Worldwide Pollution Control Association

WPCA-Duke Energy FGD Wastewater Treatment Seminar

March 7, 2013

Visit our website at www.wpca.info

EPA's Proposed 316(b) Rule for Existing Facilities

WPCA/Duke Energy
FGD Wastewater Treatment Seminar
March 7, 2013

Presented by Nathan Craig, Environmental Specialist

Introduction

Clean Water Act (CWA) §316(b)

- Requires that the location, design, construction and capacity of cooling water intake structures reflect the Best Technology Available (BTA) for minimizing adverse environmental impact
- The rule currently being developed applies to existing facilities
- 316(b) Rule for New Facilities was effective January 17, 2002

EPA Actions to Date

- Proposed Rule for Existing Facilities published on April 20, 2011
- Notice of data availability (NODA) Related to Impingement Mortality Control Requirements, published on June 11, 2012
- NODA Related to EPA's Stated Preference Survey published on June 12, 2012

Proposed Rule Highlights

- EPA proposed 4 options
  - Option 1 (EPA preferred)
    - Entrainment: Standards determined on a site-by-site basis by appropriate state agency
    - Impingement: Mortality standard (12% annual and 31% monthly) or reduce intake velocity to <0.5 fps
    - Modify traveling screens or other active screens to be "fish friendly"

Proposed Rule Highlights

- Option 1 (continued)
  - Operate and maintain intake with less than 15% blockage
  - Ensure intake does not lead to entrapment of fish
  - For water withdraws from ocean or tidal waters, achieve impingement mortality reductions of shellfish comparable to barrier nets
  - Several evaluations / studies / information submittals required

Proposed Rule Highlights

- Requirements for New Units
  - Proposal includes special requirements for "new units" (defined to exclude replacement or repowered units), modeled on Phase II rule
  - New units must have flows consistent with closed-cycle cooling (CCC) or demonstrate entrainment mortality reductions equivalent to 90% or greater of reduction that could be achieved by CCC, and meet 0.5 fps through-screen velocity standard

Proposed Rule Highlights

Compliance Schedule

- Impingement: Within 8 years of the effective date of the rule
- Entrainment: To be determined by the NPDES Permit Writer (some entrainment studies not due until 5 years after the effective date of the rule)

NODA on Impingement Mortality

- Alternatives / Clarifications presented:
  - Site Specific Approach for Reducing Impingement Mortality
  - Closed-Cycle Recirculating Systems
  - Measurement of Intake Velocity
  - Impingement Mortality Limitations
  - Credit for Existing or Newly Installed Technologies
  - Facilities With Low Impingement Rates
  - Species of Concern

NODA on Stated Preference Survey

- Results range widely among the regional studies, e.g., from $0.75 per percentage improvement in SE to $2.52 in Pacific

- EPA notes that conclusion on BTA for entrainment is unaffected by the results

Regulatory Update

Impingement Compliance Alternatives under Consideration as of January 2013

- Direct biological monitoring with traveling screens with modifications to reduce risk of non-compliance
- Achieving a 0.5 fps through screen velocity or less with modifications to reduce risk of non-compliance
- **New:** Streamlined (pre-approved) approach based on modified traveling screens
- **New:** Use of "defined" technology
- **New:** Site-specific approach (may be limited to facilities that cannot comply with any other option)
- **New:** Exemption for low levels of impingement

Regulatory Update

- EPA is working to provide an integrated schedule toward meeting the impingement and entrainment requirements
- On some issues such as the 0.5 through-screen velocity (e.g., where measurement is to be made) and entrapment, EPA may be less prescriptive
- Recalculating impingement mortality criteria

Regulatory Update

- Stated Preference survey is not expected to be part of the final rule.
- More flexibility to the State, especially with respect to entrainment compliance
- Concern with Peer Review requirement
- Concern with the definition of closed-cycle cooling

Regulatory Update

- Efforts to inform EPA on industry concerns are still ongoing
- Edison Electric Institute (EEI) recently provided EPA with a paper outlining key elements needed to produce a reasonable, workable final rule, including:
  - Abandoning the impingement mortality standard
  - Pre-Approving a Suite of Technologies
  - Allowing Comparable Alternative Technology
  - Allowing Site-Specific Review, Including Credit for Past Action and Relief for *De Minimis* Effects

Regulatory Update

- Rule is expected to be finalized in **June 2013** with an effective date 90 days after publication in the Federal Register (**~October 2013**)
- If finalized as proposed, initial submittals for facilities with a DIF greater than 50 MGD due **~ April 2014**
- EPA on notice from the Riverkeeper that they will litigate

Questions???

Steam Electric Effluent Guidelines

WPCA/Duke Energy
FGD Wastewater Treatment Seminar
March 7, 2013

Presented by Nathan Craig, Environmental Specialist

What are Effluent Guidelines?

- Developed for a specific industrial category
- EPA selects a ***model technology*** for the industry and/or waste stream
- Establishes permit limits for applicable parameters based on the performance of the model technology
- Requirements are incorporated into National Pollutant Discharge Elimination System (NPDES) discharge permits

What are Effluent Guidelines?

- Historically, for all ELG rules, EPA estimates pollutant removals (lbs/yr) for candidate technologies and then calculates individual pollutant "toxic weighted pounds equivalent" or TWPEs, by multiplying the lbs/yr by a toxic weighting factor (TWF)
- Example: 1 lb. Hg x 117.2 (TWF) = 117.2 TWPEs
- EPA evaluates technologies for cost effectiveness using cost per TWPE of pollutant removed

STEAM ELECTRIC EFFLUENT GUIDELINES

- 40 CFR Part 423
- Promulgated in 1974, and amended 1977, 1978, 1980 and 1982
- Applicable to generation of electricity for distribution and sale which results primarily from a process utilizing fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle employing the steam water system

STEAM ELECTRIC EFFLUENT GUIDELINES

- **Last Revised in 1982**
- **Fly Ash Transport Water:** No Best Available Technology (BAT) limits with the exception of no discharge of PCBs. Maintained Best Practicable Control Technology (BPT) limits
- Established New Source Performance Standards (NSPS) for no discharge of pollutants from fly ash transport water
- **Bottom Ash Transport Water:** No BAT limits with the exception of no discharge of PCBs. Maintained BPT limits
- Reserved BPT and BAT for several other waste streams, including FGD wastewater until future rule-making

EPA Plans for Revision

- Limits are expected to be revised/developed for the following waste streams:
  - FGD Wastewater
  - Fly Ash Transport Water
  - Bottom Ash Transport Water
  - Leachate from CCR Landfills / Ponds
  - Gasification Wastewater (IGCC)

EPA Plans for Revision

For FGD wastewater, EPA is considering:

- No change

Or setting limits based on the performance of:

- Chemical precipitation
- Chemical precipitation plus biological
- Chemical precipitation with vapor-compression evaporation

EPA Plans for Revision

- Draft NPDES Permit for PSNH Merrimack Station (Fall 2011)

- Region 1 proposed internal BAT limits on the FGD wastewater based on the performance of a physical/chemical plus bioreactor treatment system

EPA Plans for Revision

Internal Limits on FGD Wastewater Proposed for PSNH Merrimack Station based on Analysis by EPA Headquarters

Compound/Units	Maximum Daily Limit	Monthly Average Limit
Arsenic (ug/L)	15	8
Chromium (ug/L)	10	Report
Copper (ug/L)	16	8
Selenium (ug/L)	19	10
Mercury (ug/L)	55	22
Zinc (ug/L)	15	12

EPA Plans for Revision

For fly ash transport water, EPA is considering:

- No discharge of pollutants in fly ash transport water (based on conversion to dry fly ash transport)

or

- No change

EPA Plans for Revision

For bottom ash transport water, EPA is considering:

- No discharge of pollutants in bottom ash transport water based on either complete recycle of transport water or conversion to dry bottom ash handling

or

- No change

EPA Plans for Revision

For leachate from landfills / ponds containing CCRs, EPA is considering:

- No change

Or setting limits based on the performance of:

- Chemical precipitation
- Chemical precipitation plus biological

EPA Plans for Revision

For Gasification Wastewater, EPA is considering:

- No change

Or setting limits based on the performance of:

- Vapor-compression evaporation
- Vapor-compression evaporation plus cyanide destruction

EPA Plans for Revision

Other issues

- Metal Cleaning, non-chemical and chemical, Wastewater
- Mercury Control System Wastewater
- Best Management Practices (coal pile runoff, etc.)

EPA Plans for Revision

- January 14, 2013: EPA sent the proposed rule to OMB for interagency review.
- **April 19, 2013:** EPA to sign proposed rule according to stipulation in Defenders of Wildlife v. Jackson.
- Early May 2013: Proposed rule to be published in the Federal Register, starting a comment period.
- Early August 2013: Assuming a 90-day period, the comment period on the proposal ends.
- **May 22, 2014:** EPA to take final action on the rule.
- 2014-2018 (?): Rule implementation. Specifics of timing unknown at this time.

EPA Plans for Revision

UWAG met with DOE on Feb. 13 and emphasized:

- Based on preliminary work, FGD wastewater treatment by ZLD or biological treatment are not cost effective.
- Dry bottom ash handling is not cost effective.
- Industry needs a reasonable compliance period (8-10 yrs.) if forced to retrofit FGD WWT and dry bottom ash and fly ash handling.
- Rule may require treatment of non-chemical metal cleaning wastes. That change will affect all types of facilities that wash metal process equipment with water and discharge the wastewater.

Potential Impacts

- Installation of enhanced treatment of FGD Wastewater
- Limits at the internal outfall
- Possibly more rigor in the O&M of the FGD WWTS
- May need to install back-up equipment for critical shared components of the dry fly ash collection system
- Rerouting landfill / ash pond leachate to a treatment system

Potential Impacts

- Reconfiguring the boiler for dry bottom ash handling or installing hydrobins
- Still need to meet water quality based effluent limits (WQBEL)
- Handling of other low volume waste streams
- Need for additional ash storage in landfills

Questions & Thoughts?