



# Stormwater Regulations for Shale Oil & Gas Sites in Ohio

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# Outline

- Ohio Oil & Gas Background
- Stormwater Regulations
- Surface Water Regulations
- Typical Well-Site Layout
- Erosion & Sediment Control BMPs
- Pad Surface Runoff BMPs
- Conclusions / Questions

# Hull & Associates, Inc.

- Founded in 1980
- 170 employees
- Offices in Cleveland, Columbus, Cincinnati, Newark, Toledo, and St. Clairsville Ohio, Pittsburgh, PA; and Austin, TX

*“Highly successful and sought after project development and engineering firm, solving complex challenges related to land, energy, and the environment, as demonstrated by premier projects.”*



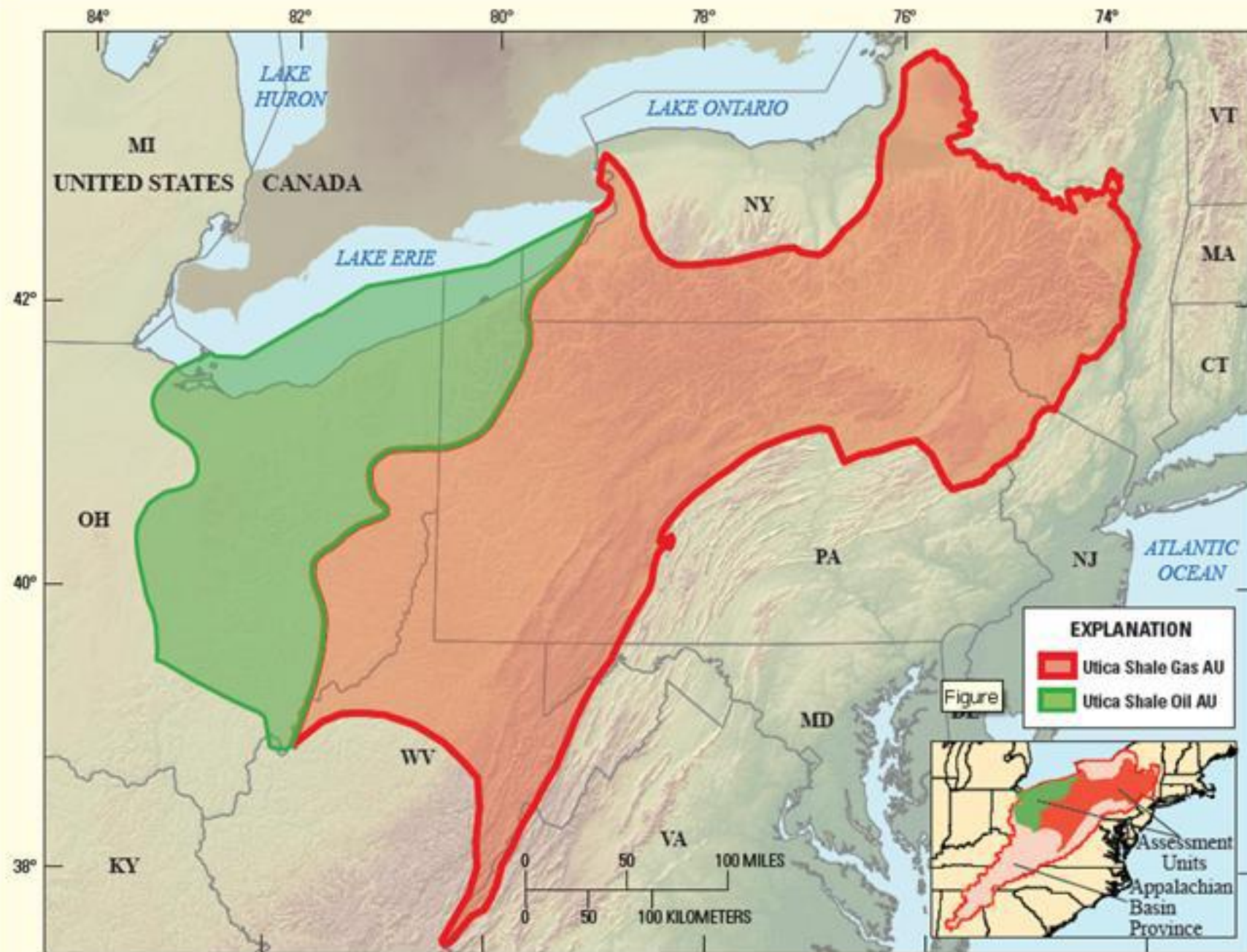
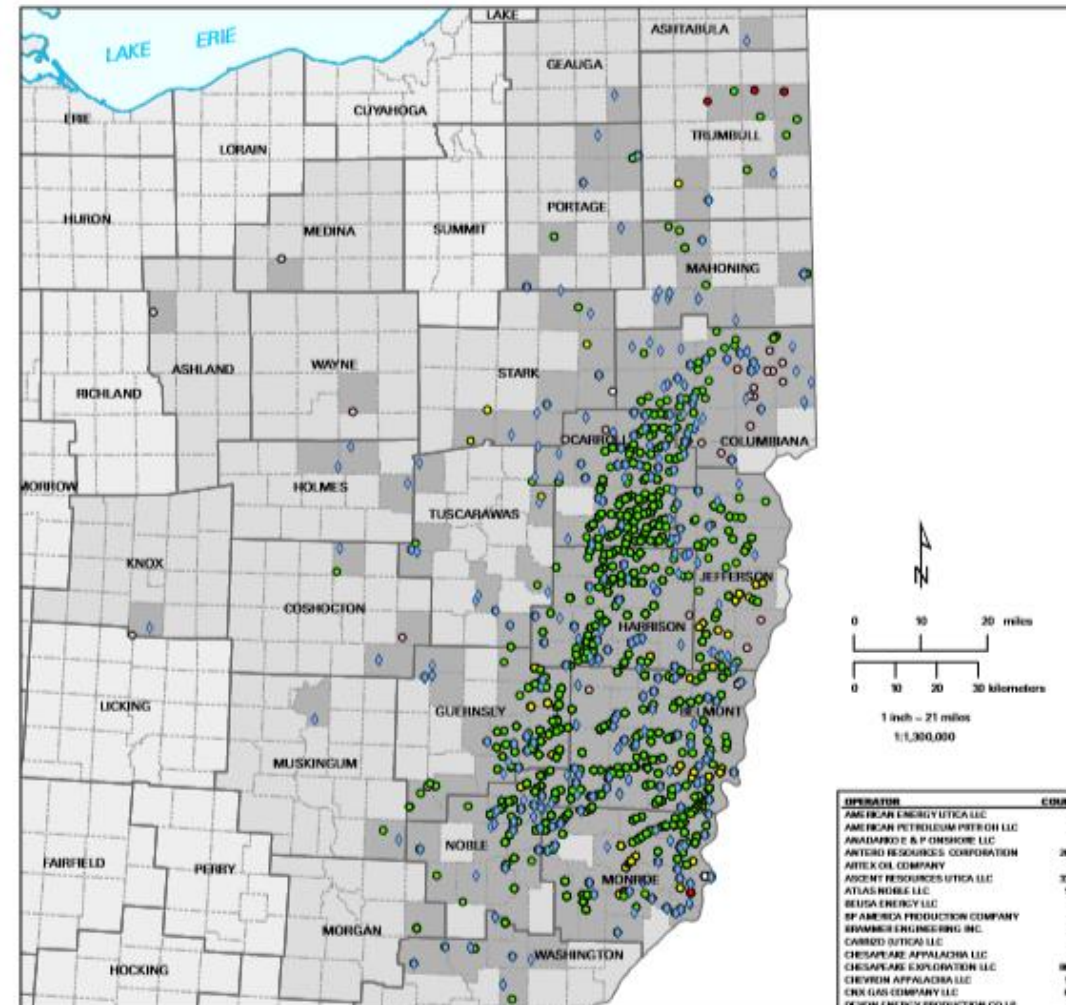


Figure 1. Location of the oil and gas assessment units (AU) for the Utica Shale in the Appalachian Basin Province.



# Utica Shale Play in Ohio

## HORIZONTAL UTICA - PT PLEASANT WELL ACTIVITY IN OHIO



### EXPLANATION

Horizontal well status as of 4/7/2018

- ♦ PERMITTED-(Permitted; Not Drilled; Canceled) (485)
- DRILLED-(Drilling; Well Drilled) (354)
- PRODUCING-(Producing; Plugged Back) (1,886)
- INACTIVE-(Drilled Inactive; Shut in) (27)
- Lost Hole or Final Restoration (27)
- Dry and Abandoned (3)
- Plugged and Abandoned (17)



Well permit information from the ODNR Division of Oil and Gas Resources Management

**Recommended citation:**  
Ohio Department of Natural Resources, 2018, Horizontal Utica-Point Pleasant Well Activity in Ohio: Columbus, scale 1:1,300,000, revised 4/10/2018.

OPERATOR	COUNT
AMERICAN ENERGY UTICA LLC	5
AMERICAN PETROLEUM PETROL LLC	2
ANADARKO E & P ONSHORE LLC	4
ANTERO RESOURCES CORPORATION	261
ARTEX OIL COMPANY	7
ASCENT RESOURCES UTICA LLC	303
ATLAS NOBLE LLC	12
BEUSA ENERGY LLC	1
BP AMERICA PRODUCTION COMPANY	1
BRAMMER ENGINEERING INC.	2
CARRIOT UTICA LLC	3
CHESAPEAKE APPALACHIA LLC	5
CHESAPEAKE EXPLORATION LLC	866
CHEVRON APPALACHIA LLC	10
CRK GAS COMPANY LLC	81
DEVON ENERGY PRODUCTION CO LP	9
ECLIPSE RESOURCES LLP	139
EN ENERGY OHIO LLC	21
ENERVEST OPERATING LLC	26
EDT PRODUCTION COMPANY	4
GEOPART LLC	9
GULFPORT APPALACHIA LLC	31
GULFPORT ENERGY CORPORATION	388
HALCON OPERATING COMPANY INC.	4
HESS OHIO DEVELOPMENTS LLC	89
HESS OHIO RESOURCES LLC	1
HO ENERGY LLC	7
HUCCOR ENERGY COMPANY	63
M & B INVESTMENTS OHIO LLC	1
MOUNTAINVIEW REVISION LLC	8
NORTHWOOD ENERGY CORP.	8
PDG ENERGY INC.	42
PRINCE ENERGY PARTNERS LLC	13
PROTEGE ENERGY II LLC	2
R E GAS DEVELOPMENT LLC	10
RKE DRILLING & LLC	109
SKEMA RESOURCES LLC	3
STATOIL USA ONSHORE PROP INC.	39
SUNFLIP	1
TRINITY HUNTER LLC	36
XTG ENERGY INC.	62
<b>TOTAL</b>	<b>3,798</b>

Source: O.D.N.R.

# Federal Construction Stormwater Permit - Oil & Gas Exemption

- Oil and Gas Activities
  - “**122.26(c)(1)(iii)** *The operator of an existing or new discharge composed entirely of storm water from an oil or gas exploration, production, processing, or treatment operation, or transmission facility is not required to submit a permit application in accordance with paragraph (c)(1)(i) of this section, unless the facility:*
    - (A) *Has had a discharge of storm water resulting in the **discharge of a reportable quantity** for which notification is or was required pursuant to 40 CFR 117.21 (Haz. Sub.) or 40 CFR 302.6 (EPCRA) at anytime since November 16, 1987; or*
    - (B) *Has had a discharge of storm water resulting in the **discharge of a reportable quantity** for which notification is or was required pursuant to 40 CFR 110.6 (Oil) at any time since November 16, 1987; or*
    - (C) *Contributes to a violation of a **water quality standard**.*”

# Ohio Stormwater Regulations – Oil & Gas

- The Ohio Environmental Protection Agency (OEPA) does not require a National Pollutant Discharge Elimination System (NPDES) permit for discharges of storm water associated with oil and gas exploration and production.
- The OEPA encourages operators to implement best management practices (BMPs).
- While the oil and gas industry is exempt from obtaining an NPDES permit, the industry must still design, construct and manage their facilities in a way to prevent exceedance of a water quality standard.

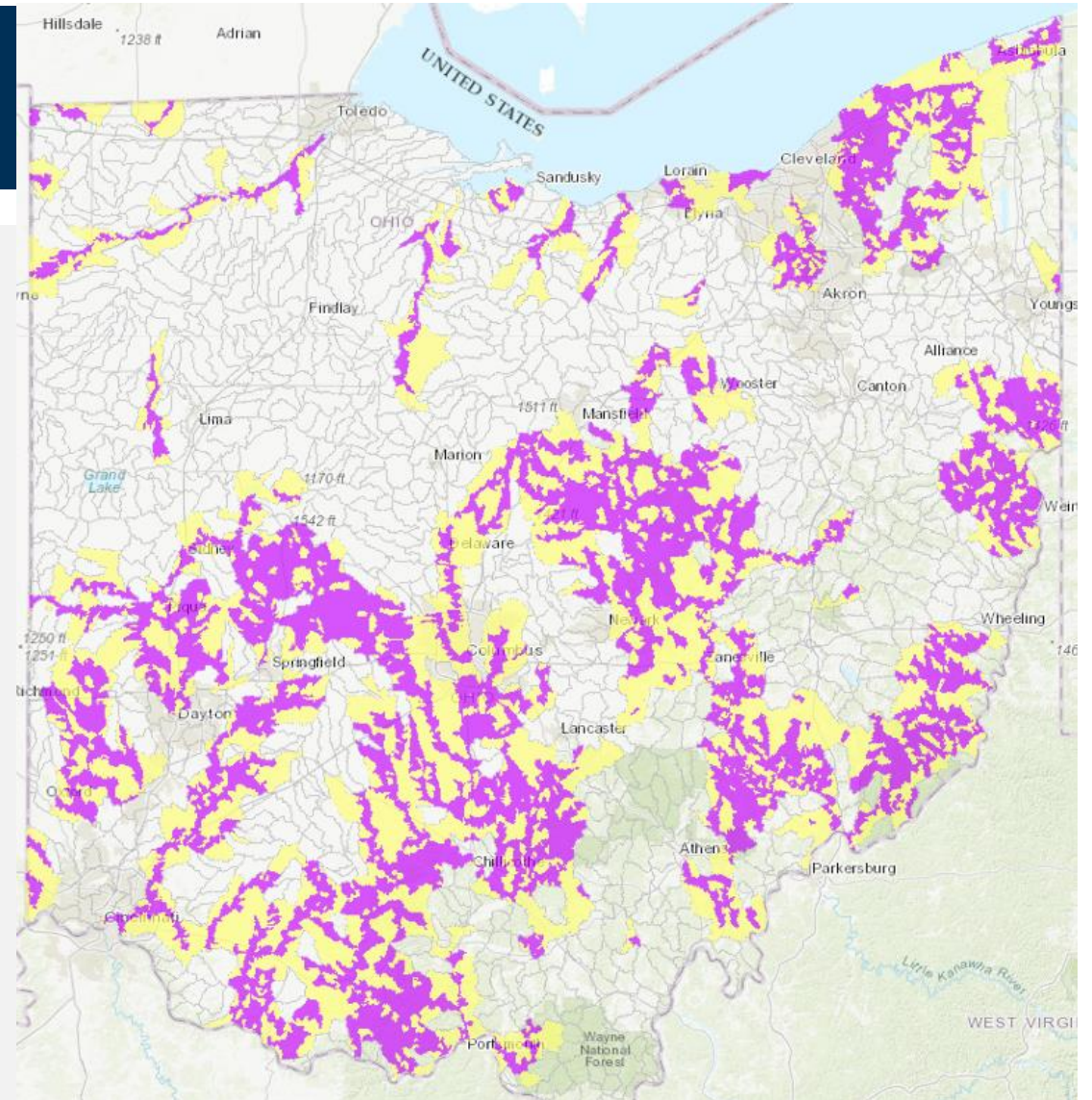
# Ohio Department of Natural Resources

- ODNR developed the Well Site Construction Rule to include additional stormwater requirements (refers to RLD Manual).
- OAC 1501:9-2-01 and 1501:9-2-02
  - Finalized in 2015
  - Additional Construction Drawing Requirements
  - Emergency Release Conveyance Map
  - Sediment and Erosion Control Plan
  - Stormwater Hydraulic Report



# Ohio EPA

- New Ohio Water Quality Certification (WQC) of Nationwide Permits
  - Any work in Ohio streams is either: **Eligible** for coverage by WQC, **Possibly Eligible**, or **Ineligible**

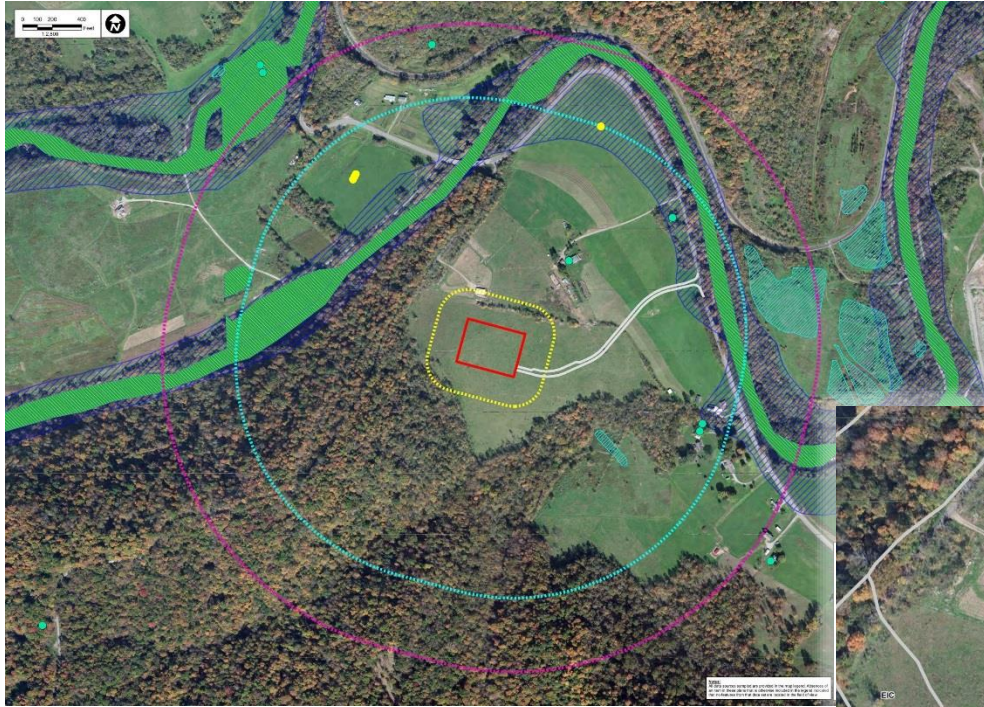


# Typical Well Pad





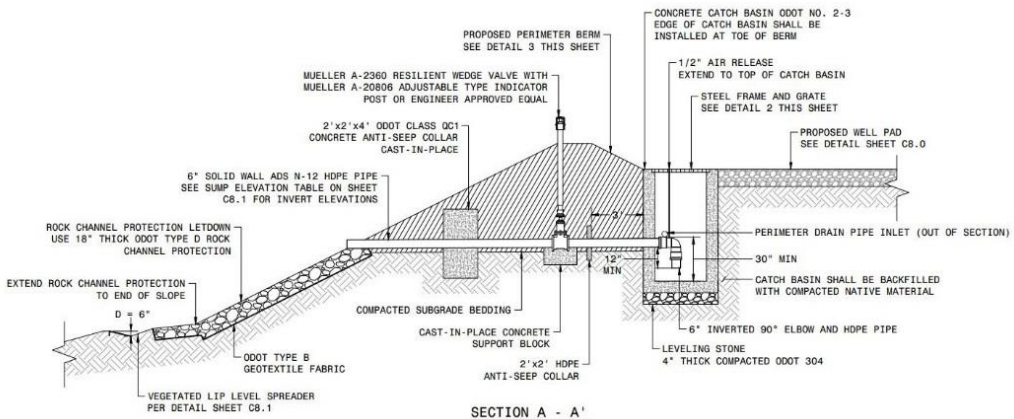
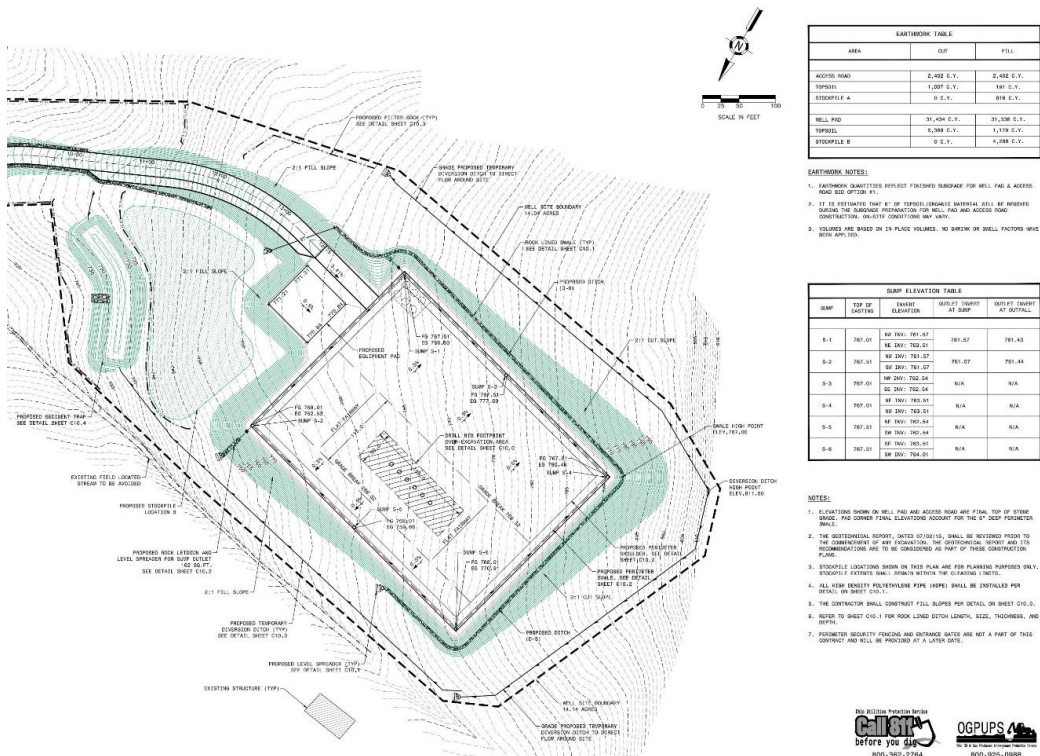
# Detailed Drawings Required Include...



- Soil Types
- Surface Waters/Wells
- Stormwater Conveyances



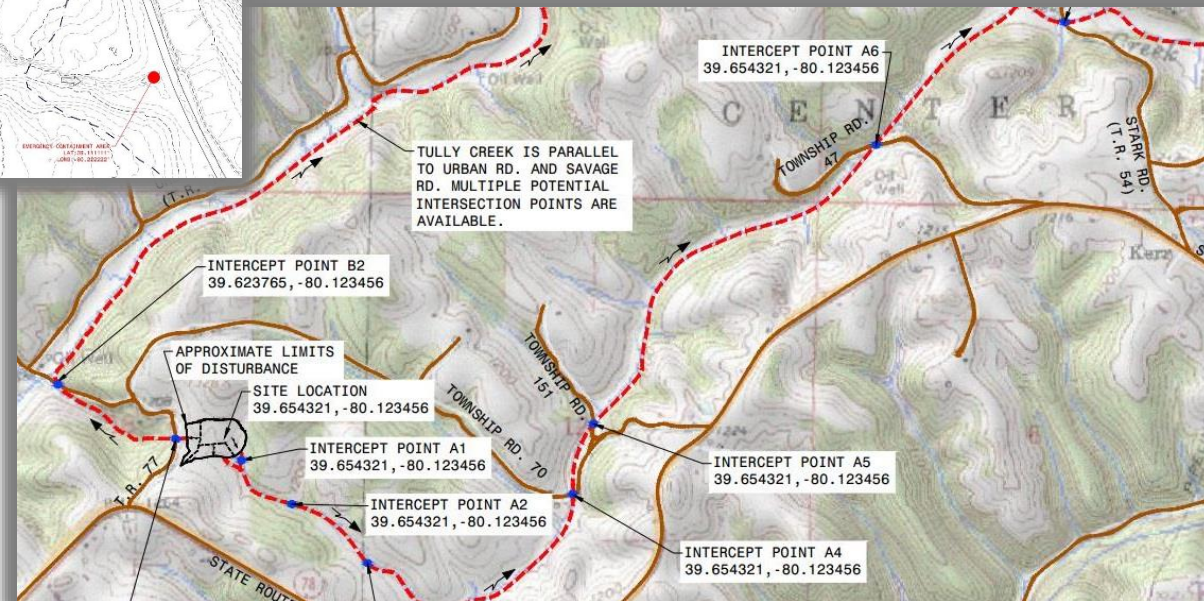
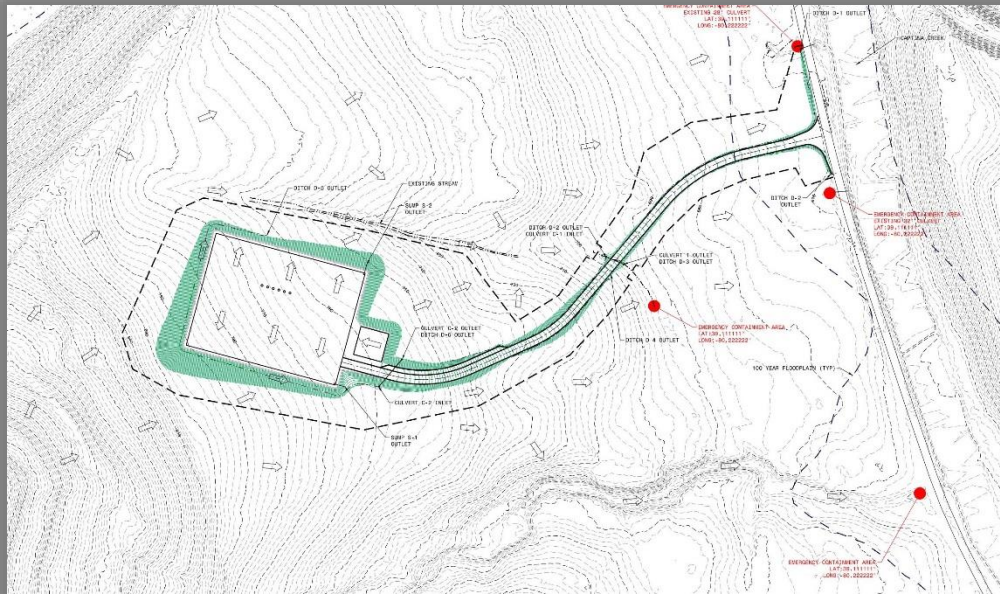






# Conveyance Maps Required Include...

- Response Locations
- Surface Waters
- Stormwater Conveyances





# Sediment and Erosion Control Plan Required to Include...

- BMPs
  - Suitable for conditions
  - Consistent with engineering design criteria
  - Comply with Manufacturer's Specifications





# Sediment and Erosion Control Plan Required to Include...

- Basins/Traps
  - Drainage Area  $\geq 5$  Acres
  - 117 CY/Acre (Min.)
  - ODNR RLDM
  - Diversionary techniques
  - Controls with equivalent capture efficiency in lieu



# Sediment and Erosion Control Plan Required to Include...

- Soil Stabilization Measures
  - Seeding/Vegetation
  - Temporary/Mulch Cover
  - Schedule of Implementation





# Stormwater Hydraulic Report Required to Include...

- Design Documentation
  - All pipes/ ditches/ conveyances/ control structures
  - 10 year storm event
  - Capacity to screen stormwater prior to discharge
  - Professional Engineer analysis
  - Supporting Calculations



# Example Stormwater BMPs for Oil & Gas Facilities

- Silt Fence
- Filter Sock
- Sediment Traps
- Check Dams
- Re-vegetation
- Construction Entrances
- Erosion Blankets
- Rock Channels
- Sump Structures















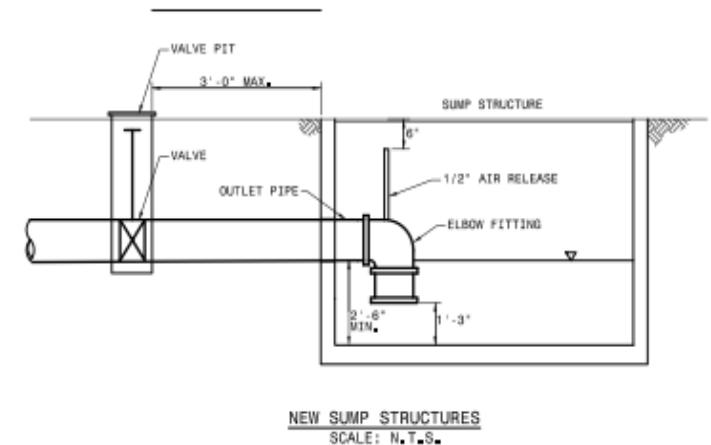
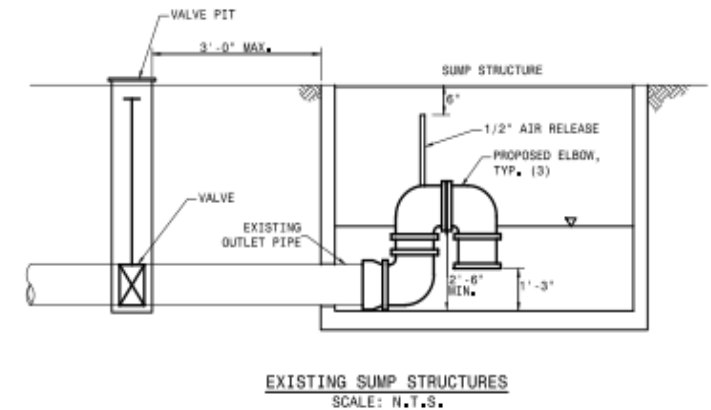


# General Guidance for Stormwater Compliance

- Routine inspection of site conditions to determine effectiveness of site BMPs
- For discharge of stormwater that comes in contact with the pad surface, implement a collection sump discharge procedure including:
  - conduct field tests of the collected storm water prior to discharge.  
Testing includes:
    - Sediment/turbidity
    - Presence or absence of a sheen
    - Odor
    - Unnatural discoloration
    - pH and chloride levels

# Pad Sump / Drain Operation BMP

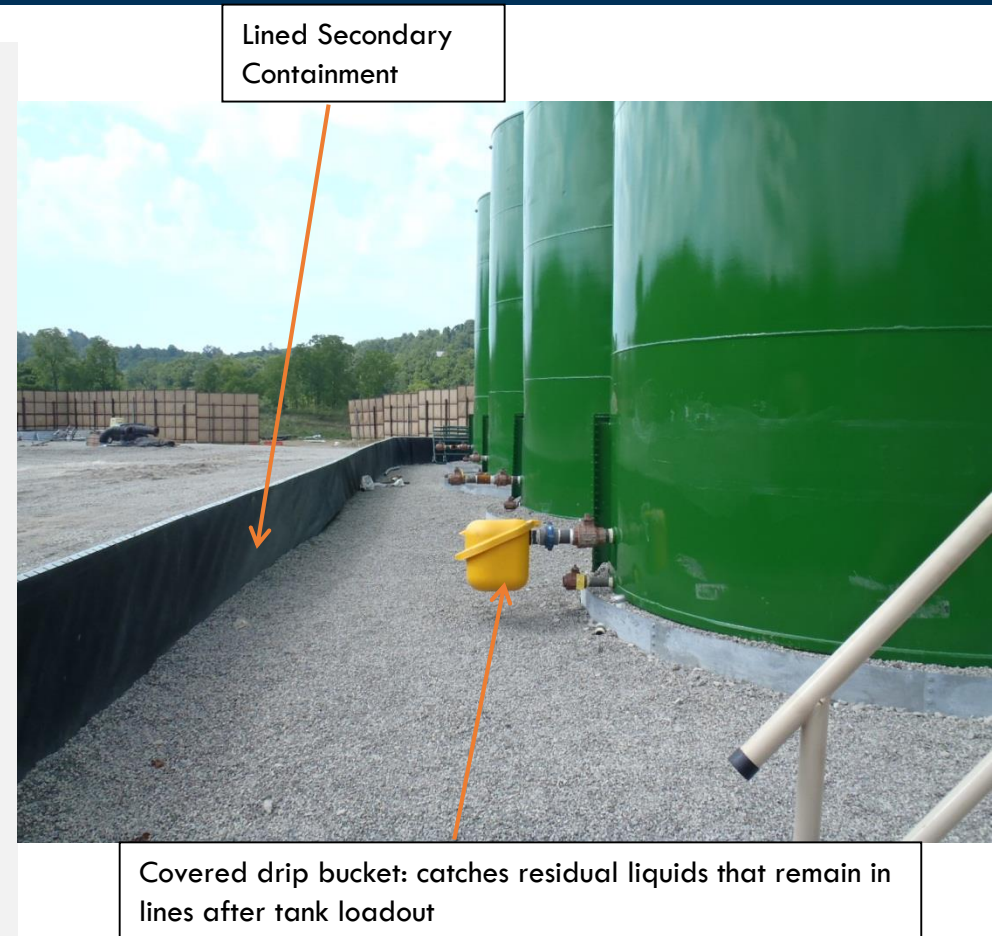
- Sumps include inverted pipe elbows to separate any potential oil from storm water.
- *40 CFR 112 and ORC 3745-39-04 (2)*





# Well Pad BMP List

- Secondary Containment = largest tank volume plus 10% (freeboard)
- Pad Infiltration BMP = Rig mat and synthetic liner system
- Well pad built with earthen surface and perimeter berm
- Routine Storm Water & Site Inspections
- Collection sump valves closed during drilling & completions. Open during production.



# Conclusions

- At the federal level, the oil & gas industry is exempt from NPDES permits for stormwater discharge.
- Other states may have state-specific stormwater permit requirements.
- ODNR has rules regarding well pad design and construction including management of stormwater and erosion and sediment control.
- Multiple stormwater BMPs, which are site-specific, are currently being used to manage stormwater runoff from these facilities.
- Routine stormwater and site inspections are recommended to ensure compliance.

# Questions?

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