

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Water Standards and Facility Regulation

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TITLE: Water Quality Toxics Management Strategy

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POLICY: The Department of Environmental Protection (DEP) will develop, release for public comment and publish technical guidance on how to deal with toxics in NPDES Permits.

PURPOSE: To encourage a consistent, statewide approach for dealing with the Environmental Protection Agency (EPA) priority pollutants with known or suspected toxic impacts.

APPLICABILITY: NPDES Permits

DISCLAIMER: The policies and procedures outlined in this guidance are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of DEP to give the rules in these policies that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.

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I. INTRODUCTION

This Toxics Management Strategy (TMS) has been developed to encourage a consistent, statewide approach for dealing with the U.S. Environmental Protection Agency (EPA) priority pollutants with known or suspected toxic impacts under the National Pollutant Discharge Elimination System (NPDES) permit program. It is based upon DEP's Toxics Management Policy statement as contained in Title 25 Pa. Code Chapter 16 (Chapter 16) available on the web at www.pacode.com.

The TMS has its origins in the 1976 consent decree between the Natural Resources Defense Council (NRDC) and EPA, NRDC v. Train, 8 ERC 2120, which identified 65 toxic pollutant classes to be given priority with regard to water pollution control. The basic terms of the consent decree were incorporated into the 1977 amendments to the Federal Clean Water Act (CWA).

Pursuant to the CWA, EPA is assigned the responsibility to develop water quality criteria for toxic pollutants and technology-based effluent limitation requirements for dischargers of such pollutants. In partial fulfillment of this requirement, EPA (with guidance from a nationwide committee of experts) has identified a list of 126 compounds and elements from the 65 primary pollutant categories. The list of elements and compounds (the "priority pollutant list") includes substances with known toxic effects on aquatic life and human health, including those known or suspected to be carcinogens. The priority pollutant list includes heavy metals, asbestos, cyanides and various organic compounds. The organic compounds are further categorized into the following broad groups: volatile compounds, acid compounds, base/neutral compounds, pesticides and dioxins.

As part of its responsibility for developing technology-based effluent limitation requirements for various industries, EPA conducted an extensive screening and verification sampling program to determine the types and levels of priority pollutants present in wastewaters from those industries which are known or suspected users and/or manufacturers of these pollutants (i.e., the "primary industries"). This development effort is ongoing for various industry groups. These technology-based requirements are contained in 40 CFR Subchapter N, and are referred to as Effluent Limitations Guidelines (ELGs). ELGs typically specify Best Available Technology Economically Achievable (BAT) requirements, which are parameter-specific discharge concentration limits. ELGs also may contain industry-specific new source performance standards (NSPS) and pretreatment standards.

In addition to developing BAT, NSPS and pretreatment standards, and in order to help develop discharge requirements that will ensure water quality sufficient to protect specified stream uses, EPA developed surface water quality criteria for the priority pollutants when sufficient information was available. For those remaining priority pollutants, where sufficient information was not available to develop criteria, the lowest observed effect levels (LOELs) were listed by EPA based on available information from acute and chronic exposure. These recommended criteria and effect levels were originally published in the Federal Register on November 28, 1980 (Vol. 25, No. 231 pp. 79318-79379). Several updates have since been issued by EPA and have been incorporated where applicable. They are the subject of continuing study and will continue to be updated as necessary. DEP has developed criteria for some priority pollutants and other toxic substances for which EPA has not developed criteria. These are included with all other applicable criteria for toxics at Chapter 16, Subchapter A.

DEP has also adopted Analytical Methods and Method Detection Limits (MDLs) for Toxic Substances. These are specified in Chapter 16, Subchapter B. At a minimum, Chapter 16 is subject to annual reviews and revisions.

II. BASIC APPROACH AND PHILOSOPHY REPRESENTED IN THE TMS

This TMS has been developed by DEP to regulate priority pollutants and other pollutants discharged by point sources with toxic impacts on human health and aquatic life. This TMS is based on the current understanding of these pollutants, i.e., where they may come from, what levels may cause harm to aquatic life or to humans, at what levels can they be detected in the laboratory, what is the pollutants' fate and transport, and how well can they be removed from wastewater.

A. Water Quality-Oriented Approach

Since water quality protection is the primary goal of this TMS, some discussion on the roles of Pennsylvania's existing water quality standards and EPA's recommended and finalized water quality criteria is warranted.

The Environmental Quality Board (EQB) approved changes to Title 25 Pa. Code Chapter 93, Water Quality Standards (WQS), on November 15, 1988. These were published as final regulations in the *Pennsylvania Bulletin* on March 11, 1989. These have been updated several times since. These changes removed the toxic metals previously listed in Title 25 Pa. Code Chapter 93 and provided for their control (along with control of all other toxic substances) via the Statement of Policy in Chapter 16, which contains water quality criteria development procedures for those criteria among other topics. Before incorporation into Chapter 16, all toxic substances were reevaluated utilizing the best available scientific data relating to human health and aquatic life protection. The criteria listed were developed from aquatic toxicological studies (bioassays) and mammalian toxicological and epidemiological studies. Many of the criteria were developed by EPA pursuant to Section 304(a) of the CWA, while others were developed by DEP. WQS are reviewed every 3 years. Water Quality Criteria (WQC) for toxic substances are reviewed annually and revised if necessary.

Control and permitting of toxics must be consistent with the results of any Total Maximum Daily Load (TMDL) analysis or report for the receiving stream or watershed in question. The TMDL may limit the wasteload allocation (WLA) available for a given toxic substance, and the NPDES permit limits assigned for that substance must be consistent with that limit.

B. Dealing With Known or Suspected Carcinogens and Related Health Impacts

Based on the no threshold theory, it is EPA's premise that there is no scientific basis for estimating "safe" levels for carcinogens. So the criterion for carcinogens for the maximum protection to human health should be "zero," however, this may be unachievable either from a technological or monitoring standpoint.

For the purpose of this TMS, and in accordance with 25 Pa. Code § 93.8a, a cancer risk management level of 10^{-6} is used in establishing criteria for carcinogens. Additional discussion on carcinogens and cancer risk assessment is presented in Chapter 16.

As more is learned about the occurrence, health and aquatic life impacts, treatability and environmental fate of these pollutants, this information will be incorporated. This approach will allow for the most effective utilization of scientific data and information in dealing with priority pollutants and other toxics.

III. APPLICATION OF THE TMS

The TMS is a step-by-step process for reviewing point source discharges and related NPDES permit applications and for developing appropriate effluent limitations and other conditions for inclusion in NPDES permits. The general sequence is:

- Step 1 - Preliminary Review Considerations
- Step 2 - Determining Parameters of Concern
- Step 3 - Development of NPDES Effluent Limits and Monitoring Requirements
- Step 4 - Establishment of NPDES Permit Terms and Conditions for Control of Toxic Pollutants
- Step 5 - Follow-Up Evaluation After Final Permit Issuance
- Step 6 - Modification of Final Permit Requirements

DEP intends (to the maximum extent feasible) to apply Steps 1 through 4 of the strategy on a watershed basis by reviewing all existing and proposed NPDES discharges within the same hydrologic unit at the same time. This will ensure that cumulative water quality discharge impacts are accounted for in the setting of effluent limitations. It may, however, result in some NPDES permits being reopened before their scheduled expiration date.

The issuance of new or modified permits in watersheds where comprehensive reviews are not currently underway will be handled through a combination of administrative permit extensions and individual discharge analysis. In cases where the necessary data is available to evaluate potential discharge interactions, the impact of the new or modified discharge on other existing discharges will be made. If the evaluation indicates a significant discharge interaction, a WLA among the contributors may need to be made.

Submission of Permit Renewal Applications and Related Data

It is the permittee's responsibility to submit a completed permit renewal application to DEP at least 180 days before the existing permit expires.

For discharges in a watershed where a comprehensive review is being conducted, DEP may require permittees to submit the completed renewal application and supply pertinent data (such as existing and/or projected flows, concentrations, production levels, discharge monitoring

characteristics, etc.) as much as 18-24 months ahead of the expiration date of the existing permit. It is in the permittee's best interest to collect and submit appropriate data to avoid the possible imposition of effluent limits that are based on inadequate or incomplete data.

A. Step 1 - Preliminary Review Considerations

1. Purpose

The purpose of this step is for DEP to become familiar with the facilities and associated wastewater discharges for which NPDES permit applications have been submitted or which are part of a watershed review.

2. Reference Materials to be Used

NPDES and Water Quality Management (WQM) permit application forms and supporting documents; discharger's case files(s); additional data collected by DEP or by the discharger.

3. Guidance and Process

Discrepancies or inconsistencies in the application or other materials will be identified. Pertinent historical data will be reviewed, including compliance history of the discharge.

Prior to beginning a review, the discharger's water quality management case files should be reviewed to determine the current operational and enforcement status of the wastewater treatment facilities. Specific attention should be paid to:

- Previous NPDES permit application and permit documents.
- Preparedness, Prevention and Contingency (PPC) Plans.
- Discharge monitoring reports (DMR).
- EPA and DEP inspection reports.
- Effluent sampling results.
- Previous Toxics Reduction Evaluation (TRE)/Best Demonstrated Technology (BDT) reports.

For municipal discharges, the status of local pretreatment program development and implementation should be determined.

The current NPDES permit application (if one has been submitted) and supporting documentation should then be reviewed to determine the following:

- a. Type of manufacturing or commercial activity involved and identification of Standard Industrial Classification (SIC)/North American Industry Classification System (NAICS) Code(s).
- b. Types of products involved and associated production rates.

- c. Sources and volumes of wastewater (process, cooling, sanitary, stormwater).
- d. EPA industrial category or subcategory involved.

Information gained from review of permit applications for similar types of discharges should also be referenced during this review.

The process/wastewater flow diagram, which is a part of the NPDES permit package, should be closely reviewed to determine the configuration of water intake/sources, discharge points, wastestreams and internal sampling locations used by the applicant. The package should also be examined to determine the time-frame in which the sample results reported were obtained by the discharger, what analytical techniques the discharger or the discharger's laboratory employed, and that the facility testing or analyzing the sample is in compliance with the Environmental Laboratory Accreditation Act, 27 Pa. C.S. § 4101 *et seq.* and applicable regulations.

If the applicant submitted site-specific data, it should be closely reviewed to see if approved protocols were used, whether the protocols were followed and what the results of the studies were.

DEP staff may make field visits to industrial and municipal facilities to develop a clearer understanding of the discharger's facilities and physical layout of the associated discharges/outfalls.

Discrepancies noted during this preliminary review should be brought to the attention of the discharger and any questions which arise should be resolved to eliminate further delays. This may also be done in conjunction with Step 2.

B. Step 2 - Determining Parameters of Concern

1. Purpose

The purpose of this step is to compile a list of toxic pollutants that may require NPDES permit limits or otherwise need to be addressed in the permit. In general, parameters of concern identified in this step will be addressed in the NPDES permit and receive monitoring requirements, effluent limits, or both. If a parameter of concern is identified in this step, but for some reason the analyst determines that it need not be addressed in the permit, the rationale for not addressing a parameter of concern should be documented in the Water Quality Protection Report documentation or its equivalent. However, permit limits for parameters for which BAT limits apply may not be waived.

2. Reference Materials to be Used

- NPDES Discharge Application Form.
- Previous TRE/BDT reports.

- DMRs and other discharger supplied data.
- TMDL report for receiving stream or watershed, if applicable.
- Occurrence of priority pollutants observed by EPA during BAT screening and verification sampling surveys.
- Analytical Methods and Detection Limits for Toxics Substances - Chapter 16, Subchapter B.
- Appropriate EPA BAT Development Documents and Contractor Reports.
- Appropriate EPA Effluent Limitation Guideline (ELG) Regulations.
- Integrated Water Quality Monitoring and Assessment Report.

3. Guidance and Process

Parameters of concern are selected after consideration of all toxics listed in the NPDES application form, available TRE/BDT reports, DMR, TMDL report, compliance inspection reports, and Federal ELG regulations and development documents. The screening process will consider known pollutants expected to be discharged, reported by the permittee and/or collected by DEP.

The Water Quality-Based Effluent Limitation (WQBEL) is one possible basis for the final permit limit. The water quality model PENTOXSD is used to determine the WQBEL based on a single-discharge analysis, if applicable. PENTOXSD considers the assimilative capacity of the receiving stream and applies the design conditions listed in Table 1 to the analysis. However, PENTOXSD is only capable of handling single-discharge scenarios and cannot directly perform a WLA to allocate the resource. See Step 3 for guidance on handling multiple discharge scenarios.

The Excel spreadsheet TOXCONC can assist in analyzing existing discharge concentration data, if discharge data exist in sufficient quantity. Assuming lognormal or delta-lognormal distribution, TOXCONC projects an Average Monthly Effluent Concentration (AMEC) at a 99 percent confidence level based on discrete discharge effluent concentration data. This AMEC is useful in making “reasonable potential” determinations, in determining the basis for a (previous) permit limit, or in cases where “anti-backsliding” applies. TOXCONC also produces the coefficient of variation (CV) of the data, which can then be entered into PENTOXSD instead of the default CV value when producing the WQBEL.

A general description of the process used to identify parameters of concern is presented below.

a. Application of Technology-Based Requirements

(1) Parameters for Which a BAT Limit Applies

If a BAT limit applies for a pollutant, the pollutant must be identified as a parameter of concern. The corresponding BAT limit (expressed in concentration form) establishes a ceiling on the effluent limit that may be written into the NPDES permit. When applying applicable BAT limits in permits, permit writers need to

be aware that they do not have the authority to extend statutory deadlines in an NPDES permit; thus, all applicable technology-based requirements (BAT limits) must be applied in NPDES permits without the benefit of a compliance schedule.

(2) Parameters Which Have Other Technology-Based Requirements

If a Best Professional Judgment (BPJ) or other technology-based requirement has been developed by DEP for a given pollutant and type of discharge, the pollutant must be identified as a parameter of concern. The technology-based requirement (expressed in concentration form) establishes a ceiling on the effluent limit that may be written into the NPDES permit.

b. Parameters for Which No BAT Limit or Other Technology-Based Requirements Apply (Reasonable Potential)

If a pollutant for a given type of discharge has no ELG or other technology-based requirement, a “reasonable potential” analysis (as defined by this document) should be performed. This involves comparing the existing discharge concentration to the WQBEL to determine if there is reasonable potential for a pollutant to cause water quality excursions. There are two options that apply. First, if only a few existing discharge concentration data values are available, the arithmetic mean of the data should be calculated. If the average of the existing data exceeds 50 percent of the average monthly WQBEL, the pollutant should be considered a parameter of concern. Second, if many existing discharge data values are available, TOXCONC should be used to generate the AMEC of the data. If the AMEC exceeds 50 percent of the average monthly WQBEL, the pollutant should be considered a parameter of concern. The WQBEL used in this comparison could be based on a PENTOXSD analysis, a TMDL report, or other watershed-based WLA.

Generally, the first option is more applicable to small dischargers with low loadings of the pollutant, and the second option is more applicable to large dischargers with high loadings of the pollutant. TOXCONC should always be used to generate the AMEC when sufficient data are available. If there are insufficient discharge concentration data to project an AMEC based on existing data, the analyst may require the permittee to collect additional data. “Sufficient data” generally is defined as 10 or more individual data points collected over time.

c. Additional Data Collection

(1) Additional Discharger Data Submissions

Permittees may be required to collect and submit additional analytical data on potential parameters of concern, where in the judgment of the analyst, additional data is needed to verify or

supplement existing data. This would be applicable especially for large discharges, where the adverse consequences of substantial error in the data could be high. These submissions are in addition to the normal submissions of discharge monitoring data otherwise required by the permit.

(2) Additional DEP Data Collection

Concurrent with the permittee data collection, DEP may elect to collect field data for potential parameters of concern where the analyst determines that overlapping or cumulative effects of multiple sources may be present, or background concentrations of the pollutant may be significant.

d. Interpretation of Analytical Results

Typically, when a laboratory reports an analytical result as less than (<) a quoted value, that value is the analytical detection limit and the inference is that the parameter was not found in the sample. In the absence of evidence that indicates that the parameter is present, it may be assumed that the parameter is not in the effluent if the detection level used is equal to or less than that of the MDL established in Chapter 16. If there is any question on the meaning of the data supplied in any other form by a discharger, the discharger or his laboratory may be asked to provide clarification. This may include additional sampling using a more sensitive test method.

If a detection limit in a permit screening analysis is reported at a higher value than listed in Chapter 16, a brief written explanation from the discharger's laboratory should be provided to document the reason. Unfortunately, there is no applicable model or guideline to determine acceptable limits of variation from the MDLs established in Chapter 16. BPJ, which may be enhanced with information from the laboratory performing the analysis, must be employed in such cases. Central Office - Division of Water Quality Standards (DWQS) may also be contacted for case-specific questions on this issue.

All data values reported as less than the MDLs established in Chapter 16 should be treated as zeros for all permitting compliance monitoring and reporting and enforcement actions.

C. Step 3 – Development of NPDES Effluent Limits and Monitoring Requirements

1. Purpose

The purpose of this step is to develop effluent limits and monitoring requirements for the parameters of concern identified in Step 2.

2. Reference Material to be Used

- Statement of Policy in Chapter 16.
- *Technical Reference Guide PENTOXSD for Windows PA Single Discharge Wasteload Allocation Program for Toxics Version 2.0*, DEP ID: 391-2000-011, as amended, available on DEP's Web site at <http://www.depweb.state.pa.us/>.
- *Technical Support Document for Water Quality-Based Toxics Control*, U.S. EPA, March 1991, EPA/505/2-90-001.
- Act 537 Plans.
- Municipal Waste Load Management Reports.
- DMR.
- TMDL report for receiving stream or watershed, if applicable.
- Priority Water Body Survey Reports.
- *Implementation Guidance Design Conditions*, DEP ID: 391-2000-006, available on DEP's Web site.
- Integrated Water Quality Monitoring and Assessment Report.
- Public Water Supply Intakes.

3. Guidance and Process

a. Basis for Permit Limit

The basis for the permit limit for each parameter of concern may be a technology-based (BAT, ELG) requirement, a WQBEL calculated by PENTOXSD based on a single-source analysis, or a WQBEL based on an applicable TMDL report or other analysis that considers multiple sources or other concerns that apply across the watershed. The most restrictive limits produced as a result of each of these three processes shall be selected as the applicable NPDES permit limits.

If a TMDL report exists for the stream or watershed, and toxics are addressed in the TMDL report, then the analyst must consider the TMDL requirements in developing the effluent limits. If no TMDL report has been produced for the stream or watershed, or toxics are not addressed in the TMDL report, then the WQBEL produced by the PENTOXSD analysis will apply. However, to the maximum extent feasible, the analyst must address watershed-wide considerations in developing the WQBEL, using all available information on existing or anticipated sources and background levels of the pollutant(s).

In general, the design conditions and other considerations described in TABLE 1, and in the reference materials, shall be used in developing the WQBEL.

TABLE 1
Design Conditions and Considerations

Design Condition/Consideration	CMC	CCC	THH	CRL
Water Quality Criteria Duration	1 Hour	4 days	30 days	70 years
Point of Criteria Application	At point of first aquatic use.		Just below point of discharge, except for TDS, NO ₂ -NO ₃ , phenolics, chloride, sulfate and fluoride.	
Maximum Allowable Criteria Compliance Time at Design Flow Conditions ⁽¹⁾	15 minutes	12 hours	The smaller of 12 hours, or travel time to nearest PWS intake.	12 hours
Design Stream Flow Condition	Q ₇₋₁₀			70 year design flow ⁽²⁾
Design Ambient/Background Instream Pollutant Concentration	Zero, unless available long-term average data indicates otherwise			
Planning Horizon	A minimum of 10 years			
Reserve Factor	Determined by analyst			
Factor of Safety	Determined by analyst			
Consideration of Instream Fate For Multiple Discharge Evaluation	Yes	Yes	Yes	Yes
Multiple Discharge Wasteload Allocation Strategy	Equal Marginal Percent Removal (EMPR) ⁽³⁾			
Stream Hardness (default) ⁽⁴⁾	100	100	N/A	N/A
Stream pH (default) ⁽⁴⁾	7	7	N/A	7

- (1) If complete mix occurs at a time less than indicated, criteria compliance must be achieved at point of complete mix.
- (2) Harmonic mean flow.
- (3) Alternative WLA strategies proposed by one or a group of permittees may be considered.
- (4) Substitute site-specific values where available (use measured or calculated value after mixing between the stream and the discharge).

b. Governing Water Quality Criterion and Calculation of WQBEL

Water quality criteria are divided into those designed to protect fish and aquatic life and those designed to protect human health. Fish and aquatic life criteria are divided into Criteria Maximum Concentration (CMC) criteria (also termed acute fish criteria), and Criteria Continuous Concentration (CCC) criteria (also termed chronic fish criteria). Human health criteria are divided into Threshold Human Health (THH) criteria, and Cancer Risk Level (CRL) criteria. All applicable criteria are listed in Chapters 93 and 16. All applicable criteria shall be considered in determining which water quality criterion governs the determination of WQBEL, using PENTOXSD or equivalent. The water quality criterion which results in the most restrictive WQBEL governs.

Where no water quality criteria are listed in Chapters 93 or 16 for a potential parameter of concern, the analyst should contact the DWQS to obtain the necessary criteria or guidance.

c. Background Water Quality

Apply this guidance to evaluate existing or background concentrations of toxic substances: *Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances*, DEP ID 391-2000-022, available on DEP's Web site.

d. Multiple-Discharge Scenarios

If an overlapping effect between multiple discharges for a given pollutant is known or suspected, the analyst should evaluate key variables to determine how to proceed. These variables would include whether or not complete-mix occurs in the receiving stream between discharges; consideration of inflows to the receiving stream between discharges; which of the four criteria (CMC, CCC, THH, or CRL) are likely to govern; and whether it is reasonable to treat the pollutant as a conservative substance, based primarily on the distance between discharges. 25 Pa. Code § 96.4(e)(2) requires that a pollutant be treated as conservative "...unless [DEP] finds based on scientifically valid information that the substance is not conservative and adequate information is available to characterize the substance's fate or transformation, or both." For highly volatile pollutants, for example, it may be evident that a substance has volatilized to near completion based on the distance between discharges. If a quantitative solution is required, consult *Protocol for Estimating First Order Pollutant Fate Coefficients for Volatile Organic Substances*, DEP ID: 391-2000-020, available on DEP's Web site. Other pollutants may be subject to biodegradation or transformation. To avoid an excessively restrictive WLA based on the assumption that the pollutant is conservative, permittees should be given the option to sponsor a field sampling study to quantify fate and transport of a pollutant.

When a calculated WLA is appropriate, the EMPR WLA method shall be applied. PENTOXSD cannot directly address multiple-discharge scenarios, so a custom solution is required for each scenario. Central office is the primary resource for technical support in multiple-discharge scenarios for toxics, including evaluating proposed sampling study designs, calculating WLAs, and determining when it may be appropriate to enter the TMDL process.

e. Monitor and Report

If no technology-based requirement for a numerical permit limit exists, and the existing discharge concentration (or AMEC) of a pollutant does not exceed 50 percent of the WQBEL, the analyst may elect to implement a Monitor and Report requirement in the permit. This would be most applicable to a pollutant that, while not determined to be a parameter of concern based on the process detailed in Step 2, may have residual issues or uncertainty regarding the quantity, quality or trend of the data supporting the determination. Under some conditions, a Monitor and Report requirement may be implemented even if the existing discharge concentration (or AMEC) of a pollutant exceeds 50 percent of the WQBEL. Specifically, a Monitor and Report requirement may be appropriate for a given pollutant for any of the reasons listed below:

- The reported discharge concentration (or AMEC) is more than 50 percent of the WQBEL, but it is not clear whether the pollutant in question is routinely expected to occur in the discharge. It may be suspected to occur only as a result of the quality of industrial intake water, and periodic monitoring may be appropriate to verify the actual discharge concentration or reasons for occurrence.
- The existing effluent concentration being discharged is not well characterized (based on less than 4 samples, for example) so that setting an “interim” limit based on existing effluent data is not possible.
- The initial information on the permit application form reflects “less than _____” or “not detectable,” but the level of detectability being used by the applicant is less sensitive (i.e., higher) than the “minimum acceptable (screening) detection limit.” There is insufficient data to confirm the presence of the pollution at a level high enough to require a WQBEL.
- The reported discharge concentration (or AMEC) is less than 50 percent of the WQBEL, but the loading is substantial and the analyst judges it appropriate to guard against facility process changes, or possible reduced reactor or treatment efficiency.

- For conservative pollutants, the analyst should consider a monitor-only requirement whenever the loading (or AMEC) to the receiving waters constitutes a substantial portion of the assimilative capacity (or WQBEL) of the receiving waters. This consideration is most applicable to receiving waters where present or future multiple loads of that pollutant are known or suspected. The monitoring will provide the data required to quantify the cumulative load to the stream.

f. Discharges to Acid-Impacted Streams

The provisions of 25 Pa. Code § 95.5 apply to waters polluted by abandoned mine drainage to the extent that aquatic communities are essentially excluded. Permit limits and WQBELs for the protection of fish and aquatic life for toxic discharges to acid-impacted streams shall be developed in accordance with 25 Pa. Code § 95.5, provided, however, that fish and aquatic life uses in downstream non-acid stream segments are protected.

Many acid impregnated streams are potential sources of potable water supply and may also be used for water contact sports. Water quality criteria for human health protection should, therefore, be applied at the point of discharge, except where otherwise specified in 25 Pa. Code § 96.3(d) (special PWS parameters).

g. Discharges to High Quality (HQ) or Exceptional Value (EV) Waters.

Refer to *Water Quality Antidegradation Implementation Guidance*, DEP ID: 391-0300-002, available on DEP's Web site.

h. Expressing Permit Limits Based on the WQBEL

Generally, PENTOXSD is used to generate the WQBEL and will provide the appropriate average monthly limit (AML) and maximum daily limit. If a TMDL report or some other basis is used to generate the WQBEL and associated AML, the maximum daily limit should be expressed as 2 times the AML. The instantaneous maximum discharge concentration, if applicable, should be expressed as 2.5 times the AML. Alternative multipliers may be used to determine maximum daily or instantaneous maximum values if sufficient site-specific discharge concentration data are available to determine the variability of the discharge. Generally, a minimum of 10 samples should be collected and analyzed (using TOXCONC or equivalent) to determine a representative site-specific CV. Methods in the EPA Technical Support Document for Water Quality-based Toxics Control (TSD) (EPA/505/2-90-001, PB91-127415, March 1991) may then be used to generate the corresponding maximum limit(s).

i. Determining Final Permit Parameters and Effluent Limitations

(1) Parameters Which Have Applicable ELGs

If a pollutant has an applicable ELG requirement, the ELG or the WQBEL, whichever is more restrictive, must be placed in the permit. If a discharger asserts that a pollutant with an applicable ELG is not present in his wastewater at significant levels, the discharger may provide analytical data to support this contention. If the data submitted are adequate to verify the discharger's assertion, the ELG requirement shall be retained in the permit, but monitoring requirements may be relaxed. The minimum monitoring frequency for pollutants with an applicable ELG shall be at least twice per year.

(2) Parameters Which Have Other Technology-Based Requirements

If a BPJ or other technology-based requirement has been developed by DEP, the technology-based requirement, or the corresponding WQBEL (whichever is more restrictive) must be placed in the permit.

If a discharger asserts that a pollutant is not present in his wastewater at significant levels, the discharger may provide analytical data to support this contention. If the data submitted are adequate to verify the discharger's assertion, the technology-based effluent limit may be deleted from the permit. However, a minimum monitoring frequency of twice per year must be placed in the permit.

(3) Parameters Which Have No Applicable ELG or Other Technology-Based Requirements

If a discharge parameter of concern has no applicable ELG or other technology-based requirement, the WQBEL shall be placed in the permit.

D. Step 4 – Establishment of NPDES Permit Terms and Conditions for Control of Toxic Pollutants

1. Purpose

The purpose of this step is to establish appropriate effluent limitations, monitoring and reporting requirements, and other special conditions to be incorporated into the NPDES permit, based on the results of Steps 1 through 3 above.

2. Actions

- a. A draft NPDES permit is prepared which contains effluent limitations, monitoring and reporting requirements and other special conditions as appropriate.
- b. The draft permit is forwarded to the applicant, to EPA Region III for non-waived cases and to the Delaware River Basin Commission (DRBC) (for estuary cases), for review and comments.
- c. A public notice of the draft NPDES permit is developed and forwarded to the *Pennsylvania Bulletin*. DEP's regional office may be asked to forward a copy of the draft permit, for selected cases, to the Bureau of Water Standards and Facility Regulation (BWSFR) for review before they are published.
- d. After the required 30-day comment period and after all comments have been addressed, a final permit is issued.

3. Reference Materials To Be Used

- *NPDES Permit Writers' Manual*, DEP ID: 362-0400-001, available on DEP's Web site.
- Final TMDL/WLA Detailed Analysis Report.
- Technical Support Document of Water Quality-Based Toxics Control, U.S. EPA, March 1991.
- Chapter 16 - Analytical Methods and Detection Limits for Toxics Substances, Subchapter B.
- Appendix C - Permittee Guidance for Conducting a TRE.
- Appendix D - Guidance for Obtaining 25 Pa. Code § 95.4 Extension of Time to Achieve WQBEL.

4. Guidance and Process

The following procedures apply when establishing NPDES permit terms and conditions for control of toxic pollutants.

a. Expressing Effluent Requirements as "Monitor and Report"

Based on the previous evaluations, it may be that a WQBEL is not necessary for a particular parameter; however, monitoring may be required to verify the presence of or the amount of actual concentration being discharged. In these situations, the permittee shall be instructed to "monitor only," using an EPA-approved analytical procedure of sufficient sensitivity to meet the level of detection necessary to provide meaningful information to DEP in evaluating the need for a permit limitation for the parameter. In many cases, any of the EPA-approved test methods will be acceptable for monitoring. Therefore, the permit language should be as follows:

“Monitor and Report”

Only in cases where a very low detection limit is necessary should the permit list an analytical method by name and number. Permit language should be as follows:

“Monitor and report using EPA Method _____ or equivalent, as approved by DEP.”

A discharger’s laboratory is thereby given the opportunity to propose an alternative analytical method that may still achieve the desired data, without a confrontation or challenge to the permit.

See Step 3 for situations where Monitor and Report limits in permits may be appropriate.

b. WQBEL At or Below Detection Limits

For the toxic pollutants, where the calculated “average monthly” or “maximum daily” WQBEL is at or below the detection limit, the WQBEL shall be placed on the permit page according to Table 2 with the following special notation in Part C of the permit:

- (1) The calculated limits for (list parameters) as specified in this permit are the final limits necessary to comply with the state water quality standards. These effluent limits are lower than the MDL of the most sensitive existing EPA-approved (40 CFR Part 136) test method or other DEP-approved method. If the sensitivity of the specified method improves or a more sensitive test method becomes available, DEP may modify the permit to require use of the more sensitive method.
- (2) All samples shall be analyzed using the specified EPA method or other equivalent test method, as approved by DEP. When a laboratory determines that the result of an analysis is below the detection limit it will report the result as < (less than) the lowest detectable number. When using this result to calculate an average or mean, use zero (0) in the calculation. If all the individual samples are reported as less than the detection limit, report “ND” as the average or mean. If any of the individual samples are detected above the MDL, report the mean on the DMR even if the mean is below the detection limit. Report the lowest detection level achieved and the number of times “ND” results were reported as “0” in the “Comments Section” of the DMR.

Parameter Name	Required Analytical Test Method	MDL
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

- (3) The permittee may develop a site-specific alternate MDL pursuant to the procedure contained in 40 CFR Part 136 Appendix B. DEP should be contacted for guidance before initiating this procedure.

c. Applicable Deadlines for Compliance with Effluent Requirements

(1) “New Dischargers and New Sources”

NPDES permit requirements for new dischargers (those with no previous valid permit) shall be effective immediately upon issuance of the permit. The discharger must achieve the governing technology-based or WQBEL upon commencement of discharge.

A discharge is considered a “new source” if it started “construction” after EPA promulgation of the applicable New Source Performance Standards (NSPS). The promulgation dates for NSPS may be found in the *Federal Register*. NPDES permit requirements for “new sources” shall be effective upon issuance of the permit. The discharger must achieve the governing effluent limitations upon commencement of discharge.

EPA’s regulations concerning “new source” determinations are discussed in 40 CFR §122.29.

(2) Existing, Unpermitted Dischargers

Existing dischargers who have never received valid NPDES or WQM permits must legally be treated as “new dischargers”; i.e., new sources. The governing effluent limitations are to be effective immediately upon issuance of the permit. A consent order and agreement (COA) or DEP order must be used to resolve the permittee’s noncompliance status.

(3) Existing, Permitted Dischargers

Existing permitted dischargers (including those with a previously issued WQM permit but with no NPDES permit) whose permits are being reissued, modified or revoked and reissued, are subject to the most stringent of technology-based limits, WQBEL or previous NPDES permit requirements (where EPA’s “anti-backsliding” regulations, 40 CFR § 122.44(1), so require, also see Table 2).

WQBEL may, however, be relaxed if the new limit results from a TMDL activity.

- (a) BAT requirements for industrial dischargers must be effective upon date of permit reissuance or modification (unless EPA has provided for a later compliance deadline in its BAT regulations). These are placed in Part A of the permit.

If the applicant cannot meet these limits on their effective date, a separate COA or a DEP order must be developed either during or subsequent to permit issuance to resolve the permittee's noncompliance status. The COA or order may also refer to other applicable permit conditions, which require achievement of final water quality limitations, submittal of a TRE and any related demonstrations to DEP.

- (b) Carry-Over WQBEL Requirements (i.e., from previous permits).

Pollutants and their WQBEL being continued from the existing previously issued NPDES permit are to be effective upon date of permit reissuance or modification and are placed in Part A of the permit.

Should the permittee not be able to meet these limits, a COA or order must be issued to resolve the permittee's noncompliance status.

- (c) New WQBEL Requirements

This includes both the new parameters and their associated limits and carry-over parameters with more stringent WQBEL than previously permitted. A COA or a DEP order may also be used to resolve the permittee's noncompliance status.

- d. Determining Whether WQBEL Should be Placed in Part A as a Final Limitation or Subject to a TRE in Part C of the Permit

- (1) TABLE 2 outlines the decision-making process in determining how to place WQBEL in Part A of the permit and when to require a full-scale or a limited-scale TRE. Generally, the first step in the determination of the applicability of WQBEL is the comparison of the WQBEL to the appropriate BAT value. If the BAT/BPJ value is more stringent, it must be placed in Part A of the permit, as a final limitation.

- (2) Where the WQBEL is more stringent than the BAT/BPJ value, the permit writer must make several additional evaluations. The permit writer must consider the basis of the WQBEL and whether the existing facilities are capable of providing the treatment necessary to achieve these limitations.
- (3) For dischargers already achieving the WQBEL or for situations where the discharger can meet the WQBEL using facilities currently in operation, the WQBEL must be placed in Part A of the permit. A TRE for these cases is optional.
- (4) A WQBEL that is based on adequate site-specific data must be placed in Part A of the permit. If the WQBEL can be met by the permittee, the limit should be effective upon issuance (no TRE). If the WQBEL cannot be achieved by the permittee, a “limited” TRE may be required.
- (5) Where adequate site-specific data are not available at the time of permit issuance, the WQBEL should be placed in Part A of the permit and a “full-scale” TRE should be required.
 - (a) Site-specific data should be considered adequate if use of more refined data will not significantly change the calculated WQBEL. For example, the partial mixing factor is a function of the stream width, depth and slope. If complete mixing occurs for a particular discharge, it makes no difference what width, depth and slope were used in the analysis. Refining these data will not change the WQBEL. Similarly, if no pollutant fate is applied, changing the stream velocity will not change the WQBEL.

Whether or not adequate data exists is to be decided by the individual performing the water quality modeling and the individual writing the NPDES permit.

TABLE 2

How to Include New WQBEL in Permit

		A	B
		WQBEL Based Upon <u>Sufficient Data</u>	WQBEL Based Upon <u>Currently Available Data</u>
1	New WQBEL more stringent than existing WQBEL <u>and</u> permittee meets new WQBEL or permittee should be able to achieve WQBEL upon permit issuance.	* Governing Tech Limits or Calculated WQBEL in Part A * Limits effective immediately * No TRE	* Governing Tech Limits or Calculated WQBEL in Part A * Full-Scale TRE
2	New WQBEL <u>equal to or less</u> stringent than existing WQBEL <u>and</u> permittee meets new WQBEL now.	* Governing Tech Limits or Calculated WQBEL in Part A * Limits effective immediately * No TRE	* Governing Tech Limits or Calculated WQBEL in Part A * Limits effective immediately * No TRE
3	New WQBEL <u>more or less</u> stringent than existing WQBEL, <u>and</u> permittee <u>does not</u> meet new WQBEL now.	* Governing Tech Limits or Calculated WQBEL in Part A * Limited Scale TRE * Possible §95.4 extension	* Governing Tech Limits or Calculated WQBEL in Part A * Full-Scale TRE * Possible §95.4 extension

- (b) The permit shall contain a TRE condition similar to Appendix A (approved by EPA) in all permits requiring a TRE to comply with the final WQBEL. A copy of the guideline for carrying out a TRE (Appendix C) and for obtaining a 25 Pa. Code § 95.4 time extension (Appendix D) shall be forwarded to the permittee when transmitting the final permit.

e. Addressing Total Toxic Organics (TTO) as a BAT Parameter

EPA has chosen to control the organic priority pollutants for certain industrial categories by using TTO as a BPT/BAT parameter. The following approach shall be taken for dealing with TTO in NPDES permits:

- (1) The applicable BAT limitation for TTO will be included in the permit, as specified in the BAT regulation for the industry.
- (2) The applicable definition of what constitutes “TTO,” based on the BAT regulation being used, will be included in Part C of the permit. See Appendix B.

- (3) A self-monitoring and reporting requirement for TTO of “once/year” shall be assigned in the permit. The once/year monitoring frequency is the minimum frequency required by EPA under its NPDES permit program regulations. This monitoring will also provide data on the types and quantities of pollutants found in these discharges. The above monitoring frequency may be increased and/or the time period for collecting samples may be specified (i.e., to assure that the sampling is representative of the normal operation of the facility), as considered appropriate on a case-by-case basis.
- (4) Additional special monitoring and/or limitations on individual TTO pollutants shall be included in the permit along with TRE requirements and other special conditions as considered necessary, in accordance with this TMS.

f. Specific Sample Type for Discharger Self-Monitoring and Reporting of Toxic Pollutants

The type of sample will depend upon the nature of the parameter of concern.

Metals (1M-13M), Total Cyanide (14M) and Total Phenols (15M) - the type of sample required is a composite sample of at least 8 hours duration. The sampling period shall include the period of peak daily discharge. Grab samples may be specified for noncontinuing discharges.

Volatile Organic Fraction (1V-31V) - because of the unstable character of the volatile fraction, composite sampling is not practical. Four grab samples collected during actual hours of discharge over a 24-hour period (not necessarily flow-proportioned) must be taken for GC/MS Volatile Organic Analysis. These 4 samples must be combined in the laboratory immediately before analysis and one analysis performed for reporting of a value.

Acid, Base/Neutral and Pesticide Fractions (1A-11A, 1B-46B and 1P-25P respectively) - the type of sample required is a composite sample of at least 8 hours duration. The sampling period shall include the period of peak daily discharge. Grab samples may be specified for noncontinuous discharges.

The Sampling and Analytical Testing Instructions - the permit application provides a guide to the sample collection, preservation and handling techniques that are associated with self-monitoring of priority pollutants.

g. Specifying Sampling Frequency

(1) Organic Toxic Pollutants

Depending on the degree of concern over the pollutants(s) and the method used to express permit limitations, a minimum of 4 samples per monthly self-monitoring requirement is appropriate. The permittee should be allowed an option to demonstrate compliance with the final effluent limit with less than the above minimum number of samples.

The sampling frequency shall be clearly listed on the effluent limitations page of the NPDES permit. The same self-monitoring frequency should generally apply to all organic priority pollutants of the same fraction (i.e., volatile, acids, base/neutrals, pesticides).

(2) Since limits on organic toxics are expressed as “monthly average” and their analytical costs are relatively inexpensive, their monitoring frequency should be increased to be more statistically valid. Weekly or 4/month self-monitoring is appropriate. The permittee should be allowed an option to demonstrate compliance with the final effluent limited with less than the above minimum number of samples.

(3) The following permittee language is recommended for use in all permits with toxics limits:

“Effluent limits for all toxic pollutants in this permit were calculated using 4 samples per month. The sampling frequency specified in the DMR in this permit is the minimum number of sample events required for the outfall. The permittee may take additional samples each month to demonstrate compliance with the average monthly effluent limitations contained in this permit.”

h. Use of Indicator Pollutants

The general purpose of “indicator” pollutants is to indicate the relative success of the treatment facilities to remove other pollutants. Ordinarily when using indicator pollutants as a permit condition, the permit writer must first look at the relationship of treatability of the indicator pollutant with that of the other pollutants in question. Both the “indicator” and the pollutant(s) in question must have similar treatability characteristics (i.e., they must be effectively removed by the treatment facilities in question).

For purposes of this TMS, “indicator pollutants” are generally considered inappropriate for the following reasons:

(1) The TMS is water quality-oriented (as opposed to BAT-oriented).

- (2) The use of “indicators” based on treatability alone may overlook other pollutants which have substantially different water quality impacts.
- (3) Because of the nature of the organic priority pollutants fractions, the indicator approach may or may not result in decreased analytical costs for the permittee (i.e., if all pollutants of concern are in the same GC-MS fraction, then the analytical cost is usually the same regardless of how many pollutants are being analyzed).

i. Reporting of Effluent Data for Toxic Pollutants

The requirements for reporting effluent data for toxic pollutants must be specified in the permit and on the DMR, as is done for all other pollutants.

j. NPDES Public Notice to Address Toxic Effluent Limits and Other Requirements

The basic NPDES public notice format will be used to reflect the requirements found in Part A of the permit.

The Part C special conditions for management of toxic pollutants will be briefly described using the following specific wording.

- (1) Requirement to submit a TRE by (date).
- (2) Conditions for future permit modification.
- (3) Procedures for granting time extension to achieve final WQBEL.
- (4) Procedures for demonstrating alternative site-specific bioassay effluent limitations.
- (5) Procedures for demonstrating alternative method detection limits.

E. Step 5 – Follow-up Evaluation After Final Permit Issuance

1. Purpose

The purpose of this step is to evaluate information submitted by permittees in response to initial permit special conditions concerning WQBEL and other requirements for management of toxic pollutants (as described in Step 4 above).

2. Action

DEP’s regional office will evaluate the following additional information as applicable, submitted by the permittee in response to permit requirements.

- TRE reports best management practices (BMP), source reductions, site-specific effluent data, etc.).
- Related discharge monitoring data.

- Request for 25 Pa. Code § 95.4 time extension and related “BDT” demonstrations.
 - Request for alternative, site-specific bioassay-based effluent limitations.
 - Alternative MDL determinations.
 - Water effects ratio documentation.
 - Site-specific water quality criteria.
3. Reference Materials to Be Used:
- Department Regulations, 25 Pa. Code Chapters 93, 95, 96.
 - Appendix C - Permittee Guidance for Conducting a TRE.
 - Appendix D - Guidance for Obtaining 25 Pa. Code § 95.4 Extension of Time to Achieve WQBEL.
4. Guidance and Process

DEP’s regional office will be responsible for expeditious review and approval of TREs and other related submittals from the permittee. These reviews should be considered high priority. Phases I and II of the TREs and other submittals should be reviewed as quickly as possible to allow permittees time to implement the TRE results. Follow-up implementation of final permit requirements should occur within the 5-year life of the initial permit.

a. Review of TRE

The permittee will submit the TRE report in two phases. Phase I must be submitted within 18 months of the permit effective date and Phase II within 6 months of DEP approval of Phase I. DEP will review and act upon each phase of the TRE within 6 months of receipt of a complete submission. When, in the regional permit writer’s opinion, review by BWSFR is required, DEP’s regional office shall forward a copy to the Division of Planning and Permits for information, review and comment from a statewide perspective. The Division of Planning and Permits will provide appropriate technical review in a timely manner and, where necessary, coordinate reviews with DWQS and EPA.

Each phase of the TRE shall be reviewed for completeness and for its technical conformity with the Guidance for Reviewing a TRE Report and 25 Pa. Code § 95.4 request (Appendix E). Not every element of the TRE process as described in these guidelines will be applicable to every discharge situation. A TRE review checklist should be completed for each phase of the TRE to document the review and support recommended follow-up action(s) on the TRE. The reviewer must, however, be satisfied that the permittee has made a valid attempt to adequately address those applicable TRE elements in his submittal. Establishment of final permit requirements for toxics shall be done as discussed next in Step 6.

b. Review of Related Discharge Monitoring Data

During review of the TRE, the reviewer should review available DMR data submitted by the permittee under Part A of the initial permit. Discrepancies between DMR data and the TRE findings and conclusions must be resolved prior to approval of the TRE.

c. Review of Information Related for 25 Pa. Code § 95.4 Extensions and BDT Determinations

Time extension requests should be submitted by the permittee in conjunction with submittal of the Phase II TRE report (unless other arrangements have been made with the permittee on a case-by-case basis).

The regional office may forward a copy of the material submitted to the Division of Planning and Permits for information, review and comment and technical review assistance. Requests shall be reviewed for completeness and for conformance with the basic eligibility requirements of 25 Pa. Code § 95.4. Each request must also be reviewed for its technical content and conformance with the regulations and guidelines for obtaining time extensions. Establishment of final Part A permit requirements for toxics shall be done as discussed in Step 6.

d. Review of Requests for Alternative Site-Specific Criteria Modification

A permittee required to perform a full-scale TRE is required to collect site-specific modeling data and is encouraged to conduct an alternate site-specific criteria modification study, and if any of the WQBEL in the permit are at a below-detection limit, an alternate method detection level determination. If a permittee is required to perform a limited-scale TRE, these studies are optional. Source reductions, BMPs and sound housekeeping practices are required of all permittees both under the full- and limited-scale TRE.

As a prerequisite to conducting such an evaluation, the permittee must submit within 2 months of the permit effective date a formal request and plan of study in accordance with procedures set forth in 25 Pa. Code § 93.8. BWSFR must formally approve this plan of study prior to the conduction of the study by the permittee. The plan of study may include a protocol for studies relating to collection and submission of site-specific data integral to application of water quality criteria and verification of WQBEL.

Once the permittee has carried out the demonstration, the complete study is to be submitted to the region in conjunction with Phase I of the TRE (unless other arrangements have been made with the permittee on a case-by-case basis).

DEP's regional office may forward a copy of the study to DWQS for review and comment and technical review assistance.

Each study will be reviewed for completeness, conformance with the requirements of Title 25 Pa. Code Chapter 93 and for basic technical content. Revised effluent limitations (including more stringent limits where appropriate) are to be incorporated into the modified or reissued permit. An alternate detection level may be applied to the permit along with the WQBEL.

F. Step 6 – Modification of Final Permit Requirements

1. Purpose

The purpose of this step is to reflect the results of the follow-up evaluations carried out as discussed in Step 5 above, in the NPDES permit and related enforcement documents.

2. Action

- a. Based on the evaluation of the TRE and related demonstrations, the NPDES permit will be reopened and either “modified” or “revoked and reissued” to reflect appropriate changes resulting from the above evaluations.
- b. Standard NPDES procedures, draft permit development, public notice and comment period will be followed.
- c. Related enforcement documents (DEP orders, consent orders and agreements) will also be reopened and modified as appropriate.

3. Reference Material To Be Used: *Wastewater Management Permitting Guidance*, DEP ID: 362-2000-001, available on DEP's Web site.

4. Guidance and Process

a. Type of Permit Actions

Once the final Phase II TRE, related demonstrations and requests for permit modification have been received and evaluated, the region will prepare a draft revision to the NPDES permit. Two possible courses of action can be taken, permit “modification” or “revocation and reissuance,” depending upon the circumstances described below:

(1) Permit Modification

When a permit is “modified,” only the permit conditions subject to modification are reopened for the purpose of technical review, public notification and comment. When modifying an NPDES

permit, the expiration date of the original permit is maintained, unless the purpose of the modification is to synchronize the permit expiration date with other nearby permits that have common parameters of concerns.

The permit should be modified when there is a significant portion of the initial permit term remaining (for example 3 years out of the original 5 years) at the time of permit modification and where the necessary toxics reduction measures will be taken by the permittee during the remaining life of the modified permit.

Permit modifications to reflect the findings of the TRE or related demonstrations will be considered as a major modification, subject to the normal NPDES draft permit, public notification and comment process.

(2) Permit Revocation and Reissuance

When a permit is “revoked and reissued,” the entire permit is reopened for the purpose of technical review, public notification and comment. Once the review process is complete the modified permit is issued for a new term not to exceed 5 years.

Revocation and reissuance would be appropriate where either the remaining life of the permit would not be sufficient to incorporate a realistic schedule for implementation of toxics reductions measures, or where less than half of the original 5-year permit term remains at the time of revocation and reissuance.

When revoking and reissuing NPDES permits under this TMS, it is not necessary for the applicant to submit a new application or fee. The revocation and reissuance process shall include the normal NPDES draft permit, public notification and comment steps. The final action of revocation and reissuance is an appealable DEP action.

b. Establishment of Final Water Quality-Based Permit Requirements for Toxics

Once it has been determined to either “modify” or “revoke and reissue” the NPDES permit, a draft revision shall be prepared. A copy of the draft permit shall be forwarded to the permittee for the normal 30-day review and comment period. The regional office will follow the procedure for a “Major” permit revision and prepare the Public Notice and distribution of the draft permit accordingly.

The permit revisions will normally reflect some combination of the following:

(1) Changing (Interim) Effluent Requirement in the Permit

Interim requirements (for WQBEL developed during Step 3) may need to be changed where factors relevant to their determination have changed (as determined during review of the TRE and related submittals) since the permit was originally issued.

(2) Additional effluent limits may be incorporated into Part A of the revised permit based upon additional monitoring information submitted by the permittee.

(3) Changing Final Limitations in the Permit

WQBEL developed during Step 3 that have been placed in Part A of the permit may need to be changed where factors relevant to their determination either have changed since the permit was originally issued or will change as a result of anticipated facility modifications, changing wastewater discharge characteristics, etc.

For example, once the regional office has concurred with the permittee's demonstrated attempts to meet the effluent requirements in the original permit, a set of revised final WQBEL shall be incorporated into Part A of the permit (based on the final results of the permittee's TRE submittal and related demonstrations).

The final WQBEL requirements originally contained in Part A of the permit are to remain in Part A, unchanged, unless any one or more of the following circumstances exist:

- Where the permittee demonstrates that the effluent requirement is no longer needed (for example, the pollutant is no longer expected to be present in the wastewater).
- Where the permittee demonstrates that a revised final effluent requirement would be appropriate because of new information or TRE/BDT demonstrations or water quality impact analysis.
- Where the permittee demonstrates that the final effluent requirements can be achieved. No permit action is needed as the final limits are already in Part A and are effective.

A compliance date (if needed) for these final limitations will also be reflected in Part A of the permit. Any related schedules

necessary for achieving compliance with final Part A limitations will be incorporated into Part C of the permit.

- c. Final Effluent Requirements Still Not Technologically Achievable, 25 Pa. Code § 95.4 Time Extension Being Granted (see APPENDIX D for guidance)

If the permittee conducted the complete TRE and the 25 Pa. Code § 95.4 time extension analysis and DEP accepted the results, the permit must be modified to incorporate these conclusions into the permit. The following Part C condition should be added to the permit by modification:

Time Extension to Achieve WQBEL and Reporting Requirements

(1) WQBEL

In addition to the effluent limitations shown in Part A of this permit, the permittee is expected to ultimately achieve the WQBEL shown below.

Outfall _____

Parameter	Units	Average Monthly	Maximum Daily	Instantaneous Maximum
-----------	-------	--------------------	------------------	--------------------------

“No final date for compliance is shown. The permittee has demonstrated to DEP’s satisfaction that these limitations are not technologically achievable and the permittee has met DEP’s requirements to qualify for a time extension under Section 95.4 of DEP’s Rules and Regulations.”

(2) Reporting Requirements

In order for the permittee to continue to qualify for the initial extension period and subsequent extension renewal, the discharger shall submit periodic reports to DEP, at a frequency acceptable to DEP, but in no case less than once a year detailing its efforts to meet the water quality-based requirements in question.

Note: As part of this Part C special condition, the permit reviewer should add any other conditions that are appropriate to ensure that the permittee fulfills the above obligation to continue efforts to improve effluent quality. For example, if the TRE/§95.4 time extension request identifies further potential areas for study, then the permittee should be directed to do likewise. Also, if the permit reviewer determines that other options should be explored, then the permittee should be directed to do so.

d. Public Notice Format for Permit Modifications/Reissuance

The normal format for *Pennsylvania Bulletin* public notices will be followed when modifying or revoking/reissuing NPDES permits under this strategy. The notice will contain general, brief references to any revised Part C special conditions remaining in the permit for management of toxic pollutants. The notice will also indicate the expected dates for compliance with final Part A effluent limitations. Refer to *Wastewater Management Permitting Guidance*, available on DEP's Web site for additional guidance on when to revoke or modify a permit and when and what to publish in the *Pennsylvania Bulletin*.

APPENDIX A

Part C Condition for Conducting a TRE

Toxics Reduction Evaluation (TRE)

A. Water Quality-Based Effluent Limitations (WQBEL)

1. Based on the discharge and stream data currently available to DEP, the WQBEL are necessary to protect the receiving stream uses designated in DEP's Rules and Regulations.
2. Within 60 days of the permit effective date (PED), the permittee must submit notification to DEP verifying one of the following options has been selected.
 - a. The permittee accepts DEP's data, assumptions and water quality modeling which was the basis for the WQBEL and will not proceed with optional site-specific data collection activities described in Section C of this condition. The WQBEL will be considered final and enforceable 3 years after the PED and should be used as the basis for conducting Phase II of the TRE.
 - b. During the period following permit issuance and prior to the WQBEL becoming final, the permittee agrees to conduct site-specific discharge and/or stream data collection and provide DEP with data to verify or refine the WQBEL in accordance with the schedule in Section B.2., herein. If warranted, modified WQBEL will be established through a permit amendment. Any such permit shall be considered a formal permitting action of DEP subject to applicable permit modification procedures.

If the permittee fails to select one of these options within 60 days of the permit effective date, option A.2.a. is selected by default. If the permittee selects option A.2.b. and conducts TRE actions within the schedule in Section B.2. of this condition of the permit, herein, DEP will issue a written decision by letter or permit amendment. The permittee will have 30 days from the date of receipt of such written DEP letter or decision to file an appeal of the final WQBEL.

3. In either case, the permittee must conduct a TRE as outlined below. Phase I of the TRE has both required and optional components.

B. TRE Submission Requirements

1. The TRE shall be developed to:
 - a. Confirm and quantify the presence of the pollutants in the discharge with the WQBEL.
 - b. Verify or refine the modeling data and/or assumptions used to develop the WQBEL.

- c. Identify sources of the pollutants with final WQBEL.
 - d. Recommend management practices, wastewater treatment technologies or other control techniques to reduce or eliminate these pollutants.
2. A copy of APPENDIX C - "*Permittee Guidance for Conducting a Toxics Reduction Evaluation (TRE)*" is enclosed for your use. The TRE and associated reports shall be completed and submitted in accordance with the following schedule:

	<u>Action</u>	<u>Date</u>
a.	Submit notification specified in A.2. above	within 60 days of PED
b.	Submit work plan for conducting Phase I	within 90 days of PED
c.	Start Phase I	within 120 days of PED
d.	Submit complete Phase I report (3 copies)	within 18 months of PED
e.	Start Phase II	within 30 days of notice from DEP to proceed with Phase II
f.	Submit complete Phase II report	within 180 days of notice to proceed with Phase II
g.	Progress reports	every 3 months starting 120 days after PED

C. Phase I TRE Requirements

1. The permittee is required to submit the Phase I report of the TRE consisting of the following components:
 - Influent and effluent quality review.
 - Source inventory and evaluation.
 - Source reduction evaluation.
 - Implementation of pollution prevention, sound housekeeping practices and other management practices.

2. The permittee selecting option A.2.b. above has the option of providing all or some of the following site-specific data as part of Phase I for use in verifying and refining the WQBEL:

- Discharge hardness.
- Discharge pollutant concentration and variability.
- Design discharge flow.
- Discharge mixing characteristics.
- Pollutant fate characteristics.
- Stream width, depth and slope.
- Stream velocity.
- Ambient stream data for pollutants, pH, temperature.
- Instream hardness.
- Water intake quality and quantity.
- Treatment plant influent pollutant concentrations.
- Chemical translators.
- Water Effects Ratio (WER).

The permittee should contact DEP for guidance in determining which of the above data will have a significant impact on the WQBEL and also for protocols on collecting and submitting the data. DEP will determine the adequacy of any site-specific data submitted and advise the permittee accordingly. If initial review of the submitted data suggests that additional data collection is necessary, DEP will so advise the permittee. DEP will notify the permittee of what effect, if any, the data will have on the WQBEL using the procedure outlined in A.2. above. Refer to APPENDIX F for a list of Water-Effect Ratio (WER) and Metals Translator Guidance Documents.

3. Site-Specific Criteria

The permittee may request an opportunity to demonstrate alternative, site-specific criteria for any pollutants with WQBEL. The procedures for carrying out such demonstrations must receive written approval in advance by DEP and must be in accordance with the requirements of Section 93.8 of DEP's Rules and Regulations.

If the permittee chooses this option, requests for alternative, site-specific criteria must be submitted to DEP as part of the Phase I TRE report. Where the demonstration results in more stringent limitations than those previously established by DEP, the more stringent limitation will apply. Any less stringent limitations, which are approved by DEP, shall not violate any other applicable water criteria.

4. Alternative Site-Specific MDL

In some cases, the WQBEL may be less than the MDL in Title 25 Pa. Code Chapter 16. In this event, the permittee has the option to demonstrate alternative, facility-specific MDL to account for analytical matrix interference associated with

the wastewater in question. The procedures for determining MDL published as Appendix B in 40 CFR Part 136 must be followed and complete documentation provided. The request for approval of alternative facility-specific MDL including all documentation required to support such a request must be submitted to DEP with the Phase I TRE report. DEP may grant a facility-specific MDL by including the numeric alternate MDL value for compliance purposes through the permit modification or renewal process.

D. Phase II TRE Requirements

The permittee should not proceed with Phase II until notified by DEP to do so. Depending on the results of Phase I, WQBEL may need to be modified or Phase II may not be necessary.

1. Source Reduction Evaluation

In addition to those items in C.1. above, as part of Phase II, the permittee must conduct source reduction evaluations including recycle, reuse and process/chemical substitution. The intent of this portion of the TRE is to investigate and implement all low-cost, nonstructured alternatives to reduce pollutants.

2. Final WQBEL Compliance Strategies and Schedule

A complete TRE report must consist of identification and assessment of all available pollution control options (BMP and/or treatment technologies and other structural alternatives) and their ability to comply with the final WQBEL or other WQBEL identified in response to Phase I. The permittee must select a specific pollution control option that will achieve the applicable WQBEL and specify a schedule for the implementation of this option.

3. 25 Pa. Code § 95.4 Time Extension Requests

In some cases, the final WQBEL may not be technologically achievable using any combination of control options. In this event, the permittee has the option of requesting an extension of time to achieve the WQBEL, provided the permittee demonstrates eligibility for time extension under the requirements contained in 25 Pa. Code § 95.4. If the permittee elects to submit the 25 Pa. Code § 95.4 time extension request, the request must be submitted with Phase II of the TRE report using APPENDIX D Guidance for obtaining 25 Pa. Code § 95.4 Extension of Time to Achieve WQBEL.

Note for Final Permit: The dates specified on the schedule should be actual dates based on the given dates after PED. APPENDIX C and D should be sent with the permit.

APPENDIX B

Part C Condition for Total Toxic Organics (TTO)

Total Toxic Organics (TTO) is the summation of all quantifiable values greater than 0.01 milligrams per liter (mg/L) for the analysis of the following toxic organics:

Acenaphthene	4-bromophenyl phenyl ether	Fluorene
Acrolein	Bis (2-chloroisopropyl) ether	Phenanthrene
Acrylonitrile	Bis (2-chloroethoxy) methane	1,2,5,6-dibenzanthracene
Benzene	Methylene chloride(dichloromethane)	(dibenzo(a,h)anthracene)
Benzidine	Methyl chloride (chloromethane)	Indeno (1,2,3-cd) pyrene
Carbon Tetrachloride (tetrachloromethane)	Methyl bromide (bromomethane)	(2,3-o-phenylene pyrene)
Chlorobenzene	Bromoform (tribromomethane)	Pyrene
1,2,4-trichlorobenzene	Dichlorobromomethane	Tetrachloroethylene
Hexachlorobenzene	Chlorodibromomethane	Toluene
1,2-dichloroethane	Hexachlorobutadiene	Trichloroethylene
1,1,1-trichloroethane	Hexachlorocyclopentadiene	Vinyl chloride (chloroethylene)
Hexachloroethane	Isophorone	Aldrin
1,1-dichloroethane	Naphthalene	Dieldrin
1,1,2-trichloroethane	Nitrobenzene	Chlordane (technical mixture and metabolites)
1,1,2,2-tetrachloroethane	2-nitrophenol	4,4-DDT
Chloroethane	4-nitrophenol	4,4-DDE (p,p-DDX)
Bis (2-chloroethyl) ether	2,4-dinitrophenol	4,4-DDD (p,p-TDE)
2-chloroethyl vinyl ether (mixed)	4,6-dinitro-o-cresol	Alpha-endosulfan
2-chloronaphthalene	N-nitrosodimethylamine	Beta-endosulfan
2,4,6-trichlorophenol	N-nitrosodiphenylamine	Endosulfan sulfate
Parachlorometa cresol	N-nitrosodi-n-propylamine	Endrin
Chloroform (trichloromethane)	Pentachlorophenol	Endrin aldehyde
2-chlorophenol	Phenol	Heptachlor
1,2-dichlorobenzene	Bis (2-ethylhexyl) phthalate	Heptachlor epoxide
1,3-dichlorobenzene	Butyl benzyl phthalate	(BHC-hexachlorocyclohexane
1,4-dichlorobenzene	Di-n-butyl phthalate	Alpha-BHC
3,3-dichlorobenzidine	Di-n-octyl phthalate	Beta-BHC
1,1-dichloroethylene	Diethyl phthalate	Gamma-BHC
1,2-trans-dichloroethylene	Dimethyl phthalate	Delta-BHC
2,4-dichlorophenol	1,2-benzanthracene	(PCB-polychlorinated biphenyls)
1,2-dichloropropane	(benzo(a)anthracene)	PCB-1242 (Arochlor 1242)
1,3-dichloropropylene	Benzo(a)pyrene (3,4-benzopyrene)	PCB-1254 (Arochlor 1254)
(1,3-dichloropropene)	3,4-Benzofluoranthene	PCB-1221 (Arochlor 1221)
2,4-dimethylphenol	(benzo(b)fluoranthene	PCB-1232 (Arochlor 1232)
2,4-dinitrotoluene	1,1,1-benzofluoranthene	PCB-1248 (Arochlor 1248)
2,6-dinitrotoluene	(benzo(k)fluoranthene)	PCB-1260 (Arochlor 1260)
1,2-diphenylhydrazine	Chrysene	PCB-1016 (Arochlor 1016)
Ethylbenzene	Acenaphthylene	Toxaphene
Fluoranthene	Anthracene	2,3,7,8-tetrachlorodibenzo-
4-chlorophenyl phenyl ether	1,12-benzoperylene	p-dioxin (TCDD)
	(benzo(ghi)perylene)	

APPENDIX C

Permittee Guidance for Conducting a Toxics Reduction Evaluation (TRE)

I. INTRODUCTION

In order to achieve the goals of aquatic life and human health protection in receiving waters, DEP's BWSFR has developed a strategy and procedure for regulating the discharge of toxic pollutants via NPDES permits. The purpose of this document is to provide guidance to permittees for conducting a TRE at industrial and municipal facilities. It should be noted that the Pennsylvania TRE is different from the EPA TRE in that the Pennsylvania TRE is a process to address compliance with chemical-specific water quality standards, whereas the EPA Toxicity Reduction Evaluation is based on compliance with whole effluent toxicity.¹

DEP may require a permittee to conduct a TRE in accordance with this guidance in order to ensure compliance with WQBEL. Each of the components in this guidance must be addressed to obtain DEP approval. Checklists are provided to assure that all aspects of the TRE are sufficiently addressed in the TRE report.

II. BACKGROUND

In the past, the treatment of industrial and municipal wastewater has primarily focused on the more conventional pollutant parameters, such as biochemical oxygen demand (BOD), oil and grease, total suspended solids (TSS), pH and others. The historical approach to the control of these pollutant parameters has been "end-of-pipe" treatment, followed by discharge to a stream.

This approach does not always address the problem of controlling specific toxic pollutants. Control of toxic pollutants has increased in importance as a result of the 1976 consent decree between the Natural Resources Defense Council and EPA. This, coupled with the 1977 and 1987 Federal Clean Water Act amendments, emphasized a shift toward the control of toxics in order to produce an effluent that is not detrimental to aquatic life or human health.

On March 9, 1984, EPA published a national policy statement entitled *Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants* (49FR9016). In part, that policy states that:

"Where violations of water quality standards are identified or projected, the State will be expected to develop water quality-based effluent limits for inclusion in any issued permit. Where necessary, EPA will develop these limits in consultation with the State. Where there is a significant likelihood of toxic effects to biota in the receiving water, EPA and the States may impose permit limits on effluent toxicity and may require an NPDES permittee to conduct a toxicity reduction evaluation. Where toxic effects are present but there is a significant likelihood that compliance with technology-based requirements will sufficiently mitigate the effects, EPA and the States may require chemical and toxicity

¹ Although the DEP TRE and EPA TRE are different in concept, the overall processes for identifying and controlling sources of toxicity are similar. Therefore, the EPA guidance for conducting a Toxicity Reduction Evaluation could also assist permittees in controlling toxic discharges.

testing after installation of treatment and may reopen the permit to incorporate additional limitations if needed to meet water quality standards.”

DEP’s BWSFR is responsible for the implementation, enforcement and administration of the NPDES permit program. A key component of Pennsylvania’s NPDES program is the TMS. This TMS was developed to encourage a consistent, statewide approach for controlling the discharge of toxic pollutants (EPA priority pollutants and other toxic pollutants) through NPDES permits. The TMS is supported by DEP’s regulations codified under Chapters 16, 92, 93, 95 and 96 of Title 25 of the Pa. Code.

III. TRE PROCESS

A. Overview of the TRE Process

The complexity of the TRE process will vary considerably from case to case. For industrial permittees, this complexity will depend upon the number and types of toxic pollutants regulated, the complexity of the manufacturing process(es) and the extent of existing controls for wastewater contaminants. For municipal permittees, this complexity will depend upon many things, including for example, the number and types of toxic pollutants regulated, the types of treatment plant unit processes used and the number and types of nondomestic establishments that discharge to the municipal wastewater treatment plant. In the simplest case, a TRE may only involve monitoring and analysis to verify the presence or absence of toxics in raw or treated wastewater. If existing levels or toxics do not exceed any WQBEL, then no further evaluation would be necessary. Such analysis is one of the first steps for all TREs.

The process allows verification that any WQBEL contained in the permit actually reflect the site-specific discharge conditions, development or alternative effluent limitations or determination of alternate method detection limits.

The responsibility for providing the technical basis for modifying any WQBEL is that of the permittee.

If site-specific studies are performed, results may be used by DEP to modify any WQBEL through a modification of the NPDES permit. If such modifications are made, the permittee must meet the modified limitations by the original compliance date established in the permit. It should also be noted that if a permittee performs a study, the data submitted to DEP may result in the development of a more stringent effluent limitation. Compliance with the more stringent limitation will also be required by the original compliance date in the NPDES permit.

B. The TRE Process for Industrial Dischargers

The TRE development process should occur in two distinct phases, which are discussed in more detail below and summarized in FIGURE C-1.

FIGURE C-1

TRE Process for Industrial Dischargers

PHASE I - SOURCE REDUCTION EVALUATION

1. Influent and Effluent Quality Review
2. Source Inventory Evaluation
 - a. Wastewater Flow Diagram
 - b. Verification of Toxics Present
 - c. Inventory of Materials and Chemical Additives Used in Facility
 - d. Examination of Relevant Literature on the Industry
 - e. Comparison of Toxics Found in the Wastewater With Materials Inventory
3. Source Reduction Evaluation
 - a. Pollution Prevention
 - (1) Source Reduction
 - (2) Recycling and Reuse
 - b. Alternative Waste Management Practice
4. Data Collection/Effluent Limits Verification - Optional
 - a. Site-Specific Data Collection and Submission
 - b. Request for Site-Specific Criteria Modification
 - c. Request For Alternate Site-Specific Method Detection Limits (MDL)
5. Phase I Report

PHASE II - WQBEL COMPLIANCE STRATEGIES AND IMPLEMENTATION SCHEDULE

1. End-of-Pipe Treatment
2. In-Plant Controls and End-of-Pipe Treatment
3. TRE Report

PHASE I - SOURCE REDUCTION EVALUATION

1. Step 1 - Influent and Effluent Quality Review

The permittee must determine whether the pollutants that are regulated in their NPDES permit are present in quantities and/or concentrations that will exceed the effluent limitations established by DEP. To accomplish this, the permittee should sample and analyze each discharge outfall and treatment plant influent for all regulated pollutants. In carrying out such analyses, the permittee must use analytical procedures of sufficient sensitivity and accuracy in order to enable comparison between the concentrations of toxic pollutants in their effluent(s) with the effluent limitations in their NPDES permit.

If the results of this monitoring indicate that existing controls are not adequate to comply with all effluent limitations contained in the NPDES permit, then the permittee must initiate Step 2 of the TRE process. If the results of the monitoring indicate that existing controls are adequate to comply with all effluent limitations contained in the NPDES permit, no further evaluations are needed. However, the permittee is still required to develop and submit a TRE report to present the monitoring data and analysis.

2. Step 2 - Source Inventory Evaluation

If the results of the influent and effluent quality review indicate the presence of regulated pollutants at concentrations or in quantities that exceed effluent limitations, then a source inventory evaluation is needed to determine the source(s) of the toxic pollutants in the wastewater. Such an evaluation should incorporate the following:

a. Construction of a Water and Wastewater Flow Diagram

Based on an in-plant survey, carefully construct a flow diagram that identifies all probable sources and quantities of water and wastewater. The construction of a diagram should include a “water-wastewater balance” so that all sources and discharges are accounted for. An example of such a flow diagram is shown in FIGURE C-2. The wastewater flow diagram should also indicate all in-plant sampling locations and the locations used to perform Step 1 - Influent and Effluent Quality Review.

b. Verification of Pollutants Present

Based on the water-wastewater flow diagram, sample or resample various wastewater sources, intermediate wastewater streams, water supply sources (including wells, public water supply connection points and surface water intakes) and outfalls to verify the presence or absence of toxic pollutants of concern. When selecting sampling locations, care must be taken to avoid the impact associated with dilution of concentrated wastestreams with cooling water and other less-contaminated wastewater sources. In-plant sample points should be located where the samples taken

will be most representative of individual plant processes. Document the rationale for selecting sampling locations and sampling methods and include this rationale in the TRE report.

In carrying out such verification analyses the permittee is expected to use analytical procedures of sufficient sensitivity and accuracy in order to be able to compare the concentrations in wastestreams with the effluent requirements contained in the NPDES permit.

The outcome of the pollutants verification step will determine the extent and necessity of carrying out Steps c. and d. as outlined below.

Alternatively, this step may have to be postponed until Steps c. and d. below have been taken so that proper sample locations can be selected.

c. Inventory of Materials and Chemical Additives Used in the Facility

To assist in identifying the potential sources of toxic pollutants, the permittee should inventory all materials, including chemical additives and catalysts, water treatment chemicals, chemical impurities and cleaning agents used at the industrial facility.

Where appropriate, the permittee should also evaluate any raw materials, additives, etc., that may consist of several chemical components, which may contain toxic pollutants (e.g., a product called “Plate-Ease” may contain several chelating agents or organic polymers, which would not necessarily be indicated separately on the material inventory).

The inventory should also include those pollutants generated as side reactants, which may be formed as part of the manufacturing process or extracted as part of any purification or curing steps. FIGURE C-3 illustrates a simplified version of such an inventory.

FIGURE C-2

Water and Wastewater Flow Diagram

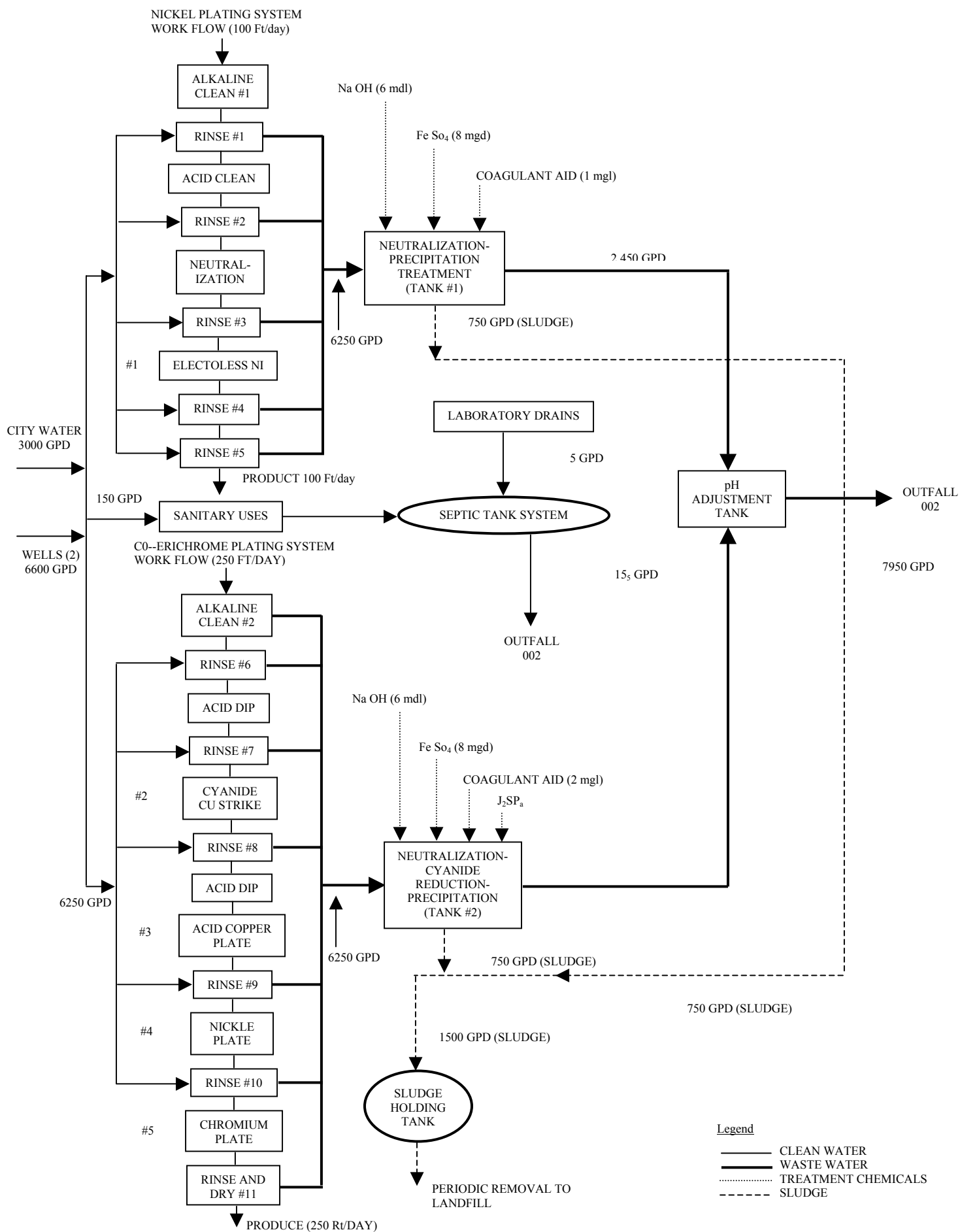


FIGURE C-3**Example of a Raw Material Inventory**

Raw Material	Frequency and Amount Used	Use
Nickel Sulfate	75 GPD	Nickel Source in Plating Tank 1 & 4
Boric Acid	50 GPD	Cleaning Solution in Acid Cleantank (NI Line)
Sodium Hypophosphate	10 GPD	Nickel Reducing Agent in Plating Tank 1
Citric Acid	25 GPD	NI Chelating Agent in Plating Tank 1
Formaldehyde	40 GPD	Cu Reducing Agent in Plating Tank 2
Benzene	5 GPD	Cleaning Agent/Lab Solvent
Carbon Tetrachloride	5 GPD	Cleaning Solution (55 Gal Drums in Work Area)
Chloroform	Lab Quantities*	Lab Solvent/Rinse Baths #2 & 8
Ethyl Benzene	Lab Quantities*	Lab Solvent
Acetaldehyde	20 GPD	Cu Reducing Agent in Plating Tank 3
Sodium Cyanide	80 GPD	Cyanide "Strike" Source in Plating Tank 2
Chromic Acid	100 GPD	Chrome Source in Plating Tank 5
Copper Sulfate	100 GPD	Copper Source in Plating Tank 3
Potassium Cyanide	40 GPD	Degreaser in Rinse Tank 4, 5, 10 & 11
Acetone	Lab Quantities*	Lab Solvent
Acetic Acid	20 GPD	Acid Cleaning Tank (Ni Line) and Dip Tank (Cu, Cr Line)
Sulfuric Acid	30 GPD	pH Adjustment in Neutralization Tank and Cyanide Destruction - TRMT Tank 2
Sodium Hydroxide	20 GPD	Alkaline Clean Tank 1 & 2 and Treatment Tanks 1 & 2 (pH Adjustment)
Nitro Benzene	Lab Quantities*	Lab Reagent
Iron Sulfate	70 lbs/day	Coagulant and Intreatment Tanks 1 & 2
Coagulant Aid	150 lbs/day**	Aid in Coagulation and Precipitation in Treatment Tanks 1 & 2
Fluorene	5 GPD	Cleaning Agent Prior to Plating Tanks

* used every morning when testing is performed

** Contains: Activated Silica
 Potassium Permanganate (Oxidant)
 Diethyl Phthalate

d. Examination of Relevant Literature on the Industry

In addition to the inventory discussed in Step c. above, the examination of relevant literature should be conducted to assist in determining sources and quantities or toxics that may be otherwise overlooked during the initial in-plant survey. A comprehensive evaluation of industrial processes, associated wastewaters and available treatment technologies has been performed by EPA for many industrial categories. Specifically, these evaluations were performed to support development of effluent limitations guidelines and standards for wastewaters generated by over

25 industrial categories. The data and information collected by EPA for effluent guidelines development are contained in industry-specific development documents, which are published in conjunction with the effluent guidelines.

Industry trade journals and newsletters are likewise a valuable source of information. Technical journals and conference proceedings published by various professional societies, trade associations and research-oriented organizations should also be reviewed for relevant information. EPA's Pollution Prevention Office (PPO) can also provide information on industry-specific pollutants.

e. Comparison of Toxics Found in the Wastewater with Materials Inventory Compounds

By comparing the material inventory compounds and their uses with the pollutants found in the various sampling locations and effluent, the permittee should be able to identify the problem pollutants and select the most probable source(s). Additional sampling needs may also be identified. (See FIGURE C-4 for an example comparison.)

At the completion of Step 2, the source(s) of toxic pollutants may not be identified. If pollutant sources are not identified after the materials inventory and literature review are performed, additional evaluations must be performed. Evaluation of manufacturing process(es) and treatment process(es) chemical reactions may be required. In cases where these "unaccounted for" pollutants are inorganic (i.e., copper, zinc, etc.), the discharger should also examine sources such as equipment corrosion or raw material impurities.

The permittee may also find that some pollutants are present in the discharge, yet they are not used in any manufacturing or treatment process(es). Such pollutants may represent chemicals that are formed as reaction products or byproducts. For example, when chlorine plus a bromide or iodide ion reacts with organic material commonly present in water, trihalomethanes (THMs) may be formed.

FIGURE C-4

Example of a Comparison of Effluent with Raw Material Inventory

Outfall#	Pollutant in Effluent	Reported Levels mg/L	Possible Source(s)				Location
			Raw Material	Intermediary Product	Reaction Product	Other (Specify)	
001	1,1,1 Trichloroethane	0.010			Rinse Bath		Added to rinse bath #1, 3, 6 & 7
	Chloroform	0.010		Rinse Bath			Formed in rinse baths 1 & 6
	Mathylene	1.18				Lab Contam.	Contaminant from lab plastics in sample containers
	Naphthalene	0.014			Rinse Bath		Formed in rinse baths by reactions of benzene, etc.
	bls-2-(Ethyl Hexyl) Phtahlate	0.220					Contaminant from lab plastics in sample containers
	Diethyl Phthalate	0.480	Constituent of Coag. Ald				Major constituent of coag. and intreatment tanks 1 & 2
	Acenaphthene	3.88			Rinse Bath		Formed in rinse baths by reactions of benzenes, etc.
	Benzene	0.110	Cleaner				Used in cleaning parts prior to plating
	Fluorene	0.140	Cleaner				Used in cleaning parts prior to plating
	Trichloroethylene	23.20	Degreaser				Used to clean rinse parts in baths 4, 5, 10 & 11
	Chromium	2.20			Cr Source		Result of chromic acid in plating bath
	Nickel	24.00			NI Source		Result of nickel sulfite in plating bath
	Copper	15.80			Cu Source		Result of copper sulfate in plating bath
	Cyanide	0.214		"Strike" Plate Sol.	"Strike" Plate Sol.		Result of potassium cyanide and sodium cyanide in "strike" tank
002	Chloroform	2.11	Lab Reagent				From laboratory drains
	Ethyl Benzene	0.010	Lab Solvent				From laboratory drains
	Nitrobenzene						From laboratory drains
	Acetone	0.45	Lab Solvent				From laboratory drains
	Carbon Tetrachloride	2.61	Cleaning Solution				Stored in 55-gal. barrels near plating area - drains
	Bromform	0.009		Reaction In Septic System			From reaction of acetone

3. Step 3 - Source Reduction Evaluation

Upon completion of the source inventory evaluation, in which the in-plant source(s) of toxic pollutants are determined, the permittee must conduct a source reduction evaluation. During this step, the permittee will identify and assess available pollutant control options based on the ability to bring the facility into compliance with its specific effluent limitations as set forth in the NPDES permit.

Pollutant control options can include one of three general types:

- In-plant controls.
- End-of-pipe treatment.
- A combination of in-plant controls and end-of-pipe treatment.

Specific in-plant control options are described below. Specific end-of-pipe treatment options are discussed under Phase II.

In-Plant Controls

For the purpose of this guidance document, in-plant controls refer to any controls that are not considered end-of-pipe treatment, including pollution prevention and alternate waste management practices.

a. Pollution Prevention

One of the best means of reducing wastes is through better management and operating or housekeeping practices (i.e., ways to make existing processes work more efficiently and thereby generate less waste). Better operating practices can involve anything from finding a more efficient way to handle a particular pollutant to making fundamental changes in the way management and personnel think about waste management.

Better management practices include implementation of employee training and employee input to pollution prevention options, improved procedural measures and production scheduling.

Better operating practices include improved inventory management of all trace and raw materials, wastestream segregation, purchase of fewer toxic and more nontoxic production materials and improved material receiving, storage and handling practices.

Generally, good housekeeping measures such as repairing leaky valves, replumbing drain pipes, cleaning up chemical or raw material spills or eliminating potential spill hazards, can reduce the amount of toxic pollutants entering floor drains or other uncontaminated areas. A more detailed discussion of these types of control measures can be found in DEP's *Guidelines for the Development and Implementation of*

EPA developed guidance on minimization of wastes generated at industrial facilities. According to EPA's *Waste Minimization Opportunity Assessment Manual* (EPA/625/7-88/003; July 1988), waste minimization consists of source reduction and recycling. The concept of pollution prevention or waste minimization is presented in FIGURE C-5. A waste management tool developed at EPA is included in FIGURE C-6 - Individual Wastestream Characterization Checklist.

(1) Source Reduction

Source reduction options include modification of equipment and production process changes. Examples of these source reduction options include the following:

Modification of Equipment

- Install equipment that produces minimal or no waste
- Modify equipment to enhance recovery or recycling options
- Redesign equipment or production lines to produce less waste
- Improve operating efficiency of equipment
- Maintain strict preventive maintenance program

Production Process Changes

- Substitute nontoxic for toxic raw materials
- Segregate wastes by type for recovery
- Eliminate sources of leaks and spills
- Redesign or reformulate end products to be less toxic
- Optimize reactions and raw material use

It is recommended that permittees refer to EPA's *Facility Pollution Prevention Guide* for further guidance regarding waste minimization.

(2) Recycling and Reuse

Recycling and reuse options (on-site and off-site) include: 1) use and reuse such as return material to original process (closed-loop system) and raw material substitution for another process; and 2) resource recovery practices for process solutions and wastestreams.

EPA has adopted a pollution prevention policy to encourage facilities to practice source reduction and recycling via input substitution, product reformulation, process modification, improved housekeeping and recycling. This policy prefers source

reduction and recycling over end-of-pipe treatment and waste disposal or discharge. EPA's PPO program is responsible for pollution prevention and technology transfer information dissemination.

b. Alternate Waste Management Practices

There are several other in-plant practices that can be used to reduce the quantity of toxic pollutants and improve the quality of wastewaters discharged from a facility. One of the most effective methods for reducing pollutants in wastewaters is to segregate and separate highly contaminated wastewaters from other wastewaters. Once separated, these highly contaminated wastewaters can be treated using in-plant treatment technologies. The primary reasons for installing in-plant treatment for segregated wastewaters are to reduce loadings of pollutants that may inhibit end-of-pipe treatment, to remove certain pollutants which are not sufficiently removed by end-of-pipe treatment and to recover products or process materials. As a result of separating wastewaters, the permittee can also effectively reduce the amount requiring treatment to achieve effluent limitations. In addition, using in-plant treatment technologies on segregated wastewaters is usually more cost-effective, since treatment of low volume, concentrated and homogenous wastewaters generated by specific manufacturing processes is more efficient. Physical/chemical in-plant treatment technologies are used selectively in certain industries such as organic chemicals manufacturing, according to EPA's *Development Document for Effluent Limitations Guidelines, New Source Performance Standards and Pretreatment Standards for the Organic Chemicals and the Plastics and Synthetic Fibers Point Source Category*. The in-plant controls frequently used by organic chemical manufacturers for the treatment of segregated wastewaters include steam stripping, distillation, filtration, chemical precipitation, solvent extraction and carbon adsorption.

4. Step 4 - Data Collection/Effluent Limits Verification - Optional

a. Site-Specific Data Collection and Submission

DEP uses the best available information in calculating the WQBEL in the NPDES permit. Where sufficient information is lacking, assumptions and/or default data values are used. The permittee has the option of providing all or some of the following site-specific data as part of Phase I for use in verifying and refining the WQBEL:

- Discharges, pollutant concentrations and variability
- Design discharge flow
- Discharge mixing characteristics
- Pollutant fate characteristics
- Stream width, depth and slope
- Stream velocity
- Ambient stream data for pollutants, pH, temperature

- Ambient stream and discharge hardness
- Water intake quality and quantity
- Treatment plant influent pollutant concentrations
- Chemical translators
- WER

The permittee should contact DEP for guidance in determining which of the above data will have a significant impact on the WQBEL and also for protocols on collecting and submitting the data. DEP will determine the adequacy of any site-specific data submitted and advise the permittee accordingly. If initial review of the submitted data suggests that additional data collection is necessary, DEP will so advise the permittee. DEP will notify the permittee regarding what effect, if any, the data will have on the WQBEL.

b. Request for Site-Specific Criteria Modification

The permittee may request an opportunity to demonstrate alternative, site-specific criteria for some pollutants. The procedures for carrying out such demonstrations must receive written approval in advance by DEP and must be in accordance with the requirements of 25 Pa. Code § 93.8. If the permittee chooses this option, requests for alternative, site-specific criteria must be submitted to DEP as part of the Phase I TRE report. Where the demonstration results in more stringent limitations than those previously established by DEP, the more stringent limitations will apply. Any less stringent limitations which are approved by DEP shall not violate applicable water quality criteria for the protection of human health.

c. Request For Alternate Site-Specific Method Detection Limits (MDL)

In some cases, the WQBEL may be less than the MDL in Chapter 16. In this event, the permittee has the option to demonstrate alternative, facility-specific MDL to account for analytical matrix interference associated with the wastewater in question. The procedure for determining an alternate MDL is published in Appendix B in 40 CFR Part 136.

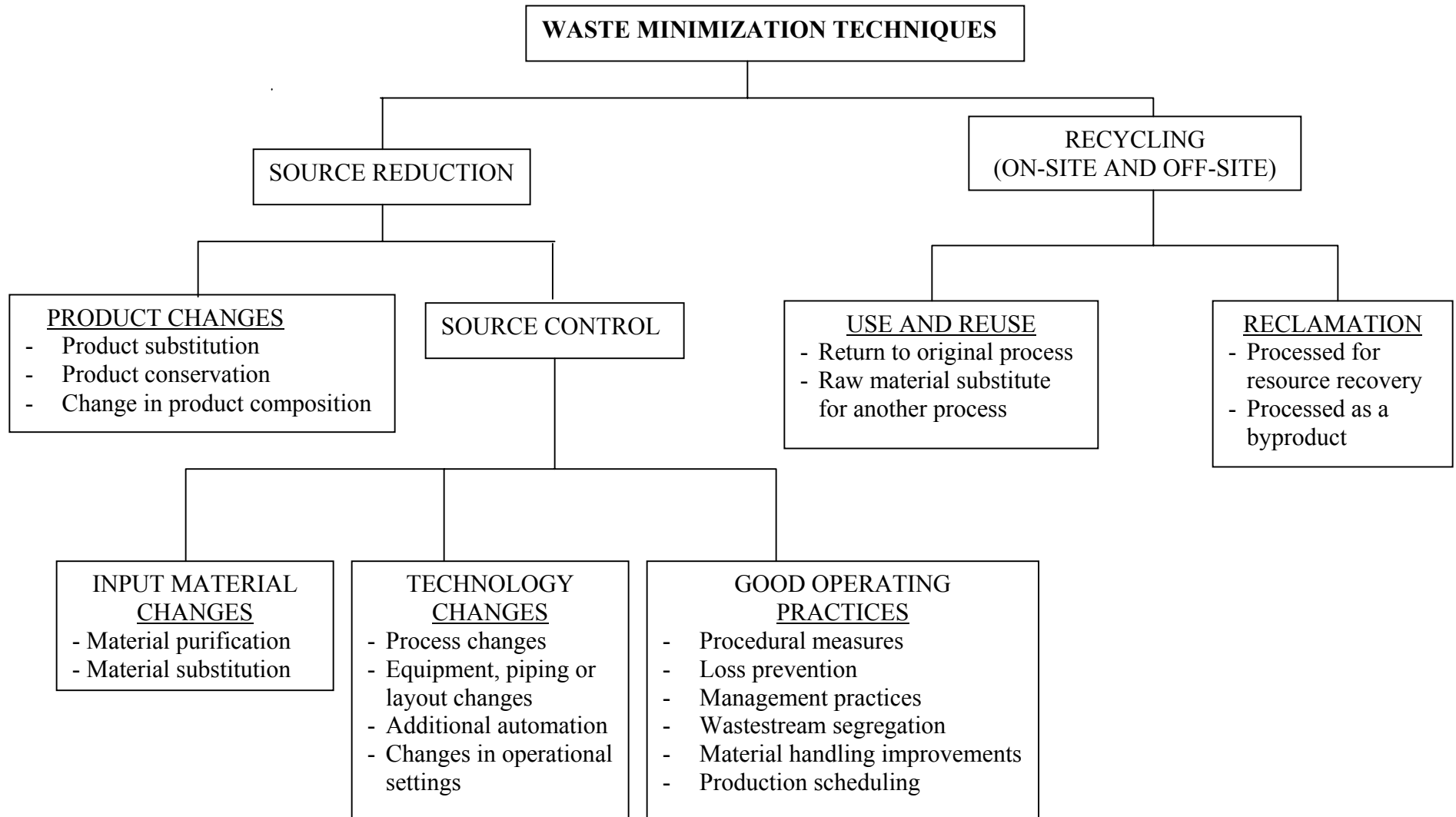
The request for approval of alternative facility-specific MDL, including all documentation required to support such a request, must be submitted to DEP with the Phase I TRE report. DEP may grant a facility-specific MDL, and include the numeric alternate MDL value for compliance purposes, through the permit modification or renewal process.

5. Step 5 - Phase I Report

At the completion of all the required and/or optional steps in Phase I - Source Reduction Evaluation, a report must be prepared to summarize the findings of Phase I. Three copies of the report using the format shown in FIGURE C-8 including supporting documentation must be submitted to DEP's regional office for review prior to starting Phase II.

FIGURE C-5

Waste Minimization Techniques



Source: EPA's *Waste Minimization Opportunity Assessment Manual* (EPA/625/7-88/003); July, 1988

FIGURE C-6

Individual Wastestream Characterization Checklist

1. Wastestream Name/ID: _____ Stream Number: _____
Process Unit/Operation: _____
2. Waste Characteristics (attach additional sheets with composition data, as necessary).

☐ gas ☐ liquid ☐ solid ☐ mixed phase

Density, lb/cu ft _____ High Heating Value, Btu/lb _____
Viscosity/Consistency _____
pH _____ Flash Point _____ %Water _____
3. Waste Leaves Process as:

☐ air emission ☐ wastewater ☐ solid waste ☐ hazardous waste
4. Occurrence

☐ continuous

☐ discrete

discharge triggered by ☐ chemical analysis _____
 ☐ other (describe) _____

Type: ☐ periodic _____ length of period _____

☐ sporadic (irregular occurrence)

☐ nonrecurrent
5. Generation Rate

Annual _____ lbs per year _____
Maximum _____ lbs per _____
Average _____ lbs per _____
Frequency _____ batches per _____
Batch Size _____ average _____ range _____

PHASE II - WQBEL COMPLIANCE STRATEGIES AND IMPLEMENTATION SCHEDULE

The permittee should not proceed with Phase II until notified by DEP to do so. Depending on the results of Phase I, the WQBEL may need to be modified or Phase II may not be necessary.

During this Phase, the permittee must evaluate treatment technologies and control measures to comply with the WQBEL. This includes consideration of both structural and nonstructural alternatives. An implementation schedule is required as part of the Phase II report. The Phase II must be completed and submitted within 6 months of the Phase I approval by DEP or as otherwise approved in the NPDES permit.

1. End-of-Pipe Treatment

In cases where in-plant controls are not feasible or desired, pollutant reduction may be achieved through use of end-of-pipe treatment technologies. For some facilities, only improved operation and maintenance of the existing wastewater treatment facilities may be needed. The permittee may need to add to, modify existing wastewater treatment facilities or install new end-of-pipe treatment facilities.

The determination of the appropriate end-of-pipe technology to be used at a facility will depend upon the number and types of toxic pollutants in the raw wastewater, the kind of or space available for the treatment equipment, etc. There are numerous sources of information available to assist you in identifying and evaluating applicable end-of-pipe treatment technologies. These sources include technical literature and equipment catalogs. EPA's development documents used to support effluent guidelines development deal with the applicability and performance of end-of-pipe treatment technologies.

2. In-Plant Controls and End-of-Pipe Treatment

There may be instances where the permittee must rely on a combination of controls to ensure compliance with toxic pollutant effluent limitations. For example, implementation of resource recovery practices of process raw material may not result in the capture of all raw material. Therefore, the permittee may also need to install end-of-pipe treatment to reduce toxic pollutant loadings due to the residual raw material contained in the wastewater.

A summary sheet, such as the one shown in FIGURE C-7, should be prepared to facilitate developing a pollutant control strategy.

3. 25 Pa. Code § 95.4 Time Extension Requests

In some cases, the final WQBEL may not be technologically achievable using any combination of control options. In this event, the permittee has the option of requesting an extension under the requirements contained in §95.4. If the permittee elects to submit the §95.4 time extension request, the request must be submitted with Phase II of the TRE report. APPENDIX D of the TMS provides guidance for this request.

FIGURE C-7**Example of Pollutant Control Strategy Summary Sheet**

POLLUTANT	PROCESS/SOURCE	NATURE OF POLLUTION	CONTROL STRATEGY
<u>OUTFALL 001</u> 1,1,1 Trichloroethane	Rinse baths 1, 3, 6 & 7	Formed as a result of reactions in rinse baths	Remove residual cleaning solutions prior to plating operations
Chloroform	Rinse baths 1 & 6	Intermediary formed in initial rinse baths from acetone cleaners	
Methylene Chloride	Found in all samples	Probably due to lab sampling processes	Practice better QA/QC procedures
Naphthalene	Rinse baths 4 and 5, 9, 10 & 11	Formed from reactions of hydrocarbons in alkaline and acidic environments	Wash parts prior to placing them in alkaline or acidic cleaning baths
B is-2 (Ethyl Hexyl) Phthalate	Found in all samples	Probably due to lab sampling procedures	Practice better QA/QC procedures
Diethyl Phthalate	Constituent of coagulant aid used in treatment tanks 1 & 2	Remnant of coagulant aid polymers	Reduce amounts of benzene or replace with other cleaners
Acenaphthene	Rinse baths 4, 5, 9, 10 & 11	Formed from reactions of benzene with hot rinse baths	Reduce amounts of benzene or replace with other cleaners
Benzene	Used as a cleaner prior to plating parts	Residues are carried into rinse/cleaning baths	Remove residues prior to entering plating line or replace with other cleaners
Fluorene	Used as a cleaner prior to plating parts	Residues are carried into rinse/cleaning baths	
Trichloroethylene	Rinse baths 4, 5, 10 & 11	Used as a degreaser prior to plating	Reduce volume used or clean prior to rinse baths
Chromium	Chromium plate tank	From chromic acid bath	Consider installation of metal recovery system
Nickel	Nickel plate tank	From nickel sulfate bath	
Copper	Copper plate tank	From copper sulfate bath	
Cyanide	Cyanide "strike" tank	Intermediary and reaction prd. from potassium and sodium cyanide	Reduce cyanide prior to final treatment system
<u>OUTFALL 002</u> Carbon Tetrachloride	Used as a cleaner	Spills in work area - enter floor drains	Repair valve on container, clean up spills promptly
Bromoform		Probably forms from reaction of acetone and other hydrocarbons in drain system	Practice good housekeeping procedures such as disposing of used reagents in proper receptacles, clean spills promptly, etc.
Chloroform Ethyl Benzene Nitrobenzene Acetone	Used as lab reagents and glassware cleaners	Enter drain system from spillways or routine lab practices	Practice good housekeeping procedures such as disposing of used reagents in proper receptacles, clean spills promptly, etc.

4. TRE Report

If Phase II is required to comply with the WQBEL, an expanded report building on the already approved Phase I report must be prepared using the format shown in FIGURE C-8.

The TRE report should carefully describe the options considered for the control of the toxic pollutants of concern. The discussion should include all backup information on the necessity, feasibility and effectiveness of implementing particular options and the advantages and disadvantages associated with each. The discussion should also address the expected levels of control a particular option may provide. These expected levels may be justified by using technical reports, bench scale or pilot plant data (in instances where equipment must be upgraded or installed). The Summary Sheet, prepared as part of Phase II and shown in FIGURE C-7 can serve as a basis for this discussion.

List the choice(s) of control options. This discussion should include the reasons for choosing the option. Summarize the effluent quality considered achievable through implementation of the control measures selected.

The TRE report must include a schedule for implementing the selected structural or nonstructural wastewater management or treatment/control measures. The schedule must include improvements/construction milestones which will serve as a basis for any implementation schedule to be placed in the permit. The submitted schedule will provide for the completion of any structural and/or nonstructural wastewater management and treatment practices which will achieve compliance with the WQBEL.

Written progress reports, at least yearly, must be submitted to DEP detailing the actions taken toward the requirements set forth in the NPDES permit. These progress reports will be required until compliance with the effluent limits is achieved.

In some cases, the WQBEL may not be technologically achievable using any combination of known treatment technology, BMPs or pollution prevention measures. In this event, the permittee has the option of requesting an extension of time to achieve the WQBEL, provided the permittee demonstrates eligibility for time extension under the requirements contained in Section 95.4 of DEP's Rules and Regulations. Refer to APPENDIX D of the TMS.

If the permittee elects to submit the Section 95.4 time extension request, the request must be submitted with the Phase II of the TRE report.

FIGURE C-8

Outline for TRE Report - Industrial Dischargers

NPDES Permit No. PA:

Date:

Permittee Name:

Name of Discharging Facility:

Industry Description/NAICS Code:

PHASE 1 - SOURCE REDUCTION EVALUATION

1. Review of Influent and Effluent Quality
 - a. Presentation of Phase I Monitoring and Analysis Data
2. Source Inventory Evaluation
 - a. Wastewater Flow Diagram
 - b. Verification of Toxics Present
 - c. Material Inventory
 - d. Examination of Relevant Literature
 - e. Comparison of Effluent with Raw Material Inventory
 - f. Other
3. Source Reduction Evaluation
 - a. Pollution Prevention
 - (1) Source Reduction
 - (2) Recycling and Reuse
 - (3) Good Housekeeping Practices/BMP
 - b. Alternate Waste Management Practices
4. Data Collection/Effluent Limits Verification - Optional
 - a. Site-Specific Data Collection and Submission
 - b. Request for Site-Specific Criteria Modification
 - c. Alternate Method Detection Limit Determination

PHASE II - WQBEL COMPLIANCE STRATEGIES AND IMPLEMENTATION SCHEDULE

1. End-of-Pipe Treatment
2. In-Plant Controls
3. Choice of Options and Projected Schedule for Achieving the Necessary Control

Summary of Effluent Quality Achievable

Bibliography of References Used to Investigate Possible In-Plant Process Modifications

Attachments

C. The TRE Process For Municipal Dischargers

In contrast to an industrial discharger, a municipal discharger faces a more complex task of controlling toxic pollutants. An industrial facility generally has direct control over the quantity and type of toxics which enter its wastewater. A municipal discharger must rely on less direct mechanisms to evaluate and control pollutants. The complexity of the TRE process for a municipal discharger will depend upon the number and types of industrial and commercial establishments which discharge wastewater along with the other sources of toxics into the municipal sewage collection/conveyance system. Also, the treatment facility involved may receive wastewater from several municipalities, each of which may have several potential contributors of toxics. The TRE process for a municipal discharger should take place in two distinct phases which are discussed below and summarized in FIGURE C-9. Prior to carrying out a TRE, the permittee is advised to review the following reference documents which provide valuable information and insight into the roles and responsibilities of municipalities in controlling discharges of toxics into and from their wastewater treatment facilities:

- *Guidance Manual for POTW Pretreatment Program Development* (October, 1983), U.S. Environmental Protection Agency, (EPA)
- *Fate of Priority Pollutants in Publicly Owned Treatment Works, Vol. I and II* (September, 1982), EPA 440/1-82-303
- *Sources of Toxic Compounds in Household Wastewater* (August, 1980), EPA, 600/2-80-128
- *RCRA Information on Hazardous Wastes for Publicly-Owned Treatment Works* (September, 1985), EPA
- *Toxicity Reduction Evaluations in Municipal Wastewater Treatment* (September, 1985), EPA, ORD Cincinnati, NTIS PB 86-101102
- *Guidance Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program* (December, 1987), EPA, Office of Water Enforcement and Permits
- *Toxicity Reduction Evaluation Protocol for Municipal Wastewater Treatment Plants* (April, 1989), EPA, 600/2-88/062

FIGURE C-9

Toxics Reduction Evaluation (TRE) Process for Municipal Dischargers

PHASE I - SOURCE REDUCTION EVALUATION

1. Influent and Effluent Quality Review
2. Source Inventory Evaluation
 - a. Identification of Industrial and Commercial Contributors of Toxics
 - b. Identification of Other Potential Sources of Toxics
 - c. System Sampling Survey
3. Source Reduction Evaluation
 - a. Industrial Waste Pretreatment
 - b. Sewer Use Codes and Local Ordinances
 - c. Other Controls
 - (1) Waste Haulers
 - (2) Water Supply
4. Data Collection/Effluent Limits Verification - Optional
 - a. Site-Specific Data Collection and Submission
 - b. Request for Site-Specific Criteria Modification
 - c. Alternate Method Detection Limit Determination
5. Phase I Report

PHASE II - WQBEL COMPLIANCE STRATEGIES AND IMPLEMENTATION SCHEDULE

1. Treatment Plant Effectiveness for Toxics Removal
2. Treatment Plant Modification for Control of Toxics
3. TRE Report

PHASE I - SOURCE REDUCTION EVALUATION

1. Step 1 - Influent and Effluent Quality Review

This phase of the TRE is intended to verify the presence or absence of the toxic pollutants of concern in a municipal discharge. Prior to conducting an in-depth inventory of possible contributors of toxic pollutants within the municipal sewage collection/conveyance system, the permittee should carry out a sampling program to accurately determine the levels of toxic pollutants entering and leaving the sewage treatment facilities.

This influent/effluent sampling effort must be carefully designed to take into account the most likely time periods (during the day, week, month) during which the pollutants of interest may be present. The type and frequency of samples taken should also be designed to provide both representative 24-hour average and longer term average (weekly, monthly) levels of toxics present. The overall sampling effort should also take place during periods when infiltration/inflow within the sewerage system are at a minimum.

Because of the high potential for dilution of toxic pollutants in sewerage systems, care must be taken to use analytical methods of appropriate sensitivity and accuracy. In carrying out such analyses, the permittee is expected to use analytical procedures of sufficient sensitivity and accuracy in order to be able to compare the concentrations of toxic pollutants in the effluent with the effluent requirements contained in the NPDES permit. At a minimum, monitoring must be conducted according to the test procedures approved by EPA under 40 CFR Part 136, unless other test procedures have been specified in the permit.

During the influent/effluent quality review process, the permittee should be able to make some general observations concerning the physical/chemical/biological fate of some, or all, of the toxic pollutants entering the treatment facility. This will help determine the effectiveness of the treatment facility in removing these pollutants. The “lag period” which would be expected to occur between the time the pollutants enter the treatment facility and the time they would normally be expected to appear in the effluent must be characterized and considered during such determinations (so that the effluent sampling may be conducted at the appropriate time for comparison with influent sampling results).

The observations and determinations of the influent and effluent quality review should be reflected in the analysis of Treatment Plant Effectiveness, which is discussed below under Step 3 - Source Reduction Evaluation.

2. Step 2 - Source Inventory Evaluation

In conjunction with carrying out the Influent/Effluent Quality Review, the permittee should begin designing a comprehensive survey of potential sources of toxics which may be entering the tributary municipal wastewater collection/conveyance system.

a. Identification of Industrial and Commercial Contributors of Toxics

The most likely industrial sources of “toxic” pollutants are the so-called “primary industries” which use and/or produce these pollutants as a part of their manufacturing or commercial activities. Sources of information concerning the nature and extent of toxic pollutants associated with “primary industry” dischargers are discussed above in Section B - The TRE Process for Industrial Dischargers. The permittee should use existing municipal data systems, such as sewer and water supply customer billing records, Chamber of Commerce listings, property tax records, etc., to establish the location of industrial/commercial facilities which potentially discharge toxic pollutants to the sewerage system.

If the permittee is required to develop local pretreatment programs pursuant to the General Pretreatment Regulations (40 CFR Part 403), an industrial waste survey (IWS) should have been performed to identify all nondomestic discharges to the municipal sewer system. If the IWS is outdated, the permittee may wish to consider updating the IWS, particularly for nonregulated industrial and commercial users of the municipal sewer system. The permittee should also investigate the availability of “right to know” information concerning toxic and hazardous material in use by local industry.

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 requires EPA to compile and make publicly available information on annual toxic chemical releases to the environment from manufacturing facilities. These releases include discharges of toxic chemicals to municipal sewer systems. EPA gathers this information annually through the Toxics Release Inventory (TRI) survey. The permittee is encouraged to obtain results of the TRI survey for evaluation of sources of toxic discharges.

b. Identification of Other Potential Sources of Toxics

In addition to industrial/commercial activities, there may be several other potential contributors of toxic pollutants to a municipal sewerage system. These include, but may not be limited to the following:

- (1) Waste haulers who discharge into the sewer system (legally and illegally) at various locations.
- (2) Septage haulers, who use the sewage treatment facilities for a disposal point (where the septage may contain certain toxic pollutants).
- (3) Waste processing facilities.
- (4) Waste disposal facilities (landfills).

- (5) Medical laboratories.
- (6) Domestic chemical users.
- (7) Dry cleaners, garages, furniture stripping shops (solvent users).
- (8) Public water systems (for corrosion products such as lead, copper, cadmium and zinc).
- (9) Operation and maintenance practices of the municipal wastewater treatment plant, including:
 - (a) Cleaning and degreasing compounds.
 - (b) Odor control chemicals.
 - (c) Foam control chemicals.
 - (d) Disinfection practices (THM formation).
 - (e) Digester supernatant management (dissolved metals).
- (10) Stormwater (combined sewer systems only).
- (11) Infiltration/inflow of contaminated groundwater.

c. System Sampling Survey

Once potential sources of toxics contributors have been determined, the permittee should carry out a comprehensive sampling survey (which may include the use of sampling carried out by industrial/commercial/other contributors) to more accurately determine the nature and extent of toxics being contributed. As part of the survey, it may be appropriate to sample raw sewage overflows and bypasses, as well as locations within the municipal water distribution system.

3. Step 3 - Source Reduction Evaluation

The following aspects of the toxics management process should be thoroughly evaluated:

- Industrial waste pretreatment
- Sewer use codes/ordinances
- Other controls
- Treatment plant effectiveness for toxics removal
- Treatment process modification for control of toxics

a. Industrial Waste Pretreatment

The effectiveness of the control of toxics discharged to municipal treatment systems depends on:

- (1) The installation and proper operation/maintenance of pretreatment facilities by industrial/commercial activities; and
- (2) The establishment of industrial waste pretreatment programs by municipal government.

The Federal CWA requires the development of technology-based effluent limitations for various categories and subcategories of industrial activities. These effluent limitations are commonly referred to as categorical standards. To comply with categorical standards, many facilities must install pretreatment facilities to achieve certain minimum levels of pollutant removal by specific deadlines (generally within 3 years from promulgation of applicable categorical pretreatment standards by EPA).

The CWA and EPA's General Pretreatment Regulations (40 CFR Part 403) also require municipal wastewater dischargers, commonly referred to as "publicly-owned treatment works" (POTWs) which meet either of the following conditions to develop a local treatment program:

- (1) Have a design flow greater than 5 million gallons per day (mgd) and receive industrial wastes subject to pretreatment requirements; or
- (2) Have a design average flow of 5 mgd or less and experience treatment process upsets, violations of POTW effluent limitations, contamination of municipal sludge or other circumstances which warrant the development and implementation of a local pretreatment program.

For POTWs which have developed, or are in the process of developing, a local pretreatment program and have identified toxics in their effluent in amounts which require a TRE, the TRE process should include a review of the local pretreatment program and its effectiveness in reducing the toxic pollutants of concern. At a minimum, a discussion of the following should be included in the TRE report:

- (1) How the local program will affect the installation of necessary pretreatment facilities and the expected reduction of the toxic pollutants; and/or
- (2) How the local program can be modified (including the development and enforcement of specific local limits) to result in the reduction of the toxic pollutants.

b. Sewer Use Codes and Local Ordinances

The permittee should review and evaluate existing, applicable sewer use codes and ordinances to determine how they address potential contributors of toxic pollutants from various types of system users (industrial, commercial, residential).

c. Other Controls

(1) Waste Haulers

The permittee should review existing and proposed contractual arrangements with septage and other waste haulers who may be disposing of their materials via the municipal sewerage system, to determine if any changes may be needed for more effective control of toxic pollutants. Permittees that accept waste from haulers should refer to EPA's *Guidance Manual for the Identification of Hazardous Waste Delivered to Publicly Owned Treatment Works by Truck, Rail, or Dedicated Pipe*, June 1987, EPA, Office of Water Enforcement and Permits (EPA ID: 833-B-87-100, available at www.epa.gov).

(2) Water Supply

In situations where it appears that the municipal water supply system may be contributing to the toxics problem, discussions should be held with the owner/operator of the water system concerning possible modifications to the operation of the system for toxics control. These toxics control modifications can be of two types - adjustments made at the water treatment plant (in-plant) or in the water distribution system. An example of in-plant modifications the permittee may suggest to the owner-operator of the treatment plant may be the substitution of water treatment chemicals which do not contribute toxics of concern (i.e., if zinc is a toxic of concern at the POTW and the water treatment plant treats the water with zinc orthophosphate, a substitute could be used). If it is determined that toxics of concern are products of the distribution system, the permittee should work with the public water supplier to identify the problem areas in the distribution system. The results of such discussions should be included in the TRE report. Any modification to the treatment process at a potable water facility must be approved by the regional Water Supply Management Program.

A common cause for elevated levels of toxics in water supplies is corrosion of water distribution system components. The degree of water corrosivity of plumbing materials (i.e., lead and copper) depends largely on the pH hardness and alkalinity of the water. A number of additional factors such as temperature, flow rate, free

chlorine levels and age of plumbing materials are also important. Although the use of specific plumbing materials is not under the control of water suppliers, water chemistry parameters are. Therefore, adjustment of water quality parameters, especially pH and alkalinity to lower corrosion and the addition of corrosion inhibitors, such as orthophosphates or silicates, are the primary methods of corrosion control treatment. Another option could be distribution system or service line replacement.

In general, water is most corrosive or aggressive when:

- (a) The pH is less than 7.0 or greater than 10.0 standard units.
- (b) Alkalinity is less than 20-25 mg of calcium carbonate per liter.
- (c) Hardness is greater than 200 mg of calcium carbonate per liter and pH is greater than 10.0.
- (d) High levels of chlorides are present.
- (e) High levels of total dissolved solids are present.

4. Step 4 - Data Collection/Effluent Limits Verification – Optional

a. Site-Specific Data Collection and Submission

DEP uses the best available information in calculating the WQBEL in the NPDES permit. Where sufficient information is lacking, assumptions and/or default data are used. The permittee has the option of providing all or some of the following site-specific data as part of Phase I for use in verifying and refining any WQBEL:

- Discharge pollutant concentration and variability
- Design discharge flow
- Discharge mixing characteristics
- Pollutant fate characteristics
- Stream width, depth and slope
- Stream velocity
- Ambient stream data for pollutants, pH, temperature
- Ambient stream and discharge hardness
- Water intake quality and quantity
- Treatment plant influent pollutant concentrations
- Chemical translators
- WER

The permittee should contact DEP for guidance in determining which of the above data will have a significant impact on any WQBEL and also for protocols on collecting and submitting the data. DEP will determine the adequacy of any site-specific data submitted and advise the permittee accordingly. If initial review of the submitted data suggests that additional data collection is necessary, DEP will so advise the permittee. DEP will notify the permittee regarding what effect, if any, the data will have on any WQBEL.

b. Request for Site-Specific Criteria

The permittee may request an opportunity to demonstrate alternative, site-specific criteria for some pollutants. The procedures for carrying out such demonstrations must be preapproved in writing by DEP and must be in accordance with the requirements of Section 93.8 of DEP's Rules and Regulations. If the permittee chooses this option, requests for alternative, site-specific criteria must be submitted to DEP as part of the Phase I TRE report. Where the demonstration results in more stringent limitations than those previously established by DEP, the more stringent limitations will apply. Any less stringent limitations which are approved by DEP shall not violate applicable water quality criteria for the protection of human health.

c. Request for Alternative Site-Specific Method Detection Limits (MDL)

In some cases, a WQBEL may be less than the MDL in Chapter 16. In this event, the permittee has the option to demonstrate alternative, facility-specific MDL to account for analytical matrix interference associated with the wastewater in question. The procedures for determining MDL, published as Appendix B in 40 CFR Part 136, must be followed.

The request for approval of alternative site-specific MDL, including all documentation required to support such a request, must be submitted to DEP with the Phase I TRE report. DEP may grant a facility-specific MDL through the permit modification or renewal process.

5. Step 5 - Phase I Report

At the completion of all the required and/or optional steps in Phase I - Source Reduction Evaluation, a report must be prepared to summarize the findings of Phase I. Three copies of the report using the format shown in FIGURE C-10 including supporting documentation must be submitted to the regional office for review prior to starting Phase II.

PHASE II - WQBEL COMPLIANCE STRATEGIES AND IMPLEMENTATION SCHEDULE

The permittee should not proceed with Phase II until notified by DEP to do so. Depending on the results of Phase I, the WQBEL may need to be modified or Phase II may not be necessary.

1. Treatment Plant Effectiveness for Toxics Removal

Based on data developed during the Phase I, Step 1 - Influent/Effluent Quality Review, the permittee should evaluate the effectiveness of the municipal wastewater treatment facilities to remove toxic pollutants from the incoming wastewater.

The evaluation should separately identify the physical, chemical and biological mechanisms involved and whether or not these mechanisms can adequately remove toxic pollutants. Particular attention should be paid to accumulation of pollutants in treatment plant sludge (as an indication of possible sludge disposal problems).

2. Treatment Process Modification for Control of Toxics

Based upon the Phase I, Step 2 - Source Inventory Evaluation, the permittee should evaluate in-plant sources of toxics and possible control mechanisms. Examples of these sources and possible controls include:

- a. Operation and maintenance chemicals (odor-control chemicals, anti-foam agents, etc.) which may contribute toxics to plant effluent should be reduced or eliminated.
- b. Disinfection practices which produce significant levels of chloroform and other chlorinated organics, should be reviewed for possible modification.
- c. Modifications to handling of sludge digester supernatant (which may contain elevated levels of dissolved metals) should be evaluated for control of such toxics.

3. 25 Pa. Code § 95.4 Time Extension Requests

In some cases, the final WQBEL may not be technologically achievable using any combination of control options. In this event, the permittee has the option of requesting an extension under the requirements contained in 25 Pa. Code § 95.4. If the permittee elects to submit the 25 Pa. Code § 95.4 time extension request, the request must be submitted with Phase II of the TRE report. APPENDIX D provides guidance for this request.

4. TRE Report

If Phase II is required to comply with the WQBEL, an expanded report building on the already approved Phase I report must be prepared using the format shown in FIGURE C-10.

The TRE report should carefully describe the options considered for the control of the toxic pollutants of concern. The discussion should include all backup information on the necessity, feasibility and effectiveness of implementing particular options and the advantages and disadvantages associated with each. The discussion should also address the expected levels of control a particular option may provide. These expected levels may be justified by using technical reports, bench scale or pilot plant data (in instances where equipment must be upgraded or installed). The permittee should list the choice(s) of control options. This discussion should include reasons for choosing the option. The permittee should summarize the effluent quality considered achievable through implementation of the control measures selected.

The TRE report must include a schedule for implementing the selected structural or nonstructural wastewater management or treatment/control measures. The schedule must include improvements/construction milestones since DEP will be tracking the progress of the implementation of the control measures. The submitted schedule will provide for the completion of any structural and/or nonstructural wastewater management and treatment practices which will achieve compliance with the WQBEL. The permittee will be required to submit written periodic progress reports to DEP which detail the actions taken toward reaching the requirements set forth in the NPDES permit. These progress reports will be required until the permittee is in compliance with the effluent limits.

FIGURE C-10

Outline for Toxics Reduction Evaluation Report - Municipal Dischargers

NPDES Permit No. PA:

Date:

Permittee Name:

Name of Discharging Facility:

PHASE I - SOURCE REDUCTION REVIEW / EVALUATION

1. Influent and Effluent Quality Review
 - a. Presentation of Phase I Monitoring and Analysis Data
2. Source Inventory Evaluation
 - a. Industrial and Commercial Contributors
 - b. Other Sources
 - c. System Sampling Survey
3. Source Reduction Evaluation
 - a. Industrial Waste Pretreatment
 - b. Codes and Ordinances
 - c. Other Controls
4. Data Collection/Effluent Limits Verification
 - a. Optional Site-Specific Data Collection
 - b. Optional Request for Site-Specific Criteria Modification
 - c. Optional Alternate Site-Specific Method Detection Limit Determination

PHASE II - COMPLIANCE STRATEGY AND IMPLEMENTATION SCHEDULE

1. Sewage Treatment Plant Effectiveness for Toxics Removal
2. Sewage Treatment Process for Control of Toxics
3. Choice of Options and Projected Schedule for Achieving the Necessary Control

Summary of Effluent Quality Achievable

Bibliography of All References Used to Investigate Available Control Options Modifications

Attachments

APPENDIX D

Guidance for Obtaining 25 Pa. Code § 95.4 Extension of Time to Achieve WQBEL

I. INTRODUCTION

Industrial and municipal wastewater discharges to surface waters may be granted extensions of time to achieve WQBEL contained in NPDES permits, provided that certain eligibility requirements and prerequisites are met. Such time extensions may be granted for a period of up to 5 years and may be further extended under certain circumstances.

The basis for granting such time extensions is contained in Title 25 Pa. Code § 95.4.

II. BASIC ELIGIBILITY REQUIREMENTS

A. The discharge was in existence on October 8, 1979, or the date on which the water quality standard applicable to the specific pollutant was originally promulgated, whichever is later (25 Pa. Code § 95.4(a)(1)).

1. Section 95.4 first came into effect on October 8, 1979. In addition, most of the WQS for the pollutants in Title 25 Pa. Code Chapter 93 were updated as of October 8, 1979.

As additional revisions to these WQS are promulgated, the above eligibility date on which the discharge was to be in existence will change accordingly for the pollutants in question.

2. Many pollutants have no specific criteria listed in Title 25 Pa. Code Chapter 93. Resulting effluent limits for these pollutants are developed on a case-by-case basis pursuant to the general requirements of 25 Pa. Code § 93.6 of these regulations as shown below:

“93.6 - General Water Quality Criteria

- (a) Water may not contain substances attributable to point or nonpoint source waste discharges in concentration or amounts sufficient to be inimical or harmful to the water uses to be protected or to human, animal, plant, or aquatic life.
- (b) In addition to other substances listed within or addressed by this chapter, specific substances to be controlled include, but shall not be limited to, floating materials, oil, grease, scum and substances which produce color, tastes, odors, turbidity, or settle to form deposits.”

If the discharge of the pollutants in question began prior to the establishment of a WQBEL under the provisions of 25 Pa. Code § 93.6, then the discharger is considered to have met the eligibility requirements of 25 Pa. Code § 95.4(a)(1).

New dischargers not in existence prior to the establishment of the water quality-based effluent requirements are not eligible for a 25 Pa. Code § 95.4 time extension.

- B. The discharger has installed BAT and BCT, as appropriate. (25 Pa. Code § 95.4(a)(2)).
1. Prior to granting a time extension request, DEP must be satisfied that the discharger has installed facilities capable of meeting the requirements of Section 301 of the CWA with regard to:
 - Best Available Technology Economically Achievable (BAT).
 - Best Conventional Pollutant Control Technology (BCT).
 - New Source Standards of Performance (NSPS).
 2. Or the discharger has installed best demonstrated technology (BDT), which will not result in the discharger achieving the WQBEL. (25 Pa. Code § 95.4(a)(2) and (3))

BDT is defined in 25 Pa. Code § 95.4(g) as:

“The combination of wastewater treatment technologies and management practices which have been demonstrated, to the satisfaction of DEP, to achieve the most effective degree of pollutant reduction applicable to the type of wastewater and pollutants in question.

The determination of BDT shall be based upon the documented results of either full-scale installation and operation or treatment technologies and management practices, ** or investigation and pilot plant operations carried out by the discharger.

In no case shall BDT be less stringent than Best Available Technology Economically Achievable (BAT), Best Conventional Pollutant Control Technology (BCT), or standards of performance for new sources for the wastewater and pollutants as determined by the Administrator of the U.S. Environmental Protection Agency under 33 U.S.C. §§1314 (b) and 1316.”

**This will encompass an evaluation of the discharger’s own efforts as well as reviewing the effectiveness of full-scale installation and operation of the treatment technologies and management practices which are being used for similar types of dischargers.

- C. The discharger must demonstrate additional efforts to meet WQBEL. (25 Pa. Code § 95.4(a)(4) and (e)).

The discharger must demonstrate to the satisfaction of DEP additional efforts to meet the WQBEL by:

1. Modifying process materials or production methods or both.

2. Utilizing an alternate point of wastewater discharge - including the use of land application of wastewater.
3. Implementing wastewater management practices such as wastewater recycling, wastewater reuse and good housekeeping.
4. Conducting research into the application of new or innovative wastewater treatment technologies or management practices - including carrying out pilot plant operations of sufficient size and duration to demonstrate adequately the technical feasibility of such treatment technologies or management practices.

The results of related efforts by the discharger should also be documented, including development of:

- Industrial waste pretreatment programs.
- Environmental Emergency Response Plans (EERP).
- Toxics Reduction Evaluations (TRE).

The above-mentioned efforts and investigations are to be carried out prior to submitting a time extension request (i.e., they should be an integral part of the determination of BDT). In addition, as a condition to granting time extensions, the discharger will be expected to continue such efforts toward solving the problem.

As discussed in 25 Pa. Code § 95.4(e), during the initial time extension period and any subsequent renewals of the time extension, the discharger shall be expected to submit periodic reports to DEP at least once every year detailing such efforts to meet the WQBEL.

- D. The discharge must not be a “new source” as defined by EPA under Section 306 of the CWA (25 Pa. Code § 95.4(b)(1)).

EPA’s NPDES program regulations have defined “new source” in 40 CFR §122.2.

In simpler terms, a discharge is considered a “new source” when:

1. EPA has promulgated NSPS applicable to the discharge in question; and
2. The discharge emanates from a facility for which construction was started either within the 120-day period between the proposal and the promulgation of the NSPS or any time after promulgation of the NSPS.

- E. The discharge and pollutants for which the time extension is requested are not subject to toxic pollutant effluent standards or prohibitions as defined by EPA under Section 307 of the CWA (25 Pa. Code § 95.4(b)(2)).

EPA has promulgated certain toxic pollutant effluent standards and prohibitions for certain types of discharges and pollutants. These are contained in EPA regulations 40

CFR Part 129 - Toxic Pollutant Effluent Standards. These apply to certain pesticides and PCB's from specific types of wastewater discharges.

- F. The discharger must not have a history of noncompliance with the Clean Streams Law or related department regulations, permits or orders (25 Pa. Code § 95.4(b)(3)).

DEP will deny a request for a 25 Pa. Code § 95.4 time extension if the discharger's past compliance history would indicate that such a time extension is inappropriate.

III. HOW TO APPLY FOR A TIME EXTENSION

Each request for a 25 Pa. Code § 95.4 time extension must be submitted in writing to DEP. (Two copies are to be submitted.) Each request shall be accompanied by a completed Request for Time Extension to Achieve WQBEL included as FIGURE D-2. In completing this form, the discharger will explain how the eligibility requirements and prerequisites discussed above have been met or achieved.

IV. EVALUATION OF TIME EXTENSION REQUESTS

DEP will review such requests for conformance with the eligibility requirements and prerequisites discussed above. FIGURE D-1 shows the general evaluation process.

Incomplete submissions will either be returned or a request for additional information shall be sent to the applicant. Requests which contain insufficient supporting documentation or inadequate basis for granting time extensions will be denied.

V. PROCEDURES FOR GRANTING TIME EXTENSION REQUESTS

Once it has been decided to grant a time extension, the NPDES permit will be reopened and either "modified" or "revoked and reissued."

When a permit is "modified," only the permit conditions subject to modification are reopened for the purpose of technical review, public notification and comment and modification. When modifying an NPDES permit, the expiration date of the original permit is maintained.

When a permit is "revoked and reissued," the entire permit is reopened for the purpose of technical review, public notification and comment. Once the review process is complete, the permit is reissued for a new term not to exceed 5 years.

Standard permit application processing procedures will be followed for modifying or revoking and reissuing permits including public notice and opportunity for review and comment by the permittee and the public.

DEP's decision whether to modify a permit to grant or deny a time extension request is an appealable action.

FIGURE D-1

General Process for Evaluating 25 Pa. Code § 95.4 Time Extension Requests

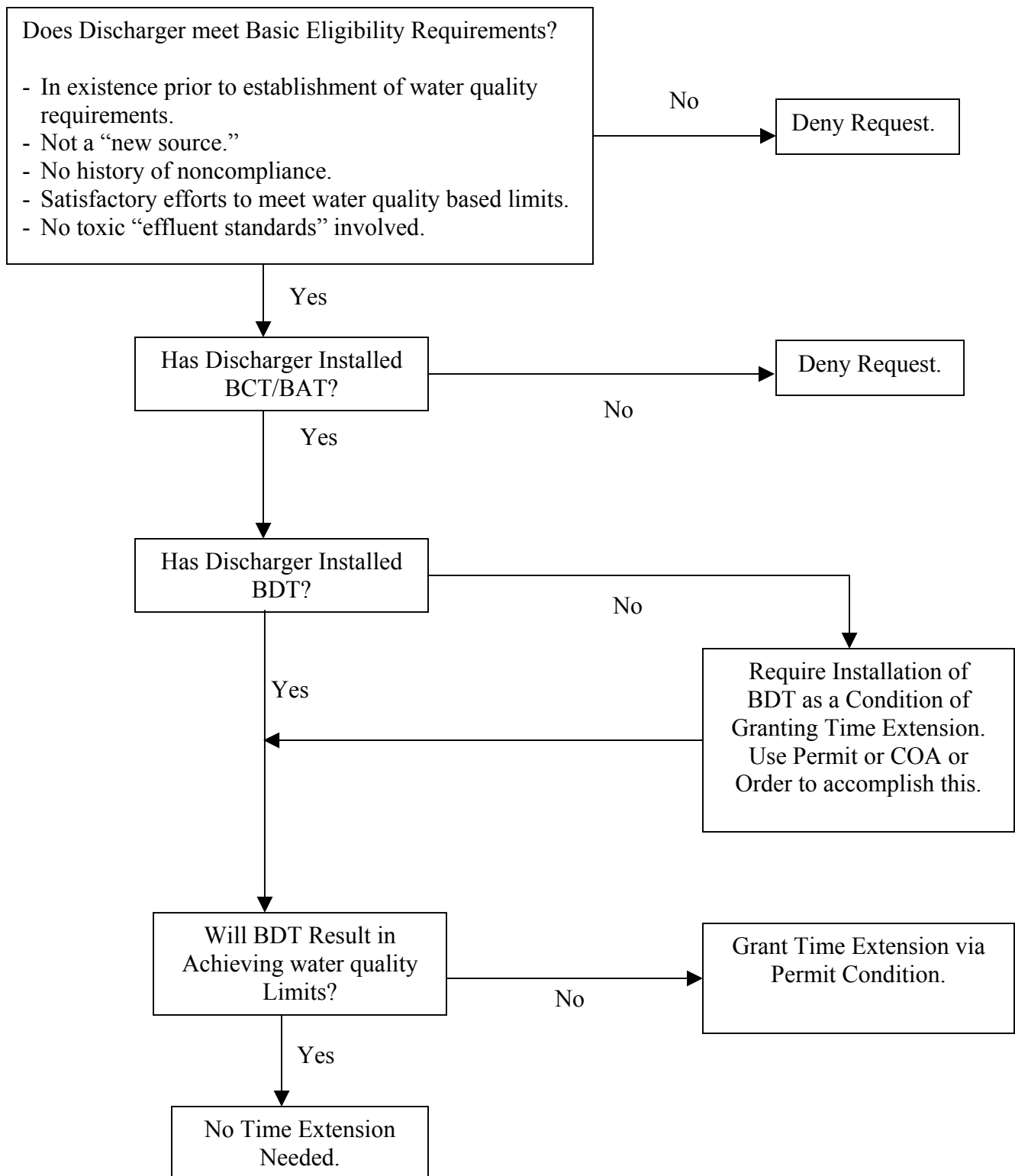


FIGURE D-2

Request for Time Extension to Achieve WQBEL

A. Basic Discharge Information

Date
Prepared _____

1. Permittee Name and Mailing Address
2. Name of Discharging Facility _____ Municipality/County _____
3. Stream Which Receives Discharge _____
4. NPDES Permit Number and Date Issued _____
5. Time extension being requested for the following outfalls and parameters

<u>Outfall Number</u>	<u>Source(s) of Wastewater</u>	<u>Pollutant</u>	<u>Applicable Effluent Limit</u>	<u>Permit Page No.</u>
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B. Information Needed to Determine Eligibility Requirements (see 25 Pa. Code § 95.4 of DEP's Rules and Regulations)

1. Cutoff Date (25 Pa. Code § 95.4(a)(1))

Indicate the date on which discharge of the pollutant(s) in question began. Include amplifying information as needed.

2. New Source (25 Pa. Code § 95.4(b)(1))

- a. Has EPA promulgated effluent limitation guideline regulations which include "Standards of Performance for New Sources" (NSPS) for the wastewater discharge(s) in question? (Not Applicable for Municipal Dischargers.)

Yes ☐

No ☐

- b. If so, identify the NSPS regulation and its date of promulgation.

- c. When did “construction” of the facility which is the source of the wastewater discharge(s) begin?

3. Toxic Pollutant Effluent Standards or Prohibitions (25 Pa. Code § 95.4(b)(2))

- a. Has EPA promulgated a toxic pollutant “effluent standard or prohibition” under Section 307 of the CWA which applies to the wastewater discharge(s) and pollutant(s) in question?
- b. If so, identify the effluent standard or prohibition and the date of promulgation, the type of wastewater and the applicable pollutants.

4. Compliance History 25 Pa. Code § 95.4(b)(3))

Explain below, and/or attach a summary, the discharger’s history of compliance with regard to applicable requirements of DEP during the past 5 years.

C. Other Prerequisites

1. Installation of BCT/BAT/NSPS (25 Pa. Code § 95.4(a)(2)) (Not Applicable for Municipal Dischargers)

- a. Has EPA promulgated ELG regulations which define BCT, BAT, and/or NSPS for the wastewater discharge(s) and pollutant(s) in question?
- b. If so, identify BCT/BAT/NSPS regulation and its date of promulgation.
- c. Has the applicant installed facilities capable of meeting BCT/BAT requirements? (Attach explanation if necessary.)

2. Installation of Best Demonstrated Technology (BDT) (25 Pa. Code § 95.4(a)(2) and (3))

Attach a description of efforts which have been made or will be made to install BDT for the wastewater and pollutants for which the 25 Pa. Code § 95.4 time extension is being requested. Include in this documentation the actual or expected results of:

- a. Full-scale installation and operation of treatment technologies and management practices (include information, where available, on experiences of other similar dischargers).
- b. Pertinent investigations and pilot plant operations carried out by the discharger which have been used in establishing BDT for the discharger.

3. Additional Efforts to Achieve WQBEL. (25 Pa. Code § 95.4(a)(4))

Describe in detail (using attached sheets and by cross-referencing other documents available to DEP) additional efforts which have been made to achieve WQBEL for the discharge(s) and pollutants in question. This discussion should include, but should not be limited to:

- a. Modifying process materials or production methods or both.
- b. Utilizing alternate point of wastewater discharge - including the use of land application of wastewater.
- c. Implementing wastewater management practices such as wastewater recycling, wastewater reuse and good housekeeping.
- d. Conducting research into the application of new or innovative wastewater treatment technologies or management practices (including pilot plant operations of sufficient size and duration to demonstrate adequately the technical feasibility of such treatment technologies or management practices).

4. Effluent Quality Considered Achievable

- a. Summarize the effluent quality considered achievable with BDT as described under 2. above and through further investigations identified under Step 3. above.
- b. Indicate the date(s) on which compliance with such effluent quality will be achieved.

AFFIDAVIT

I certify that I am authorized to make this application and am familiar with the information contained in the application and that to the best of my knowledge and belief such information is true, complete and accurate. (It is an offense under the Pennsylvania Crimes Code to affirm a false statement in documents submitted to DEP.)

Print Name and Title of Person Signing

Date of Submittal

Signature

Contact person in the event DEP requires additional information

Name _____

Address _____

Telephone No. (____) _____

List of Attachments

APPENDIX E

Guidance for Reviewing a TRE Report and 25 Pa. Code § 95.4 Request

I. INTRODUCTION

In order to achieve the goals of aquatic life and human health protection in receiving waters, DEP developed the TMS for regulating the discharge of toxic pollutants via NPDES permits. As part of implementation of this strategy, DEP is establishing WQBEL for toxic pollutants for direct discharging permittees.

To ensure that WQBEL will be met, DEP requires that all permittees conduct TRE in accordance with the guidelines presented in APPENDIX C. Once the TRE has been conducted and the TRE report submitted, it will be the responsibility of the regional DEP to evaluate the TRE to ensure that all requirements have been met. Additionally, DEP must assess the validity of the conclusions of the TRE to ensure that proper measures are planned to comply with the WQBEL.

In cases where a permittee believes that a WQBEL will not be met, a time extension for compliance may be requested as allowed under 25 Pa. Code § 95.4 of DEP's Rules and Regulations. It will also be the responsibility of DEP to ensure that the permittee is eligible for such an extension as set out in 25 Pa. Code § 95.4 and in accordance with the procedures contained in APPENDIX D.

This guidance is designed to assist in the review of the TRE report and 25 Pa. Code § 95.4 time extension requests. This guidance discusses information that DEP should consider when reviewing the information submitted by the permittee. It should be noted that it is outside the scope of this guidance to provide all information which may be necessary in the review process. The permittee guidances (APPENDIX C and D) contain extensive explanations on the conduct and submission of TREs and the qualification for and submission of 25 Pa. Code § 95.4 time extension requests. These permittee guidances also reference additional supplemental guidance which are not discussed herein.

After issuance or reissuance of an NPDES permit containing WQBEL, the responsibility shifts to evaluating whether the permittee can achieve compliance with these limitations. As part of DEP's TMS, a process has been developed that should result, for most permittees, in compliance with the WQBEL within 3 years after permit issuance. This process, which begins after the NPDES permit is issued, is summarized in FIGURE E-1.

A. FIGURE E-2 summarizes the timetable for TRE implementation. The general process of carrying out a TRE for industrial and municipal discharges is outlined in FIGURE E-3. The TRE process for permittees should occur in four distinct phases:

1. The influent/effluent quality review phase.
2. The process engineering analysis.
3. The pollution control evaluation phase.

4. Development of the TRE report.

The complexity of the TRE process will vary considerably from case to case. For industrial permittees, this complexity will depend upon the number and types of toxic pollutants regulated, the complexity of the manufacturing process(es) and the extent of existing controls for wastewater contaminants. For municipal permittees, this complexity will depend upon many things, for example, the number and types of toxic pollutants regulated, the types of treatment plant unit processes used and the number and types of nondomestic establishments that discharge to the municipal wastewater treatment plant. In the simplest case, a TRE may only involve monitoring and analysis to verify the presence or absence of toxics in raw or treated wastewater. If existing levels of toxics do not exceed WQBEL, then no further evaluation would be necessary.

FIGURE E-1

Toxics Management Strategy

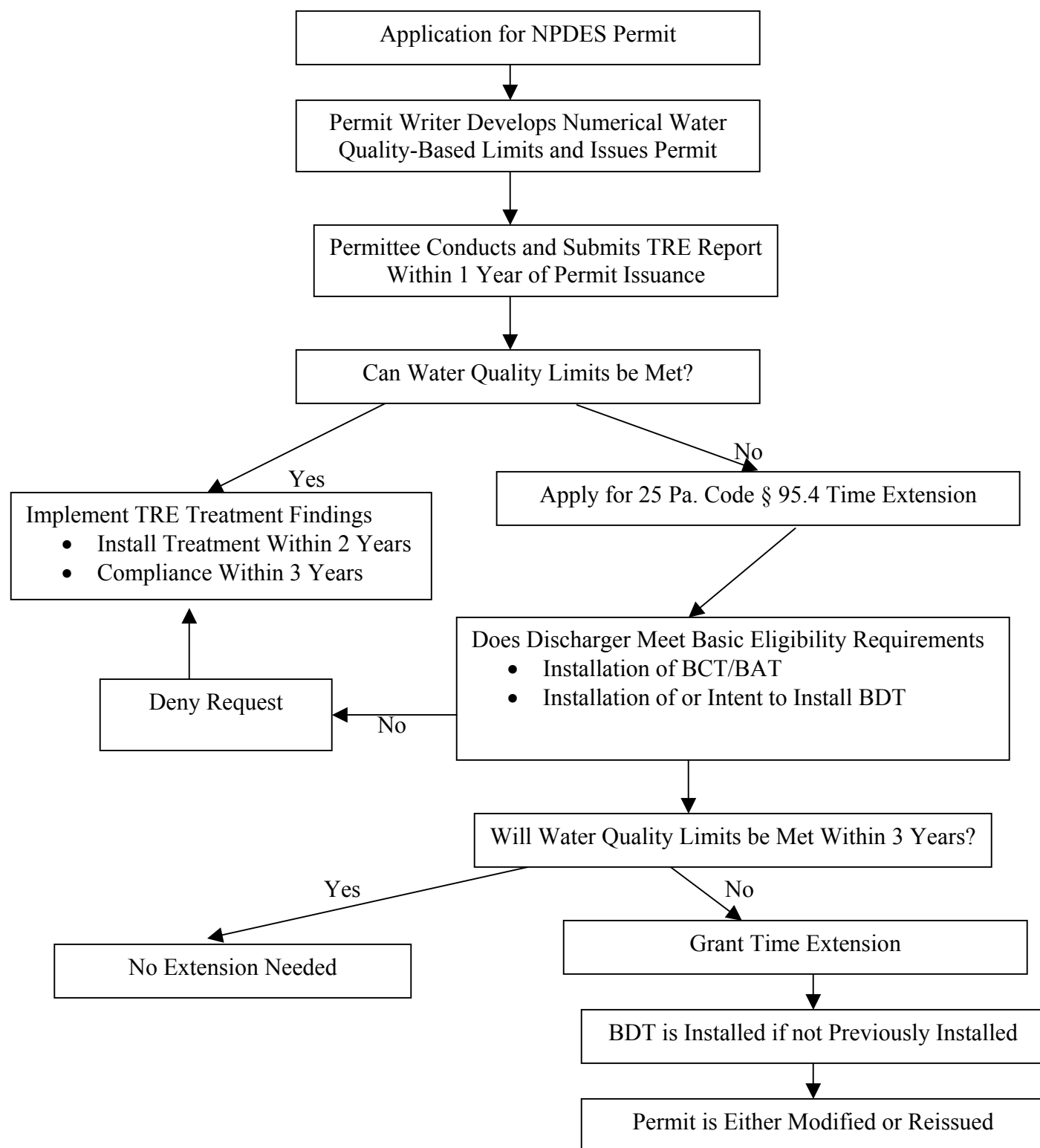


FIGURE E-2

TRE Implementation Timetable

Within 1 Year After the Permit Effective Date

- Permittee performs a TRE in accordance with DEP Guidelines.
- Permittee submits TRE report to DEP.
- Optional – Permittee submits study plan to DEP for developing alternative site-specific WQBEL. After DEP approval, permittee performs study and submits results to DEP along with the TRE report.

Between the 1st and 2nd Years of the Permit Effective Date

- As necessary, permittee institutes the selected toxic pollutant control option (e.g., design and construction of additional treatment units, implementation of BMPs, etc.).
- Permittee submits quarterly progress reports.

Between the 2nd and 3rd Years of the Permit Effective Date

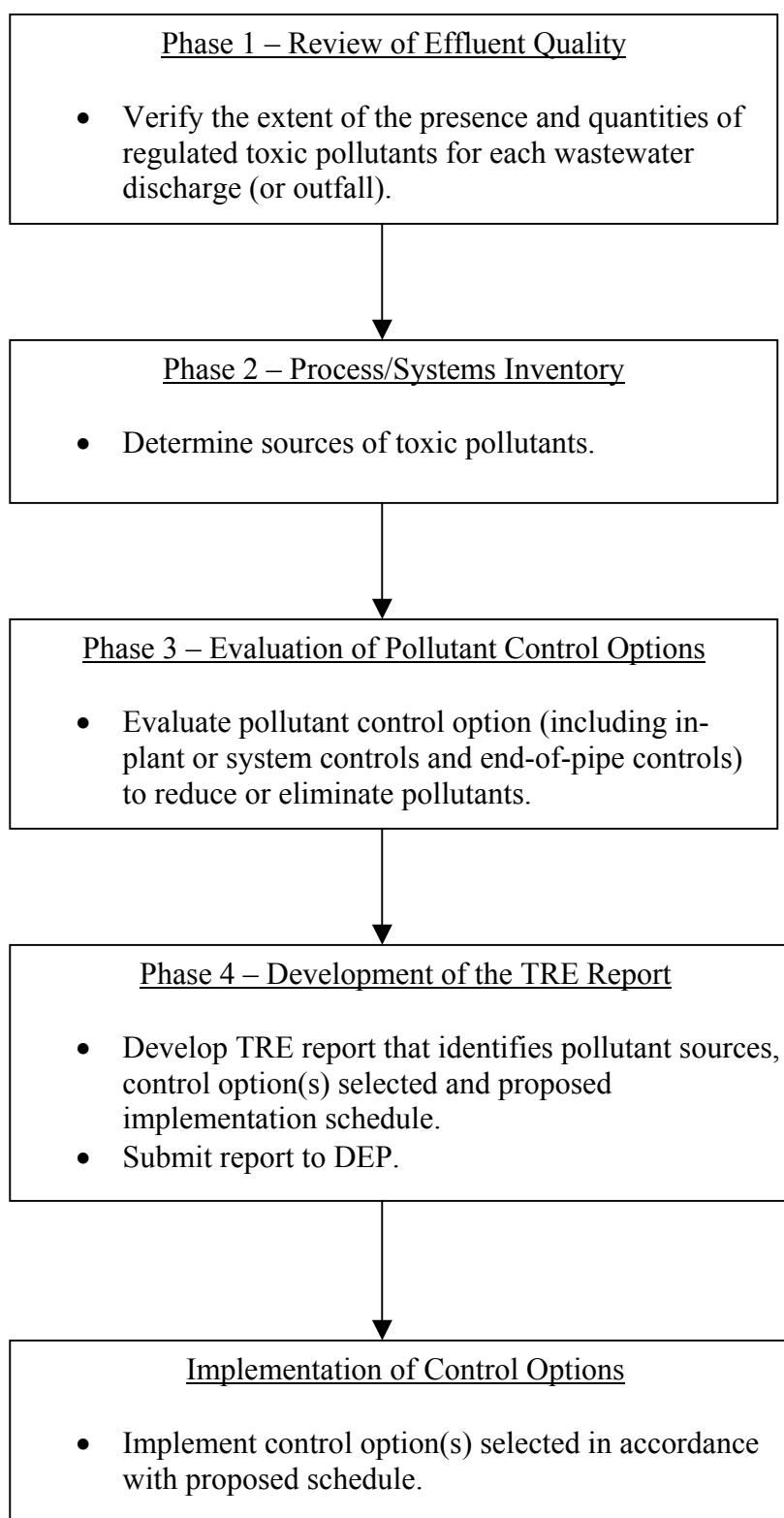
- Permittee initiates start-up of toxic pollutant control option and demonstrates that WQBEL will be met.
- Permittee submits quarterly progress reports.

Between the 3rd Year and the Permit Expiration Date

- WQBEL are effective.
- Permittee must be in compliance with all WQBEL.

FIGURE E-3

Overview of the TRE Process



B. Requests for Alternative Water Quality-Based Limits Requirements

Concurrent with the performance of the TRE, a permittee will be allowed to verify whether any WQBEL contained in their permit actually reflect their site-specific discharge conditions. In addition, a permittee will be allowed to conduct studies to base a request for development of alternative effluent limitations.

If the permittee opts to conduct studies which will support the request for modification of WQBEL, a study plan must first be submitted to DEP's regional office for approval during the initial stages of the TRE process. Only after approval from DEP may the permittee perform the study and submit the results as part of the TRE report. The responsibility for providing the technical basis for modifying a WQBEL is that of the permittee. Therefore, if no studies are submitted or the studies are inadequate to make a determination, the original WQBEL will remain fully effective.

When adequate studies are performed, results will be used by DEP to modify a WQBEL through a modification of the NPDES permit. If such modifications are made, the permittee must meet the modified limitations by the original compliance date established in the permit. It should also be noted that if a permittee elects to perform a study, the data submitted to DEP may result in the development of a more stringent effluent limitation. Compliance with the more stringent limitation will also be required by the original compliance date in the NPDES permit.

C. 25 Pa. Code § 95.4 Time Extension Requirements

One of the key outcomes of the TRE process will be a determination of the extent to which a permittee can control, reduce or eliminate discharges of toxic pollutants. Such findings are critical to the determination of whether or not the permittee may be eligible to request an extension of time to achieve a WQBEL for the pollutant(s) in question, pursuant to 25 Pa. Code § 95.4.

Industrial and municipal wastewater dischargers to surface waters may be granted time extensions to achieve WQBEL contained in NPDES permits, provided that the specific eligibility requirements and prerequisites are met. If DEP determines that such a time extension can be granted, the duration of the extension must be limited to 5 years. More background information on 25 Pa. Code § 95.4 time extensions is contained in 25 Pa. Code § 95.4 and APPENDIX D.

II. EVALUATION OF TOXICS REDUCTION EVALUATION REPORTS

This section provides guidance for DEP permit writers responsible for reviewing TRE reports submitted by industrial (APPENDIX C, Section III.B.) and municipal (Section III.C.) permittees.

A. TREs For Industrial Dischargers

To assist DEP in reviewing industrial TRE reports, a checklist is provided as FIGURE E-4. The remainder of this section discusses each of the phases of the industrial

TRE, highlighting the items that must be considered by DEP in order to answer each of the questions in the checklist.

1. Phase 1 - Effluent Quality Review

The objective of Phase 1 is to determine if toxic pollutants are present in quantities and/or concentrations that exceed the WQBEL established by DEP. To make this determination, DEP requires each permittee to sample each affected discharge outfall of the toxic pollutants that are regulated. As part of their review of Phase I of the TRE report, consideration will be given to the following:

- a. Have representative effluent sampling data been submitted for all outfall locations?

Due to the expected variability among permittee wastewater characteristics, DEP has not established any specific protocol to define representative effluent sampling data. It is DEP's responsibility to review the effluent quality data provided in the TRE report and determine if data are representative of the permittee's discharge and adequate to reasonably determine compliance with effluent limitations.

(1) Representative Effluent Data

There are several criteria to be considered when determining representative permittee effluent data:

- (a) Sample Location - At a minimum, samples should be taken at the location(s) specified in the NPDES permit for each regulated outfall.
- (b) Regulated Parameters – It should be ensured that the permittee is monitored for all regulated pollutants for each outfall that contains a WQBEL.
- (c) Sample Type - Either composites or grab samples should be taken based on the wastewater characteristics and variability. Grab samples should be taken for sulfides, phenols, TTO, pH, oil and grease, and volatile organic acids.
- (d) Sample Frequency - More samples should be taken where wastewater flow and characteristics are expected to be highly variable. Alternatively, a smaller number of samples may be adequate to represent relatively small, continuous and uniform discharges.
- (e) Discharge Variations - Sampling efforts should be designed to take into account the most likely time periods during which the regulated toxic pollutants may be present. For

example, samples taken from industrial establishments that are involved in batch-type production should be taken during times when actual discharge from a batch operation occurs. Many facilities often conduct process equipment washdown/clean-up at the end of the week in expectation of closing down for the weekend. Therefore, the majority of toxic pollutants may be present on Friday. When a facility makes specific products on different days, monitoring at specific times to ensure that pollutants of concern are found is also necessary.

The permittee may not always submit all information necessary for DEP to make a determination of adequacy. Therefore, DEP may request additional information in order to ensure that a complete and thorough review can be conducted.

(2) Data Quality

The permittee should use analytical procedures of sufficient sensitivity and accuracy in order to enable comparison between the level(s) of occurrence of toxic pollutants in their effluent(s) and the WQBEL in the NPDES permit. In no case should compliance be determined based on data with detection limits above that which is achievable by EPA and DEP-approved analytical methods.

To determine whether permittee effluent data represent achievable detection limits, DEP should refer to Chapter 16, Subchapter B. Table 2 within Subchapter B provides a list of DEP and EPA-approved analytical methods and the associated detection limits for toxic substances.

(3) Compliance Evaluation

If the results of Phase 1 monitoring indicate that existing controls are not adequate to comply with all WQBEL contained in the NPDES permit, the permittee must initiate Phase 2 of the TRE process to address those that are not achieved. The following question should be answered:

(a) Do the data presented in the report indicate compliance?

It should be verified that compliance is either attained with all limitations or that the permittee continues to Phase 2. If the results of Phase 1 monitoring indicate that existing controls are adequate to comply with all effluent limitations contained in the NPDES permit, no further evaluations (i.e., Phases 2 and 3 of the TRE) are needed. However, the permittee is still required to develop and submit a TRE report.

If existing controls are not adequate to meet WQBEL, the following question is the final step of Phase 1:

- (b) Is there a request for modification of WQBEL, time extensions or alternative water quality criteria?

If such request(s) have been submitted, FIGURES E-4 and E-6 should be referred to for a discussion of the evaluation of such requests.

2. Phase 2 - Process Engineering Analysis

The objective of Phase 2 is to determine the source(s) of the toxic pollutants in the wastewater. The first step in this determination is evaluation of wastewater flow throughout the facility. Therefore, the first question to be answered is:

- a. Does the report include a wastewater flow diagram?

The permittee should have constructed a flow diagram based on an in-plant survey that identifies all probable sources and quantities of water and wastewater. The diagram should include a “water-wastewater balance” so that all sources and discharges are accounted for. It should be verified that a flow balance exists.

It should also be verified that sources of wastewater expected at the industrial source are included on the diagram. The NPDES permit applications (the most recent and past applications) should be reviewed to verify that all process flows are accounted for in the flow diagram. If applicable, EPA’s development documents(s) supporting effluent guidelines and standards for the specific industry may be referred to. EPA’s development documents(s) may provide information on the different wastestreams that can be expected at the facility.

Once DEP is satisfied that the flow diagram accurately depicts the wastewater sources and quantities throughout the facility, the following will be assessed:

- b. Is a sufficient rationale presented for all sampling locations (i.e., in-plant or end-of-pipe) and methods?

The permittee should have sampled or resampled potential sources of toxic pollutants, including intermediate wastewater streams, water supply sources (including wells, public water supply connection points and surface water intakes) and internal outfalls, to verify the presence or absence of toxic pollutants. Sources monitored should be discussed in the TRE report.

- c. Are data presented to verify the presence or absence of the toxic pollutants of concern?
- d. Are approved sampling and analytical procedures (i.e., 40 CFR Part 136 or as specified in the permit) used and discussed?

The data should be sufficient enough to enable verification of the presence of toxic pollutants. The permittee is expected to use analytical procedures of sufficient sensitivity and accuracy in order to be able to compare the level(s) of occurrence in the effluent with the limitations contained in the NPDES permit. These detection limits should be evaluated to ensure that, where necessary, the most sensitive detection limits are achieved (refer to Chapter 16, Subchapter B, Analytical Methods and Detection Limits for Toxic Substances, to determine achievable analytical detection limits).

Additionally, it should be verified that sampling locations chosen by the permittee avoid the impact associated with dilution of concentrated wastestreams from commingling with cooling water and other less-contaminated wastewater sources (these uncontaminated wastestreams may cause the resulting pollutant concentrations to be below detection limits). The in-plant sampling locations should be most representative of individual plant processes, thereby allowing for isolation of the sources of pollutants.

The verification data should adequately represent the potential sources of toxic pollutants. The factors that should be considered when determining the representativeness of sampling data include sample location, regulated parameters, sample type, sample frequency and sample variability.

- e. Have potential sources of the toxics of concern been listed via a raw material and chemical additives inventory?

In order to identify the potential sources of toxic pollutants, each permittee should consider all the material, including chemical additives and catalysts, water treatment chemicals, chemical impurities and cleaning agents used within their facility. As part of the TRE report, the permittee should provide a complete listing of the sources considered. The permittee should verify all reasonable sources of toxic pollutants. EPA's development documents provide information regarding the sources of toxic pollutants for each of the industrial categories for which effluent guidelines have been developed.

- f. Has a comparison of compounds listed in the material inventory with the regulated toxic pollutants been conducted and presented (in tabular form)?
- g. Have all potential sources of toxic pollutants been identified?

After developing the material inventory, the permittee should perform a comparison of this list with the list of regulated toxic pollutants to

determine the sources of pollutants. If all sources are not identified through this comparison, then the permittee should consider possible reaction products, byproducts, etc., as possible sources of toxic pollutants. If the permittee fails to identify all sources of pollutants, then DEP deems the TRE report unsatisfactory.

3. Phase 3 - Pollutant Control Evaluation

The objective of Phase 3 - Pollutant Control Evaluation is to identify and assess available pollutant control options as to their ability to bring the permittee into compliance with its specific WQBEL. The questions that should be considered when reviewing the pollutant control evaluation are:

- a. Were all possible in-plant control measures considered?
- b. Were all available end-of-pipe treatment processes considered?

Pollutant control options available to the permittee can include one of three general types: 1) in-plant controls, 2) end-of-pipe treatment, and 3) a combination of in-plant controls and end-of-pipe treatment. The permittee should have considered all methods of pollutant reduction. This is particularly important should the permittee claim that control options to comply with WQBEL do not exist or are very limited.

Should the permittee conclude that the limitations cannot be met, or if DEP determines that the control options chosen will not result in adequate treatment, EPA's treatability database may need to be consulted. This will assist in determining what control technologies are available to permittees.

4. Phase 4 - TRE Report

When the permittee has completed Phases 1 through 3 of the TRE process, a report on the findings must be submitted to DEP in accordance with the guidelines presented in APPENDIX C.

- a. Have three copies of the TRE report been submitted within 1 year of permit issuance?

Three copies of the TRE report must be submitted within 1 year of permit issuance. The report should follow the format provided in APPENDIX C, contain all required information and be submitted in triplicate. Upon receipt of the TRE report, DEP will review the report and determine compliance with the TRE requirements as outlined in the review checklist provided. Additional questions that must be answered include:

- b. Is backup information presented for the feasibility and effectiveness of implementing particular options including advantages and disadvantages?

- c. Is the effluent quality expected to be achieved by implementing the proposed toxics treatment/control program presented and supported with technical reports and/or bench scale data?

During the review of the TRE report, DEP will carefully review the description of the options considered and chosen by the permittee for the control of the toxic pollutants including:

- Information on the feasibility and effectiveness of the control options considered.
- Advantages and disadvantages associated with the control options considered.
- Expected levels of the control options considered substantiated through the use of technical reports, bench scale or pilot plant data.
- Choice(s) of control options.
- Discussion of the reasons for choosing the control options(s).
- A summary of the effluent quality considered achievable through implementation of the control measures selected.

- d. Is a program of toxics treatment/control proposed and a schedule of implementation presented?

The TRE report must also include a schedule for implementing the selected structural or nonstructural wastewater management, treatment or control measures. The schedule must include milestone dates of improvement and/or construction for tracking the progress of the implementation of the control measures. The submitted schedule must provide for the completion of any structural and/or nonstructural wastewater management and treatment practices which will result in compliance with the water quality-based limitations by the end of the second year of the permit. The schedule must also provide for compliance with effluent limitations no later than 3 years after permit issuance. Additionally, the permittee must submit written periodic progress reports to DEP which detail the actions taken toward reaching the requirements set forth in the NPDES permit. These progress reports will be required until the permittee is in compliance with the effluent limits.

B. TREs For Municipal Dischargers

To assist DEP in reviewing municipal TRE reports, a checklist is provided as FIGURE E-5. The remainder of this section discusses each of the phases of the municipal TRE, highlighting the items that must be considered in order to answer each of the questions in the checklist.

1. Phase 1 - Influent/Effluent Quality Review

The objective of Phase 1 is for the permittee to verify the presence or absence of the toxic pollutants of concern in a municipal discharge. The primary questions that must be answered in reviewing the results of a Phase 1 are:

- a. Has a sampling program been conducted to determine the levels of toxic pollutants entering and leaving the facility?
- b. Are data presented to verify the presence or absence of the toxic pollutants of concern?

Although similar to Phase 1 for industrial dischargers, Phase 1 for municipal dischargers differs in that the permittee is not only interested in what leaves the facility, but is also interested in quantifying what enters the facility. In order to achieve this objective, the permittee must conduct an in-depth inventory of possible contributors of toxic pollutants within the municipal sewage collection/conveyance system and carry out a sampling program to accurately determine the levels of toxic pollutants entering and leaving the sewage treatment facilities.

As discussed previously in Section II.A.1.a.(1), there are several criteria that DEP will consider when determining the representativeness of permittee data:

- (1) Sample Location - At a minimum, samples should be taken at the location(s) specified in the NPDES permit for each regulated outfall. In addition, influent samples should be taken prior to any process flow returns (e.g., returned activated sludge flows).
- (2) Regulated Parameters - The permittee monitored for all regulated pollutants at the treatment plant headworks and each outfall that contains WQBEL.
- (3) Sample Type - Either composites or grab samples should be taken based on the wastewater characteristics and variability. Grab samples must be taken for sulfides, phenol, TTO, pH, oil and grease, and volatile organic acids.
- (4) Sample Frequency - More samples should be taken where wastewater flow and characteristics are expected to be highly variable. Alternatively, a smaller number of samples may be adequate to represent relatively small, continuous and uniform discharges.
- (5) Discharge Variations - Sampling efforts should be designed to take into account the most likely time periods during which the regulated toxic pollutants may be present. For example, samples taken from industrial establishments that are involved in batch-type production should be taken during times when actual discharge from the batch operation occurs. Many facilities often conduct process equipment washdown/cleanup at the end of the week in expectation of closing down for the weekend. Therefore, the majority of toxic pollutants may be present on Friday. When a

facility makes specific products on different days, monitoring at specific times to ensure that pollutants of concern are found is also necessary.

As previously discussed, the permittee may not always submit all information necessary for DEP to make a determination of adequacy. Therefore, DEP may need to request additional information in order to ensure that a complete and thorough review can be conducted. If data are determined to be representative, then DEP must determine whether the permittee sampled and analyzed in accordance with approved procedures. Specifically, the following question must be addressed:

- c. Are approved sampling and analytical procedures (i.e., 40 CFR Part 136 or as specified in the permit) used and discussed?

The permittee should demonstrate that it used analytical procedures of sufficient sensitivity and accuracy in order to enable comparison between the level(s) of occurrence of toxic pollutants in their effluents(s) and the WQBEL in their NPDES permit. In no case should compliance be determined based on data with detection limits above limits achievable by EPA and DEP analytical methods. Analytical detection limits must also be sensitive enough to detect toxic pollutants in influent wastewaters.

In determining whether permittee effluent data represent achievable detection limits, Chapter 16, Subchapter B, Analytical Methods and Detection Limits for Toxic Substances, should be referred to for the list of DEP EPA-approved analytical methods and the associated analytical detection limits for toxics.

Permittees are required during the final step of Phase 1, to conduct an influent/effluent quality review to evaluate the data of toxic pollutants entering the treatment plant. Therefore, it should be determined:

- d. Has an evaluation of the fate of toxics entering the facility been performed and the results presented?

If the results of Phase 1 monitoring indicate that existing controls are not adequate to comply with each WQBEL contained in the NPDES permit, the permittee must initiate Phase 2 of the TRE process. The following question must then be answered:

- e. Does the data presented in the report indicate compliance?

It should be verified that compliance is either attained with all limitations or that the permittee continues to Phase 2. If the results of Phase 1 monitoring indicate that existing controls are adequate to comply with all effluent limitations contained in the NPDES permit, no further evaluations (i.e., Phases 2 and 3 of the TRE) are needed. However, the permittee is still required to develop and submit a TRE report.

If existing controls are not adequate to meet WQBEL, the following question should be asked as the final step of Phase 1:

- f. Is there a request for modification of a WQBEL, time extensions or alternative water quality criteria?

If such request(s) have been submitted, FIGURES E-5 and E-6 should be referred to for a discussion of the evaluation of such requests.

2. Phase 2 - Source Inventory

The objective of Phase 2 is to identify potential sources of toxics which may be entering the municipal wastewater collection/conveyance system. The first question that must be answered regarding a source inventory is as follows:

- a. Is information presented to indicate that industrial and commercial sources have been identified, characterized and evaluated to locate the most likely sources of toxic pollutants?

Generally, there are two types of municipal permittees, those required to develop and implement a local pretreatment program as required under 40 CFR Part 403 and those not required to develop local pretreatment programs. Data regarding the discharge of toxic pollutants will be more readily available to those municipal permittees implementing a local pretreatment program.

As part of the implementation of a local pretreatment program, municipal permittees are required to annually update the list of industrial users subject to their program. Additionally, the permittee is required to monitor its industrial users once per year and industrial users are required to monitor wastewater discharges and report twice per year. In addition, newly promulgated revisions to the general pretreatment regulations require that a one-time report be submitted by industrial users, containing a list of the ultimate disposal methods of all hazardous wastes. These existing requirements for local pretreatment programs should result in an up-to-date and accurate source inventory of nondomestic users.

To verify the pretreatment program-related information provided as part of the source inventory, the annual reports submitted by the municipality, as well as the results of inspections (i.e., pretreatment program audits and pretreatment compliance inspections) conducted on the permittee's pretreatment program will be considered. Both of these sources should allow DEP to identify if source inventory identification problems exist.

In addition to the information already available as part of the local pretreatment programs or in the absence of a local program, DEP may access other sources of information which may reveal other industrial and commercial dischargers of pollutants. One such source is information

available pursuant to Section 313 of the Comprehensive Environmental Response, Compensation and Liabilities Act (CERCLA). The annual TRI contains data concerning releases of toxic substances to the environment including discharges to wastewater treatment plants (WWTPs) and to receiving waters.

There may be instances when industrial and commercial users are not the source of toxic pollutants to a municipal sewerage system. Therefore, the following question must be answered:

- b. Is information presented to indicate that other potential sources of toxic pollutants have been identified?

There are other potential sources of toxic pollutants that should be considered by municipal permittees, particularly if industrial/commercial users are not suspected as being the primary source of the toxic pollutants of concern. The permittee has the responsibility to consider all possible sources of toxic pollutants. The most likely other sources include:

- Waste and septage haulers.
- Municipal waste processing and disposal facilities
- Public water supply.
- Municipal WWTP operation and maintenance practices.
- Domestic sources.
- Stormwater via combined sewers.
- Infiltration/inflow.

Once the potential sources of toxic pollutants have been identified, municipal permittees are required to carry out a sampling survey to more accurately determine the nature and extent of toxic pollutants being discharged. Therefore, the following question must be answered:

- c. Has a sampling survey been performed to determine the nature and extent of toxics discharged to the municipal wastewater treatment system?

The results of the sampling survey should be reviewed to determine if the municipal permittee has adequately determined the nature and extent of the toxic pollutants being discharged to the municipal wastewater treatment system. During this review, it should be ensured that the permittee has monitored all potential sources of toxic pollutants.

3. Phase 3 - Pollutant Control Evaluation

The objective of Phase 3 is to identify the toxic pollutant control option(s) which best controls each of the regulated pollutants. Due to the number of potential sources of toxic pollutants, several types of control options could be considered by the permittee. All reasonable control options should have been considered by the permittee. This is especially important should the permittee state that no or limited control option(s) are available to control toxic pollutants. The questions

in this section reflect the control options that will most likely be considered by permittees.

- a. If an approved local pretreatment program exists, is its enhanced implementation discussed as a control option?

Where applicable, some permittees may consider toxic pollutants control through enhanced implementation of their local pretreatment program. This would be particularly effective should the results of Phase 2 - Source Inventory, indicate that the likely sources of toxic pollutants are either industrial or commercial dischargers. Although permittees required to develop and implement pretreatment programs should already be controlling discharges of toxic pollutants, there may be instances where the pretreatment program could be modified for better toxics removal including, for example, revisions of existing or development of new local limits. A specific example is that of the pretreatment program implemented by the town of Mt. Airy, North Carolina. In response to the presence of toxic pollutants that were causing NPDES permit violations, Mt. Airy required industrial users to cease discharging certain chlorinated hydrocarbons, phthalate compounds and alkyl phenol compounds, and some industries were required to optimize the use of process chemicals.

It should be cautioned that the permittee's NPDES permit already requires implementation of its pretreatment program. Therefore, a permittee's claim to enhance the implementation of the program may actually just highlight the fact that the current program is not properly implemented. For example, a permittee may state that it will begin issuing permits to each significant industrial user or include local discharge limits in permits. Since both of these options are already required by the general pretreatment regulations, they would not serve as an enhancement of the existing pretreatment program. Therefore, the permittee should present an analysis of the effectiveness of its local program. DEP's responsibility will be to evaluate this analysis. The following question must be answered:

- b. Is an analysis provided concerning significant industrial users, their compliance with applicable discharge standards (i.e., local limits and/or categorical pretreatment standards) and the impact this could have on toxic pollutant loadings to the municipal wastewater treatment system?

The purpose of the analysis of the extent of control of existing discharges is to determine the effectiveness of mechanisms already in place to control discharges of toxic pollutants. The result of this analysis may simply show that existing limitations on the sources of toxic pollutants should be an adequate control option. However, increased oversight of existing dischargers may be needed to ensure compliance with existing discharge limitations.

- c. Are local sewer use ordinances, codes and user control mechanisms (e.g., permits, contracts and discharge limits therein) discussed as a control option?

DEP should also ensure that the permittee considered the revision of local sewer use ordinances, existing and proposed contractual arrangements, for more effective control of toxic pollutants.

- d. As applicable, have other controls not associated with the municipal treatment system been considered as control options?

If waste haulers are identified as a potential source of toxic pollutants, the permittee should consider regulating them. Examples of possible controls include the institution of a permitting program and monitoring prior to allowing discharges, etc.

In situations where it appears that the municipal water supply system may be contributing to the exceedance of the discharge limitations, modifications to the operation of the water supply system should be considered for toxics control. For example, lead and copper are the typical toxic pollutants found in water supply systems in quantifiable concentrations. Through the implementation of local programs such as corrosion control, these pollutants may be reduced.

For the ubiquitous sources of toxic pollutants, institutional control options may be necessary. For example, in a number of areas across the nation (e.g., Las Vegas, Nevada and Largo, Florida) where diazinon, a common ingredient in pesticides, is being introduced indirectly via groundwater infiltration/inflow, stormwater infiltration and combined sewer systems to municipal discharges, the permittee may consider a heightened citizen awareness program on pesticides or a permitting system for sellers of such pesticides.

There may be instances where the control of toxic pollutants can be achieved at the municipal wastewater treatment plant. Therefore, the following question should be answered:

- e. Is the use of the wastewater treatment plant to remove toxics discussed as a control option?

As necessary, the permittee should consider the effectiveness of the municipal wastewater treatment facilities to remove toxic pollutants from the incoming wastewater. Through the installation of tertiary treatment or advanced treatment, some toxic pollutants can be reduced substantially. For example, Orange County, California reduced 1,1,1-trichloroethane by over 98 percent through the use of reverse osmosis after secondary treatment (activated sludge followed by lime and polymer-assisted clarification). Using this same treatment, 80 percent removal of naphthalene was achieved.

If one of the potential sources of toxic pollutants is the municipal wastewater treatment system itself, the following question should be answered:

- f. Has treatment process modification been considered as a control option for toxic pollutants?

The permittee should have considered modifications to the existing treatment system to control toxic pollutants, including:

- Operation and maintenance chemicals (odor-control chemicals, anti-foam agents, etc.), which may contribute toxics to plant effluent, should be reduced or eliminated.
- Disinfection practices which produce significant levels of chloroform and other chlorinated organics should be reviewed for possible modification.
- Modifications to handling of sludge digester supernatant (which may contain elevated levels of dissolved metals) should be evaluated for control of such toxics.

4. Phase 4 - TRE Report

When the permittee has completed Phases 1 through 3 of the TRE process, the requirement is to submit a report on the findings to DEP in accordance with the guidelines presented in APPENDIX C.

- a. Have three copies of the TRE report been submitted within 1 year of the permit issuance?

Three copies of the TRE report must be submitted within 1 year of permit issuance. The report should follow the format provided in FIGURE C-10, contain all required information and be submitted in triplicate. Upon receipt of the TRE report, DEP will review the report and determine compliance with the TRE requirements as outlined in the review checklist provided in FIGURE E-5. Additional questions that must be answered include:

- b. Is backup information presented for the feasibility and effectiveness of implementing particular options including advantages and disadvantages?

- c. Is the effluent quality expected to be achieved by implementing the proposed toxics treatment/control program presented and supported with technical reports and/or bench scale data?

During the review of the TRE report, DEP will carefully review the description of the options considered and chosen by the permittee for the control of the toxic pollutants including:

- Information on the feasibility and effectiveness of the control options considered.
- Advantages and disadvantages associated with the control options considered.
- Expected levels of the control options considered, substantiated through the use of technical reports, bench scale or pilot plant data.
- Choice(s) of control options.
- Discussion of the reasons for choosing the control option(s).
- A summary of the effluent quality considered achievable through implementation of the control measures selected.

- d. Is a program of toxics treatment/control proposed and a schedule of implementation presented?

The TRE report must also include a schedule for implementing the selected treatment or control measures. The schedule must include milestone dates of improvements and/or construction measures. The submitted schedule will provide for the completion of any structural and/or nonstructural wastewater management, treatment practices and/or regulatory options which will result in compliance with the water quality-based limitations by the end of the second year of the permit. The schedule must also provide for compliance with effluent limitations no later than 3 years after permit issuance. Additionally, the permittee must submit written periodic progress reports to DEP which detail the actions taken toward reaching the requirements set forth in the NPDES permit. These progress reports will be required until the permittee is in compliance with the effluent limits.

FIGURE E-4

Completeness Review Checklist for Industrial Wastewater TRE Reports

NPDES No. PA _____ Outfall Nos. _____, _____, _____, _____ Date ____/____/____

Permittee Name _____

Name of Facility _____

Toxics of Concern _____

Instructions: Indicate whether the following topics have been addressed by the TRE report. A negative response may suggest that the TRE is incomplete. Refer to the text in this guidance manual for further information on what must be included, at a minimum, in the various sections of a TRE report. Provide page numbers or sections where these items are addressed. If not addressed, indicate why not under "Comment."

PHASE 1 - EFFLUENT QUALITY REVIEW

1. Have representative effluent sampling data been submitted for all outfall locations? YES ☐ NO ☐

COMMENT:

2. Do the data presented in the report indicate compliance? YES ☐ NO ☐

COMMENT:

3. Is there a request for modification of water quality-based limitations, time extensions or alternative water quality criteria? YES ☐ NO ☐

COMMENT:

INDICATE: _____ Request for modification of WQBEL
_____ Request for time extension
_____ Request for alternative bioassay-based instream water quality criteria

PHASE 2 - PROCESSING ENGINEERING ANALYSIS

1. Does the report include a wastewater flow diagram? YES ☐ NO ☐

COMMENT:

2. Is sufficient rationale presented for all sampling locations (i.e., in-plant or end-of-pipe) and methods? YES ☐ NO ☐

COMMENT:

3. Is data presented to verify the presence or absence of the toxic pollutants of concern? YES ☐ NO ☐

COMMENT:

4. Are approved sampling and analytical procedures (i.e., 40 CFR Part 136 or as specified in the permit) used and discussed? YES ☐ NO ☐

COMMENT:

5. Have potential sources of the toxics of concern been listed via a raw material and chemical additives inventory? YES ☐ NO ☐

COMMENT:

6. Has a comparison of compounds listed in the material inventory with the regulated toxic pollutants been conducted and presented (in tabular form)? YES ☐ NO ☐

COMMENT:

7. Have all potential sources of toxic pollutants been identified? YES ☐ NO ☐

COMMENT:

PHASE 3 - POLLUTANT CONTROL EVALUATION

1. Were all possible in-plant control measures considered? YES ☐ NO ☐

INDICATE: _____ Waste Minimization
_____ Source Reduction
_____ Recycling and Reuse
_____ Good Housekeeping
_____ BMPs

COMMENT:

2. Were all available end-of-pipe treatment processes considered? YES ☐ NO ☐

COMMENT:

3. Is a pollutant control strategy summary sheet included? YES ☐ NO ☐

COMMENT:

PHASE 4 - TRE REPORT

1. Have three copies of the TRE report been submitted within 1 year of permit issuance? YES ☐ NO ☐

COMMENT:

2. Is backup information presented for the feasibility and effectiveness of implementing particular options, including advantages and disadvantages? YES ☐ NO ☐

COMMENT:

3. Is the effluent quality expected to be achieved by implementing the proposed toxics treatment/control program presented and supported with technical reports and/or bench scale data? YES ☐ NO ☐

COMMENT:

4. Is a program of toxics treatment/control proposed and a schedule of implementation presented? YES ☐ NO ☐

COMMENT:

FIGURE E-5

Completeness Review Checklist for Municipal Toxics Reduction Evaluation (TRE) Reports

NPDES No. PA _____ Outfall Nos. _____, _____, _____, _____ Date ____/____/____

Permittee Name _____

Name of Facility _____

Toxics of Concern _____

Instructions: Indicate whether the following topics have been addressed by the TRE report. A negative response may suggest that the TRE is incomplete. Refer to the text in this guidance for further information on what must be included, at a minimum, in the various sections of a TRE report. Provide page numbers or sections where these items are addressed. If not addressed, indicate why not under "Comment."

PHASE 1 - INFLUENT/EFFLUENT QUALITY REVIEW

1. Has a sampling been conducted to determine the levels of toxic pollutants entering and leaving the facility? YES ☐ NO ☐

COMMENT:

2. Is data presented to verify the presence or absence of the toxic pollutants of concern? YES ☐ NO ☐

COMMENT:

3. Are approved sampling and analytical procedures (i.e., 40 CFR Part 136 or as specified in the permit) used and discussed? YES ☐ NO ☐

COMMENT:

4. Has an evaluation of the fate of toxics entering the facility been performed and the results presented? YES ☐ NO ☐

COMMENT:

5. Does the data presented in the report indicate compliance? YES ☐ NO ☐

COMMENT:

6. Is there a request for modification of water quality-based limitations, time extensions or alternative water quality criteria? YES ☐ NO ☐

INDICATE: _____ Request for modification of WQBEL
_____ Request for time extension
_____ Request for alternative bioassay-based instream water quality criteria

COMMENT:

PHASE 2 - SOURCE INVENTORY

1. Is information presented to indicate that industrial and commercial sources have been identified, characterized and evaluated to locate the most likely sources of toxic pollutants? YES ☐ NO ☐

COMMENT:

2. Is information presented to indicate that other potential sources of toxic pollutants have been identified? YES ☐ NO ☐

INDICATE: _____ Waste and Septage Haulers
_____ Municipal Waste Processing and Disposal Facilities
_____ Public Water Supply
_____ POTW Operations and Maintenance Practices
_____ Domestic Sources
_____ Stormwater (combined sewers only)
_____ Infiltration and Inflow

COMMENT:

3. Has a sampling survey been performed to determine the nature and extent of toxics discharged to the municipal wastewater treatment system? YES ☐ NO ☐

COMMENT:

PHASE 3 - POLLUTANT CONTROL EVALUATION

1. If an approved local pretreatment program exists, is its enhanced implementation discussed as a control option? YES ☐ NO ☐

COMMENT:

2. Is an analysis provided concerning significant industrial users, their compliance status with applicable discharge standards (i.e., local limits and/or categorical pretreatment standards) and the impact this could have on toxic pollutant loadings to the municipal wastewater treatment system? YES ☐ NO ☐

COMMENT:

3. Are local sewer use ordinances, codes and user control mechanisms (e.g., permits, contracts and discharge limits therein) discussed as control options? YES ☐ NO ☐

COMMENT:

4. As applicable, have other controls not associated with the municipal treatment system been considered as control options? YES ☐ NO ☐

COMMENT:

5. Is the use of the wastewater treatment plant to remove toxics discussed as a control option? YES ☐ NO ☐

COMMENT:

6. Has treatment process modification been considered as a control option for toxic pollutants? YES ☐ NO ☐

INDICATE: _____ Operation and Maintenance Practices
_____ Disinfection Practices
_____ Sludge Handling Practices

COMMENT:

PHASE 4 - TRE REPORT

1. Have three copies of the TRE report been submitted within 1 year of permit issuance? YES ☐ NO ☐

COMMENT:

2. Is backup information presented for the feasibility and effectiveness of implementing particular options including advantages and disadvantages? YES ☐ NO ☐

COMMENT:

3. Is the effluent quality expected to be achieved by implementing the proposed toxics treatment/control program presented and supported with technical reports and/or bench scale data? YES ☐ NO ☐

COMMENT:

4. Is a program of toxics treatment/control proposed and a schedule of implementation presented? YES ☐ NO ☐

COMMENT:

FIGURE E-6

Completeness Review Checklist for 25 Pa. Code § 95.4 Time Extension Requests

NPDES No. PA _____ Outfall Nos. _____, _____, _____, _____ Date ____/____/____

Permittee Name _____

Name of Facility _____

Toxics of Concern _____

Instructions: Indicate whether the following topics have been addressed by the TRE report. A negative response may suggest that the permittee does not qualify for a 25 Pa. Code § 95.4 time extension. Refer to APPENDIX D - Guidance for Obtaining 25 Pa. Code § 95.4 Extension of Time to Achieve WQBEL, for further guidance on what must be included, as a minimum, in the various sections of a 25 Pa. Code § 95.4 request. Provide page numbers or sections where these items are addressed. If the items are not addressed, indicate why not under "Comment."

DATE OF DISCHARGER'S EXISTENCE

1. Does the permittee indicate the date on which its discharge originated? YES ☐ NO ☐

COMMENT:

2. Is the date prior to promulgation of the applicable water quality standard? YES ☐ NO ☐

COMMENT:

3. Is the date prior to the NSPS effective date for the industrial category? YES ☐ NO ☐

COMMENT:

POLLUTANT SUBJECT TO EFFLUENT STANDARDS OR PROHIBITIONS

1. Are any of the toxic pollutants for which an extension has been requested subject to EPA Toxic Pollutant Effluent Standards (40 CFR Part 129)? YES ☐ NO ☐

COMMENT:

HISTORY OF NONCOMPLIANCE

1. Does the description of the permittee compliance history indicate a history of continued compliance with all permits issued by DEP? YES ☐ NO ☐

COMMENT:

2. Is the description consistent with your knowledge of the permittee's compliance history? YES ☐ NO ☐

COMMENT:

INSTALLATION OF BAT AND BCT TECHNOLOGIES

1. Has the permittee installed BAT/BCT treatment technologies? YES ☐ NO ☐

COMMENT:

If no, will existing treatment technologies meet the equivalent treatment of the applicable BAT/BCT technology? YES ☐ NO ☐

COMMENT:

BDT INSTALLATION

1. Has the permittee made all efforts to determine BDT and provided a description of these efforts? YES ☐ NO ☐

COMMENT:

2. Is the selected BDT at least as advanced in terms of toxic pollutant treatment as the applicable BAT/BCT and BDT for the applicable category? YES ☐ NO ☐

COMMENT:

3. Will the selected BDT ensure compliance with water quality-based limitations? YES ☐ NO ☐

COMMENT:

APPENDIX F

Water-Effect Ratio (WER) and Metals Translator Guidance Documents

Guidance Document Title	Document #	Web link
Interim Guidance on Interpretation and Implementation of Aquatic Life Criteria for Metals	EPA-821-R-92-009 (February 1994)	on EPA's website at: http://www.epa.gov/waterscience/library/wqstandards/ratiomemo.pdf or in Appendix L of the EPA Water Quality Standards Handbook (2nd Edition) at: http://www.epa.gov/waterscience/standards/handbook/handbookappxL.pdf
Modifications to "Interim Guidance on Determination and Use of Water-Effect Ratios for Metals" and EPA's "Recalculation Procedure when Deriving Site-Specific Criteria"	EPA Office of Water memo, December 3, 1997	on EPA's website at: http://www.epa.gov/ost/library/wqstandards/modif-int-wer.pdf
Streamlined Water-Effect Ratio Procedure for Discharges of Copper	EPA-822-R-01-005 (March 2001)	on EPA's website at: http://www.epa.gov/waterscience/criteria/copper/copper.pdf
The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From A Dissolved Criterion	EPA 823-B-96-007 (June 1996)	on EPA's website at: http://www.epa.gov/ostwater/guidance.pdf

These and many other WQS Policy Guidance documents are available at EPA's Water Quality Standards online Reference Library at: <http://www.epa.gov/ost/library/wqstandards/> or <http://www.epa.gov/waterscience/standards/policy.htm> or at EPA's complete index of the Office of Water publications at: <http://yosemite.epa.gov/water/owrccatalog.nsf/EPATitle?OpenView&CartID=12580-091527>