

Regulated Waterbody Issues Associated with Energy Projects

Peter D. McKone, CWB

Weaver Consultants Group

817-946-7379

pmckone@wcgrp.com



This Morning's Focus



- Water Rights
- Floodplains
- Questions

Water Rights

Two Kinds

- **Surface**
- **Groundwater**

Surface

- **Colonists brought the English common law – Riparian doctrine**
 - Recognized the right of riverbank owners to use the water in ways that would not diminish or alter the river for downstream users
 - A right to the natural flow of the stream or river
 - Riparian owner – could use the stream for fishing, watering stock, cleaning, or travel
 - But, could not alter the course of the river, reduce its volume, or pollute it so that downstream owners could not reuse the water
 - Riparian right could not be sold independent of the adjoining land
 - All riparian owners along a river had an equal right to use the water

Prior Appropriation

- **Miners in western states started to develop a water rights regime based on first use**
- **Prior appropriation – recognizes that a person who diverts the water first and puts it to a recognized beneficial use has the most senior right to the water**
- **Subsequent users can claim rights to any water still remaining in the stream**
- **It is considered a vested property that one can sell, trade or give away**

Prior Appropriation

- **First in time, first in right**
- **Beneficial use required**
- **Not detrimental to public welfare**
- **Avoid waste**
- **Consider impacts on bays, instream flows, fish, water quality**
- **Permit required**

Texas Exemptions

- **Domestic and livestock use**
 - Includes water for livestock, meet household needs, irrigate a yard
 - Commonly referred to as the stock tank exception
 - Do not need a permit
 - Can impound up to 200 acre-feet
 - Cannot sell for commercial use
- **Wildlife management exemption added in 2001**

Groundwater

- **Laws were developed with little understanding of the nature of groundwater**
 - As a result, rules vary

Rule of Capture (Texas)

- **Groundwater is considered the private property of the landowner**
 - Landowners have the legal right to withdraw as much groundwater from beneath their land as they can capture
- **Law of the biggest pump**
- **Groundwater districts formed to regulate/price groundwater**
 - Mixed results based on politics and history
- **Three rights**
 - Try to capture groundwater
 - Right to the water actually brought to the surface
 - Sell or use the water

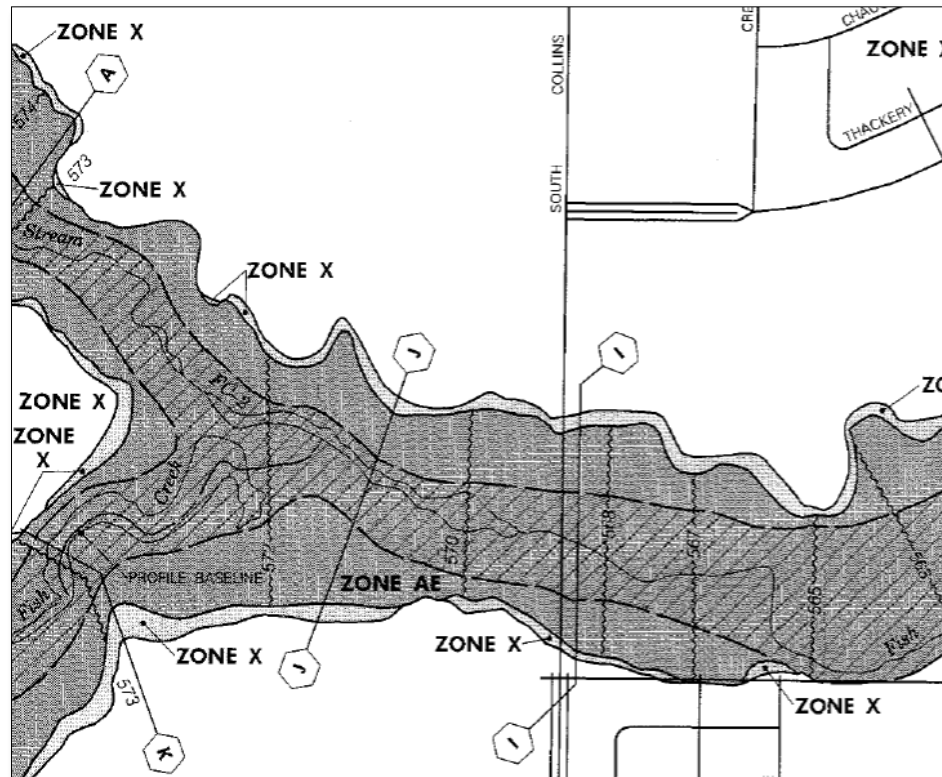
Floodplains

Federal

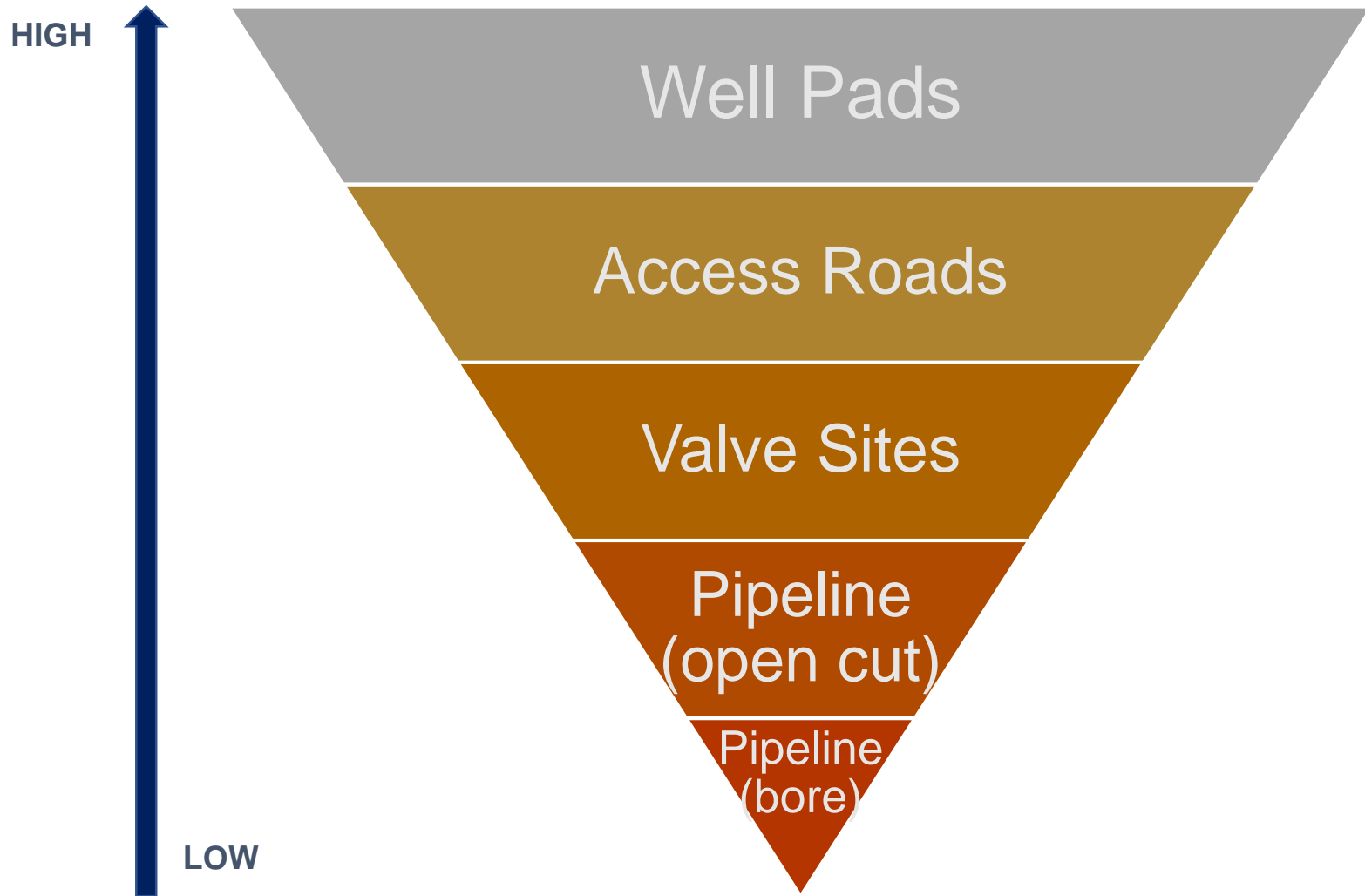
- **FEMA – oversees overall floodplain management program**
 - Increasing awareness of importance of development in floodplains
 - Develops overall guidelines
 - Provides insurance programs
 - Develops maps

Floodplains

- Zone A – Unstudied floodplain
- Zone AE – Studied floodplain
- Zone X – outside 500-year floodplain



Potential floodplain impacts



Canadian County, OK – May 9, 2007



Photo courtesy of OFMA / OWRB / Canadian County, OK

Coffeyville, KS – July 7, 2007



Photo courtesy of OFMA / OWRB / Canadian County, OK

Bartlesville, OK – July 3, 2007



Photo courtesy of OFMA / OWRB / Canadian County, OK

Yukon, OK – August 22, 2007



Photo courtesy of OFMA / OWRB / Canadian County, OK

Kingfisher, OK – August 19, 2007



Photo courtesy of OFMA / OWRB / Canadian County, OK

State/Local

- Develop floodplain ordinances
- Oversee building permits

Floodproofing Measures

- Must be designed to resist flotation
- Floodproof fencing
- Tie-downs/Anchoring
- Relocation of tank batteries outside the floodplain
- Build up out of the floodplain
- Water tight connections/fittings

Floodplain Development

- **Generally avoid the floodways**
 - At a minimum, no increase in BFE
- **Electrical must be out of the floodplain**
 - Raise it or relocate it out of the floodplain
- **As-built verification/surveys almost always required**
- **Provide list of chemicals**

Methods to Minimize Impacts

- **Build at-grade**
 - Includes pad sites, tank batteries, lease road
- **Elevate the pad**
- **Avoid the floodplain**
- **Flood depth indicators on road crossings**
- **Remote shut-off valve**

Valve sites

- Typical components:
 - Fencing
 - Gravel fill
 - Electrical / mechanical equipment
- Potential floodplain impacts
 - Electrical / mechanical equipment should be elevated above BFE
 - Pad site may include gravel fill above grade
 - Siting in floodplain may have minimal impact to WSE due to above ground structures
 - Floating debris
- Mitigative Measures
 - Fence
 - Site out of floodplain



Lease roads

- Typical components
 - Gravel or limestone top
 - Culvert
- Potential floodplain impacts
 - Crossing floodplain may have an impact on WSE due to fill
 - Dam effect
- Mitigative measures
 - Additional culverts
 - Construct at-grade



Well pads

- Typical components:
 - Wells (Oil/Water)
 - Fencing
 - Tanks
 - Ponds
 - Gravel fill
 - Electrical / mechanical equipment
 - Drilling equipment
 - Production equipment
- Potential floodplain impacts
 - Electrical / mechanical equipment should be elevated above BFE
 - Pad site may include gravel fill above grade
 - Siting in floodplain may have a significant impact on floodplain due to above ground components

Pump Jack



Photo courtesy of Center for Local Government Technology, OSU

Well pad components

Storage tanks



Production unit



Photos courtesy of Center for Local Government Technology, OSU

Challenges for oil and gas companies

- Often work in rural areas where floodplain regulations are less defined than urban areas
- Regulations can vary considerably by jurisdiction
- Time is critical

Good practices

- Avoid floodplain where possible
- Elevate facilities above base flood elevation
- Mitigate for fill in the floodplain
- Reduce permanent well pad site after drilling
- Properly anchor all facilities to resist flotation, collapse and lateral movement
- Floodproof to make water tight (facilities and pipelines)
- Protect facilities from floating debris
- Protect hazardous and explosive materials

Questions

