Spill Response in Ohio: Practical Guidance for Operators of Horizontal Oil and Gas Wells

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OUTLINE

- Introduction
- Regulatory Structure
- Contamination Avoidance
- Spill Response Measures
Introduction
**Well Pads in the Utica Shale Play**

- The Utica Shale play is bringing heavy industry to rural areas of eastern Ohio. Over the course of a few weeks, a remote pasture or hilltop can be converted to a 5 acre well pad. In less than a year, as many as six or more wells can be producing thousands of barrels of condensate and millions of cubic feet of natural gas.
### Typical Chemicals On-Site

- Development of unconventional plays requires a greater variety of chemicals, equipment and crews than conventional plays.

<table>
<thead>
<tr>
<th>Construction</th>
<th>Drilling</th>
<th>Frac</th>
<th>Drill-out</th>
<th>Flowback</th>
<th>Production</th>
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<td>Diesel</td>
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<td>Chloride</td>
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<td>Mud and Additives</td>
<td>Corrosion</td>
<td>Inhibitors</td>
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<td>Produced</td>
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<td>Brine</td>
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<td>Hydrocarbons</td>
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<td>Surfactant</td>
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<td>Hydrocarbons</td>
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- Diesel Engine Oil
- Engine Oil
- Coolant
- Hydraulic Oil
- Compressor Oil
- Potassium
- Chloride
- Mud and Additives
- Brine
- Surfactant

- Frac Diesel
- Frac Engine Oil
- Frac Coolant
- Frac Hydraulic Oil
- Frac Compressor Oil
- Frac Brine
- Frac Acid
- Frac Inhibitors
- Frac Biocides

- Drill-out Diesel
- Drill-out Engine Oil
- Drill-out Coolant
- Drill-out Hydraulic Oil
- Drill-out Compressor Oil
- Drill-out Brine
- Drill-out Produced
- Drill-out Hydrocarbons

- Flowback Diesel
- Flowback Engine Oil
- Flowback Coolant
- Flowback Hydraulic Oil
- Flowback Brine
- Flowback Produced
- Flowback Hydrocarbons

- Production Diesel
- Production Engine Oil
- Production Coolant
- Production Hydraulic Oil
- Production Brine
- Production Produced
- Production Hydrocarbons
REGULATORY STRUCTURE
JURISDICTION

• Under Ohio law (Ohio Revised Code (ORC) 1509.02), the Ohio Department of Natural Resources (ODNR) has nearly exclusive jurisdiction over activities on oil and gas locations.

• Accordingly, spills that are limited to oil and gas locations may need to be reported to ODNR, but may not be considered releases to the environment unless they extend beyond the limits of the location.

• Spills to the environment, beyond the limits of an oil and gas location, may be reportable to other agencies such as the National Response Center (NRC), the Ohio Environmental Protection Agency (Ohio EPA), the county Local Emergency Planning Commission (LEPC), and the jurisdictional fire department. Refer to Table 1 for spills of crude oil and related materials, hazardous substances.
INCIDENT REPORTING

- In general, any spills should be reported to the jurisdictional ODNR County Inspector. Informal reporting guidelines can be developed with individual inspectors based on the relationship and experience with the inspector.
  - Regional Emergency Operations Managers
  - ODNR Engineering

<table>
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<tr>
<th>TYPE AND VOLUME OF SPILL</th>
<th>REPORTING REQUIREMENTS FOR SPILLS</th>
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</thead>
<tbody>
<tr>
<td>Release of any volume crude oil/produced water spill that has the potential to contaminate the surface of the land, or water on the surface or in the subsurface.</td>
<td>ODNR – Verbal notification immediately</td>
</tr>
<tr>
<td>Release of any amount of oil that causes a film or sheen on a waterway or causes discoloration of the surface of the waters or causes a sludge or emulsion to be deposited beneath the surface of the waters.</td>
<td>NRC, Ohio SERC, LEPC, Jurisdictional FD – Verbal notification immediately</td>
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<tr>
<td>Release of crude oil/produced water &gt;1,000 gals from a single spill or &gt;42 gals for each of 2 spills within a 12-month timeframe of crude oil that reaches a navigable waterway. Spill amounts represent the volume that reaches the navigable waterway; not the volume of the spill which could be greater.</td>
<td>Ohio SERC, LEPC - Written follow-up emergency notice within 30 days.</td>
</tr>
<tr>
<td>Any spill or release of petroleum product (e.g., diesel fuel, gasoline, hydraulic fluid, etc.) to the environment, excluding navigable waters, of 25 gallons or more. Any spill of crude oil to the environment, excluding navigable waters, of 210 gallons (5 barrels) or more.</td>
<td>U.S. EPA and LEPC – Verbal notification immediately and written report within 30 days.</td>
</tr>
<tr>
<td>Any release of hazardous substance or extremely hazardous substance over its assigned reportable quantity (RQ).</td>
<td>NRC, Ohio SERC, LEPC, Jurisdictional FD – Verbal notification immediately</td>
</tr>
<tr>
<td></td>
<td>Ohio SERC, LEPC - Written follow-up emergency notice within 30 days.</td>
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REGULATORY DEFINITION

- ORC 1509.22(A) “…no person shall place or cause to be placed in ground water or in or on the land or discharge or cause to be discharged in surface water brine, crude oil, natural gas, or other fluids associated with the exploration, development, well stimulation, production operations, or plugging of oil and gas resources that causes or could reasonably be anticipated to cause damage or injury to public health or safety or the environment.”

- OAC 1501: 9-07(A) “All persons engaged in any phase of operation of any well or wells shall conduct such operation or operations in a manner which will not contaminate or pollute the surface of the land, or water on the surface or in the subsurface”
GUIDANCE FROM ODNR INSPECTORS

• Unlike states with specific, prescribed spill reporting thresholds (e.g., reportable quantities (RQs)), Ohio rules prohibit contamination of the environment. Operators in Ohio are expected to clean up all spill and work closely with their Division of Oil & Gas Resource Management (DOGRM) Inspectors.

• Operators need to work closely with their assigned DOGRM County Inspector and must keep the Inspector informed of operators’ activities. This is especially true of non-routine events (e.g., spills).

• Communications with ODNR should be direct, i.e., you must speak with them directly in person or by phone. Voice mail or email notifications is generally not acceptable.
GUIDANCE FROM ODNR INSPECTORS

- Most inspectors will expect that an operator will have plans and protocol in place to respond to spills. Inspectors will want to be notified and informed of an assessment of a spill and any potential harm to people and the environment. Inspectors will want to know:

  - Material Spilled
  - Quantity spilled
  - Process spilled from
  - How site personnel were involved in the spill
  - Has the spill been stopped?
  - Were there any injuries?
  - What’s being done to make sure the spill doesn’t happen again?
GUIDANCE FROM ODNR INSPECTORS

• The response by most inspectors will also vary based on:

- Spills onto secondary containment
  vs.
  - Spills on the pad surface (gravel) or on the access road

- Small spills on containment that will be cleaned up immediately
  vs.
  - Spills that cannot or will not be cleaned up quickly due to volume or nature of the spilled material and/or availability of response resources

- Spills occurring entirely on the oil & gas location
  vs.
  - Spills that have or can migrate off the location

Is the incident likely to be reported to any outside agency by private citizens? Have law enforcement or fire department been called? Will the news media pay attention (e.g., fire or incident in view of nearby homes, public roads)?
Contamination Avoidance
Rig Containment

- Mat
- Plastic Liner
- Felt
- Sand
- Gravel

Rubber Gasket between the Plastic Sheet and the Cellar Wall
SECONDARY Containment

• Cleanup of spilled liquids on containment plastic is much easier.
• Spills and contaminated surfaces should be cleaned as soon as possible to avoid accumulating contaminated precipitation.
SPILL RESPONSE MEASURES
Spill Response Procedure

Identify and Stop Source
Prevent Migration
Cleanup Spilled Material
Remove Impacted Media
Test as Required
Site Restoration

Appropriate initial response can make the difference between a catastrophe and a manageable mishap. It is important to isolate the area of the spill so that traffic does not travel through the spill and spread the material.
SPILL SOURCES

• Most on-site spills occur during fluid transfer:
  – Trucks and Tanks
  – Valves, Hatches, Hoses, and Connections
INITIAL RESPONSE AND REPORTING

Determine the extent of a release:

- Direct Observation
- Direct Reading Instruments
- Field Sampling
Initial Response and Reporting

Direct Observation

• Visual evidence of releases on ground surface are the best indication of the extent of fresh spills.
• Standing liquids, residue, stained gravel or soil from small spills can usually be cleaned up quickly.
• Use of ground marking paint is often helpful.
• Some materials (e.g., diesel fuel, coolant and condensate) have a distinctive odor or color that can be useful as an indicator.
Field Instrumentation

Direct Reading Instruments:
- chloride strips,
- pH strips
- photoionization detectors
- Air meters (4 gas)
- Water quality meters
INITIAL RESPONSE AND REPORTING

• Field Sampling and Laboratory Analysis
INITIAL RESPONSE AND REPORTING

SAFETY

INITIAL SPILL CONTROL

INTERNAL REPORTING
On-Site Safety

- Assess the spill area and determine if it is safe to enter area to address the spill. If there is an imminent danger to life and health, follow protocol in Operator Emergency Response Plan.
- Determine if on-site equipment is sufficient to handle the release without risk to Life Safety
- If safe, shut off ignition sources, flow sources and control the spill using absorbents, berms, etc.
INITIAL SPILL CONTROL

• If spill exits pad, prevent spilled materials from entering any waterway (e.g., drainage channels, streams, wetlands, sewers)
• Whether on or off-pad, take immediate steps to limit flow of released materials (e.g., booms, interception trench(es))
• Recover spilled liquids from pad surface as quickly as possible
SOME SPILL CASE STUDIES
QUESTIONS?

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