

U.S. Environmental Protection Agency Regulatory and Environmental Framework for Oil and Gas Extraction

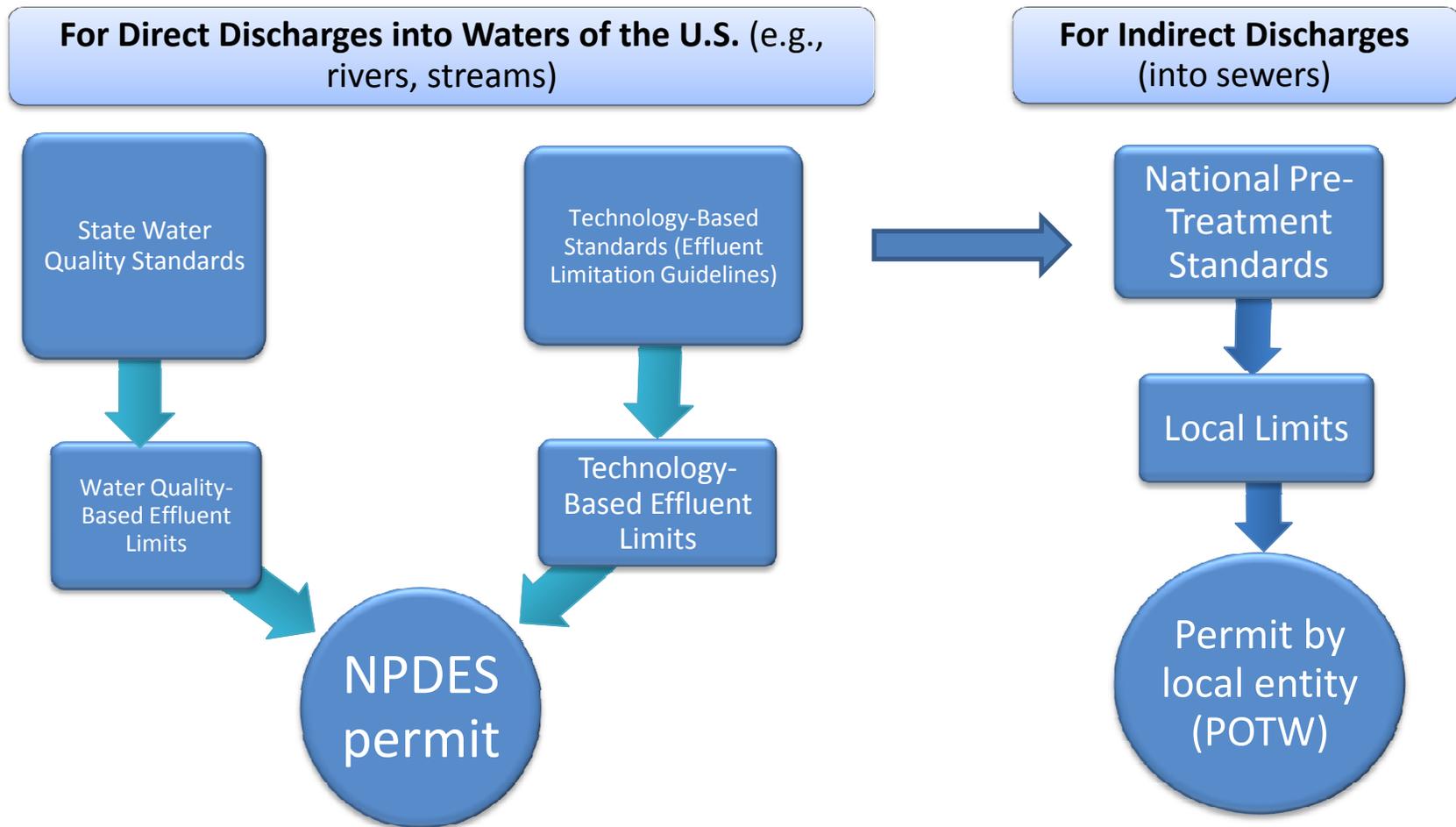


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The Clean Water Act

- Established the National Pollutant Discharge Elimination System (NPDES) permitting program
- Prohibits the discharge of pollutants, unless authorized by NPDES permits
- Requires permits to contain limits for:
 - Best Available Technology Economically Achievable
 - Effluent Limitations Guidelines (ELGs) have been established for most industries
 - Water Quality based limits are added when technology based limits are not sufficient to protect water quality

Clean Water Act



Oil and Gas Extraction Effluent Limitations Guidelines (ELGs) 40 CFR Part 435

- Onshore Subcategory
 - No discharge
- Striper Subcategory
 - Produces <10 bbl/day of oil
 - Oil and grease limited to 35 ppm
 - Discharges recently permitted in Region 6 (Wilson County, TX)
- Ag and Wildlife (western U.S.)
 - Wastewater must be of Good enough quality for Agriculture or Wildlife uses
- Coastal Subcategory
 - No discharge
- Offshore Subcategory
 - oil and grease 29/42 ppm



Most ELGs are not Recent

1979

- Onshore, Stripper, and Ag. and Wildlife Subcategories

1992

- Offshore Subcategory

1996

- Coastal Subcategory

2000

- Centralized Waste Treatment

Challenges with Current ELGs

- Onshore Subcategory – No pretreatment standards
- Coal Bed Methane – not under Part 435 ELG
 - Where no applicable ELG, permit writers must include limits based on case-by-case, “best professional judgment” basis.
 - EPA began studying the need for an ELG in 2006
 - States permit CBM discharges inconsistently:
 - Coal Mining ELGs (iron limits)– Eastern states
 - Agriculture and Wildlife Subcategory – Rocky Mountain States
 - No discharge – New Mexico, Oklahoma, Texas
- Centralized Waste Treatment Facilities
 - Current regulations at Part 437 do not include pertinent limits
 - Subcategories: Metals, Oils, Organics, and Mixed Wastes
 - Example: Oil and Grease limits are 38 ppm avg./127 ppm max.

Agriculture and Wildlife Subcategory

- Discharges are currently authorized in some western states
 - More arid areas
 - Currently mostly from oil extraction
- States vary on what meets the ELG limits of “good enough quality”
- TDS limits vary by state from 150 ppm to 10,000 ppm based on cattle watering
- Limits on whole effluent toxicity in many cases



Water Quality Based Limits

- Based on levels needed to meet Water Quality Criteria
 - Often allowed mixing in the receiving water
 - Mixing Zone size defined by State Water Quality Standards for discharges to State waters
 - State Water Quality Standards – State Waters
 - Protect aquatic life and human health
 - Numeric State Water Quality Standards
 - Narrative Standards (whole effluent toxicity or numeric interpretation)

Water Quality Criteria Issues

- Most states have adopted water quality criteria for total dissolved solids
 - Ionic components vary significantly by source
 - Produced water - chlorides
 - Coal Mines - bicarbonate and sulfate
 - Currently revising recommended chloride criteria
 - Starting peer review process in 2014
 - Conductivity has been suggested as a surrogate
 - Inexpensive and easy to measure
 - Impact on aquatic life is site specific/depends on mix of ions
 - Not always directly correlated to TDS
 - Developing methods to address bromide in discharges to better protect drinking water (trihalomethane)

Pending EPA Actions

- October 26, 2011 EPA Published the 2010 Effluent Guidelines Plan
 - See: <http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/>
 - Pretreatment standards for the Onshore Subcategory ELG
 - Proposal expected in 2014
 - Coal Bed Methane ELGs
 - Began studying in 2006
 - The economics of low gas prices make any new limits complicated
 - Currently little drilling
 - The 2010 plan proposed to discontinue this rulemaking
 - Shale gas frequently asked questions issued in 2011
 - See: <http://cfpub.epa.gov/npdes/hydrofracturing.cfm>
 - Currently revising to address water quality based permitting

9/2012 Western Gulf of Mexico Outer Continental Shelf (OCS)

- Oil & Grease: 29 ppm avg./42 ppm max
- Chronic Whole Effluent Toxicity limits
 - Produced water characterization study
 - Ten samples per lease area
 - Metals and cyanide
 - Industry study alternative
 - Study Report submitted by 9/2015
- Well treatment completion and workover fluids limited as produced water
 - Also, no discharge of priority pollutants

2/7/2012 Texas Territorial Seas

Currently no produced water discharges are being made

Technology Based Limits

– Oil and Grease 29 mg/l / 42 mg/l

Water Quality Based Requirements

– Toxicity

- 7-day Chronic limit (growth and reproduction)

– Critical dilutions were recalculated

- Texas 24-hr. Acute limit - 100% effluent

– Produced water characterization study required

- Produced water, receiving water, and sediment sampling for metals, benzene, and cyanide

7/31/2012 Texas Coastal

- Produced water discharges prohibited except from some stripper wells

(Carrizo-Wilcox, Reklaw, and Bartosh Formations)

- Stripper wells (<10 bbl/day oil produced)

Modification proposed December, 2013, to authorize discharges from inland wells

- Oil and Grease: 25 mg/l avg/35 mg/l max
- TDS: <3,000 mg/l
- 100% Acute toxicity limit
- Monitoring for discharge to Zn or Hg impaired waters
- No discharge from new wells to DO impaired waters

Region 4 – Atlanta

- Eastern GOM OCS general permit
- Expires 3/15/2015
 - Covers facilities in >200 meters depths off Florida and Alabama
 - More extensive notification requirements than in the Western Gulf (Region 6)
 - Bottom surveys
 - Oil & Grease – 29 mg/l / 42 mg/l
 - Whole Effluent Toxicity

Region 9 – San Francisco

– California OCS permit issued 12/20/2013

- Oil & Grease – 29 mg/l / 42 mg/l
- Whole Effluent Toxicity limits
- State water quality standard based limits
 - added to the permit in 2009
 - Removed based on new data
- New reporting requirements for well treatment fluids
 - Chemical formulations required to be reported for discharged fluids
 - Chemicals used are an issue in California (SB-4 requires reporting)

Region 10 – Seattle

- North Slope general permit
 - No discharge of produced water
 - Issued 1/3/2012
- Arctic general permit Beaufort and Chukchi seas
 - Exploration only - No discharge of produced water
 - Reissued 10/2012
- Cook Inlet general permit
 - Expired 5/2012
 - Permit proposed to be reissued jointly with Alaska
 - NPDES program delegated to Alaska in 2008
 - Only exploratory discharges in Federal waters
 - Discharge of produced water is authorized in state waters
 - Oil & Grease – 29 mg/l / 42 mg/l
 - State Water Quality Standards based limits for metals, hydrocarbons, and whole effluent toxicity

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