can involve oil, water, or gas
- Can occur while drilling, producing, on injection, or during plugging of a well
- May or may not involve fire
- **ALWAYS** require immediate notice to RRC District Office

# Greatest Risk in life of Gas Well

- Well Control during Drilling
  - Well Control during Initial Completion
  - Well Control during Fracturing
  - Well Control during Workovers
  - Well Control during Plugging
- 
- The Root cause typically involves Human Error and/or Equipment Failure.

# Statewide Rule 13: Casing & Cementing

- Well must be cased and cemented to:
  - Protect all usable-quality ground water
  - Protection depth established by the Texas Commission on Environmental Quality (TCEQ)
  - Isolate all productive intervals (prevent vertical migration of fluids behind pipe)
  - **Requires 3<sup>rd</sup> Party (cementer) certification – Technical data reviewed by RRC for all new drills in Texas to ensure compliance with SWR 13.**



# Statewide Rule 3: Sign Requirements

- Signs required at the lease entrance, tank battery, and each well
- Sign at the lease entrance: operator name, lease name (as carried on RRC records), and # of acres
- Sign at the tank battery: operator name, lease name, RRC lease #, and commingling permit #, if applicable
- Sign at each well: operator name, lease name, and well #

# SWR 8: Pollution Prevention

- SWR 8: *No activity shall be allowed to affect the quality of surface or subsurface waters of the State of Texas...*
- Willful discharge, or intentional neglect, or failure to operate prudently will likely result in referral to Enforcement

# Statewide Rule 8

- SWR 8(b): *“No pollution. No person conducting activities subject to regulation by the commission may cause or allow pollution of surface or subsurface water in the state.”*

# Statewide Rule 8: Domestic Waste

- Domestic waste on location is under jurisdiction of RRC, not TCEQ or health department
- “Borehole” disposal of domestic waste is prohibited.
- Result: you won’t get a permit for sewage disposal, so get a porta-potty.

# Statewide Rule 8: Drilling Pits

- Drilling pits **MUST** be dewatered within 30 days – 1 year depending on type of fluid.
- Drilling pits **MUST** be backfilled within one year

# Statewide Rule 8: Drilling Pits

- Drilling pits are allowed to contain only mud, cuttings, water
- Prohibited items: pallets, dope buckets, batteries, thread protectors, oil cans, filters...

# “Pit Abuse”

- Unauthorized use of a pit
- Unauthorized waste in authorized pit
- Disposal via pit

**RULE 8: PIT OPERATING GUIDELINES (AUTHORIZED PITS)**

PIT TYPE		AUTHORIZED FLUID/WASTE	DEWATER REQMTS	BACKFILL REQMTS	AUTHORIZED DISPOSAL METHODS			
					DISCHARGE	LANDFARMING	BURIAL	OTHER
RESERVE PITS MUD CIRC. PITS DRILLING PITS	Chlorides ≤ 6,100 mg/l	Drilling fluid or mud Cuttings	1 year	1 Year	Minor Permit Required	On lease with landowner's OK, if chloride <3000 mg/l	Cuttings, sand & silt Dewatered mud Pit liner material	Annular disposal with minor permit
	Chlorides > 6,100 mg/l	Rig Wash DST Fluid	30 Days	1 Year		Not Authorized	On Lease Only	RRC permitted commercial disposal facility
	OIL-BASED MUD	BOP Test Fluid	30 Days	1 Year		Off Lease Burial requires a minor permit	TCEQ commercial disposal if permitted	Other waste with minor permit
COMPLETION or WORKOVER		Spent completion fluids Workover fluids Wellbore material	30 days, or Immediately if not holding fluids	120 days	Not Authorized	Not Authorized	On lease at well site Solids only, no fluids	Fluids down authorized disposal well, not in pit
BASIC SEDIMENT or PARAFFIN <50 BBL Capacity <250 SQ FT Surface Area		Prod vessel bottoms Tank bottoms Paraffin	NO free fluids allowed	120 days after final use	Not Authorized	Not Authorized	On lease only Off lease burial requires minor permit	Reclamation Plant RRC commercial disposal facility
FLARE		Hydrocarbons during upset conditions	48 hours	120 days after final use	N/A	N/A	N/A	N/A
FRESH WATER MAKE-UP		Fresh Water	1 year	1 year after final use	Minor Permit required			
FRESH WATER from CONDENSATE Requires permit at gas plant		Condensate from natural gas at pipeline drips and compressor stations	120 days after final use	120 days after final use	No Discharge into surface waters	Authorized	Authorized	Evaporation
SUMPS: 500 Gal. Max Capacity Constructed of concrete, steel, or fiberglass		Lube Oil Antifreeze Glycol Pigging liquid Fresh wash water	To prevent overflow	After final use	Not Authorized	Not Authorized	Not Authorized	Fluid: authorized disposal well. Recycle into system
TRASH		Inert Waste Only	N/A	N/A	No discharge into surface waters	Authorized	Authorized	TCEQ commercial disposal facility if authorized by permit No household waste



# Statewide Rule 91: Crude Oil Spills

- Cleanup of soil (in non-sensitive areas) contaminated by oil spill
- Requires removal of free oil
- Requires horizontal & vertical delineation of area of contamination with  $> 1\%$  TPH
- Requires soil  $> 1\%$  TPH to be brought to surface for disposal or remediation

# Statewide Rule 91

- For non-sensitive areas, oil releases must be below 1% TPH within one year.
- Clean up of spills in sensitive areas are evaluated on a case by case basis.

# Statewide Rule 16: Completion Reports

16(b): *The operator of a well shall file with the commission the appropriate completion report within 30 days after completion of the well or within 90 days after the date on which the drilling operation is completed, whichever is earlier.*

# SWR 20 requires immediate notification of the following:

- All Fires
- Blowouts and loss of well control
- Releases of oil or condensate > 5 bbl gross
- Any release affecting groundwater or surface water

# Fires:

- *Any* fire on a lease, oil well, gas well, drilling rig, well servicing unit, tank battery, pipeline, pit, water tank, gas plant, compressor, spill, etc....
- Is a reportable incident if related to oil and gas production.

# UIC Injection Well Classes

- Class I: hazardous waste
- Class II: O&G brine disposal
- Class III: steam, water, etc for mineral extraction
- Class IV: inject hazardous or radioactive into or above USDW
- Class V: other types, simple (septic) or complex (pilot test-wells)

# Injection and Disposal Well Issues

- State Primacy from EPA-April 23, 1982
- RRC gains authority over all Class II wells
- State regulations must be as stringent as the federal requirements, but *may be* more stringent (Statewide Rules 9 and 46).
- UIC wells have many specific requirements designed to ensure environmental protection and public safety

# The Population of Injection wells

- Texas has 50,650 injection and disposal wells in service at any given time.
- 38,000 of these wells are injection wells used for secondary recovery purposes.
- 11,700 of these wells are disposal wells used to dispose of oilfield brine.
- 800 of these wells are hydrocarbon storage wells
- 150 brine mining and other misc. wells



# Statewide Rules 9 and 46

- SWR 9: Disposal into a formation not production of oil or gas.
- SWR 46: Injection or disposal into a formation productive of oil or gas.

# Statewide Rule 9/46

- No person may dispose (into non-productive formation) or inject (into productive formation) fluid oil & gas waste into a well w/o a permit
- Permit will specify authorized interval, injection pressure, & injection volume
- Requires injection through tubing & packer
- Requires initial & periodic mechanical integrity tests (typically every 5 years)

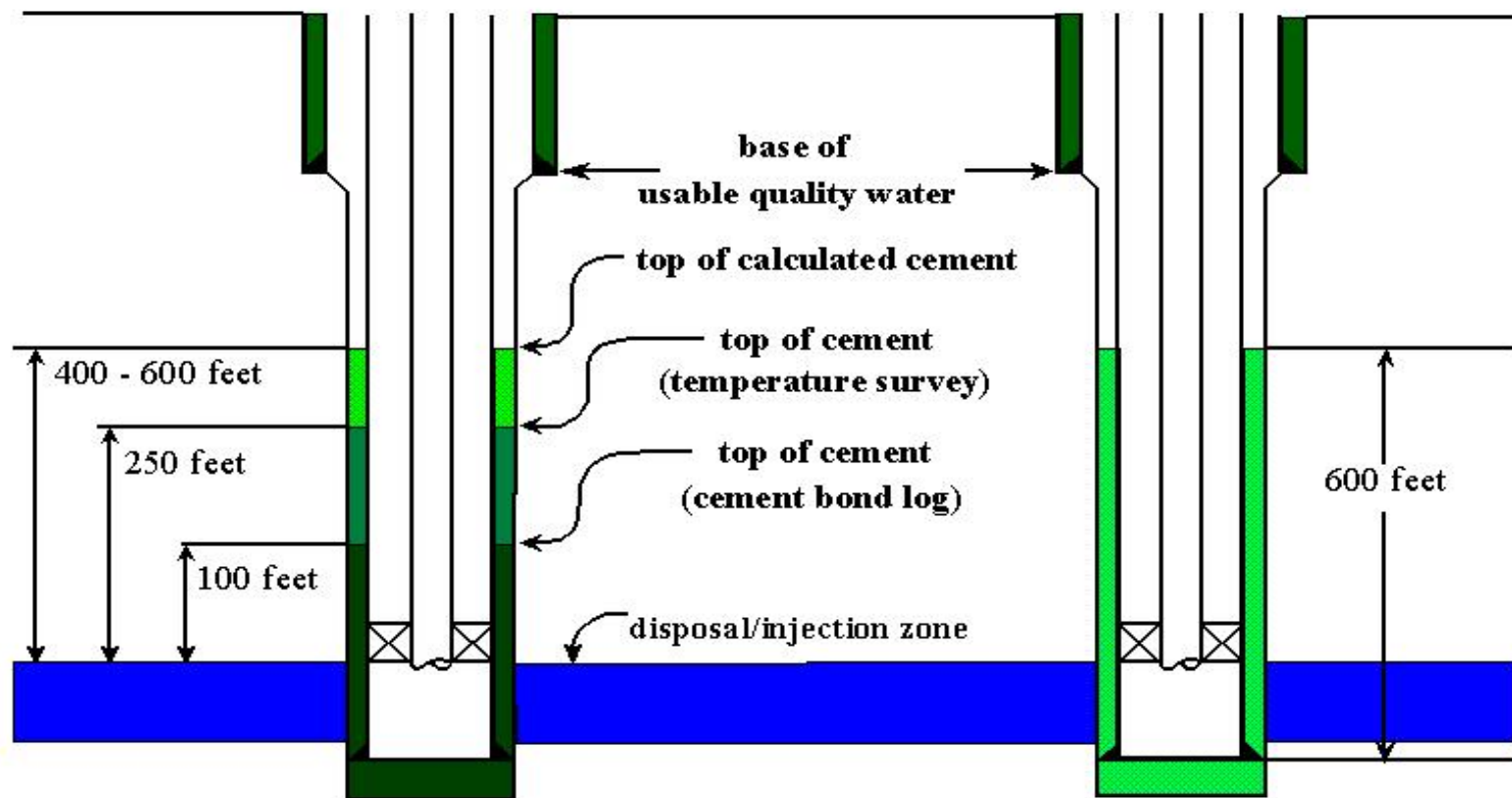
# Commercial Disposal Operations

- Commercial if fluids are trucked in and a disposal fee is charged.
- Expanded Notice Requirement to include adjoining surface owners.
- Special Operating Conditions Apply
  - 24 hour security
  - Tank level indicators
  - Catch basins at offload valves
  - Secondary containment around tanks

# Permitting Requirements

- Notice and Hearing Opportunity
  - Surface owner, offset operators, local government, publication in newspaper.
  - Commissioners carefully review/scrutinize each protested application.
- Area of Review – All wells within ¼ mile
- Geologic Requirements – Overlying Strata for Isolation of injected fluids.
- Three Layers of Protection
  - Surface Casing – Protect Usable-Quality GW
  - Production Casing
  - Tubing and Packer Requirements

## Criteria for Determining the Adequacy of Cement



# Barnett Shale Disposal Permitting Criteria (2004)

- Doubled the area of review around proposed injection wells from  $\frac{1}{4}$  mile to  $\frac{1}{2}$  mile
- Reduced maximum injection pressure by 50%; limited maximum injection rate (5,000 barrels/day) for wells injecting above the Barnett Shale
- Not more than 25,000 barrels/day at an injection pressure of .5 psig/ft for deeper disposal
- Encouraged disposal into the Ellenberger formation, below the Barnett Shale.

# Statewide Rule 9/46

## Permit Conditions

- Permit will specify authorized interval, injection pressure, & injection volume
- Requires injection through tubing & packer
- Pressure observation valves are required on the tubing and each casing annulus (for detection of down hole mechanical problems).
- Requires initial & periodic mechanical integrity tests (typically every 5 years).

# Abandoned Wells



# Statewide Rule 14(b)(2)

- SWR 14(b)(2) Compliance :
  - Inactive Well: A well that has been shut-in for 12 consecutive months
  - Inactive wells must be plugged or otherwise brought into compliance by one of the following methods:
    - Return to active status
    - Obtain Extension

# Plugging Requirements

- Proposed procedure must be approved by RRC (Form W-3A) in advance.
- Must use RRC approved plugger.
- Isolate all productive horizons.
- Isolate all usable quality water zones.
- Cut off casing three feet below ground surface.
- When last well on lease is plugged, remove all tanks and vessels within 120 days (effective Sept 1998).
- **Requires 3<sup>rd</sup> Party (cementer) certification – Technical data reviewed by RRC for all well plugging in Texas to ensure compliance with SWR 14.**

# Compliance/Enforcement

- 121,667 inspections in FY 2010
- Violation Notices – Verbal/Written
  - 71,646 documented violations in FY 10
- P-4 Cancellation/Well Seal In (SWR 73)
- Request for Administrative Penalty Action
  - 447 referrals In FY 10
- Request for OFCU Funding – only in emergency situations, or after all means of obtaining compliance from responsible party have been exhausted

# Compliance/Enforcement (cont.)

- Referral to Attorney General's Office
  - Administrative Penalty Action Case for enforcement of RRC Order and collection of administrative penalties
  - Reimbursement Case for collection of plugging expenses
  - Both assess and collect additional civil penalties, court costs, and attorneys fees Reimbursement and Collection of penalties
- All Collections deposited into OFCU Fund for plugging of orphaned wells and site clean up.

# Enforcement Initiatives:

- Inter-agency Activities
  - Coordination with EPA on major incidents
  - Coordination with TCEQ on gas venting, nuisance odors, co-jurisdictional discharges
  - Cooperation with Department of State Health Services (DSHS) Radiation Control on NORM issues (your NORM should be tagged!)

## § 81.0531. Administrative Penalty

- (a) If a person violates provisions of this title which pertain to safety or the prevention or control of pollution or the provisions of a rule, order, license, permit, or certificate which pertain to safety or the prevention or control of pollution and are issued under this title, the person may be assessed a civil penalty by the commission.
- (b) The penalty may not exceed **\$10,000** a day for each violation. Each day a violation continues may be considered a separate violation for purposes of penalty assessments.