



HARVARD LAW SCHOOL

Environmental Law Program

POLICY INITIATIVE

Regulatory Developments in Baseline Water Quality Testing and Monitoring

Presentation to Groundwater
Protection Council

2.11.15

Jurisdictions Studied

We reviewed jurisdictions for drinking water testing and investigations rules and guidance:

- 16 states (AK, CA, CO, ID, IL, KS, NC, ND, NV, OH, OK, PA, SD, UT, WV, WY)
- 7 cities, counties (in TX, NM, ID)
- Industry standards (API, CSSD)
- ongoing research

Survey of Practices: Baseline Water Quality Testing

Baseline Water Quality Testing

WHY?

These background readings can:

- identify other threats to public health;
- rule out contamination from oil and gas;
- build the public's trust in public oversight of oil and gas; and
- facilitate an efficient, effective response where contamination from oil and gas activities does occur.

Baseline Water Quality Testing

DESIGN ELEMENTS:

- Is Baseline Testing Required? For whom?
- What Features Trigger Testing (wells, well pads, laterals)? Distance from Features?
- Number of Baseline and Post-Drill Samples?
- Testing Parameters?
- Minimum Standards for Tester, Lab?
- How are Results Shared?

Baseline Water Quality Testing

IS BASELINE TESTING REQUIRED?

- AK, IL and WY require throughout the state; OH and CO in certain areas
- NC requires pre- and post-drilling sampling as a lease term.
- ID requires notification, testing upon request of land owner.

Baseline Water Quality Testing

ALTERNATIVE MODEL:

Presumption incentive to test

- Presumed liability if water is contaminated within 1,500 ft of a well site (PA), 5,000 ft of a well head (NC), or 1,500 ft from the center of a well pad (WV). Operator may rebut with baseline water quality test.
- ND land owners must conduct baseline testing w/in 1 year before drilling, to be entitled to restoration of supply if seismic, drilling activity impacts water quality, quantity.

Baseline Water Quality Testing

WHAT FEATURES TRIGGER TESTING?

- CO requires ½ mile radius from well, multi-well site, or dedicated injection well.
- NV requires 1 mile radius from well bore or surface projection of any lateral component.
- Impoundments may have separate requirements.

DISTANCE FROM FEATURES?

Sampling ranges from 1,000 ft to 1 mile from the target feature. (TX : Fort Worth, 500 ft; Dallas, 2000 ft to water wells, 750 ft to surface waters; Colleyville, Southlake, 2000 ft.)

Baseline Water Quality Testing

NUMBER OF BASELINE SAMPLES?

- CO, NV and WY require up to 4 samples from “available water sources” in required zone. State provides guidelines for prioritizing water samples.
- IL requires a minimum of 3 samples from each water source within the zone.
- 4 TX cities surveyed each require all water sources within the zone to be tested.

Water Quality Monitoring

POST-DRILLING SAMPLES?

- ID requires freshwater monitoring at the operator's cost unless the state determines the project will not pose a threat of pollution to waters.
- IL requires testing 6, 18, and 30 months after HVHF operations are completed.
- NV, CO require testing (1) 6-12 months after HF commences, and (2) 60-72 months after HF.
- WY requires testing between 12-24 months after setting the production casing, and again 36-48 months after casing.
- Southlake, TX requires "continual quarterly testing" from construction of the first well to abandonment.

Baseline Water Quality Testing

TESTING PARAMETERS?

- Common parameters: pH; alkalinity; barium; calcium; iron; magnesium; BTEX; sulfates; sodium; dissolved gases (methane, ethane, propane); bacteria; TDS.
- Cities, counties tend to require fewer testing parameters.
- IL lists NORM (other states list specific radioactive elements).
- KS tiers testing parameters in its voluntary guidelines. Tier 1 = barium, bromide, chloride, nitrate, pH, sodium, specific conductance, strontium, sulfate.

Baseline Water Quality Testing

MINIMUM STANDARDS FOR TESTER, LAB?

- PA: independent certified lab must conduct the survey; a “person independent of the well owner/operator, other than an employee of the certified laboratory, may collect the sample” if the lab affirms the procedure.
- IL: independent third party must sample, under the supervision of a P.E. or professional geologist.
- Southlake, TX: City engages a third party to coordinate sampling (and seeks reimbursement from the operator)

Baseline Water Quality Testing

HOW ARE RESULTS SHARED?

- Submittal to state: PA, within 10 days of receipt of analysis; CO, within 3 months of sample collection
- IL: submittal to state within 7 days; state posts results on its website. If property owner wants information private, a non-disclosure agreement must be signed.
- Immediate notification: CO, if results show BTEX, TPH; NV, if results show BTEX or H₂S exceed drinking water standards
- AK: notification if dissolved gases exceed a threshold.

Survey of Practices: Water Quality Investigations

Water Quality Investigations

DESIGN ELEMENTS:

- Presumptions of Liability for drinking water contamination or diminution (legal tools, not basis for scientific determination)
- Process, timeline for investigations
- Results of investigations
- Public Access to results

Water Quality Investigations

PRESUMPTIONS OF LIABILITY

- PA presumption applies within 2500 feet and 1 year of completion of an unconventional well. NC presumption applies within 5000 feet of a wellhead, at any time.
- Usually, baseline tests used to rebut the presumption.
- IL uses baseline data differently – presumption applies if contamination appears within 1500 feet of a well and within 30 days of operations, and baseline tests showed absence of contamination.
- Injection wells may not fall within presumptions.
- Presumptions are legal tools, not scientific determinations.

Water Quality Investigations

PROCESS, TIMELINE FOR INVESTIGATIONS

- CA, an investigation can happen on the supervisor's own initiative; other states (PA, OK, IL) seem to require a complaint from a landowner or water supply owner.
- IL, investigation must begin within 30 days, with a "reasonable effort" for a determination with 180 days.
- PA, investigation must begin within 10 days, with a determination within 45 days.
- OK requires quick initial action (referral or start process within 2 days) with resolution within 180 days.

Water Quality Investigations

RESULTS OF INVESTIGATIONS

- If PA presumption applies, temporary water source must be provided to persons with no “readily available alternative.”
- [NOTE: When a residual waste disposal facility affects a water supply, PA requires the owner to provide a *permanent* source of water (no water buffaloes).]
- WV requires emergency water within 24 hours, a temporary water supply within 72 hours, and a permanent supply within 30 days, as needed.
- CA, IL may issue orders as needed, for temporary or permanent supplies of water.
- Other remedies available; court reviews of determinations.

Water Quality Investigations

PUBLIC ACCESS TO RESULTS?

- PA will post on its website lists of confirmed cases of “subterranean” water supply contamination.
- IL will post on its website lists of confirmed cases of pollution of diminution that result from HVHF.

Next Steps?

- Integration of testing requirements, presumptions, and remedies for production wells, injection wells, and impoundments.
- “Traffic Light System” for testing monitoring, based on distance between production zone and aquifer
- Use of tracers (Dallas, TX; some companies)
- State-wide water flow, quality mapping efforts (Utah Geol. Survey; Garrettsville, OH water utility) for more baseline data, and determine water travel time to set appropriate post-drill sampling timelines.