Regulatory Responses to Stray Gas Incidents

* The Pennsylvania Experience *

Ground Water Protection Council

Stray Gas Conference

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Prevention – Surveillance - Response

- Identification of deepest fresh ground water
- Casing & cementing standards
- Pre-drill surveys
- Emergency response plans
- Water supply replacement requirements
- Investigation protocols & monitoring
- Mechanical integrity testing, bonding logs
- Remediation
Final Rulemaking 25 Pa. Code Chapter 78

Background

- Initial draft presented to TAB September 17, 2009
  - DEP met with TAB and subcommittee four additional times (10/28/09, 1/14/10, 1/21/10, 3/25/10)
- Notice of Final Rulemaking: Public comment period July 10, 2010 – August 9, 2010
- Approval by EQB, IRRC, Attorney General’s Office.
- Final Regulations approved on publication in the Pennsylvania Bulletin February 5, 2011
Chapter 78 Major Changes to Well Construction and Cementing and Other Changes to Subchapter D

- Revised casing standards
- New requirement for casing and cementing plan
- New Section on lost circulation
- Revised cement standards
- New Section on mechanical integrity of existing wells
78.83. Surface and Coal Protective Casing and Cementing Procedures: New Language

- Surface casing set depth: may not be set more than 200 feet below the deepest fresh groundwater except as necessary to set the casing in consolidated rock (Two string vs. three string)
- Surface casing hole must be drilled using air, freshwater, or freshwater-based drilling fluid
- Wellbore conditioning required
- Centralizers now required: surface casing- at least one within 50 ft. of the surface casing seat, then in intervals no greater than every 150 ft. above the first centralizer
- Coal protective string must have at least two centralizers, one within 50 ft. of the casing seat and the second within 100 ft. of the surface
- Intermediate and production casing centralizers required (DEP does not prescribe number and placement)
78.75a. New Section: Area of Alternative Methods

- DEP may designate an area of alternative methods if it determines that well drilling and operating requirements beyond those provided in this Chapter are necessary.
- Notice of proposed area of alternative methods published in PA Bulletin.
- Wells drilled within this area must meet the requirements specified by the Department unless the operator obtains DEP approval to drill, operate or plug the well in a different manner that is at least as safe and protective of the environment as the requirements in the area of alternative methods.
78.89. Stray Gas Mitigation Response

- Establishes protocol for operator, DEP, and local emergency response agencies to determine the nature of a gas migration incident, assess the potential for hazards to public health and safety, and mitigate any hazard posed by the release of natural gas.

- Operator, in conjunction with the Department and local emergency response agencies, must take measures necessary to ensure public health and safety.
Section 78.89: Gas Migration Response

A three-tiered approach

Category 1 (Immediate Threat): detectable concentrations equal to or greater than 10% of the lower explosive limit (LEL) or combustible gas in a building or structure(s), or otherwise deemed Category 1 by the Department.

Category 2 (Potential Threat): detectable concentrations less than 10% of the LEL of combustible gas in a building or structure(s), and/or combustible gas greater than 50% of the LEL in the headspace of a water well, and/or visual or audible evidence of stray gas bubbling through a water well column or surface body, and/or detectable concentrations of stray gas in the soils, and/or concentrations of dissolved methane in water at or above 25% of the lower solubility limit for methane (7 mg/l).

Category 3 (No Apparent Threat): none of the above conditions were met. If conditions indicate methane in groundwater at concentrations above 0.5 mg/l, but below 7 mg/l, continued monitoring is necessary to ensure that concentrations do not trend to a Category 2 potential threat.
Other Responses

- Workgroup on Casing & Cementing
- Workgroup on DFGW
- Building expertise
- Training & Resources
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