TECHNICAL GUIDANCE FOR
DEVELOPMENT OF NPDES PERMIT REQUIREMENTS
STEAM ELECTRIC INDUSTRY

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Pennsylvania Department of Environmental Protection
Water Management Program

http://www.dep.state.pa.us
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The following represents the most up to date technical guidance in developing NPDES permit terms and conditions for Steam Electric Power Plants, and supersedes previous guidance memoranda from Central Office on this subject.

1. Dealing With Toxics in Steam Electric Discharges

   a. Application of BWQM Toxics Strategy - Certain toxic pollutants may be present in trace amounts in discharges from various activities associated with steam electric facilities. Permit writers should follow the normal application review and pollutant screening process which is contained in the Toxics Strategy Document when reviewing steam electric permit applications. If the presence of such pollutants is due mainly to the quality of plant intake water, then this should be factored into the screening process.

   In some cases, levels of heavy metals have been detected above “nominal” detection levels (10 micrograms per liter) for discharges from ash handling, storage, or disposal systems. Based on information received to date it appears that fly ash handling, storage, and disposal systems have higher potential than bottom ash systems for trace metals to be present above nominal detection levels.

   If these metals become “pollutants of concern” when applying the normal Toxics Strategy screening process, then effluent limits (as necessary) should be incorporated into the draft permit and the permittee should be required to develop a Toxics Reduction Evaluation (TRE), as called for in the Strategy.

   When reviewing the results of the TRE, the following options should be kept in mind to address heavy metals in such discharges:

   1) Change source of coal or blend coal sources used as fuel at the power plant.

   2) Switch to dry ash handling system.

   3) Move discharge point.

   4) Recycle/reuse ash handling water.

   For ash storage or disposal sites with leachate/runoff which is precipitation-induced, the use of real-time water quality management may also be investigated as a
means of accommodating the discharge. This is discussed in the Bureau’s, “Interim Policy for Real-Time Management of Precipitation Induced Point Source Discharges” (February, 1983).

Finally, where the results of the screening and effluent limit development processes indicate questionable need for permit limits for certain toxics, an option would be to impose monitoring-only requirements in the permit in order to develop a firmer database on those toxics for the future. This may be warranted, for example, when it appears that the pollutant(s) in question are present in the intake water, and the discharge is to the same body of water.

b. **Toxics Present in Cooling Tower Blowdown**

1) **Toxics Present Due to Quality of Intake Water**

Power plants which recirculating cooling water, and which consequently have periodic cooling tower blowdown discharges, will concentrate pollutants which are present in the intake water. The degree of concentration varies from case to case, however, it is possible that some pollutants which are “nondetectable” in the cooling water intake would then become detectable in the blowdown.

Assuming the cooling water intake and the blowdown discharge involve the **same body of water**, and assuming there is **no net mass addition** of such pollutant(s) within the cooling water system, the need of assigning water quality based effluent limits will be determined as follows:

**Situation #1**

Upstream water quality is better than required by applicable WQ standard (see note below).

The elevated concentration of pollutant in the blowdown discharge **will not** result in a violation of the WQ standard downstream.

No WQ limit needed.
Situation #2

Upstream water quality is better than required by applicable WQ standard (see note below).

The elevated concentration of pollutant in the blowdown discharge will result in a violation of the WQ standard downstream.

WQ limit shall be assigned.

Situation #3

Upstream water quality violates the applicable WQ standard (see note below).

The elevated concentration of pollutant in the blowdown discharge will not result in a "measurable change" in downstream quality (using nominal detection methods and considering associated analytical variability).

No WQ limit needed.

Note:

If the pollutant is not-detectable in the intake water, it is appropriate to back-calculate the upstream quality by dividing the blowdown discharge concentration by the "concentration factor" for the pollutant in the blowdown, to determine if the standard is being violated upstream.

As with ash-related discharges, a monitoring-only requirement may be appropriate where there is some question as to the quality of the discharge or the need for a permit limitation in these situations.
2) **Toxics Present Due to Addition of Cooling Water Treatment Chemicals**

EPA’s BAT and NSPS regulations for cooling tower blowdown specifically require that (with the exception of Zn and Cr) any priority pollutants added for cooling tower maintenance should be “not detectable” in the blowdown.

It is not necessary to specify additional monitoring requirements for these remaining priority pollutants; however the BAT special condition shall be incorporated into Part C of the permit to read as follows:

“For outfall __________, except for Total Zinc and Total Chrome, there shall be no detectable levels of the remaining priority pollutants in this discharge due to the addition of chemicals for cooling tower maintenance. For Zinc and Chrome, the more stringent of either BAT/NSPS or water quality-based concentration limits shall be incorporated into the permit. Where the BAT limit governs, only the “maximum daily” concentration limit will be used.

c. **Effluent Prohibition for PCB’s**

EPA’s ELG regulation contains a general prohibition against the presence of PCB’s in all discharges from steam electric facilities.

The following BAT special condition shall be placed in Part C of the NPDES permit:

“There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.”

2. **Metal Cleaning Wastes**

This was a subject of a memorandum to the Norristown Region (cc: Regional Permits Chiefs) dated March 9, 1984.

“Non-chemical” metal cleaning wastes are to be considered as low-volume wastes and therefore not subject to BPT-BAT limitations for copper and iron. EPA Region III has agreed to
this approach for all steam electric cases (for consistency purposes until EPA finally clarifies this issue in terms of revised BAT regulations).

The attached Table indicates how chemical and non-chemical metal cleaning wastes should be handled when writing NPDES permits for steam electric dischargers.
METHOD OF ADDRESSING METAL CLEANING WASTEWATER IN NPDES PERMITS FOR STEAM ELECTRIC POWER Plants

Situation

1. Chemical metal cleaning wastes which are treated prior to stream discharge, or pretreated prior to discharge to main wastewater treatment facilities.

2. Chemical metal cleaning wastes which are not treated prior to stream discharge.

3. Chemical metal cleaning wastes which are not pretreated prior to discharge into main wastewater treatment facilities, but where the main facilities provide treatment which should result in removal of iron and copper.

Action

1. Apply BAT (or stricter water quality based limits) at point of discharge or BAT at the point following pretreatment. Use only concentration limits, not mass limits. Express the limits as “maximum daily”.

2. Apply BAT (or stricter water quality based limits) at point of discharge.

3. a. Assuming the absence of chemical metal cleaning wastes, determine the normally-expected effluent levels of iron and copper and the corresponding BAT or WQ-based effluent limits. Determine the most appropriate effluent limits under these conditions at the point of discharge.

   b. Assuming the required BAT effluent concentrations (1.0 mg/1) for iron and copper at the point of discharge to the main waste treatment facilities, calculate the incremental increase in final effluent concentration during chemical metal-cleaning discharge events.

   c. If the incremental increase is measurable (using nominal detection levels for both parameters), then in addition to the effluent limits from Step a. above, establish a maximum allowable increase in the “maximum daily” effluent limitations for iron and copper during chemical metal-cleaning discharge events. Put a special condition in the permit to read as follows:

   - If the incremental increase is measurable (using nominal detection levels for both parameters), then in addition to the effluent limits from Step a. above, establish a maximum allowable increase in the “maximum daily” effluent limitations for iron and copper during chemical metal-cleaning discharge events. Put a special condition in the permit to read as follows:
“Starting ________ hours after commencing the discharge of chemical metal cleaning wastewater, and during the 24-hour period immediately following, the permittee will monitor the change in final effluent concentrations of iron and copper at outfall ____________.

The allowable increase in maximum daily effluent concentrations at outfall _________ shall not exceed _____________ mg/L for iron and ____________ , mg/l for copper, as an average of all samples taken during this 24-hour period. If grab samples are taken, a minimum of _____________ samples shall be used, taken at reasonably spaced intervals during this 24-hr. sampling period.”

4. Chemical metal cleaning wastes which are not pretreated prior to combining with another waste stream which will provide dilution (but no treatment) for iron or copper removal.

4. Apply BAT (or stricter water quality based limits) at the point prior to dilution with the other waste streams.

5. Non-chemical metal cleaning wastes

5. These should be considered as “low volume” wastes and addressed as described in the Steam Electric ELG regulations.*

* If BPT limits for iron and copper had previously been set in the NPDES permit, this action could be interpreted by some as “backsliding”) i.e., allowing less stringent limits than in the previous permit); however EPA’s 4/1/83 NPDES program regulations 40 CFR 122.44(1) allow for such modifications.
a. **Applicable Regulatory Sections**

1) **Key Definitions (423.1)(c), (d), (e)**

   (c) The term "chemical metal cleaning waste" means any wastewater resulting from the cleaning of any metal process equipment with chemical compounds, including, but not limited to, boiler tube cleaning.

   (d) The term "metal cleaning waste" means any wastewater resulting from cleaning [with or without chemical cleaning compounds] any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning.

   (e) Changes From Proposal and Rationale. For chemical metal cleaning wastes, the final, BAT, NSPS, PSES and PSNS are equivalent to the 1980 proposal. The 1980 proposal contained first time coverage of copper for PSNS and, for PSES, copper was changed from a mass-based limitation to a concentration limitation. Unlike the existing regulations and the 1980 proposal, however, the requirements do not cover non-chemical metal cleaning wastes.

   Note The following discussion appears in the preamble, p.52297:

   In the preamble to the 1980 proposal, EPA explained that the existing requirements applied to all metal cleaning wastes, whether the wastes resulted from cleaning with chemical solutions or with water only. EPA rejected an earlier guidance statement which stated that wastes from metal cleaning with water would be considered “low volume” wastes. However, because many dischargers may have relied on this guidance, EPA proposed in 1980 to adopt the guidance for purposes of BPT and to change the BPT limitation to apply only to “chemical” metal cleaning wastes. See 45 FR 68333 (October 14, 1980) for a full discussion of the issue.

   Commenters argued that EPA’s clarified interpretation of the existing regulations would result in extremely high compliance costs and were not supported by the record. In response to the comments, we examined the available data on waste characteristics of non-chemical metal cleaning wastes and the costs and economic impacts of controlling them. The data indicated that there was a definite potential for differences in concentration levels of inorganic pollutants depending on whether the plants were coal or oil-fired. Further, compliance with the existing effluent limitations and standards could be very costly and result in significant adverse economic impacts. However, the data were too limited for EPA to make a final decision.
EPA requested that the Utility Water Act Group provide specific, additional information. The data were submitted too late for the Agency to use at this time. Consequently, EPA is reserving BAT, NSPS, PSES and PSNS for non-chemical metal cleaning wastes in today’s rule.

EPA is withdrawing the proposal to change the BPT definition of metal cleaning wastes. However, until the Agency promulgates new limitations and standards, the previous guidance policy may continue to be applied in those cases in which it was applied in the past.

2) **BPT (423.12)(b)**

(b) The quantity of pollutants discharged in metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of metal cleaning wastes times the concentration listed in the following table:

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>Maximum for any 1 day (mg/l)</th>
<th>Average of daily values for 30 consecutive days shall not exceed (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSS</td>
<td>100.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Oil and grease</td>
<td>20.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Copper, total</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Iron, total</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Note: Limits on Fe and Cu not needed for non-chemical metal cleaning wastes (see above discussion)

3) **BAT (423.13(e), (f))**

(e) The quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the concentration listed in the following table:

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>Maximum for any 1 day (mg/l)</th>
<th>Average of daily values for 30 consecutive days shall not exceed (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper, total</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Iron, total</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

(f) [Reserved — Nonchemical Metal Cleaning Wastes.]
4) **BAT (423.14)** Reserved Note: Use BPT for TSS, Oil and Grease in absence of BCT

5) **NSPS (423.15)(d) and (e)**

   (d) The quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the concentration listed in the following table:

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>Maximum for any 1 day (mg/l)</th>
<th>Average of daily values for 30 consecutive days shall not exceed (mg/l)</th>
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<td>15.0</td>
</tr>
<tr>
<td>Copper, total</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Iron, total</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

   (e) [Reserved--Nonchemical Metal Cleaning Wastes].

3. **Discharges of Radioactive Constituents From Steam Electric Power Plants**

   This was the subject of a memorandum to the Pittsburgh Region dated April 29, 1983, and has subsequently been incorporated into Chapter 3 of the Bureau’s NPDES Permit-Writing Technical Guidance Document.

   a. **Coal Fired Power Plants**

   There are no technology-based limits for radioactivity from coal fired power stations. There are no statewide water quality criteria governing radioactivity, however Chapter 93 of our regulations contains basin-specific criteria established by DRBC (drainage list A) and ORSANCO (drainage list W).

   Potable water supply is the most critical water use of most concern. In the absence of basin-specific water quality criteria, the acceptability of effluents from steam electric facilities which contain small levels of radioactivity is to be based upon EPA’s interim primary drinking water regulations, which specify a maximum of 5 pico curies per liter of total radium (Ra226 + Ra228) in drinking water supply systems. These Federal regulations, although not statutorily applicable to coal fired electric plants, serve as a basic reference for assessing maximum radiation levels that are acceptable on a long term basis.
Based on a review of radioactivity levels in discharges from several coal fired facilities across Pennsylvania, total radium concentrations range from 1 to 3 pico curies per liter, and in no case exceeded 5 pico per liter. Therefore, it appears that such discharges will not exceed the more stringent of the above Chapter 93 criteria or EPA limits.

For our purposes we can assume that the five pico curie per liter drinking water limit will not be violated in the stream if it is not exceeded in the effluent. If an effluent contains more than 5 pico curies per liter then a mass-balance analysis should be done to assure that this level will not be violated in the receiving stream under design stream flow conditions.

b. **Nuclear Power Plants**

Irrespective of the abovementioned water quality criteria, it can generally be assumed that NRC license requirements and conditions for nuclear power plants will adequately protect water quality.

The following permit language has been developed in consultation with the Department’s Bureau of Radiation Protection, and shall be incorporated into Part C of NPDES permits for these facilities:

“Waterborne releases of radioactive material to unrestricted areas shall conform to criteria set forth in Title 10 Code of Federal Regulations part 50 Appendix I — Numerical Guides for Design Objectives And Limiting Conditions For Operation To Meet The Criterion ‘As Low As Is Reasonably Achievable’ For Radioactive Material In Light-Water-Cooled Nuclear Reactor Effluents, as implemented through the Environmental Technical Specifications for the Facility.”

“The facility operator shall provide the Department with copies of reports specifying the quantities of radioactive materials released to unrestricted areas in liquid/gaseous effluents.”

The facility operator shall provide the Department with copies of reports of the results of environmental
surveillance activities and other such reports as necessary for the estimation of the dose consequential to facility operations.”

“The above reports are to be forwarded to the following address:
Pennsylvania Department of Environmental Protection
Bureau of Radiation Protection
13th Floor RCSOB
P.O. Box 8469
Harrisburg, Pennsylvania 17105-8469

4. **Once Through Cooling Water and Cooling Tower Blowdown**

Two previous memos concerning cooling water chlorine residual requirements for steam electric power plants have been sent to the Regions (6/10/83 and 9/20/83) - EPA has also issued a guidance memorandum on this subject (6/23/83).

Based on EPA’s ELG regulations, and the above memos, the following must be considered when writing NPDES permits for the “Steam Electric Industry”:

a. **Expressing Numerical Limitations for Chlorine in NPDES Permits**

EPA’s ELG regulations specify numerical effluent limitations for free available chlorine (FAC) in terms of “average” and “maximum” concentrations, and for total residual chlorine (TRC) in terms of “maximum” concentrations.

EPA defines “average concentration” as the average of analyses made over a single period of chlorine release which does not exceed two hours. “Maximum” is not defined by EPA.

Based on the above, the applicable numerical permit limitations for TRC and FAC should be specified in the permit effluent page as follows:

“Average Concentration” — Under the maximum daily column (FAC)

“Maximum concentration” — Under the instantaneous maximum column (FAC, TRC)

In addition, the following definition must be included in Part C of the permit:
“The term **maximum daily concentration** as it relates to chlorine discharge means the average analyses made over a single period of chlorine release which does not exceed two hours.”

It is not necessary to further define **maximum concentration**, since this represents the instantaneous maximum requirement.

b. **Compliance Deadline for Chlorine Limitations**

1) **Free Available Chlorine (once through cooling water and cooling tower blowdown)** Since the BAT limitations are the same as the BPT limitations, the compliance deadline for BAT is 3/31/89.

2) **Total Residual Chlorine (once through cooling water)** This was the subject of a Guidance Memorandum from EPA headquarters dated June 23, 1983 (attached).

The basic deadline for achieving the TRC limitation is 10/15/84, however, this EPA guidance memorandum provides for an extension of the current deadline for achieving chlorine limitations for the steam electric industry. In certain circumstances the deadline for achieving the TRC limitation can be extended to no later than November 19, 1985 (see pages 2 and 3 of EPA’s guidance memo).

When drafting the permit, the compliance date for TRC should be made effective upon permit issuance. If the permittee desires an extension of time until November 1985, the permittee must document the basis for such an extension (i.e., through conducting a chlorine minimization study).

At the request of the permittee, and with proper justification, the following special condition shall be placed in the permit relative to the TRC compliance deadline:

“With regard to the compliance deadline for the TRC for outfall _________, if the permittee: (1) conducts a chlorine minimization study, (2) concludes that chlorine minimization will not enable him to meet the TRC limitation, (3) notifies the Bureau to that effect by a letter signed and certified in compliance with 40 CFR 122.22
and which explains the basis for his conclusion and (4) receives a return letter of acknowledgement from the Bureau, the compliance deadline for the TRC BAT limitation shall be November 19, 1985. If the permittee does not receive a return letter with 30 days, the November 19, 1985 deadline shall take effect nevertheless.”

c. **Additional Restrictions on Chlorine Residuals**

In addition to the numerical effluent limitations for FAC and TRC, EPA’s ELG regulations (BPT, BAT, and NSPS) place additional restrictions on the duration of time during the day that FAC or TRC may be detectable in cooling water or blowdown discharges. The purposes of this requirement is to minimize the total amount of TRC +/or FAC being discharged. Therefore, for once-through cooling water or cooling tower blowdown discharges the appropriate wording from the BAT or NSPS regulation shall be incorporated into Part C of the NPDES permit.

Example — For a once through cooling water discharge at a 25 (or greater) megawatt plant, the wording would be:

“For outfall _____, total residual chlorine may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to the Bureau that discharge for more than two hours is required for macroinvertebrate control. Simultaneous multi-unit chlorination is permitted.”

For a once through cooling water discharge at a less-than-25 megawatt plant, the wording would be:

“For outfall _____, neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Bureau that the units in a particular location cannot operate at or below this level of chlorination.”
For cooling tower blowdown (regardless of plant size), the wording would be:

“For outfall ____ , neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Bureau that the units in a particular location cannot operate at or below this level of chlorination.”

Note: These conditions are only intended to allow the permittee to show that he should be allowed to discharge TRC =/or FAC for more than 2-hours per day. They are not intended to allow violations of the numerical limitations on chlorine.

d. **Monitoring Requirement (added 10/87)**

Total residual chlorine and free available chlorine in once-through cooling water and cooling water blowdown discharges should be monitored by a grab sample taken during all chlorinated discharges. If the permittee is not presently using chlorine, a chlorine limit is still needed in the permit. However, in these cases, the monitoring requirement may be reduced to “one grab sample per year”.

e. **Analytical Test Methods for TRC and FAC**

Because EPA’s ELG regulation specifically defines these test methods, the definitions must be included in Part C of the permit as follows:

“The term “total residual chlorine” (or total residual oxidants for intake with bromides) means the value obtained using the amperometric method for total residual chlorine described in 40 CFR Part 136.”

“The term ‘free available chlorine’ shall mean the value obtained using the amperometric titration method for free available chlorine described in “Standard methods for the Examination of Water and Wastewater,” page 112 (13th edition).”

Note: The terms “amperometric” and amperometric titration” both refer to the same analytical procedure. This method is described in Standard Methods as the “amperometric titration” method.

f. **Applicable Regulatory Sections**

1) **Key Definitions (423.11)(a), (g), (h), (j), (k), (l)**
(a) The term "total residual chlorine" (or total residual oxidants for intake water with bromides) means the value obtained using the amperometric method for total residual chlorine described in 40 CFR Part 136.

(g) The term "once through cooling water" means water passed through the main cooling condensers in one or two passes for the purpose of removing waste heat.

(h) The term "recirculated cooling water" means water which is passed through the main condensers for the purpose of removing waste heat, passed through a cooling device for the purpose of removing such heat from the water and then passed again, except for blowdown, through the main condenser.

(j) The term "blowdown" means the minimum discharge of recirculating water for the purpose of discharging materials contained in the water, the further buildup of which would cause concentration in amounts exceeding limits established by best engineering practices.

(k) The term "average concentration" as it relates to chlorine discharge means the average of analyses made over a single period of chlorine release which does not exceed two hours.

(l) The term "free available chlorine" shall mean the value obtained using the amperometric titration method for free available chlorine described in "Standard Methods for the Examination of Water and Wastewater," page 112 (13th edition).

2) **BPT (423.12(b))**

   (1) The pH of all discharges, except once through cooling water, shall be within the range of 6.0-9.0.

   (6) The quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water sources times the concentration listed in the following table:
<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>Maximum concentration (mg/l)</th>
<th>Average concentration (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free available chlorine</td>
<td>0.5</td>
<td>0.2</td>
</tr>
</tbody>
</table>

(8) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level or chlorination.

3) **BCT (423.14)**

(Reserved)

Note: Use BPT for pH in absence of BCT

4) **BAT (423.13(b) and (c))**

(b)(1) For any plant with a total rated electric generating capacity of **25 or more megawatts**, the quantity of pollutants discharged in once through cooling water from each discharge point shall not exceed the quantity determined by multiplying the flow of once through cooling water from each discharge point times the concentration listed in the following table:

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>Maximum concentration (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total residual chlorine</td>
<td>0.20</td>
</tr>
</tbody>
</table>

(2) Total residual chlorine may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to the permitting authority that discharge for more than two hours is required for macroinvertebrate control. Simultaneous multi-unit chlorination is permitted.
(c)(1) For any plant with a total rated generating capacity of less than 25 megawatts, the quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water sources times the concentration listed in the following table:

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>Maximum concentration (mg/l)</th>
<th>Average concentration (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free available chlorine</td>
<td>0.5</td>
<td>0.2</td>
</tr>
</tbody>
</table>

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

5) **NSPS 423/15(h) and (l)**

   same as BPT and BAT

6) **BAT (423.12(b))**

   (1) The pH of all discharges, except once through cooling water, shall be within the range of 6.0-9.0.

   (7) The quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown sources times the concentration listed in the following table:

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>Maximum concentration (mg/l)</th>
<th>Average concentration (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free available chlorine</td>
<td>0.5</td>
<td>0.2</td>
</tr>
</tbody>
</table>

(8) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total...
residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level or chlorination.

7) **BCT (423.14)**

(Reserved)

Note: Use BPT Limits for pH in absence of BCT

8) **NSPS (423/15(j))**

Same as BAT

9) **BAT (423.13(d))**

(d)(1) The quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown times the concentration listed in the following table:

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>Maximum concentration (mg/l)</th>
<th>Average concentration (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free available chlorine</td>
<td>0.5</td>
<td>0.2</td>
</tr>
</tbody>
</table>

**BAT effluent limitations**

The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except:

- Chromium, total
- Zinc, total

Maximum for any 1 day — (mg/l)

Average of daily values for 30 consecutive days shall not exceed = (mg/l)

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>(1)</th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium, total</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Zinc, total</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

(1) No detectable amount.

(2) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the
Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

(3) At the permitting authority's discretion, instead of the monitoring specified in 40 CFR 122.11(b) compliance with the limitations for the 126 priority pollutants in paragraph (d)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR Part 136.
5. **Coal Pile Runoff**

   a. **Separate Coal Pile Discharge**

      When coal pile runoff is being treated and discharged separately, the *instantaneous maximum* TSS limit of 50 mg/l shall be used, along with the following special condition:

      "For outfall __________, any untreated overflow from facilities designed, constructed, and operated to treat the coal pile runoff which results from a 10-year, 24-hour rainfall event shall not be subject to the total suspended solids limitations shown."

   b. **Combined With Other Waste Streams**

      This waste stream is usually combined with other waste streams (such as low volume wastes, ash transport water, etc.). When this occurs the *instantaneous maximum* TSS limit shall be pro-rated with the TSS limits for the other waste streams (see discussion in Section 10.d below); however, the 10-year, 24-hour stream exemption clause shall not apply. When pro-rating this limitation with TSS limits for other waste streams, the instantaneous maximum limit will generally not be necessary (see discussion in Section 10.c below).

   c. **Power Plants With On-Site Coal Preparation Facilities.**

      Effluent limitations and other permit conditions shall be determined based upon EPA’s Coal Mining ELG regulations, 40 CFR 434.

   d. **Applicable Regulatory Sections**

      1) **Key Definitions (423.11)(i), (m)**

         (i) The term "10 year, 24/hour rainfall event" means a rainfall event with a probable recurrence interval of once in ten years as defined by the National Weather Service in Technical Paper No. 40, "Rainfall Frequency Atlas of the United States," May 1961 or equivalent regional rainfall probability information developed therefrom.

         (m) The term "coal pile runoff" means the rainfall runoff from or through any coal storage pile.
Note: Data pertaining to 10-year, 24-hour storm events for various counties in Pennsylvania is contained in the Department’s coal mining regulations, Chapter 89.53.

2) **BPT (423.12(b))**

(9) Subject to the provisions of paragraph (b)(10) of this section, the following effluent limitations shall apply to the point source discharges of coal pile runoff:

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>BPT effluent limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum concentration for any time (mg/l)</td>
</tr>
<tr>
<td>TSS</td>
<td>50</td>
</tr>
</tbody>
</table>

(10) Any untreated overflow from facilities designed, constructed, and operated to treat the volume of coal pile runoff which is associated with a 10 year, 24 hour rainfall event shall not be subject to the limitations in paragraph (b)(9) of this section.

3) **BCT (423.14)**

(Reserved)

Note: Use BPT for TSS in absence of BCT

4) **BAT (423.13)**

Not applicable for conventional pollutants. Use BCT (BPT)

5) **NSPS (423.15(R) and (l))**

Same as BPT

6. **Fly Ash and Bottom Ash Transport Water**

For **existing** dischargers, the BAT/BCT requirements are equivalent to BPT.

For **new source** dischargers (see NPDES Permit Writing Technical Guidance Document, Appendix 1-C, for EPA’s definition of “new source”), the NSPS requirement for *Flyash* transport water is: “**There shall be no discharge of wastewater pollutants from Flyash transport water.**”
Note: EPA has not established BPT/BCT/BAT/NSPS/requirements for ash disposal sites. BPJ must therefore be used to establish technology-based limits. As a general rule, the Steam Electric BPT limitations for pH and TSS should be applied, in addition to any water quality based limits for other pollutants.

a. **Applicable Regulatory Definitions**

1) **Key Definitions (423.11)(e), (f)**

   (e) The term "fly ash" means the ash that is carried out of the furnace by the gas stream and collected by mechanical precipitators, electrostatic precipitators, and/or fabric filters. Economizer ash is included when it is collected with fly ash.

   (f) The term "bottom ash" means the ash that drops out of the furnace gas stream in the furnace and in the economizer sections. Economizer ash is included when it is collected with bottom ash.

2) **BPT (423.12(b)(4))**

   (4) The quantity of pollutants discharged in fly ash and bottom ash transport water shall not exceed the quantity determined by multiplying the flow of fly ash and bottom ash transport water times the concentration listed in the following table:

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>Maximum for any 1 day (mg/l)</th>
<th>Average of daily values for 30 consecutive days shall not exceed (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSS</td>
<td>100.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Oil and grease</td>
<td>20.0</td>
<td>15.0</td>
</tr>
</tbody>
</table>
3) **NSPS (423.15(f) and (g))**

(f) The quantity of pollutants discharged in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of the bottom ash transport water times the concentration listed in the following table:

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>Maximum for any 1 day (mg/l)</th>
<th>Average of daily values for 30 consecutive days shall not exceed (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSS</td>
<td>100.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Oil and grease</td>
<td>20.0</td>
<td>15.0</td>
</tr>
</tbody>
</table>

(g) There shall be no discharge of wastewater pollutants from fly ash transport water.

4) **BCT (423.14)**

(Reserved) Note: Use BPT for TSS, Oil and Grease in absence of BCT

5) **BAT (423.13)**

Not applicable for conventional pollutants. Use BCT (BPT).

7. **Low Volume Waste**

The term “low volume waste” as defined by EPA includes most waste streams not otherwise subject to specific BPT/BCT/BAT/NSPS requirements.

Sanitary sewage and air conditioning wastes are not considered “low volume waste.” As discussed in the Section 2. Above, EPA considers “non-chemical metal cleaning waste” as a low volume waste.

a. **Applicable Regulatory Sections**

1) **Key definitions (423.11)(b)**

(b) The term "low volume waste sources" means, taken collectively as if from one source, wastewater from all sources except those for which specific limitations are otherwise established in this part. Low volume waste sources include, but are not limited to: wastewaters from wet scrubber air pollution control systems, ion exchange water treatment system, water treatment evaporator blowdown, laboratory and sampling streams, boiler blowdown, floor drains, cooling tower basin cleaning wastes, and recirculating house...
service water systems. Sanitary and air conditioning wastes are not included.

Note: The following discussion appears in the Preamble, p. 52297

In the preamble to the 1980 proposal, EPA explained that the existing requirements applied to all metal cleaning wastes, whether the wastes resulted from cleaning with chemical solutions or with water only. EPA rejected an earlier guidance statement which stated that wastes from metal cleaning with water would be considered “low volume” wastes. However, because many dischargers may have relied on this guidance, EPA proposed in 1980 to adopt the guidance for purposes of BPT and to change the BPT limitation to apply only to “chemical” metal cleaning wastes. See 45 FR 68333 (October 14, 1980) for a full discussion of the issue.

Commenters argued that EPA’s clarified interpretation of the existing regulations would result in extremely high compliance costs and were not supported by the record. In response to the comments, we examined the available data on waste characteristics of non-chemical metal cleaning wastes and the costs and economic impacts of controlling them. The data indicated that there was a definite potential for differences in concentration levels of inorganic pollutants depending on whether the plants were coal or oil-fired. Further, compliance with the existing effluent limitations and standards could be very costly and result in significant adverse economic impacts. However, the data were too limited for EPA to make a final decision.

EPA requested that the Utility Water Act Group provide specific, additional information. The data were submitted too late for the Agency to use at this time. Consequently, EPA is reserving BAT, NSPS, PSES and PSNS for non-chemical metal cleaning wastes in today’s rule.

EPA is withdrawing the proposal to change the BPT definition of metal cleaning wastes. However, until the Agency promulgates new limitations and standards, the previous guidance policy may continue to be applied in those cases in which it was applied in the past.
2) **BPT (423.12(b))**

   (3) The quantity of pollutants discharged from low volume waste sources shall not exceed the quantity determined by multiplying the flow of low volume waste sources times the concentration listed in the following table:

<table>
<thead>
<tr>
<th>Pollutant or pollutant property</th>
<th>Maximum for any 1 day (mg/l)</th>
<th>Average of daily values for 30 consecutive days shall not exceed (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSS</td>
<td>100.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Oil and grease</td>
<td>20.0</td>
<td>15.0</td>
</tr>
</tbody>
</table>

3) **BCT (423.14)**

   (Reserved)

   Note: Use BPT limits for TSS and Oil and Grease in absence of BCT

4) **BAT (423.13)**

   Not applicable for conventional pollutants. Use BCR (BPT)

5) **NSPS (423.15(d))**

   Same as BPT

8. **Thermal Discharge Limitations**

   There are no BPT/BAT/NSPS requirements pertaining to the thermal component of discharges from Steam Electric facilities.

   The Bureau's **Thermal Discharges - Seasonal Effluent Limits Strategy (12/83)** provides the governing technical guidance on this subject.

   Where a company has applied for and received approval for a variance on thermal discharge requirements, pursuant to Section 316(a) of the Clean Water Act, the alternate thermal effluent limitations and other requirements derived during the 316(a) review process will be expressed in the permit.

9. **Variance and Time Extensions**

   In addition to the variances and time extensions discussed above for thermal discharges and for chlorine limitations in cooling water and cooling tower blowdown, Steam Electric discharges are subject to several other variances and time extensions provided for under
the Clean Water Act and in the Department’s regulations (provided they meet the eligibility requirements).

These variances and time extensions are discussed in Chapter 1 of the Bureau’s NPDES Permit Writing Technical guidance document.

10. General Permit-Writing Considerations

a. Concentration vs. Mass Limits

Each subsection (BPT, BAT, etc.) of EPA’s steam electric ELG Regulations provide the permit writer with the option of specifying only concentration limits vs. pounds-per-day limitations in NPDES permits for these types of dischargers. This flexibility has been built into EPA’s regulations since it is difficult to determine a representative combination of flow and concentrations which EPA could have used to compute production based BPT, BAT mass limitations for various parameters.

We should therefore only specify concentration limitations unless there is some site-specific reason where mass limitations would be appropriate.

b. Total Suspended Solids Limitations

This was the subject of a memorandum to the Norristown Region (cc: Regional Permits Chiefs) dated June 8, 1983.

1) Low Volume Waste, Metal Cleaning Waste, Ash Transport Water

EPA’s technology-based suspended solids limits of 30 milligrams per liter (average monthly) and 100 milligrams per liter (maximum daily) for these waste streams are somewhat different than the technology based limits for most industries where EPA normally employs a multiplier of 2.0 between maximum daily and average monthly. Therefore, for these waste streams the EPA technology-based suspended solids limits should be utilized (where applicable) and an instantaneous maximum limit should not be used.

2) Coal Pile Runoff

EPA uses an “instantaneous maximum” technology-based TSS limit of 50 mg/l. (See further discussion on this waste stream in Section 10.d and 10.c below.)

3) Water Quality-Based TSS Limits
As per discussion in Chapter 3 of the Bureau’s NPDES permit-writing Technical Guidance document, water quality based limits for TSS are not applicable.

c. **Net vs. Gross Limits (Technology-Based)**

When writing permits using technology-based limitations, if the applicant requests (and can adequately demonstrate the need for) net effluent limitations, then the permit can be written with net limits as appropriate. The use of net limits places an extra burden on the permittee to monitor both intake water quality and effluent quality.

An alternative to net limits is the use of gross limits which are adjusted to reflect intake water quality.

For further discussion on net limits see Chapter 5 of the Bureau’s NPDES permit-writing technical guidance documents.

d. **Combined Waste Streams**

EPA’s ELG regulations for the Stream Electric category state that:

“In the event that waste stream from various sources are combined for treatment or discharge, the quantity* of each pollutant or pollutant properly controlled (by the applicable ELG requirement)...attributable to each waste source shall not exceed the specified limitations for that waste stream.”

*i.e., mass

When developing BAT limitations for an outfall which receives waste from several ELG-covered sources, the concentration limitations are derived as a “flow-weighted average”. This average obtained by multiplying the individual waste stream flows by the individual guideline concentrations, then summing the products obtained, and dividing this sum by the combined waste stream flow (see attached sample calculations).

Alternatively, if any of the individual waste streams are treated separately prior to combining with other waste streams, the BAT (BCT) requirements may be imposed at the internal monitoring points which are the discharges from these individual treatment facilities.
Example - Combined Waste Stream Calculations

Outfall 001

1. Ash Transport Water, 5.0 mgd = Q_1
2. Cooling Tower Blowdown, 1.0 mgd = Q_2
3. Chemical Metal Cleaning Waste, 0.1 mgd = Q_3 (once every 3 months)
4. Coal Pile Runoff, 0.005 mgd = Q_4 (maximum expected, short duration following rainfall events)

BAT (BCT Effluent Limits for TSS)

\[
TSS = \frac{Q_1 + Q_2 + Q_3}{Q_1 + Q_2 + Q_3} \times 30 \text{ mg/l} = 30 \text{ mg/l (average monthly)}
\]

\[
TSS = \frac{Q_1 + Q_2 + Q_3}{Q_1 + Q_2 + Q_3} \times 100 \text{ mg/l} = \frac{6.1 \times (100)}{6.15} = 99 \text{ mg/l (max. daily)}
\]

Note: Q_4 is added to denominator to reflect short-term flow variations as these would impact the short-term (1-day) effluent limit.

\[
TSS = \frac{Q_4}{Q_1 + Q_2 + Q_3 + Q_4} \times 50 \text{ mg/l} = \frac{0.05 \times (50)}{6.15} = 0.4 \text{ mg/l (inst. max.)}
\]

Therefore, no need for an instantaneous maximum TSS limitation.

---

e. NPDES Permit “Boilerplate” Language

Occasionally a permittee may request changes in the boilerplate language of the NPDES permit.

First, we do not have the flexibility to modify this language on a case-by-case basis. These permit forms have been officially approved by EPA, and any further changes will need EPA approval.

Secondly, the NPDES permit and boilerplate language is based primarily upon EPA’s NPDES permit program regulations (40 CFR 122-125) and cannot be changed unless EPA revises its regulations.

EPA has published final regulation changes (9/1/83-minor revisions, and 9/26/84-major revisions). The Bureau is currently (11/84) analyzing these regulations to determine...
which portions of the permit boilerplate language must be revised. Once the forms are revised, permittees may request that their permits be amended accordingly.

Permittees should be instructed as to the above in order to avoid prolonged debate over boilerplate language. All permittees are currently subject to the same boilerplate language.

f. **Summary of Special Conditions Applicable to Stream Electric Dischargers**

The following special conditions are to be used in Part C of the permit to address the situations or pollutants shown below:

**Cooling Water Treatment**

Toxic Chemicals Present in Cooling Tower Blowdown

(See p.5)

“For outfall ____________ , except for Total Zinc and Total Chrome, there shall be no detectable levels of the remaining priority pollutants in this discharge due to the addition of chemicals for cooling tower maintenance.”

**PCB Effluent Prohibition (All Steam Electric Dischargers)** (See p.6)

“There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.”

**Metal Cleaning Waste, Situation #3** (see p.7 and attached table)

“Starting __________ hours after commencing the discharge of chemical metal cleaning wastewater, and during the 24-hour period immediately following, the permittee will monitor the change in final effluent concentrations of iron and copper at outfall ____________ .

The allowable increase in maximum daily effluent concentrations at outfall __________ shall not exceed __________ mg/l for iron and __________ mg/l for copper, as an average of all samples taken during this 24-hour period. If grab samples are taken, a minimum of
__________ samples shall be used, taken at reasonably spaced intervals during this 24-hr. sampling period.”

Nuclear Power Plants

“Waterborne releases of radioactive material to unrestricted areas shall conform to criteria set forth in Title 10 Code of Federal Regulations part 50 Appendix I — Numerical Guides for Design Objectives And Limiting Conditions For Operation To Meet The Criterion “As Low As Is Reasonably Achievable’ For Radioactive Material In Light-Water-Cooled Nuclear Reactor Effluents, as implemented through the Environmental Technical Specifications for the Facility.”

“The facility operator shall provide the Department with copies of reports specifying the quantities of radioactive materials released to unrestricted areas in liquid/gaseous effluents.”

The facility operator shall provide the Department with copies of reports of the results of environmental surveillance activities and other such reports as necessary for the estimation of the dose consequential to facility operations.”

“The above reports are to be forwarded to the following address:
Pennsylvania Department of Environmental Protection
Bureau of Radiation Protection
13th Floor RCSOB
P.O. Box 8469
Harrisburg, Pennsylvania 17105-8469

Chlorine Numerical Limitation Expression

“The term **maximum daily concentration** as it relates to chlorine discharge means the average analyses made over
a single period of chlorine release which does not exceed two hours.”

TRC Requested Deadline Extension deadline:

“With regard to the compliance deadline for the TRC for outfall ______, if the permittee: (1) conducts a chlorine minimization study, (2) concludes that chlorine minimization will not enable him to meet the TRC limitation, (3) notifies the Bureau to that effect by a letter signed and certified in compliance with 40 CFR 122.22 and which explains the basis for his conclusion and (4) receives a return letter of acknowledgement from the Bureau, the compliance deadline for the TRC BAT limitation shall be November 19, 1985. If the permittee does not receive a return letter with 30 days, the November 19, 1985 deadline shall take effect nevertheless.”

Once-Through Cooling Water of a **25 or Greater** Megawatt Plant for BAT and NSPS Wording

“For outfall ______, total residual chlorine may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to the Bureau that discharge for more than two hours is required for macroinvertebrate control. Simultaneous multi-unit chlorination is permitted.”

Once-through cooling water discharge of a **Less-than-25** megawatt plant, the wording would be:

“For outfall ______, neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Bureau that the units in a particular
location cannot operate at or below this level of chlorination.”

Cooling Tower Blowdown of Any Size Plant for BAT and NSPS wording

“For outfall ______, neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Bureau that the units in a particular location cannot operate at or below this level of chlorination.”

Analytical Test Methods for TRC and FAC

“The term total residual chlorine (or total residual oxidants for intake with bromides) means the value obtained using the amperometric method for total residual chlorine described in 40 CFR Part 136.”

“The term ‘free available chlorine’ shall mean the value obtained using the amperometric titration method for free available chlorine described in “Standard methods for the Examination of Water and Wastewater,” page 112 (13th edition).”

Separate Coal Pile Discharge

For outfall ______________, any untreated overflow from facilities designed, constructed, and operated to treat the coal pile runoff which results from a 10-year, 24-hour rainfall event shall not be subject to the total suspended solids limitations shown.”
Appendix A

Comment/Response Summary

9/84 Draft
Appendix A

Summary of Comments Received on September 1984, Draft Document

Item 1a: Application of BWQM Toxics Strategy

Relative to quality of plant intake water, we agree that this should be factored into the screening process. The nagging problem remains that Form 2c only requires one sample analysis (which is usually what is submitted) and further sample analyses are very helpful in evaluating the aspect. Perhaps this can be best addressed by certain monitoring requirements as part of the permit.

Response: Agree, see revised discussion on Page 2 of the final document.

The BWQM Toxic Strategy itself is a very clear-cut document. However, the actual application or interpretation of the strategy may be something else. The case in point is a draft permit. PA0013714, PECO, Eddystone, sent to EPA for joint review on August 24, 1984. The draft permit proposes to impose total copper, total zinc, dissolved iron, total lead, total phenol and other pollutants from the “once through cooling water system” for outfall 005 in the draft permit. The actual sources of wastewater are from runoff and fan cooling water according to the application. The above named pollutants are present mainly due to the quality of plant intake water. Other outfalls are in similar situation which results in imposing limitations on pollutants due to the intake water. (EPA Region III).

Response: See above response to Norristown’s comment.

Item 1b(1): Toxics Present in Cooling Tower Blowdown Due to Quality of Intake Water

It would be helpful to note that the “no net addition” of pollutants applies to mass rather than concentration. Obviously, treatment of the blowdown would be needed to result in “no net addition” in concentration of pollutants. (Norristown)

Please define what is meant by the phrase no “noticeable effect on downstream quality”. Does this refer to a sensitivity type evaluation? If the makeup water for the cooling tower is withdrawn upstream, there will be degradation of water quality downstream even through there may be no net addition of pollutants, simply because there is less stream flow due to evaporative water loss in the cooling tower. This may be of concern at critical flow conditions. An evaluation should be done to
see if the net concentration increases in the receiving stream will result in violation of Chapter 93 requirements or toxics guidance (Norristown)

Response: Clarification has been made regarding no net mass addition of pollutants. Also, the test has been revised after discussion with the Division of Water Quality concerning “noticeable effect on downstream quality.”

Item 1b(2): Toxics Present in Cooling Tower Blowdown Due to Addition of Cooling Water Treatment Chemicals

It has been our (Norristown) policy in the initial draft NPDES permit to use a Part C special condition to prohibit all priority pollutant discharges which are the result of cooling tower maintenance chemicals. Although the BAT regulations do allow the use of zinc and chrome based activities, we have found that chlorine alone is adequate for all cases we have processed for renewal. Using this approach saves time in having to develop and negotiate water quality based Zn and Cr limits. One problem we have had to getting appropriate information (ingredients, toxicity) from additive vendors. (Norristown)

Response: This approach is somewhat questionable, because we do not have the right to overlook BAT parameters and associated BAT limitations (this has been the subject of much debate regarding the Metal Finishing industry). If a company can achieve the desired result through use of chlorine alone then so much the better; however, we must still address the BAP parameters and BAT (or corresponding WQ-based) limits in the permit. In doing so we do not need to get detailed information from chemical additive vendors, we simply should determine if water quality based limits for Zn and Cr would be stricter than the BAT limits.

Regarding the BAT requirement of no detectable amounts of priority pollutants (except for Zn and Cr) in cooling tower blowdown, do we have to require periodic monitoring for these 124 other pollutants? (Wilkes-Barre)

Response: No, the special condition shown in this section of the guidance document is all that is needed. We can enforce this if we find these pollutants presents as a result of our own sampling.

Should we specify both a “maximum daily” and an “average monthly” concentration limit for Zn and Cr? (Wilkes-Barre)
Response: No. When both the “average monthly” and “maximum daily” concentration limits are the same, it is not possible for the permittee to demonstrate limits are same, it is not possible for the permittee to demonstrate compliance with these requirements. We should therefore specify only “maximum daily” concentration limits in the permit when the BAT numbers govern the situation. If water quality based limits are more stringent, then both monthly and daily limits are appropriate.

Item 2. Method of Addressing Metal Cleaning Wastewater

The Number 1 situation is to apply BAT limits as “maximum daily.” EPA’s BAT limitations for chemical metal cleaning water are expressed both in maximum for any one day and average of daily values for 30 consecutive days. Our recommendation is to impose both “maximum daily” and “average monthly” for the chemical metal cleaning wastes in accordance with BAT guidelines. (EPA Region III)

Response: EPA specified the same BAT concentration number for “maximum” daily and “average monthly” for Fe (1.0 mg/l) and Cu (1.0 mg./l). These would be used for the purpose of calculating lb/day limits using different flow rates (monthly average, maximum daily). Since we are only going to specify concentration limits (see Item 10.a) it makes no sense to specify the same number as a “average monthly” and “maximum daily” limit. Permittees cannot be placed in such a situation. Therefore we have elected to use only “maximum daily” concentration limits, after discussing the matter with Dennis Rudy of EPA headquarters Effluent Guidelines Divisions.

The Number 4 situation deals with the dilution, but no treatment, for iron and copper removal. Do you consider the settling pond or any other similar system a treatment system? The settling ponds are widely used in this industry.

Response: Ash settling basis should provide some degree of treatment for metal cleaning wastewater, and therefore Situation #3 would address that situation.

Item 4.d Analytical Test Methods for TRC and FAC

EPA’s definition of the term “total residual chlorine” refers to the “amperometric method” described in 40 CFR Part 136. What method is this? (Wilkes Barre)
Response: 40 CFR Part 136. (as amended through 7/20/77) describes the following methods as approved for use in testing for TRC:

- Iodimetric titration, amperometric or starchiodine end-point
- DPD colorimetric or titrimetric (interim pending lab testing)

40 CFR Part 136. Refers the reader to the 1974 EPA Manual of Methods for Chemical Analysis of Water and Wastes, Page 35. The method on Page 35 of the EPA Manual is referred to by EPA as the “amperometric titration” method. This method includes titration with phenylarsine oxide to determine both free and combined available chlorine. A potassium iodide solution is used during the second stage of the titration to assist in titrating the combined chlorine fraction. This method is more completely described in Standard Methods.

Item 5 **Coal Pile Runoff**

How do we deal with steam electric plants which have their own coal preparation facilities? (Wilkes-Barre)

Response: Effluent limitations and other requirements should be developed based on EPA’s coal mining ELG regulations to the extent that the facilities in question are similar to what EPA’s coal mining ELG regulations cover. This has been clarified.

Item 8 **Thermal Discharge Limitations**

This technical guidance refers to the Bureau’s Thermal Discharge Seasonal Effluent Limits Strategy dated December 183. Our concern with this strategy is threefold. (EPA Region III)

a. The strategy does not address the Federal 316(a) provision. In our opinion, any thermal variance through 316(a) demonstration should be the main factor in granting the thermal discharge limitations.

b. The allowable thermal effluent limits demonstrated in the strategy appear to be a net increment over intake water expressed as a heat rejection rate (BTU/day). We have seen some draft permits which impose thermal limits, according to the strategy, as the gross heat injection rate. For example, the September limit is $71,285 \times 10^6$ BTU/day according to the example problem. Assume the permittee uses 10% of
Q-10 for September or 265 CFAs and discharges to the receiving stream with a temperature of 84°F. The heat rejection rate is \(119,759 \times 10^6\) BTU/day. This heat rejection rate is almost twice as much as the above September limit, and the permittee is still in compliance with the permitted effluent limit. On October 1, 1984 we expressed our concern to Mr. Dennis F. Lee, the principal author of the strategy. A detailed technical comment will be addressed to him separately in the near future.

c. EPA recommends that the thermal discharge limitations should be imposed only when the DEP’s water quality standard may be violated and 316(a) request has been denied.

Response: The discussion thermal discharges has been expanded and clarified regarding 316(a) variances.

Item 10C General Permit - Writing Consideration - Net vs. Gross Limits

It should be made abundantly clear that this does not apply to water quality based limits as ambient quality (Chapter 93 definition) has already been taken into account to develop the water quality based limits. (Norristown)

The net/gross provision needs to be clarified. (Wilkes-Barre)

Other Comments:

BPT Effluent Limitations for Oil and Grease

BPT effluent limits specify a maximum daily of 20.0 mg/l and an average monthly of 15.0 mg/l for oil and grease for the steam electric industry. DEP has imposed the BPT limits in the permit. In addition, DEP also imposes an instantaneous maximum of 30 mg/l when the sample type is grab with measurement frequency of once per month. When the permittee collects and analyzes one single grab sample in any given month in accordance with the permit requirement and shows the result of 25 mg/l for oil and grease in the discharge, how would you determine the compliance status? Definitively, it has exceeded the BPT maximum daily limit and still within Department’s instantaneous maximum limit. (EPA Region III)

Response: The BPT limits for oil and grease apply to fly ash and bottom ash transport, metal cleaning waste, and low volume waste. The 30 mg/l instantaneous maximum limit is required under Section 97.63 of our regulations. If one
grab sample per month is taken then it is compared with the 30 mg/l limit. If more than one grab sample is taken per month then the results can be averaged to determine compliance with the “average monthly” limit of 15 mg/l.