Groundwater Monitoring at Coal-Combustion Power Plants

Department of Water, Energy, and Environment

Remediation Division

Groundwater Monitoring Establishing Background

- 40 CFR 257.94 (b) – Existing landfills and surface impoundments were required to collect and analyze a minimum of eight independent samples from each background and downgradient well for appendix III and IV constituents.
- This rule also applies to any new landfills, new surface impoundments, and lateral expansions of existing units.

Groundwater Monitoring
Detection Monitoring (Appendix III)

- Boron
- Calcium
- Chloride
- Fluoride
- pH
- Sulfate
- Total Dissolved Solids (TDS)

Groundwater Monitoring
Assessment Monitoring (Appendix IV)

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Fluoride
- Lead
- Lithium
- Mercury
- Molybdenum
- Selenium
- Thallium
- Radium 226 and 228 combined

Groundwater Monitoring
Detection Monitoring

- 40 CFR 257.94 (b) - Detection monitoring should be conducted semiannually. An alternative monitoring frequency may be established **based on the availability of groundwater**, but can be no less than annual.
- 40 CFR 257.93 (f) – Monitoring data for each constituent should be evaluated by an appropriate statistical method.
- If a statistically significant increase is determined, the facility may demonstrate an alternate source or natural variation as the cause.

Groundwater Monitoring Assessment Monitoring

- 40 CFR 257.95 (b) – Within 90 days of triggering an assessment monitoring program, facilities must sample and analyze the groundwater for all constituents listed in appendix IV.
- Groundwater protection standards (GWPS) must be established for all detected constituents, either the maximum contaminant level (MCL) or the background concentration value. If background concentration is above the MCL, the background concentration is used as the GWPS.
- 40 CFR 257.95 (d) - Assessment monitoring should be conducted semiannually. An alternative monitoring frequency may be **based on the availability of groundwater**, but can be no less than annual.

Groundwater Monitoring
Assessment Monitoring

- If the concentrations of all constituents in appendices III and IV are statistically at or below background values for two consecutive sampling events, the unit may return to detection monitoring.
- If the concentration of any constituent in appendices III and IV are statistically above background values but below the GWPS, the facility continues in assessment monitoring.
- If the concentration of one or more constituent in appendix IV is detected at a statistically significant level above the established GWPS, additional actions are required.

State & Federal CCR Program Differences

- 40 CFR 257.96-257.98 – These sections outline the process of assessing, selecting, and implementing corrective measures to address an SSL above a GWPS for any Appendix IV constituent.
  - Remedial actions will not be conducted in accordance with Nebraska Title 118.
  - 40 CFR 257.97 – Factors to consider during remedy selection include: potential risks to human health and the environment from exposure to contamination, long-term reliability of the engineering and institutional controls, and resource value of the aquifer/groundwater quantity and quality.

State & Federal CCR Program Differences

- The full suite of appendix IV constituents must be sampled at least annually when in assessment monitoring.
- When in assessment monitoring, concentration of appendix III and IV constituents must all be at or below background values for two consecutive sampling events for a facility to return to detection monitoring.

State & Federal CCR Program Differences

- 40 CFR 257.60 – The base of new CCR landfill units and existing or new surface impoundments must be at least five feet above the top of the uppermost aquifer
- Alternatively, a facility can demonstrate there will be no intermittent, recurring, or sustained hydraulic connection between any portion of the base of the unit and uppermost aquifer due to normal groundwater fluctuations (including the seasonal high water table).

Site Specific Questions?

Please complete this form for any site-specific questions you have related to changes to the groundwater monitoring program.