

## **300 Series Drilling, Development, Production and Abandonment**

318A.e

### **(4) Groundwater baseline sampling and monitoring.**

#### **A. Applicability and effective date.**

- i. This Rule 318A.e.(4) applies to Oil Wells, Gas Wells (hereinafter, Oil and Gas Wells), Multi-Well Sites, and Dedicated Injection Wells as defined in the 100-Series Rules, for which a Form 2 Application for Permit to Drill is submitted on or after May 1, 2013.
- ii. This Rule 318A.e.(4) does not apply to an existing Oil or Gas Well that is re-permitted for use as a Dedicated Injection Well.
- iii. Nothing in this Rule is intended, and shall not be construed, to preclude or limit the Director from requiring groundwater sampling or monitoring at other Production Facilities consistent with other applicable Rules, including but not limited to the Oil and Gas Location Assessment process, and other processes in place under 900-series E&P Waste Management Rules (Form 15, Form 27, Form 28).

#### **B. Sampling Locations.**

- i. Initial baseline samples and a subsequent monitoring sample shall be collected from one (1) Available Water Source in the governmental quarter section in which a new Oil and Gas Well, the first well on a Multi-Well Site, or a Dedicated Injection Well is located. If a sampling location has previously been established within the governmental quarter section, and sampled within the prior sixty (60) months before spudding, no initial baseline sample is required.
- ii. If there is no Available Water Source within the governmental quarter section where a proposed new Oil and Gas Well, Multi-Well Site, or Dedicated Injection Well is located, then an Available Water Source from a previously unsampled governmental quarter section within a 1/2 mile radius of the Oil and Gas well, Multi-Well Site, or Dedicated Injection Well, if any, shall be sampled. Once a sample location is established in a governmental quarter section, no additional sample locations are required for that governmental quarter section.
- iii. If there is more than one Available Water Source in the governmental quarter section or, if applicable, within the half-mile radius around the Oil and Gas Well, the first well on a Multi-Well Site, or a Dedicated Injection Well, the sample location shall be selected based on the following criteria:

- aa. Proximity. Available Water Sources closest to the proposed Oil or Gas Well, a Multi-Well Site, or a Dedicated Injection Well are preferred.
- bb. Type of Water Source. Well maintained domestic water wells are preferred over other Available Water Sources.
- cc. Multiple identified aquifers available. Where multiple defined aquifers are present, sampling the deepest identified aquifer is preferred.
- dd. Condition of Water Source. An operator is not required to sample Water Sources that are determined to be improperly maintained, nonoperational, or have other physical impediments to sampling that would not allow for a representative sample to be safely collected or would require specialized sampling equipment (e.g. shut-in wells, wells with confined space issues, wells with no tap or pump, non-functioning wells, intermittent springs).

**C. Exceptions.** Prior to spudding, an operator may request an exception from the requirements of this Rule 318.A.e.(4) by filing a Sundry Notice (Form 4) for the Director's review and approval if:

- i. No Available Water Sources are located within the governmental quarter section or a previously unsampled quarter section within a 1/2 mile radius of a proposed Oil and Gas Well, Multi-Well Site, or Dedicated Injection Well;
- ii. The only Available Water Sources are determined to be unsuitable pursuant to subpart (4)B.ii.dd, above. An operator seeking an exception on this ground shall document the condition of the Available Water Sources it has deemed unsuitable; or
- iii. The owners of all Water Sources suitable for testing under this Rule refuse to grant access despite an operator's reasonable good faith efforts to obtain consent to conduct sampling. An operator seeking an exception on this ground shall document the efforts used to obtain access from the owners of suitable Water Sources.
- iv. If the Director takes no action on the Sundry Notice within ten (10) business days of receipt, the requested exception from the requirements of this Rule 318A.e.(4) shall be deemed approved.

#### **D. Timing of Sampling.**

- i. Except as provided in subpart (4)B.i, above, initial sampling shall be conducted within 12 months prior to setting conductor pipe in an Oil and Gas Well or the first well on a Multi-Well Site, or commencement of drilling a Dedicated Injection Well.
- ii. One subsequent sampling event shall be conducted at the initial (or previously established) sample location between six (6) and twelve (12) months following completion of the Well or Dedicated Injection Well, or the last Well on a Multi-Well Site. Wells that are drilled and abandoned without ever producing hydrocarbons are exempt from subsequent monitoring sampling under this subpart (4)D.ii.

**E. Initial Baseline Sampling Analysis.** The initial baseline sampling required pursuant to subpart (4)D.i shall include pH, specific conductance, total dissolved solids (TDS), dissolved gases (methane, ethane, propane), alkalinity (total bicarbonate and carbonate as CaCO<sub>3</sub>), major anions (bromide, chloride, fluoride, sulfate, nitrate and nitrite as N, phosphorus), major cations (calcium, iron, magnesium, manganese, potassium, sodium), other elements (barium, boron, selenium and strontium), presence of bacteria (iron related, sulfate reducing, slime forming), total petroleum hydrocarbons (TPH) and BTEX compounds (benzene, toluene, ethylbenzene and xylenes). Field observations such as odor, water color, sediment, bubbles, and effervescence shall also be documented. The location of the sampled Water Source shall be surveyed in accordance with Rule 215.

**F. Subsequent Sampling Analysis.** Subsequent sampling to meet the requirements of subpart (4)D.ii shall include total dissolved solids (TDS), dissolved gases (methane, ethane, propane), major anions (bromide, chloride, sulfate, and fluoride), major cations (potassium, sodium, magnesium, and calcium), alkalinity (total bicarbonate and carbonate as CaCO<sub>3</sub>), BTEX compounds (benzene, toluene, ethylbenzene and xylenes), and TPH.

**G. Methane Detections.** If free gas or a dissolved methane concentration greater than 1.0 milligram per liter (mg/l) is detected in a water sample, gas compositional analysis and stable isotope analysis of the methane (carbon and hydrogen – <sup>12</sup>C, <sup>13</sup>C, <sup>1</sup>H and <sup>2</sup>H) shall be performed to determine gas type. The operator shall notify the Director and the owner of the water well immediately if:

- i. the test results indicated thermogenic or a mixture of thermogenic and biogenic gas;

- ii. the methane concentration increases by more than 5.0 mg/l between sampling periods; or
- iii. the methane concentration is detected at or above 10 mg/l.

**H. BTEX or TPH Detections.** The Operator shall notify the Director immediately if BTEX compounds or TPH are detected in a water sample.

**I. Sampling Results.** Copies of all final laboratory analytical results shall be provided to the Director and the water well owner or landowner within three (3) months of collecting the samples. The analytical results, the surveyed sample Water Source location, and the field observations shall be submitted to the Director in an electronic data deliverable format.

- i. The Director shall make such analytical results available publicly by posting on the Commission's web site or through another means announced to the public.
- ii. Upon request, the Director shall also make the analytical results and surveyed Water Source location available to the Local Governmental Designee from the jurisdiction in which the groundwater samples were collected, in the same electronic data deliverable format in which the data was provided to the Director.

**J. Liability.** The sampling results obtained to satisfy the requirements of this Rule 318A.e.(4), including any changes in the constituents or concentrations of constituents present in the samples, shall not create a presumption of liability, fault, or causation against the owner or operator of a Well, Multi-Well Site, or Dedicated Injection Well who conducted the sampling, or on whose behalf sampling was conducted by a third-party. The admissibility and probity of any such sampling results in an administrative or judicial proceeding shall be determined by the presiding body according to applicable administrative, civil, or evidentiary rules.