



Drilling Mud: Waste or Reuse?

A TEXAS STUDY

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Overview

- ❖ Oil and gas (O&G) exploration and production (E&P) RCRA Exemption
- ❖ Texas Commission on Environmental Quality (TCEQ) Vs. Railroad Commission of Texas (RRC)
- ❖ Drilling mud management under TCEQ regulations
 - ❖ Waste generation
 - ❖ Disposal options
 - ❖ Source reduction / waste minimization measures
- ❖ Drilling mud management under RRC regulations
 - ❖ Statewide Rule 8 Authorizations versus Permits
 - ❖ Non-Commercial Drilling Fluid Recycling options
 - ❖ Land Spreading Activities



RCRA Exemption 40 CFR 261.4(b)(5)

Exempt

- ❖ Produced water
- ❖ Drilling fluids and drill cuttings from E&P
- ❖ Well completion, treatment, and stimulation fluids
- ❖ Workover wastes

Rule of thumb: the waste should come from downhole

Not Exempt

- ❖ Unused fracturing fluids or acids
- ❖ Used equipment lubrication, hydraulic, or maintenance fluids
- ❖ Service company wastes, such as drums, drum rinsate, etc.
- ❖ Waste solvents, acids, cleaners, etc.

Rule of thumb: not unique to the oil and gas E&P activity

Regulations for Drilling Mud Disposal

TCEQ

- ❖ Regulates wastes derived from activities associated with refined products
- ❖ Title 30 TAC Chapter 330
 - ❖ Municipal solid waste & special waste regulations
- ❖ Title 30 TAC Chapter 335
 - ❖ Industrial solid waste regulations

RRC

- ❖ Regulates wastes derived from activities associated with crude oil and natural gas
- ❖ Statewide Rule 8
 - ❖ Surface waste management regulations
 - ❖ Pits, ponds impoundments
 - ❖ Land farms
 - ❖ Land treatments
 - ❖ Land application
- ❖ Chapter 4, Subchapter B
 - ❖ Commercial recycling of fluids and muds

Constructing Refined Products Pipelines

- ❖ Wastes derived from this activity are:
 - ❖ Not RCRA Exempt
 - ❖ Regulated by the TCEQ
- ❖ Drilling mud may contain:
 - ❖ Water
 - ❖ Bentonite
 - ❖ Polymers (lots of variations possible)
- ❖ Waste determination is based on what the mud contains
 - ❖ Hazardous or Class 1, 2, or 3 non-hazardous



TCEQ Industrial & Hazardous Wastes

Generator Status	VSQG	SQG	LQG
Monthly Hazardous Waste Generation	<220 lbs.	220 -2,200 lbs.	>2,200 lbs.
Monthly Acutely Hazardous Waste Generation	Up to 2.2 lbs.	Up to 2.2 lbs.	> 2.2 lbs.

When Mud is NOT a Solid Waste

30 TAC 335.1(146)(A) – What is a SOLID WASTE?

❖ Exempt Materials

- ❖ **Uncontaminated** soil, dirt, rock, sand, and other natural or man-made **inert** solid materials used to fill land if the object of the fill is to make the land suitable for the construction of surface improvements
- ❖ Contaminated – contains a “pollutant” or “hazardous substance”
- ❖ Inert – Essentially insoluble and non-putrescible

❖ Recycled Materials

- ❖ Drilling fluid reuse
- ❖ Drilling mud used for construction



Exempt: Not a Solid Waste

- ❖ Drill mud and/or soil cuttings are not contaminated
 - ❖ No chemical additives were used during drilling
 - ❖ Water and bentonite clay (or other natural clay) may be used
 - ❖ The drill site was also not contaminated (no prior spills or impacted media)
- ❖ You may:
 - ❖ Place these materials on the ground to:
 - ❖ Backfill a pit
 - ❖ Use as fill on or off-site (with landowner permission)
 - ❖ Line a stock pond (better with high clay content)
 - ❖ Skip notification to the TCEQ under 30 TAC 335.6
 - ❖ This material is not a solid waste



Recycling: No longer a Solid Waste

- ❖ Recycling in a manner that constitutes land disposal
 - ❖ Placement on the ground outdoors
 - ❖ Document the characterization of the waste
 - ❖ Do not place Hazardous or Class 1 wastes on the ground
- ❖ Notification is required (30 TAC 335.6(a) and (c))
 - ❖ For on-site and/or off-site recycling
 - ❖ Submit TCEQ Form at least 90 days prior to recycling activities
- ❖ Landowner permission is also required

Reduce your waste burdens!

- ❖ Plan ahead
 - ❖ Keep rain out of your waste pits
 - ❖ Drilling fluid systems that recirculate
- ❖ Product substitution / avoidance
 - ❖ Low toxicity fluids
 - ❖ Avoid additives with chromium, barite, cadmium, and mercury
- ❖ Recycle whenever possible

TCEQ Disposal Options

Off-Site Disposal

- ❖ TCEQ-Permitted MSW Landfill
 - ❖ Must accept “Special Waste”
 - ❖ Waste must be “characterized” and meet disposal criteria
- ❖ TCEQ-Permitted IHW Landfill
 - ❖ Waste must be characterized and meet disposal criteria

On-Site Disposal

- ❖ TCEQ IHW On-Site Landfill (30 TAC 335.2(d)(1))
 - ❖ No permit required
 - ❖ Nonhazardous industrial waste
 - ❖ Property owned or effectively controlled by the generator
 - ❖ Disposal within 50 miles from generation
 - ❖ Not co-mingled with wastes from other sources
 - ❖ Must notify TCEQ per 30 TAC 335.6

E&P Drilling Mud Management

- ❖ Wastes derived from this activity are:
 - ❖ RCRA Exempt
 - ❖ Regulated by the RRC
- ❖ Drilling mud may contain:
 - ❖ Water
 - ❖ Bentonite
 - ❖ Polymers, paraffin, produced water, treating chemicals, crude oil, etc.
- ❖ Disposal of RCRA-exempt wastes must not cause pollution of surface or subsurface water



RRC Statewide Rule 8: The Basics

- ❖ Get a permit for:
 - ❖ Activities on a lease other than where the oil and gas is generated
 - ❖ transporting, handling, storing, discharging, disposing, or reclaiming, or recycling oil and gas
- ❖ Do not site pits in the 100-year floodplain
- ❖ Any method of disposal not authorized by the rule or permitted is prohibited!
- ❖ The only pit absolutely prohibited by the rule is a pit used for the storage of oil.

A Pit by any other name...

PITS AUTHORIZED BY STATEWIDE RULE 8

Pit	Waste
Reserve and mud circulation pit	Drilling fluids, cuttings, rig wash, drill stem test fluids, blowout preventer test fluids
Completion/workover pits	Spent completion fluids, workover fluids, material cleaned out of wellbore
Basic sediment pits	Basic sediment from production vessels or oil storage tanks (no free saltwater or oil)

PITS REQUIRING A PERMIT

Pit
Drilling fluid storage pits (other than mud circulation pits)
Drilling fluid disposal pits (other than reserve pits or slush pits)
Washout pits
Saltwater storage or disposal pits
Collecting or skimming pits
Brine or brining mining pits
Gas plant evaporation/retention pits
Any other pit not specifically authorized

Authorized by Statewide Rule 8

❖ Reserve pits and mud circulation pits

- ❖ Drilling fluids (fresh water, salt water, or oil base)
- ❖ Drill cuttings, sands, and silts separated from the circulating fluids
- ❖ Wash water used for cleaning drill pipe
- ❖ Drill stem test fluids, and
- ❖ Blowout preventer fluids

❖ Dewater, backfill and compact the pit

- ❖ Where fluids contain chlorides at 6,100 mg/L or less: within one year
- ❖ Chlorides >6,100 mg/L: dewater in 30 days and backfill within one year

Authorized by Statewide Rule 8

❖ Completion and Workover Pits

- ❖ Dewater within 30 days and backfill and compact within 120 days of well completion

❖ Basic Sediment Pits

- ❖ Dewater, backfill and compact within 120 days of final cessation of using the pit

RRC Drilling Fluids: Recycling!

Non-Commercial Fluid Recycling (NCFR) Pits

Statewide Rule 8

Have additional design criteria

Must be emptied/inspected annually

Double lined with monthly leak monitoring

Notify District in writing prior to construction or use

Commercial Recycling Activity

Chapter 4, Subchapter B

Division 1 – General Requirements

Division 2 – On-lease solid waste recycling for reuse as road base

Division 3 - Off-lease solid waste recycling for reuse as road base

Division 4 – Stationary solid waste recycling

Division 5 – Off-lease fluid recycling

Division 6 – Stationary fluid recycling

Non-Commercial Fluid Recycling

- ❖ Certain wellbore fluids may be treated and reused without a permit (Rule 8(d)(7)(B)
 - ❖ Produced formation water
 - ❖ Completion/workover fluids
 - ❖ Fracture blowback fluids
- ❖ Notify the District office seven (7) days before recycling operations begin
- ❖ A permit is required to discharge to waters of the state

- ❖ NOTE: drilling mud manufacturer's are subject to TCEQ regulations

RRC: Land Spreading Facilities

“...uses the physical, chemical and biological capabilities of soil-plant systems to control waste migration without impairing the land for future use...”

- ❖ **Landfarming:** treat and dispose of freshwater-based drilling fluids and cuttings
- ❖ **Land treatment:** treat and dispose of oil-based drilling fluids and oil-impacted soils
- ❖ **Land application permit:** alternative to discharge of fluid wastes

Note: Non-commercial and commercial criteria exist. What follows is non-commercial only!

RRC: Landfarming

- ❖ Statewide Rule 8(d)(3): authorizes without a permit provided:
 - ❖ Specifically approved wastes (see below) disposed on lease
 - ❖ With written consent of landowner
- ❖ Wastes approved without a permit include:
 - ❖ Water base drilling fluids with chloride concentration 3000 mg/L or less
 - ❖ Drill cuttings
 - ❖ Sands and silts obtained while using drill fluids with chloride limit above, and
 - ❖ Wash water used for cleaning drill pipe and other equipment at the same well site
- ❖ Must not cause pollution of surface or subsurface water

Other landfarming operations require a permit!

RRC: Land Treatment Facilities

To spread other oil and gas wastes, including oil-based drilling fluids and cuttings, obtain a permit.

- ❖ Application made to Technical Permitting (Austin) and District Office
- ❖ Sites should have natural features that prevent or minimize release of pollutants, such as:
 - ❖ Isolation from or considerable depth to groundwater
 - ❖ Protection against flooding
 - ❖ Low permeability soils
 - ❖ Topography with low erosion potential
- ❖ Requires a written notification to the surface-owner and, if within corporate limits, to the city official
 - ❖ allows a 15-day opportunity to protest

RRC: Land Application Permits

...refers to a Permit to land apply produced water or gas plant effluent...

- ❖ Potential to cause pollution of surface or subsurface water is considered
- ❖ Other factors affect suitability, such as:
 - ❖ Wastewater quality
 - ❖ Soil characteristics
 - ❖ Topography
 - ❖ Depth to and quality of groundwater
- ❖ Requires a written notification to the surface-owner and, if within corporate limits, to the city official
 - ❖ allows a 15-day opportunity to protest

Disposal at a TCEQ- MSW Facility

- ❖ “Special wastes” include oil and gas E&P wastes typically regulated by the RRC
 - ❖ TCEQ Regulatory Guidance RG-003
- ❖ The following “special wastes” require written authorization from RRC and/or TCEQ before disposal in a TCEQ MSW Landfill, including:
 - ❖ Drill cuttings
 - ❖ Drilling muds
 - ❖ Unused drilling muds
 - ❖ Unused mud additives
 - ❖ Sand produced during exploration
 - ❖ Soil contaminated by crude oil or lube oil hydrocarbons

Any
Questions?

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