EPA United States Environmental Protection Agency

Technical Support Document for the Preliminary 2008 Effluent Guidelines Program Plan

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TABLE OF CONTENTS

Page

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

LIST OF TABLES

Page

LIST OF TABLES (Continued)

Page

LIST OF TABLES (Continued)

Page

LIST OF FIGURES

Page

LIST OF ACRONYMS

ACC	American Chemistry Council
ACWA	Airport Clean Water Alliance
API	American Petroleum Institute
BAT	Best available technology economically achievable
Bbl	Barrel
Bcfd	Billion cubic feed per day
BCT	Best conventional pollutant control technology
BMP	Best management practice
BNR	Biological treatment with nutrient removal
BOD_5	Biochemical oxygen demand
BPJ	Best professional judgment
BPT	Best practicable pollutant control technology currently available
CAFOs	Concentrated animal feeding operations
CAS	Chemical Abstracts Service
CBM	Coalbed methane
CCH	Chlorine and chlorinated hydrocarbons
CDDs	Polychlorinated dibenzo-p-dioxins
CDFs	Polychlorinated dibenzofurans
CFPR	Chemical formulation, packaging, and repackaging
CFR	Code of Federal Regulations
CMOM	Capacity, management, operations, and maintenance
CMP	Code of Management Practices
COD	Chemical oxygen demand
CSO	Combined sewer overflow
CWA	Clean Water Act
CWT	Centralized waste treaters
DAP	Diammonium phosphate
DCN	Document control number
DMR	Discharge monitoring report
DOE	Department of Energy
EAD	Engineering Analysis Division
EC	Electrical conductivity
EDC	Endocrine disrupting compound
EDS	Effluent data statistics
EIA	Energy Information Administration
ELGs	Effluent limitations guidelines and standards
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community-Right-to-Know Act
FERC	Federal Energy Regulatory Commission
FOG	Fats, oil, and grease
HAP	Hazardous air pollutant
HCB	Hexachlorobenzene
HpCDD	Heptachlorodibenzo-p-dioxin
HpCDF	Heptachlorodibenzofuran
HxCDD	Hexachlorodibenzo-p-dioxin
HxCDF	Hexachlorodibenzofuran

LIST OF ACRONYMS (Continued)

ICDC	Industrial container and drum cleaning
ICR	Information collection request
IMCC	Interstate Mining Compact Commission
LNG	Liquefied natural gas
MAP	Monoammonium phosphate
MCES	Metropolitan Council of Environmental Services
Mcf	Million cubic feed
MGD	Million gallons per day
MGY	Million gallons per year
ML	Minimum level
MMBtu	Million British thermal units
MSD	Metropolitan Sewerage District of Greater Cincinnati
MSGP	Multi-sector general permit
NACWA	National Association of Clean Water Agencies
NAICS	North American Industry Classification System
NCASI	National Council for Air and Stream Improvement
NACWA	National Association of Clean Water Agencies
NEC	Not elsewhere classified
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFMM	Nonferrous metals manufacturing
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of intent
NOIA	National Ocean Industries Association
NPDES	National Pollutant Discharge Elimination System
NRDC	National Resources Defense Council
NSPS	New sources pollutant standards
OAQPS	Office of Air Quality Planning and Standards
OCDD	Octachlorodibenzo-p-dioxin
OCDF	Octachlorodibenzofuran
OCPSF	Organic chemicals, plastics, and synthetic fibers
OECA	Office of Enforcement and Compliance Assurance
OMB	Office of Management and Budget
ORV	Open rack vaporizers
OSMRE	Office of Surface Mining and Regulatory Enforcement
OSW	Office of Solid Waste
PAC	Polycyclic aromatic compound
PBST	Petroleum bulk station terminals
PBT	Persistent bioaccumulative toxic
PCBs	Polychlorinated biphenyls
PCS	Permit Compliance System
PCSLoads	EPA database estimating annual pollutant loads based on PCS data
PDS	Preliminary data summary
PE	Porcelain enameling
PeCDD	Pentachlorodibenzo-p-dioxin
PeCDF	Pentachlorodibenzofuran
PHC	Probable hydrologic consequences
PMF	Plastics molding and forming

LIST OF ACRONYMS (Continued)

POTW	Publicly-owned treatment works
PSES	Pretreatment standards for existing sources
PSNS	Pretreatment standards for new sources
PVC	Polyvinyl chloride
RIPA	Reusable Industrial Packaging Association
SAR	Sodium adsorption ratio
SBA	Small Business Administration
SCV	Submerged combustion vaporizer
SIC	Standard Industrial Classification
SIU	Significant industrial user
SMCRA	Surface Mining Control and Reclamation Act
SSO	Sanitary sewer overflow
TCDD	Tetrachlorodibenzo-p-dioxin
TCDF	Tetrachlorodibenzofuran
TCEQ	Texas Commission on Environmental Quality
TCF	Trillion cubic feet
TDD	Technical development document
TDS	Total dissolved solids
TEC	Transportation equipment cleaning
TEF	Toxic equivalency factor
TEQ	Toxic equivalent
TMDL	Total maximum daily load
TOC	Total organic carbon
TRC	Total residual chlorine
TRI	Toxic Release Inventory
TRIReleases	EPA database estimating annual pollutant loads based on TRI data.
TRSA	Textile Rental Service Association
TSD	Technical support document
TSS	Total suspended solids
TTB	U.S. Alcohol and Tobacco Tax and Trade Bureau
TWF	Toxic weighting factor
TWPE	Toxic-weighted pound equivalent
UIC	Underground injection control
USCG	U.S. Coast Guard
UTSA	Uniform and Textile Service Association
VCM	Vinyl chloride monomer

This document provides the data supporting the preliminary 2008 Effluent Guidelines Program Plan. It presents the methodology used to perform the reviews of industrial discharges required by the Clean Water Act and the results of the reviews.

1.0 BACKGROUND

This section explains how the Effluent Guidelines Program fits into the CWA Program, describes the general and legal background of the Effluent Guidelines Program, and describes EPA's process for making effluent guidelines revision and development decisions (i.e., effluent guideline planning).

1.1 EPA's Clean Water Act Program

EPA's Office of Water is responsible for developing the programs and tools authorized under the CWA, which provides EPA and the states with a variety of programs and tools to protect and restore the Nation's waters. These programs and tools generally rely either on water-quality-based controls, such as water quality standards and water-quality-based permit limitations, or technology-based controls such as effluent guidelines and technology-based permit limitations.

The CWA gives states the primary responsibility for establishing, reviewing, and revising water quality standards. These consist of designated uses for each water body (e.g., fishing, swimming, supporting aquatic life), numeric pollutant concentration limits ("criteria") to protect those uses, and an antidegradation policy. EPA develops national criteria for many pollutants, which states may adopt or modify as appropriate to reflect local conditions. In a parallel track to water quality standards, EPA also develops technology-based effluent limitation guidelines and standards, which are factor-based regulations that provide effluent limits based on current available technologies. These limits are then incorporated into technology-based permits. While technology-based permits may, in fact, result in meeting state water quality standards, the effluent guidelines program is not specifically designed to ensure that the discharge from each facility meets the water quality standards for that particular water body. For this reason, the CWA also requires states to establish water-quality-based permit limitations, where necessary to attain and maintain water quality standards, that require industrial facilities to meet requirements that are more stringent than those in a national effluent guideline regulation. Consequently, in the overall context of the CWA, effluent guidelines must be viewed as one tool in the broad arsenal of tools Congress provided to EPA and the states to protect and restore the Nation's water quality.

1.2 Background on the Effluent Guidelines Program

The 1972 CWA marked a distinct change in Congress's efforts "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." See CWA § 101(a), 33 U.S.C. § 1251(a). Prior to 1972, the CWA relied on "water quality standards." This approach was challenging, however, because it was very difficult to prove that a specific discharger was responsible for decreasing the water quality of its receiving stream.

Since 1972, the CWA has directed EPA to promulgate effluent guidelines that reflect pollutant reductions that can be achieved by categories or subcategories of industrial point sources. The effluent guidelines are based on specific technologies (including process changes) that EPA identifies as meeting the statutorily prescribed level of control. See CWA sections 301(b)(2), 304(b), 306, 307(b), and 307(c). Unlike other CWA tools, effluent guidelines are national in scope and establish pollution control obligations for all facilities that discharge wastewater within an industrial category or subcategory. In establishing these controls, EPA assesses: (1) the performance and availability of the best pollution control technologies or pollution prevention practices that are available for an industrial category or subcategory as a whole; (2) the economic achievability of those technologies, which can include consideration of costs, effluent reduction benefits, and affordability of achieving the reduction in pollutant discharge; (3) non-water-quality environmental impacts (including energy requirements), and (4) such other factors as the Administrator deems appropriate.

Creating a single national pollution control requirement for each industrial category based on the best technology the industry could afford was seen by Congress as a way to reduce the potential creation of "pollution havens" and to set the Nation's sights on attaining the highest possible level of water quality. Consequently, EPA's goal in establishing national effluent guidelines is to assure that industrial facilities with similar characteristics, regardless of their location or the nature of their receiving water, will at a minimum meet similar effluent limitations representing the performance of the best pollution control technologies or pollution prevention practices.

Unlike other CWA tools, effluent guidelines also provide the opportunity to promote pollution prevention and water conservation. This may be particularly important in controlling persistent, bioaccumulative, and toxic pollutants discharged in concentrations below analytic detection levels. Effluent guidelines also control pollutant discharges at the point of discharge from industrial facilities and cover discharges directly to surface water (direct discharges) and discharges to publicly-owned treatment works (POTWs) (indirect discharges). For industrial dischargers to POTWs, this can have the added benefit of preventing the untreated discharge of pollutants to groundwater from leaking sewer pipes or to surface waters due to combined sewer overflows. Consequently, another of EPA's goals with the effluent guidelines program is to explore all opportunities for pollution prevention and water conservation.

1.3 What are Effluent Guidelines and Pretreatment Standards?

The national clean water industrial regulatory program is authorized under sections 301, 304, 306 and 307 of the CWA and is founded on six core concepts.

1. The program is designed to address specific industrial categories. To date, EPA has promulgated effluent guidelines that address 56 categories — ranging from manufacturing industries such as petroleum refining to service industries such as centralized waste treatment.

2. National effluent guideline regulations typically specify the maximum allowable levels of pollutants that may be discharged by facilities within an industrial category or subcategory. While the limits are based on the performance of specific technologies, they do not generally require the industry to use these technologies, but rather allow the industry to use any effective alternatives to meet the numerical pollutant limits.

3. Each facility within an industrial category or subcategory must generally comply with the applicable discharge limits — regardless of its location within the country or on a particular water body. See CWA section 307(b) and (c) and CWA section 402(a)(1). The regulations, therefore, constitute a single, standard, pollution control obligation for all facilities within an industrial category or subcategory.

4. In establishing national effluent guidelines for pollutants, EPA considers various factors, as described in Section 1.2, including: (1) the performance of the best pollution control technologies or pollution prevention practices that are available for an industrial category or subcategory as a whole; and (2) the economic achievability of the technologies, which can include consideration of costs, benefits, and affordability of achieving the reduction in pollutant discharge.

5. National regulations apply to four types of facilities within an industrial category: 1) existing facilities that discharge directly to surface waters (direct discharges); 2) existing facilities that discharge to POTWs (indirect dischargers); and 3) newly constructed facilities (new sources) that discharge to surface waters either directly 4) or indirectly.

6. The CWA section 304(b) requires EPA to conduct an annual review of existing effluent guidelines and, if appropriate, to revise these regulations to reflect changes in the industry and/or changes in available pollution control technologies.

The CWA directs EPA to promulgate effluent limitations guidelines and standards through six levels of control: BPT, BAT, BCT, NSPS, PSES, and PSNS. For point sources that discharge pollutants directly into the waters of the United States (direct dischargers), the limitations and standards promulgated by EPA are implemented through National Pollutant Discharge Elimination System (NPDES) permits. See CWA sections 301(a), 301(b), and 402. For sources that discharge to POTWs (indirect dischargers), EPA promulgates pretreatment standards that apply directly to those sources and are enforced by POTWs and state and federal authorities. See CWA sections 307(b) and (c). Figure 1-1 illustrates the relationship between the regulation of direct and indirect dischargers.

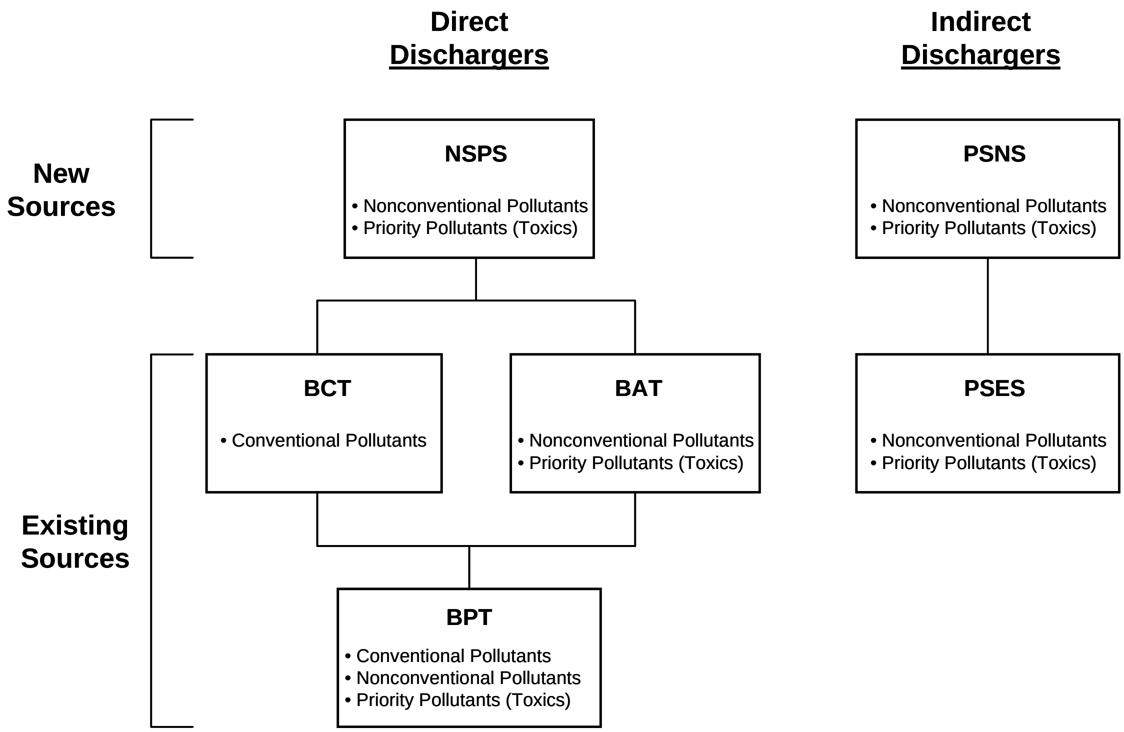


Figure 1-1. Regulations of Direct and Indirect Wastewater Discharges Under NPDES

1.3.1 Best Practicable Control Technology Currently Available (BPT) – CWA Sections 301(b)(1)(A) & 304(b)(1)

EPA develops effluent limitations based on BPT for conventional, toxic, and nonconventional pollutants. Section 304(a)(4) designates the following as conventional pollutants: biochemical oxygen demand (BOD_5), total suspended solids, fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. The Administrator designated oil and grease as an additional conventional pollutant on July 30, 1979. See 44 FR 44501 (July 30, 1979). EPA has identified 65 pollutants and classes of pollutants as toxic pollutants, of which 126 specific substances have been designated priority toxic pollutants. See Appendix A to part 423, reprinted after 40 CFR Part 423.17. All other pollutants are considered to be nonconventional.

In specifying BPT, EPA looks at a number of factors. EPA first considers the total cost of applying the control technology in relation to the effluent reduction benefits. The Agency also considers the age of the equipment and facilities, the processes employed and any required process changes, engineering aspects of the control technologies, non-water-quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate. See CWA Section 304(b)(1)(B). Traditionally, EPA establishes BPT effluent limitations based on the average of the best performances of facilities within the industry of various ages, sizes, processes or other common characteristics. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the Agency determines that the technology can be practically applied.

1.3.2 Best Conventional Pollutant Control Technology (BCT) – CWA Sections 301(b)(2)(E) & 304(b)(4)

The 1977 amendments to the CWA required EPA to identify effluent reduction levels for conventional pollutants associated with BCT for discharges from existing industrial point sources. In addition to the other factors specified in Section 304(b)(4)(B), the CWA requires that EPA establish BCT limitations after consideration of a two-part "cost-reasonableness" test. EPA explained its methodology for the development of BCT limitations in 1986.; see 51 FR 24974 (July 9, 1986).

1.3.3 Best Available Technology Economically Achievable (BAT) – CWA Sections 301(b)(2)(A) & 304(b)(2)

For toxic pollutants and nonconventional pollutants, EPA promulgates effluent guidelines based on BAT. See CWA Section 301(b)(2)(C), (D) & (F). The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the process employed, potential process changes, non-water-quality environmental impacts, including energy requirements, and other such factors as the EPA Administrator deems appropriate. See CWA Section 304(b)(2)(B). The technology must also be economically achievable. See CWA Section 301(b)(2)(A). The Agency retains considerable discretion in assigning the weight it accords to these factors. BAT limitations may be based on effluent reductions attainable through changes in a facility's processes and operations. Where existing performance is uniformly inadequate, BAT may reflect a higher level of performance than is currently being achieved within a particular subcategory based on technology transferred from a different subcategory or category. BAT may be based upon process changes or internal controls, even when these technologies are not common industry practice.

1.3.4 New Source Performance Standards (NSPS) – CWA Section 306

NSPS reflect effluent reductions that are achievable based on the best available demonstrated control technology. New sources have the opportunity to install the best and most efficient production processes and wastewater treatment technologies. As a result, NSPS should represent the most stringent controls attainable through the application of the best available demonstrated control technology for all pollutants (i.e., conventional, nonconventional, and priority pollutants). In establishing NSPS, EPA is directed to take into consideration the cost of achieving the effluent reduction and any non-water-quality environmental impacts and energy requirements.

1.3.5 Pretreatment Standards for Existing Sources (PSES) – CWA Section 307(b)

PSES apply to indirect dischargers, and are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs, including sludge disposal methods at POTWs. Pretreatment standards are technology-based and are analogous to BAT effluent limitations guidelines.

The General Pretreatment Regulations, which set forth the framework for implementing national pretreatment standards, are found at 40 CFR Part 403.

1.3.6 Pretreatment Standards for New Sources (PSNS) – CWA Section 307(c)

Like PSES, PSNS apply to indirect dischargers, and are designed to prevent the discharges of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs. PSNS are to be issued at the same time as NSPS. New indirect dischargers have the opportunity to incorporate into their plants the best available demonstrated technologies. The Agency considers the same factors in promulgating PSNS as it considers in promulgating NSPS.

1.4 Success of EPA's Effluent Guidelines Program

The effluent guidelines program has helped reverse the water quality degradation that accompanied industrialization in this country. Permits developed using the technology-based industrial regulations are a critical element of the Nation's clean water program and reduce the discharge of pollutants that have serious environmental impacts, including pollutants that:

- Kill or impair fish and other aquatic organisms;
- Cause human health problems through contaminated water, fish, or shellfish; and
- Degrade aquatic ecosystems.

EPA has issued effluent guidelines for 56 industrial categories and these regulations apply to between 35,000 and 45,000 facilities that discharge directly to the Nation's waters, as well as another 12,000 facilities that discharge to POTWs. These regulations have prevented the discharge of more than 1.2 billion pounds of toxic pollutants each year.

1.5 What Are EPA's Effluent Guidelines Planning and Review Requirements?

The CWA also requires EPA to annually review existing effluent guidelines. EPA reviews all point source categories subject to existing effluent guidelines and pretreatment standards to identify potential candidates for revision, as required by CWA sections 304(b), 301(d), 304(g) and 307(b). EPA also reviews industries consisting of direct discharging facilities not currently subject to effluent guidelines to identify potential candidates for effluent guidelines rulemakings, as required by CWA section 304(m)(1)(B). Finally, EPA reviews industries consisting entirely or almost entirely of indirect discharging facilities that are not currently subject to pretreatment standards to identify potential candidates for pretreatment standards development, as required by CWA sections 304(g) and 307(b). CWA section 304(m) requires EPA to publish an effluent guidelines program plan every two years. As part of the development of this plan, the public is provided an opportunity to comment on a "preliminary" plan before it is finalized. EPA publishes the preliminary plan on a two-year schedule followed by the final effluent guidelines program plan in the succeeding years. The preliminary plan is published in odd-numbered years and the final plan is published in even-numbered years.

2.0 PUBLIC COMMENTS ON FINAL EFFLUENT GUIDELINES PROGRAM PLAN FOR 2006

EPA published the final 2006 Plan in the Federal Register on December 21, 2006 (71 FR 76644). This notice presented EPA's final 2006 Effluent Guidelines Program Plan, as well as a description of EPA's review process. The Federal Register notice also presented: (1) the results of the Agency's 2006 annual review of existing effluent guidelines and pretreatment standards; (2) the results of the Pulp, Paper, and Paperboard; Steam Electric Power Generation, and Tobacco Products studies; (3) a response to public comments received on the preliminary Plan; and (4) the industrial sectors identified for more focused detailed review during the 2007/2008 reviews. EPA did not identify any new or existing industrial categories for effluent guidelines rulemaking in the final 2006 Plan. However, EPA identified the following four industrial categories for detailed studies in its 2007/2008 annual reviews: Steam Electric Power Generating, Coal Mining, Oil and Gas Extraction (specifically to assess whether to revise existing limits to include Coalbed Methane Extraction as a new subcategory), and the Health Services Industry.

EPA requested comments on various aspects of its analyses, data, and information to inform its 2007 annual review and the four detailed studies. EPA received four comments on the final 2006 Plan located in EPA Docket Number EPA-HQ-OW-2006-0771 (Available at: http://www.regulations.gov). This section provides background information on the four commenters and their issues. See Table 2-1.

Table 2-1. Comments on the Preliminary 2006 and Final 2004 Effluent Guidelines Program Plans
EPA Docket Number: EPA-HQ-OW-2006-0771 (http://www.regulations.gov)

No.	Commenter Name	EPA E-Docket No.	Comment Summary
1	Gregory E. Conrad Interstate Mining Compact Commission (IMCC)	0002	General comments in favor of the Coal Mining Detailed Study. Recommends that EPA focus on a review of manganeses effluent guidelines and not focus on those pollutants not currently regulated by the Coal Mining effluent guidelines (e.g., sulfates, chlorides and TDS).
2	William J. Walsh Pepper Hamilton, LLP (American Dental Association)	0003	General comments on the Health Services Detailed Study. Recommends that EPA collect more data and conduct additional analyses before requiring the universal and mandatory use of amalgam separators.
3	Beverly B. Head Metropolitan Sewer District of Greater Cincinnati, Ohio	0004	Provides information for the Health Services Detailed Study. States that, "the District's history with the Health Services Industry is that this group generally complies with all local limits for metals and organics. However, pH noncompliance does occur and appears to be tied to integrated laundries and laboratories serving the industry."
4	Joseph Pizarchik, PA Department of Environmental Protection, Bureau of Mining and Reclamation	0005	General comments in favor of the Coal Mining Detailed Study. States that, "if the current standards are not necessary for protection of public health and the environment, they are posing an undue burden on The Commonwealth of Pennsylvania and anyone else who is responsible for treating mine drainage."

3.0 THE EFFLUENT GUIDELINES PLANNING PROCESS

This section provides a general overview of the EPA's effluent guidelines and standards (ELGs) planning process. This process consists of: (1) annual review of existing ELGs to identify candidates for revision; (2) identification of new categories of direct dischargers for possible development of effluent guidelines; and (3) identification of new categories of indirect dischargers for possible development of pretreatment standards. Each of these components is illustrated in Figure 3-1 and discussed below.

3.1 Goals of the ELG Planning Process

In the effluent guideline planning process, EPA is guided by the following goals:

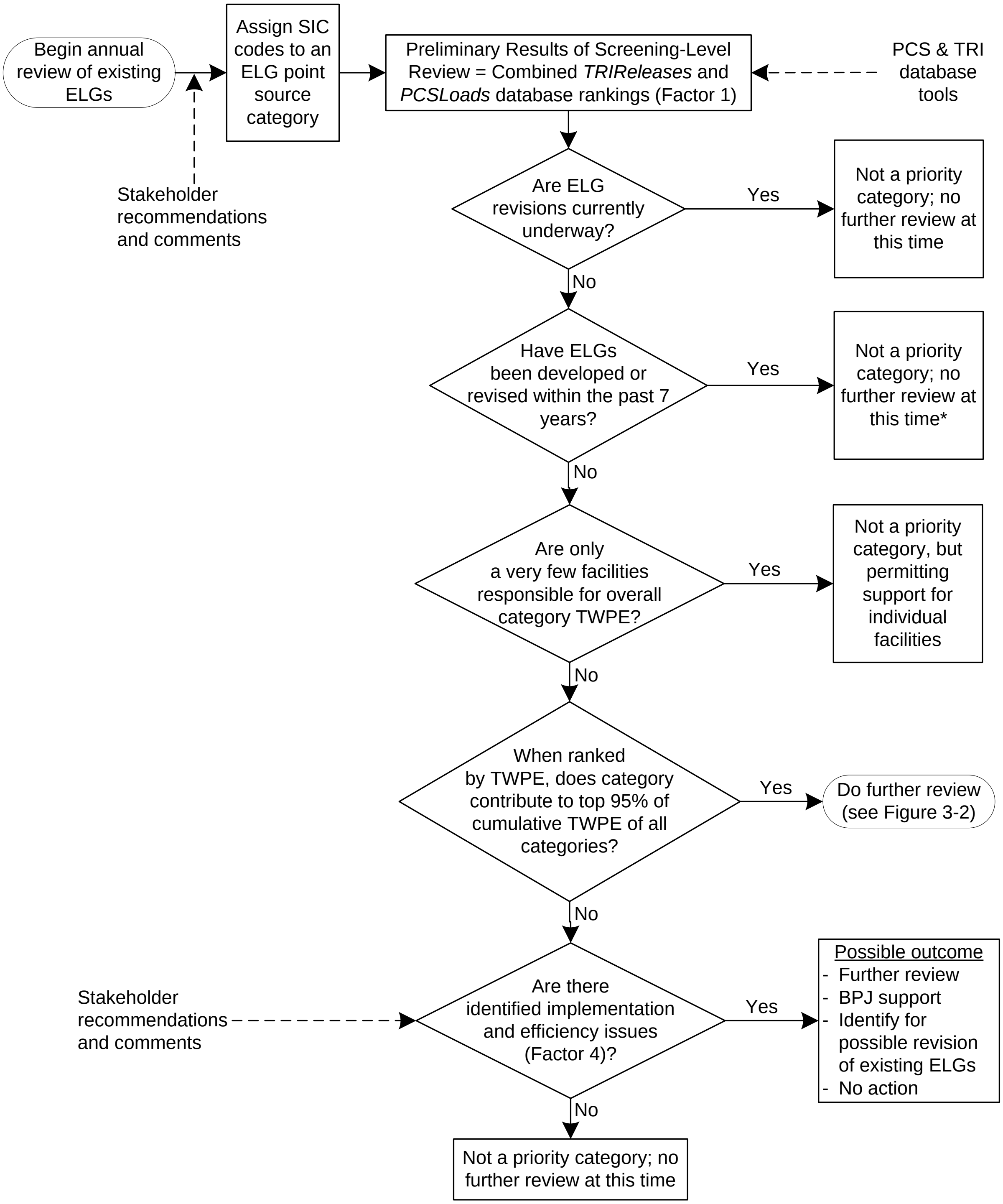
- Restore and maintain the chemical, physical, and biological integrity of the Nation's waters; and
- Provide transparent decision-making and involve stakeholders early and often during the planning process.

3.2 Annual Review of Existing Effluent Guidelines and Pretreatment Standards

This section describes the four factors used (Section 3.2.1) and how they are used (Section 3.2.2) in the annual review of existing effluent guidelines and pretreatment standards.

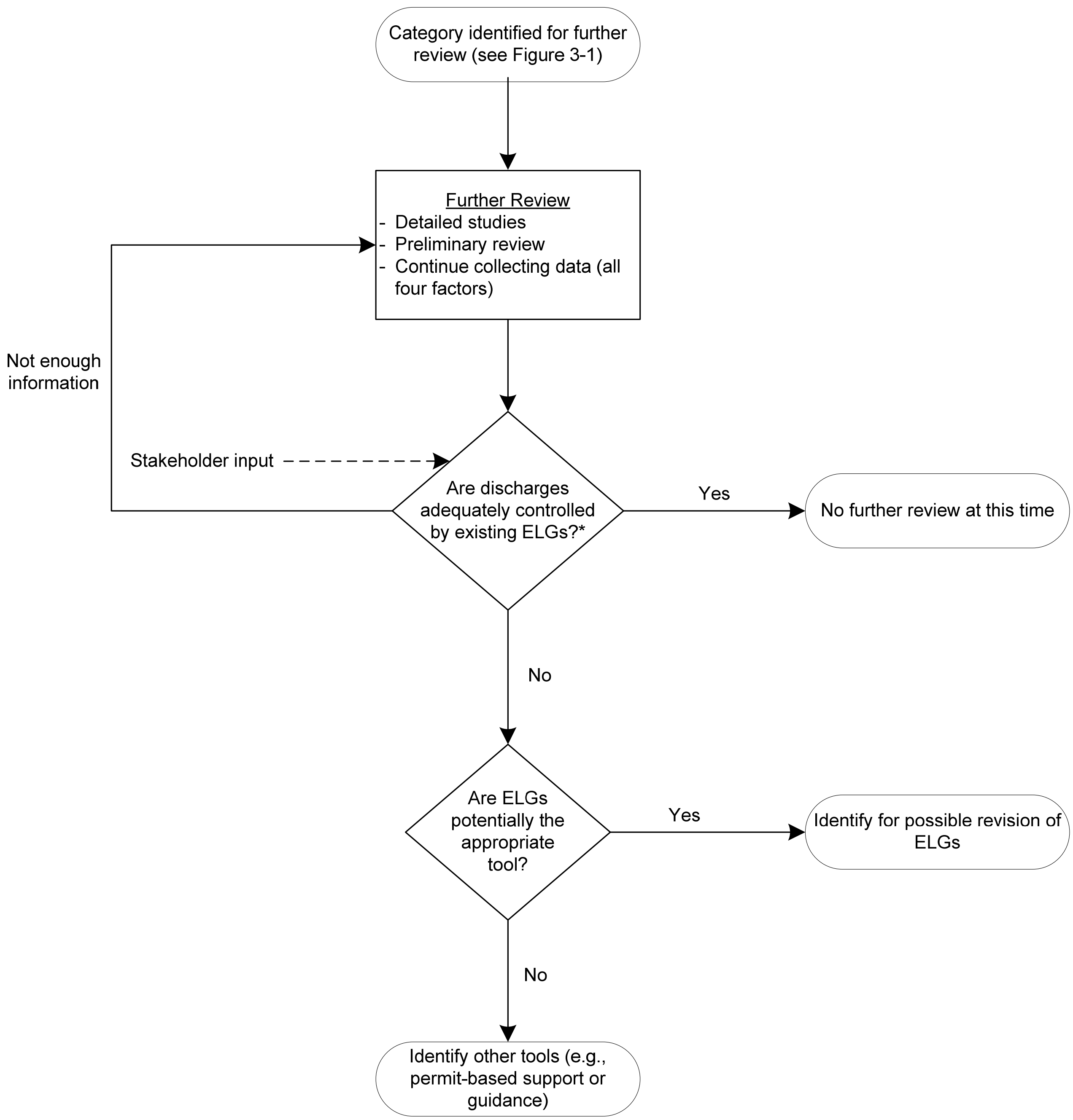
3.2.1 Factors Considered in Review of Existing Effluent Guidelines and Pretreatment Standards

EPA uses four major factors in prioritizing existing effluent guidelines or pretreatment standards for possible revision.



*If EPA is aware of new segment growth within such a category or new concerns are identified, EPA may do further review.

Figure 3-1. Flow Chart of Annual Review of Existing ELGs



*Continue further review if not enough data.

Figure 3-2. Flow Chart of Further Review of Existing ELGs

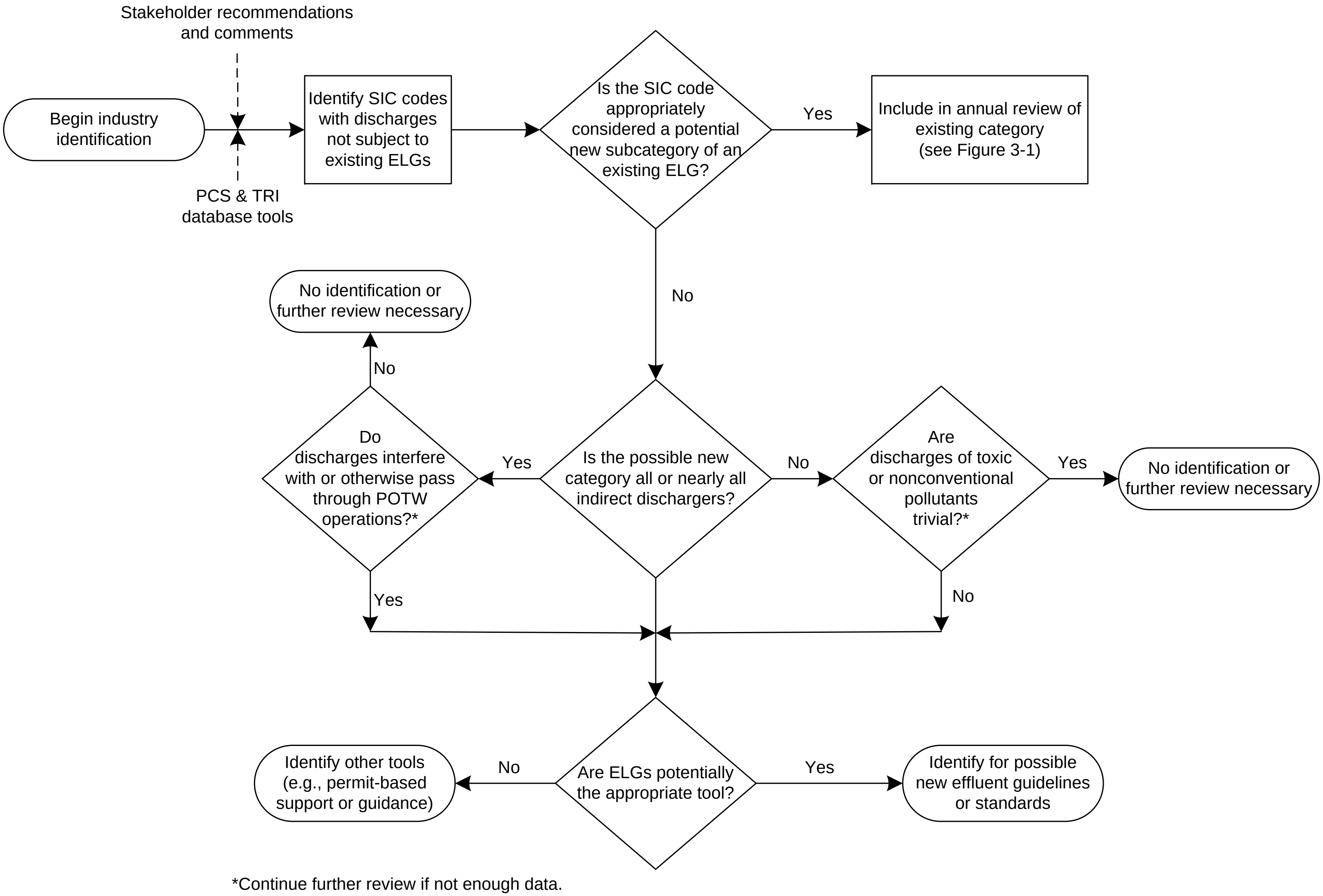


Figure 3-3. Flow Chart of Identification of Possible New ELGs

The first factor EPA considers is the amount and type of pollutants in an industrial category's discharge, and the relative hazard posed by that discharge. This enables the Agency to set priorities for rulemaking to achieve the greatest environmental and health benefits. EPA estimates the toxicity of pollutant discharges in terms of toxic-weighted pound equivalents (TWPE), discussed in detail in Section 4.1.3. To assess the effectiveness of pollution control, EPA examines the removal of pollutants, in terms of pounds and TWPE.

The second factor EPA considers is the performance and cost of applicable and demonstrated wastewater treatment technologies, process changes, or pollution prevention alternatives that could effectively reduce the pollutants in the industrial category's wastewater and, consequently, reduce the hazard to human health or the environment associated with these pollutant discharges.

The third factor EPA considers is the affordability or economic achievability of the wastewater treatment technology, process change, or pollution prevention measures identified using the second factor. If the financial condition of the industry indicates that it would be difficult to implement new requirements, EPA might conclude that it would be more cost-effective to develop less expensive approaches to reducing pollutant loadings that would better satisfy applicable statutory requirements.

The fourth factor EPA considers is an opportunity to eliminate inefficiencies or impediments to pollution prevention or technological innovation, or opportunities to promote innovative approaches such as water quality trading, including within-plant trading. This factor might also prompt EPA, during an annual review, to decide against identifying an existing set of effluent guidelines or pretreatment standards for revision where the pollutant source is already efficiently and effectively controlled by other regulatory or nonregulatory programs.

3.2.2 Overview: Review of Existing Point Source Categories

EPA has established ELGs to regulate wastewater discharges from 56 point source categories and 450 subcategories. EPA must annually review the ELGs for all of these categories and subcategories. EPA first does a screening-level review of all categories subject to existing ELGs. EPA then conducts further review of categories prioritized as a result of the screening level review. This further review consists of either an in-depth "detailed study" or a somewhat less detailed "preliminary category review." Based on this further review, EPA identifies existing categories for potential ELGs revision.

3.2.2.1 Screening-Level Review

The screening-level review is the first step in EPA's annual review. Section 4.0 provides details on the database methodology used in the screening-level review. EPA uses this step to prioritize categories for further review. In conducting the screening-level review, EPA considers the amount and toxicity of the pollutants in a category's discharge and the extent to which these pollutants pose a hazard to human health or the environment (Factor 1).

EPA conducts its screening-level review with data from TRI and PCS. The *Quality Assurance Project Plan for the 2007 Annual Screening-Level Analysis of TRI and PCS Industrial Category Discharge Data* describes the quality objectives EPA used with the TRI and PCS data in more detail (ERG, 2007). TRI and PCS do not list the effluent guideline(s) applicable to a particular facility. However, they both include information on a facility's Standard Industrial Classification (SIC) code. Therefore, the first step in EPA's screening-level review is to assign each SIC code to an industrial category[1]. EPA then uses the information reported in TRI and PCS, for a specified year, in combination with toxic weighting factors (TWFs)[2] to calculate the total discharge of toxic and nonconventional pollutants (reported in units of toxic-weighted pound equivalent or TWPE) for each facility in a category for that year. For indirect dischargers, EPA adjusts this facility-specific value to account for removals at the POTW. EPA then sums the TWPE for each facility in a category to calculate a total TWPE per category for that year. EPA calculates two TWPE estimates for each category: one based on data in TRI and one based on data in PCS. EPA then combines the estimated discharges of toxic and nonconventional pollutants calculated from the TRI and PCS databases to estimate a single TWPE value for each industrial category. EPA takes this approach because it has found that

[1] For more information on EPA's assignment of each SIC code to an industrial category, see Section 5.0 of the *2005 Annual Screening-Level Analysis Report* (U.S. EPA, 2005).
[2] For more information on Toxic Weighting Factors, see *Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process* (U.S. EPA, 2006).

combining the TWPE estimates from the TRI and PCS databases into a single TWPE number offers a clearer perspective of the industries with the most toxic pollution[3].

EPA then ranks point source categories according to their total TWPE discharges. In identifying categories for further review, EPA prioritizes categories accounting for 95 percent of the cumulative TWPE from the combined databases. (See Section 5.3). EPA also excludes from further review categories for which effluent guidelines had been recently promulgated or revised (within the past seven years), or for which an effluent guidelines rulemaking is currently underway. EPA chose seven years because this is the time it customarily takes for the effects of effluent guidelines or pretreatment standards to be fully reflected in pollutant loading data and TRI reports. EPA also considers the number of facilities responsible for the majority of the estimated toxic-weighted pollutant discharges associated with an industrial activity. Where only a few facilities in a category account for the vast majority of toxic-weighted pollutant discharges, EPA does not prioritize the category for additional review. In this case, EPA believes that revising individual permits may be more effective in addressing the toxic-weighted pollutant discharges than a national effluent guidelines rulemaking because requirements can be better tailored to these few facilities, and because individual permitting actions may take considerably less time than a national rulemaking.

3.2.2.2 Further Review

Following its screening-level review of all point source categories, EPA prioritizes certain categories for further review. The purpose of the further review is to determine whether it would be appropriate for EPA to identify in the final plan a point source category for potential effluent guidelines revision. EPA typically conducts two types of further review: detailed studies and preliminary reviews. EPA selects categories for further review based on the screening-level review and/or stakeholder input.

[3]Different pollutants may dominate the TRI and PCS TWPE estimates for an industrial category due to the differences in pollutant reporting requirements between the TRI and PCS databases. The single TWPE number for each category highlights those industries with the most toxic discharge data in both TRI and PCS. Although this approach could have theoretically led to double-counting, EPA's review of the data indicates that because the two databases focus on different pollutants, double-counting was minimal and did not affect the ranking of the top ranked industrial categories.

EPA's detailed studies generally examine the following: (1) wastewater characteristics and pollutant sources; (2) the pollutants driving the toxic-weighted pollutant discharges; (3) availability of pollution prevention and treatment; (4) the geographic distribution of facilities in the industry; (5) any pollutant discharge trends within the industry; and (6) any relevant economic factors. First, EPA attempts to verify the screening-level results and to fill in data gaps (Factor 1). Next, EPA considers costs and performance of applicable and demonstrated technologies, process changes, or pollution prevention alternatives that can effectively reduce the pollutants remaining in the point source category's wastewater (Factor 2). Lastly, EPA considers the affordability or economic achievability of the technology, process change, or pollution prevention measures identified using the second factor (Factor 3).

Types of data sources that EPA may consult in conducting its detailed studies include, but are not limited to: (1) U.S. Economic Census; (2) TRI and PCS data; (3) trade associations and reporting facilities to verify reported releases and facility categorization; (4) regulatory authorities (states and EPA regions) to understand how category facilities are permitted; (5) NPDES permits and their supporting fact sheets; (6) EPA effluent guidelines technical development documents; (7) relevant EPA preliminary data summaries or study reports; and (8) technical literature on pollutant sources and control technologies.

Preliminary reviews are similar to detailed studies and have the same purpose. During preliminary reviews, EPA generally examines the same factors and data sources listed above for detailed studies. However, in a preliminary review, EPA's examination of a point source category and available pollution prevention and treatment options is less rigorous than in its detailed studies. While EPA collects and analyzes hazard and technology performance and cost information on categories undergoing preliminary review, it assigns a higher priority to investigating categories undergoing detailed studies.

3.3 <u>Identification of New Categories of Direct Dischargers for Possible Effluent Guidelines Development</u>

Concurrent with its review of existing point source categories, EPA also reviews industries not currently subject to effluent guidelines to identify potential new point source categories. To identify possible new categories, EPA conducts a "crosswalk" analysis based on data in PCS and TRI. Facilities with data in PCS and TRI are identified by a four-digit SIC code (Section 4.1.1 provides more details on SIC codes). As with existing sources, EPA links each four-digit SIC code to an appropriate industrial category (i.e., "the crosswalk")[4]. This crosswalk identifies SIC codes that EPA associated with industries subject to an existing guideline. The crosswalk also identifies SIC codes not associated with an existing guideline. In addition to the crosswalk analysis, EPA relies on stakeholder comments and data in identifying potential new point sources categories. TRI and PCS have only limited data on discharges on potential new categories or subcategories. Section 4.1 discusses the utility and limitations of TRI and PCS in detail.

For each industry identified through the crosswalk analysis or stakeholder comments, EPA evaluates whether it constitutes a potential new *category* subject to identification in the plan or whether it is properly considered a potential new *subcategory* of an existing point source category. To make this determination, EPA generally looks at whether the industry produces a similar product or performs a similar service as an existing category. If so, EPA generally considers the industry to be a potential new subcategory of that category. If, however, the industry is significantly different from existing categories in terms of products or services provided, EPA considers the industry as a potential new stand-alone category subject to identification in the plan.

Because the CWA specifies different requirements for potential new categories of direct and indirect dischargers, EPA examines potential new categories to determine if the category comprises mostly indirect dischargers or if it comprises both direct and indirect dischargers. If a category consists largely of indirect dischargers, EPA evaluates the pass-through and interference potential of the category (see Section 3.4). If a category includes direct dischargers, EPA evaluates the type of pollutants discharged by the category.

EPA does not identify in the plan industries for which conventional pollutants, rather than toxic or nonconventional pollutants, are the pollutants of concern. Also, even where toxic and non-conventional pollutants are present in the discharge, EPA does not identify the

[4] For additional information on "the crosswalk," see Section 5.0 of the 2005 Screening-Level Analysis Report (U.S. EPA, 2005).

industry in the plan if such pollutants are present only in trivial amounts and thereby present an insignificant hazard to human health and the environment.

Further, EPA would likely not identify an industrial sector as a candidate point source category for an effluent guidelines rulemaking when: (1) the industrial category is currently the subject of an effluent guidelines rulemaking effort (e.g., Airport Deicing Operations, Drinking Water Treatment Facilities); or (2) direct discharges from point sources within the industrial sector are not subject to the CWA permitting requirements (e.g., direct discharges from silviculture operations).

Finally, EPA does not necessarily identify in the plan all potential new categories subject to identification. Rather, EPA may exercise its discretion to identify only those potential new categories for which it believes an ELG would be an appropriate tool – and rely on other CWA tools (e.g., water-quality based effluent limitations or assistance to permit writers in establishing site-specific technology-based effluent limitations) when such other mechanisms would be more effective and efficient.

3.4 Identification of New Categories of Indirect Dischargers for Possible Effluent Guidelines Development

For potential new categories with primarily indirect discharges, EPA evaluates the potential for the wastewater to "interfere with, pass through, or [be] otherwise incompatible with" the operation of POTWs. See 33 U.S.C. § 1371(b)(1). Using available data, EPA reviews the types of pollutants in an industry's wastewater. Then, EPA reviews the likelihood of those pollutants to pass through a POTW. For most categories, EPA evaluates the "pass through potential" as measured by: (1) the total annual TWPE discharged by the industrial sector; and (2) the average TWPE discharge among facilities that discharge to POTWs. EPA also assesses the interference potential of the discharge. Finally, EPA considers whether the pollutant discharges are already adequately controlled by general pretreatment standards and/or local pretreatment limits.

3.5 Stakeholder Involvement and Schedule

EPA's goal is to involve stakeholders early and often during its annual reviews of existing effluent guidelines and the development of the biennial plans. This will likely maximize collection of data to inform EPA's analyses and provide additional transparency and understanding of EPA's effluent guidelines priorities identified in the biennial plans.

EPA's annual reviews build on reviews from previous years, and reflect a lengthy outreach effort to involve stakeholders in the review process. In performing its annual reviews, EPA considers all public comments, information, and data submitted to EPA as part of its outreach activities. EPA solicits public comment at the beginning of each annual review of effluent guidelines and on the preliminary biennial plan. In each Federal Register Notice, EPA requests stakeholder comments on specific industries and discharges as well as any general comments.

EPA completes an annual review of industrial discharges each year, upon publication of the Preliminary and Final Effluent Guidelines Program Plans. In odd-numbered years, EPA publishes its preliminary plan that EPA must publish for public review and comment under CWA section 304(m)(2). In even-numbered years, EPA publishes its final plan that incorporates the comments received on the preliminary plan.

EPA intends that these coincident reviews will provide meaningful insight into EPA's effluent guidelines and pretreatment standards program decision-making. Additionally, EPA is using an annual publication schedule to most efficiently serve the public as these annual notices will serve as the 'one-stop shop' source of information on the Agency's current and future effluent guidelines and pretreatment standards program.

3.6 References

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4.0 METHODOLOGY, DATA SOURCES, AND LIMITATIONS

As discussed in Section 1.0, the CWA requires EPA to conduct an annual review of existing effluent limitations guidelines and standards (ELGs). It also requires EPA to identify which unregulated industrial categories are candidates for further review. EPA's methodology for this annual review and unregulated category identification involves several components as discussed in Section 3.0.

In performing the screening-level reviews of existing ELGs and identifying unregulated industrial categories, EPA relies on data from the Permit Compliance System (PCS) and Toxic Release Inventory (TRI). This section discusses these databases, related data sources, and their limitations.

EPA has developed two screening-level tools, the *TRIReleases* and *PCSLoads* databases, to facilitate analysis of TRI and PCS. EPA previously explained the creation of these screening-level analysis tools in the report entitled, *2005 Annual Screening-Level Analysis: Supporting the Annual Review of Existing Effluent Limitations Guidelines and Standards and Identification of Potential New Categories for Effluent Limitations Guidelines and Standards*, dated August 2005 (U.S. EPA, 2005). The 2005 SLA report provides the detailed methodology used to process thousands of data records and generate national estimates of industrial effluent discharges.

4.1 <u>Data Sources and Limitations</u>

This subsection provides general information on the use of SIC codes, TWFs, TRI data, and PCS data. The following reports supplement this section and discuss EPA's methodology for developing and using these tools:

- The 2005 SLA Report (U.S. EPA, 2005): Documents the methodology and development of the *PCSLoads2002* and *TRIReleases2002* databases, including (but not limited to) matching SIC codes to point source categories and using TWFs to estimate TWPE;

- The Technical Support Document for the 2006 Effluent Guidelines Program Plan (U.S. EPA, 2006): Explains and documents methodology corrections made to the TRI and PCS databases after EPA's 2005 and 2006 annual reviews;

- The *Draft Toxic Weighting Factor Development in Support of the CWA 304(m) Planning Process (Draft TWF Development Document),* dated July 2005 (U.S. EPA, 2005a): Explains how EPA developed its TWFs; and

- The *Toxic Weighting Factor Development in Support of the CWA 304(m) Planning Process (Final TWF Development Document)* (U.S. EPA, 2006a): Explains how EPA developed the April 2006 TWFs.

4.2 SIC Codes

The SIC system was developed to help with the collection, aggregation, presentation, and analysis of data from the U.S. economy (OMB, 1987). The SIC code is formatted in the following way:

- The first two digits represent the major industry group;
- The third digit represents the industry group; and
- The fourth digit represents the industry.

For example, major SIC code 10: Metal Mining, includes all metal mining operations. Within SIC code 10, four-digit SIC codes are used to separate mines by metal type: 1011 for iron ore mining, 1021 for copper ore mining, etc.

The SIC system is used by many government agencies, including EPA, to promote data comparability. In the SIC system, each establishment is classified according to its primary economic activity, which is determined by its principal product or group of products. An establishment may have activities in more than one SIC code. Some data collection organizations (e.g., the economic census) track only the primary SIC code for each establishment. TRI allows reporting facilities to identify their primary SIC code and up to five additional SIC codes. PCS includes one 4-digit SIC code, reflecting the principal activity causing the discharge at each facility. For a given facility, the SIC code in PCS may differ from the primary SIC code identified in TRI.

Regulations for an individual point source category may apply to one SIC code, multiple SIC codes, or a portion of the facilities in an SIC code. Therefore, to use databases that identify facilities by SIC code, EPA linked each 4-digit SIC code to an appropriate point source category, as summarized in the "SIC/Point Source Category Crosswalk" table (Table A-1, Appendix A).

There are some SIC codes for which EPA has not established national ELGs. Some of these SIC codes were reviewed because they were identified through stakeholder comments or other factors. Table A-2 in Appendix A lists the SIC codes for which facility discharge data are available in TRI and/or PCS, but for which EPA could not identify an applicable point source category. For a more detailed discussion, see Section 5.5 of the *2005 Annual Screening-Level Analysis* report (U.S. EPA, 2005).

4.3 Toxic Weighting Factors

In developing ELGs, EPA developed a variety of tools and methodologies to evaluate effluent discharges. Within EPA's Office of Water, the Engineering and Analysis Division (EAD) maintains a Toxics Database, compiled from over 100 references, containing aquatic life and human health toxicity data, as well as physical/chemical property data, for more than 1,900 pollutants. The pollutants in this database are identified by a unique Chemical Abstracts Service (CAS) number. EPA calculates TWFs from these data to account for differences in toxicity across pollutants and to provide the means to compare mass loadings of different pollutants on the basis of their toxic potential. In its analyses, EPA multiplies a mass loading of a pollutant in pounds per year (lb/yr) by a pollutant-specific weighting factor to derive a "toxic-equivalent" loading (lb-equivalent/yr). The development of TWFs is discussed in detail in the Draft and Final TWF Development Documents (U.S. EPA, 2005a; U.S. EPA, 2006a).

EPA derives TWFs from chronic aquatic life criteria (or toxic effect levels) and human health criteria (or toxic effect levels) established for the consumption of fish. For carcinogenic substances, EPA sets the human health risk level at 10^{-5} (i.e., protective to a level allowing 1 in 100,000 excess lifetime cancer cases over background). In the TWF method for assessing water-based effects, these toxicity levels are compared to benchmark values. EPA selected copper, a toxic metal commonly detected and removed from industry effluent, as the benchmark pollutant. The Final TWF Development Document contains details on how EPA developed its TWFs. Table A-3 in Appendix A lists the TWFs for those chemicals in the *TRIReleases* and *PCSLoads* databases for which EPA has developed TWFs.

4.3.1 Peer Review Process

EPA is continuously investigating and soliciting comment on how to improve its analyses. In particular, EPA recently conducted a peer review of this TWF methodology and its use of TWFs in effluent guidelines program planning. An independent panel of scientific experts was asked to provide comment on the appropriateness of the TWF calculations and the quality and hierarchy of the data used in developing individual TWFs. EPA is currently in the process of reviewing and responding to the peer reviewers' comments. EPA is also in the process of updating the following document, *Draft Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process*, EPA-HQ-OW-2004-0032-1634, to address some of the peer reviewers concerns (U.S. EPA, 2006a).

4.3.2 New Toxic Weighted Factors Developed During the 2007 Annual Review

During the 2007 annual review, EPA revised the TWF for one chemical reflecting updated information on the underlying data, and developed new TWFs for chemicals that did not previously have TWFs. EPA revised the TWF for picloram, CAS 1918-02-01 from 2.07 to 0.01. Table 4.1 lists the newly-developed TWFs.

Table 4.1. Newly Developed TWFs in 2007

Pollutant	CAS Number	TWF
Picloram Salts	2545-60-0 and 50655-56-6	4.31E-03
Nonylphenol	25154-52-3	0.848
Octylphenol	27193-28-8	0.295
Alkyl Phenol Ethoxylates	68987-90-6	2.80

4.4 Calculation of TWPE

EPA weighted the annual pollutant discharges calculated from the TRI (see Section 4.1.4) and PCS (see Section 4.1.5) databases using EAD's TWFs to calculate TWPE for each reported discharge. EPA summed the estimated TWPE discharged by each facility in a point source category to understand the potential hazard of the discharges from each category. The following subsections discuss the calculation of TWPE.

4.5 Data from TRI

TRI is the common name for Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA). Each year, facilities that meet certain thresholds must report their releases and other waste management activities for listed toxic chemicals. Facilities must report the quantities of toxic chemicals recycled, collected and combusted for energy recovery, treated for destruction, or disposed of. A separate report must be filed for each chemical that exceeds the reporting threshold. The TRI list of chemicals for reporting years 2002 and 2003 includes more than 600 chemicals and chemical categories. For the 2007 screening-level review, EPA used data for reporting year 2004, because they were the most recent available at the time the review began.

A facility must meet the following three criteria to be required to submit a TRI report for a given reporting year:

1. *SIC Code Determination*: Facilities in SIC codes 20 through 39, 16 additional SIC codes outside this range[5], and federal facilities are subject to TRI reporting. EPA generally relies on facility claims regarding the SIC code identification. The primary SIC code determines TRI reporting.

2. *Number of Employees*: Facilities must have 10 or more full-time employees or their equivalent. EPA defines a "full-time equivalent" as a person that works 2,000 hours in the reporting year (there are several exceptions and special circumstances that are well-defined in the TRI reporting instructions).

[5] The 16 additional SIC codes are 1021, 1031, 1041, 1044, 1061, 1099, 1221, 1222, 1231, 4911, 4931, 4939, 4953, 5169, 5171, and 7389.

3. *Activity Thresholds:* If the facility is in a covered SIC code and has 10 or more full-time employee equivalents, it must conduct an activity threshold analysis for every chemical and chemical category on the current TRI list. The facility must determine whether it manufactures, processes, OR otherwise uses each chemical at or above the appropriate activity threshold. Reporting thresholds are not based on the amount of release. All TRI thresholds are based on mass, not concentration. Different thresholds apply for persistent bioaccumulative toxic (PBT) chemicals than for non-PBT chemicals. Generally, threshold quantities are 25,000 pounds for manufacturing and processing activities, and 10,000 pounds for otherwise use activities. All thresholds are determined per chemical over the calendar year. For example, dioxin and dioxin-like compounds are considered PBT chemicals. The TRI reporting guidance requires any facility that manufactures, processes, or otherwise uses 0.1 grams of dioxin and dioxin-like compounds to report it to TRI (U.S. EPA, 2000).

In TRI, facilities report annual loads released to the environment of each toxic chemical or chemical category that meets reporting requirements. They must report on-site releases to air, receiving streams, disposal to land, underground wells, and several other categories. They must also report the amount of toxic chemicals in wastes transferred to off-site locations, (e.g., POTWs, commercial waste disposal facilities).

For its screening-level reviews, EPA focused on the amount of chemicals facilities reported either discharging directly to a receiving stream or transferring to a POTW. For facilities discharging directly to a stream, EPA took the annual loads directly from the reported TRI data for calendar year 2004. For facilities transferring to POTWs, EPA first adjusted the TRI pollutant loads reported to be transferred to POTWs to account for pollutant removal that occurs at the POTWs prior to discharge to the receiving stream. Table A-4 in Appendix A lists the POTW removals used for all TRI chemicals reported as transferred to POTWs.

Facilities reporting to TRI are not required to sample and analyze waste streams to determine the quantities of toxic chemicals released. They may estimate releases based on mass balance calculations, published emission factors, site-specific emission factors, or other approaches. Facilities are required to indicate, by a reporting code, the basis of their release estimate. TRI's reporting guidance is that, for most chemicals reasonably expected to be present but measured below the detection limit, facilities should use one-half the detection limit to estimate the mass released. However, for dioxins and dioxin-like compounds, nondetects should be treated as zero.

TRI allows facilities to report releases as specific numbers or as ranges, if appropriate. Specific estimates are encouraged if data are available to ensure the accuracy; however, EPA allows facilities to report releases in the following ranges: 1 to 10 pounds, 11 to 499 pounds, and 500 to 999 pounds. For its screening-level reviews, EPA used the mid-point of each reported range to represent a facility's releases, as applicable.

4.5.1 Utility of TRI Data

The data collected in TRI are particularly useful for ELG planning for the following reasons:

- TRI is national in scope, including data from all 50 states and U.S. territories;
- TRI includes releases to POTWs, not just direct discharges to surface water;
- TRI includes discharge data from manufacturing SIC codes and some other industrial categories; and
- TRI includes releases of many toxic chemicals, not just those in facility discharge permits.

4.5.2 Limitations of TRI

For purposes of ELG planning, limitations of the data collected in TRI include the following:

- Small establishments (less than 10 employees) are not required to report, nor are facilities that don't meet the reporting thresholds. Thus, facilities reporting to TRI may be a subset of an industry.
- Release reports are, in part, based on estimates, not measurements, and, due to TRI guidance, may overstate releases, especially at facilities with large wastewater flows.

- Certain chemicals (PACs, dioxin and dioxin-like compounds, metal compounds) are reported as a class, not as individual compounds. Because the individual compounds in most classes have widely varying toxic effects, the potential toxicity of chemical releases can be inaccurately estimated.

- Facilities are identified by SIC code, not point source category. For some SIC codes, it may be difficult or impossible to identify the point source category that is the source of the toxic wastewater releases.

Despite these limitations, EPA determined that the data summarized in *TRIReleases2004* were usable for the 2007 screening-level review and prioritization of the toxic-weighted pollutant loadings discharged by industrial categories. The TRI database remains the only data source for national estimates of industrial wastewater discharges of unregulated pollutants.

4.6 Data from PCS

PCS is a computerized information management system maintained by EPA's Office of Enforcement and Compliance Assurance (OECA). It was created to track permit, compliance, and enforcement status of facilities regulated by the NPDES program under the CWA. Among other things, PCS houses discharge data for these facilities.

More than 65,000 industrial facilities and wastewater treatment plants have permits for wastewater discharges to waters of the United States. To provide an initial framework for setting permitting priorities, EPA developed a major/minor classification system for industrial and municipal wastewater discharges. Major discharges almost always have the capability to impact receiving waters if not controlled and, therefore, have received more regulatory attention than minor discharges. There are approximately 6,400 facilities (including sewerage systems) with major discharges for which PCS has extensive records. Permitting authorities classify discharges as major based on an assessment of six characteristics:

1. Toxic pollutant potential;
2. Discharge flow: stream flow ratio;
3. Conventional pollutant loading;
4. Public health impact;

5. Water quality factors; and
6. Proximity to coastal waters.

Facilities with major discharges must report compliance with NPDES permit limits via monthly Discharge Monitoring Reports (DMRs) submitted to the permitting authority. The permitting authority enters the reported DMR data into PCS, including pollutant concentration and quantity values and identification of any types of permit violations.

Minor discharges may, or may not, adversely impact receiving water if not controlled. Therefore, EPA does not require DMRs for facilities with minor discharges. For this reason, the PCS database includes data only for a limited set of minor dischargers when the states choose to include these data.

Parameters in PCS include water quality parameters (such as pH and temperature), specific chemicals, conventional parameters (such as BOD_5 and total suspended solids (TSS)), and flow rates. Although other pollutants may be discharged, PCS contains only data for the parameters identified in the facility's NPDES permit. Facilities typically report monthly average pounds per day discharged, but also report daily maxima and average pollutant concentrations.

For the 2007 annual review, EPA used data for reporting year 2004, to correspond to the data obtained from TRI. EPA used a mainframe computer program, called the Effluent Data Statistics (EDS) System to calculate annual loads using PCS data for 2000 and 2002 discharges. For the 2007 annual review, however, EPA used the Load Calculator to develop the *PCSLoads2004* database, instead of EDS to calculate annual loads using PCS data for 2004 discharges. EPA used the Load Calculator because it allows EPA more flexibility and control over the annual load calculations and provides more transparent documentation of the calculation routine. See Section 6.6.1 for additional information.

4.6.1 Utility of PCS

The data collected in PCS are particularly useful for the ELG planning process for the following reasons:

- PCS is national in scope, including data from all 50 states and U.S. territories.
- Discharge reports included in PCS are based on effluent chemical analysis and metered flows.
- PCS includes facilities in all SIC codes.
- PCS includes data on conventional pollutants for most facilities and for the nutrients nitrogen and phosphorus for many facilities. However, EPA did not use the nutrient data because of data quality concerns.

4.6.2 Limitations of PCS

Limitations of the data collected in PCS include the following:

- PCS contains data only for pollutants a facility is required by permit to monitor; the facility is not required to monitor or report all pollutants actually discharged.
- Some states do not submit all DMR data to PCS, or do not submit the data in a timely fashion.
- PCS includes very limited discharge monitoring data from minor dischargers.
- PCS does not include data characterizing indirect discharges from industrial facilities to POTWs.
- Some of the pollutant parameters included in PCS are reported as a group parameter and not as individual compounds (e.g., "Total Kjeldahl Nitrogen," "oil and grease"). Because the individual compounds in the group parameter may have widely varying toxic effects, the potential toxicity of chemical releases can be inaccurately estimated.
- In some cases, the PCS database identifies the type of wastewater (e.g., process wastewater, stormwater, noncontact cooling water) being discharged; however, most do not and, therefore, total flow rates reported

to PCS may include stormwater and noncontact cooling water, as well as process wastewater.

- Pipe identification is not always clear. For some facilities, internal monitoring points are labeled as outfalls, and PCS may double-count a facility's discharge. In other cases, an outfall may be labeled as an internal monitoring point, and PCS may not account for all of a facility's discharge.

- Facilities provide SIC code information for only the primary operations, even though data may represent other operations as well. In addition, some facilities do not provide information on applicable SIC codes.

- Facilities are identified by SIC code, not point source category. For some SIC codes, it may be difficult or impossible to identify the point source category that is the source of the reported wastewater discharges.

- PCS was designed as a permit compliance tracking system and does not contain production information.

- PCS data may be entered into the database manually, which leads to data-entry errors.

- In PCS, data may be reported as an average quantity, maximum quantity, average concentration, maximum concentration, and minimum concentration. For many facilities and/or pollutants, average quantity values are not provided. In these cases, EPA is limited to estimating facility loads based on the maximum quantity. Section 4.4.2 discusses the maximum quantity issue in detail.

Despite these limitations, EPA determined that the data summarized in *PCSLoads2004* were usable for the 2007 screening-level review and prioritization of the toxic-weighted pollutant loadings discharged by industrial facilities. The PCS database remains the only data source quantifying the pounds of regulated pollutants discharged directly to surface waters of the United States.

4.7 <u>References</u>

OMB. 1987. Office of Management and Budget. *Standard Industrial Classification Manual*. 1987.

U.S. EPA. 2000. *EPCRA Section 313 Guidance for Reporting Toxic Chemicals Within the Dioxins and Dioxin-Like Compounds Category*. EPA-745-B-00-021. Washington, DC. (December). DCN 01164.

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5.0 *TRIRELEASES2004*: DEVELOPMENT AND CATEGORY RANKINGS

As discussed in Section 1, the CWA requires EPA to annually review existing effluent guidelines and pretreatment standards. As part of this annual review, EPA uses data reported to the Toxics Release Inventory (TRI) to estimate the mass of pollutants discharged by industry categories. TRI includes data for facilities that discharge pollutants directly to surface waters ("direct dischargers"), as well as facilities that discharge pollutants to Publicly-Owned Treatment Works (POTWs) ("indirect dischargers"). Section 4.5 of this report provides more details on TRI.

This section discusses how EPA compiled TRI data into a database entitled *TRIReleases2004* to estimate the mass and toxicity of pollutants discharged by industry categories. *TRIReleases2004* compiles information for all facilities reporting wastewater discharges to TRI for the year 2004 and for the point source categories that these facilities represent. Appendix B presents the results of *TRIReleases2004* on a four-digit SIC code and pollutant basis. This section is organized in the following subsections:

- Section 5.1 describes the database development tools;
- Section 5.2 describes the corrections that were made to the *TRIReleases2004* database;
- Section 5.3 presents the point source category rankings generated by the *TRIReleases2004* database; and
- Section 5.4 describes the quality review of the data used to develop *TRIReleases2004*.

5.1 <u>Database Development Methodology</u>

To develop *TRIReleases2004*, EPA downloaded the raw TRI data (i.e., data as reported to TRI) from EPA's web site (http://www.epa.gov/tri/tridata/tri04/data/index.htm). EPA created the following three databases to analyze the TRI data and generate point source category rankings:

- *TRIRawData2004*: This PC-based database includes the TRI data downloaded from EPA's TRI web site, as reported;

- *TRICalculations2004*: This PC-based database calculates discharges and weights them according to toxicity; and
- *TRIReleases2004*: This PC-based database allows users to rank discharges and perform analysis of TRI data.

EPA used the same development methodology for *TRIReleases2002* and *TRIReleases2003* to create *TRIReleases2004*. The *2005 Annual Screening-Level Analysis Report* (referred to as the "SLA Report") describes the development methodology for *TRIReleases2002* during the 2005 screening-level review in detail (U.S. EPA, 2005). Sections 4.2 and 4.3 of the *Technical Support Document for the 2006 Effluent Guidelines Program Plan* describe changes made to the database development methodology for *TRIReleases2002* and *TRIReleases2003* for the 2006 screening-level review.

5.2 Database Corrections

During previous screening-level analyses, EPA identified numerous facility-specific corrections for TRI data reported for calendar years 2002 and 2003. Several of these corrections similarly apply to the 2004 TRI data. In addition, EPA's TRI quality review (Section 5.4) identified 55 other corrections to the 2004 TRI data (e.g., categorizing the facilities reporting SIC code 4953 into the CWT, landfills, and waste combustors categories). Appendix C of this report lists all corrections made to the 2004 TRI data. In addition to the facility-specific data corrections, *TRICalculations2004* performs modifications to the annual loads, described in the following subsections.

5.2.1 Categorization of Discharges

This section describes database corrections to categorization of facilities and pollutant discharges. The database corrections described in this section apply to both the *TRIReleases2004* and *PCSLoads2004* databases. Section 5 of the SLA Report describes the development of the SIC/Point Source Category Crosswalk, which EPA uses to link between facility SIC codes and categories with existing ELGs (U.S. EPA, 2005). Because most point source categories are not defined by SIC code, the relationship between SIC code and point source category is not a one-to-one correlation. A single SIC code may include facilities in more than one point source category, so associating an SIC code with only one category may be an over simplification. Also, many facilities have operations subject to more than one point source category. Further, facilities in some categories cannot be identified by SIC code (e.g., Centralized Waste Treatment facilities). The database changes, summarized below, are described in detail in Section 5 of the SLA Report:

- **Facility-Level Point Source Category Assignment.** For some SIC codes that include facilities subject to guidelines from more than one point source category, EPA was able to assign each facility to the category that best applied to the majority of its discharges. EPA reviewed information available about each facility to determine which point source category applied to the facility's operations. EPA assigned the following SIC codes to point source categories at the facility level:

    — SIC 2048 (Prepared Feed and Feed Ingredients for Animals and Fowl, Except Dogs and Cats): Facility discharges are assigned to either the Grain Mills Manufacturing, Meat and Poultry Products, or Pharmaceutical Manufacturing point source categories,

    — SIC 2819 (Industrial Inorganic Chemicals, NEC): Facility discharges are assigned to either the Inorganic Chemicals Manufacturing, Nonferrous Metals Manufacturing, or Phosphate Manufacturing point source categories, and

    — SIC 2874 (Phosphatic Fertilizers): Facility discharges are assigned to either the Phosphate Manufacturing or Fertilizer Manufacturing point source categories.

- **Pollutant-Level Point Source Category Assignment.** Many facilities have operations subject to more than one point source category. For most of these facilities, EPA cannot divide the pollutant discharges among the applicable point source categories. Two exceptions where EPA was able to assign wastewater discharges of certain chemicals to the appropriate point source category include Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) /Pesticides and MP&M/Metal Finishing:

    — OCPSF/Pesticides: EPA removed all pesticide discharges from OCPSF and counted them as discharges from the Pesticides Chemicals Point Source Category.

    — MP&M/Metal Finishing: EPA used the methodologies described in Section 5 of the SLA Report to apportion pollutant loads between the MP&M and Metal Finishing Point Source Categories.

- **Categories Not Identified By SIC Code (e.g., Centralized Waste Treatment).** The SIC/Point Source Category Crosswalk does not assign any SIC codes to the Centralized Waste Treatment (CWT) Point Source Category (40 CFR Part 437). Furthermore, the applicability of the CWT regulations is not defined by SIC codes and no SIC Code properly describes CWT services. However, some CWT facilities report under SIC 4953, Refuse Systems. EPA identified specific facilities as CWTs during previous category reviews and assigned these CWT facilities a placeholder SIC code of "CWT" which then categorized the facility into the CWT point source category. In addition, for the *TRIReleases2004* database, EPA categorized the facilities reporting SIC code 4953 (Refuse Systems) into the CWT, Landfills, or Waste Combustors point source categories based on the specific operations at the facility.

5.2.2 Pollutant Corrections

This section describes database corrections made to discharges of specific pollutants reported to the TRI for EPA's 2007 screening-level review. The database corrections described in this section apply only to the *TRIReleases2004* database.

- **Metal Compounds.** For TRI reporting, facilities may be required to report discharges of a metal (e.g., zinc) and its compounds (e.g., zinc compounds) on a single reporting form. Because the release quantity for the metal compound reporting is based on the mass of the parent metal, EPA uses the parent metal TWF to calculate TWPE for the metal and metal compound discharges. For ranking purposes, EPA combined the TWPEs for the metal and metal compounds (i.e., TWPE reported for "zinc and zinc compounds"). For more details on this correction, see section 3.4.4 of the SLA Report.

- **Sodium Nitrite.** For TRI reporting, sodium nitrite release quantities are reported as the mass of the sodium nitrite. Sodium nitrite is an ionic salt that will fully dissociate into nitrite and sodium ions in aqueous solutions. In addition, the nitrite ions are unstable in water and will oxidize to nitrate. Therefore, EPA converted the pounds of TRI-reported sodium nitrite discharges to pounds of nitrogen in the discharge and used the TWF for "nitrate as N" (0.0032) to calculate TWPE for sodium nitrite. In addition, EPA also used the POTW removal for nitrate to account for the removal of sodium nitrite in POTWs.

- **Fumes and Dusts.** For TRI reporting, aluminum and zinc are reported as "fumes or dusts," which are mixtures of solids and gases. Because fumes and dusts are air pollutants and do not exist in water, EPA deleted all reported discharges of aluminum (fume or dust) and zinc (fume or dust) from the *TRIReleases2004* database.

- **Phosphorus (Yellow or White).** Yellow and white phosphorus are allotropes of elemental phosphorus and are hazardous chemicals that spontaneously ignite in air. During the 2006 screening-level review, EPA determined that facilities were incorrectly reporting discharges of total phosphorus (i.e., the phosphorus portion of phosphorus-containing compounds) as phosphorus (yellow or white). Therefore, EPA deleted all phosphorus (yellow or white) discharges reported to TRI for the 2007 screening-level review.

5.3 Results

This section presents the results of the *TRIReleases2004* database. Table 5-1 presents the categories ranked from highest to lowest TWPE. Table B-1 of Appendix B presents the four-digit SIC code rankings by TWPE. Table B-2 presents the total TWPE for chemicals reported in TRI.

5.4 Data Quality Review

EPA evaluated the quality of TRI data for use in the 2007 screening-level review and prioritization of loadings of toxic and non-conventional pollutants discharged by industrial categories based on completeness, accuracy, reasonableness, and comparability. The *Quality Assurance Project Plan for the 2007 Annual Screening-Level Analysis of TRI and PCS Industrial Category Discharge Data* describes the quality objectives in more detail (ERG, 2007). The following discussion provides an overview of the quality review steps:

- *Completeness checks.* EPA compared counts of facilities in *TRIReleases2004* to *TRIReleases2003* and *TRIReleases2002* to describe the completeness of the database. From the comparison, EPA determined that most of the SIC codes (76%) had a change in the number of facilities reporting wastewater discharges from 2003 to 2004 of less than 25 percent. EPA also determined that most of the changes that resulted in a large percentage change were because there were only a few facilities reporting discharges (e.g., a change from 1 facility to 3 facilities is equivalent to a 200% increase).

Table 5-1. *TRIReleases2004* Category Rankings from the 2007 Screening-Level Review

40 CFR Part	Category	Number of Direct Dischargers	Number of Indirect Dischargers	Number of Facilities that Discharge Both Directly and Indirectly	Number of Facilities Reporting Releases to Any Medium	Total Pounds Discharged[a]	TWPE
414.1	Chlorine and chlorinated hydrocarbons[b]	34	7	3	64	1,690,000	10,900,000
437	Centralized waste treatment	8	17	6	36	762,000	7,461,000
414	Organic chemicals, plastics and synthetic fibers	224	469	61	2,106	35,300,000	957,000
423	Steam electric power generating	345	24	18	692	2,750,000	791,000
419	Petroleum refining	234	57	34	864	18,800,000	669,000
430	Pulp, paper and paperboard	191	81	11	494	23,200,000	669,000
455	Pesticide chemicals	31	28	3	113	1,630,000	518,000
433	Metal finishing	261	1,664	305	7,144	6,900,000	408,000
444	Waste combustors	4	2	1	68	6,370	243,000
420	Iron and steel manufacturing	123	68	48	361	38,800,000	152,000
415	Inorganic chemicals manufacturing	75	91	28	458	8,160,000	123,000
440	Ore mining and dressing	28	1	-	78	550,000	88,000
463	Plastics molding and forming	33	102	21	1,450	1,730,000	72,700
432	Meat and poultry products	88	67	15	285	79,900,000	64,100
429	Timber products processing	88	29	24	959	31,100	63,900
421	Nonferrous metals manufacturing	58	33	19	212	4,010,000	52,600
458	Carbon black manufacturing	9	-	-	20	523	48,600
464	Metal molding and casting (foundries)	85	88	43	604	249,000	19,100
424	Ferroalloy manufacturing	3	2	1	16	243,000	11,300
418	Fertilizer manufacturing	42	3	2	105	5,470,000	10,800
439	Pharmaceutical manufacturing	16	86	6	215	1,670,000	10,700
468	Copper forming	36	53	48	253	205,000	10,600
471	Nonferrous metals forming and metal powders	57	94	56	493	1,520,000	10,000
425	Leather tanning and finishing	2	21	1	29	366,000	8,830
469	Electrical and electronic components	4	75	11	168	4,980,000	7,690

Table 5-1 (Continued)

40 CFR Part	Category	Number of Direct Dischargers	Number of Indirect Dischargers	Number of Facilities that Discharge Both Directly and Indirectly	Number of Facilities Reporting Releases to Any Medium	Total Pounds Discharged[a]	TWPE
407	Canned and preserved fruits and vegetables processing	8	13	1	96	5,980,000	6,390
454	Gum and wood chemicals manufacturing	6	3	2	24	17,100	6,310
417	Soap and detergent manufacturing	3	78	3	201	114,000	6,160
NA	Miscellaneous foods and beverages	15	122	9	319	6,350,000	6,150
428	Rubber manufacturing	28	108	62	479	732,000	5,700
413	Electroplating	20	397	33	612	1,510,000	5,680
436	Mineral mining and processing	52	41	8	488	1,510,000	5,390
NA	Tobacco products	1	14	5	32	381,00	5,160
406	Grain mills	8	11	7	118	1,760,000	4,340
405	Dairy products processing	31	226	5	384	4,780,000	3,710
467	Aluminum forming	49	84	45	419	753,000	3,320
410	Textile mills	14	62	10	274	564,000	3,040
426	Glass manufacturing	10	41	14	232	210,000	2,820
461	Battery manufacturing	4	35	28	86	63,400	2,440
434	Coal mining	21	-	-	61	340,000	1,190
422	Phosphate manufacturing	11	1	-	26	75,700	1,060
NA	Drinking water treatment	2	-	3	6	7,710	1,040
411	Cement manufacturing	51	18	2	680	7,320	898
443	Paving and roofing materials (tars and asphalt)	11	7	4	274	428	612
435	Oil & gas extraction	-	-	1	3	24,100	596
466	Porcelain enameling	-	6	4	15	69,600	247
438	Metal products and machinery	29	-	-	-	8,600	242
446	Paint formulating	7	47	5	469	105,000	210
NA	Independent and stand alone labs	1	-	-	5	83,100	205
409	Sugar processing	14	1	1	33	232,000	200
408	Canned and preserved seafood processing	7	-	-	22	263,000	198

Table 5-1 (Continued)

40 CFR Part	Category	Number of Direct Dischargers	Number of Indirect Dischargers	Number of Facilities that Discharge Both Directly and Indirectly	Number of Facilities Reporting Releases to Any Medium	Total Pounds Discharged[a]	TWPE
NA	Printing & publishing	2	59	1	179	32,300	177
465	Coil coating	2	46	-	121	6,820	167
445	Landfills	3	6	2	70	1,390	152
457	Explosives manufacturing	8	2	2	40	113,000	92.9
412	CAFO	-	1	-	12	75,500	83.8
447	Ink formulating	1	7	1	81	2,480	41.8

Source: *TRIReleases2004_v3*.
[a]Accounts for estimated POTW removals for indirect discharges.
[b]414.1 refers to the chlorinated hydrocarbon segment of 414 and the chlor-alkali segment of 415.
NA – Not applicable; no existing ELGs apply to discharges.

- *Accuracy of facility discharges.* EPA reviewed the accuracy of calculated discharges from facilities with discharges that had the greatest impact on total category loads and category rankings. EPA reviewed discharges reported to TRI for other reporting years (i.e., 2000, 2002, and 2003) and compared them to discharges reported to TRI for reporting year 2004. EPA also reviewed monthly information reported in PCS, as well as measurement data available on EPA's Envirofacts web page and information from the facility's NPDES permit, to identify possible errors. In some cases, EPA contacted facilities to verify the pollutant discharges were reported correctly.

- *Accuracy of category discharges*. EPA reviewed the accuracy of category discharges by verifying that pollutant discharges in TRI were assigned to the appropriate point source category. EPA used engineering judgment to determine if pollutant discharges were reasonably associated with the point source category.

- *Accuracy of database queries.* EPA's quality review for the development of *TRIReleases2004* included accuracy checks for database queries in *TRICalculations2004* and *TRIReleases2004*. Documentation of accuracy checks is provided in a QC table in each Microsoft Access database.

- *Reasonableness of pollutant identity.* EPA reviewed the pollutants comprising the majority of the TWPE for high-ranking point source categories and, using engineering understanding of industrial processes, identified pollutants that could not be reasonably related to operations in the industry. EPA then reviewed documentation of the SIC code assigned to the facility and other EPA databases (e.g., PCS, Envirofacts), company websites, or contacted the facility directly to verify the pollutant discharge.

- *Reasonableness of facility loads*. EPA identified facilities with the highest TWPE loadings. EPA identified facilities for review whose pollutant discharges accounted for more than 95 percent of the TWPE for its point source category. EPA compared 2004 TRI data to other available information, such as PCS, information from EPA's Envirofacts web page, the facility's NPDES permit, and discussion with the facility contact.

- *Comparability*. EPA compared *TRIReleases2004* to *TRIReleases2002* and *TRIReleases2003* to identify pollutant discharges that differ more than the year-to-year variation of other chemicals and facilities. From the comparison, EPA determined that 59 percent of the pollutants discharged in both 2004 and 2003 had a change of less than 50 percent in the quantity discharged. EPA also determined that most of the changes that resulted in a large percentage change were because there was a small quantity discharged initially. In addition, most of these pollutant discharges resulted in small TWPEs. However, EPA did identify several large changes in pesticide discharges from one facility that resulted in large TWPE changes. EPA contacted this facility to verify the discharges.

5.4.1 Facility Reviews

Table 5-2 presents EPA's TRI facility review and corrections made to the TRIReleases2004 database. EPA reviewed the accuracy of calculated discharges from facilities with discharges that have the greatest impact on total category loads and category rankings. EPA used the following criteria to select facilities for review:

- Facilities with the highest toxic-weighted discharges of all facilities reporting to TRI for reporting year 2004;
- Facilities with the highest toxic-weighted discharges of individual chemicals that contribute the majority of the toxic-weighted discharges for all categories; and
- Facilities with the highest toxic-weighted discharges from categories that contribute the majority of the toxic-weighted discharges for all categories.

For the identified facilities, EPA used the following steps to review the accuracy of the loads calculated from TRI data.

1. Review database corrections for *TRIReleases2003*, *TRIReleases2002*, and *TRIReleases2000* to determine whether corrections were made during previous reviews and evaluate whether these corrections should be applied to the 2004 TRI discharges.
2. Review discharges reported to TRI for other reporting years (i.e., 2000, 2002, and 2003) and compare to discharges reported to TRI for reporting year 2004.
3. Review 2004 DMR data in PCS, if available, to hand calculate annual pollutant loads, and compare to discharges reported to TRI for reporting year 2004.
4. Contact the facility to verify whether the pollutant discharges are reported correctly.

Table 5-2. Summary of TRI Facility Review

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Review Findings	Actions Taken/Database Correction
Chemical Waste Management	Emelle, AL	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Teris LLC	El Dorado, AR	Waste Combustors	All Chemicals	The facility operates a hazardous waste combustor. (Matuszko, 2007)	Changed the facility's SIC code to "4953WC" to associate the facility's discharges with the Waste Combustors category.
Romic Environmental Technologies Inc	Chandler, AZ	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Clean Harbors Buttonwillow LLC	Buttonwillow, CA	Landfills	All Chemicals	The facility operates a landfill. (Matuszko, 2007)	Changed the facility's SIC code to "4953L" to associate the facility's discharges with the landfills category.
Clean Harbors San Jose LLC	San Jose, CA	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Commerce Refuse-To-Energy Authority	Commerce, CA	Landfills	All Chemicals	The facility operates a landfill. (Matuszko, 2007)	Changed the facility's SIC code to "4953L" to associate the facility's discharges with the landfills category.
Dk Environmental Inc.	Los Angeles, CA	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Onyx Environmental Services LLC	Azusa, CA	Landfills	All Chemicals	The facility operates a landfill. (Matuszko, 2007)	Changed the facility's SIC code to "4953L" to associate the facility's discharges with the landfills category.
Rho-Chem Corp	Inglewood, CA	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.

Table 5-2 (Continued)

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Review Findings	Actions Taken/Database Correction
Usfilter Recovery Services (Ca) Inc	Vernon, CA	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Clean Harbors Of Connecticut Inc	Bristol, CT	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
United Oil Recovery Inc.	Meriden, CT	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Beaver Oil Co Inc	Hodgkins, IL	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Cid Recycling & Disposal Facility	Calumet City, IL	Landfills	All Chemicals	The facility operates a landfill. (Matuszko, 2007)	Changed the facility's SIC code to "4953L" to associate the facility's discharges with the landfills category.
Clean Harbors Services Inc	Chicago, IL	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Envirite Of Illinois Inc.	Harvey, IL	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Onyx Environmental Services	Sauget, IL	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Safety-Kleen Systems Inc	Dolton, IL	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Beaver Oil Co Inc Plant 2	Gary, IN	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.

Table 5-2 (Continued)

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Review Findings	Actions Taken/Database Correction
Heritage Environmental Services LLC	Indianapolis, IN	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Safety-Kleen Systems Inc	Smithfield, KY	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Clean Harbors Baton Rouge LLC	Baton Rouge, LA	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Colfax Treating Co LLC	Pineville, LA	Timber Products	Dioxin and dioxin-like compounds	The facility reported a dioxin distribution that was not representative of the pentachlorophenol that the facility uses in its operations. (Finseth, 2007)	Changed the dioxin distribution to match the industry-specific distribution.
Exxonmobil Chemical Baton Rouge Chemical Plant	Baton Rouge, LA	Organic Chemicals, Plastics and Synthetic Fibers	PACs	The facility has never detected PACs in the final effluent. The measurement is always less than the detection limit. (Finseth, 2007a)	Changed the PACs discharge from 7,849 pounds/year to 0.0 pounds/year.
Millennium Inorganic Chemicals Inc Hawkins Point Plant	Baltimore, MD	Inorganic Chemicals	Dioxin and dioxin-like compounds	The facility did not detect dioxin and dioxin-like compounds in their wastewater. (Schildt, 2006)	Changed dioxin and dioxin-like compounds discharge from 0.000485017 pounds/year to 0.0 pounds/year.
Dynecol Inc	Detroit, MI	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Eq Detroit Inc.	Detroit, MI	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Eq Resource Recovery Inc.	Romulus, MI	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Wayne Disposal Inc	Belleville, MI	Landfills	All Chemicals	The facility operates a landfill. (Matuszko, 2007)	Changed the facility's SIC code to "4953L" to associate the facility's discharges with the landfills

Table 5-2 (Continued)

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Review Findings	Actions Taken/Database Correction
					category.
Usfilter Recovery Services Inc	Roseville, MN	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Ecoflo Inc	Greensboro, NC	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Clean Earth Of North Jersey Inc.	South Kearny, NJ	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Dupont Chambers Works	Deepwater, NJ	Pesticide Chemicals	Atrazine	The facility stated that the atrazine discharges are associated with the plant's centralized waste treatment system and not with the plant's operations. (Wood, 2007)	Changed the SIC code for the atrazine discharge to "CWT" to associate it with the CWT category.
Newmont Mining Corp Lone Tree Mine	Valmy, NV	Ore Mining and Dressing	Arsenic	The facility erroneously reported 30,000 lbs on the Form R, but meant to report 3,000 lbs (MacQueen, 2007)	Changed the arsenic discharge from 30,000 pounds/year to 3,000 pounds/year.
Cwm Chemical Services LLC	Model City, NY	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Envirite Of Ohio Inc.	Canton, OH	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
General Environmental Management	Cleveland, OH	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Onyx Environmental Services LLC	West Carrollton, OH	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.

Table 5-2 (Continued)

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Review Findings	Actions Taken/Database Correction
Perma-Fix Of Dayton Inc	Dayton, OH	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Ross Incineration Services Inc	Grafton, OH	Waste Combustors	All Chemicals	The facility operates a hazardous waste combustor. (Matuszko, 2007)	Changed the facility's SIC code to "4953WC" to associate the facility's discharges with the Waste Combustors category.
Spring Grove Resource Recovery	Cincinnati, OH	Landfills	All Chemicals	The facility operates a landfill. (Matuszko, 2007)	Changed the facility's SIC code to "4953L" to associate the facility's discharges with the landfills category.
Von Roll America Inc	East Liverpool, OH	Waste Combustors	All Chemicals	The facility operates a hazardous waste combustor. (Matuszko, 2007)	Changed the facility's SIC code to "4953WC" to associate the facility's discharges with the Waste Combustors category.
Conoco Philips Ponca City	Ponca City, OK	Petroleum Refining	Dioxin and dioxin-like compounds	The facility estimates the dioxin and dioxin-like compounds discharge based on an emission factor and the volume of wastewater generated during the catalyst regenerations during the year. (Hercyk, 2007)	No changes made to the database.
Michelin North America Ardmore Plant	Ardmore, OK	Rubber Manufacturing	PACs	Facility provided a revised Form R to TRI, changing the PACs load. (Michelin, 2006)	Changed PACs discharge from 731 pounds/year to 2.1 pounds/year.
Envirite Of Pennsylvania Inc.	York, PA	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Max Environmental Yukon Facility	Yukon, PA	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Safety-Kleen Lexington	Lexington, SC	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.

Table 5-2 (Continued)

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Review Findings	Actions Taken/Database Correction
Du Pont Memphis Plant	Memphis, TN	Inorganic Chemicals	Dioxin and dioxin-like compounds	The facility provided dioxin congener measurement data from an analysis of facility wastewater. (Zweig, 2000)	Changed the dioxin and dioxin-like compounds discharge from 0.00171211 pounds/year to 0.0000389867 pounds/year. In addition, changed the dioxin distribution based on the information provided.
Ucar Carbon Co Inc.	Columbia, TN	Carbon Black Manufacturing	PACs	The facility operations are more closely associated with carbon black manufacturing than metal finishing operations. (Johnston, 2007)	Changed the facility's SIC code to "3624CB" to associated the facility's discharges with the Carbon Black Manufacturing Category.
Clean Harbors Deer Park LP	Deer Park, TX	Waste Combustors	Benzidine, Toxaphene, Hexachlorobenzene, And Chlordane	The facility operates a hazardous waste combustor. (Finseth, 2007b)	Changed the facility's SIC code to "4953WC" to associate the facility's discharges with the Waste Combustors category.
Duratherm	San Leon, TX	Waste Combustors	All Chemicals	The facility operates a hazardous waste combustor. (Matuszko, 2007)	Changed the facility's SIC code to "4953WC" to associate the facility's discharges with the Waste Combustors category.
Onyx Environmental Services LLC	Port Arthur, TX	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Set Environmental Inc.	Houston, TX	Landfills	All Chemicals	The facility operates a landfill. (Matuszko, 2007)	Changed the facility's SIC code to "4953L" to associate the facility's discharges with the landfills category.
Vopak Logistics Services USA Inc.	Deer Park, TX	Centralized Waste Treaters	Diazinon, Malathion, Acrylonitrile, And Dimethoate	The facility operates a centralized waste treatment system and NPDES permit limits are based on the CWT effluent guidelines. (MacQueen, 2007a)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Hovensa LLC	Christiansted, VI	Petroleum Refining	Dioxin and dioxin-like compounds	The facility estimates the dioxin and dioxin-like compounds discharge based on an emission factor and the number of platform regenerations during the year. (Antione, 2007)	No changes made to the database.

Table 5-2 (Continued)

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Review Findings	Actions Taken/Database Correction
Burlington Environmental Inc	Tacoma, WA	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.
Burlington Environmental Inc	Kent, WA	Centralized Waste Treaters	All Chemicals	The facility operates a centralized waste treatment system. (Matuszko, 2007)	Changed the facility's SIC code to "CWT" to associate the facility's discharges with the CWT category.

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6.0 *PCSLOADS2004*: DEVELOPMENT AND CATEGORY RANKINGS

As described in Section 1, the Clean Water Act (CWA) requires EPA to annually review existing effluent guidelines and pretreatment standards. As part of this annual review, EPA uses data reported to the Permit Compliance System (PCS) to estimate the mass of pollutants discharged by facilities in the regulated categories. PCS includes data for facilities that discharge pollutants directly to surface waters ("direct dischargers"). Section 2.2.1 of the SLA Report provides more details on PCS (U.S. EPA, 2005). As discussed in the SLA Report and in Section 4.6 of this document, the PCS database has a number of limitations including having only limited data on pollutant discharges from industrial facilities to POTWs ("indirect dischargers"). Consequently, EPA was not able to use PCS data for its review of existing pretreatment standards or indirect discharges from industries not currently subject to pretreatment standards.

This section describes how EPA compiled PCS data into a database entitled *PCSLoads2004* to estimate the mass and toxicity of pollutants discharged by industry categories. *PCSLoads2004* compiles information for all facilities classified as major dischargers in PCS for the year 2004 and for the point source categories that these facilities represent. Appendix B lists pollutant loads calculated by *PCSLoads2004*, presented by 4-digit SIC code and pollutant. The remainder of Section 6 is organized in the following subsections:

- Section 6.1 describes the database development tools including calculation methodologies and assumptions;
- Section 6.2 presents the point source category rankings generated by the *PCSLoads2004* database; and
- Section 6.3 describes the quality review of the data used to develop *PCSLoads2004*.

6.1 Database Development Methodology

To develop *PCSLoads2004*, EPA used a number of data sources and database development tools described below:

- PCS: This mainframe database is the source of the pollutant discharge data and facility information used in the development of *PCSLoads2004*. EPA used year 2004 data from PCS to develop *PCSLoads2004*.

- EPA's CNVRT ("convert") module: This mainframe computer program converts pollutant concentrations and loads in PCS into standard units of kilograms per day (kg/day) and milligrams per liter (mg/L). This program also converts flow data in PCS into standard units of millions of gallons per day (MGD), and matches flows with pollutant measurements.

- *PCSLoadCalculator2004:* This PC-based database implements EPA's Annual Load Calculator Routine, which EPA created during the 2005 Annual Review. The load calculator produces six alternatives for each calculated annual load by applying variations on selected calculation assumptions. EPA reviewed the impact of each assumption on the results of *PCSLoads2004*.

- *PCSLoadsAnalysis2004:* This PC-based database combines the annual loads data from *PCSLoadCalculator2004* and examines the impact of the alternative load calculations. The database uses the calculation assumptions that EPA selected based on the results of the data sensitivity analyses conducted for the 2005 annual review, and creates the "PCS2004" Table, which provides one annual load per pollutant discharge. In addition, this database applies all database corrections, such as facility categorization, pollutant discharge categorization, parameter groupings, internal monitoring, and intermittent discharges.

- *PCSNutrients2004:* This PC-based database uses the annual loads for nitrogen and phosphorus compounds from the PCS2004 table to calculate aggregate "nitrogen as N" and "phosphorus as P" loads for each facility outfall. The database sums the aggregate nitrogen and phosphorus loads by facility and by point source category.

Figure 6-1 shows the relationship between PCS, the CNVRT module, EPA's *PCSLoadCalculator2004*, *PCSLoadsAnlaysis2004*, *PCSNutrients2004*, and *PCSLoads2004*.

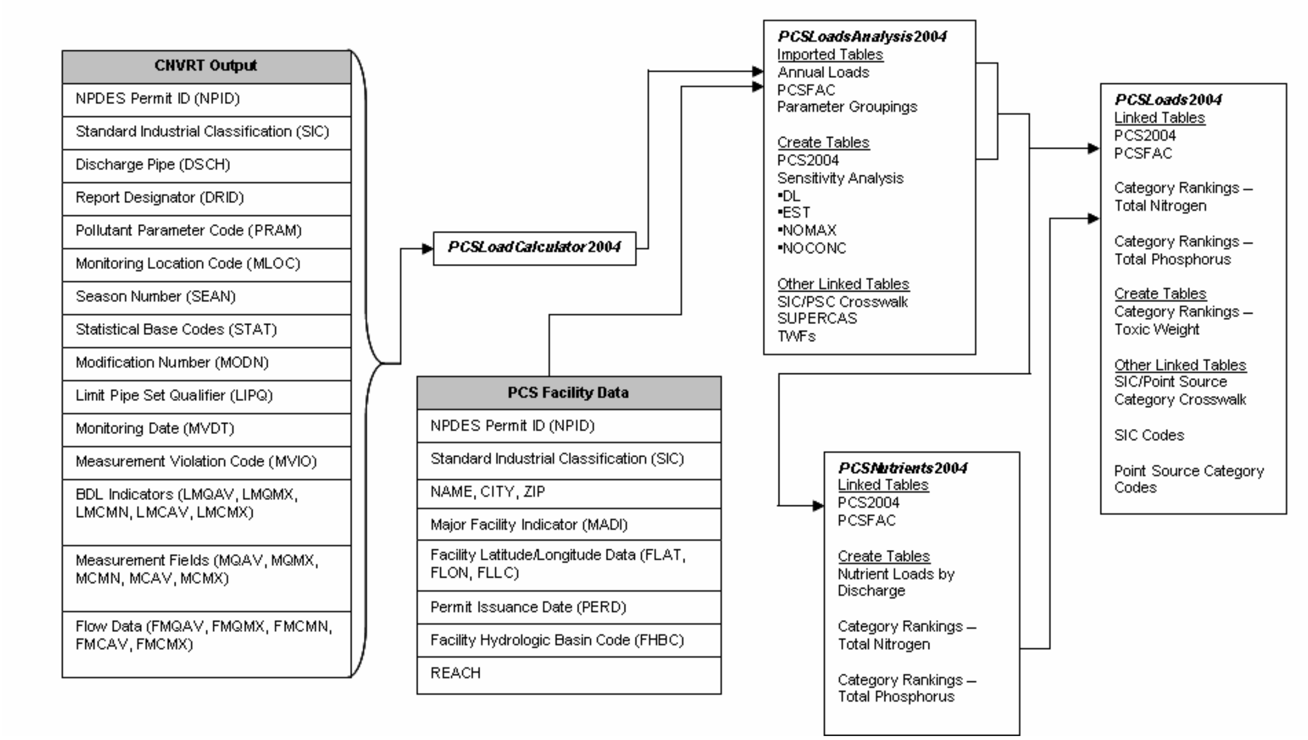

Figure 6-1. Relationship Between Data Sources and Database Development Tools for the Development of *PCSLoads2004*

6.1.1 *PCSLoadCalculator2004*

PCSLoadCalculator2004 is a Microsoft Access™ database that implements EPA's PCS Load Calculator routine ("Load Calculator"). As depicted in Figure 6-1, *PCSLoadCalculator2004* uses CNVRT output and calculates annual loads for each pollutant and discharge point using the Load Calculator routine. The output from *PCSLoadCalculator2004* is an "Annual Loads" table which is exported to *PCSLoadsAnalysis2004* for further calculations and analyses.

For the 2003 and 2005 Annual Reviews, EPA used a mainframe computer program, called the Effluent Data Statistics (EDS) System to calculate annual loads using PCS data for 2000 and 2002 discharges. For the 2007 Annual Review, EPA used the Load Calculator instead of EDS to calculate annual loads using PCS data for 2004 discharges. EPA used the Load Calculator because it allows EPA more flexibility and control over the annual load calculations and provides more transparent documentation of the calculation routine. The following subsections describe the development of *PCSLoadCalculator2004*:

- Section 6.1.1.1 discusses the development and verification of EPA's Load Calculator routine and comparison to EDS output;
- Section 6.1.1.2 describes the data sources;
- Section 6.1.1.3 describes the annual load calculation; and
- Section 6.1.1.4 describes changes to the EDS methodology that EPA implemented for *PCSLoadCalculator2004*.

6.1.1.1 Development and Verification of Load Calculator Methodology

While attempting to use the EDS system to estimate the 2002 pollutant loadings for all facilities nationwide for the 2005 Annual Review, EPA encountered a problem processing records for Florida, Virginia, and Missouri. In particular, EPA was unable to run the EDS program to estimate annual loads for missing DMR data in PCS (EST=YES). Because EPA was unable to address this problem through the EDS system, it developed a separate program, called the Load Calculator, to calculate loads for facilities in Florida, Virginia, and Missouri. EPA used the annual load calculation methodology of the EDS program (see Section 2.2.2 of the SLA Report) as the basis for the design of the Load Calculator routine, replicating the EDS methodology using Microsoft Access™ queries. As part of the development of the Load Calculator routine, EPA compared its output to EDS output.

As discussed in Section 2.2.1 of the SLA Report, EPA developed the *PCSLoadCalculator* to calculate EST=YES loads for facilities in Florida, Virginia, and Missouri (U.S. EPA, 2005). EPA obtained useable EST=NO load estimates from EDS for these facilities; however, the EST=YES run encountered errors that prohibited EDS from calculating loads. As a result, EPA used the loads calculations for the EST=NO runs to compare and validate results from the EDS system to the Load Calculator. For Florida, Virginia, and Missouri, EPA conducted a record-by-record comparison of the Load Calculator (EST=NO) output to EDS (EST=NO) output. As shown in Table 6-1, 84 percent of the loads calculated using the Load Calculator matched EDS by plus or minus 5 percent. Of these records, 53 percent matched EDS exactly.

Table 6-1. Comparison of Load Calculator Output for Florida, Virginia, and Missouri to EDS Output Using 2002 PCS Data

Comparison	Exact Matches		Correct within + or - 5%		Poor Match (greater than 5% difference)		Total # of Records
	# of Records	%	# of Records	%	# of Records	%	
All Loads	5,510	53	8,778	84	1,648	16	10,426
Loads no POTWs (SIC 4952)	3,260	56	4,887	84	907	16	5,794
All TWPEs	861	29	2,164	73	782	27	2,946
TWPE w/o POTWs (SIC 4952)	572	33	1,273	74	455	26	1,728

Source: *SLA Report (U.S. EPA, 2005).*

EPA evaluated how the failure of the Load Calculator to exactly replicate EDS would affect the screening-level analysis for the 2005 Annual Review. Because the screening-level analysis is based on toxic-weighted discharges and focuses on industrial discharges (i.e., non-POTW discharges), EPA estimated TWPE for all reported discharges excluding discharges for SIC 4952 (Sewerage Systems). The total TWPE for non-POTW discharges calculated using the Load Calculator loads was 32.4 million pound-equivalents, and the TWPE calculated using EDS loads was 32.1 million pound-equivalents. The difference in total TWPE using the Load Calculator loads compared to EDS is less than one percent.

The point source categories that had largest differences in TWPE calculated using the Load Calculator loads and EDS loads for 2002 were Steam electric power generation, Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF), Nonferrous Metals Manufacturing, and Phosphate Manufacturing. None of these four categories had more than a 16 percent difference in TWPE calculated using the Load Calculator loads and EDS loads. Attachment 2-B of the SLA Report presents this comparison for all point source categories.

Based on comparison of the Load Calculator output and EDS output using 2002 PCS data, EPA concluded that the Load Calculator output was sufficiently close to EDS for use in the screening-level analysis step of EPA's annual review of existing ELGs. EPA did not compare Load Calculator output to EDS output using 2004 PCS data.

6.1.1.2 Data Sources for Load Calculator

EPA used PCS data accessed through EPA's CNVRT module to create the input to *PCSLoadCalcualtor2004* (see Figure 6-1). Before downloading the measurement data for annual load calculations EPA used the CNVRT module to perform units conversions, match flow rates with pollutant measurements, assign a statistical basis, and perform other activities to put the PCS data into a format that is usable for annual load calculations. The following describes the functions of the CNVRT module:

- Unit conversions: The CNVRT module converts the PCS measurement data into standard units of kilograms per day for mass quantities, milligrams per liter for concentrations, and millions of gallons per day for flow rates.

- Matching Flows with Pollutant Discharges: Wastewater flow rates are reported to PCS as a pollutant parameter using the same five measurement fields as pollutant parameters (MQAV, MQMX, MCMN, MCAV, MCMX). CNVRT matches wastewater flow rates with pollutant measurements using identifying fields in PCS, such as monitoring period end date, monitoring location, discharge pipe number, report designator, and season number. CNVRT creates five new columns for each pollutant discharge record and stores the matching flow information in these fields (FMQAV, FMQMX, FMCMN, FMCAV, and FMCMX).

- Assigning Statistical Basis: CNVRT categorizes the 150 statistical base codes as representing average, maximum, minimum, or total measured values. CNVRT then simplifies the statistical base code reported for each of the five measurement value fields by assigning it a number from 0 to 4 as follows:

  - 0 – No Value Reported,
  - 1 – Average,
  - 2 – Total Monthly Value,
  - 3 – Maximum, and
  - 4 – Minimum.

  CNVRT combines the PCS statistical base codes assigned to each of the five measurement values into one five-digit code called the STAT. Each of the five digits in the STAT corresponds to one of the five measurement fields for pollutant loads or concentrations. Section 2.2.1 of the SLA Report describes the STAT code in more detail.

- Formatting Changes: For pollutants measured at concentrations below their detection limit (BDL), facilities report the detection limit concentration to PCS and indicate that the measurement is BDL using a less than sign "<". CNVRT pulls the less than signs from the measurement value fields and places them in a separate field.

Table 6-2 presents the CNVRT module output that EPA used as a starting point for its annual load calculations.

Table 6-2. CNVRT Module Output

PCS Field	Description
NPID	NPDES Number
SIC2	Standard Industrial Classification Code
DSCH	Discharge Pipe
DRID	Report Designator
NRPU	Number of Units in Reporting Period
PRAM	Parameter Code
MLOC	Monitoring Location
SEAN	Season Number
MODN	Modification Number
LIPQ	Limit Pipe Set Qualifier
STAT	Statistical Base Code
MVDT	Measurement/Violation Monitoring Period End Date
MVIO	Measurement/Violation Code
NODI	No Data Indicator
LMQAV	Measurement/Violation Quantity Average BDL Indicator
LMQMX	Measurement/Violation Quantity Maximum BDL Indicator
LMCMN	Measurement/Violation Concentration Minimum BDL Indicator
LMCAV	Measurement/Violation Concentration Average BDL Indicator
LMCMX	Measurement/Violation Concentration Maximum BDL Indicator
MQAV	Measurement/Violation Quantity Average
MQMX	Measurement/Violation Quantity Maximum
MCMN	Measurement/Violation Concentration Minimum
MCAV	Measurement/Violation Concentration Average
MCMX	Measurement/Violation Concentration Maximum
FMQAV	Measurement/Violation Quantity Average Flow
FMQMX	Measurement/Violation Quantity Maximum Flow
FMCMN	Measurement/Violation Concentration Minimum Flow
FMCAV	Measurement/Violation Concentration Average Flow
FMCMX	Measurement/Violation Concentration Maximum Flow

6.1.1.3 Annual Load Calculation

This section describes the calculations used to produce annual loads from CNVRT output files. As described in Section 6.1.1.1, EPA developed the Load Calculator routine during the 2005 Annual Review to exactly replicate the EDS calculation methodology using 2002 PCS data. For the 2007 Annual Review, EPA made changes to the Load Calculator methodology to calculate annual loads using 2004 PCS data. Section 6.1.1.4 discusses these variations from the EDS methodology. Figure 6-2 presents a flow diagram for the Load Calculator routine that was implemented in *PCSLoadCalcualtor2004*. The calculation steps depicted in the diagram are discussed in the following sections.

Files obtained from the CNVRT module are the starting point for the Load Calculator routine. Because the goal of EPA's screening-level analysis is to use the PCS discharge information to characterize pollutant loadings to receiving streams, some monitoring data in the CNVRT output are not relevant to EPA's screening-level analysis. Irrelevant information includes pollutant discharges for internal monitoring locations, pollutant discharges reported for certain measurement fields, and flows reported for certain measurement fields. For example, for a certain monitoring location pollutant discharges may be reported as both a mass quantity and a concentration. However, EPA does not need concentration data if the quantity is also reported. EPA adapted EDS methodology to create hierarchies for selecting relevant PCS data for its annual loads calculations. The three hierarchies used to select 1) monitoring location, 2) measurement value, and 3) flow value are described below.

Monitoring Location Selection. Permits often require a facility to monitor at multiple locations. The monitoring location is indicated in PCS in the MLOC field. Two of the many PCS MLOC codes designate effluent discharges:

- MLOC 1 - Effluent gross discharge; and
- MLOC 2 - Effluent net discharge.

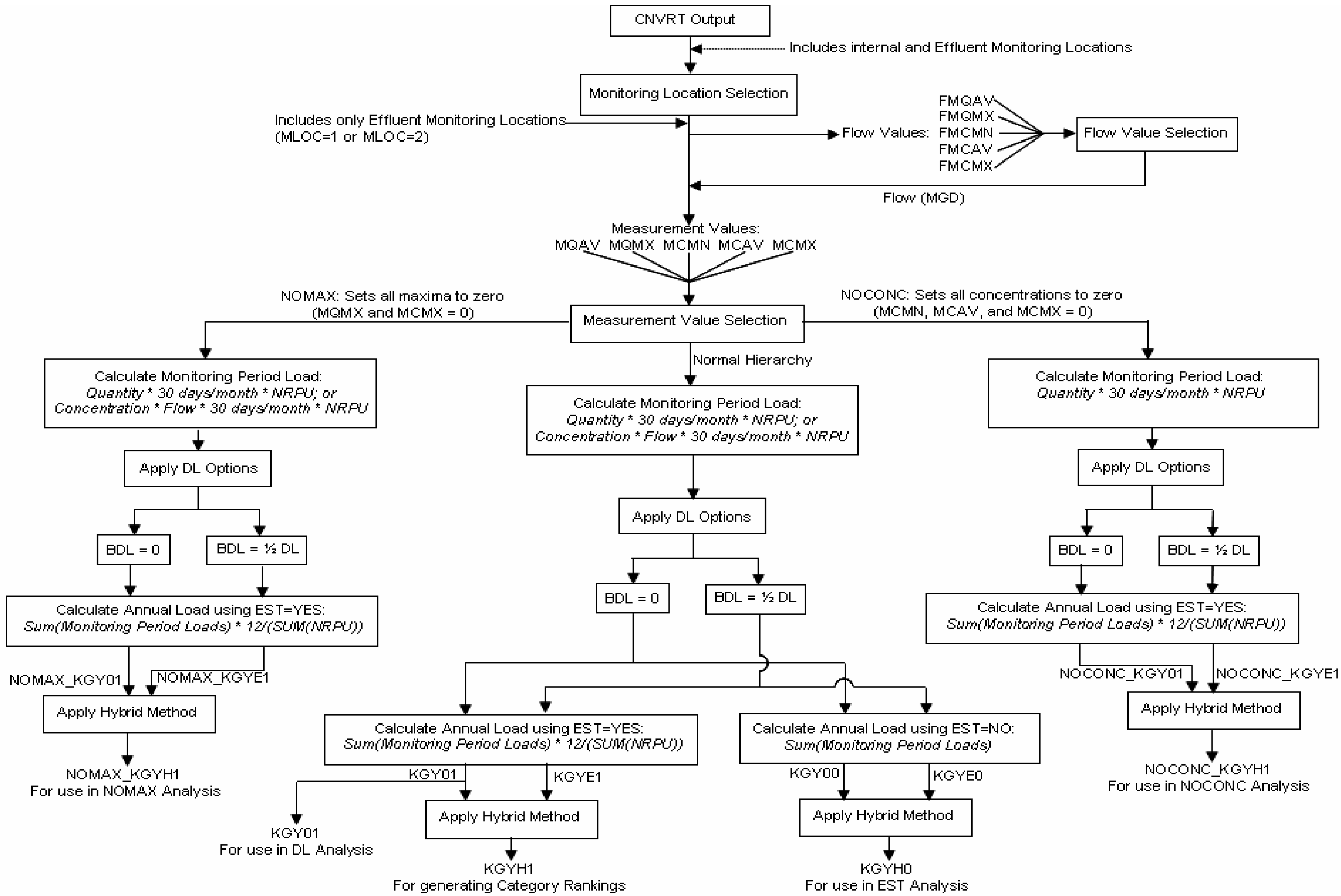

Figure 6-2. Flow Diagram for Load Calcualtor Routine

For its screening level review, EPA estimates annual loads that represent effluent discharges. Therefore, the Load Calculator searches the monitoring field location (MLOC) in PCS to find effluent data only (MLOC 1 or MLOC 2). When both types of effluent data are present for an outfall, MLOC 2 is used in preference to MLOC 1.

***Measurement Value Selection*.** PCS contains five measurement value fields for measured pollutant data (MQAV, MQMX, MCMN, MCAV, and MCMX). The Load Calculator uses a two-step process to select which of these measurement values to use to calculate the annual loads. In the first step, the Load Calculator attempts to identify an average value using the STAT and a measurement field hierarchy. (See section 6.1.1.2 for how CNVRT develops the STAT number using statistical base codes in PCS data.) This first hierarchy defines a value as average if its STAT digit is equal to 1, regardless of which measurement value field it populates. The Load Calculator searches each STAT digit corresponding to the PCS measurement fields in the following sequence, or hierarchy:

- Average Load (MQAV);
- Maximum Load (MQMX);
- Average Concentration (MCAV);
- Maximum Concentration (MCMX); or
- Minimum Concentration (MCMN).

A measurement must meet two criteria to be selected for loads calculation: 1) the mass quantity or concentration must be nonzero, and 2) the corresponding STAT digit for the measurement value field must equal 1.

If the Load Calculator cannot identify a measurement that meets these two criteria, it uses a second hierarchy to select a measurement field for the load calculation. In this second hierarchy, the Load Calculator abandons the STAT code and selects measurement values based on which field they populate:

- The average load (MQAV) field is used if it contains a non-zero value;

- If MQAV cannot be used, and a flow rate is reported, the concentration fields are searched in the following order and the first nonzero concentration is multiplied by the flow to calculate the load:

  - — Average Concentration (MCAV),
  - — Maximum Concentration (MCMX), and
  - — Minimum Concentration (MCMN); and

- If flow and concentration cannot be used to calculate the load, the maximum load (MQMX) is used.

EPA calculated two sets of alternative loads (“NOMAX” and “NOCONC”) using variations on the measurement value selection hierarchy. The relationship between these alternative loads and the loads calculated using the normal hierarchy is depicted in Figure 6-2. Section 6.1.2.3 describes the alternative calculations and EPA’s analysis of the NOMAX and NOCONC annual loads.

Flow Value Selection. To select the appropriate flow data to use to calculate annual loads, the Load Calculator uses a hierarchy that is similar to the measurement value selection hierarchy. The Load Calculator searches the flow measurement fields in the following sequence and selects the first non-zero value it finds:

- Average Quantity Flow (FMQAV);
- Average Concentration Flow (FMCAV);
- Maximum Concentration Flow (FMCMX);
- Minimum Concentration Flow (FMCMN); and
- Maximum Quantity Flow (FMQMX).

While conducting the flow selection process, the Load Calculator attempts to identify and correct flows that have misreported units, which is a common problem for flows in PCS. The Load Calculator attempts to correct this problem by assuming that any reported flow rate greater than 5,000 million gallons per day (MGD) is actually gallons per day (GPD), and divides the reported flow by one million. For flows ranging from 1,300 to 5,000 MGD, EPA compares units for flow permit limits to verify the units reported in PCS and makes corrections on a case-by-case basis. This is a change from the EDS methodology, which divides all flows that are greater than 1,300 MGD by one million. Section 6.1.1.3 discusses EPA’s basis for this change in methodology.

Calculate Monitoring Period Load. After completing the monitoring location, measurement value, and flow selection hierarchies, the Load Calculator has identified one mass quantity or one concentration and flow to use to calculate a load for each pollutant discharge for each monitoring period. The duration of discharge that each monitoring period represents depends on the reporting frequency required by a facility's NPDES permit. For example, if a facility is required to report a pollutant discharge monthly to PCS, then the reported discharge for the monitoring period will represent one month of discharges. If a facility is required to report a pollutant discharge quarterly to PCS, then the reported discharge for the monitoring period will represent three months of discharges. EPA assumes that an outfall discharges continuously for 30 days per month, so the Load Calculator calculates the monthly load using one of the following equations:

- Calculation of monthly load from daily load (MQAV or MQMX):

  Monthly Load (kg/mo) = Daily Load (kg/day) × 30 (days/mo)

- Calculation of monthly load from concentration and flow (MCAV, MCMX, or MCMN):

  Monthly Load (kg/mo) = Conc. (mg/L) × Flow (MGD) × 3.785 (L/gal) × 30 (days/mo)

The Load Calculator then adjusts the monthly load to represent quarterly, semiannual, or annual loads where appropriate by multiplying each monthly load the number of reporting units (NRPU). The NRPU data element is a numeric code that indicates whether a pollutant is monitored monthly (NRPU = 1), quarterly (NRPU = 3), semiannually (NRPU = 6), or annually (NRPU = 12). For example, if a facility reported a 30-day average load of 25 kg/day for its required quarterly report (NRPU=3), the Load Calculator calculates the load for the quarter as 25 kg/day × 30 days/mo x 3 mo/qrt = 2,250 kg/qrt. The output from the monitoring period load calculation step includes the following sets of loads for pollutant discharges:

- Twelve loads for monthly reports;
- Four loads for quarterly reports;
- Two loads for semiannual reports; and
- One load for annual reports.

Apply DL Options. As shown in Figure 6-2, the Load Calculator produces two monitoring period loads by using different calculation assumptions for pollutants that were measured at concentrations below the detection limit (BDL). Using the BDL indicator field from the CNVRT output, the Load Calculator identifies pollutants that were measured BDL. If the BDL indicator field contains a less-than sign (<), the Load Calculator calculates two period loads: one by setting the monitoring period load to zero (BDL = 0) and a second by dividing the monitoring period load in half (BDL = ½ DL). If the BDL indicator field is blank, then the Load Calculator uses the calculated period load for both options. Table 6-3 shows an example calculation of loads for the two DL options.

Table 6-3. Example Calculation for DL Option Loads

Calculated Monitoring Period Load (kg/period)	BDL Indicator Field	Option BDL = 0 Load (kg/period)	Option BDL = ½ DL Load (kg/period)
100	Blank	100	100
100	<	0	50

Calculate EST=YES annual loads. As mentioned previously, the output from the monitoring period load calculation step should include the following sets of loads for pollutant discharges:

- Twelve loads for monthly reports;
- Four loads for quarterly reports;
- Two loads for semiannual reports; and
- One load for annual reports.

However, in some cases, PCS does not contain a complete set of discharges for the year. If a facility does not report a pollutant concentration or mass quantity on its DMR, then the facility uses the no data indicator (NODI) field to explain why no discharge is reported. NODI is a single character code in PCS, which corresponds to a no data indicator description. For example, a facility may not report pollutant concentrations or mass quantities if no discharge occurred for the monitoring period (NODI=C). In other cases, a facility may be discharging during the monitoring period, but does not report pollutant concentrations or quantities because monitoring is conditional and not required for the monitoring period (NODI=9). The Load Calculator includes two options for calculating the annual load when PCS does not contain a complete set of monitoring period loads for the year: 1) sum the existing monitoring period loads to calculate the annual load (EST=NO); or 2) estimate loads for the missing monitoring periods (EST=YES). This section describes the calculation of EST=YES loads, which is the option that EPA used to calculate annual loads for the 2007 Annual Review.

The Load Calculator uses the sum of NRPU values to identify annual loads that do not include a complete set of monitoring period loads. First, the Load Calculator sums the NRPU values for the monitoring period that have calculated pollutant loads. In addition, the Load Calculator sums the NRPU values for blank records with NODI codes that indicate that no discharge occurred for the monitoring period. (See section 2.3 of the SLA Report for a list of NODI codes that indicate that no discharge occurred for a monitoring period.) The Load Calculator then combines the sum of NRPU values for monitoring period loads and monitoring periods with no discharge. If all monitoring periods for the annual data set either have discharge data or indicate no discharge, then the sum of NRPU will equal 12. For example, if a facility is required to monitor quarterly, the NRPU assigned to each quarterly report is 3. If four quarterly reports are present, the total NRPU is 12 (3+3+3+3), indicating all required reports are present. However, if the annual data set includes blanks for any of the monitoring periods and does not indicate that no discharge occurred for the monitoring period, then the sum of NRPU will be less than 12.

As shown in Figure 6-2, the input to the *Calculate EST=YES Annual Loads* step includes two sets of monitoring period loads from the *Calculate DL Options* step: BDL=0 and BDL = ½ DL. To calculate the EST=YES load, the Load Calculator sums monitoring period loads for the DL = 0 option and also separately sums the monitoring period loads for the DL = ½ DL option. For each sum the Load Calculator then uses the ratio of 12 to the sum of NPRU to extrapolate the calculated annual load to account for blank records. The following equation calculates the EST=YES annual load:

$$(EST{=}YES)\ Annual\ Load\ (kg/yr) = Sum(Monthly\ Load \times NRPU) \times (12/Sum(NRPU))$$

Calculate EST=NO annual loads. During the EST=YES calculation step, the Load Calculator also calculates an alternative annual load using the EST=NO option. The calculation for EST=NO is the same as the EST=YES calculation except EST=NO does not multiply the sum of the period loads by the ratio of 12 and the sum of NRPU values. The EST=NO annual load is shown in the following equation:

(EST=NO) Annual Load (kg/yr) = Sum(Monthly Load × NRPU)

Apply Hybrid Method. As shown in Figure 6-2, the output from the *Calculate EST=YES Annual Loads* step includes two annual loads for the DL options: BDL = 0 and BDL = ½ DL. During this calculation step, the Load Calculator applies the following logic to select which calculated load to use to represent the final annual load:

- If the BDL = 0 load equals zero, use the BDL = 0 load (all monitoring period loads for 2004 are zero); and
- If the BDL = 0 load is greater than zero, use the BDL = ½ DL load (at least one monitoring period was not zero, i.e., the pollutant was detected at least once during 2004).

As shown in Figure 6-2, the Load Calculator calculates alternative annual loads starting at the *Measurement Value Selection* step. During this step, the Load Calculator calculated two sets of alternative monitoring period loads using variations on the measurement value selection hierarchy: 1) Set all maximum concentrations and loads to zero (NOMAX); and 2) Set all average, maximum, and minimum concentrations to zero (NOCONC). The Load Calculator then applied the DL options to these alternative loads and calculated EST=YES and EST=NO annual loads for the NOMAX and NOCONC alternatives. As a final step the Load Calculator applies the Hybrid Method to the loads calculated alternative loads.

PCSLoadCalculator2004 Output. The Load Calculator produces twelve calculated annual loads for each pollutant discharge. Seven of the loads use various assumptions for pollutant measurements reported as BDL, which are used to calculate final loads using the Hybrid Method. Five of the loads are final loads, which are used for category rankings and sensitivity analyses (see Section 6.1.2.3). Table 6-3 lists the 12 calculated annual loads and describes the purpose of each load. The five final annual loads are included in the *PCSLoadCalculator2004* output to *PCSLoadsAnalysis2004*.

Table 6-3. *PCSLoadCalculator2004* Output

Annual Load	EST Option	DL Option	Measurement Selection Hierarchy	Purpose
Interim Loads				
KGYE1	Yes	BDL = ½ DL	Normal	Used with KGY01 to calculate Hybrid (KGYH1)
KGY00	No	BDL = 0	Normal	Used with KGYE0 to calculate Hybrid (KGYH0)
KGYE0	No	BDL = ½ DL	Normal	Used with KGY00 to calculate Hybrid (KGYH0)
NOMAX_KGY01	Yes	BDL = 0	All maxima set to zero	Used with NOMAX_KGYE1 to calculate Hybrid (NOMAX_KGYH1)
NOMAX_KGYE1	Yes	BDL = ½ DL	All maxima set to zero	Used with NOMAX_KGY01 to calculate Hybrid (NOMAX_KGYH1)
NOCONC_KGY01	Yes	BDL = 0	All concentrations set to zero	Used with NOCONC_KGYE1 to calculate Hybrid (NOCONC_KGYH1)
NOCONC_KGYE1	Yes	BDL = ½ DL	All concentrations set to zero	Used with NOCONC_KGY01 to calculate Hybrid (NOCONC_KGYH1)
Final Loads				
KGYH1	Yes	Hybrid	Normal	Category Rankings
KGYH0	No	Hybrid	Normal	EST Analysis
KGY01	Yes	BDL = 0	Normal	DL Analysis
NOMAX_KGYH1	Yes	Hybrid	All maxima set to zero	No Max Analysis
NOCONC_KGYH1	Yes	Hybrid	All concentrations set to zero	No Conc Analysis

6.1.1.4 Changes to EDS Methodology

As stated previously, EPA used the EDS methodology to develop the annual load calculation methodology for *PCSLoadCalculator2004*. This section discusses changes that EPA made to the methodology including the reason for the change.

NRPU Correction. Monitoring frequencies may vary for certain pollutants or outfalls depending on a facility's permit requirements. Discharges may be reported monthly, quarterly, semiannually, or annually. The NRPU data element is a numeric code that indicates whether a pollutant is monitored monthly (NRPU = 1), quarterly (NRPU = 3), semiannually

(NRPU = 6), or annually (NRPU = 12). As described in Section 6.1.1.3, the Load Calculator uses the NRPU value for two steps in the annual load calculation.

- The first step that uses the NRPU value is the monitoring period load calculation. During this step, the Load Calculator calculates a monthly load by multiplying a mass quantity by 30 days per month, and then multiplies the monthly load by the NRPU value to calculate a quarterly, semi-annual, or annual load.

- The second step that uses the NRPU value is the calculation of annual loads using the EST=YES option. During this step, the Load Calculator uses the sum of the NRPU values associated with the reported discharges to determine if all DMR data for the pollutant are present in PCS. If the sum of the NRPU values equals 12, then all required discharge data are present for that reporting year.

During the development of *PCSLoadCalculator2004,* EPA observed that the sum of NRPU values for several annual loads was greater than 12, indicating that discharge data for more than the required number of DMRs were present in PCS. The following discusses two scenarios which resulted in the sum of NRPU exceeding 12.

- **Scenario 1: Incorrect NRPU reported.** The first scenario is a data-entry error where the NRPU in PCS was incorrect for the frequency of the reported discharges. For example, a quarterly discharge report should have an NRPU value of 3, but the NRPU value in PCS was 6. As a result, the monthly load for each quarter was multiplied by 6 instead of 3 during the quarterly load calculation, which double-counted the quarterly loads. The EST=YES calculation automatically corrects this error by multiplying the annual load by the ratio of 12 to the sum of the NRPU values. For this example, the sum of NRPU values for the four quarterly reports would be 24 instead of 12. Therefore, using EST=YES, the annual load would be multiplied by 12/24 (0.5), which eliminates the double-counting. For EST=NO, however, this error results in double-counting the annual load since the EST=NO calculation does not multiply the annual load by the ratio of 12 to the sum of NRPU values. EPA corrected the NRPU values for the Scenario 1 cases by changing the NRPU values in the monthly data to correctly reflect the monitoring frequency.

- **Scenario 2: Multiple monthly measurements.** The second scenario occurred if a facility reported discharges twice in one month. For example, a facility reports a discharge monthly to PCS (NRPU = 1), but reported two discharges for September (one on September 15 and one on September 30). The NRPU values for both September reports are 1.

Similar to scenario 1, the double-counting that results from this error is corrected during the EST=YES calculation but not during the EST=NO calculation. Aside from double-counting, this error also causes the discharges reported for September to account for a disproportionate amount of the annual load. For example, the monthly load calculation multiplies both the September 15th and September 30th loads by 30. As a result, September discharges account for 2 out of 13 months instead of 1 out of 12 months. EPA corrected the NRPU values for the Scenario 2 cases by dividing the NRPU values for months with multiple discharges by the number of discharges reported for the month. For this example, the September NRPU value of 1 was divided by 2 because there were two discharge reports for September (corrected NRPU = 0.5). As a result, the monthly load calculation multiplies each September discharge by 30 days per month and 0.5, making each discharge account for one half of a month (15 days).

Flow Correction. As described in Section 6.1.1.3, the Load Calculator attempts to identify and correct flows that have misreported units using a two-step process. First, the Load Calculator assumes that any flow rate that is greater than 5,000 million gallons per day (MGD) should actually be reported as gallons per day (GPD), and divides the flow by one million. EPA also reviews reported flows ranging from 1,300 to 5,000 MGD by comparing reporting units to permit limits to verify the reporting units and makes corrections on a case-by-case basis. This is a change from the EDS methodology, which divides all flows that are greater than 1,300 MGD by one million.

The 1,300 MGD cutoff was based on the maximum flow rate identified at the time that EDS was developed. EPA has identified several facilities that currently discharge wastewater at flows exceeding 1,300 MGD. The 1,300 MGD cutoff used by EDS would underestimate loads for these facilities by a factor of one million if the facilities report pollutant discharges as concentrations in PCS. EPA queried the Envirofacts Data Warehouse[6] webpage for design flows. The design flow rate is the average flow, in MGD, that a facility is designed to accommodate. The highest design flow identified by this query was 4,453 MGD for the DC Water and Sewer Authority (DC0000221). EPA based the new 5,000 MGD cutoff on this design flow.

[6] Envirofacts is a web-based system that allows the public to access PCS data for recent years.

NODI B. The following is a discussion of a methodology change that EPA considered, but decided not to implement. NODI (no data indicator) is a single character code that indicates why pollutant measurements are blank for a reporting period. NODI = B means that the pollutant was measured BDL for that monitoring period. Typically, facilities report BDL measurements by reporting the detection limit concentration (or a mass quantity that was calculated using the detection limit concentration) and indicate the measurement is BDL using a less than "<" sign. However, some facilities report BDL measurements by leaving the measurement value field blank and reporting B in the NODI field. Because the detection limit concentration is not provided in PCS, EPA cannot calculate period loads when the NODI B reporting method is used.

If the pollutant is measured BDL for all 12 months of the year, then the outcome using NODI B is the same as the Hybrid Method – the total annual load is zero. However, if the pollutant is detected at least once during 2004, the EST=YES option will estimate loads for the months when the pollutant was measured BDL based on the detected value. For example, if a pollutant is measured BDL for 11 months but is measured at a concentration above its detection limit for one month, then the effect of the EST=YES option would be to multiply the detected concentration by 12 to account for the months when the facility reported NODI B. This is an overestimation of the Hybrid Method, which would use a concentration equal to ½ the detection limit for months when the pollutant was measured BDL.

EPA considered three options for correcting the overestimation of loads for NODI B:

- Option 1: Make no change.
- Option 2: Exclude NODI B from the EST=YES estimation option. The EST function currently excludes a list of NODI characters that indicate that no discharge occurred for the monitoring period. Adding NODI B to the list would result in setting all BDL measurements that use the NODI B reporting method to zero, which is an underestimation of the Hybrid Method.

- Option 3: Use a concentration of one half the method detection limit (MDL) for BDL measurements if the pollutant was detected at least once for 2004. This option most closely resembles the Hybrid Method, but it requires EPA to identify MDLs for 77 to127 pollutant parameters.

EPA conducted an analysis to determine the impact of using EST for NODI B on the category rankings. EPA ran the Load Calculator and generated category rankings first using EST for NODI B and then without using EST for NODI B. EPA's analysis found that NODI B estimation accounts for only 465,000 lb-eq (0.15%) of the TWPE in *PCSLoads2004*. In addition, the category rankings generated using NODI B estimation and not using NODI B estimation are identical for the top 12 categories. Therefore, EPA concluded that, because NODI B estimation did not have a significant impact on the screening-level analysis, no correction was necessary for NODI B estimation. As a result, EPA did not make any changes to the EST=YES calculation methodology for NODI B.

6.1.2 *PCSLoadsAnalysis2004*

As depicted in Figure 6-1, the *PCSLoadsAnalysis2004* database imports annual load tables from *PCSLoadCalculator2004* and facility information (PCSFAC) from PCS. *PCSLoadsAnalysis2004* uses the five sets of final annual loads from the *PCSLoadCalculator2004* output (see Table 6-3) along with information from PCSFAC and Chemical Abstract Services (CAS) numbers to perform two major functions for the screening-level analysis:

- Calculate TWPE and create the annual loads table ("PCS2004") that is used by *PCSLoads2004* to generate category rankings; and
- Conduct sensitivity analyses to examine the impacts of the alternative load calculations.

Table 6-4 describes the function of each table in *PCSLoadsAnalysis2004*.

Table 6-4. Tables Imported or Created in *PCSLoadsAnalysis2004*

Table Name	Created or Imported	Description
PRAM Codes	Imported from *PCSLoads2002*	Lists pollutants and parameter codes used for them in PCS.
SIC/Point Source Category Crosswalk	Linked from *TRICalculations2004*	Links SIC codes with point source categories using a numeric code assigned in the Point Source Category Codes table.
Point Source Category Codes	Linked from *TRICalculations2004*	Assigns a numeric code to industrial categories using their 40 CFR part or 2-digit or 4-digit SIC Code.
SIC Codes	Linked from *TRICalculations2004*	Lists SIC codes and their descriptions.
SUPERCAS Category	Imported from *PCSLoads2002*	Links CAS numbers to pollutant parameter codes.
TWFs	Linked from *TRICalculations2004*	Assigns TWF values to chemicals by CAS number.
PCS FAC	Imported from PCS	Presents information on permitted facilities, such as facility name, location, major/minor discharge status, and date of most recent permit issuance
PCS2004	Created using queries	Presents the annual loads in pounds per year and TWPE for each pollutant discharge for each outfall at major permitted facilities.
PCS Flows	Created using queries	Presents the annual flow in millions of gallons per year for each outfall at major permitted facilities.
Sensitivity Analysis	Created using queries	Presents the annual loads in pounds per year for each pollutant discharge for each outfall at major permitted facilities for the five annual loads calculated by the Load Calculator.

The annual loads tables from *PCSLoadCalculator2004* identify pollutants using PCS parameter codes. TWFs, however, are assigned to chemicals identified by CAS numbers. As a result, EPA developed a crosswalk that links CAS numbers to parameter codes. The crosswalk linking parameters to CAS numbers and TWFs is discussed in Section 2.1.1 of the SLA Report (U.S. EPA, 2005). In addition to creating the PCS2004 Table, *PCSLoadsAnalysis2004* performs a number of modifications to the annual loads. These modifications include applying database corrections that were identified during previous Annual Reviews, grouping discharges for pollutant parameters that represent the same pollutant (e.g. total copper and dissolved copper), and calculating TWPE. Figure 6-3 depicts the *PCSLoadsAnalysis2004* inputs used to create the PCS2004 Table.

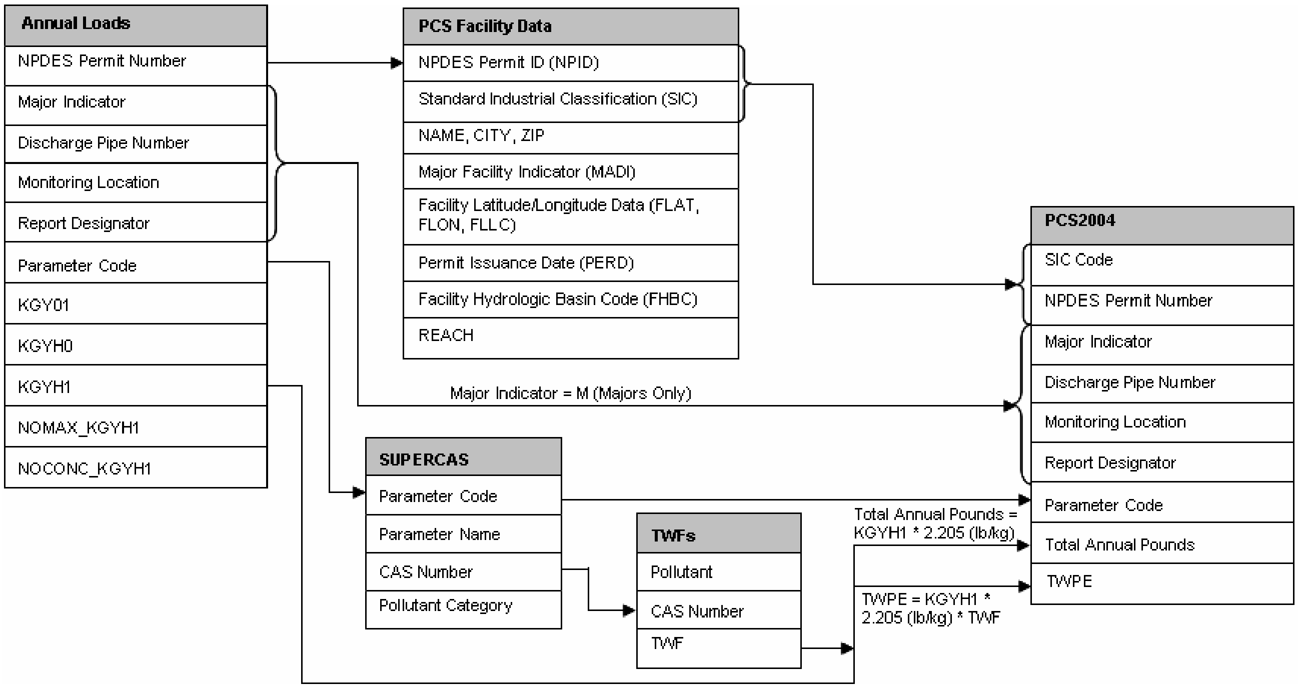

Figure 6-3. *PCSLoadsAnalysis2004* Inputs Used to Create PCS2004 Table

The following subsections describe the functions of *PCSLoadsAnalysis2004*:

- Section 6.1.2.1 describes the database corrections;
- Section 6.1.2.2 describes the grouping of pollutant parameters that represent one pollutant; and
- Section 6.1.2.3 describes the sensitivity analyses.

6.1.2.1 Database Corrections

During the 2004 and 2005 screening-level analyses, EPA identified numerous facility-specific corrections for PCS data. Several of these corrections similarly apply to the 2004 data. In addition, EPA's quality review (Section 6.3) identified 53 other corrections to the 2004 PCS data, (e.g., units incorrectly reported to PCS as gallons per day were corrected to MGD). Table D-1 in Appendix D of this report lists all corrections made to the 2004 PCS data. In addition to the facility-specific data corrections, *PCSLoadsAnalysis2004* performs the following modifications to the annual loads:

- **Categorization of Discharges.** Section 5.2.1 describes the database corrections to categorization of facilities and pollutant discharges. The database corrections described in Section 5.2.1 apply to both the *TRIReleases2004* and *PCSLoads2004* databases.

- **Internal Monitoring.** As described in Section 6.1.1, the Load Calculator calculates loads only for monitoring locations that are labeled as effluent (MLOC 1 or 2) in PCS. As a result, the Load Calculator excludes discharges for internal monitoring locations such as intake water, influent to treatment, and intermediate points in the wastewater treatment system. However, during previous category reviews and detailed studies, EPA identified instances of double counting that resulted from internal monitoring for effluent data. For example, a facility monitors for Pollutant A at the effluent from its wastewater treatment system (Internal Outfall 101). Outfall 101 wastewater is later combined with other plant discharges at final Outfall 001 and is discharged to a receiving stream. The facility also monitors for Pollutant A at Final Outfall 001. Both outfalls are effluent monitoring points identified as MLOC 1 or MLOC 2; however, Outfall 101 is upstream of the final outfall. Calculating loads for Pollutant A at both the internal and final outfalls results in double counting Pollutant A discharges. EPA identified instances where pollutant discharges are reported for multiple monitoring locations along the same discharge line, and eliminated the discharges for the upstream monitoring locations.

- **Intermittent Discharges.** As described in Section 6.1.1, the Load Calculator assumes that all discharges in PCS are continuous. During previous Annual Reviews, EPA identified facility discharges that are intermittent and therefore are overestimated by the Load Calculator. EPA calculates annual loads for these discharges based on information obtained from the facility on the frequency and duration of wastewater discharges.

- **Pollutant Parameters Excluded from *PCSLoads2004.*** Parameters in PCS include water quality parameters (e.g., dissolved oxygen and temperature), specific chemicals (e.g., phenol), bulk parameters (e.g., biochemical oxygen demand), and flow. As described in Section 6.1.1.2, facilities report pollutant mass quantities, pollutant concentrations, and wastewater flow rates to PCS using a variety of units. EPA's CNVRT program converts the discharges into standard units of kilograms per day for mass quantities, milligrams per liter for concentrations, and millions of gallons per day for flow rates. However, some parameters are reported to PCS in units that cannot be converted into kg/day or mg/L (e.g. temperature and pH). EPA excluded annual loads for these parameters from the screening-level analysis. Table D-2 of Appendix D lists the excluded parameters.

6.1.2.2 Parameter Groupings

An NPDES permit may require a facility to measure a pollutant in more than one way. For example, a facility may report both total lead and dissolved lead. Because total lead includes dissolved lead, adding the two measurements together overestimates the mass of lead discharged from the facility. To avoid double counting, EPA groups parameters that represent the same pollutant. *PCSLoadsAnalysis2004* groups the annual loads from *PCSLoadCalculator2004* using a hierarchy to determine which parameter best represents the total pollutant discharge. For example, copper has six parameter codes: (1) dissolved copper, (2) suspended copper, (3) total copper, (4) total recoverable copper, (5) copper, and (6) potentially dissolved copper. Below is the "grouping" hierarchy for copper *PCSLoadsAnalysis2004* uses if a facility reports multiple parameter codes:

1. The data for total copper has precedence over the data for copper;
2. If total copper is not reported, the data for copper has precedence over the data for total recoverable copper;
3. If total copper and copper are not reported, the data for total recoverable copper has precedence over the data for potentially dissolved copper;
4. If total copper, copper, and total recoverable copper are not reported the data for potentially dissolved copper has precedence over the data for either dissolved copper or suspended copper; and
5. The data for dissolved copper are used to represent the facility's copper discharges in the absence of other copper parameters.

For the development of *PCSLoads2004*, EPA used the same parameter grouping hierarchy as the *PCSLoads2002* database (see Attachment 2-A of the SLA Report).

6.1.2.3 Sensitivity Analyses

As described in Section 6.1.1.2, EPA developed queries in *PCSLoadCalculator2004* to calculate annual loads using the following alternative methods:

- No Maximum (NOMAX) – PCSLoadCalculator2004 used an alternative measurement selection hierarchy, which set maximum concentrations (MCMX) and maximum quantities (MQMX) to zero during the measurement value selection process.

- No Concentration (NOCONC) – PCSLoadCalculator2004 used an alternative measurement selection hierarchy, which set average concentrations (MCAV), minimum concentrations (MCMN), and maximum concentrations (MCMX) to zero during the measurement value selection process.

- EST=NO – PCSLoadCalculator2004 assumes a discharge of zero for monitoring periods where discharge data are missing.

- DL=0 – PCSLoadCalculator2004 assumes a discharge of zero for pollutants that are labeled BDL.

Table 6-5 compares the assumptions and calculation options that PCSLoadCalculator2004 used to calculate each set of annual loads.

Table 6-5. Comparison of Alternative Load Calculation Methods

Annual Load Set	EST Option	DL Option	Measurements Included in Selection Hierarchy
Standard Load Calculation			
PCS 2004	EST=YES	Hybrid	MQAV MQMX MCMN MCAV MCMX
Alternative Load Calculations			
NOMAX	EST=YES	Hybrid	MQAV MQMX=0 MCMN MCAV MCMX=0
NOCONC	EST=YES	Hybrid	MQAV MQMX MCMN=0 MCAV=0 MCMX=0
EST=NO	EST=NO	Hybrid	MQAV MQMX MCMN MCAV MCMX
DL=0	EST=YES	DL=0	MQAV MQMX MCMN MCAV MCMX

EPA examined the impact of each calculation method, shown in Table 6-4, on the calculated pollutant loadings in a series of sensitivity analyses. To conduct each sensitivity analysis, EPA calculated TWPE for loads calculated with each alternative method, and compared TWPE calculated using the standard and alternative load calculation methods. EPA made this comparison for total discharge and for the discharges separated into categories. EPA then identified categories and individual facilities within a category that show a large difference between PCS 2004 TWPE and alternative TWPE using the calculations shown below:

> Amount of TWPE Based on Calculation Alternative (lb-eq/yr) = Standard Load TWPE (lb-eq/yr) – Alternative Load TWPE (lb-eq/yr)
>
> Percent of TWPE Based on Calculation Alternative = Amount of TWPE Based on Calculation Alternative (lb-eq/yr) / Standard Load TWPE (lb-eq/yr)

Section 2.3 of the SLA Report provides a more detailed discussion of the DL and EST options and EPA's sensitivity analyses for these options based on 2002 PCS data. The following sections discuss the results of the DL, EST, NOMAX, and NOCONC sensitivity analyses based on 2004 PCS data.

DL Sensitivity Analysis

The purpose of the DL sensitivity analysis is to evaluate the impact of EPA's use of the Hybrid method, which estimates loads for some pollutants reported to PCS as BDL, on the screening-level analysis. Table 6-6 presents a summary of the results of the DL analysis for the point source categories showing the highest sensitivity to the DL options and the total for *PCSLoads2004*. Table D-3 of Appendix D compares the category rankings generated using DL=0 loads and Hybrid method loads. As shown in the table, only 2.9 percent (568,000 lb-eq) of the TWPE in *PCSLoads2004* are based on BDL assumptions using the Hybrid method. The categories showing the greatest sensitivity to DL options include cement manufacturing, waste combustors, and landfills. Pollutant parameters showing the highest sensitivity to DL options include acrolein, benzidine, and DDT.

Table 6-6. Results of DL Sensitivity Analysis

Point Source Category	Total Number of Records	Number of Records Based on DL	Total Annual Load, lb/yr	Total Annual Load Based on DL, lb/yr	Total TWPE, lb-eq/yr	Total TWPE Based on DL, lb-eq/yr
Cement manufacturing	108	21 (19%)	334,000,000	3,080,000 (0.92%)	17,500	9,190 (53%)
Waste combustors	960	130 (14%)	39,400,000	439,000 (1.1%)	9,090	4,590 (51%)
Landfills	960	130 (14%)	39,400,000	439,000 (1.1%)	9,090	4,590 (51%)
Oil & Gas Extraction	72	1 (1.4%)	553,000	91 (0.016%)	18	4 (24%)
Metal Finishing	2,530	231 (9.1%)	256,000,000	138,000 (0.054%)	616,000	138,000 (22%)
Meat and Poultry Products	913	26 (2.8%)	191,000,000	183,000 (0.10%)	46,700	7,010 (15%)
Organic chemicals, plastics and synthetic fibers	12,100	468 (3.9%)	3,810,000,000	1,230,000 (0.032%)	490,000	65,200 (13%)
Grain mills	118	3 (2.5%)	30,500,000	2,680 (0.0088%)	2,430	295 (12%)
Textile mills	942	79 (8.3%)	71,100,000	196,000 (0.28%)	123,000	13,300 (11%)
Pharmaceutical manufacturing	893	67 (7.5%)	64,500,000	28,100 (0.044%)	13,300	1,380 (10%)
Total PCSLoads2004	**52,900**	**3,910 (0.070%)**	**64,500,000,000**	**100,000,000 (0.16%)**	**19,400,000**	**568,000 (2.9%)**

EST Sensitivity Analysis

The purpose of the EST sensitivity analysis is to evaluate the impact of EPA's use of the EST=YES option, which estimates loads for certain blank records in PCS based on the NODI code, on the screening-level analysis. Table 6-7 presents a summary of the results of the EST analysis for the point source categories showing the highest sensitivity to the EST options and the total for *PCSLoads2004*. Table D-4 of Appendix D compares the category rankings generated using EST=YES loads and EST=NO loads. As shown in the table, 15 percent (3,010,000 lb-eq) of the TWPE in *PCSLoads2004* are based on estimation ("based on EST") using the EST=YES option. The categories showing the greatest sensitivity to EST options include battery manufacturing, petroleum refining, and hospitals. Pollutant parameters showing the highest sensitivity to EST options include dioxin (TCDD), mercury, and PCBs.

NOMAX Sensitivity Analysis

The purpose of the NOMAX sensitivity analysis is to evaluate how frequently *PCSLoadCalculator2004* uses concentrations or loads that are reported as maxima to PCS for the annual load calculation, and evaluates the effect of maxima on the screening-level analysis. Table 6-8 presents a summary of the results of the NOMAX analysis for the point source categories showing the highest sensitivity to the NOMAX options and the total for *PCSLoads2004*. Table D-5 of Appendix D compares the category rankings generated using NOMAX loads and PCS 2004 loads. As shown in the table, 15 percent (2,890,000 lb-eq) of the TWPE in *PCSLoads2004* are based on maxima. The categories showing the greatest sensitivity to quantities and concentrations reported as maxima to PCS include printing and publishing, cement manufacturing, and airport deicing. Pollutant parameters reported to PCS most frequently using maximum concentration or quantity include mercury, selenium, and chlorine.

Table 6-7. Results of EST Sensitivity Analysis

Point Source Category	Total Number of Records	Number of Records Based on EST	Total Annual Load, lb/yr	Total Annual Load Based on EST, lb/yr	Total TWPE, lb-eq/yr	Total TWPE Based on EST, lb-eq/yr
Battery manufacturing	19	17 (89%)	88,400	73,700 (83%)	5,170	4,310 (83%)
Petroleum refining	3,441	518 (15%)	1,760,000,000	142,000,000 (8.1%)	819,000	449,000 (55%)
Hospital	24	7 (29%)	36,400	13,100 (36%)	14	7 (53%)
Centralized Waste Treatment	377	32 (8.5%)	10,500,000,000	6,050,000,000 (58%)	8,731	4,350 (50%)
Paving and roofing materials (tars and asphalt)	50	24 (48%)	274,000,000	114,000,000 (42%)	1,310	631 (48%)
Pharmaceutical manufacturing	893	119 (13%)	64,500,000	24,300,000 (38%)	13,300	5,880 (44%)
Gum and wood chemicals manufacturing	29	6 (21%)	2,930,000	74,200 (2.5%)	46,400	19,400 (42%)
Ore mining and dressing	1,060	296 (28%)	2,160,000,000	127,000,000 (5.9%)	581,000	234,000 (40%)
Mineral Mining and Processing	420	135 (32%)	379,000,000	238,000,000 (63%)	49,300	18,500 (37%)
Canned and preserved seafood processing	54	37 (69%)	111,000,000	60,400,000 (55%)	828	281 (34%)
Total	**52,900**	**8,300 (16%)**	**64,500,000,000**	**19,300,000,000 (30%)**	**19,400,000**	**3,010,000 (15%)**

Table 6-8. Results of NOMAX Sensitivity Analysis

Point Source Category	Total Number of Records	Number of Records Based on Concentration	Total Annual Load, lb/yr	Total Annual Load Based on Maxima, lb/yr	Total TWPE, lb-eq/yr	Total TWPE Based on Maxima, lb-eq/yr
Printing & Publishing	23	15 (65%)	624,000	4,570 (0.73%)	2,190	2,190 (100%)
Cement manufacturing	108	51 (47%)	334,000,000	333,000,000 (99.8%)	17,500	17,400 (99.7%)
Airport Deicing	42	15 (36%)	614,000	285,000 (46%)	1,560	1,560 (99.7%)
Metal Products and Machinery	666	129 (19%)	10,900,000	6,540,000 (60%)	1,050	1,040 (99%)
Aluminum forming	268	106 (40%)	119,000,000	4,380,000 (4%)	27,600	25,900 (94%)
Metal molding and casting (foundries)	117	12 (10%)	4,960,000	907,000 (18%)	4,750	4,300 (91%)
Grain mills	118	19 (16%)	30,500,000	22,300,000 (73%)	2,430	1,990 (82%)
Ore mining and dressing	1,060	137 (13%)	2,160,000,000	101,000,000 (4.7%)	581,000	450,000 (77%)
Mineral Mining and Processing	420	155 (37%)	379,000,000	125,000,000 (33%)	49,300	35,200 (71%)
Independent and Stand Alone Labs	203	43 (21%)	4,160,000	1,390,000 (33%)	269	179 (67%)
Total PCSLoads2004	**52,900**	**8,680 (16%)**	**64,500,000,000**	**16,700,000,000 (26%)**	**19,400,000**	**2,890,000 (15%)**

NOCONC Sensitivity Analysis

The purpose of the NOCONC sensitivity analysis is to evaluate how frequently PCSLoadCalculator2004 uses concentrations and flows in PCS for the annual load calculation, and evaluates the effect using concentrations and flows on the screening-level analysis. Table 6-9 presents a summary of the results of the NOCONC analysis for the point source categories showing the highest sensitivity to the NOCONC option and the total for *PCSLoads2004*. Table D-6 of Appendix D compares the category rankings generated using NOCONC loads and PCS 2004 loads. As shown in the table, 87 percent (16,800,000 lb-eq) of the TWPE in *PCSLoads2004* are based on concentration. The categories showing the greatest sensitivity to loads calculated using concentration and flow include cement manufacturing, battery manufacturing, and construction and development. Pollutant parameters reported to PCS most frequently using concentration measurements include dioxin, aluminum, and selenium.

6.1.3 *PCSNutrients2004*

PCSNutrients2004 uses the annual loads for nitrogen and phosphorus compounds from the PCS2004 table to calculate aggregate nitrogen as N and phosphorus as P loads for each facility outfall. The database sums the aggregate nitrogen and phosphorus loads by facility and by point source category. Table C-6 of Appendix C presents the category rankings for total nitrogen as N loads and Table C-7 presents the category rankings for total phosphorus as P loads.

PCS data include discharges of nitrogen and phosphorus in various chemical forms. For example, nitrogen may be reported in its elemental form (as N), total Kjeldahl nitrogen (TKN), organic nitrogen, ammonia as N, ammonia as NH_3 or NH_4, un-ionized ammonia, nitrite, or nitrate. EPA developed a series of hierarchies to select the appropriate combination of nitrogen and phosphorus compounds to calculate the total nitrogen and total phosphorus loads. These hierarchies, summarized below, are described in detail in the 9 August 2005 memorandum entitled “Point Source Category Rankings by Nitrogen and Phosphorus Loads Calculated Using 2002 PCS Data” (Kandle, 2005).

Table 6-9. Results of NOCONC Sensitivity Analysis

Point Source Category	Total Number of Records	Number of Records Based on Concentration	Total Annual Load, lb/yr	Total Annual Load Based on Concentration, lb/yr	Total TWPE, lb-eq/yr	Total TWPE Based on Concentration, lb-eq/yr
Cement manufacturing	108	58 (54%)	334,000,000	334,000,000 (>99.9%)	17,500	17,500 (100%)
Battery manufacturing	19	17 (89%)	88,400	88,400 (100%)	5,170	5,170 (100%)
Construction and Development	82	82 (100%)	29,100	29,100 (100%)	231	231 (100%)
Photographic	12	4 (33%)	3,590	3,590 (100%)	0.0553	0.0553 (100%)
Photo Processing	12	4 (33%)	3,590	3,590 (100%)	0.0553	0.0553 (100%)
Printing & Publishing	23	16 (70%)	624,330	66,708 (11%)	2,190	2,190 (100%)
Miscellaneous Foods and Beverages	115	94 (82%)	5,560,000,000	5,507,000,000 (99%)	280,000	280,000 (>99.9%)
Drinking Water Treatment	194	120 (62%)	920,000,000	919,000,000 (99.9%)	128,000	128,000 (99.9%)
Ore mining and dressing	1,063	635 (60%)	2,160,000,000	2,160,000,000 (>99.9%)	581,000	580,000 (99.9%)
Hospital	24	18 (75%)	36,400	35,200 (97%)	14	14 (99.9%)
Total PCSLoads2004	**52,900**	**18,900 (36%)**	**64,500,000,000**	**60,400,000,000 (94%)**	**19,400,000**	**16,800,000 (87%)**

Total Nitrogen Load

EPA calculated total nitrogen using one of the following equations (presented in order of use):

- Total Nitrogen Load = Total Nitrogen as N;
- Total Nitrogen Load = TKN + Nitrite (NO2) + Nitrate (NO3); or
- Total Nitrogen Load = Organic Nitrogen + Ammonia + Nitrite + Nitrate.

Nitrogen compounds that are reported as NH_3, NH_4, NO_2, or NO_3 were converted to N based on molecular weight, then summed to calculate Total Nitrogen Load. Table 6-10 presents the conversion factors EPA used for nitrogen compounds.

Table 6-10. Conversion Factors for Nitrogen Compounds

Nitrogen Compound	Conversion Factor
Ammonia as NH_3 or NH_4[a]	14 N / 17 NH_3
Nitrite as NO_2	14 N / 46 NO_2
Nitrate as NO_3	14 N / 62 NO_3

[a]The conversion factor for ammonia assumes that the majority of ammonia loads in *PCSLoads2002* are reported as NH_3.

Total Phosphorus Load

Loads for phosphorus parameters were grouped by EPA's grouping hierarchy described in Section 6.1.2 and assigned to a grouped parameter code. As a result, PCSNutrient2004 includes only two parameters for phosphorus compounds. EPA used the following hierarchy to calculate total phosphorus load:

- If loads of phosphorus (PRAM PHOSP) were available, EPA used the PRAM PHOSP load to represent total phosphorus. EPA assumed that the majority of the loads were reported as P and did not apply a conversion factor to calculate pounds of P.

- If loads of phosphorus (PRAM PHOSP) were not available, EPA used loads of phosphate (PRAM PO4). EPA multiplied the load by 31/95 to convert the reported phosphate load to pounds of P.

6.1.4 *PCSLoads2004*

As depicted in Figure 6-1, the *PCSLoads2004* database uses the PCS2004 and PCSFAC tables from *PCSLoadsAnalysis2004* along with the SIC/Point Source Category Crosswalk to generate point source category rankings for each industrial category. Table 6-11 describes the function of each table in *PCSLoads2004*.

Table 6-11. Tables Imported or Created in PCSLoads2004

Table Name	Created or Imported	Description
PRAM Codes	Imported from *PCSLoads2002*	Lists pollutants and parameter codes used for them in PCS.
SIC/Point Source Category Crosswalk	Linked from *TRICalculations2004*	Links SIC codes with point source categories using a numeric code assigned in the Point Source Category Codes table.
Point Source Category Codes	Linked from *TRICalculations2004*	Assigns a numeric code to industrial categories using their 40 CFR part or 2-digit or 4-digit SIC Code.
SIC Codes	Linked from *TRICalculations2004*	Lists SIC codes and their descriptions.
SUPERCAS Category	Imported from *PCSLoads2002*	Links CAS numbers to pollutant parameter codes.
TWFs	Linked from *TRICalculations2004*	Assigns TWF values to chemicals by CAS number.
PCS FAC	Linked from *PCSLoadsAnalysis2004*	Presents information on permitted facilities, such as facility name, location, major/minor discharge status, and date of most recent permit issuance
PCS2004	Linked from *PCSLoadsAnalysis2004*	Presents the annual loads in pounds per year and TWPE for each pollutant discharge for each outfall at major permitted facilities.
PCS Flows	Linked from *PCSLoadsAnalysis2004*	Presents the annual flow in millions of gallons per year for each outfall at major permitted facilities.
Category Rankings - Nitrogen	Linked from *PCSNutrietns2004*	Presents rankings of categories based on aggregated nitrogen load.
Category Rankings - Phosphorus	Linked from *PCSNutrients2004*	Presents rankings of categories based on aggregated phosphorus load.
SIC Code Rankings	Created using queries	Presents rankings of SIC codes based on calculated TWPE.
Category Rankings – Toxic Weight	Created using queries	Presents rankings of categories based on calculated TWPE.

PCS2004 also assigns a facility's discharge to an industrial category using 4-digit SIC codes. Point source categories are not generally defined by SIC codes. As a result, EPA developed a second crosswalk that links point source categories to 4-digit SIC codes. The crosswalk linking SIC codes and point source categories is discussed in Section 2.1.2 of the SLA Report (U.S. EPA, 2005).

As shown in Figure 6-4, *PCSLoads2004* links information from the PCS2004 Table, PCSFAC, and the SIC/Point Source Category Crosswalk to create point source category rankings. The SIC codes in the PCS2004 Table are specific to each parameter, discharge pipe (outfall), and facility (NPDES permit number). This allows EPA to make SIC adjustments to differentiate between various operations/outfalls at one facility and assign discharges at the pollutant-level to different point source categories, as described in Section 5.2.1.

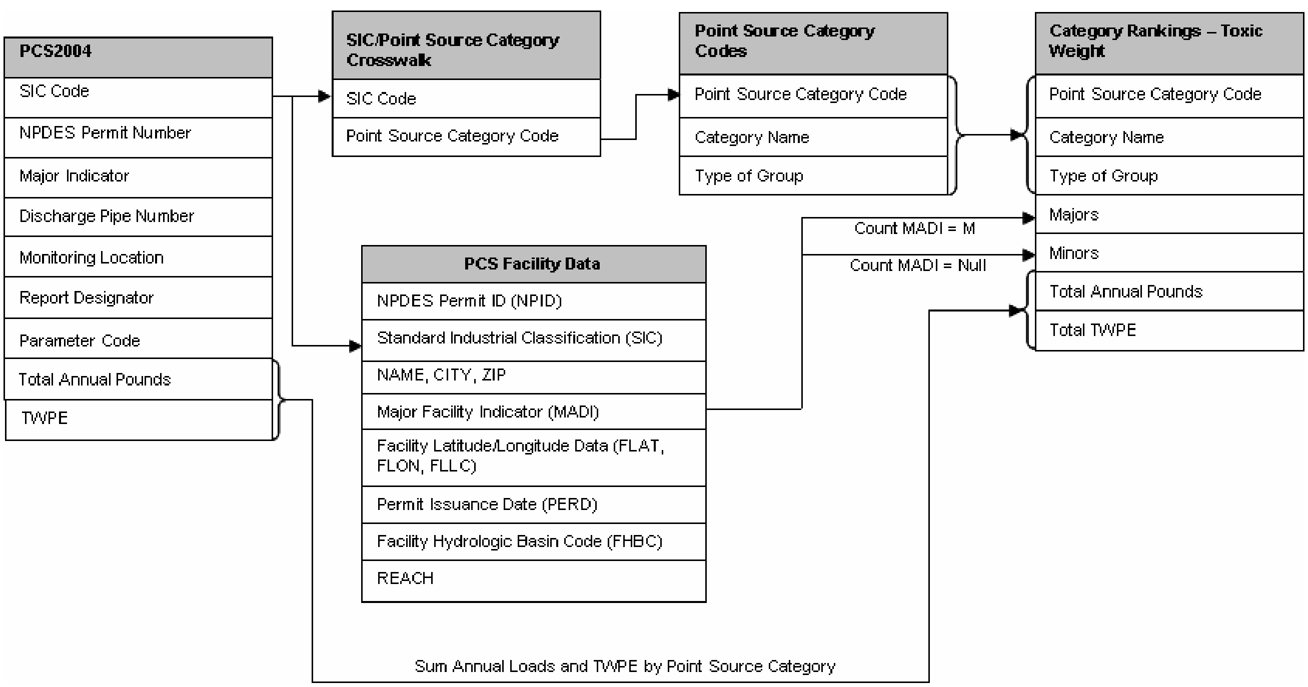

Figure 6-4. *PCSLoads2004* Database Structure

6.2 Results

This section presents the results of the *PCSLoads2002* database. Table 6-12 presents the categories ranked from highest to lowest TWPE. Table B-3 of Appendix B presents the four-digit SIC code rankings by TWPE. Table B-4 presents the total TWPE for pollutant parameters reported in PCS.

6.3 Data Quality Review

EPA evaluated the quality of PCS data for use in the screening-level review and prioritization of loadings of toxic and non-conventional pollutants discharged by industrial categories based on completeness, accuracy, reasonableness, and comparability. The *Quality Assurance Project Plan for the 2007 Annual Screening-Level Analysis of TRI and PCS Industrial Category Discharge Data* describes the quality objectives in more detail (ERG, 2007). EPA conducted quality reviews for three stages of the development of *PCSLoads2004*: CNVRT program output; the Load Calculator routine; and *PCSLoads2004* results. The following discussion provides an overview of the quality review steps for each stage:

- **CNVRT program output.** EPA's quality review of the CNVRT output files included reasonableness checks of pollutant quantities and concentrations. EPA reviewed the CNVRT program output (i.e., the measured pollutant discharges in PCS converted into standard units of kg/day and mg/L) to identify possible errors in recording units of measure. EPA reviewed ranges of pollutant quantities and concentrations and identified pollutant measurements and flows that were unreasonably high. EPA then compared these measurements with measurements available on EPA's Envirofacts web page. If the measurements were similar EPA concluded that the Convert file output was acceptable. This review resulted in two types of systematic corrections to the CNVRT output:

    — Corrections to 164 flows ranging from 1,300 MGD to 5,000 MGD (see Section 3.1.1.4), and

    — Corrections to 290 mercury concentrations reported to PCS using PRAM 50092 (Mercury Total Low Level) (see Section 3.3.1).

Table 6-12. Point Source Category Rankings by TWPE

40 CFR Part	Point Source Category	Major Dischargers	Minor Dischargers	Total Pounds	TWPE
414.1	Chlorine and Chlorinated Hydrocarbons[a]	41	7	2,091,000,000	10,500,000
423	Steam Electric Power Generating	524	434	21,900,000,000	2,410,000
418	Fertilizer Manufacturing	22	28	646,000,000	1,170,000
419	Petroleum Refining	113	583	1,720,000,000	819,000
433	Metal Finishing	106	767	256,000,000	616,000
440	Ore Mining and Dressing	52	43	2,160,000,000	581,000
420	Iron and Steel Manufacturing	89	72	509,000,000	516,000
414	Organic Chemicals, Plastics and Synthetic Fibers	228	307	3,800,000,000	490,000
421	Nonferrous Metals Manufacturing	36	27	197,000,000	321,000
415	Inorganic Chemicals Manufacturing	64	171	1,060,000,000	309,000
NA	Miscellaneous Foods and Beverages	11	131	5,560,000,000	280,000
430	Pulp, Paper and Paperboard	218	67	2,340,000,000	165,000
NA	Drinking Water Treatment	15	1,121	920,000,000	128,000
410	Textile Mills	63	63	71,100,000	123,000
455	Pesticide Chemicals	152	11	178,000,000	102,000
422	Phosphate Manufacturing	15	10	133,000,000	74,200
436	Mineral Mining and Processing	33	1,096	379,000,000	49,300
432	Meat And Poultry Products	45	157	191,000,000	46,700
454	Gum and Wood Chemicals Manufacturing	3	8	2,930,000	46,500
467	Aluminum Forming	10	30	119,000,000	27,600
411	Cement Manufacturing	5	122	334,000,000	17,500
439	Pharmaceutical Manufacturing	27	49	64,500,000	13,300
409	Sugar Processing	20	23	289,000,000	11,900
471	Nonferrous Metals Forming and Metal Powders	13	34	2,000,000	11,600
463	Plastics Molding and Forming	8	118	37,100,000	10,800
413	Electroplating	21	39	3,320,000	9,550
445	Landfills	18	284	39,400,000	9,090
444	Waste Combustors	18	284	39,400,000	9,090
437	Centralized Waste Treatment	4	0	10,500,000,000	8,730
424	Ferroalloy Manufacturing	3	5	15,300,000	6,430
461	Battery Manufacturing	1	7	85,700	5,170
469	Electrical and Electronic Components	5	7	2,390,000	4,890

Table 6-12 (Continued)

40 CFR Part	Point Source Category	Major Dischargers	Minor Dischargers	Total Pounds	TWPE
464	Metal Molding and Casting (Foundries)	6	59	4,960,000	4,750
468	Copper Forming	8	22	4,160,000	3,640
426	Glass Manufacturing	4	59	698,000	2,710
434	Coal Mining	10	320	7,990,000,000	2,490
407	Canned And Preserved Fruits and Vegetables Processing	11	73	15,400,000	2,460
406	Grain Mills	11	28	30,500,000	2,430
457	Explosives Manufacturing	4	9	13,500,000	2,270
NA	Printing and Publishing	1	17	624,000	2,190
428	Rubber Manufacturing	19	104	11,600,000	1,670
NA	Airport Deicing	3	48	614,000	1,560
443	Paving and Roofing Materials (Tars And Asphalt)	4	71	274,000,000	1,310
438	Metal Products And Machinery	69	0	10,900,000	1,050
408	Canned and Preserved Seafood Processing	5	83	111,000,000	828
425	Leather Tanning and Finishing	4	1	876,000	705
429	Timber Products Processing	8	227	13,200,000	443
NA	Independent and Stand Alone Labs	7	37	4,160,000	269
NA	Construction and Development	1	15	29,100	231
417	Soap and Detergent Manufacturing	4	11	217,000	79.8
405	Dairy Products Processing	4	78	34,500,000	40.7
435	Oil & Gas Extraction	3	291	553,000	17.8
460	Hospital	2	143	36,400	13.6
466	Porcelain Enameling	2	1	5,620	7.23
NA	Tobacco Products	1	2	117,000	1.15
459	Photographic	1	1	3,590	0.0553
NA	Photo Processing	1	1	3,590	0.0553

Source: PCSLoads2004_v3.
[a]414.1 refers to the chlorinated hydrocarbon segment of 414 and the chlor-alkali segment of 415.
NA – Not applicable; no existing ELGs apply to discharges.

- **Load Calculator routine.** EPA's quality review for the Load Calculator routine included accuracy checks for database queries. EPA reviewed the programming code used to develop each query to verify the logic and verified that the number of records in the output table equaled the number of records in intermediate queries, to ensure that no data were missing and that there were no duplicate data. In addition, EPA performed hand calculations to verify the accuracy of the Load Calculator output during reviews of facility discharges for *PCSLoads2004* results.

- ***PCSLoads2004* results.** EPA's quality review of the *PCSLoads2004* results included the following:

  — *Completeness checks:* EPA compared counts of dischargers in *PCSLoads2004* to *PCSLoads2002* to describe the completeness of the database. In addition, as discussed further in Section 6.3.2, EPA identified discharges for 13 major dischargers that were excluded from the CNVRT output because the facilities were partially active for 2004. To identify these facilities, EPA queried the PCS database for facilities that changed their activity status during 2004. EPA then compared this list of facilities to the facilities included in the CNVRT output. EPA used raw PCS data to calculate annual loads for these facilities and added the loads to the PCS2004 Table in *PCSLoads2004*.

  — *Accuracy of facility discharges.* EPA reviewed the accuracy of calculated discharges from facilities with discharges that had the greatest impact on total category loads and category rankings. EPA reviewed monthly information reported in PCS, as well as measurement data available on EPA's Envirofacts web page and information from the facility's NPDES permit, to identify possible calculation errors. In some cases, EPA contacted facilities to verify the monthly measurements in PCS. Section 6.3.3 describes EPA's review of facility discharges in more detail.

  — *Accuracy of category discharges*. EPA reviewed the accuracy of category discharges by verifying that pollutant discharges in PCS were assigned to the appropriate point source category. EPA used engineering judgment to determine if pollutant discharges were reasonably associated with the point source category. Section 2.2.1 discusses facility-level and pollutant-level category assignments.

  — *Accuracy of database queries.* EPA's quality review for the development of *PCSLoads2004* included accuracy checks for database queries in *PCSLoadsAnalysis2004*, *PCSNutrients2004*, and *PCSLoads2004*. Documentation of accuracy checks is provided in a QC table in each Microsoft Access database.

— *Reasonableness of pollutant loads.* EPA reviewed the Load Calculator output (i.e., the calculated kg/year for each pollutant at each discharge pipe and monitoring location) for those pollutant discharges with the highest toxic-weighted loads (e.g., dioxins, PCBs, and mercury). To identify possible errors in recording units of measure, EPA identified calculated discharges that were unreasonably high and reviewed the PCS-reported quantities or concentrations and flows that the Load Calculator used to calculate the annual discharge. EPA compared these measurements with measurements available on EPA's Envirofacts web page. If the measurements were similar then EPA concluded that the Load Calculator output was acceptable.

— *Reasonableness of facility loads*. EPA identified facilities with the highest TWPE and nutrient pollutant loadings. EPA identified facilities for review whose pollutant discharges accounted for more than 95 percent of the TWPE for its point source category. Similarly, EA identified facilities for review whose nitrogen and phosphorus discharges account for the majority of nutrient discharges in *PCSLoads2004*. EPA compared 2004 PCS data to other available information, such as information from EPA's Envirofacts web page, the facility's NPDES permit, and discussion with the facility contact.

— *Reasonableness of pollutant identity.* EPA reviewed the pollutants comprising the majority of the TWPE for high-ranking point source categories and, using engineering understanding of industrial processes, identified pollutants that could not be reasonably related to operations in the industry. EPA then reviewed documentation of the SIC code assigned to the facility and other EPA databases (e.g., Envirofacts), company websites, or contacted the facility directly to verify the pollutant discharge.

— *Comparability*. EPA compared *PCSLoads2004* to *PCSLoads2000* and *PCSLoads2002* to identify pollutant discharges or wastewater flows that differ more than the year-to-year variation of other chemicals and facilities.

The following subsections discuss EPA's quality review for the development of *PCSLoads2004*:

- Section 6.3.1 describes EPA's review of mercury using PRAM 50092 (Mercury Total Low Level);
- Section 6.3.2 describes EPA's review of partially active facilities for 2004; and

- Section 6.3.3 describes EPA's reviews of anomalous facility and pollutant discharges.

6.3.1 Mercury Discharges Reported Using PRAM 50092

As part of the reasonableness checks conducted for the CNVRT output, EPA identified unusually high mercury concentrations reported to PCS by facilities located in Ohio. These facilities reported mercury discharges using PRAM 50092 (Mercury Total Low Level). The PRAM 50092 concentrations in the CNVRT output ranged from 0.2 to 673 mg/L. EPA contacted the Ohio Environmental Protection Agency (Ohio EPA) to determine the correct reporting units for PRAM 50092 (Finseth, 2007c). An Ohio EPA representative explained that Ohio EPA started requiring low level mercury analyses in 2002. At that time, some facilities had limits in micrograms per liter (ug/L). Currently, all of the limits are in nanograms per liter (ng/L).

As a result of this contact, EPA concluded that the units for the PRAM 50092 concentrations should be ng/L, not mg/L. Therefore, EPA corrected the concentrations by dividing all concentrations for PRAM 50092 in *PCSLoadCalculator2004* by one million.

6.3.2 Partially Active Facilities for 2004

EPA identified 13 facilities, shown in Table 6-13, that reported discharges to PCS for 2004, but were not included in the CNVRT output because the facilities were active for only part of calendar year 2004. EPA calculated discharges for the 13 facilities and included the calculated loads in the screening-level analysis as follows:

- EPA downloaded year 2004 discharges for the 13 facilities from PCS data stored on EPA's Mainframe;
- EPA applied conversion factors and other data formatting procedures used by the CNVRT module (described in Section 6.1.1.2) to convert the PCS discharges into units of milligrams per liter and kilograms per day and put the data into the same format as the CNVRT module output;

- EPA ran the converted monthly data for the 13 facilities through the PCSLoadCalculator2004 routine; and

- EPA incorporated the annual loads into the PCS2004 Table in *PCSLoads2004* and included the loads as part of the screening-level analysis.

Table 6-13. Partially Active Facilities for 2004

40 CFR Part	Point Source Category	NPDES ID	Facility Name	Location
440	Ore mining and dressing	AK0053341	Teck-Pogo Inc	Delta Junction, AK
436	Mineral Mining and Processing	AZ0024384	San Xavier Rock & Materials	Cortaro, AZ
419	Petroleum refining	CA0057177	No information	No information
414	Organic chemicals, plastics and synthetic fibers	DE0000647	Kaneka Delaware Corporation	Delaware City, DE
414	Organic chemicals, plastics and synthetic fibers	DE0020001	Metachem Products, LLC	Delaware City, DE
430	Pulp, paper and paperboard	NY0004570	Fort Orange Paper Company	Castleton-On-Hudson, NY
409	Sugar processing	NY0008443	Brooklyn Cane Sugar Refinery	Brooklyn, NY
420	Iron and steel manufacturing	OH0007188	J&L Specialty Steel Inc.	Louisville, OH
420	Iron and steel manufacturing	OH0092444	Massillon Stainless, Inc.	Massillon, OH
423	Steam electric power generation	OK0044164	No information	No information
411	Cement manufacturing	PR0001201	Ready Mix Concrete Inc.	Rio Piedras, PR
411	Cement manufacturing	PR0023108	Ready Mix Concrete Inc.	Ponce, PR
420	Iron and steel manufacturing	TX0003026	Vision Metals, Inc.	Rosenberg, TX

6.3.3 Facility Reviews

EPA reviewed the accuracy of calculated discharges from facilities with discharges that have the greatest impact on total category loads and category rankings. EPA used the following criteria to select facilities for review:

- Facilities with the highest toxic-weighted discharges of individual pollutant parameters;

- Facilities with the highest discharges of nutrients; and

- Facilities with relatively high percent of their discharges based on estimates for missing DMR data (EST).

For the identified facilities, EPA used the following steps to review the accuracy of the loads calculated from PCS data.

1. Review database corrections for *PCSLoads2002* and *PCSLoads2000* to determine whether corrections were made during previous reviews and evaluate whether these corrections should be applied to the 2004 PCS discharges.

2. Review 2004 DMR data in PCS, hand calculate annual pollutant loads, and compare to loads calculated by *PCSLoadCalculator* and stored in *PCSLoads2004*;

3. Review PCS pipe description information available in PCS, EPA's on-line Envirofacts data system, or from the facility's NPDES permit to identify monitored pollutant discharges that are:

   — Intermittent (e.g., tidal, seasonal, or occur after a storm event),

   — Internal monitoring locations from which wastewater is combined with other waste streams and monitored again, resulting in double counting loads, and

   — Not representative of category discharges (e.g., storm water runoff from non-process areas, NCCW, or wastewater related to operations in another point source category).

Table 6-14 presents EPA's PCS facility review and corrections made to the *PCSLoads2004* database.

Table 6-14. Summary of PCS Facility Review

Point Source Category	NPDES ID	Facility	Location	Review Findings	Action Taken/ Database Correction
Meat and Poultry Products	AL0003697	Pilgrims Pride Corp	Coffee County, AL	The pollutant TWF used from PRAM 71855 is "nitrates". PRAM 71855 is reported in pounds of NO2 while other nitrate PRAMs are reported as pound of N.	Converted pounds of Nitrates as NO2 to Nitrates as N to be consistent for TWPE calculation
Steam	CA0001368	Duke Energy South Bay, LLC	Chula Vista, CA	Identified high chlorine load for facility. Previous contact identified units error in 2002 data (Finseth, 2005). Suggested same correction for 2004 data.	Corrected chlorine units.
Steam	CA0108073	Southern California Edison Co.	Camp Pendleton, CA	Identified high selenium load for facility. Reviewed NPDES permit and verified flow of 1,200 MGD. Selenium concentrations are below permit limit of 1.7 mg/L.	Make no change.
Steam	CA0108181	Southern California Edison Co.	Camp Pendleton, CA	Identified high selenium load for facility. Reviewed NPDES permit and verified flow of 1,200 MGD. Selenium concentrations are below permit limit of 1.7 mg/L.	Make no change.
Ore Mining	CO0000248	Climax Molybdenum Company	Summit County, CO	Identified high molybdenum load for facility. Estimation function was estimating loads for 8 out of 12 months for 2004. EPA determined that reporting was quarterly for facility.	Changed NRPU from 001 (monthly reporting) to 003 (quarterly reporting).
Steam	CT0003778	PSEG Power Connecticut	Bridgeport, CT	Large hydrazine discharge is for Outfall 008 (Misc. Plant Drains). The units in Envirofacts for this discharge are in GPD.	Divided flow for Outfall 008 by 1,000,000 to correct units.
Copper Forming	CT0021873	Olin Corporation	Waterbury, CT	Identified a high chlorine load for facility that resulted from a flow units error.	Divided flows by 1,000,000.

Table 6-14 (Continued)

Point Source Category	NPDES ID	Facility	Location	Review Findings	Action Taken/ Database Correction
Drinking Water	DC0000019	Washington Aqueduct	Washington, DC	Previous Annual Reviews identified this facility as an intermittent discharger. EPA previously contacted facility and facility provided discharge information for 2004 (Kandle, 2005a).	EPA used annual flow information for previous facility contact to calculate annual loads for 2004.
Steam Electric	DC0000094	Pepco-Potomac Electric Co.	Washington, DC	UWAG comments for 2006 Plan identified outfalls 402 and 416 as internal monitoring locations (Aldridge, 2005).	ERG removed loads for internal monitoring points.
Phosphate Manufacturing	FL0000523	CF Industries – Bartow Phos.	Polk County, FL	Identified a high fluoride load that was the result of a flow units error. Flows in PCSLoads2004 do not match Envirofacts flows for 2004 (Oct-Dec) for Outfalls 004, 005, 006, & 007. Flows in Envirofacts are in gallons per month. Contacted facility to obtain correct flow data (Wolford, 2007).	Corrected flow data
Phosphate Manufacturing	FL0000655	PCS Phosphate – White Springs	Jasper, FL	EPA identified several outfalls that were upstream monitoring locations for other outfalls. Contacted facility and determined that the final effluent outfalls were 104 and 202 (Wolford, 2005).	Deleted loads for upstream outfalls if pollutants were reported for final effluent outfalls 104 and 202.
Steam Electric	FL0002275	Gulf Power Co – Crist Steam	Pensacola, FL	Facility was contacted previously to verify a units error for 2002 (Finseth, 2005a). The 2004 iron load is very similar to the 2002 load prior to corrections.	Divided iron concentration by 1,000 to change units from mg/L to ug/L.

Table 6-14 (Continued)

Point Source Category	NPDES ID	Facility	Location	Review Findings	Action Taken/ Database Correction
Steam Electric	FL0002283	Gulf Power Co – Sholz Steam	Chattahoochee, FL	Identified high iron load for facility resulting from one concentration of 190 mg/L. Facility provided data for 2002 that identified an iron concentration of 280 ug/L. Since concentrations for 2004 and 2002 are similar suggested correcting concentration units for 2004.	Corrected iron concentration units (from mg/L to ug/L).
Pulp and Paper	FL0002763	Georgia Pacific Corp	Palatka, FL	Previous detailed study identified monitoring data for PRAM 38691 as internal monitoring (Bleach Plant Effluent) (U.S. EPA, 2005b).	Removed loads for bleach plant monitoring (PRAM 38691).
Phosphate Manufacturing	FL0036226	PCS Phosphate White Springs	White Springs, FL	ERG identified several outfalls that were upstream monitoring locations for other outfalls. Contacted facility and determined that the final effluent outfalls were 118 and 401 (Wolford, 2005).	Deleted loads for upstream outfalls if pollutants were reported for final effluent outfalls 118 and 401.
Drinking Water Treatment	FL0186813	Tampa Bay Desal	Tampa Bay, FL	Identified a high chloride load that resulted from a mismatch between flows and concentrations for the annual load calculation. Reviewed NPDES permit to determine appropriate matches for flows and concentrations. Also considered accounting for intake pollutants to decrease load.	Corrected flow and concentration match up. Did not account for intake pollutants.
Steam Electric	IN0001759	Indiana-Kentucky Electric Corp	Madison, IN	PCS data did not have a DSCH code for any of the facility's discharges. EPA compared PCS data to data in Envirofacts for flows and concentrations to identify the correct DSCH numbers.	Assigned DSCH number for pollutant discharges.

Table 6-14 (Continued)

Point Source Category	NPDES ID	Facility	Location	Review Findings	Action Taken/ Database Correction
Pulp and Paper	KY0000176	Weyerhaeuser, Hawesville, KY	Hancock County, KY	Previous detailed study identified monitoring data for dioxin as internal monitoring (Bleach Plant Effluent). (U.S. EPA, 2005b)	Removed dioxin loads for bleach plant monitoring.
Inorganic Chemicals	KY0004049	US DOE Paducah Gas Diffusion Plant	McCracken County, KY	PCB limit on Envirofacts is 0.000065 ug/L. Only had one detect for 2004 (0.26 mg/L) this value is multiplied by 12 to EST for the other 11 months. Other months have a NODI of B (Below Detection Limit), but no less than signs to indicate BDL. Contacted facility and determined that the detect was reported as ug/L not mg/L and facility provided detection limit data for other months (Wolford, 2007a).	Divided the detected concentration by 1,000 to change units from ug/L to mg/L. Set the other 11 measurements for 2004 to ½ MDL.
WC/Landfills	LA0038245	Safety-Kleen, Inc.	Baton Rouge, LA	Identified high dioxin load for facility. Suspected data entry error for dioxin concentration. Contacted facility and verified that the dioxin concentration was BDL (Crisenbery, 2007). Determined facility should be categorize as CWT.	Set dioxin concentration to BDL. Categorized facility as CWT.
Pulp and Paper	MD0021687	Upper Potomac River Commission	Westernport, MD	PCS included a TCDD detect at 10 pg/L. Industry commented that this was actually a <10 pg/L measurement (U.S. EPA, 2005b)	Set dioxin measurements to ND.
Ore Mining	MN0055301	Northshore Mining	Silver Bay, MN	Identified high mercury load. Estimation function was estimating loads for 8 out of 12 months for 2004. EPA determined that the facility was a quarterly reporter. EPA also contacted facility and identified a units error for the molybdenum concentration reported for January 2004 (Finseth, 2007d).	Changed NRPU value from 001 (monthly reporting) to 003 (quarterly reporting). Divided January molybdenum concentration by 1,000 to convert units from ug/L to mg/L.

Table 6-14 (Continued)

Point Source Category	NPDES ID	Facility	Location	Review Findings	Action Taken/ Database Correction
NFMM	MO0000337	DOE Run Resources Recycling	Boss, MO	Reviewed NPDES permit and determined that Outfall 004 is an instream monitoring point.	Deleted loads for instream monitoring.
Fertilizer Manufacturing	MO0000817	River Cement Company	Festus, MO	The pollutant TWF used from PRAM 71855 is “nitrates”. PRAM 71855 is reported in pounds of NO2 while other nitrate PRAMs are reported as pound of N.	Converted pounds of Nitrates as NO2 to Nitrates as N to be consistent for TWPE calculation
National Security	MO0029378	USAF, Whiteman AFB	Knob Noster, MO	EPA identified a flow error based on the facility’s design flow of 2.19 MGD. Also the facility used different report designators (DRIDs) to distinguish between reporting for summer months and winter months. As a result, load calculator overestimated the annual load by estimating discharges for the missing months for both DRIDs.	Divided flows by 1,000 to be consistent with the design flow for facility. Changed DRID C to DRID B so that all discharges for the same outfall were reported using one DRID.
NFMM	MO0105732	Noranda Aluminum, Inc.	New Madrid, MO	Reviewed NPDES permit and determined that outfalls 001, 002, and 003 are upstream of outfall 004.	Deleted loads for 001, 002 and 003 for pollutants that were also reported for outfall 004.
Steam Electric	MS0001261	Entergy Mississippi, Inc.	Greenville, MS	UWAG comments identified Outfall 002 as an internal monitoring point (Aldridge, 2005).	Deleted loads for Outfall 002.
Timber Products	MT0000205	Stimson Lumber Co. Bonner Mill	Bonner, MT	High chlorine load was identified for the facility that resulted from a flow units error for Outfall 003.	Divided flows for Outfall 003 by 1,000,000.
Textiles	NC0003867	Edenton Dyeing and Fin LLC, Edenton Town, NC	Edenton Town, NC	Review of monthly mercury data indicated one outlier month with a concentration of 23.8 mg/L. Review of Envirofacts data for 2005 and 2006 showed that measurements should be reported in ng/L.	Divided measurement by 1,000,000.

Table 6-14 (Continued)

Point Source Category	NPDES ID	Facility	Location	Review Findings	Action Taken/ Database Correction
Textiles	NC0043320	Burlington Industries, Cordova, NC	Cordova, NC	No chlorine detects for 2004 in PCSLoads2004. Measurements from Jan-July were reported as MLOC E. Measurements from Aug-Dec were reported as MLOC 1. Contacted facility and determined that MLOC E and MLOC 1 were the same monitoring point and there must have been a data entry error by State during upload to PCS.	Changed MLOC E to MLOC 1 to include in load calculation.
Meat and Poultry Products	NE0001392	Tyson Fresh Meats, Inc.	Dakota City, NE	Identified a high ammonia load due to BDL error. BDL indicator was present in concentration fields but not quantity fields.	Added BDL indicator for quantity measurement fields.
Meat and Poultry Products	NE0032191	Farmland Foods, Inc.	Crete, NE	Reviewed NPDES permit and determined that high nitrogen loads were from biosolids monitoring data.	Excluded parameters for biosolids monitoring from load calculation.
NFMM	NY0001732	ALCOA Massena	Massena, NY	Reviewed NPDES permit and identified outfalls that were upstream of other outfalls.	Deleted loads for upstream outfalls for pollutant that were also measured at the final discharge.
Independent and Stand-Alone Labs	NY0005835	Brookhaven National Laboratory	Brookhaven, NY	Envirofacts flows are in GPD. Flow units error was not detected in initial screening because it is below the 2,500 MGD cutoff.	Divided PCS flows by 1,000,000.
Steam Electric	OH0009865	Cinci Gas & Electric	New Richmond, OH	The monthly data for September appear to be switched for chlorine (50060) and chlorine duration (78739)	Revised PRAM codes for September. This set the chlorine load for this facility to zero.
CCH	OH0007269	Dover Chemical	Dover, OH	Identified high dioxin load due to BDL error. Facility reported one detect of TCDD for 2004, but reported NODI B for the other 11 months. As a result, Load Calculator estimated dioxin loads for the other 11 months.	Inserted BDL indicator (<) for months with NODI B and used ML for 2,3,7,8-TCDD for concentration value.

Table 6-14 (Continued)

Point Source Category	NPDES ID	Facility	Location	Review Findings	Action Taken/ Database Correction
NFMM	OH0011550	Ormet Primary Aluminum Corp	Hannibal, OH	Envirofacts flows are in GPD. Flow units error was not detected in initial screening because it is below the 2,500 MGD cutoff.	Divided PCS flows by 1,000,000.
Pulp and Paper	OR0000442	Weyerhaeuser Co.	Albany, OR	The pollutant TWF used from PRAM 71855 is “nitrates”. PRAM 71855 is reported in pounds of NO2 while other nitrate PRAMs are reported as pound of N.	Converted pounds of Nitrates as NO2 to Nitrates as N to be consistent for TWPE calculation
Pulp and Paper	OR0001074	Pope and Talbot, Halsey, OR	Halsey, OR	TCDD concentrations range from 3.6 to 4.7 pg/L. This is less than Method 1613ML.	Set dioxin measurements to ND.
Steam Electric	PA0005011	Reliant Energy Northeast MGMT	West Wheatfield TWP, PA	UWAG comments identified Outfall 207 as an internal outfall to 007 (Aldridge, 2005).	Deleted loads for Outfall 207 if pollutants were also reported for Outfall 007.
Iron & Steel	PA0094510	US Steel Corp - Edgar Thomson	North Braddock, PA	High discharges are reported for outfalls containing Non-contact cooling water (NCCW). EPA contacted facility and determined that discharges were for stormwater that was commingled with NCCW prior to discharge. The pollutant concentrations were measured in stormwater prior to commingling, but flow was reported after commingling of NCCW (Belack, 2007).	Calculated annual load using the total stormwater flow for 2004 and concentrations reported in PCS.
Steam Electric	SC0000574	SCE&G/Urquhart Steam Station	Beech Island, SC	Identified data-entry error for mercury concentration for one month in 2004.	Corrected mercury concentration
Ore Mining	SD0025852	Wharf Resources (USA), Inc.	Lead, SD	Load calculator divided some of the monthly flows by 1,000,000 because they exceeded the 5,000 MGD limit. Flows for other months were not corrected because they were below the 5,000 MGD limit.	Divided flows by 1,000,000 that were not corrected by load calculator.

Table 6-14 (Continued)

Point Source Category	NPDES ID	Facility	Location	Review Findings	Action Taken/ Database Correction
Printing & Publishing	TN0002330	Holliston Mills Kingsport	New Canton, TN	One monthly vinyl acetate report drives load, which is based largely on EST. Contacted facility and verified that the vinyl acetate load was a data-entry error and should be BDL (Horton, 2007). Considered classifying facility as a Textile Mill.	Changed vinyl acetate load to BDL. Did not change facility categorization
Administration of Economic Programs	TN0002968	U.S. DOE-Y12 National Security Complex	Oak Ridge, TN	Reviewed NPDES permit and determined that the high chlorine load is from instream monitoring. Suggested deleting instream monitoring from PCSLoads2004 and categorizing facility as a metal finisher (MF).	Deleted loads for instream monitoring locations and classified facility in MF category.
CWT	TX0003191	Encycle Texas	Corpus Christi, TX	Previous facility contact identified facility as an intermittent discharger (Kandle, 2005b). Facility discharges for 72 days per year.	Calculated annual loads assuming 72 days of discharge per year.
OCPSF	TX0003531	Equistar Chemicals	Houston, TX	Industry comments stated that chlorine is monitored at an internal monitoring location after sanitary chlorination (Elam, 2005).	Deleted chlorine loads for Outfall 001.
Petroleum Refining	TX0006271	ExxonMobil Refining & Supply	Baytown, TX	Identified high nitrate concentrations. Contacted facility to verify discharges. Facility provided revised data for 2004 (Wavro, 2007).	Corrected nitrate concentrations using revisions provided by facility.
OCPSF	VA0000248	Radford Army Ammunition Plant	Montgomery County, VA	Reviewed NPDES permit and identified several outfalls that were regulated under OCPSF rather than Explosives. Also identified several outfalls tat were upstream monitoring locations of Outfall 999.	Changed SIC code from2892 to 2892OC for outfalls identified as OCPSF outfalls. Deleted loads for upstream monitoring if pollutants were reported for Outfall 999.

Table 6-14 (Continued)

Point Source Category	NPDES ID	Facility	Location	Review Findings	Action Taken/ Database Correction
Independent and Stand-Alone Labs	WA0025917	Fluor Hanford, Inc.	Richland, WA	The pollutant TWF used from PRAM 71855 is “nitrates”. PRAM 71855 is reported in pounds of NO2 while other nitrate PRAMs are reported as pound of N.	Converted pounds of Nitrates as NO2 to Nitrates as N to be consistent for TWPE calculation
Pesticide Chemicals	WV0000086	Bayer Cropscience Institute	Institute, WV	The facility reported the same concentration of carbaryl each quarter of 2004 and according to a previous contact with the facility, the permit writer directs the plant to report non-detects as the detection limit without a less than indicator.	Deleted the carbaryl load from the outfall because carbaryl was not detected each quarter of the year.
Steam Electric	WV0005525	Virginia Electric and Power Co.	Mount Storm, WV	UWAG comments identified Outfall 401 as an internal monitoring location (Aldridge, 2005).	Deleted loads for Outfall 401.
Coal Mining	WV0050717	Upshur Property	Tallmansville, WV	Identified high selenium load that resulted from a flow units error. EPA reviewed flows in Envirofacts and determined that flow was reported in gpm and was not converted into MGD. EPA also identified BDL errors for December and January 2004. The PCS data indicate that maximum concentrations for these months were BDL but average concentrations were not reported BDL.	Corrected flow units for Outfalls 001 and 004. Added BDL indicators for months where the maximum concentration was reported as BDL but average concentration was not reported BDL.

6.3.4 References

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7.0 2007 ANNUAL REVIEW

For the 2007 annual review, EPA conducted the following activities:

- Updated the reviews from previous years (i.e., revising the 2006 annual review results with new or corrected data);
- Performed new research: contacted industry to verify discharges, conducted literature searches, and collected additional data; and
- Solicited information from stakeholders through comment response and other stakeholder outreach (e.g., meetings with industry trade groups).

This section summarizes the results from the 2006 annual review (Section 7.1), presents the results of the 2007 screening-level review (Section 7.2), and presents the prioritization of categories for the 2007 annual review (Section 7.3).

7.1 Summary of the Results from the 2006 Annual Review

EPA published its 2006 annual review of existing ELGs on December 21, 2006 (71 FR 76644). In the 2006 annual review, EPA conducted further review of 13 industrial categories. EPA conducted a “detailed study” of two categories (i.e., Steam Electric Power Generation and Pulp, Paper, and Paperboard categories) and a “preliminary category review” of 11 other categories based on the results of the 2006 screening-level review and stakeholder comments. Based on the findings from the detailed studies and preliminary category reviews, EPA identified the following four categories for further review in 2007: Steam Electric Power Generating (Part 423), Coal Mining (Part 434), Oil and Gas Extraction (Part 435) (to assess whether to revise the limits to include Coal Bed Methane extraction as a new subcategory), and the Heath Care Industry (including Hospitals (Part 460)).

In view of the annual nature of its reviews of existing ELGs, EPA believes that each annual review can and should influence succeeding annual reviews (e.g., by indicating data gaps, identifying new pollutants or pollution reduction technologies, or otherwise highlighting industrial categories for more detailed scrutiny in subsequent years). EPA used the findings, data and comments on the 2006 annual review to inform its 2007 annual review. The 2006 review built on previous reviews by continuing to use the screening methodology, incorporating some refinements to assigning discharges to categories, and updating toxic weighting factors used to estimate potential hazards of toxic pollutant discharges. Likewise, EPA made similar refinements to estimate potential hazards of toxic pollutant discharges for the 2007 annual review.

7.2 Results of the 2007 Screening-Level Review

For the 2007 screening-level review, EPA combined the results of the *TRIReleases2004_v3* and the *PCSLoads2004_v3* databases, which are presented in Sections 5.5 and 6.2 of this document, respectively. When combining the results of these databases, EPA made adjustments to the rankings for the following: discharges from industrial categories for which EPA is currently developing or revising ELGs, discharges from point source categories for which EPA has recently promulgated or revised ELGs, and discharges from facilities determined not to be representative of their category. Sections 7.2.1 through 7.2.3 discuss the rationale for these decisions. The final combined database rankings represent the results of the 2007 screening-level review and are presented in Section 7.2.4.

7.2.1 Facilities for Which EPA is Currently Developing or Revising ELGs

EPA is currently considering revisions to ELGs for Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) (40 CFR 414) and the Inorganic Chemicals Manufacturing (40 CFR 415) Point Source Categories for facilities that produce chlorine or chlorinated hydrocarbons (CCH)[7]. Because the CCH rulemaking is underway, EPA excluded discharges from these facilities from further consideration under the current planning cycle. EPA subtracted the TWPE loads from facilities that produce chlorine or chlorinated hydrocarbons from the OCPSF and Inorganic Chemicals Manufacturing Point Source Category loads. Because facilities that produce chlorine and chlorinated hydrocarbons are only a subset of the OCPSF and Inorganic Chemicals Manufacturing Categories, EPA included loads for all other facilities in these two categories in the prioritization of categories for further review.

[7] EPA is also currently revising the CAFOs ELG; however, the TWPE associated with this category is low and does not affect the prioritization of categories based on TWPE.

7.2.2 Categories for Which EPA Recently Promulgated or Revised ELGs

For the 2007 annual review and development of category rankings, EPA did not prioritize point source categories for which ELGs were recently established or revised but not yet fully implemented, or were recently reviewed. In general, EPA removes a category from further consideration during a review cycle if EPA established, revised, or reviewed the category's ELGs within seven years prior to the current annual review. This seven-year period allows time for the ELGs to be incorporated into NPDES permits. For the 2007 annual review, this equates to any category with ELGs established or revised after 2000. Table 7-1 lists these categories.

Removing a point source category from further consideration in the development of the rankings does not mean that EPA eliminates the category from annual review. In cases where EPA is aware of the growth of a new segment within such category, or where new concerns are identified for previously unevaluated pollutants discharged by facilities in the category, EPA would apply closer scrutiny to the discharges from the category in deciding whether to consider it further during the current review cycle. For example, EPA is currently conducting a detailed study of the coal mining industry based on comments received on the 2006 Preliminary Plan, although the coal mining ELGs were revised in January 2002.

Table 7-1. Point Source Categories That Have Undergone a Recent Rulemaking or Review

40 CFR Part Number	Point Source Category	Date of Rulemaking
451	Concentrated Aquatic Animal Production (or Aquaculture)	August 23, 2004
432	Meat and Poultry Products	September 8, 2004
413, 433, and 438	Metal Products and Machinery (including Metal Finishing and Electroplating)	May 13, 2003
122, 123, and 412	Concentrated Animal Feeding Operations (CAFOs)	February 12, 2003
420	Iron and Steel Manufacturing	October 17, 2002
434	Coal Mining (Coal Remining and Western Alkaline Coal Mining)	January 23, 2002
435	Oil & Gas Extraction (Synthetic-Based and Other Non-Aqueous Drilling Fluids)	February 21, 2001

Source: "Guidelines: Final, Proposed, and Under Development" at http://www.epa.gov/waterscience/guide.

7.2.3 Categories with One Facility Dominating the TWPE

EPA identified point source categories where only one facility was responsible for most of the TWPE reported to be discharged (i.e., where one facility's TWPE accounted for more than 95 percent of the category TWPE). Table 7-2 lists these categories. EPA identified three facilities that dominated the TWPE in the category to which they belonged. EPA investigated these facilities to determine if their discharges were representative of the category. If they were not, EPA subtracted the facility's TWPE from the total category TWPE and recalculated the category's ranking. EPA performed this analysis separately for both of the databases. Based on EPA's knowledge of the industries and the review of the pollutant discharges, EPA determined that the pollutant discharge are representative of the industry and therefore, did not remove the discharges from the category.

7.2.4 Results of the 2007 Screening-Level Review

After adjusting the category TWPE totals and rankings as described in Sections 7.2.1 through 7.2.3, EPA consolidated the PCS and TRI rankings into one set using the following steps:

- EPA combined the two lists of point source categories by adding each category's PCS TWPE and TRI TWPE. EPA notes that this may result in "double-counting" of chemicals a facility reported to both PCS and TRI, and "single-counting" of chemicals reported in only one of the databases. The combined databases do not count chemicals that may be discharged but are not reported to PCS or TRI.

- EPA then ranked the point source categories based on total PCS and TRI TWPE.

Table 7-3 presents the combined PCS 2004 and TRI 2004 rankings. These are the final category rankings accounting for all corrections made to the databases during the 2007 screening-level review and removal of any categories and discharges as discussed in Sections 7.2.1 through 7.2.3.

Table 7-2. Point Source Categories with One Facility Dominating the TWPE Discharges

Point Source Category	Facility with Over 95% of Category TWPE	Facility Location	Data Source	Pollutant Driving TWPE	Facility TWPE	Percent of Total Category TWPE	Action
Pesticide chemicals (Part 455)	Dow Chemical Co Freeport Facility	Freeport, TX	TRI 2004	Picloram (492,107 TWPE)	492,108	95.0%	Did not remove load from category TWPE
Waste combustors (Part 444)	Clean Harbors Deer Park LP	Deer Park, TX	TRI 2004	Benzidine (187,680 TWPE)	242,547	99.9%	Did not remove load from category TWPE
Gum and wood chemicals manufacturing (Part 454)	Hercules-Brunswick	Brunswick, GA	PCS 2004	Carbon Tetrachloride (46,361 TWPE)	46,361	99.8%	Did not remove load from category TWPE

Source: *TRIReleases2004_v3*; *PCSLoads2004_v3*.

Table 7-3. Final PCS 2004 and TRI 2004 Combined Point Source Category Rankings

40 CFR Part	Point Source Category	PCS 2004 TWPE	TRI 2004 TWPE	Total TWPE	Cumulative Percent of Total TWPE	Rank
437	Centralized Waste Treatment	8,731	7,460,703	7,469,434	39.89%	1
423	Steam Electric Power Generating	2,410,093	791,179	3,201,272	56.98%	2
419	Petroleum Refining	818,705	669,434	1,488,139	64.93%	3
414	Organic Chemicals, Plastics and Synthetic Fibers	490,290	957,134	1,447,424	72.66%	4
418	Fertilizer Manufacturing	1,168,160	10,843	1,179,003	78.96%	5
430	Pulp, Paper and Paperboard	164,787	668,518	833,306	83.41%	6
440	Ore Mining and Dressing	580,831	88,001	668,832	86.98%	7
455	Pesticide Chemicals	102,256	518,385	620,641	90.29%	8
415	Inorganic Chemicals Manufacturing	309,022	122,514	431,536	92.60%	9
421	Nonferrous Metals Manufacturing	321,299	52,599	373,898	94.60%	10
444	Waste Combustors	9,087	242,888	251,975	95.94%	11
410	Textile Mills	123,392	3,043	126,435	96.62%	12
463	Plastics Molding And Forming	10,766	72,657	83,423	97.06%	13
422	Phosphate Manufacturing	74,218	1,064	75,282	97.46%	14
429	Timber Products Processing	443	63,885	64,328	97.81%	15
436	Mineral Mining and Processing	49,315	5,387	54,702	98.10%	16
454	Gum and Wood Chemicals Manufacturing	46,446	6,311	52,757	98.38%	17
458	Carbon Black Manufacturing		48,603	48,603	98.64%	18
467	Aluminum Forming	27,580	3,318	30,897	98.81%	19
439	Pharmaceutical Manufacturing	13,255	10,706	23,962	98.93%	20
464	Metal Molding and Casting (Foundries)	4,746	19,147	23,893	99.06%	21
471	Nonferrous Metals Forming and Metal Powders	11,599	10,033	21,632	99.18%	22
411	Cement Manufacturing	17,461	898	18,359	99.27%	23
424	Ferroalloy Manufacturing	6,431	11,327	17,758	99.37%	24
468	Copper Forming	3,644	10,573	14,217	99.45%	25
469	Electrical and Electronic Components	4,890	7,693	12,583	99.51%	26
409	Sugar Processing	11,919	200	12,118	99.58%	27

Table 7-3 (Continued)

40 CFR Part	Point Source Category	PCS 2004 TWPE	TRI 2004 TWPE	Total TWPE	Cumulative Percent of Total TWPE	Rank
425	Leather Tanning and Finishing	705	8,832	9,537	99.63%	28
445	Landfills	9,087	152	9,239	99.68%	29
407	Canned and preserved Fruits and Vegetables Processing	2,457	6,392	8,849	99.73%	30
461	Battery Manufacturing	5,169	2,441	7,610	99.77%	31
428	Rubber Manufacturing	1,667	5,695	7,362	99.80%	32
406	Grain Mills	2,427	4,336	6,763	99.84%	33
417	Soap and Detergent Manufacturing	80	6,156	6,236	99.87%	34
426	Glass Manufacturing	2,707	2,822	5,529	99.90%	35
NA	Tobacco Products	2	5,159	5,161	99.93%	36
405	Dairy Products Processing	41	3,710	3,751	99.95%	37
NA	Printing & Publishing	2,190	177	2,367	99.96%	38
457	Explosives Manufacturing	2,273	93	2,366	99.98%	39
443	Paving and Roofing Materials (Tars And Asphalt)	1,313	612	1,924	99.99%	40
408	Canned and Preserved Seafood Processing	828	198	1,027	99.99%	41
NA	Independent and Stand Alone Labs	269	205	474	100.00%	42
466	Porcelain Enameling	7	247	254	100.00%	43
NA	Construction and Development	231		231	100.00%	44
446	Paint Formulating		210	210	100.00%	45
465	Coil Coating		167	167	100.00%	46
447	Ink Formulating		42	42	100.00%	47
460	Hospital	14		14	100.00%	48
459	Photographic	0		0	100.00%	49
	Total	**6,820,831**	**11,904,689**	**18,725,520**		

Source: *TRIReleases2004_v3*; *PCSLoads2004_v3*.
NA – Not applicable; no existing ELGs apply to discharges.

7.3 Prioritization of Categories for the 2007 Annual Review

Based on its screening level review, EPA was able to prioritize for further review (i.e., a detailed study or preliminary category review) those industrial categories whose pollutant discharges potentially pose the greatest hazards to human health or the environment because of their toxicity (i.e., categories that collectively discharge over 95 percent of the total TWPE). EPA also considered efficiency and implementation issues raised by stakeholders in identifying candidates for further review. By using this multilayered screening approach, the Agency concentrated its resources on those point source categories with the highest estimates of toxic-weighted pollutant discharges (based on best available data), while assigning a lower priority to categories that the Agency believes are not good candidates for ELGs revision at this time.

Table 7-4 lists the point source categories with existing ELGs, the level of review EPA performed as part of the 2007 annual review, and how the category was identified for further review, if applicable.

As shown in Table 7-4, EPA identified four point source categories with existing ELGs for detailed study: Steam Electric Power Generating (Part 423), Coal Mining (Part 434), Oil and Gas Extraction (Part 435) (to assess whether to revise the limits to include Coalbed Methane extraction as a new subcategory), and Health Services Industry (includes Hospitals (part 460)). EPA also identified for preliminary review those industrial categories currently regulated by existing effluent guidelines that cumulatively compose 95% of the sum hazard (reported in units of toxic-weighted pound equivalent or TWPE). In addition to the Steam Electric Power Generating category this list includes the following 10 point source categories:

- Centralized Waste Treatment;
- Petroleum Refining;
- Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF);
- Fertilizer Manufacturing;
- Pulp, Paper, and Paperboard;
- Ore Mining and Dressing;
- Inorganic Chemicals;
- Nonferrous Metals Manufacturing;
- Waste Combustors; and
- Pesticide Chemicals.

Table 7-4. 2007 Annual Review of Categories with Existing ELGs: Level of Review

40 CFR Part	Point Source Category	Level of Review	Source of Identification for Further Review
405	Dairy Products Processing	Screening-Level Review	NA[a]
406	Grain Mills	Screening-Level Review	NA[a]
407	Canned and Preserved Fruits and Vegetables Processing	Screening-Level Review	NA[a]
408	Canned and Preserved Seafood Processing	Screening-Level Review	NA[a]
409	Sugar Processing	Screening-Level Review	NA[a]
410	Textile Mills	Preliminary Review	TWPE
411	Cement Manufacturing	Screening-Level Review	NA[a]
412	Concentrated Animal Feeding Operations	Screening-Level Review	NA[a]
413	Electroplating	Screening-Level Review	NA[a]
414	Organic Chemicals, Plastics and Synthetic Fibers	Preliminary Review	TWPE
415	Inorganic Chemicals Manufacturing	Preliminary Review	TWPE
417	Soap and Detergent Manufacturing	Screening-Level Review	NA[a]
418	Fertilizer Manufacturing	Preliminary Review	TWPE
419	Petroleum Refining	Preliminary Review	TWPE
420	Iron and Steel Manufacturing	Screening-Level Review	NA[a]
421	Nonferrous Metals Manufacturing	Preliminary Review	TWPE
422	Phosphate Manufacturing	Screening-Level Review	NA[a]
423	Steam Electric Power Generating	Detailed Study	TWPE
424	Ferroalloy Manufacturing	Screening-Level Review	NA[a]
425	Leather Tanning and Finishing	Screening-Level Review	NA[a]
426	Glass Manufacturing	Screening-Level Review	NA[a]
427	Asbestos Manufacturing	Screening-Level Review	NA[a]
428	Rubber Manufacturing	Screening-Level Review	NA[a]
429	Timber Products Processing	Screening-Level Review	NA[a]
430	Pulp, Paper and Paperboard	Preliminary Review	TWPE
432	Meat and Poultry Products	Screening-Level Review	NA[a]
433	Metal Finishing	Screening-Level Review	NA[a]
434	Coal Mining	Detailed Study	Comments
435	Oil & Gas Extraction	Detailed Study (of Coal Bed Methane Operations)	Comments
436	Mineral Mining and Processing	Screening-Level Review	NA[a]
437	Centralized Waste Treatment	Preliminary Review	TWPE
438	Metal Products and Machinery	Screening-Level Review	NA[a]
439	Pharmaceutical Manufacturing	Screening-Level Review	NA[a]
440	Ore Mining and Dressing	Preliminary Review	TWPE
442	Transportation Equipment Cleaning	Screening-Level Review	NA[a]

Table 7-4 (Continued)

40 CFR Part	Point Source Category	Level of Review	Source of Identification for Further Review
443	Paving and Roofing Materials (Tars and Asphalt)	Screening-Level Review	NA[a]
444	Waste Combustors	Preliminary Review	TWPE
445	Landfills	Screening-Level Review	NA[a]
446	Paint Formulating	Screening-Level Review	NA[a]
447	Ink Formulating	Screening-Level Review	NA[a]
451	Concentrated Aquatic Animal Production	Screening-Level Review	NA[a]
454	Gum and Wood Chemicals Manufacturing	Screening-Level Review	NA[a]
455	Pesticide Chemicals	Preliminary Review	TWPE
457	Explosives Manufacturing	Screening-Level Review	NA[a]
458	Carbon Black Manufacturing	Screening-Level Review	NA[a]
459	Photographic	Screening-Level Review	NA[a]
460	Hospital	Detailed Study	Comments
461	Battery Manufacturing	Screening-Level Review	NA[a]
463	Plastics Molding and Forming	Screening-Level Review	NA[a]
464	Metal Molding and Casting (Foundries)	Screening-Level Review	NA[a]
465	Coil Coating	Screening-Level Review	NA[a]
466	Porcelain Enameling	Screening-Level Review	NA[a]
467	Aluminum Forming	Screening-Level Review	NA[a]
468	Copper Forming	Screening-Level Review	NA[a]
469	Electrical and Electronic Components	Screening-Level Review	NA[a]
471	Nonferrous Metals Forming and Metal Powders	Screening-Level Review	NA[a]

[a]For categories with only a screening-level review, the source of identification is not applicable, as EPA conducts a screening-level review of all categories subject to existing effluent guidelines. The "source of identification" is only applicable for those industries selected for further review.
NA – Not available.

The following sections provide EPA's preliminary review of the industrial categories currently regulated by existing effluent guidelines that cumulatively compose 95% of the sum hazard (reported in units of toxic-weighted pound equivalent or TWPE). Additionally, EPA identified Textile Mills (Part 410) and Ore Mining and Dressing (Part 440), at the conclusion of the 2006 annual review as candidates for additional preliminary review in the 2007 reviews based on the toxic discharges reported to the Toxics Release Inventory (TRI) and Permit Compliance System (PCS).

With two exceptions, EPA recently conducted detailed studies or preliminary category reviews of each of the categories listed above. Table 7-5 lists these categories and the level of review EPA performed for its 2003-2006 annual reviews. For these categories, because EPA's annual review builds on previous reviews, EPA primarily looked at the pollutants reported in 2004 for each of these categories and their contribution to their category's TWPE. EPA then compared these more recent results to its previous studies and reviews. EPA did not prioritize Centralized Waste Treatment (Part 437) or Waste Combusters (Part 444) for further review in 2003-2006 because EPA it applies less scrutiny to industrial categories for which EPA has promulgated effluent guidelines or pretreatment standards within the past seven years. See Section 7.2.2 for additional discussion.

Table 7-5. Previous Reviews for Point Source Categories Collectively Discharging over 95% of the Total TWPE

40 CFR Part	Point Source Category	Level of Review for 2003/2004	Level or Review for 2005/2006
423	Steam Electric	Preliminary Category Review	Detailed Study
434	Coal Mining	NA	Preliminary Category Review
435	Oil and Gas Extraction	NA	Preliminary Category Review
460	Hospitals (Health Services)	NA	Preliminary Category Review
419	Petroleum Refining	Detailed Study	Preliminary Category Review
414	OCPSF	Detailed Study	Preliminary Category Review
418	Fertilizer Manufacturing	Preliminary Category Review	Preliminary Category Review
430	Pulp, Paper, and Paperboard	Preliminary Category Review	Detailed Study
455	Pesticide Chemicals	NA	Preliminary Category Review
440	Ore Mining and Dressing	Preliminary Category Review	Preliminary Category Review
415	Inorganic Chemicals	Preliminary Category Review	Preliminary Category Review
421	Nonferrous Metals Manufacturing	Preliminary Category Review	Preliminary Category Review

7.4 Preliminary Category Reviews

Preliminary category reviews are similar to detailed studies and have the same purpose. During preliminary reviews, EPA generally examines the same items listed above for detailed studies. However, EPA's preliminary review of a category and available pollution prevention and treatment options is less rigorous than its detailed studies. While EPA collects and analyzes hazard and technology-based information on categories undergoing preliminary review, it assigns a higher priority to investigating categories undergoing detailed studies.

7.4.1 Petroleum Refining

The total TWPE for petroleum refining from EPA's 2007 screening level review of 2004 reported discharges is 1,488,139 compared to 632,086 using 2002 reported discharges. Table 7-6 shows the screening level results estimated for the petroleum refining industry from the 2002, 2003, and 2004 TRI and PCS databases

Table 7-6. Petroleum Refining Screening Level Results

Year	TRI TWPE	PCS TWPE
2002	467,009	165,076
2003	488,367	NA
2004	669, 434	818, 705

Table 7-6 illustrates that both TRI and PCS-reported releases have increased. By far, the largest increase is discharges reported to PCS. Table 7-7 and 7-8 list the pollutants that collectively contribute 95% of the category's overall TWPE using information reported in 2004 to TRI and PCS respectively.

Table 7-7. 2007 Annual Review: Petroleum Refining Pollutants of Concern from TRI

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Dioxin and Dioxin-Like Compounds	17	0.0157	558,877	83.5%
Polycyclic Aromatic Compounds	65	1,027	26,110	3.9%
Lead and Lead Compounds	108	8,905	19,947	3.0%
Nitrate Compounds	63	16,737,280	12,497	1.9%
Mercury and Mercury Compounds	61	102	11,978	1.8%
Copper and Copper Compounds	18	12,971	8,235	1.2%
Total			**669,434**	

Table 7-8. 2007 Annual Review: Petroleum Refining Pollutants of Concern from PCS

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
TCDD Equivalents	1	0.000761	535,673	65.4%
Sulfide	71	41,309	115,724	14.1%
Chlorine	16	100,888	51,368	6.3%
Aluminum	9	530,616	34,326	4.2%
Fluoride	11	432,123	15,124	1.8%
Mercury	16	82	9,629	1.2%
Selenium	18	8,144	9,132	1.1%
Heptachlor Epoxide	1	1	8,577	1.0%
Total			**818,704**	

For comparison purposes, Table 7-9 provides similar information using information reported to PCS and TRI in 2002 and 2003.

With the exception of dioxins, the top pollutants reported as discharged to TRI and PCS by petroleum refining facilities from 2002-2004 and their relative contribution generally remain the same. The 2004 and 2006 TSDs discuss EPA's conclusions for pollutants other than dioxin (U.S. EPA, 2004; U.S. EPA, 2006).

The increase in the overall TWPE for the petroleum refining industry is largely due to reported increases of dioxins to TRI and PCS. EPA looked at reported dioxin discharges from petroleum refining facilities extensively for its detailed and preliminary studies. From these previous studies, EPA concluded that:

> *Dioxin and dioxin like compounds are produced during catalytic reforming and catalyst regeneration operations at petroleum refineries. Of the 163 petroleum refineries, 17 reported discharges of dioxin and dioxin-like compounds to TRI. Of the 17 refineries reported discharges in 2002, only five reported discharges based on analytical measurements. Only two of these facilities detected dioxin and dioxin-like compounds above the Method 1613B minimum level and both of these facilities measured dioxin at the point immediately following catalytic regeneration and prior to wastewater treatment.*

As shown above, the most recent data show the same trend. Once again, 17 facilities reported dioxin or dioxin-like discharges to TRI in 2004. One new facility reported dioxin discharges to PCS in 2004. EPA contacted the facilities with newly reported dioxin discharges and those who reported increased dioxin discharges. The facility reporting dioxin discharges to PCS for the first time in 2004 is the Tesoro Northwest facility. EPA analyzed and studied dioxin discharge data from this facility as part of its previous detailed study. The Tesoro facility has performed extensive studies to determine the source of its dioxin discharges and concluded that stormwater is the largest source of dioxin. The contribution from treated process wastewater equates to 12.8 TWPE (U.S. EPA, 2004).

For discharges reported to TRI, as with the previous detailed and preliminary study, the vast majority of the new or increased dioxin discharges are based on estimates rather than wastewater monitoring data. One facility, Chevron Products in Richmond, CA, contributes approximately 140,000 TWPE annually. Chevron investigated its reported discharges and indicated that it based them on semi-annual analytical data collected at their effluent discharge. A review of the analytical data shows that the vast majority of dioxin compounds were non-detected or detected below the lower calibration limit. In reporting dioxin concentrations to TRI, Chevron used one-half the detection limits (DL) for non-detect data and one-half of the laboratory sample analysis lower calibration limit (LCL) for results at a concentration above the DL but below the LCL based on EPA's TRI guidance. However, the facility did detect a few dioxin congeners in 2003 and 2004. The detected congeners accounted for 350 of the 37,000 TWPE in 2003 and 69,000 of the 141,000 TWPE in 2004. In 2004, Chevron detected 2,3,4,7,8-Pentachlorodibenzofuran which accounted from most of the increase in TWPE from 2003 to 2004. Chevron noted that the only process identified where conditions exist for dioxin formation and subsequent capture in the process wastewater is regeneration of two semi-regenerative catalytic reformers' catalyst.

Table 7-9. Previous Annual Reviews Pollutants of Concern for Petroleum Refining

SIC Code	2002 PCS[a]			2002 TRI[b]			2003 TRI[b]		
	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE
Hexachlorobenzene (HCB)	13	53	103,420	4	30	59,272	4	32	61,656
Chlorine	58	106,278	54,113	25	56,954	28,999	22	55,810	28,416
Fluoride	14	910,270	31,859	Pollutants are not in the top five TRI 2002 reported pollutants.			Pollutants are not in the top five TRI 2003 reported pollutants.		
Benzo(a)pyrene	16	288	28,990						
Copper	100	33,629	21,348						
Dioxin and Dioxin-like Compounds	Pollutants are not in the top five PCS 2002 reported pollutants.			8	0.019	115,132	6	0.440	703,572
Nitrate Compounds				131	44,533,702	33,252	Pollutants are not in the top five TRI 2003 reported pollutants.		
Hydroquinone				6	13,513	17,217			
PACs				Pollutants are not in the top five TRI 2002 reported pollutants.			10	675	67,964
PCBs							2	0.812	27,627
OCPSF Category Total	**232[c]**	**978,243,371**	**397,951**	**791[c]**	**53,973,135**	**349,429**	**762[c]**	**37,904,315**	**1,021,401**

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]Discharges include only major dischargers.
[b]Discharges include transfers to POTWs and account for POTW removals.
[c]Number of facilities reporting TWPE greater than zero.

7.4.2 Organic Chemicals, Plastics and Synthetic Fibers (OCPSF)

The total TWPE for Organic Chemicals, Plastics and Synthetic Fibers (OCPSF) from EPA's 2007 screening level review of 2004 reported discharges is 1,447,424 compared to 747,379 using 2002 reported discharges. Table 7-10 shows the screening level results estimated for the OCPSF industry from the 2002, 2003, and 2004 TRI and PCS databases

Table 7-10. OCPSF Screening Level Results

Year	TRI TWPE	PCS TWPE
2002	349, 429	397,951
2003	1,021,401	NA
2004	957,134	490,290

Table 7-10 illustrates that PCS-reported releases have increased and that TRI reported releases have decreased since 2003. Table 7-11 and 7-12 list the pollutants that collectively contribute 95% of the category's overall TWPE using information reported in 2004 to TRI and PCS respectively.

Table 7-11. 2007 Annual Review: OCPSF Pollutants of Concern from TRI

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Dioxin and Dioxin-Like Compounds	8	0.527	693,358	72.4%
Hexachlorobenzene	4	43	84,480	8.8%
Chlorine	21	45,018	22,921	2.4%
Hydroquinone	6	13,383	17,051	1.8%
Nitrate Compounds	130	21,719,795	16,217	1.7%
Acrylonitrile	29	5,703	12,998	1.4%
Copper and Copper Compounds	60	18,451	11,713	1.2%
Polycyclic Aromatic Compounds	9	110	11,027	1.2%
o-Dinitrobenzene	1	102,329	9,551	1.0%
Carbon Disulfide	8	2,962	8,294	0.9%
Cobalt and Cobalt Compounds	23	68,307	7,807	0.8%
Arsenic and Arsenic Compounds	2	1,438	5,813	0.6%
Manganese and Manganese Compounds	23	82,385	5,803	0.6%
Diaminotoluene (Mixed Isomers)	6	14,219	4,817	0.5%
Total			**957,134**	

Table 7-12. 2007 Annual Review: OCPSF Pollutants of Concern from PCS

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Aluminum	20	3,233,568	209,183	42.7%
Benzidine	1	23	63,844	13.0%
Chlorine	46	74,952	38,162	7.8%
Fluoride	12	806,793	28,238	5.8%
Tin	2	61,551	18,531	3.8%
Copper	92	26,877	17,062	3.5%
Cyanide	33	10,425	11,644	2.4%
Nitrogen, Ammonia	107	8,381,271	9,303	1.9%
Benzo(a)pyrene	12	77	7,769	1.6%
Polychlorinated Biphenyls (PCB)	2	0	7,374	1.5%
Boron	4	40,505	7,178	1.5%
Iron	24	1,261,850	7,066	1.4%
Chloride	30	209,550,113	5,102	1.0%
Sulfide	5	1,814	5,082	1.0%
BHC	13	63	4,424	0.9%
Zinc	109	93,716	4,394	0.9%
Lead	44	1,856	4,157	0.8%
Nitrogen, Nitrate Total (as N)	13	1,218,890	3,900	0.8%
Mercury	18	33	3,876	0.8%
Nickel	54	31,923	3,477	0.7%
Nitrogen, Kjeldahl Total (as N)	18	1,373,930	3,133	0.6%
Cadmium	3	122	2,829	0.6%
Total			**489,423**	

For comparison purposes, Table 7-13 provides similar information using information reported to PCS and TRI in 2002 and 2003. The top pollutants reported as discharged to TRI in 2003 and 2004 by OCPSF refining facilities and their relative contribution generally remain the same. The 2004 and 2006 TSDs discuss EPA's conclusions for these pollutants (U.S. EPA, 2004; U.S. EPA, 2006).

Table 7-13. Previous Annual Reviews Pollutants of Concern for OCPSF

SIC Code	2002 PCS[a]			2002 TRI[b]			2003 TRI[b]		
	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE
Hexachlorobenzene (HCB)	13	53	103,420	4	30	59,272	4	32	61,656
Chlorine	58	106,278	54,113	25	56,954	28,999	22	55,810	28,416
Fluoride	14	910,270	31,859	Pollutants are not in the top five TRI 2002 reported pollutants.			Pollutants are not in the top five TRI 2003 reported pollutants.		
Benzo(a)pyrene	16	288	28,990						
Copper	100	33,629	21,348						
Dioxin and Dioxin-like Compounds	Pollutants are not in the top five PCS 2002 reported pollutants.			8	0.019	115,132	6	0.440	703,572
Nitrate Compounds				131	44,533,702	33,252	Pollutants are not in the top five TRI 2003 reported pollutants.		
Hydroquinone				6	13,513	17,217			
PACs				Pollutants are not in the top five TRI 2002 reported pollutants.			10	675	67,964
PCBs							2	0.812	27,627
OCPSF Category Total	**232[c]**	**978,243,371**	**397,951**	**791[c]**	**53,973,135**	**349,429**	**762[c]**	**37,904,315**	**1,021,401**

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]Discharges include only major dischargers.
[b]Discharges include transfers to POTWs and account for POTW removals.
[c]Number of facilities reporting TWPE greater than zero.

The top pollutants as reported to PCS in 2002 and 2004 differ, however. Aluminum and benzidine are the top two pollutants discharged in terms of TWPE in 2004. Neither of these pollutants was listed as a top pollutant in 2002. A single facility reported discharges of benzidine and EPA plans to contact the facility to obtain additional information on these discharges. One facility, GE Silicones in Friendly, WV, accounts for over 98% of the reported aluminum discharges. The facility is reporting concentrations between 50 and 600 mg/L aluminum from one of the discharge pipes and between 0.036 and 0.35 mg/L for another pipe. Hexachlorobenzene, the top pollutant reported in 2002, is not a major contributor in 2004. This supports EPA's earlier conclusion that the TWPE associated with hexachlorobenzene discharges reported in 2002 was based on non-detected concentrations.

7.4.3 Fertilizer Manufacturing

The total TWPE for fertilizer manufacturing from EPA's 2007 screening level review of 2004 reported discharges is 1,179,003 compared to 1,378,824 using 2002 reported discharges. Table 7-14 shows the screening level results estimated for the fertilizer manufacturing industry from the 2002, 2003, and 2004 TRI and PCS databases.

Table 7-14. Fertilizer Manufacturing Screening Level Results

Year	TRI TWPE	PCS TWPE
2002	9,062	1,369,762
2003	10,268	NA
2004	10,843	1,168,160

Table 7-14 illustrates that both TRI and PCS-reported releases have remained relatively constant or decreased. Table 7-15 and 7-16 list the pollutants that collectively contribute 95% of the category's overall TWPE using information reported in 2004 to TRI and PCS respectively.

Table 7-15. 2007 Annual Review: Fertilizer Manufacturing Pollutants of Concern from TRI

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Nitrate Compounds	31	4,763,519	3,557	32.8%
Dioxin and Dioxin-Like Compounds	1	0	1,961	18.1%
Polycyclic Aromatic Compounds	1	16	1,570	14.5%
Copper and Copper Compounds	13	1,955	1,241	11.4%
Chlorine	9	2,379	1,211	11.2%
Ammonia	39	609,894	677	6.2%
Zinc and Zinc Compounds	11	3,374	158	1.5%
Total			**10,843**	

Table 7-16. 2007 Annual Review: Fertilizer Manufacturing Pollutants of Concern from PCS

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Fluoride	3	32,134,629	1,124,712	96.3%
Aluminum	1	258,872	16,747	1.4%
Total			**1,168,160**	

For comparison purposes, Table 7-17 provides similar information using information reported to PCS and TRI in 2002 and 2003.

The top pollutants reported as discharged to TRI in 2003 and 2004 by fertilizer manufacturing facilities and their relative contribution generally remain the same. The 2004 and 2006 TSDs discuss EPA's conclusions for these pollutants and this category (U.S. EPA, 2004; U.S. EPA, 2006).

Table 7-17. Previous Annual Reviews Pollutants of Concern for Fertilizer Manufacturing

Pollutant	2002 PCS[a]			2002 TRI[b]			2003 TRI[b]		
	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE
Fluoride	4	38,348,483	1,342,197	Pollutants are not in the top five TRI 2002 reported pollutants.			Pollutants are not in the top five TRI 2003 reported pollutants.		
Aluminum	1	168,191	10,880						
Cadmium	1	267	6,172						
Nitrate Total (as N)	13	1,631,915	5,222						
Ammonia	21	4,189,153	4,650						
Nitrate Compounds	Pollutants are not in the top five PCS 2002 reported pollutants.			32	4,450,361	3,323	33	4,402,180	3,287
Dioxin and Dioxin-like Compounds				2	0.0080	2,288	2	0.0093	2,658
Chlorine				9	2,697	1,373	10	2,846	1,449
Copper and Copper Compounds				11	1,382	878	10	1,138	722
Ammonia				42	396,219	440	40	727,893	808
Fertilizer Manufacturing Category Total	**24**	**624,125,300**	**1,369,762**	**49**	**4,980,784**	**9,062**	**49**	**5,276,210**	**10,268**

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]Discharges include only major dischargers.
[b]Discharges include transfers to POTWs and account for POTW removals.

7.4.4 Pulp, Paper and Paperboard

The total TWPE for Pulp, Paper and Paperboard from EPA's 2007 screening level review of 2004 reported discharges is 833,306 compared to 3,515,050 using 2002 reported discharges. Table 7-18 shows the screening level results estimated for the pulp, paper, and paperboard industry from the 2002 and 2004 TRI and PCS databases.

Table 7-18. Pulp, Paper, and Paperboard Screening Level Results

Year	TRI TWPE	PCS TWPE
2002	1,952,130	1,537,056
2004	668,518	164,787

Table 7-18 illustrates that both TRI and PCS-reported releases have decreased.

Table 7-18 and 7-19 list the pollutants that collectively contribute 95% of the category's overall TWPE using information reported in 2004 to TRI and PCS respectively.

Table 7-19. 2007 Annual Review: Pulp, Paper, and Paperboard Pollutants of Concern from TRI

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Manganese and Manganese Compounds	117	4,493,341	316,479	47.3%
Dioxin and Dioxin-Like Compounds	64	0	177,587	26.6%
Lead and Lead Compounds	189	27,490	61,578	9.2%
Polycyclic Aromatic Compounds	77	1,266	42,625	6.4%
Zinc and Zinc Compounds	83	346,193	16,232	2.4%
Chlorine	10	29,370	14,954	2.2%
NABAM	1	31,000	8,903	1.3%
Total			**668,518**	

Table 7-20. 2007 Annual Review: Pulp, Paper, and Paperboard Pollutants of Concern from PCS

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Aluminum	26	993,426	64,266	39.0%
Chlorine	22	55,156	28,083	17.0%
Sulfide	1	5,023	14,071	8.5%
Dioxin	1	0	8,644	5.2%
Iron	12	1,381,404	7,736	4.7%
Cyanide	7	6,240	6,970	4.2%
Nitrogen, Kjeldahl Total (as N)	19	2,927,754	6,675	4.1%
Manganese	5	73,431	5,172	3.1%
Nitrogen, Ammonia	61	3,691,930	4,098	2.5%
Copper	31	5,385	3,418	2.1%
Lead	10	1,124	2,517	1.5%
Arsenic	5	563	2,274	1.4%
Zinc	35	38,781	1,818	1.1%
Pentachlorophenol	1	3,146	1,756	1.1%
Total			**164,787**	

For comparison purposes, Table 7-21 provides similar information using information reported to PCS and TRI in 2002 and 2003.

The 2004 TRI and PCS TWPEs dropped significantly from the 2002 TWPE. This is largely due to a reduction in dioxin reported discharges. This supports EPA's previous conclusions concerning dioxin discharges from this industry. The other top TRI and PCS-reported pollutants, their relative contribution, and amounts are generally the same for 2002 and 2004. The most recent data supports EPA's earlier findings presented in EPA's *Final Report: Pulp, Paper, and Paperboard Detailed Study* (U.S. EPA, 2006b).

Table 7-21. Previous Annual Reviews Pollutants of Concern for Pulp, Paper and Paperboard

Pollutant	2002 PCS[a]			2002 TRI[b]			2003 TRI[b]		
	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE
PiDioxin and Dioxin-like Compounds	1	0.002	1,366,677	61	0.145	1,469,101	60	0.216	2,387,924
aluminum	29	1,425,308	92,205	Not a top TRI 2002 reported pollutant			Not a top TRI 2003 reported pollutant		
chlorine	25	47,105	23,984	12	34,442	17,537	11	28,555	14,539
sulfide	1	2,442	6,841	Not a top TRI 2002 reported pollutant			Not a top TRI 2003 reported pollutant		
mercury	15	58	6,838	74	62	7,251	77	61	7,196
copper	44	8,657	5,496	Not a top TRI 2002 reported pollutant			11	4,590	2,914
Manganese	Not top PCS 2002 reported pollutants			112	4,312,307	303,729	113	4,317,774	304,114
Lead and Lead compounds				186	29,571	66,240	180	25,449	57,006
PACs				79	1,341	45,146	76	1,313	44,190
Zinc				72	309,694	14,520			
Pulp, Paper, and Paperboard Category Total		**$3.98x10^9$**	**1,537,056**		**19,399,504**	**1,952,130**			

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]Discharges include only major dischargers.
[b]Discharges include transfers to POTWs and account for POTW removals.
[c]Number of facilities reporting TWPE greater than zero.

7.4.5 Pesticide Chemicals

The total TWPE for pesticide chemicals manufacturing from EPA's 2007 screening level review of 2004 reported discharges is 620,641 compared to 604,972 using 2002 reported discharges. Table 7-22 shows the screening level results estimated for the pesticide chemicals industry from the 2002, 2003, and 2004 TRI and PCS databases.

Table 7-22. Pesticide Chemicals Screening Level Results

Year	TRI TWPE	PCS TWPE
2002	554,673	50,299
2003	485,460	NA
2004	518,385	102,256

Table 7-22 illustrates that both TRI reported releases have remained fairly constant while PCS reported releases have approximately doubled. Table 7-23 and 7-24 list the pollutants that collectively contribute 95% of the category's overall TWPE using information reported in 2004 to TRI and PCS respectively.

Table 7-23. 2007 Annual Review: Pesticide Chemicals Pollutants of Concern from TRI

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Picloram	2	237,426	492,452	95.0%
Carbaryl	4	25	7,014	1.4%
Total			**518,385**	

Table 7-24. 2007 Annual Review: Pesticide Chemicals Pollutants of Concern from PCS

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Boron	1	446,694	79,161	77.4%
Fluoride	1	337,974	11,829	11.6%
Arsenic	3	419	1,693	1.6%
Total			**92,683**	

For comparison purposes, Table 7-25 provides similar information using information reported to PCS and TRI in 2002 and 2003.

Table 7-25. Previous Annual Reviews Pollutants of Concern for Pesticides Manufacturing

Pollutant	2002 PCS[a]			2002 TRI[b]			2003 TRI[b]		
	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE
Picloram	Pollutants are not in the top five PCS 2002 reported pollutants.			2	240,111	498,021	1	213,664	443,167
Dichlorvos				1	6.24	34,935	1	1.24	6,929
Diazinon	1	2.16	1,344	3	12.4	7,685	3	8.35	5,196
Cyfluthrin	Pollutants are not in the top five PCS 2002 reported pollutants.			1	26	5,463	1	26	5,463
Merphos				1	23	1,549	1	10	674
Carbaryl, Total	1	153	42,918	Pollutants are not in the top five TRI 2002 reported pollutants.					
Hexachlorocyclo hexane, Total	1	14.8	1,038						
Chlorine	3	1,608	819						
Daconil ($C_8Cl_4N_2$)	1	83	613						
Pesticide Chemicals Category Total	**48**[c]	**122,206,792**	**50,299**	**67**[c]	**1,757,740**	**554,673**	**63**[c]	**1,927,344**	**485,460**

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]Discharges include only major dischargers.
[b]Discharges include transfers to POTWs and account for POTW removals.
[c]Number of facilities reporting TWPE greater than zero.

The majority of the TWPE associated with the 2007 screening level review overall TWPE and the TRI TWPE is reported discharges of picloram. The vast majority of picloram reported to TRI in 2002-2004 originated from a single facility, Dow Chemical in Freeport, Texas. During this past year, Dow conducted various activities to better understand its reported picloram discharges - including its generation and subsequent discharge to/from the facility's wastewater treatment system. While Dow reported picloram acid discharges to TRI, Dow found that the discharges are overwhelmingly (over 99%) in the form of picloram salts. Because TRI does not have a reporting parameter for picloram salts, Dow has been reporting its discharges as picloram. Based on its findings, Dow revised its reported water picloram discharges for 2006 to below 1 lb/year. In addition, as a result of its investigations, Dow plans to make process improvements that should increase the performance of its current wastewater treatment system in reducing its picloram discharges.

EPA's toxic weighting factor (TWF) database contains a TWF for picloram, but not for picloram salts (see Section 4.3 for more information on toxic weighting factors and how EPA uses them in its annual review). As a result, EPA developed a TWF for picloram salts. EPA also reviewed the underlying data used to calculate the TWF in its database for picloram and updated it with the most recent information available. The picloram salt TWF and the revised picloram TWF are 0.0043 and 0.01, respectively. The revised TWF for picloram is approximately 2 orders of magnitude lower than EPA's original TWF.

Based on the updated information on the form in which picloram is being discharged and TWFs, EPA revised its estimate of TWPE associated with reported picloram discharges. Dow reported discharging 237,426 lbs of picloram in 2004. The revised TWPE associated with these discharges is 1020 lb-eq. This reduces the overall TRI TWPE for pesticide chemical manufacturers to approximately 20,000 with a combined TRI/PCS TWPE of approximately 200,000.

The increase in the PCS TWPE is largely due to boron discharges reported by a single facility, Coronet Industries, in Plant City, FL. This facility discharges 446,693 pounds of boron with an estimated TWPE of 79,160. The facility reports boron discharges for two discharge pipes. The concentrations for the reported discharges range from 46.2 mg/L to 35.96

mg/L. During the 2008 review, EPA plans to contact this facility to obtain additional information on these discharges.

7.4.6 Inorganic Chemicals

The total TWPE for inorganic chemicals from EPA's 2007 screening level review of 2004 reported discharges is 431,536 compared to 293,344 using 2002 reported discharges. Table 7-26 shows the screening level results estimated for the inorganic chemicals industry from the 2002, 2003, and 2004 TRI and PCS databases.

Table 7-26. Inorganic Chemicals Screening Level Results

Year	TRI TWPE	PCS TWPE
2002	186,185	107,159
2003	182,427	NA
2004	122,514	309,022

Table 7-26 illustrates that PCS-reported releases have increased, while TRI reported releases have decreased.

Table 7-27 and 7-28 list the pollutants that collectively contribute 95% of the category's overall TWPE using information reported in 2004 to TRI and PCS respectively.

Table 7-27. 2007 Annual Review: Inorganic Chemicals Pollutants of Concern from TRI

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Manganese and Manganese Compounds	29	956,640	67,379	55.0%
Dioxin and Dioxin-Like Compounds	7	0	24,966	20.4%
Mercury and Mercury Compounds	13	37	4,386	3.6%
Nitrate Compounds	48	5,312,163	3,966	3.2%
Hexachlorobenzene	4	2	3,603	2.9%
Vanadium and Vanadium Compounds	15	97,765	3,422	2.8%
Lead and Lead Compounds	54	1,147	2,569	2.1%
Arsenic and Arsenic Compounds	4	525	2,121	1.7%
Polychlorinated Biphenyls	1	0	2,042	1.7%
Ammonia	65	1,485,889	1,649	1.3%
Nickel and Nickel Compounds	39	10,508	1,145	0.9%
Total			122,514	

Table 7-28. 2007 Annual Review: Inorganic Chemicals Pollutants of Concern from PCS

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Sulfide	2	31,383	87,918	28.5%
Lead	14	23,403	52,423	17.0%
Chlorine	10	79,478	40,467	13.1%
Iron	8	5,334,030	29,871	9.7%
Copper	27	46,975	29,821	9.7%
Polychlorinated Biphenyls (PCB)	1	0	16,173	5.2%
PCB-1254 (AROCHLOR 1254)	1	2	14,994	4.9%
Zinc	27	292,415	13,710	4.4%
Fluoride	9	212,677	7,444	2.4%
Chloride	10	74,448,577	1,813	0.6%
Total			**309,018**	

For comparison purposes, Table 7-29 provides similar information using information reported to PCS and TRI in 2002 and 2003.

Table 7-29. Previous Annual Reviews Pollutants of Concern for Inorganic Chemicals

Pollutant	2002 PCS[b]			2002 TRI[c]			2003 TRI[c]		
	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE
Manganese and Manganese Compounds	Pollutants are not in the top five PCS 2002 reported pollutants.			30	1,105,758	77,882	31	1,186,329	83,557
Lead and Lead Compounds				54	13,148	29,451	57	3,128	7,007
Mercury and Mercury Compounds				14	206	24,164	15	164	19,174
Dioxin and Dioxin-Like Compounds				4	0.066	21,197	5	0.039	22,404
PCBs				1	0.300	10,210	2	0.314	10,687
Iron	10	11,540,889	64,629	Pollutants are not in the top five TRI 2002 reported pollutants.					
Chlorine	13	16,915	8,612						
Sulfide	2	2,640	7,396						
Fluoride	10	205,338	7,187						
Cadmium	7	91	2,109						
Inorganic Chemicals Category Total	**66[d]**	**1,242,687,564**	**107,159**	**195[d]**	**9,072,771**	**186,185**	**201[d]**	**8,831,964**	**182,427**

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]Values exclude TWPE from the Chlor-Alkali Subcategory, because EPA is investigating chlor-alkali discharges as part of the CCH rulemaking.
[b]Discharges include only major dischargers.
[c]Discharges include transfers to POTWs and account for POTW removals.
[d]Number of facilities reporting TWPE greater than zero.

The top pollutants reported as discharged to TRI from 2002-2004 by inorganic chemicals manufacturing facilities and their relative contribution generally remain the same. The decrease in TRI-reported TWPEs in 2004 as compared to previous years is primarily due to a reduction in reported discharges of lead, mercury, and hexachlorobenzene. Because the pollutants of concern and their contribution remain generally the same, see the 2004 and 2006 TSDs for EPA's conclusions for the pollutants of concern from TRI reports for this category.

PCS reported discharges of iron in 2002 contributed the majority of the overall PCS TWPE in 2002. However, for 2004, the PCS TWPE is primarily driven by reported discharges of sulfide, lead, chlorine, iron, and copper. Many of the other top pollutants reported as discharged to PCS in 2002 and 2004 by inorganic chemical manufacturing facilities and their relative contribution are also similar. One or two facilities drive the TWPE for each of the pollutants driving the overall PCS TWPE. Additionally, discharges reported by a single facility contribute over 1/3 of the overall PCS TWPE. During the 2008 annual review, EPA plans to contact the facilities driving the TWPE for the top pollutants and the overall category to obtain additional information on these discharges.

7.4.7 Non-Ferrous Metals Manufacturing

The total TWPE for non-ferrous metals manufacturing from EPA's 2007 screening level review of 2004 reported discharges is 373,898 compared to 448,560 using 2002 reported discharges. Table 7-30 shows the screening level results estimated for the non-ferrous metals manufacturing industry from the 2002, 2003, and 2004 TRI and PCS databases.

Table 7-30. Non-Ferrous Metals Manufacturing Screening Level Results

Year	TRI TWPE	PCS TWPE
2002	57,093	394,881
2003	78,400	NA
2004	52,599	321,299

Table 7-30 illustrates that both TRI and PCS-reported releases have decreased. Table 7-31 and 7-32 list the pollutants that collectively contribute 95% of the category's overall TWPE using information reported in 2004 to TRI and PCS respectively.

Table 7-31. 2007 Annual Review: Nonferrous Metals Manufacturing Pollutants of Concern from TRI

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Cadmium and Cadmium Compounds	9	854	19,752	37.5%
Manganese and Manganese Compounds	20	89,437	6,299	12.0%
Lead and Lead Compounds	79	2,710	6,070	11.5%
Polycyclic Aromatic Compounds	4	52	5,244	10.0%
Vanadium and Vanadium Compounds	2	121,912	4,267	8.1%
Copper and Copper Compounds	67	4,824	3,062	5.8%
Nitrate Compounds	18	3,629,473	2,710	5.2%
Zinc and Zinc Compounds	25	35,038	1,643	3.1%
Arsenic and Arsenic Compounds	13	287	1,161	2.2%
Total			**52,603**	

Table 7-32. 2007 Annual Review: Nonferrous Metals Manufacturing Pollutants of Concern from PCS

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Polychlorinated Biphenyls (PCB)	1	2.05	69,768	21.7%
Arsenic	10	12,200	49,305	15.3%
Cadmium	11	1,937	44,768	13.9%
Molybdenum	6	173,372	34,924	10.9%
Fluoride	18	899,544	31,484	9.8%
Silver	3	1,275	21,006	6.5%
Chlorine	9	30,393	15,475	4.8%
Lead	14	6,036	13,520	4.2%
Aluminum	13	176,237	11,401	3.5%
Vanadium	3	221,077	7,738	2.4%
Zinc	21	153,438	7,194	2.2%
Total			**321,299**	

For comparison purposes, Table 7-33 provides similar information using information reported to PCS and TRI in 2002 and 2003.

Table 7-33. Previous Annual Reviews Pollutants of Concern for Non-Ferrous Metals Manufacturing

Pollutant	2002 PCS[a]			2002 TRI[b]			2003 TRI[b]		
	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE
Cadmium and Cadmium Compounds	12	4,246	98,153	7	987	22,822	11	1,311	30,296
Chlorine	17	165,958	84,500	Pollutants are not in the top five TRI 2002 reported pollutants.			Pollutants are not in the top five TRI 2003 reported pollutants.		
Silver	4	3,028	49,871						
Molybdenum	5	237,108	47,763						
Aluminum	21	448,672	29,025						
Manganese and Manganese Compounds	Pollutants are not in the top five PCS 2002 reported pollutants.			20	83,684	5,894	19	90,809	6,396
PACs				3	48	4,832	5	168	16,921
Lead and Lead Compounds				73	2,001	4,483	70	3,055	6,844
Copper and Copper Compounds				64	5,494	3,488	58	6,471	4,108
NFMM Category Total	**46[c]**	**118,048,210**	**396,740**	**112[c]**	**2,397,391**	**51,819**	**104[c]**	**2,755,833**	**78,400**

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]Discharges include only major dischargers.
[b]Discharges include transfers to POTWs and account for POTW removals.
[c]Number of facilities reporting TWPE greater than zero.

The top pollutants reported as discharged to TRI in 2003 and 2004 by fertilizer manufacturing facilities and their relative contribution generally remain the same. However, two less facilities reported discharging cadmium in 2004 to TRI which largely accounts for the reduction. See the 2004 and 2006 TSDs for EPA's conclusions for these pollutants.

PCBs and arsenic are the top pollutants in terms of TWPE as reported to PCS in 2004. Neither of these was a top pollutant in 2002. The PCB discharges are from one facility, United States Enrichment Corporation in McCracken, KY. The facility has an estimated discharge of 2.05 pounds of PCBs for an estimated TWPE of 69,767. The facility monitors for PCBs from 8 discharge pipes and has estimated discharges from 6. For 5 of the 6 discharge pipes, the facility reported only one measured PCS concentration, and all other 11 months were either no discharge or a non-detect. For the last pipe, the facility reported 2 measured concentrations.

The arsenic discharges are primarily from one facility, Doe Run Resources Recycling in Boss, MO. This facility accounts for 44,421 TWPE out of 49,305 (90%). The facility reports from 3 discharge pipes: 207 pounds/yr, 6 pounds/yr, and 10,777 pounds/yr.

7.4.8 Waste Combustors (Part 444)

The Waste Combustors effluent guidelines (Part 444) applies to wastewater discharges from hazardous waste combustor facilities, except cement kilns, regulated as "incinerators" or "boilers and industrial furnaces" under the Resource Conservation and Recovery Act (RCRA). The rule applies solely to commercial facilities (i.e., facilities that accept wastes from off-site for fee or remuneration). It does not apply to commercial facilities that only accept off-site wastes that are of a similar nature to the wastes being generated and burned on-site. An example of similar wastes are wastes that are generated in operations that are subject to the same CWA limitations and standards in 40 CFR Subchapter N. The rule does not apply to a hazardous waste combustor facility that accepts wastes from off-site without a fee or other remuneration. At the time of promulgation, EPA estimated the rule would apply to 8 facilities.

The total TWPE for waste combustors from EPA's 2007 screening level review of 2004 reported discharges is 251,975. TRI-reported discharges contribute over 96% of the total TWPE. As explained above, for the past four years EPA has removed this category for further consideration at the screening level step because EPA recently promulgated this ELG and was in the process of implementing it. Because this ELG no longer falls within this time frame and it ranks in the top 95% of TWPE contributors, EPA has prioritized it for further review.

Tables 7-34 and 7-35 list the pollutants that collectively contribute 95% of the category's overall TWPE using information reported in 2004 to TRI and PCS respectively.

Table 7-34. 2007 Annual Review: Waste Combustors Pollutants of Concern from TRI

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Benzidine	1	67	187,680	74.0%
Toxaphene	1	1	34,520	13.6%
Hexachlorobenzene	1	6	11,901	4.7%
Polychlorinated Biphenyls	2	0	9,189	3.6%
Total			**253,489**	

Table 7-35. 2007 Annual Review: Waste Combustors Pollutants of Concern from PCS

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Sulfide	2	493	1,381	15.2%
Boron	1	7,667	1,359	15.0%
PCB-1248 (Arochlor 1248)	1	0	814	9.0%
PCB-1254 (Arochlor 1254)	1	0	814	9.0%
PCB-1242 (Arochlor 1242)	1	0	814	9.0%
PCB-1232 (Arochlor 1232)	1	0	814	9.0%
PCB-1260 (Arochlor 1260)	1	0	814	9.0%
Copper	11	542	344	3.8%
Lead	6	143	320	3.5%
Arsenic	6	78	314	3.5%
Cadmium	7	12	273	3.0%
Aluminum	5	4,110	266	2.9%
Zinc	15	4,308	202	2.2%
Nickel	8	884	96	1.1%
Nitrogen, Kjeldahl Total (as N)	3	28,321	65	0.7%
Total			**9,087**	

A single facility, Clean Harbors in Deer Park Texas, is responsible for 92% of the total TWPE discharges reported for the entire category. This facility reported discharging benzidine, toxaphene, and hexachlorobenzene in its treated process wastewaters. EPA contacted this facility to learn more about these discharges (Finseth, 2007b). The facility estimates its discharges using monthly sampling data from the wastewater treatment plant effluent multiplied by the monthly flow from the treatment plant. The facility indicated that it had detected all of the above pesticides in its wastewater at some point, but that these pollutants are not detected each month[8]. The facility also indicated that the detection of these pesticides likely depends on what type of waste the facility was incinerating prior to the collection of the samples.

The Waste Combustors effluent guidelines (Part 444) do not include limitations or standards for pesticides. At the time of the rulemaking, EPA collected grab samples of untreated industrial waste combustor scrubber blowdown water at twelve commercial hazardous waste combustor (CHWC) facilities. Among other pollutants, EPA analyzed these wastewater samples for pesticides and herbicides. EPA found that pesticides/herbicides were generally only found, if at all, in low concentrations. In particular, EPA analyzed the grab samples for all of the pollutants driving the TWPE for this category and did not detect any of them.

Because of the variable nature of the wastes incinerated at these facilities and the potential for a wide variety of pollutants in a single facility's discharge and across CHWC facilities, EPA does not know if the pesticides reported at Clean Harbors are unique to it or if other CHWCs may also discharge these pollutants, and are not monitoring for them. As a result, EPA plans to further investigate possible pesticide discharges from this industrial category as part of its 2008 annual review.

7.4.9 Centralized Waste Treatment (Part 437)

The Centralized Waste Treatment (CWT) effluent guidelines (Part 437) apply to facilities that treat and/or recover hazardous or non-hazardous industrial waste, wastewater, or used material from off-site. The business of the centralized waste treatment (CWT) industry is to handle wastewater treatment residuals and industrial process by-products that come from other

[8] For months when the pesticides are not-detected, the facility uses one-half the detection limit times the flow to estimate the discharge for that month.

manufacturing facilities. CWT facilities receive a wide variety of hazardous and non-hazardous industrial wastes for treatment. Many of the wastes contain very high pollutant concentrations and are unusually difficult to treat. At the time of promulgation, EPA estimated it would apply to 233 facilities.

The total TWPE for centralized waste treatment (CWT) from EPA's 2007 screening level review of 2004 reported discharges is 7,469,434. TRI-reported discharges contribute over 99.9% of the total TWPE. As explained above, for the past four years EPA has removed this category for further consideration at the screening level step because EPA recently promulgated this ELG and was in the process of implementing it. Because this ELG no longer falls within this time frame and it ranks in the top 95% of TWPE contributors, EPA has prioritized it for further review.

Tables 7-36 and 7-37 list the pollutants that collectively contribute 95% of the category's overall TWPE using information reported in 2004 to TRI and PCS respectively.

Table 7-36. CWT TRI 2004 Top Pollutant Discharges by TWPE (95%)

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Diazinon	1	10,282	6,398,170	85.9%
Malathion	1	10,283	575,931	7.7%
Polycyclic Aromatic Compounds	1	2,600	261,716	3.5%
Total			**7,450,245**	

Table 7-37. PCS 2004 Top Pollutant Discharges by TWPE (95%)

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Zinc	3	103,596	4,857	55.6%
Sulfide	2	912	2,555	29.3%
Cadmium	1	21	493	5.6%
Barium	2	155,451	309	3.5%
Arsenic	2	44	176	2.0%
Total			**8,730**	

Diazinon and malathion discharges to waters of the U.S. reported by a single facility, Vopak Logistics Services in Deer Park, Texas contribute 94% of the category's total TWPE. EPA contacted this facility to learn more about these reported discharges (MacQueen, 2007a). The facility explained that each of its customers provides a wastestream profile, which lists the concentration of each pollutant in the waste stream shipment. These profiles usually include concentration ranges. Vopak uses a computer program which records the high-end concentration provided for each pollutant, then multiplies by the shipment volume to obtain pollutant masses. These masses are summed for each pollutant and a factor is applied to account for treatment.

PAC discharges also have a significant contribution to this category's TWPE. These reported discharges are attributed to the LNVA North Regional Treatment Plant in Beaumont, Texas. EPA plans to contact this facility during the 2008 annual review to obtain additional information about these reported discharges.

40 CFR Part 437 does not include limitations or standards for pesticides. At the time of the rulemaking, EPA collected samples at two CWT facilities and analyzed for the entire spectrum of chemical compounds for which EPA had approved analytical methods. This included pesticides and herbicides. EPA found that pesticides/herbicides were generally only found, if at all, in low concentrations. However, EPA did not analyze the samples for diazinon or malathion – the two pesticides driving the TWPE for this industrial category. As of December 31, 2004, it is unlawful to sell diazinon outdoor, non-agricultural products in the United States. It is, however, legal for consumers to use diazinon products, provided they follow all label directions and precautions[9]. Since some CWT facilities are permitted to accept hazardous waste, CWT facilities may be a viable option for disposing of diazinon for some time even though it is no longer sold in the U.S.

Pollutants included in the TRI "PAC" grouping are widespread in CWT discharges. As a result, CWT includes limitations and standards for individual pollutants that serve as indictor parameters for the PAC chemicals.

[9] http://www.epa.gov/pesticides/factsheets/chemicals/diazinon-factsheet.htm

Because of the variable nature of the wastes treated/recovered at CWT facilities, the potential for a wide variety of pollutants in a single facility's discharge and across CWT facilities, and a lack of analytical data on diazinon and malathion as they related to this industry, EPA does not know if the pesticides reported at Vopak should be of concern to EPA. As explained by the facility, the discharges are estimated based on maximum quantities received. If these pesticides are actually discharged in significant quantities from Vopak, EPA does not know if these discharges are unique to it or if other CWT facilities may also discharge these pollutants, and are not monitoring for them. As a result, EPA plans to further investigate possible pesticide discharges from this industrial category as part of its 2008 annual review.

7.4.10 Textile Mills (40 CFR 410)

EPA selected the Textile Mills (Textiles) Category for additional data collection and analysis because of the high TWPE identified in the 2005 screening-level review (see Table V-1, 70 FR 51050, August 29, 2005). The 2004 Plan summarizes the results of EPA's previous reviews of this industry (U.S. EPA, 2004). This section summarizes the 2007 annual review of the discharges associated with the Textiles Category. EPA's 2006 annual review builds on the previous annual reviews.

The total TWPE for the Textile Mills category from EPA's 2007 screening level review of 2004 reported discharges is 126,435 compared to 156,850 using 2002 reported discharges. Table 7.38 shows the screening level results estimated for the textile mills industry from the 2002 and 2004 TRI and PCS databases

Table 7-38. Textile Mills Screening Level Results

Year	TRI TWPE	PCS TWPE
2002	32,765	124,085
2004	3,043	123,392

EPA identified in the 2006 Plan that discharges of sulfide account for a majority of the category PCS TWPE. Part 410 regulates discharges of sulfide from textile mills, and 39 textile mills report sulfide discharges to PCS in 2002 and 2004, respectively. EPA identified in the 2006 Plan that it would review additional data on these sulfide discharges. EPA identified a number of treatment control technologies for controlling sulfide discharges, which include chemical oxidation (e.g., potassium permanganate, sodium hydroxide) (ASCE, 1989). Sulfide discharges can also cause damage to POTW collection and treatment facilities and can be a serious concern for worker safety. EPA reviewed PCS concentration data for sulfide discharges from the four textile mills with the highest TWPE, but only two had concentration data available. At these two mills, the data show concentrations ranging from levels below laboratory detection limits to 6 mg/L. With sufficient dilution with domestic wastewater this sulfide concentrations should likely not cause damage to the receiving POTWs or impact worker safety.

Additionally, EPA identified this industrial category as one collectively contributing 95% of the overall TWPE in the 2006 annual review. In EPA's 2007 annual review, this category is no longer among the list of top dischargers of toxic pollutants (as measured by TWPE). Consequently, EPA concluded its preliminary category review of the Textile Mills category in the 2007 annual review.

EPA will review this category with all other categories in the 2008 annual review.

7.4.11 Ore Mining and Dressing (40 CFR 440)

The total TWPE for the ore mining and dressing industry from EPA's 2007 screening level review of 2004 reported discharges is 668,832 compared to 480,480 using 2002 reported discharges. Table 7-39 shows the screening level results estimated for the ore mining and dressing industry from the 2002, 2003, and 2004 TRI and PCS databases.

Table 7-39. Ore Mining and Dressing Screening Level Results

Year	TRI TWPE	PCS TWPE
2002	60,544	406,548
2004	88,001	580,831

Table 7-39 illustrates that both TRI and PCS-reported releases have increased. By far, the largest increase is discharges reported to PCS. Table 7-40 and 7-41 list the pollutants that collectively contribute 95% of the category's overall TWPE using information reported in 2004 to TRI and PCS respectively.

Table 7-40. 2007 Annual Review: Ore Mining and Dressing Pollutants of Concern from TRI

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Arsenic and Arsenic Compounds	5	7,532	30,439	34.6%
Lead and Lead Compounds	21	9,344	20,930	23.8%
Cadmium and Cadmium Compounds	6	512	11,840	13.5%
Silver and Silver Compounds	2	500	8,235	9.4%
Vanadium and Vanadium Compounds	3	205,500	7,193	8.2%
Copper and Copper Compounds	14	4,013	2,548	2.9%
Selenium and Selenium Compounds	2	1,550	1,738	2.0%
Mercury and Mercury Compounds	5	11	1,335	1.5%
Total			**88,001**	

Table 7-41. 2007 Annual Review: Ore Mining and Dressing Pollutants of Concern from PCS

Chemical Name	Number of Facilities	Total Pounds	Total TWPE	Percent of Total TWPE
Mercury	13	3,768	441,338	76.0%
Arsenic	7	7,651	30,921	5.3%
Cadmium	26	911	21,052	3.6%
Lead	30	8,523	19,091	3.3%
Molybdenum	4	93,117	18,757	3.2%
Fluoride	4	367,046	12,847	2.2%
Aluminum	4	183,422	11,866	2.0%
Total			**580,831**	

For comparison purposes, Table 7-42 provides similar information using information reported to PCS and TRI in 2002 and 2003.

Table 7-42. Ore Mining Category Pollutants of Concern from Previous Annual Reviews

Pollutant	2002 PCS[a]			2002 TRI[b]			2003 TRI[b]		
	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE
Molybdenum	4	770,329	155,174	Pollutants are not in the top five TRI 2002 reported pollutants.			Pollutants are not in the top five TRI 2003 reported pollutants.		
Cyanide	7	109,018	121,764						
Cadmium and Cadmium Compounds	26	2,360	54,556	10	848	19,603	9	642	14,878
Lead and Lead Compounds	30	10,406	23,309	25	5,526	12,378	23	5,153	11,542
Arsenic and Arsenic Compounds	11	3,143	12,701	9	3,312	13,383	8	5,882	23,770
Silver and Silver Compounds	Pollutants are not in the top five PCS 2002 reported pollutants.			2	500	8,235	2	500	8,235
Vanadium and Vanadium Compounds				3	147,310	5,156	3	240,200	8,407
Ore Mining Category Total	**50[c]**	**702,310,349**	**410,266**	**35[c]**	**462,061**	**70,214**	**32[c]**	**597,196**	**77,649**

Source: *PCSLoads2002_v4; TRIReleases2002_v4*; *TRIReleases2003_v2*.
[a]Discharges include major dischargers only.
[b]Discharges include transfers to POTWs and account for POTW removals.
[c]Number of facilities reporting WPE greater than zero.

The top pollutants and their contributions have changed from 2002 to 2004. TRI reported releases of arsenic and lead have increased in 2004 while discharges of cadmium have decreased. Mercury is the top reported pollutant to PCS in 2004 in terms of TWPE, but it wasn't a top pollutant in 2002. Discharges of the top pollutants reported to PCS in 2002 have all decreased.

EPA received comments from previous effluent guidelines program plans stating that discharges from facilities in this category may not be adequately quantified in the PCS and TRI databases and that these discharges can cause significant water quality impacts (Johnston, 2003). In particular, EPA is evaluating the impact of discharges from waste rock and overburden piles, which are not now regulated by effluent guidelines, and whether these discharges are adequately controlled by the Storm Water Multi-Sector General Permits (MSGP).[10] See 65 FR 64746 (Oct. 30, 2000 and 70 FR 72116, December 1, 2005).

The MSGP includes very general benchmark values for sampling and general requirements to develop a stormwater pollution prevention plan, but does not establish numeric limits or stormwater containment/treatment requirements. The MSGP establishes benchmark monitoring for pollutants including TSS, pH, hardness, arsenic, beryllium, cadmium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, zinc, and uranium.[11] The data from this sampling are now available due to the 2000 MSGP requirements.

Commenters on previous effluent guidelines program plans have requested that EPA reverse its decision to exclude discharges from waste rock and overburden piles from the Part 440 applicability definition of "mine drainage." Specifically, commenters suggested that EPA should conduct a rulemaking to address discharges from waste rock piles, overburden piles,

[10] Mine sites not regulated by the MSGP include: (1) sites with their stormwater discharges regulated by an individual permit; and (2) sites without any discharge of stormwater. A facility has the option of obtaining an individual permit for stormwater discharges instead of requesting coverage under the MSGP; however, in practice this is seldom done. The current MSGP expires this year; however EPA intends to reissue it. Almost all mine sites discharge stormwater (e.g., stormwater discharges from haul roads, process areas, equipment storage areas, mine waste rock).

[11] Table G-4 of the MSGP lists what wastewaters from mining activities are covered by Part 440 and what wastewaters are to be covered by the industrial MSGP. In response to litigation from the National Mining Association, EPA revised its interpretation of applicability for wastewaters from hard rock mining operations. Under the revised interpretation, runoff from waste rock and overburden piles is not subject to effluent guidelines unless it naturally drains (or is intentionally diverted) to a point source and combines with "mine drainage" that is otherwise subject to the effluent guidelines (65 FR 64774, October 30, 2000).

and other sources of water pollution at mine sites that are not currently covered by Part 440. See 63 FR 47285 (September 4, 1998).

The Agency will review the MSGP data for usefulness in revising the effluent guidelines, for example, to determine the mass and concentrations of pollutants discharged and effluent variability associated with these discharges, and to evaluate the performance and effectiveness of the permit controls (primarily "best management practices") at reducing pollutants. Additionally, EPA may gather other relevant data (such as cost data) on wastewater treatment technologies for this category. Preliminary MSGP data indicate high concentrations of metals in active and inactive mine site runoff. The volumes of discharge can be significant due to the large land area covered by the mine sites. Additionally, EPA Regions are evaluating whether states are adequately addressing mine site runoff. Finally, EPA is also investigating the potential for facilities in this category to contaminate ground water and, through infiltration and inflow, adversely affect POTW operations (U.S. EPA, 2002).

EPA determined there is incomplete data available for a full analysis of the Ore Mining Category. EPA intends to continue its preliminary category review for the 2008 annual review.

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8.0 DETAILED STUDIES

The following sections provides EPA's review of the industrial categories currently regulated by existing effluent guidelines that cumulatively compose 95% of the sum hazard (reported in units of toxic-weighted pound equivalent or TWPE).

In addition to conducting a screening-level review of all existing categories, EPA started or continued detailed studies of four categories: Steam Electric Power Generating (Part 423), Coal Mining (Part 434), Oil and Gas Extraction (Part 435) (only to assess whether to include coalbed methane extraction as a new subcategory), and Hospitals (Part 460) (which is part of the Health Services Industry detailed study). For these industries, EPA gathered and analyzed additional data on pollutant discharges, economic factors, and technology issues during its 2007 annual review. EPA examined: (1) wastewater characteristics and pollutant sources; (2) the pollutants discharged from these sources and the toxic weights associated with these discharges; (3) treatment technology and pollution prevention information; (4) the geographic distribution of facilities in the industry; (5) any pollutant discharge trends within the industry; and (6) any relevant economic factors.

EPA is relying on many different sources of data including: (1) the 2002 U.S. Economic Census; (2) TRI and PCS data; (3) contacts with reporting facilities to verify reported releases and facility categorization; (4) contacts with regulatory authorities (states and EPA regions) to understand how category facilities are permitted; (5) NPDES permits and their supporting fact sheets; (6) monitoring data included in facility applications for NPDES permit renewals (Form 2C data); (7) EPA effluent guidelines technical development documents; (8) relevant EPA preliminary data summaries or study reports; (9) technical literature on pollutant sources and control technologies; (10) information provided by industry including industry conducted survey and sampling data; and (11) stakeholder comments. Additionally, in order to evaluate available and affordable treatment technology options for the coalbed methane extraction industry sector, EPA intends to submit an Information Collection Request (ICR) to the Office of Management and Budget (OMB) for its review and approval in prior to publication of the final 2008 Plan.

8.1 Steam Electric Power Generating (Part 423)

The Steam Electric Power Generating effluent guidelines (40 CFR 423) apply to a subset of the electric power industry, namely those facilities "primarily engaged in the generation of electricity for distribution and sale which results primarily from a process utilizing fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium." EPA's most recent revisions to the effluent guidelines and standards for this category were promulgated in 1982 (November 19, 1982; 47 FR 52290).

EPA previously found that facilities in the Steam Electric Power Generating point source category collectively discharge relatively high amounts of toxic pollutants (as measured in toxic-weighted pound equivalents (TWPE)). Tables 5-3 and 5-4 of the TSD for the final 2006 Plan, and Section 5.4.4.7 of the TSD for the final 2004 Plan present the TWPE for this category (U.S. EPA, 2004; U.S. EPA, 2006). The 2007 annual review again identified this category as the second-largest discharger of toxic pollutants. EPA also determined that PCS and TRI data provide an incomplete picture of the wastewaters generated by the regulated steam electric industry. For example, EPA anticipates greater amounts of nitrogen compounds, selenium, and other metals, most of which are not regulated by the effluent guidelines, and therefore, may not reported to TRI or PCS, in steam electric wastewaters as a result of the increasing use of air pollution controls (U.S. EPA, 2006c). Consequently, EPA focused on supplementing its review of PCS and TRI data for this category with additional data collection as described below and in the supporting docket (U.S. EPA, 2007d).

The detailed study for the Steam Electric Power Generating point source category is mainly focused on: (1) characterizing the mass and concentrations of pollutants in wastewater discharges from coal-fired steam electric facilities; and (2) identifying the pollutants that comprise a significant portion of the category's TWPE discharge estimate and the corresponding industrial operation. Wastestreams of particular interest include cooling water, fly ash and bottom ash wastes, coal pile runoff, and discharges from wet air pollution control devices [*e.g.*, wet flue gas desulfurization (FGD)]. EPA's previous annual reviews have identified that: (1) the TWPE discharge estimate for this category is predominantly driven by the metals present in wastewater discharges; and (2) the waste streams contributing the majority of these metals are associated with ash handling and wet FGD systems (U.S. EPA, 2006c). Other potential sources of metals include coal pile runoff, metal/chemical cleaning wastes, coal washing, and certain low volume wastes. EPA is collecting data for the detailed study through facility inspections, wastewater sampling, a data request that was sent to a limited number of companies, and various secondary data sources (U.S. EPA, 2007d).

EPA is conducting wastewater sampling of ash ponds and FGD wastewater treatment systems at several steam electric facilities. Samples collected are being analyzed for metals and classical pollutants, such as total suspended solids and nitrogen. EPA selected the plants for sampling based on characteristics and process configurations of interest. Factors taken into consideration include the type of fuel, type of wet FGD systems in operation, fly ash handling practices, nitrogen oxides (NOx) controls (*e.g.*, selective catalytic reduction systems), and wastewater treatment technologies. The *Generic Sampling and Analysis Plan for Coal-Fired Steam Electric Power Plants* provides information about the sample collection methodologies, analytes of interest, and laboratory analytical methods (ERG, 2007a).

EPA also collected facility specific information using a data request conducted under authority of CWA section 308 (Claff, 2006). EPA sent this data request to nine companies that operate a number of coal-fired power plants with wet FGD systems. The data request complements the wastewater sampling effort as it collects facility-specific information about wastewaters EPA is not sampling. Additionally, the data request collects detailed information about wastewater generation rates and management practices for wastewaters included in EPA's sampling program. The data request seeks information on selected wastewater sources, air pollution controls, wastewater management and treatment practices, water reuse/recycle, and treatment system capital and operating costs.

8.2 Coal Mining (Part 434)

As discussed in the "Notice of Availability of Final 2006 Effluent Guidelines Program Plan," (December 21, 2006; 71 FR 245, Page 76644-76667) EPA is conducting a detailed study during the 2007 and 2008 annual reviews to evaluate the merits of comments by states, industry, and a public interest group that urged revisions to pollutant limitations in the coal mining effluent guidelines (40 CFR Part 434). The Interstate Mining Compact Commission, which represents mining agencies in 35 states, together with a few individual state agencies, and a few mining companies, asked EPA to remove the current manganese limitations and allow permittees to employ best management practices as necessary to reduce manganese discharges based on the quality of receiving waterbodies. Appendix E presents the Coal Mining Detailed Study Status Memorandum, which describes the documents that were prepared in support of the Preliminary 2008 Effluent Guidelines Program Plan.

The public interest group, the Environmental Law and Policy Center, asked EPA to place greater controls on coal mining discharges of sulfates, chlorides, mercury, cadmium, manganese, selenium, and other unspecified pollutants.

State and industry commentors cited the following factors in support of their comments: (1) new, more stringent coal mining reclamation bonding requirements on post-closure discharges; (2) evidence that current manganese limitations are more stringent than necessary to protect aquatic life; (3) perception that high cost of manganese treatment is causing permittees to default on their post-closure bonds; and (4) perception that treatment with chemical addition may complicate permit compliance, especially after a mine is closed. The public interest group referenced a study by EPA Region 5 on potential adverse impacts of the discharge of sulfates on aquatic life (ERG, 2006).

EPA initiated the Coal Mining Detailed Study in January 2007. The study follows the framework presented in the Detailed Study Plan, a draft of which the Agency placed into the docket (ERG, 2006a) during the Fall of 2006. EPA revised and finalized the Detailed Study Plan in April 2007 to reflect public comments. The study will evaluate treatment technologies, costs, and pollutant discharge loads, as well as the effects of manganese and other pollutants on aquatic life. The study will also address the question of whether bonds are being forfeited because of the cost of manganese treatment by examining bonding and trust fund requirements, past bond forfeiture rates, future potential bond forfeiture rates, and the issues related to state assumption of long-term water treatment responsibilities for mines where the bonds have been forfeited. As outlined in the Detailed Study Plan, EPA has framed study questions based on public comment, identified data sources to help answer the study questions, developed a methodology for estimating treatment costs and discharge loads, and initiated data collection activities with the Interstate Mining Compact Commission, state agencies, and the Office of Surface Mining, Reclamation, and Enforcement within the U.S. Department of the Interior.

The Coal Mining Detailed Study consists of several interim products which will be summarized in the 2008 final report: an industry financial profile which will include information about the types and locations of mines, ownership, and revenues; a summary of state and federal permitting requirements; a summary of bonding and trust fund requirements for control of water discharges from post-mining sites; an analysis of bond forfeiture and the consequences for the states; an analysis of treatment technologies, costs, and pollutant discharge loads; and an environmental summary of the aquatic life effects of manganese and other pollutants.

During 2007, EPA plans to complete data collection, complete the industry financial profile, begin analysis of bonding and trust fund issues, and begin analysis of treatment costs and discharge loads. During 2008, EPA will complete analysis of bonding and trust fund issues, complete estimates of treatment costs and discharge loads, complete the summary environmental impacts, and complete the final report.

EPA will use the results of the Coal Mining Detailed Study, which will be summarized in the Final 2008 Effluent Guidelines Program Plan, to help decide appropriate regulatory steps. EPA may decide that revisions to certain current effluent limitations are warranted, that effluent limitations should be developed for certain pollutants that are not currently regulated, or that no regulatory action is warranted.

8.3 Oil and Gas Extraction Category (Part 435)

As discussed in the 2006 annual review, EPA is conducting a detailed study of the coalbed methane industry to determine whether to revise the effluent guidelines for the Oil and Gas Extraction category to include limits for this potential new subcategory (December 21, 2006;

71 FR 76656). The coalbed methane (CBM) industrial sector is an important part of the Nation's domestic source of natural gas. In 2004, CBM accounted for about 10.4% of the total U.S. natural gas production and is expanding in multiple basins across the Nation. Currently, the Department of Energy's Energy Information Administration (EIA) expects CBM production to remain an important source of the domestic natural gas over the next few decades. Based on Bureau of Land Management (BLM) and States' projections this will likely involve over 100,000 CBM wells. The growth in the CBM industrial sector can be explained by the decrease in drilling and transmission costs in getting the CBM to market, clarity of gas ownership, and the increase of long-term natural gas prices. See Section 6 of the TSD for the final 2006 Plan (U.S. EPA, 2006). EPA identified the CBM extraction industry as a potential new subcategory of the Oil and Gas Extraction category (40 CFR 435) in the final 2006 Plan (December 21, 2006; 71 FR 76656).

Coalbed methane (CBM) extraction requires removal of large amounts of water from underground coal seams before CBM can be released. CBM wells have a distinctive production history characterized by an early stage when large amounts of water are produced to reduce reservoir pressure which in turn encourages release of gas; a stable stage when quantities of produced gas increase as the quantities of produced water decrease; and a late stage when the amount of gas produced declines and water production remains low (De Bruin, 2004). The quantity and quality of water that is produced in association with CBM development will vary from basin to basin, within a particular basin, from coal seam to coal seam, and over the lifetime of a CBM well.

Pollutants often found in these wastewaters include chloride, sodium, sulfate, bicarbonate, fluoride, iron, barium, magnesium, ammonia, and arsenic. Total dissolved solids (TDS) and electrical conductivity (EC) are bulk parameters for quantifying the total amount of dissolved solids in a wastewater and also used to quantify the amount of pollutants in CBM produced waters. Equally important in preventing environmental damage is controlling the sodicity of the CBM produced waters. Sodicity is often quantified as the sodium adsorption ratio (SAR), which is expressed as the ratio of sodium ions to calcium and magnesium ions, and is an important factor in controlling the produced water's suitability for irrigation and its potential for degrading soils. All of these parameters can potentially cause environmental impacts as well as affect potential beneficial uses of CBM produced water.

Impacts to surface water from discharges of CBM produced waters can be severe depending upon the quality of the CBM produced waters. Saline discharges have variable effects depending on the biology of the receiving stream. Some waterbodies and watersheds may be able to absorb the discharged water while others are sensitive to large amounts of low-quality CBM water. For example, large surface waters with sufficient dilution capacity or marine waters are less sensitive to saline discharges than freshwater surface waters. Discharge of these CBM produced waters may also cause erosion and in some cases irreversible soil damage from elevated TDS concentrations and SAR values. This may limit future agricultural and livestock uses of the water and watershed.

Currently, regulatory controls for CBM produced waters vary from State to State and permit to permit (U.S. EPA, 2006; Ruckelshaus Institute, 2005). There is very limited permit information (*e.g.*, effluent limits, restrictions) in PCS and TRI for this industrial sector. Consequently, EPA is gathering additional information from State NPDES permit programs and industry on the current regulatory controls across the different CBM basins.

EPA identified in the 2006 annual review that it will need to gather more specific information as part of a detailed review of the coalbed methane industry in order to determine whether it would be appropriate to conduct a rulemaking to potentially revise the effluent guidelines for the Oil and Gas Extraction category to include limits for CBM. In particular, EPA will need to collect technical, economic, and environmental data from a wide range of CBM operations (*e.g.*, geographical differences in the characteristics of CBM-produced waters, current regulatory controls, potential environmental impacts, availability and affordability of treatment technology options). Accordingly, EPA intends to submit an Information Collection Request (ICR) to the Office of Management and Budget (OMB) for its review and approval under the Paperwork Reduction Act (PRA), 33 U.S.C. 3501, et seq. EPA is working with stakeholders in the design of this industry survey. EPA solicits comment on the potential scope and methodology of this ICR. See section IX.C for a list of questions that EPA will use to develop the ICR. EPA expects to distribute the ICR in late summer of 2008.

EPA is also collecting discharge related information from five site visit trips to support this detailed study, and collecting other secondary data sources to supplement its current understanding of the CBM industrial sector. EPA is specifically gathering data on available and affordable beneficial use and treatment technology options, and potential impacts of CBM produced water discharges. A summary of the data collected for this detailed study is provided in the TSD for the preliminary 2008 Plan.

8.4 Health Services Industry and Hospitals (Part 460)

The Health Services Industry includes establishments engaged in various aspects of human health (*e.g.* hospitals, dentists, long-term care facilities) and animal health (*e.g.,* veterinarians). Health services establishments fall under SIC major group 80 "Health Services" and industry group 074 "Veterinary Services." According to the 2002 Census, there are over 475,000 facilities in the Health Services Industry (Mott, 2005). EPA is including the following industrial sectors within the Health Services Industry: Offices and Clinics of Dentists, Nursing and Personal Care Facilities (long-term care facilities), Hospitals and Clinics, and Veterinary Care Services (August 29, 2005; 70 FR 51054).

All these industrial sectors require services to be delivered by trained professionals for the purpose of providing health care and social assistance for individuals. These entities may be free standing and perhaps privately owned or may be part of a hospital or health system. The services can include diagnostic, preventative, cosmetic, and curative health services.

The vast majority of establishments in the health services industries are not subject to categorical limitations and standards. In 1976, EPA promulgated 40 CFR 460 which only applies to effluent discharges to surface water from hospitals with greater than 1,000 occupied beds. Part 460 did not establish pretreatment standards for indirect discharging facilities.

In evaluating the health services industries to date, EPA has found little readily available information. Both PCS and TRI contain sparse information on health care service establishments. For 2002, PCS only has data for two facilities which are considered "major" sources of pollutants and only Federal facilities in the healthcare industry are required to report to TRI. In 1989, EPA published a Preliminary Data Summary (PDS) for the Hospitals Point Source Category (U.S. EPA, 1989). Also, EPA's Office of Enforcement and Compliance Assistance (OECA) published a Healthcare Sector Notebook in 2005 (U.S. EPA, 2005c). In addition, industry and POTWs have conducted studies to estimate pollutant discharges for some portions of this industry (e.g., dentists) (Stone, 2004).

Based on preliminary information, major pollutants of concern in discharges from health care service establishments include solvents, mercury, pharmaceuticals, endocrine-disrupting compounds (EDCs), and biohazards (*e.g.,* items contaminated with blood) (U.S. EPA, 2005c). The majority of the mercury originates from the following sources: amalgam used in dental facilities; and medical equipment, laboratory reagents, and cleaning supplies used in healthcare facilities (Johnston, 2005; Johnston, 2005a). EPA found little to no quantitative information on wastewater discharges of emerging pollutants of concern such as pharmaceuticals and EDCs but was able to identify some information on biohazards.

As described above, the Health Services Industry is expansive and contains approximately half a million facilities. Because of the size and diversity of this industrial category and other resource constraints, EPA decided to focus its detailed study on certain subcategories of dischargers. EPA selected its focus areas, for the most part, to respond to stakeholder concerns. The focus areas are:

- Dental mercury: EPA is focusing its evaluation of mercury discharges from the offices and clinics of dentists due to the potential hazard and bioaccumulative properties associated with mercury.
- Unused pharmaceuticals: EPA is focusing its evaluation of unused pharmaceuticals from health service facilities due to the growing concern over the discharge of pharmaceuticals into water and the potential environmental effects.

Unused pharmaceuticals include dispensed prescriptions that patients do not use as well as materials that are beyond their expiration dates. It includes both human and veterinary drugs (including certain pesticides such as flea, tick, and lice controls. As a point of clarification, unused pharmaceuticals does not include excreted pharmaceuticals. In particular, EPA is evaluating disposed unused pharmaceutical practices from the following sectors:

- Nursing and personal care facilities (including long-term care facilities);
- Veterinary care services; and
- Hospitals and clinics.

The Agency notes that it has an overall interest in mercury reduction and on July 5, 2006, issued a report titled, “EPA’s Roadmap for Mercury,” (U.S. EPA, 2006d). Among other things, EPA’s report highlights mercury sources and describes progress to date in addressing mercury sources. Similarly, assessing pharmaceuticals in wastewater is part of the Agency’s Strategic Plan (2006-2011) to meet its goals of clean and safe water, (U.S. EPA, 2006e). EPA is concerned about pharmaceuticals in the environment and is working on this issue in many different areas. Currently, the Agency is: (1) developing analytical methods to measure pharmaceuticals in wastewater and biosolids; (2) studying the health and ecological effects of pharmaceuticals on aquatic life; and (3) engaged in determining the significance of consumer disposal of drugs to wastewater. Additionally, the Agency is considering amending its hazardous waste regulations to add hazardous pharmaceuticals to the universal waste system to facilitate the disposal of consumer waste (40 CFR 273) (RIN 2050-AG39, April 30, 2007; 72 FR 23170).

While stakeholders and EPA are concerned about EDC discharges, EPA has found only limited data on EDCs. In order to fill in some of these data gaps, in conjunction with its Health Services Industry detailed study, EPA is conducting a POTW study that, among other things, has the goal of developing wastewater analytical methods for certain pollutants, characterizing the presence of chemicals such as surfactants and pharmaceuticals in POTW wastewaters, and evaluating POTW treatment technology effectiveness in reducing such pollutant discharges. To the extent that the results of the POTW studies are available during this Health Services Industry detailed study, EPA may include relevant information in this study at that time.

The Health Services Study is described in more detail in *EPA's Draft Detailed Study Plan for the Health Services Industry* (U.S. EPA, 2007e). As explained there, EPA is researching the following questions/topics as they relate to disposal of mercury and unused pharmaceuticals into municipal sewer systems:

- What are the current industry practices in regards to disposal of unused pharmaceuticals and mercury? To what extent are each of these practices applied? What factors drive current practices?
- Are there federal, state, or local requirements or guidance for disposal of unused pharmaceuticals and/or mercury? What are these requirements?
- How are control authorities currently controlling (or not) disposal of unused pharmaceuticals and mercury via wastewater?
- To what extent do POTWs report pass through or interference problems related to unused pharmaceuticals or mercury discharges?
- What technologies are available: (1) as alternatives to wastewater disposal; and (2) to control discharges? Is there any qualitative or quantitative information on their efficiency?
- What Best Management Practices (BMPs) are used as alternatives to wastewater disposal and/or to control discharges and is there any qualitative or quantitative information on their efficiency?
- Is there any quantitative or qualitative information on the costs associated with identified technologies and/or BMPs?

Appendix F presents the Health Services Industry Detailed Study Status Memorandum, which describes the documents that were prepared in support of the Preliminary 2008 Effluent Guidelines Program Plan.

8.4.1 Dental Mercury

Across the United States, states and municipal wastewater treatment plants (publicly owned treatment works (POTWs)) are working toward the goal of reducing discharges into collection systems. Many studies have been conducted in an attempt to identify the sources of mercury entering these collection systems. According to the 2002 *Mercury Source Control* *and Pollution Prevention Program Final Report* prepared for the National Association of Clean Water Agencies (NACWA), dental clinics are the main source of mercury discharges to POTWs. The American Dental Association (ADA) estimated in 2003 that 50% of mercury entering POTWs was contributed by dental offices**.**

EPA estimates there are approximately 200,000 dental offices in the United States – almost all of which discharge their wastewater exclusively to POTWs. Mercury in dental wastewater originates from waste particles associated with the placement and removal of amalgam fillings. Most dental offices currently use some type of basic filtration system to reduce the amount of mercury solids passing into the sewer system. However, best management practices and the installation of amalgam separators have been shown to reduce discharges even further.

Some states, regions, and POTWs have already implemented or are considering alternatives to reduce mercury discharges from dental offices. For example, a number of states have enacted legislation requiring the installation and operation of amalgam separators or use of best management practices (Singer, 2007). EPA Region 5 published guidance for permitting dental mercury discharges (U.S. EPA, 2003). The ADA has also adopted and published best management practices for its members. The memorandum entitled, "Current Federal, State, Local and Industry Group Requirements and Guidance to Control mercury Discharges from Dentists" presents a compilation of the information EPA has collected to date on existing guidance and requirements for dental mercury (Singer, 2007).

In 2007, EPA has focused its efforts on collecting and compiling information on current mercury discharges from dental offices, best management practices (BMPs), and control technologies such as amalgam separators. For control technologies and BMPs, EPA has looked at the frequency with which each is currently used; their effectiveness in reducing discharges to POTWs; and the capital and annual costs associated with their installation and operation (Singer, 2007a and Singer, 2007b). EPA encourages all stakeholders to review the information collected to date and provide additional information, if available. EPA is particularly interested in quantitative information on the effectiveness and costs of implementing best management practices.

At this time, EPA does not know if its investigation will lead to the development of national, categorical pretreatment standards for dental mercury discharges. While this is a possibility, EPA is aware of a number of successful local programs and that there are many opportunities for pollution prevention and BMPs without federal regulation. Furthermore, the dental industry is voluntarily and actively working towards reducing its mercury discharges.

8.4.2 Unused Pharmaceuticals

Stakeholders have expressed concern over the discharge of pharmaceuticals into water and their environmental effects. Recent studies have indicated the presence of pharmaceuticals in waters of the U.S. (USGS, 2002). Recent studies have also shown the presence of pharmaceuticals directly downstream of municipal wastewater treatment plants (i.e., POTWs) (USGS, 2007). To date, EPA has found little quantitative information on the origin of pharmaceuticals in these municipal wastewaters. There is even less data on the presence or absence of pharmaceuticals entering and leaving wastewater treatment plants. The discharge of pharmaceuticals to these treatment plants, with few exceptions, is not currently regulated or monitored.

Health Services Industry facilities (*e.g.*, hospitals, veterinarian hospitals, and long term care facilities) may dispose unused, expired, and unwanted medications ("unused pharmaceuticals") down the drain or toilet, which then may pass through the POTW and on to surface waters. Given this concern, EPA plans to collect information from the Health Services Industry to better understand pharmaceutical discharges to POTWs and to make informed decisions. POTWs are not specifically designed to remove the wide range of pharmaceuticals, and often the treatment plant removal efficiencies are unknown. The full spectrum of pharmaceuticals occurring in POTW effluent are not yet known, and for those that are present, the POTW removal efficiency is a function of the treatment technology employed and will vary from drug to drug. As a result, unused pharmaceuticals have the potential to cause interference or to pass through municipal wastewater treatment plants.

In order to obtain further quantitative information on unused pharmaceuticals in Health Service Industry wastewaters, EPA plans to send a data request to targeted long term care facilities, hospitals, and veterinarians. EPA is interested in obtaining the records facilities keep to track disposal of unused pharmaceuticals and their quantities. EPA especially wants to know how much and how often unused pharmaceuticals are disposed of via the sink or toilet, and what drives such practices.

There are best management practices (BMPs) and alternatives to disposing pharmaceuticals into POTWs via sinks and toilets. Alternative disposal options include hazardous waste incinerators, regulated medical waste incinerators, and non-hazardous landfills (i.e., trash). Also, there are pharmacy take back programs via the mail and physical drop off locations (*e.g.*, reverse distribution brokers or centers). These take back programs are typically only available to pharmaceuticals that have not been sold and are not available to consumers. EPA is exploring the utility of take back programs and has given a grant to the University of Maine Center on Aging to devise, implement and evaluate a mail back plan to remove unused over the counter and prescription medications. A network of 75 distribution points located at pharmacies will provide for mailer pick up and drop offs to return unused medications. Informational materials for pharmacists, staff and individuals regarding the mailers will be developed and distributed. In addition, the pilot will test the effectiveness of an educational campaign about the hazards to life, health, and the environment posed by improper storage and disposal of unused mediations.

Many of the current disposal practices are driven by Federal requirements or guidance. In addition to Federal rules, there are state and local policies that influence disposal of unused pharmaceuticals. EPA will continue to evaluate disposal alternatives in context of the existing requirements which affect disposal decisions.

At this time, EPA does not have enough information to know if this study will lead to the development of a national, categorical pretreatment standard for unused pharmaceuticals. While this is a possibility, EPA is gathering information on pollution prevention opportunities and BMPs that may preclude a federal regulation.

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9.0 IMPLEMENTATION (BPJ PERMITTING) SUPPORT

In the absence of applicable effluent guidelines for the discharge or pollutant, technology-based limitations are determined by the permit writer on a case-by-case basis, in accordance with the statutory factors specified in CWA §§ 301(b)(2) and 304(b), 33 U.S.C. §§ 1311(b)(2), (3), 1314(b), 1342(a)(1). These site-specific, technology-based effluent limitations reflect the BPJ of the permit writer under 40 CFR 125.3(c)(2) taking into account the same statutory factors EPA would use in promulgating a national categorical rule, but considering unique factors relating to the applicant.

As requested, EPA will provide assistance to permitting authorities in better tailoring permit requirements for these categories. For these categories EPA determined that national effluent guidelines (including categorical pretreatment standards) are not the best tools for establishing technology-based effluent limitations because most of the toxic and non-conventional pollutant discharges are from one or a few facilities in their respective industrial category. For facilities in these categories EPA provided assistance to permitting authorities, as requested, in identifying pollutant control and pollution prevention technologies for the development of technology based effluent limitations by best professional judgment (BPJ) on a facility specific basis.

For example, EPA provided a background information to support Region 4 as they work with NPDES permit writers in Florida and Georgia to develop effluent limitations that reflect their “Best Professional Judgment” (BPJ) of what constitutes BAT for an individual mill. See Table 9-1. Among other topics this document provides background information on:

- What mass of the toxic and non-conventional pollutants limited by the 1998 Pulp and Paper Cluster Rules (BAT pollutants) is discharged from dissolving pulp mills?
- What is the source of BAT pollutants in mill wastewater?
- How are loads of BAT pollutants related to the type of pulp produced?
- Why should permit writers require mills to monitor for BAT pollutants at the bleach plant effluent?

- How could permit writers develop permit limits for BAT pollutants at dissolving kraft mills?
- How could permit writers develop permit limits for BAT pollutants at dissolving sulfite mills?
- How could permit writers use Cluster Rules variability factors to develop BPJ technology-based permit limits?
- What are EPA's candidate technologies for control of BAT pollutants from dissolving kraft and dissolving sulfite pulp production?
- Are EPA's candidate technologies for control of BAT pollutants from dissolving kraft pulp production technically feasible?
- Are EPA's candidate technologies for control of BAT pollutants at dissolving sulfite mills technically feasible?
- Are EPA's candidate technologies for control of BAT pollutants from dissolving kraft and dissolving sulfite pulp production economically achievable?

Table 9-1. Dissolving Pulp Mills Operating in 2007

Dissolving Kraft Mills	Dissolving Sulfite Mills
Buckeye Technologies, Inc. Foley Mill Perry, Florida NPDES Permit No. FL0000876 FRS ID: 110000362223 http://www.bkitech.com/	Cosmopolis, Washington† NPDES Permit No. WA0000809 FRS ID: 110000490709
Rayonier, Inc., Performance Fibers Jesup, Georgia NPDES Permit No. GA0003620 FRS ID: 110017412968 http://www.rayonier.com/	Rayonier, Inc., Performance Fibers Fernandina Beach, Florida NPDES Permit No. FL0000701 FRS ID: 110000588551 http://www.rayonier.com/

†Note: Weyerhaeuser closed this mill in September 2006 and accepted a purchase offer from Charlestown Investments in January 2007. Charlestown plans to reopen the mill in late 2007 and manufacture dissolving grade pulp.

See "Background Information Document for Permit Writers: Dissolving Kraft and Dissolving Sulfite Pulp Mills," U.S. Environmental Protection Agency, Engineering and Analysis Division, April 2007 - DCN 04167.

EPA solicits comments on whether and if so how, the Agency should provide EPA Regions and States with permit-based support instead of revising effluent guidelines (e.g., when the vast majority of the hazard is associated with one or a few facilities).