

# **Oil and Gas Floodplain Management**

Oklahoma Floodplain Managers Association

# We need to regulate Oil and Gas in our Floodplains

- Many Oklahoma communities are not following floodplain regulations for oil and gas development in their floodplains.
- O/G is heavily regulated by the Oklahoma Corporation Commission, but they don't require any floodplain management practices.

# Where We Are Headed

- The Oklahoma Water Resources Board and the Oklahoma Floodplain Managers Association are working toward standardizing oil and gas floodplain permitting across the state.
- We need cooperation from all counties in the NFIP!

# Why do we need a statewide consistent effort?

- Some communities are requiring too much regulation of oil and gas in their floodplains.
  - ex: all production sites must be elevated *and* anchored.
- Some communities are requiring too little.
  - not regulating at all or simply giving a permit with no oversight.
- These widely varying requirements are difficult for the O/G industry and are causing problems for floodplain management.

# Due Consideration

- Our efforts at permitting the industry must not place undue hardship on a business that is often required to be in the floodplain.
- This is STATE LAW: OS 82 Section 1614

# Process your permits quickly

- The Oil and Gas industry often needs to move quickly once they decide to drill.
- It is in the best interest of our state floodplain management program and the O/G industry to process their permits without delay.

## OFMA's recommendation:

Regulate the industry in an *expedient manner*, enforcing the *minimum* NFIP standards

# FEMA Guidance

- *Interim Technical Guidance on Drilling Oil and Gas Wells in Special Flood Hazard Areas*
- Brief, general guidelines which are included in this presentation.

**Why is it important to regulate the oil and gas industry in our floodplains?**

# Kingfisher, OK, August 19, 2007



# Bartlesville OK, July 3, 2007



Yukon, OK, August 22, 2007



# Pipeline Break, Blaine Co., OK



# Canadian County, OK, May 9, 2007



# Coffeyville, Kansas, July 2, 2007



REUTERS/Cindy Price/The Coffeyville Journal/Handout

# Identifying O/G Equipment

- It's hard to permit equipment if you don't know what it is.
- Different counties and states may have different types of production equipment.

# Safety

- Get permission to go onto site.
- Watch out for dangers at the site.
- Safety concerns:
  - Poisonous Gas
  - Chemicals
  - Energized Electrical Equipment
  - Potentially Explosive Atmosphere

# Drilling Rig

Drills the production hole.



# Well Head/Christmas Tree



Assembly of valves, pipes, and fittings used to control the flow of oil and gas. May need a flood protection fence.

# Pump Jack



Lifts oil and water from the reservoir through the well bore to the surface. Does not need anchoring.

# In-Line Heater

Used to facilitate crude oil and gas in cold temperatures, when the emulsion is very heavy, or when paraffin is present.



# Separators



Separates natural gas from  
crude oil and water.

# Heater Treater

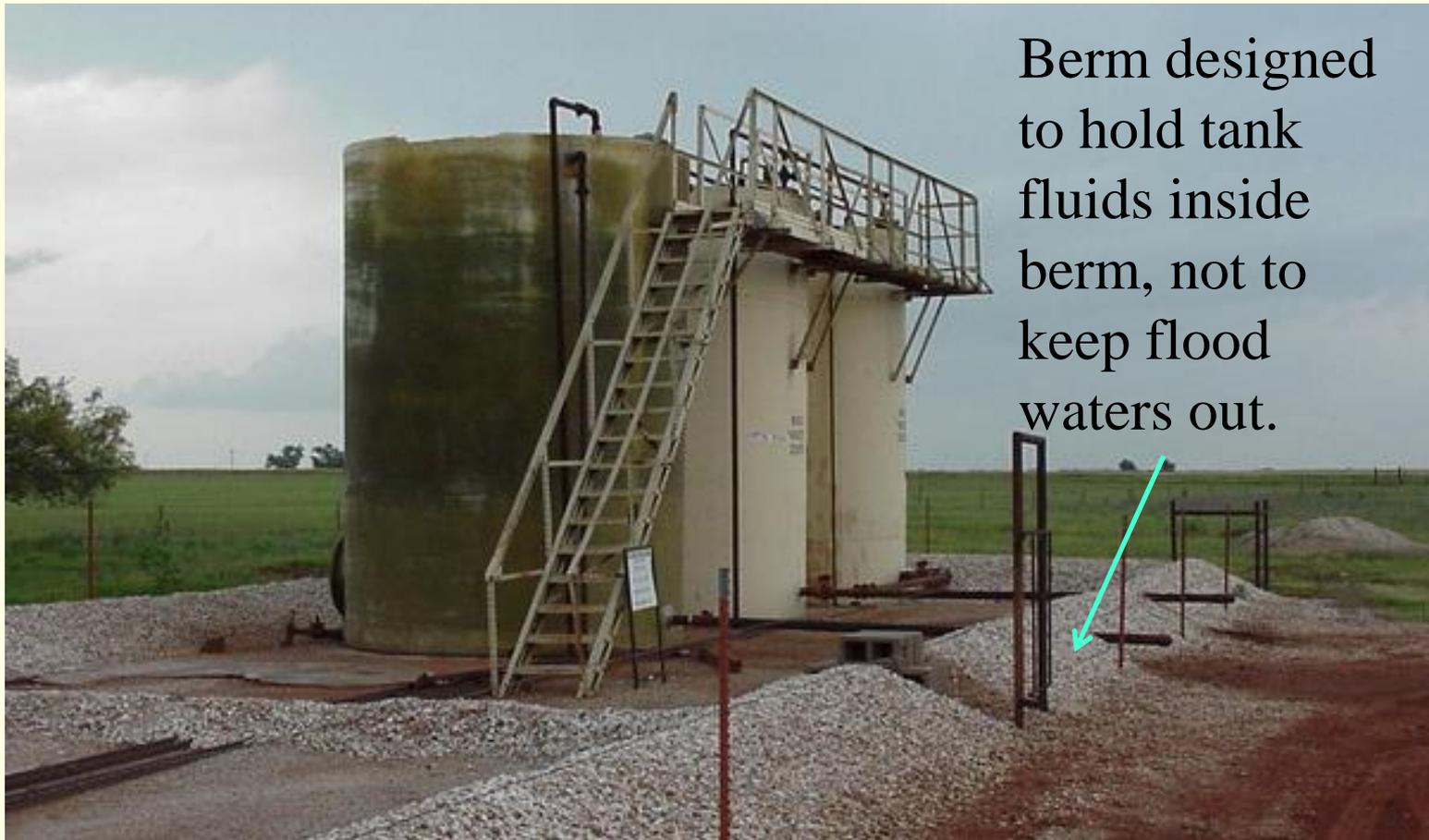
Separates water  
from oil.



Photos courtesy Center for Local  
Government Technology, OSU

# Tank Battery

Steel tanks store oil. Generally the saltwater is stored in fiberglass tanks.



Berm designed to hold tank fluids inside berm, not to keep flood waters out.

# Production Unit



Separates the natural gas from the oil and water when production is primarily natural gas.

# Dehydrator



Glycol tank

Removes water vapor from natural gas using glycol as a drying agent.

# Meter Run



Above-ground valve with meter to measure the gas. May need flood protection fence.

Photos courtesy Center for Local Government Technology, OSU

# Compressor

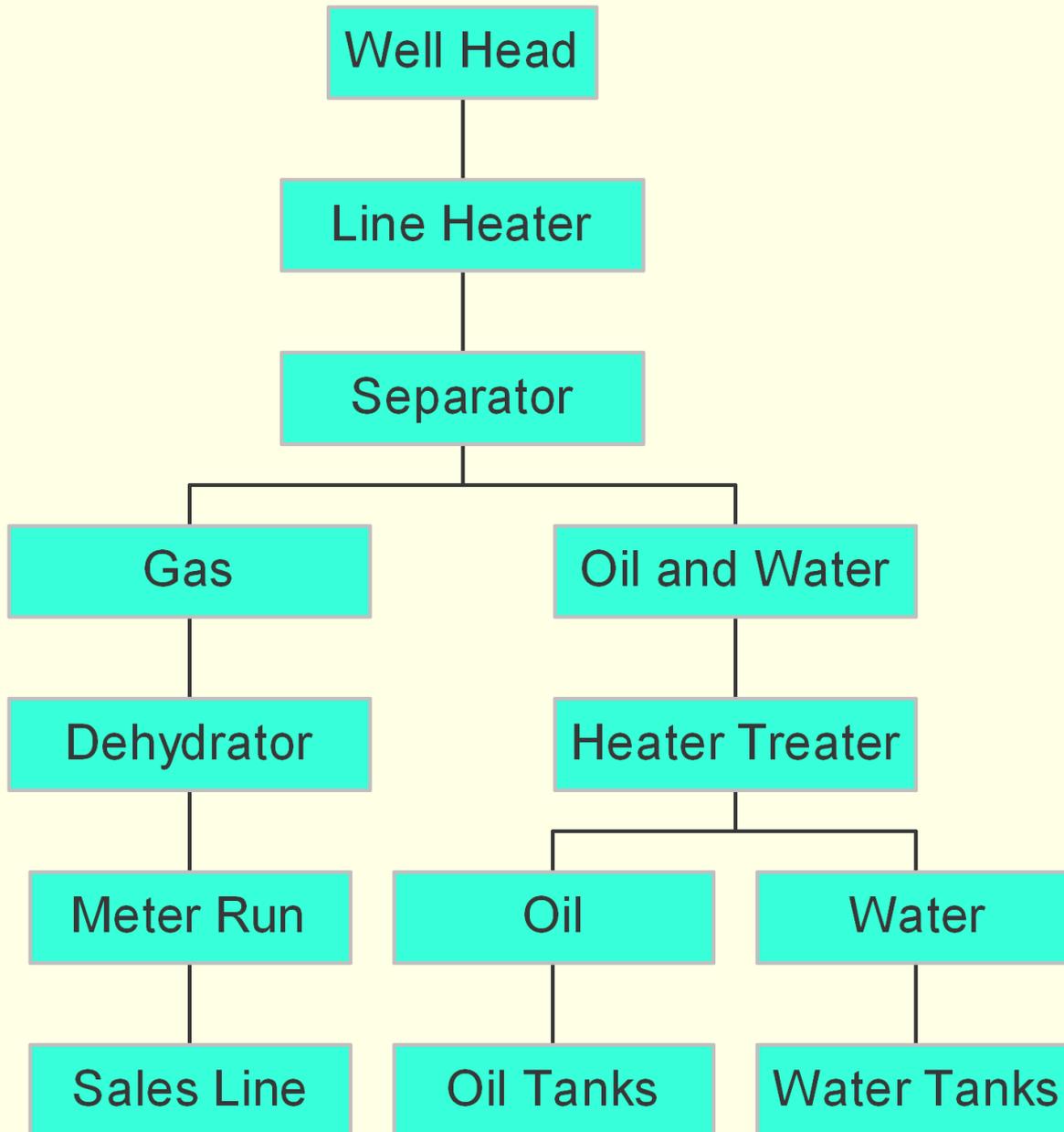


Raises the pressure of compressible liquids and/or gases.

# Workover Rig

A recompletion is a change in the location of the downhole producing interval. Typically the permanent equipment set at the surface to handle existing production will be adequate to handle the new production.





# Permitting Responsibilities

# Notify Company of your Permit Requirements

- Many oil and gas companies (including pipelines) do not know they need a floodplain permit, especially in the unincorporated areas.
- After a few times, hopefully they will come to you for a permit.

# So How Do You Find Them?

- Check the OK Corporation Commission website for Intent to Drill Permits.
- Drilling will often take place immediately after approval of Intent to Drill.
- Items to look for on Intent to Drill permit:
  - Operator name and contact info
  - Location of well site
  - Lease name, ex: Rother 1-6H
  - Drilling mud pit type
- Check to see if site is in the floodplain.

# http://imaging.occeweb.com/ Oil and Gas Well Records Forms

## OCC Imaging - OG Well Records

Form #  Choose Form # from the drop down box

Legal Location  example: 0711N10E or 1201N24ECM  
 Check to exclude ECM Legal Locations

API #  example: 00724967

Well Name  example: "Hudson 1-12" or "hudson"

Operator #  example: 01701-0 or 01701

Effective/Test Date  to  example: 1/1/2001 or 1/1/2001 to 1/31/2001

Scan Date  to  example: 1/1/2001 or 1/1/2001 to 1/31/2001

Choose Form 1000

Enter dates to check here

Click API to sort by county

Type in your search criteria then click the 'Search' button.

Page 1 of 31 1502 Documents Found

1 2 3 4 5 6 7 8 9 10 ...

ID	Form	Legal Location	API	Well Name	Operator #	Eff/Test Date	ScanDate
<a href="#">3443627</a>	1000	1023N12W NE SW SE NW	00320183B	DAVIDSON 1		8/20/2007	8/17/2007
<a href="#">500000498</a>	1000	1023N12W NE SW SE NW	00320183B	DAVIDSON 1		8/20/2007	8/20/2007
<a href="#">500000518</a>	1000	0923N10W W2 E2 NW SW	00321833B	MCCOLLUM 1-9		8/21/2007	8/21/2007
<a href="#">3445581</a>	1000	0923N10W W2 E2 NW SW	00321833B	MCCOLLUM 1-9		8/21/2007	8/21/2007
<a href="#">3373621</a>	1000	3028N11W C SW NE SW	00321869A	HENDRICKS 1-30		8/7/2007	7/27/2007
<a href="#">500000097</a>	1000	3028N11W C SW NE SW	00321869A	HENDRICKS 1-30		8/7/2007	8/7/2007
<a href="#">500000151</a>	1000	1823N12W C SE NE	00321872	FERN 1-18		8/8/2007	8/8/2007
<a href="#">3376201</a>	1000	1823N12W C SE NE	00321872	FERN 1-18		8/8/2007	8/1/2007

Click here to view Form

# So How Do You Find Them?

- Look for drilling rigs.
  - Find sign at road that lists phone number of company.
- Go through Landmen.
  - Make sure your County Clerk's office of Land Records has a prominently displayed floodplain map(s) with permit requirement posted.

# So How Do You Find Them?

- Get to know your OCC local inspector.
- Check the Road Crossing Permits in your County Commissioners Office for pipelines.
- Utilize your County District Shops and Assessor's Office Field Appraisers.
  - These guys are out in the county and see everything.

# What do the O/G companies have to do to be compliant?

They must:

- Get a floodplain permit before development (including pad construction) begins.
- Install flood protection measures (anchor, flood fence), elevate, or relocate production equipment.
- Get a licensed engineer to certify the design of the flood protection measures and elevation.

# Floodway

- If the drilling and/or production site is in the floodway, the oil/gas company will have to demonstrate through an engineering study that there will be no increase in flood heights during the discharge of the 1% chance flood.

# Permit Steps for the FPA

- Identify the site on the floodplain map.
  - What is the potential water velocity at the site?  
Or is the flood potential backwater only?
  - How far would they have to go to get tanks and equipment out of floodplain? This could be an option.
  - Note whether lease road will be under water during flood or will impede water flow.
- Visit the site—Know your site!
  - Take photos.
  - Note condition and location of trees and shrubs.

# Permit Steps

- Establish a BFE
  - In rural A zones with no BFE's on the maps, use the Simplified Method of Contour Interpolation – Line up the floodplain boundaries over a topo map.
  - Found in *FEMA 265: Managing Floodplain Development in Approximate A Zones*.

# Permit Steps

- The Operator has 3 Options:
  - **Elevate** production site above BFE, Elevation Certificate required.
  - **Relocate** production site out of floodplain.
  - **Install flood protection measures:**
    - Anchor all production equipment to BFE.
    - Protect vulnerable equipment such as well head and gas valve with flood protection fence to prevent flood debris damage.

# FEMA guidance on anchoring fuel tanks

- *FEMA Publication 348 Protecting Building Utilities from Flood Damage*

# Permit Steps

- A closed drilling mud pit system must be used.
- The lease road must be constructed so it will not obstruct the flow of water.
- A culvert must be placed in the barrow ditch where lease road meets county road.
- Tree and brush debris may need to be removed from floodplain or burned if they could be washed downstream.
- Make agreement to be able to inspect the site periodically after permit is completed.

# Permit Steps

- Permit application must include:
  - Completed permit application form
  - Detailed plans and specs for the site
  - Engineered and stamped anchoring plans
  - Staking plat
  - Other applicable permits
  - Spill Prevention and Counter Measure Plan

# Permit Steps

- Floodplain board meets to consider approval of permit application.
- Issue permit and checklist of future tasks to be completed.

# Use your Floodplain Board's knowledge of the area

- Your Board probably knows the flood potential of your area very well.
- Some sites will require more flood protection than others.
  - Ex: A production site right next to a river may need elevation and flood protection fence around well head and gas valve. A site at the edge of the floodplain with only backwater may just need anchoring of production equipment.

# Post-Construction Permit Steps

## When site is complete

The O/G company will

- provide you with a list of production equipment on the site
- engineered certification of anchoring and fence designs.
- elevation certificates if elevation was used.
- notify you if
  - they add new equipment.
  - they sell the site to another company.

# Post-Construction Permit Steps

FPA will

- do a final inspection of site.
- take photos.
- send out a permit completion letter.
- keep all records organized in files.

# When they are in a big hurry...

- The Floodplain Administrator can issue a letter of permission to begin work before the permit is issued by the Floodplain Board.
- Do this for non-controversial sites.

# Pipelines

- Have your Floodplain Board establish burial depth requirement.
- Recommendation:
  - 72 inches under creeks/rivers, 48 inches in the rest of the floodplain
  - Company must sign Statement of Burial Depth Compliance after construction is complete.

Examples of good and bad  
flood protection of  
production equipment

# The Good



Proper anchoring



Proper anchoring



Proper anchoring on equipment other than tanks





Well Head Guard



Elevation of production site



Relocated production equipment

# The Bad



Infringement on waterway



Inadequate well head guard



New unpermitted equipment added after final inspection

# Partner with the Industry

- Approach them with an attitude of cooperation.
- If they don't know about floodplain permitting, give them the benefit of the doubt.
- There are many different people and contractors involved with an oil and gas site. Educate them all.
- A good working relationship with the industry is the goal.

## **Oklahoma Floodplain Managers Association**

Amy Brandley, CFM  
Canadian County FPA  
200 N Choctaw Ave  
El Reno, OK 73036  
(405) 295-6260

## **Oklahoma Water Resources Board**

Gavin Brady, CFM  
NFIP State Coordinator  
440 S Houston, Room #2  
Tulsa, OK 74127  
(918) 581-2924