EPA United States Environmental Protection Agency

Technical Support Document for the 2006 Effluent Guidelines Program Plan

More information about this document can be found at http://www.epa.gov/waterscience/guide/

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PART I: INTRODUCTION

This document provides the data supporting the Final 2006 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.

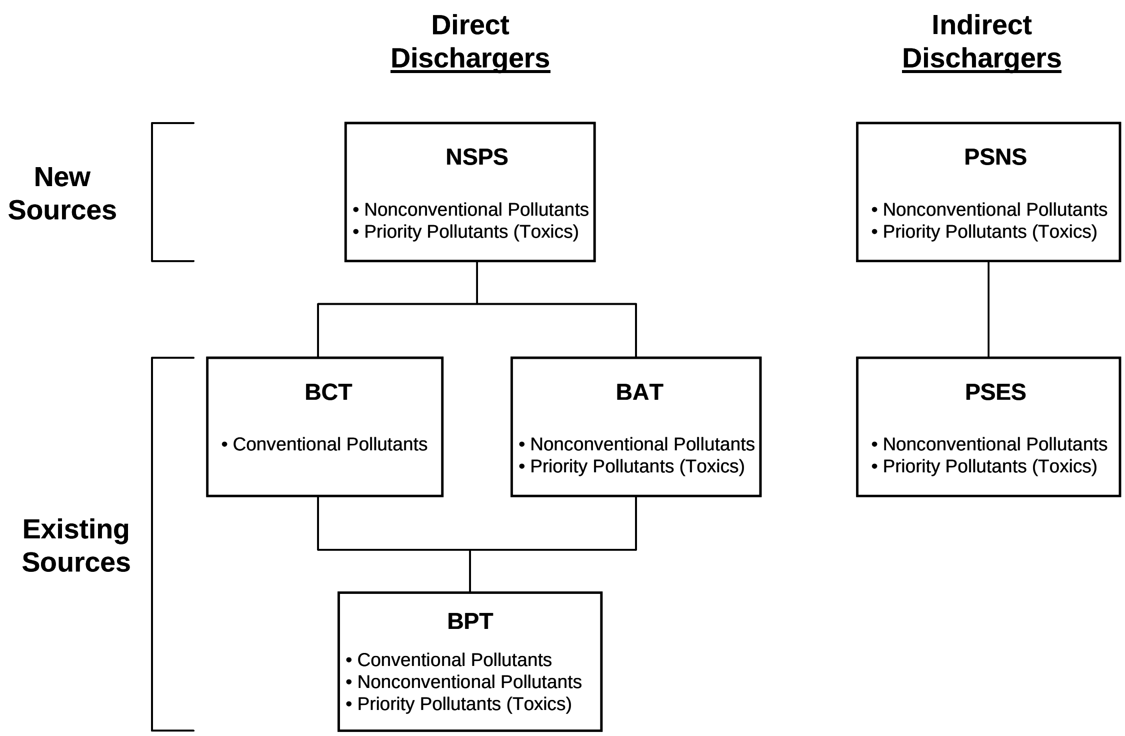


Figure 1-1. Regulations of Direct and Indirect Wastewater Discharges Under NPDES

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 THE PRELIMINARY EFFLUENT GUIDELINES PROGRAM PLAN FOR 2006 AND FINAL EFFLUENT GUIDELINES PROGRAM PLAN FOR 2004

EPA published its Preliminary 2006 Effluent Guidelines Program Plan (2006 Preliminary Plan) on August 29, 2005 (70 FR 51042-51060) and requested comments on various aspects of its analyses, data, and information to inform its 2006 annual review. In addition, EPA published its Final 2004 Effluent Guidelines Program Plan (2004 Final Plan) on September 2, 2004 (69 FR 53705-53721) and also requested comments, data and information to inform its 2005 annual review. Comments EPA received on the 2006 Preliminary Plan and on the 2004 Final Plan are located in EPA Docket Number EPA-HQ-OW-2004-0032. This section provides background information on the list of commenters and issues raised during these comment periods.

The Agency received 60 comments from a variety of commenters including industry and industry trade associations, municipalities and sewerage agencies, environmental groups, other advocacy groups, private citizens, federal agencies, and state government agencies. Stakeholders' suggestions played a significant role in both the 2005 and 2006 annual reviews. Table 2-1 lists all commenters as well as a synopsis of the comments.

Table 2-1. Comments on the Preliminary 2006 and Final 2004 Effluent Guidelines Program Plans
EPA Docket Number: EPA-HQ-OW-2004-0032

No.	Commenter Name	EPA E-Docket No.	Comment Summary
1	Chris Sproul Environmental Advocates	1088	Effluent Guidelines Program Plan violates CWA requirements.
2	Melanie Shepherdson Natural Resources Defense Council	1090	General comments on effluent guidelines planning process and industry-specific information. Focus is on industries without ELGs or pretreatment standards.
3	Albert Ettinger Environmental Law and Policy Center of the Midwest	1075 (duplicate at 1071 and 1066)	Questions use of TRI and PCS databases. EPA needs to better assess the toxicity of coal mining wastewaters. ELGs are justified for coal fired power plants and drinking water treatment facilities. EPA should focus its review on nutrients. EPA should set pretreatment standards on alkylphenol ethoxylates (used in industrial cleaners).
4	Doug Mendoza Metropolitan St. Louis Sewer District, MO	1038	Provides DMR data for the rubber, inorganic chemical, industrial laundries, pesticides, and transportation equipment cleaning point source categories. Also provides names, addresses, and SIC codes of miscellaneous food and beverage facilities.
5	L. Kinman Des Moines Water Works, IA	1040	Supports designation of CWT for CAFOs. Drinking water: water utility should not be regulated if a contaminant is removed and ultimately returned to the same source.
6	Don Theiler King County Wastewater Treatment Division, WA	1042	Supports EPA conclusions that food service, laundries, printing and publishing, and photoprocessing don't need categorical pretreatment standards. Health services: worked extensively with dentists and hospitals. Developed effective rules at local levels; significantly reduced mercury discharges from dentists; additional efforts not justified. Waste and waste disposal practices change rapidly. Established a Laboratory Waste Management Guide with BMPs. Categorical standards are not the correct approach. Recommends BMPs and possibly control documents. Information on dentists and hospitals including BMP guidance.

Table 2-1 (Continued)

No.	Commenter Name	EPA E-Docket No.	Comment Summary
7	Beverly B. Head Metropolitan Sewer District of Greater Cincinnati, Ohio	1051 (duplicate at 1085)	Provides information on cogeneration and coverage under steam electric, recommending cogeneration facilities continue to be regulated under local limits or categorical requirements for the primary processes. Water conservation: EPA should develop a policy that will not lower mass-based limits for those employing water conservation. By industrial category, provides a list of the number of facilities, type of treatment, and remaining pollutants. Provides information on how they classify various industries, including health services. POTW pass-through analysis: supports TWPE approach to pass through; recommends considering color and foam as pollutants. Provides information on elevated levels of certain chemicals in laundries, ICDC, and OCPSF. Says that the headspace analysis requirement reduces risk of pass through and interference. EPA should not issue last-minute changes as it did with CWT.
8	Sherry E. Bagwell City of Winston-Salem, NC	1061	City regulates three tobacco processing facilities with no problems; continues to regulate at the local level; submitted data on flows, treatment technologies in place, and some metals monitoring data.
9	Bernie Strohmeyer Hampton Roads Sanitation District, Virginia	1086	No new PSES categories necessary. Comment on need for new POTW study as well as some suggestions about current study. Comments on pulp and paper and steam electric ELGs. Information and comments on tobacco and health services industries. Stakeholder involvement early in process is critical. No new PSES categories necessary. Flow-normalized mass-based permit limits: adopt flow-normalized mass-based permit limits for all indirect dischargers to encourage water conservation. Strategy: agrees with risk approach; focus on revising of existing ELGs, not development of new ones; good opportunity for collaboration; and agrees with 4 factors (especially that the first one is key). Technology: consider financial incentives or tax breaks for companies that develop innovative technologies. Trading: allow effluent trading for indirect dischargers.
10	Richard Lanyon Metropolitan Water Reclamation District of Greater Chicago	1078	Provides information on SIUs in their region that fall within the detailed and preliminary study categories. No data on loads or discharges. New PSES categories are unnecessary unless permitting authorities request guidance.

Table 2-1 (Continued)

No.	Commenter Name	EPA E-Docket No.	Comment Summary
11	Mary Boatman Minerals Management Service	1056 (duplicate at 1044 & OW-2002-0020-0070)	Recommends setting effluent guidelines for “open-loop” LNG import terminals.
12	Thomas Bigford NOAA Fisheries Service	1094	Recommends setting effluent guidelines for “open-loop” LNG import terminals.
13	Gary Valasek Intercontinental Chemical Corporation	0002	Provides information on potential Chemical Formulating, Packaging, and Repackaging subcategory of OCPSF ELG.
14	Roger E. Claff American Petroleum Institute	0005 & 0006	Recommends that EPA continue to use the 4-factor strategy to screen new and existing industrial categories for new or revised effluent guidelines. Provided suggestions for improving EPA’s strategy for selecting industries, and concurs with EPA’s decision not to select the petroleum refining effluent guidelines for revision.
15	G. H. Holliday Holliday Environmental Services	0007 through 0011	EPA should clarify the Oil and Gas Extraction Point Source Category (40 CFR 435), Offshore Subcategory BAT and NSPS requirements for the sediment toxicity test for certain synthetic base drilling fluids. Believes these requirements are not demonstrated, and the variability inherent in the test method makes it inappropriate as the basis for regulatory compliance.
16	Stephan von Tapavicza Cognis Oilfield Chemicals	1041	Provides information on an ester-based synthetic-based drilling fluid.
17	Timothy P. Gaughan Arkema Inc	1045 & 1046	Provides information on OCPSF and mass-limits issue re: water conservation.
18	Lindlief Hall Tongue River Water Users’ Association	1048 (duplicate at 1050)	Recommends ELGs for Coal Bed Methane (CBM).
19	Gregory E. Conrad Interstate Mining Compact Commission (IMCC)	1055 & 1057	Recommends modifying or deleting Manganese limitations in Coal Mining ELGs (Part 434).
20	Carl Johnson, Southern Pressure Treaters Association and Dave Webb, Creosote Council III	1052	Provides information on Timber Products ELGs (Part 429).

Table 2-1 (Continued)

No.	Commenter Name	EPA E-Docket No.	Comment Summary
21	S. Noble Photo Marketing Association International	1053 (duplicate at 1054)	Provides information on photoprocessing industry.
22	Thomas W. Curtis American Water Works Association	1059 (dup & OW-2002-0020-0072)	EPA should focus on sediments, nutrients, and microbiological contamination in its effluent guidelines – not discharges from drinking water treatment facilities.
23	Robert E. Fronczak Association of American Railroads	1060	Provides information and comments on methodology including TWFs and POTW removal rates.
24	Norbert Dee National Petrochemical & Refiners Association	1063	Provides information on Petroleum Refining ELGs. Comments on including cogeneration units in Steam Electric ELGs.
25	P. Spencer Davies Strathkelvin Instruments	1102	Provides information on his monitoring technology for assessing interference with an activated sludge POTW.
26	Roger E. Claff American Petroleum Institute	1067	Provides information on Petroleum Refining ELGs. Comments on including cogeneration units in Steam Electric ELGs. TWF methodology comments.
27	Betty Anthony (API) & Kim Harb (NOIA) American Petroleum Institute and National Ocean Industries Association	1089	Provides information on synthetic-based drilling fluids and related analytic methods in Part 435.
28	Amy E. Schaffer Weyerhaeuser Company	1070 1099 (revisions to 1070)	Provides information on Phase I and Phase II Pulp and Paper facilities.
29	Elizabeth Aldridge Utility Water Act Group	1083	Provides information on Steam Electric ELGs and methodology comments.
30	John Candler M-I SWACO	1084	Provides information on synthetic-based drilling fluids and related analytic methods in Part 435.

Table 2-1 (Continued)

No.	Commenter Name	EPA E-Docket No.	Comment Summary
31	Tracey Norberg Rubber Manufacturers Association	1097	Provides information on Rubber Manufacturing ELGs (Part 428).
32	Paul Weigand National Council for Air and Stream Improvement, Inc.	1079 (duplicate at 1069) 1104 (updates)	Provides information and comments on Pulp and Paper ELGs.
33	Jerry Schwartz American Forest & Paper Association	1074	Provides information and comments on Pulp and Paper ELGs.
34	Robert Elam American Chemistry Council	0073 (duplicate at 1068)	Comments on possible inclusion of cogeneration units under steam electric ELGs. Comments on review methodology. Facility-specific OCPSF comments. Comments on mass-based versus concentration-based limits. Provides information on the OCPSF ELGs.
35	Steve C. Curl R. J .Reynolds Tobacco Company	1096	Provides information on their tobacco facilities and environmental studies.
36	Susan Bruninga National Association of Clean Water Agencies	1093	No new PSES categories necessary. Comment on need for new POTW study as well as some suggestions about current study. Comments on Pulp and Paper and Steam Electric ELGs. Provides information and comments on tobacco and health services industries. Flow-normalized mass-based permit limits: adopt flow-normalized mass-based permit limits for all indirect dischargers to encourage water conservation. Strategy: agrees with risk approach; focus on revisions of existing ELGs, not development of new ones; good opportunity for collaboration; agrees with 4 factors (especially that the first one is key). Technology: consider financial incentives or tax breaks for companies that develop innovative technologies. Trading: allow effluent trading for indirect dischargers.
37	Jeff Gunnulfsen Synthetic Organic Chemical Manufacturers Association	1098	Provides information on OCPSF and mass- vs. concentration-based limits issue.

Table 2-1 (Continued)

No.	Commenter Name	EPA E-Docket No.	Comment Summary
38	Thomas White Pharmaceutical Research and Manufacturers of America	1095	Comments on possible inclusion of cogeneration units under Steam Electric ELGs. Comments on mass- vs. concentration-based limits issue.
39	Terrance Rucker American Public Power Association	1065	Provides information on Steam Electric ELGs and Detailed Study.
40	Paul Chu Electric Power Research Institute	1073	Provides information on Steam Electric ELGs and Detailed Study.
41	John Ochs Penn View Mining, Inc. T.J.S. Mining, Inc. Thomas J. Smith, Inc.	1091	Recommends modifying or deleting manganese limitations in Coal Mining ELGs (Part 434).
42	Stanley R. Geary Pennsylvania Coal Association	1062 (duplicate at 1100)	Recommends modifying or deleting manganese limitations in Coal Mining ELGs (Part 434).
43	David D. Dunlap Uniform & Textile Service Association	1064	Supports EPA's two-part evaluation for determining pass-through potential. TWFs have not been properly vetted and development needs to be more transparent. EPA should focus its efforts on assisting small POTWs rather than categorical standards. Information on laundries industry.
44	Jeffrey S. Lynn International Paper	1087	Provides information on Pulp and Paper ELGs and Detailed Study.
45	Kairas Parvez, Sr. MeadWestvaco	1077 (duplicate at 1092)	Provides information on Pulp and Paper ELGs and Detailed Study.
46	Porcelain Enamel Institute	1072	Provides information on Porcelain Enameling ELGs (Part 466).
47	John M. Ross NiSource Inc	1076	Comments on the possible inclusion of cogeneration units under Steam Electric ELGs.
48	Mayes Starke Georgia-Pacific	1082	Provides information on Pulp and Paper ELGs and Detailed Study.

Table 2-1 (Continued)

No.	Commenter Name	EPA E-Docket No.	Comment Summary
49	Kenneth S. Johnson Constellation Generation Group	1080	Provides information on the Steam Electric ELGs and Detailed Study.
50	Christine M. Andrews National Restaurant Association	1081	EPA should not establish pretreatment standards for food service establishments.
51	Richard Marchi Airports Council International – North America (ACI-NA) American Association of Airport Executives (AAAE) Airport Clean Water Alliance (ACWA)	OW-2002-0020-0074 {Note that this is in the 'Strategy' Docket}	Seeks assurance that promulgation of an airport deicing regulation will not occur without full consideration of the complex issues affecting airport deicing issues.
52	Robert J. King Lorillard Tobacco Company	1105	Provides information on the tobacco industry and study.
52	Hugh Wise	1047	EPA should recodify ELGs to put them in plain English.
53	George M. Jett		Develop TWFs for oil and grease compounds and nutrients. Revise the POTW Study. Implement OMB review of EPA policy making. Evaluate new industrial categories. Publish ELG Guidance Documents. Fix older regulations and implement all regulations.
54	Karl Mueldener Kansas Department of Health and Environment	0003	Commenter provided information on Kansas' program to control discharges from drinking water treatment facilities.
55	William Creal Michigan Department of Environmental Quality	0004	Strongly supports EPA continuing to revise and update technology-based effluent limitations, which they believe is one of EPA's primary responsibilities and a cornerstone of the CWA.

Table 2-1 (Continued)

No.	Commenter Name	EPA E-Docket No.	Comment Summary
56	Allen Gilliam Arkansas Department of Environmental Quality Dave Knight Washington State Department of Ecology	0678	Recommends EPA revise the effluent guidelines for the Transportation Equipment Cleaning Point Source Category (40 CFR 442) due to difficulties in assessing compliance with the current requirements. The control authority has insufficient knowledge of the practices. Recommends EPA evaluate pretreatment standards with more focus on small to medium sized POTWs, who may not be aware of the opportunity to provide comment on rulemaking activities. Industrial wastewater treatment effectiveness of smaller POTWs may differ from larger POTWs. Revisit pretreatment standards for Meat and Poultry Products (40 CFR 432), Industrial Laundries (never promulgated), and Metal Molding and Casting (40 CFR 464) Point Source Categories. Also recommends EPA study hospitals and dental facilities, with particular focus on emerging pollutants of concern, and laboratory and pharmaceutical exotics. Recommends sunsetting existing source standards for new source standards for all industries by a future date, and removing phenol limits from all pretreatment standards, particularly the Metal Molding and Casting Point Source Category (40 CFR 464).
57	Steve Caspers State of Kansas	0680	Recommends EPA review interference issues associated with UV disinfection equipment at POTWs. Notes that this issue could also become more prevalent as more cities convert from chlorine to UV for disinfection.
58	Dave Knight Washington State Department of Ecology	1036	Comments on TWFs and the TWF Methodology. Need guidance/tools for emerging contaminants. Comments on screening-level analysis and TRI/PCS databases. Need to solicit more information from POTWs on interference. Supports development of ELGs for dentists. Review new and existing source definitions. Remove phenol limits from all PSES for all point source categories.
59	Benny R. Wampler VA Department of Mines, Minerals, and Energy	1049	Recommends modifying or deleting manganese limitations in Coal Mining ELGs (Part 434).
60	Kathleen A. McGinty PA Department of Environmental Protection	1101	Recommends modifying or deleting manganese limitations in Coal Mining ELGs (Part 434).

3.0 THE EFFLUENT GUIDELINES PLANNING PROCESS

This section provides a general overview of the process EPA used to identify industrial categories for potential development of new or revised effluent limitations guidelines and pretreatment standards (ELGs) in 2005 and 2006. 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 was 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.

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.

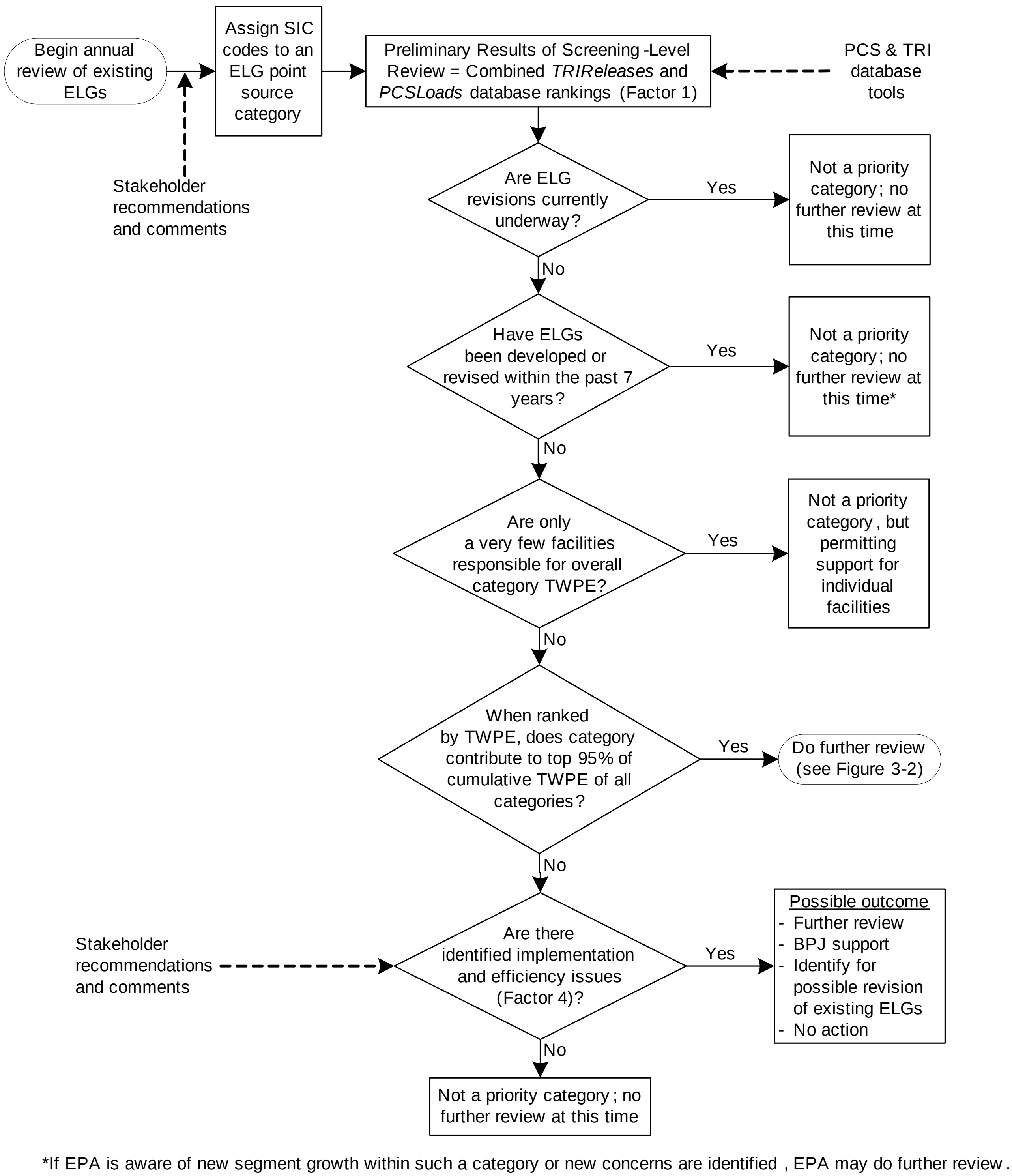
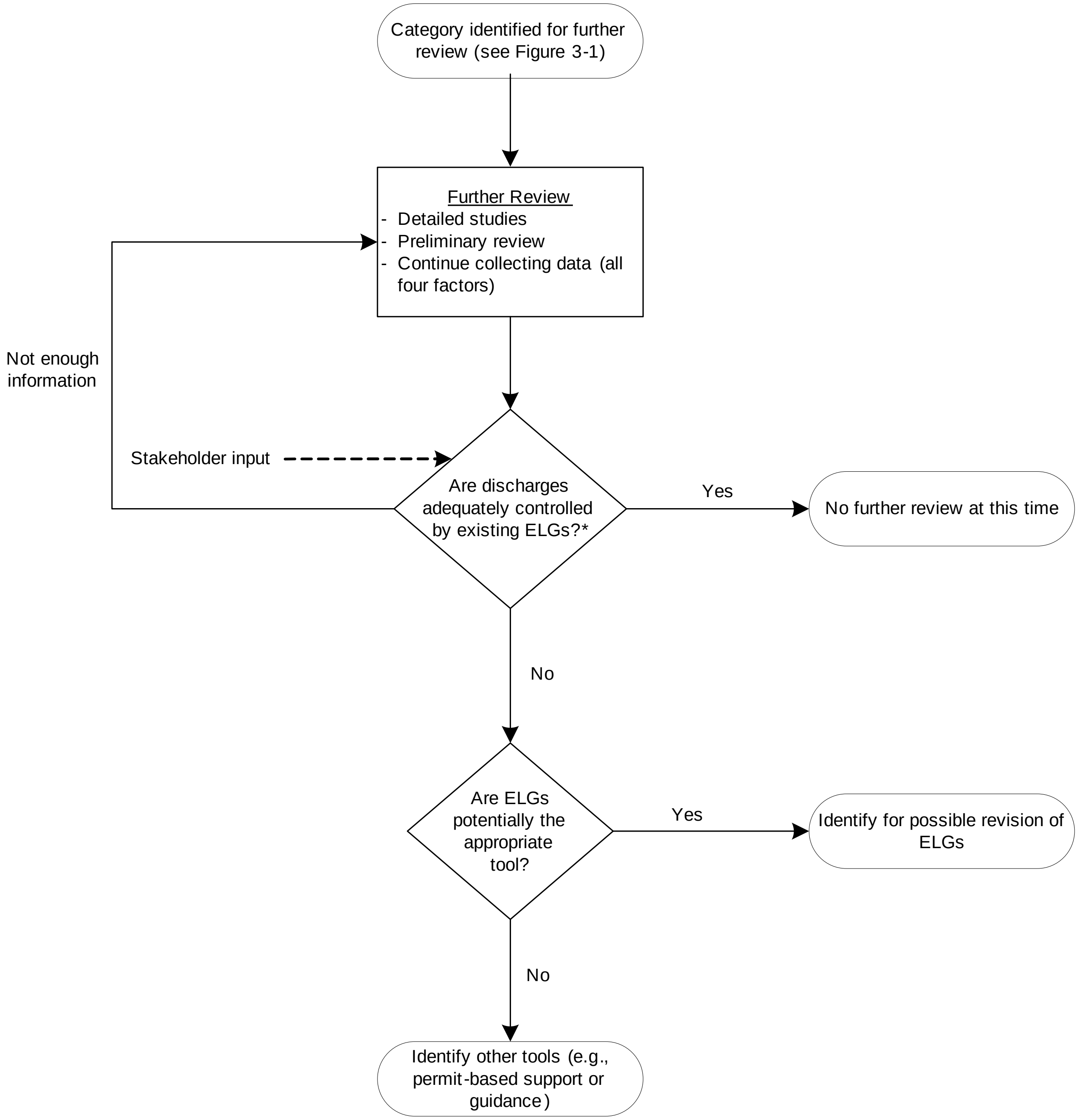


Figure 3-1. Flow Chart of Annual Review of Existing ELGs



*Continue further review if not enough data .

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

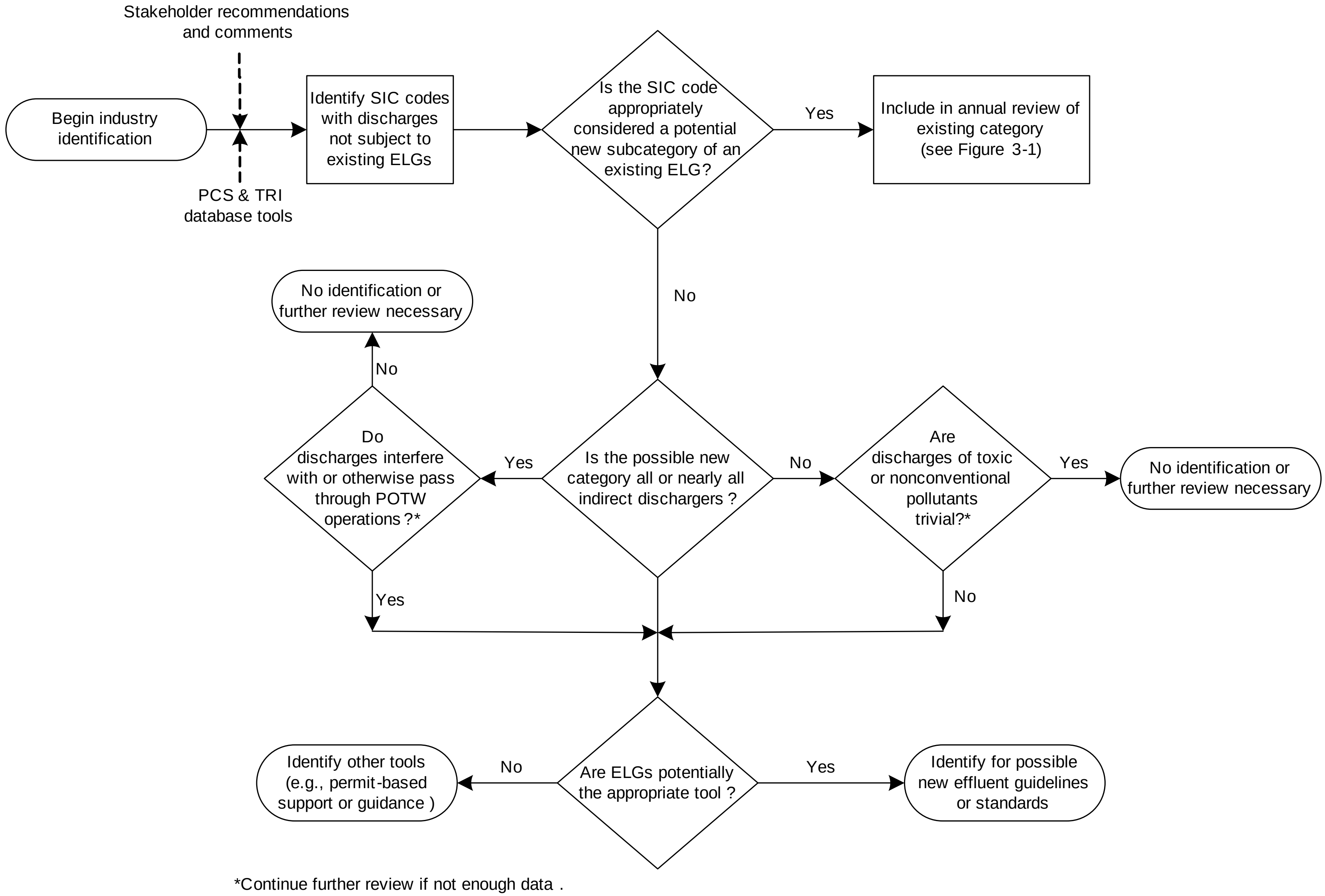


Figure 3-3. Flow Chart of Identification of Possible New ELGs

The 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. 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. In its 2005

[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).

and 2006 reviews, EPA combined 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 took this approach because it found that combining the TWPE estimates from the TRI and PCS databases into a single TWPE number offered 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.

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).

[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.

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 Identification of New Categories of Direct Dischargers for Possible Effluent Guidelines Development

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

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

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 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 evaluated 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. Section 19 of this TSD describes EPA's review of industries with primarily indirect discharges to determine whether to establish categorical pretreatment standards under CWA sections 304(g) and 307(b).

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

U.S. EPA. 2004. *Technical Support Document for the 2004 Effluent Guidelines Program Plan*. EPA-821-R-04-014. Washington, DC. (August). DCN 01088.

U.S. EPA. 2005. *2005 Annual Screening-Level Analysis: Supporting the Annual Review of Existing Effluent Limitations Guidelines and Standards and Identification of New Point Source Categories for Effluent Limitations and Standards*. EPA-821-B-05-003. Washington, DC. (August). DCN 02173.

U.S. EPA. 2006. *Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process*. Washington, DC. (June). DCN 03196.

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.

First, EPA performs a screening-level review of all point source categories subject to existing ELGs to identify categories discharging high levels of toxic and nonconventional pollutants relative to other categories. Using the results of the screening-level review, EPA continues its annual review of priority categories to identify candidate ELGs for revision, as required by CWA sections 304(b), 301(d), 304(g) and 307(b). The findings of EPA's 2006 annual review are discussed in Part II (Sections 5.0 to 18.0). Second, EPA reviews indirect discharging industries not currently subject to pretreatment standards to identify potential candidates for pretreatment standards development, as required by CWA section 307(b). The findings of this review are discussed in Part III (Section 19.0) of this report. Finally, EPA reviews direct discharging industries not currently subject to ELGs to identify potential candidates for ELG development, as required by section 304(m)(1)(B) of the CWA. The findings of this review are discussed in Part III (Section 20.0) of this report.

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 explains 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, 2005b). The 2005 SLA report provides the detailed methodology used to process thousands of data records and generate national estimates of industrial effluent discharges. This section does not revisit the details of creating the database tools. Instead, it lists the methodology corrections made to the PCS and TRI databases after EPA's 2005 annual review. It also presents the preliminary category rankings from *TRIReleases2002_v4*, *TRIReleases2003_v2*, and *PCSLoads2002_v4.*

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, 2005b): 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 *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.

4.1.1 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 (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. These are discussed in Part III of this document. Appendix B 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, 2005b).

4.1.2 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. Appendix C lists the TWFs for those chemicals in the *TRIReleases* and *PCSLoads* databases for which EPA has developed TWFs.

4.1.3 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.

4.1.4 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 2005 and 2006 screening-level reviews, EPA used data for reporting years 2002 and 2003, 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).

(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 years 2002 and 2003. 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. Appendix D 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

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

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.

4.1.4.1 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.

4.1.4.2 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 *TRIReleases2002* and *TRIReleases2003* were usable for the 2005 and 2006 screening-level reviews 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.

4.1.5 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 2005 annual review, EPA used data for reporting year 2002, to correspond to the data obtained from TRI. For the 2006 annual review, EPA corrected certain aspects of the 2002 data in response to comments (see Section 4.2). EPA also explored the use of PCS nutrients data but decided not to use nutrients data at this time, because of data quality concerns. EPA did not use data for reporting year 2003 because, based on comparisons of 2000, 2001, and 2002 PCS data for certain industrial categories, 2003 discharges were not likely to change significantly from 2002, and also because the creation of the *PCSLoads* database is labor-intensive. To develop the *PCSLoads2002* database, EPA used its Effluent Data Statistics (EDS) program, an automated query system, to calculate annual pollutant discharges using the monthly reports in PCS. The 2005 SLA Report provides details on the methodology and development of *PCSLoads2002* (U.S. EPA, 2005b).

4.1.5.1 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.

4.1.5.2 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 *PCSLoads2002* were usable for the 2006 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.

4.2 Methodology Corrections Affecting Both Screening-Level Review Databases

The 2005 SLA Report provides detailed information on the methodology EPA used to develop the screening-level review databases (U.S. EPA, 2005b). After publication of the 2006 Preliminary Plan (see 70 FR 51042-51060, August 29, 2005), EPA received comments on its methodology, including the development of the *TRIReleases2002_v2* and the *PCSLoads2002_v2* databases. This subsection summarizes the comments received and the actions taken by EPA in response to the comments.

4.2.1 Summary of *TRIReleases* and *PCSLoads* Database Methodology Changes

For comments that led to a change in database methodologies, Table 4-1 summarizes pollutants that were identified by commenters, the affected pollutant and database, the comment or issue, and EPA's responding action. For more detailed information about these comments, see the memoranda entitled, *Response to Comments: Database Methodology Issues* (Bartram, 2006), *Comments Received Regarding Toxic-Weighting Factors* (Bicknell, 2006b), and *Comments Received Regarding POTW Removals* (Bicknell, 2006a).

4.2.2 Summary of *TRIReleases* and *PCSLoads* Database Methodology Comments Resulting in No Changes

EPA received comments in addition to those discussed in Section 4.2.1, but ultimately found that they did not affect the database results. Typically these comments did not impact the databases because the subject pollutant was not discharged or was discharged in very small amounts. For this reason, and for other reasons listed in Table 4-2, EPA did not revise its database development methodologies in response to these comments. EPA summarized its analyses of these issues and its findings in a series of memoranda. Table 4-2 lists the comment issues raised, the reason no action was taken, and the corresponding memoranda.

Table 4-1. Summary of Database Changes Applicable to Both *TRIReleases* and *PCSLoads* Based on Database Methodology Comments

Pollutant/Issue	Database	Comment/Issue	Changes to Database
Mass Discharges without "Less than" Indicator	PCS	PCS includes data for mass discharges for some facilities without a "less than" indicator, even when the concentration included in PCS is labeled as below the detection limit.	For the facilities named in the comments, EPA corrected the loads in *PCSLoads2002* to treat the mass quantity discharges as below the detection limit.
Nitrites	PCS	The nitrite ion is unstable in water and will oxidize to nitrate.	Assuming nitrite will oxidize to nitrate, EPA calculated the pounds of nitrogen in the reported nitrite discharges (i.e., nitrite as N) and used the TWF for nitrate as N (0.0032) to calculate TWPE of nitrites. Previously, EPA used a TWF value of 0.0056.
Cyanide Compounds	TRI	The TWF used for "cyanide compounds" reported to TRI is too low.	EPA changed the "cyanide compounds" TWF to the median value of eight cyanide compounds, 0.0054, because this is consistent with EPA approach for other group compounds.
Nitric Acid	TRI	Nitric acid will fully dissociate into nitrate and hydrogen ions in aqueous solution.	EPA changed the POTW removal rate for nitric acid to the POTW removal for nitrate (90%), and changed the TWF for nitric acid to the TWF for nitrate (0.000747).
Sodium Nitrite	TRI	Sodium nitrite is an ionic salt that will fully dissociate into nitrite and sodium ions in aqueous solution. The nitrite ions are unstable in water and will oxidize to nitrate.	Assuming sodium nitrite will dissociate and the nitrite will oxidize to nitrate, EPA calculated the pounds of nitrogen in the reported sodium nitrite discharges (i.e., sodium nitrite as N) and used the TWF for nitrate as N (0.0032) to calculate TWPE of sodium nitrite. EPA also used the POTW removal rate for nitrate (90%, previously 1.87%) to account for the removal of sodium nitrite in POTWs.
Dinitrotoluene (mixed isomers)	TRI	The POTW removal rate for dinitrotoluene (mixed isomers) is too low. The TWF for dinitrotoluene is too high.	EPA has POTW removal rate data for two dinitrotoluene isomers and changed the POTW removal rate for dinitrotoluene (mixed isomers) to the average of the two isomer removal rates, 62%. EPA has TWF data for five dinitrotoluene isomers and changed the dinitrotoluene (mixed isomers) TWF to the median TWF of the five isomers: 0.0431. Both of these approaches are consistent with EPA's approach for other group compounds.
Chlorophenols	TRI	The chlorophenols TWF was based on the TWF for pentachlorophenol from August 2004.	EPA changed the chlorophenols TWF to equal the median value of six chlorophenols included in the TRI chemical group, 0.0555, because this is consistent with EPA's approach for other group compounds.
Chlorine	TRI	The POTW removal rate for chlorine is unreasonably low (1.87%) based on its chemistry in water and its addition to treatment systems as a disinfectant.	Assuming that chlorine entering POTW will be completely reduced to chloride, EPA changed the POTW removal rate for chlorine to 100 percent.

Table 4-1 (Continued)

Pollutant/Issue	Database	Comment/Issue	Changes to Database
Hydrogen Cyanide	TRI	The POTW removal rate for hydrogen cyanide (7%) is low compared to the POTW removal rate for cyanide compounds (70%).	EPA changed the hydrogen cyanide POTW removal rate to equal the cyanide compounds POTW removal rate, 70%, because both hydrogen cyanide and cyanide compounds dissociate in water.
Phosphorus (yellow or white)	TRI	Phosphorus (yellow or white) is insoluble in water.	EPA deleted all phosphorus (yellow or white) discharges reported to TRI as "transferred to POTWs" because facilities incorrectly reported total phosphorus as elemental phosphorus (yellow or white).
Fumes and Dust	TRI	"Fumes and dusts" are mixtures of solids and gases and do not exist in water.	EPA deleted the reported discharges for aluminum (fume or dust) and zinc (fume or dust) from *TRIReleases2002_v4* and *TRIReleases2003_v2* because “fumes and dust” are air pollutants, not water pollutants.

Source: Memoranda *Response to Comments: Database Methodology Issues* (Bartram, 2006); *Comments Received Regarding Toxic-Weighting Factors* (Bicknell, 2006b); and *Comments Received Regarding POTW Removals* (Bicknell, 2006a).

Table 4-2. Summary of Comments on Database Methodologies Applicable to Both *TRIReleases* and *PCSLoads* for Which EPA Did Not Take Action

Issue Raised in Comment	Reason EPA Did Not Take Action on Comment	Memorandum Describing EPA Analysis and Findings
Chlorine Dioxide POTW Removal	Pollutant was not discharged or was discharged in very small amounts and therefore does not impact the databases.	Memorandum entitled, *Comments Received Regarding POTW Removals*, dated September 8, 2006 (Bicknell, 2006a).
Phenol Compounds POTW Removal		
Ozone POTW Removal		
Hydrazine Sulfate POTW Removal		
Titanium Tetrachloride POTW Removal		
Ammonium Sulfate POTW Removal		
Ammonium Nitrate POTW Removal		
Phosphine POTW Removal		
Methyl Mercury TWF	Pollutant was not discharged or was discharged in very small amounts and therefore does not impact the databases.	Memorandum entitled, *Comments Received Regarding Toxic-Weighting Factors*, dated September 8, 2006 (Bicknell, 2006b).
PACs TWF		
Cyanide TWF		
Inorganic Metallic Salts TWFs		
Organometallic Compounds TWFs		
Chlorine Dioxide TWF		
TWFs for Compounds That Do Not Exist In Water		
TWFs For Chemicals Without A Wastewater Method For Detection		
Facilities Reporting the Same Concentration Each Month	Did not have large impact on the database.	*Response to Comments: Database Methodology Issues* dated November 2006 (Bartram, 2006)
Use of Maximum Values to Calculate Annual Loads (also discussed in Section 4.2.2)	Maximum values are used only where average values are not available in PCS.	
Use of Internal Monitoring Points to Calculate Annual Loads in PCS	There is no systematic way to identify internal monitoring points in the database.	
Use of the Hybrid Approach for Treatment of Measurements Below the Detection Limit (see the 2005 SLA Report for more details)	EPA believes that this is a valid approach for the screening-level review.	
Use of Data on Intake Pollutants	Intake pollutants are not typically reported in PCS.	
Batch vs. Continuous Discharges	There is no systematic way to identify batch discharges in the database.	

4.2.3 Revisions to TWF Development

In addition to comments on database methodology, EPA received comments on how it develops TWFs. EPA reviewed and incorporated changes, as applicable, to the TWFs for which it received comments. The Final TWF Development Document, dated June 2006 (U.S. EPA, 2006a), explains how EPA revised some TWF values from the 2004 Final Plan to the values used to support the 2006 Final Plan, which are included in the "2006 TWFs" database. As discussed in the TWF Development Document, EPA has developed TWFs for over 1,000 chemicals. EPA made the following general changes to the TWF database between the 2006 Preliminary Plan and the 2006 Final Plan:

- EPA revised TWFs for 13 chemicals based on data corrections/improvements;
- EPA developed new TWFs for 12 chemicals that did not previously have TWFs assigned, such as nicotine; and
- EPA revised TWFs for 12 chemicals based on TWF revisions carrying through to other chemicals (e.g., the TWF change to nitrate affects the TWF for chemicals based on nitrate, such as sodium nitrite).

Table 4-3 lists TWFs that changed between the 2006 Preliminary Plan and the 2006 Final Plan, including the new TWFs. Table 4-4 presents the chemicals in *PCSLoads2002* with the largest change in TWPE when EPA used the 2006 TWFs compared to the 2004 TWFs[6]. The changes in TWF for these chemicals are small; however, because some of the pollutants are discharged in large quantities, they result in a substantial change in TWPE. For example, manganese showed the largest and only major increase in TWPE (over 600,000 pound-equivalents).

Table 4-5 presents the chemicals in *TRIReleases2002* with the largest change in TWPE when EPA used the 2006 TWFs. As with the PCS database, the changes in TWF for these chemicals are small; however, because some of the pollutants are discharged in large quantities, they result in a substantial change in TWPE. As with PCS, manganese and manganese compounds showed the largest change in TWPE, with an increase of over 400,000 pound-equivalents.

[6] The 2004 TWFs refer to the December 2004 TWFs that are referenced in the 2005 SLA Report (U.S. EPA, 2005b). This term does not refer to the August 2004 TWFs, which are also described in the 2005 SLA Report.

Table 4-3. TWFs Revised in 2006

Pollutant	CAS Number	2004 TWF	2006 TWF
TWFs Revised by EPA in Response to Comments on the Draft TWF Development Document			
Alachlor / Lasso	15972608	1.78	1.52
Ammonia as NH3	7664417	0.00151	0.00111
Atrazine	1912249	2.31	1.04
Benzo(a)anthracene	56553	36.3	30.7
Chloroethene	75014	0.0855	0.23
Cyanazine	21725462	0.00572	2.07
Dibenzo(a,h)anthracene	53703	30.7	30.8
Dichloroethene, 1,1-	75354	0.176	0.471
Fluoranthene	206440	0.829	1.28
Manganese	7439965	0.0144	0.0704
Nitrate	14797558	0.0056	0.000747
Simazine	122349	0.642	0.308
Tributyltin (TBT)	688733	88.9	77.8
New TWFs Developed by EPA			
1-nitropyrene	5522430	NA	0.026
2,6-diethylaniline (alachlor degradation product)	579668	NA	0.00537
Acetochlor	34256821	NA	0.147
Bromobenzene	108861	NA	0.0166
DCPA di-acid degradate	2136790	NA	0.00041
Dibenzo(c,g)carbazole, 7H-	194592	NA	0.0303
Nicotine	54115	NA	0.0016
Nitrate (as N)	N	NA	0.0032
Nitrogen-total, K, organic (as N)	N_as_N	NA	0.00228
Perchlorate	14797730	NA	0.00206
Trinitro-triazine, hexahydro-/	121824	NA	0.00415
Triazines	Triazines	NA	2.46
TWFs Affected by Revisions to Other TWFs			
Chlorophenols	N084	0.442	0.0555
Creosote	8001589	1.35	1.36
Cyanide compounds	N106	0.00263	0.0054
Dinitrotoluene (mixed isomers)	25321146	0.642	0.0431
Manganese compounds	N450	0.0144	0.0704
Nitrate compounds	N511	0.000062	0.000747
Nitric acid	7697372	NA	0.000747
Nitrites	14797650	0.373	0.0032
PACs (Petroleum Refining)	N590	26.3	25.4
PACs (Pulp and Paper)	N590	34.2	33.7
PACs (Wood Preserving)	N590	8.36	8.33
Sodium Nitrite (as N)	N1000	0.373	0.0032

Source: *Toxic Weighting Factor Development in Support of the CWA 304(m) Planning Process* (U.S. EPA, 2006a).
NA – Not applicable; TWFs were not developed for the 2004 analysis.

Table 4-4. Chemicals with the Largest Change in TWPE in *PCSLoads2002* Resulting from 2006 Revised TWFs

Parameter	Lbs/Yr Reported Discharged	TWF		Change in TWF[a]	TWPE		Change in TWPE[a]
		2004	2006		2004	2006	
Manganese	10,700,000	0.0144	0.0704	0.056	155,000	756,000	601,000
Nitrogen, Nitrite Total (as N)	292,000	0.373	0.0032	(0.37)	109,000	933	(108,000)
Nitrogen, Nitrate Total (as N)	18,900,000	0.0056	0.0032	(0.0024)	106,000	60,600	(45,500)
Nitrite Plus Nitrate Total 1 Det. (as N)	7,980,000	0.0056	0.0032	(0.0024)	44,700	25,500	(19,200)
Nitrogen, Ammonia	24,400,000	0.00151	0.00111	(0.000395)	36,700	27,100	(9,640)
Benzo(a)Anthracene	320	36.3	30.7	(5.57)	11,600	9,810	(1,780)
Nitrite Nitrogen, Dissolved (as N)	4,090	0.373	0.0032	(0.37)	1,530	13	(1,520)
Nitrogen, Nitrate Total (as NO3)	56,900	0.0056	0.000747	(0.00485)	319	43	(276)
Ammonia	692,000	0.00151	0.00111	(0.000395)	1,040	768	(274)
Fluoranthene	377	0.829	1.28	0.456	313	485	172
Vinyl Chloride	842	0.0855	0.23	0.144	72	193	121
Nitrogen, Nitrite Total (as NO2)	254	0.373	0.0032	(0.37)	95	0.81	(94)
Dibenzo (a,h) Anthracene	23	30.7	30.8	0.112	691	693	2.5
Alachlor (Brand Name-Lasso)	8	1.78	1.52	(0.259)	15	13	(2.2)
Benzo(ghi)Perylene	0.00714	0.3		-	0.0021		-
Rdx, Total	43		0.00415	-		0.18	-

Source: *PCSLoads2002_v4*.
[a]Decreases in TWF and TWPE are indicated by the values enclosed in parentheses.

Table 4-5. Chemicals with the Largest Changes in TWPE for TRI Databases Resulting from 2006 Revised TWFs

Chemical Name	TWF		Change in TWF[a]	TRI 2002				TRI 2003			
	2004	2006		Lbs/Yr Reported Discharged	2004 TWPE	2006 TWPE	Change in TWPE[a]	Lbs/Yr Reported Discharged	2004 TWPE	2006 TWPE	Change in TWPE[a]
Manganese and Manganese Compounds	0.0144	0.0704	0.056	7,180,000	104,000	506,000	402,000	7,210,000	104,000	508,000	404,000
Sodium Nitrite (as N)	0.373[b]	0.0032	(0.37)	580,000	217,000[b]	1,860	(215,000)	306,000	114,000[b]	980	(113,000)
Nitrate Compounds	0.000062	0.00075	0.000685	222,000,000	13,800	166,000	152,000	207,000,000	12,800	155,000	142,000
Dinitrotoluene (Mixed Isomers)	0.642	0.0431	(0.599)	28,700	18,400	1,240	(17,200)	26,300	16,900	1,130	(15,700)
Creosote	1.35	1.36	0.0127	11,800	15,800	1,740	(14,100)	8,410	11,300	2,220	(9,100)
Ammonia	0.00151	0.00111	(0.000395)	10,700,000	16,100	11,900	(4,230)	14,200,000	21,300	15,700	(5,610)
Polycyclic Aromatic Compounds (Petroleum Refining)	26.3	25.4	(0.861)	3,290	86,400	83,600	(2,830)	1,290	33,900	32,800	(1,110)
Atrazine	2.31	1.04	(1.27)	794	1,830	826	(1,010)	3,810	8,800	3,960	(4,840)
Polycyclic Aromatic Compounds (Pulp and Paper)	34.2	33.7	(0.544)	1,420	48,700	47,900	(774)	1,390	47,500	46,800	(756)
Cyanide Compounds	0.00263	0.0054	0.00277	88,300	232	477	245	76,100	200	411	211
Nitric Acid	0	0.000747	0.000747	282,000	0	211	211	306,000	0	228	228
Vinyl Chloride	0.0855	0.23	0.144	577	49	133	83	384	33	88	55
Cyanazine	0.00572	2.07	2.06	28	0.16	58	58	39	0.22	81	81
Simazine	0.642	0.308	(0.334)	87	56	27	(29)	93	60	29	(31)
Vinylidene Chloride	0.176	0.471	0.296	39	6.8	18	12	10	1.7	4.6	2.9
Chlorophenols	0.442	0.0555	(0.386)	20	8.8	1.1	(7.7)	73	32	4.1	(28)
Alachlor	1.78	1.52	(0.259)	13	23	20	(3.4)	15	27	23	(3.9)
Polycyclic Aromatic Compounds (Wood Preserving)	8.36	8.33	(0.026)	57	475	473	(1.5)	40	331	330	(1.0)
Benzo(g,h,i)Perylene	0.3										

Source: *TRIReleases2002_v4* and *TRIReleases2003_v2*.

[a]Decreases in TWF and TWPE are indicated by the values enclosed in parentheses.

[b]For sodium nitrite, EPA changed the calculation methodology as well as the TWF, in response to comments. The 2004 TWF (0.373) is for sodium nitrite. The 2004 TWPE (217,000 for TRI 2002 and 114,000 for TRI 2003) represent the new methodology of using the pounds of "sodium nitrite as N" (14.01 molecular weight) instead of sodium nitrite (NaNO2, or 69.00 molecular weight). See also Section 4.2.1 (Table 4-1).

4.2.4 Conclusions

The changes in methodology EPA used to develop *PCSLoads2002*, *TRIReleases2002*, and *TRIReleases2003* databases significantly affected the total TWPE estimated for industrial discharges. The largest change resulted from changes in the TWF and POTW removal used for sodium nitrite. The estimated TWPE of sodium nitrite discharges decreased from 1.7 million (*TRIReleases2002_v2)* to 1,860 (*TRIReleases2002_v4)*. The manganese and nitrate TWF changes also had significant impacts on the estimates of TWPE discharges from all the databases because of the large quantities of loadings associated with both pollutants. Although these changes had significant impacts for certain pollutants and industrial categories, the methodology changes did not significantly affect the category rankings that EPA used to prioritize the categories for further review.

4.3 Corrections Affecting Only the *TRIReleases* Databases

For the 2006 annual review, EPA compiled *TRIReleases2002_v4* and *TRIReleases2003_v2*, using 2002 and 2003 TRI data, respectively. The *2005 Annual Screening-Level Analysis Report* provides details on the methodology for developing *TRIReleases2002*; EPA used the same methodology for the 2003 data (U.S. EPA, 2005b). This section describes changes made to the *TRIReleases* database methodology after publication of the 2006 Preliminary Plan.

4.3.1 TWF Changes for Compound Groups

Not all chemicals on the TRI chemical list are individual chemicals. Some are compound groups, which consist of a group of chemicals that are of similar structure, such as dioxin and dioxin-like compounds and polycyclic aromatic compounds (PACs) (which are discussed in this subsection). EPA develops TWFs for specific chemicals and not for these compound groups. EPA has developed methodologies to assign TWFs to several of the TRI compound groups, typically using known TWFs for chemicals within the group.

In some cases, EPA calculated industry-specific TWFs for certain chemical compound categories. EPA created specific TWFs when it had additional information about the composition of the compound category, as released from specific industries. The remainder of this subsection describes how EPA developed the TWFs, in the following order:

- Dioxin and dioxin-like compounds;
- Creosote for all industrial categories;
- PACs for all industrial categories, except petroleum refining, wood preserving, and pulp, paper, and paperboard;
- Petroleum refining PACs;
- Wood preserving PACs; and
- Pulp, paper, and paperboard PACs.

4.3.1.1 Dioxin and Dioxin-Like Compounds

The term 'dioxin and dioxin-like compounds' refers to polychlorinated dibenzo-p-dioxins (CDDs) and polychlorinated dibenzofurans (CDFs), which constitute a group of PBT chemicals. There are 17 CDDs and CDFs congeners with chlorine substitution of hydrogen atoms at the 2, 3, 7, and 8 positions on the benzene rings, the most toxic of which is 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). The 17 compounds (called congeners) are referred to as 'dioxin-like,' because they have similar chemical structure, similar physical-chemical properties, and invoke a common battery of toxic responses (U.S. EPA, 2000), though the toxicity of the congeners varies greatly.

Toxic equivalency factors (TEFs), developed by the World Health Organization, assess the relative toxicities of the 17 compounds, to simplify risk assessment and regulatory control of exposures to dioxins. As defined by Van den Berg, et al., a TEF is a relative potency value that is based on the results of several *in vivo* and *in vitro* studies (Van den Berg, 1998). TEFs are order-of-magnitude estimates of the toxicity of a compound relative to 2,3,7,8-TCDD. TEFs, along with the measured concentration of dioxin congeners are used to calculate toxic equivalent (TEQ) concentrations.

EPA developed TWFs for each of the 17 dioxin congeners, ranging from 2,021 for octachlorodibenzofuran to 703,584,000 for 2,3,7,8-TCDD, using the methodology discussed in the TWF TDD (U.S. EPA, 2006a). Due to their toxicity and ability to bioaccumulate, the various congeners of dioxin have high TWFs relative to most chemicals. Consequently, even small mass amounts of dioxin and dioxin-like compound discharges translate into high TWPEs. Table 4-6 presents the TEFs and TWFs used in the 2006 screening-level analysis for each of the 17 dioxin congeners.

Beginning with reporting year 2000, facilities meeting certain reporting criteria are required to report to TRI the total mass, in grams, of the 17 dioxin and dioxin-like compounds released to the environment every year. This reporting method does not account for the relative toxicities of the 17 compounds. Reporting facilities are given the opportunity to report a facility-specific congener distribution. Yet even if dioxin and dioxin-like compounds are released to more than one medium, the facility can report only one distribution. Therefore, EPA cannot know if the single dioxin congener distribution reported by a facility accurately reflects the dioxin congener distribution in wastewater. Nevertheless, it is the best available information, and EPA uses it to calculate the reporting facility's dioxin and dioxin-like compounds TWPE.

To account for the relative toxicities of the various dioxin congeners, EPA first converted the reported discharges of dioxin and dioxin-like compounds discharges from grams to pounds because the TWPE is associated with pounds and not grams. EPA then estimated the TWPE of dioxin and dioxin-like compounds using the facility-specific congener distributions for all facilities that reported a distribution. Based on information provided by facilities, EPA made corrections to the reported dioxin distributions for several facilities. Section 4.3.2 discusses these corrections in more detail.

Table 4-6. Dioxin and Dioxin-Like Compounds and Their Toxic Weighting Factors

CAS Number	Chemical Name	Abbreviated Name	Toxic Equivalency Factor	Toxic Weighting Factor
CDDs				
1746-01-6	2,3,7,8-tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	1	704,000,000
40321-76-4	1,2,3,7,8-pentachlorodibenzo-p-dioxin	1,2,3,7,8-PeCDD	1	693,000,000
39227-28-6	1,2,3,4,7,8-hexachlorodibenzo-p-dioxin	1,2,3,4,7,8-HxCDD	0.1	23,500,000
57653-85-7	1,2,3,6,7,8-hexachlorodibenzo-p-dioxin	1,2,3,6,7,8-HxCDD	0.1	9,560,000
19408-74-3	1,2,3,7,8,9-hexachlorodibenzo-p-dioxin	1,2,3,7,8,9-HxCDD	0.1	10,600,000
35822-46-9	1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin	1,2,3,4,6,7,8-HpCDD	0.01	411,000
3268-87-9	1,2,3,4,6,7,8,9-octachlorodibenzo-p-dioxin	1,2,3,4,6,7,8,9-OCDD	0.0001	6,590
CDFs				
51207-31-9	2,3,7,8-tetrachlorodibenzofuran	2,3,7,8-TCDF	0.1	43,800,000
57117-41-6	1,2,3,7,8-pentachlorodibenzofuran	1,2,3,7,8-PeCDF	0.05	7,630,000
57117-31-4	2,3,4,7,8-pentachlorodibenzofuran	2,3,4,7,8-PeCDF	0.5	557,000,000
70648-26-9	1,2,3,4,7,8-hexachlorodibenzofuran	1,2,3,4,7,8-HxCDF	0.1	5,760,000
57117-44-9	1,2,3,6,7,8-hexachlorodibenzofuran	1,2,3,6,7,8-HxCDF	0.1	14,100,000
72918-21-9	1,2,3,7,8,9-hexachlorodibenzofuran	1,2,3,7,8,9-HxCDF	0.1	47,300,000
60851-34-5	2,3,4,6,7,8-hexachlorodibenzofuran	2,3,4,6,7,8-HxCDF	0.1	51,200,000
67562-39-4	1,2,3,4,6,7,8-heptachlorodibenzofuran	1,2,3,4,6,7,8-HpCDF	0.01	85,800
55673-89-7	1,2,3,4,7,8,9-heptachlorodibenzofuran	1,2,3,4,7,8,9-HpCDF	0.01	3,030,000
39001-02-0	1,2,3,4,6,7,8,9-octachlorodibenzofuran	1,2,3,4,6,7,8,9-OCDF	0.0001	2,020

Source: *EPCRA Section 313 Guidance for Reporting Toxic Chemicals Within the Dioxins and Dioxin-Like Compounds Category* (U.S. EPA, 2000); *Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs, for Humans and Wildlife* (Van den Berg, 1998); *Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process* (U.S. EPA, 2006a).

EPA calculated an average dioxin distribution for each SIC code that had reported discharges of dioxin and dioxin-like compounds. For facilities that did not report a dioxin distribution, EPA used the average SIC code distribution to calculate the facility's dioxin and dioxin-like compounds TWF. For facilities that did not report a congener distribution and did not have any facilities within its SIC code that reported a congener distribution, EPA used a TWF equal to 10,595,840 (the median of the 17 dioxin congener TWFs).

In the 2006 Preliminary Plan, for facilities in the Pulp, Paper, and Paperboard Point Source Category that did not report a dioxin distribution, EPA calculated an average dioxin distribution for each regulatory phase, not the SIC code[7]. However, for the 2006 screening-level

[7] A 1988 legal suit obligated EPA to address discharges of polychlorinated dibenzo-(p)-dioxins and polychlorinated dibenzofurans from 104 bleaching pulp mills, including nine dissolving pulp mills. During its response to this suit, EPA decided to review and revise the Pulp and Paper Category regulations in three "regulatory phases." Phase I is Subpart B, Bleached Papergrade Kraft and Soda and Subpart E, Papergrade Sulfite. Phase II is categories that do not bleach chemical pulp with chlorine: Subpart C, Unbleached Kraft; Subpart F, Semi-Chemical; Subpart G, Groundwood, Chemi-Mechanical, and Chemi-Thermo-Mechanical; Subpart H, Non-Wood Chemical Pulp; Subpart

review, EPA used a different approach. The National Council for Air and Stream Improvement (NCASI) developed an emission factor for pulp and paper mills to use for estimating dioxin discharges for reporting to TRI. The emission factor is based on the average mill effluent concentrations measured from four bleached kraft mills. EPA assumed that all pulp and paper mills had the same dioxin distribution as the mills used to develop the emission factor. However, EPA developed facility-specific wastewater dioxin congener distributions when a facility-specific dioxin congener distribution was available (Matuszko, 2006).

4.3.1.2 Creosote

Creosote is a commonly used wood preservative, comprising many different chemicals. EPA did not develop a TWF for creosote using creosote toxicity data. Instead, EPA used the chemical composition of creosote, provided in IARC Monographs, Vol 35, "Coal Tar and Derived Products," (IARC, 1985), and the TWFs for these individual chemicals to calculate a TWF for creosote. In developing the TWF for creosote, EPA assumed the chemicals will be present in wastewater in the same proportion that they are present in the creosote.

Using the data provided in IARC Monographs, Vol 35 (IARC, 1985), EPA calculated the average percentage that the chemical represents in creosote based on the high and low values. EPA calculated an adjusted TWF for each chemical by multiplying its chemical-specific TWF by its average percentage in creosote. EPA summed these values to calculate a new overall TWF for creosote discharges. The current creosote TWF has been updated since the 2006 Preliminary Plan because several individual chemical TWFs for creosote changed. Table 4-7 lists the chemical composition of creosote, along with the associated TWF of the various chemicals.

4.3.1.3 Polycyclic Aromatic Compounds (PACs)

PACs, sometimes known as polycyclic aromatic hydrocarbons (PAHs), are a class of organic compounds consisting of three or more fused aromatic rings. PACs are classified as persistent, bioaccumulative and toxic (PBT) chemicals. They are likely present in petroleum products such as crude oil, fuel oil, diesel fuel, gasoline, and paving asphalt (bituminous concrete) and refining by-products such as heavy oils, crude tars, and other residues. PACs form as the result of incomplete combustion of organic compounds.

For TRI, facilities that manufacture, process, or otherwise use more than 100 pounds of PACs per year must report the combined mass of PACs released; they do not report releases of individual compounds. Table 4-8 lists the 21 individual compounds in the PAC category for TRI reporting, CAS number, and TWF, if available. EPA has TWFs for only 10 of the 21 PAC chemicals. For the 2006 annual review, EPA revised the TWFs for three PACs (benzo(a)anthracene, benzo(j,k)fluorene, and dibenzo(a,h)anthracene) and developed new TWFs for two PACs (7H-dibenzo(e,g)carbazole and 1-Nitropyrene).

I, Secondary Fiber Deink; Subpart J, Secondary Fiber Non-Deink; Subpart K, Fine and Lightweight Papers from Purchased Pulp; and Subpart L, Tissue, Filter, Non-Woven and Paperboard from Purchased Pulp. Phase III is Subpart A, Dissolving Kraft, and Subpart D, Dissolving Sulfite.

Table 4-7. Chemical Composition of Creosote and Associated TWFs

Pollutant	Chemical Percentage (%)	2006 TWF	Weighted 2006 TWF
Acenaphthene	11.85	0.0326	0.00386
Anthracene	4.50	2.55	0.115
Benzo(a)anthracene	0.21	30.7	0.0645
Benzo(a)pyrene	0.05	101	0.0503
Benzofluourenes	1.50	0.156	0.00233
Biphenyl	1.20	0.0366	0.000439
Carbazole	1.60	0.709	0.0113
Chrysene	2.80	31	0.868
Dibenzo(a,h)anthracene	0.03	30.8	0.00769
Dibenzofuran	5.75	0.492	0.0283
Dimethylnaphthalenes	2.15		0
Fluoranthene	5.25	1.28	0.0674
Fluorene	8.65	0.701	0.0606
Methylanthracenes	3.95		0
Methylfluorenes	2.65	0.0487	0.00129
1-Methylnaphthalene	6.45	0.00622	0.000401
2-Methylnaphthalene	6.60	0.193	0.0127
Methylphenanthrenes	3.00	0.104	0.00311
Naphthalene	9.65	0.0159	0.00153
Phenanthrene	18.50	0.295	0.0545
Pyrene	4.75	0.0932	0.00443
Total			**1.36**

Source: IARC Monographs, Vol 35, *Coal Tar and Derived Products* (IARC, 1985); *Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process* (U.S. EPA, 2006a).

Table 4-8. Definition of Polycyclic Aromatic Compounds

PAC Compound	CAS Number	2006 TWF
Benzo(a)anthracene	56-55-3	30.7
Benzo(a)phenanthrene (chrysene)	218-01-9	31
Benzo(a)pyrene	50-32-8	101
Benzo(b)fluoranthene	205-99-2	30.7
Benzo(j)fluoranthene	205-82-3	NA
Benzo(k)fluoranthene	207-08-9	30.7
Benzo(j,k)fluorene (fluoranthene)	206-44-0	1.28
Benzo(r,s,t)pentaphene	189-55-9	NA
Dibenzo(a,h)acridine	226-36-8	NA
Dibenzo(a,j)acridine	224-42-0	NA
Dibenzo(a,h)anthracene	53-70-3	30.8
Dibenzo(a,e)fluoranthene	5385-75-1	NA
Dibenzo(a,e)pyrene	192-65-4	NA
Dibenzo(a,h)pyrene	189-64-0	NA
Dibenzo(a,l)pyrene	191-30-0	NA
7H-Dibenzo(e,g)carbazole	194-59-2	0.0303
7,12-Dimethylbenzo(a)anthracene	57-97-6	NA
Indeno(1,2,3-cd)pyrene	193-39-5	30.7
3-Methylcholanthrene	56-49-5	NA
5-Methylchrysene	3697-24-3	NA
1-Nitropyrene	5522-43-0	0.026

Source: *EPCRA Section 313: Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category* (U.S. EPA, 2001); *Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process* (U.S. EPA, 2006a).
NA – Not applicable; EPA has not developed a TWF for this chemical.

For the analyses supporting the 2004 Final Plan, EPA made a worst-case assumption that the total mass of PACs reported was benzo(a)pyrene and assigned the TWF of benzo(a)pyrene to PACs. EPA chose this conservative approach because benzo(a)pyrene is a pollutant commonly found in wastewater from many industries, including organic chemicals, plastics, and synthetic fibers, petroleum refining, pulp and paper, nonferrous metals manufacturing, iron and steel, and other industries. By using the TWF for benzo(a)pyrene, EPA identified the upper bound of the TWPE for PACs, because the TWF for benzo(a)pyrene (100.66) is higher than any other PAC. This assumption most likely overestimates the toxicity of the discharges because PACs are likely a mixture of the compounds listed in Table 4-9, not just benzo(a)pyrene. In the subsequent development of TRI databases, EPA collected data on the PACs present, or likely to be present, in wastewater from petroleum refineries, wood preservers, and pulp and paper mills. As a result, for *TRIReleases2002* and *TRIReleases2003*, EPA calculated an industry-specific PACs TWF for petroleum refineries, wood preservers, and pulp and paper mills. For all other industries, EPA continued applying the benzo(a)pyrene TWF. In future analyses, EPA will develop additional industry-specific PAC TWFs as appropriate.

Petroleum Refining PACs (SIC Codes 2911 and 5171)

Petroleum refining facilities report to TRI the combined mass of PACs released. In addition, EPA has information on the distribution of PACs in crude oil and petroleum products. As a result, EPA developed an industry-specific approach to estimate TWPE associated with PACs from petroleum refineries for the study of the Petroleum Refining Point Source Category supporting the 2004 Final Plan. This approach is described in detail in Section 3.4.3 of the 2005 SLA Report (U.S. EPA, 2005b) and summarized below.

EPA made the following assumptions in developing the TWF for Petroleum Refining PACs:

1. PACs will be present in wastewater in the same proportion that they are present in the crude oil and products throughput at U.S. refineries.

2. If EPA did not have literature data available for a specific PAC compound, its concentration in the crude oil or product was assumed to be zero. If a PAC compound was reported as not detected, its concentration in the crude oil or product was assumed to be zero.

3. Where PAC composition is not available, it can be estimated using the composition from similar products.

Table 4-9. Calculation of Toxic Weighting Factor for Petroleum PACs

Pollutant	2006 TWF	Chemical Percentage (%)	Weighted 2006 TWF
Benzo(a)anthracene	30.7	17.47	5.36
Benzo(a)phenanthrene (Chrysene)	31	46.29	14.4
Benzo(a)pyrene	101	4.17	4.2
Benzo(b)fluoranthene	30.7	2.74	0.84
Benzo(j)fluoranthene	NA	0.36	
Benzo(k)fluoranthene	30.7	0.7	0.215
Benzo(j,k)fluorene (Fluoranthene)	1.28	24.32	0.312
Benzo(r,s,t)pentaphene	NA	0	0
Dibenz(a,h)acridine	NA	0	0
Dibenz(a,j)acridine	NA	0	0
Dibenzo(a,h)anthracene	30.8	0.43	0.132
Dibenzo(a,e)fluoranthene	NA	0	0
Dibenzo(a,e)pyrene	NA	0	0
Dibenzo(a,h)pyrene	NA	0	0
Dibenzo(a,l)pyrene	NA	0	0
7H-Dibenzo(c,g)carbazole	0.0303	0	0
7,12-Dimethylbenz(a)anthracene	NA	0	0
Indeno(1,2,3-cd)pyrene	30.7	0.01	0.00307
3-Methylcholanthrene	NA	0	0
5-Methylchrysene	NA	3.5	0
1-Nitropyrene	0.026	0	0
Total			**25.4**

Source: *Petroleum Supply Annual 2000* (EIA, 2001); Data compiled in the American Petroleum Institute's *Transport and Fate of non-BTEX Petroleum Chemicals in Soil and Groundwater* (API, 1994); *Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process* (U.S. EPA, 2006a).
NA - Not available.

4. For crude oil, representative domestic and foreign oils can be used to calculate a weighted average PAC composition for crude oil. According to the EIA (EIA, 2001), 39.1 percent (volumetric basis) of the total consumed crude oil in the United States in the year 2000 was domestic, while 60.9 percent (volumetric basis) was imported. EPA selected South Louisiana Oil as representative of domestic oil and Alberta Oil as representative of foreign oil, because they had available PAC compositions. EPA assumed that a weighted average of the composition of these two crude oils is a reasonable representation of crude oil composition for the purpose of this study. EPA also used a specific weight of 0.92 for crude oil to convert PAC concentrations reported as mg/kg to mg/L.

5. For refined products, EPA assumed a specific weight of 1.0 to simplify the calculation (i.e., no need to convert between mg/kg and mg/L).

Based on the above assumptions, EPA calculated the proportion of each of the 21 TRI PACs that would be present in refinery wastewater by multiplying each product percentage by its chemical concentration. EPA then summed all the mass of each PAC, and calculated percentages for each chemical relative to the total mass of all 21 chemicals, presented in Table 4-9. For example, EPA estimated that 17.47 percent of the total PACs released in refinery wastewater is attributable to benzo(a)anthracene. The 2006 TWF updates had little impact on the Petroleum Refining PAC TWF, decreasing it from 26.3 to 25.4.

Wood Preserving PACs (SIC Code 2491)

After EPA identified PAC discharges from facilities in the Timber Products Processing Point Source Category as a hazard during the 2004 annual review (U.S. EPA, 2004), industry members stated that PAC discharges resulted from stormwater from creosote wood preserving facilities. Industry members stated that for TRI reporting prior to 2005, the industry estimated their PAC releases based on surrogate analytes, such as oil and grease or total organic carbon, rather than measurement of actual PACs constituents. The industry conducted a stormwater sampling program to determine the actual concentrations of PACs in stormwater from creosote wood preserving facilities.

Ten wood preserving facilities participated in a sampling program to determine the PACs released in their stormwater runoff. Over several months, the facilities collected grab samples of runoff during rainfall events, for a total of 74 samples from the 10 facilities. In 37 of these samples, at least one PAC was measured above the detection limit, with six different PACs being detected overall. Fluoranthene was detected in all 37 of these samples. EPA used the data from the 37 samples with at least one detected value to calculate a TWF for the PACs discharged from wood preserving facilities. EPA excluded data from samples where all PACs constituents were below sample detection limits, because these data do not demonstrate the composition of PACs, but rather, the relative detection limits for PACs constituents.

Using the data provided, EPA calculated the average concentration of the six PAC compounds measured. Where a pollutant was reported as nondetect, EPA assumed the concentration to be zero. For each of the six PACs, EPA calculated an average concentration using each of the measurements from the 37 samples, using zeros as the value for samples that were not detected. EPA then summed the average concentrations to estimate a total PACs concentration and calculated the percentage of each compound relative to the total PACs. EPA calculated a weighted TWF for each compound by multiplying its chemical-specific TWF by its percentage relative to the total PACs. EPA summed these values to calculate a new overall TWF value for PACs discharged in the wood preserving SIC code. Table 4-10 presents the TWFs for all PACs, the percentage of total PACs, and the weighted TWF for each PAC. The 2006 TWF updates had little impact on this wood preserving PAC TWF, decreasing it from 8.36 to 8.33.

Pulp, Paper, and Paperboard PACs (SIC Codes 2611, 2621, and 2631)

NCASI provided guidance to the pulp, paper, and paperboard industry (NCASI, 1998) on how to estimate PAC discharges from pulp and paper mills. The NCASI guidance for PAC discharges includes a table listing the concentrations of PAC compounds found in wastewaters for several pulping types (kraft, bisulfite, CTMP, and TMP). Because the vast majority of mills in the United States are kraft mills, EPA used the kraft mill concentrations to calculate the pulp and paper PAC TWF[8].

NCASI calculated the emission factors for the industry based on six PACs: benzo(a)anthracene, benzo(a)pyrene, benzo(b+k)fluoranthene, dibenzo(a,h)anthracene, fluoranthene, and indeno(1,2,3-c,d)pyrene. However, only fluoranthene was detected in kraft mill effluent. To be consistent with NCASI, and because four of the five other compounds were detected above the method detection limit for the other pulping types, EPA used one-half the detection limit for the other five compounds that were not detected in kraft mill wastewaters.

EPA used the concentrations of six PACs to calculate a pulp, paper, and paperboard PAC TWF. EPA first summed the concentrations to calculate the total concentration of PACs in the effluent and then calculated the percentage of each chemical relative to the total PACs in the effluent. After EPA calculated a weighted TWF for each compound by multiplying its chemical-specific TWF by its percentage relative to the total PACs, EPA summed these values to calculate an overall TWF value for PACs discharged in the pulp, paper, and paperboard industry. Table 4-11 presents the TWFs for the six PACs, the percentage of total PACs, and the weighted TWF for each PAC. The 2006 TWF changes had little impact on this pulp and paper PAC TWF, decreasing it from 34.2 to 33.7.

[8] The NCASI guidance does not distinguish between effluents from mills with or without bleaching. Therefore, the calculated TWF applies to all pulp, paper, and paperboard mills.

Table 4-10. Calculation of Toxic Weighting Factor for Wood Preserving PACs

Chemical Name	2006 TWF	Chemical Percentage (%)	Weighted 2006 TWF
Benzo(a)anthracene	30.7	6.73	2.07
Benzo(a)phenanthrene(chrysene)	31	9.73	3.02
Benzo(a)pyrene	101	0.49	0.49
Benzo(b)fluoranthene	30.7	4.98	1.53
Benzo(j)fluoranthene	NA	0	0
Benzo(k)fluoranthene	30.7	0.78	0.24
Benzo(j,k)fluorene(fluoranthene)	1.28	77.29	0.99
Benzo(r,s,t)pentaphene	NA	0	0
Dibenz(a,h)acridine	NA	0	0
Dibenz(a,j)acridine	NA	0	0
Dibenzo(a,h)anthracene	30.8	0	0
Dibenzo(a,e)fluoranthene	NA	0	0
Dibenzo(a,e)pyrene	NA	0	0
Dibenzo(a,h)pyrene	NA	0	0
Dibenzo(a,l)pyrene	NA	0	0
7H-Dibenzo(e,g)carbazole	0.0303	0	0
7,12-Dimethylbez(a)anthracene	NA	0	0
Indeno(a,2,3-cd)pyrene	30.7	0	0
3-Methylcholanthrene	NA	0	0
5-Methylchrysene	NA	0	0
1-Nitropyrene	0.026	0	0
Total PACs TWF			**8.33**

Source: *Creosote Wood Treating Industry Storm Water Runoff Study Conducted on Behalf of the Southern Pressure Treaters Association and Creosote Council III* (Rollins, 2005); *Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process* (U.S. EPA, 2006a).
NA - Not available.

Table 4-11. Calculation of Toxic Weighting Factor for Pulp, Paper, and Paperboard PACs

Chemical Name	2006 TWF	Chemical Percentage (%)	Weighted 2006 TWF
Benzo(a)anthracene	30.7	11.74	3.60
Benzo(a)pyrene	101	11.74	11.8
Benzo(b+k)fluoranthene	30.66	11.74	3.6
Benzo(j,k)fluorene(fluoranthene)	1.28	17.84	0.23
Dibenzo(a,h)anthracene	30.8	23.47	7.22
Indeno(1,2,3-cd)pyrene	30.7	23.47	7.20
Total PACs TWF			**33.7**

Source: *Handbook of Chemical-Specific Information for SARA Section 313 Form R Reporting* (NCASI, 1998); *Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process* (U.S. EPA, 2006a).

4.3.2 Database Corrections

During the review of the TRI data quality, EPA identified inaccuracies in the data reported to TRI, such as facilities reporting the wrong SIC code or facilities reporting discharges of chemicals that they did not detect in wastewater. As these inaccuracies were identified, EPA corrected the data to more accurately reflect the discharges from facilities and their respective industrial categories. EPA made several corrections to the TRI data during the 2005 annual review; these corrections are detailed in Table 3-A of the *2005 Annual Screening-Level Analysis Report* (U.S. EPA, 2005b). After the publication of the 2006 Preliminary Plan and during the 2006 annual review, EPA made additional corrections to the TRI data. Appendices E and F list the changes made to the *TRIReleases2002* and *TRIReleases2003* databases, respectively, as part of the 2006 screening-level review.

4.4 Corrections Affecting Only the *PCSLoads* Databases

For the 2006 annual review, EPA updated the *PCSLoads2002_v2* database. The *2005 Annual Screening-Level Analysis Report* provides details on the methodology for developing the *PCSLoads2002* database (U.S. EPA, 2005b). This subsection describes the changes made to the *PCSLoads2002* database after publication of the 2006 Preliminary Plan.

4.4.1 Database Corrections

During the review of the PCS data quality, EPA identified inaccuracies in some of the PCS data, such as facilities reporting the wrong SIC code and errors in the loadings estimations for pollutant discharges. As these inaccuracies were identified, EPA corrected the data to more accurately reflect the discharges from facilities and their respective industrial categories. EPA made several corrections to the PCS data during the 2005 annual review; these corrections are detailed in Table 2-B of the *2005 Annual Screening-Level Analysis Report* (U.S. EPA, 2005b). After the publication of the 2006 Preliminary Plan, EPA made additional corrections to the PCS data. Appendix G presents the changes made to the *PCSLoads2002* database since the publication of the 2006 Preliminary Plan.

4.4.2 Corrections Made to Steam Electric Power Generating Facilities PCS Discharges

During the Steam Electric Power Generating Point Source Category detailed study, EPA identified several data quality issues regarding the development of the *PCSLoads2002* database. These include concentration unit issues, data entry errors, internal monitoring point double-counting issues, and intake pollutant and intermittent discharge quantification concerns.

During the review of the steam electric PCS data quality, EPA identified the facilities with the largest discharges in terms of TWPE and contacted the facilities to verify the discharges. EPA also received comments on the 2006 Preliminary Plan identifying facility-specific corrections. EPA reports its findings in the memorandum entitled Changes Made to the *PCSLoads2002* Database Based on Facility-Specific Comments, dated October 17, 2006 (Finseth, 2006). As a result of the contacts and comments, EPA made the following types of changes to the steam electric PCS data:

- Corrected data-entry errors;
- Corrected concentration unit issues;
- Adjusted loads for facilities discharging intermittently;
- Adjusted loads to account for intake pollutants; and
- Adjusted loads to account for internal monitoring points.

4.5 <u>TRI 2002 and 2003 Rankings and PCS 2002 Rankings</u>

After incorporating the changes discussed in Sections 4.2, 4.3, and 4.4, EPA generated the final versions of the TRI and PCS databases used for the 2006 screening-level review: *TRIReleases2002_v4*, *PCSLoads2002_v4*, and *TRIReleases2003_v2*. The rankings represent the results of the three databases and are presented in Section 4.5.1. Section 4.5.2 presents the data quality review issues identified for each database.

4.5.1 Results of the *TRIReleases2002*, *TRIReleases2003*, and *PCSLoads2002* Databases

Tables 4-12 through 4-14 present the category rankings by TWPE from the *TRIReleases2002_v4*, *PCSLoads2002_v4*, and *TRIReleases2003_v2* databases, respectively. The category rankings presented in these tables reflect all the corrections made during the 2006 screening-level review. Appendices H through J present the four-digit SIC code rankings by TWPE from the *TRIReleases2002_v4*, *PCSLoads2002_v4*, and *TRIReleases2003_v2* databases, respectively. Appendices K through M present the chemical rankings by TWPE from the *TRIReleases2002_v4*, *PCSLoads2002_v4*, and *TRIReleases2003_v2* databases, respectively.

Table 4-12. *TRIReleases2002_v4* Category Rankings from the 2006 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[b]	Chlorine and Chlorinated Hydrocarbons	33	9	2	63	1,290,000	9,040,000
430	Pulp, Paper and Paperboard	199	85	11	509	20,300,000	1,980,000
467	Aluminum Forming	50	102	49	448	1,170,000	940,000
423	Steam Electric Power Generation	340	15	21	693	3,060,000	833,000
455	Pesticide Chemicals Manufacturing	31	28	7	124	1,760,000	555,000
433	Metal Finishing	294	1,795	318	7,438	6,450,000	499,000
419	Petroleum Refining	250	66	36	928	18,400,000	467,000
414	Organic Chemicals, Plastics and Synthetic Fibers	238	489	65	2,188	54,000,000	349,000
445/444	Landfills/Waste Combustors	13	26	8	113	654,000	222,000
415	Inorganic Chemicals	69	88	38	483	9,070,000	186,000
420	Iron and Steel Manufacturing	116	69	52	375	39,600,000	167,000
463	Plastic Molding and Forming	26	104	22	1,459	1,380,000	113,000
440	Ore Mining and Dressing	31	4	-	81	462,000	70,200
432	Meat and Poultry Products	87	72	16	307	61,900,000	62,400
421	Nonferrous Metals Manufacturing	66	30	19	240	2,400,000	51,800
429	Timber Products Processing	80	41	25	1,012	65,000	48,000
437	Centralized Waste Treaters	2	-	-	1	156,000	38,100
464	Metal Molding and Casting (Foundries)	96	83	36	629	194,000	16,000
454	Gum and Wood Chemicals	7	4	1	26	25,300	13,000
439	Pharmaceutical Manufacturing	15	111	10	234	2,440,000	11,100
471	Nonferrous Metals Forming and Metal Powders	58	107	59	524	1,260,000	10,800
424	Ferroalloy Manufacturing	5	2	1	15	248,000	9,910
425	Leather Tanning and Finishing	1	22	4	36	497,000	9,880
407	Fruits and Vegetable Processing	9	17	2	104	7,950,000	9,450

Table 4-12 (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
418	Fertilizer Manufacturing	42	4	3	121	4,980,000	9,060
413	Electroplating	21	414	35	643	2,130,000	7,660
NA	Tobacco Products	2	15	3	32	594,000	7,120
NA	Miscellaneous Foods and Beverages	14	130	10	363	5,390,000	6,860
469	Electrical and Electronic Components	5	91	10	188	3,430,000	6,340
468	Copper Forming	38	59	50	265	293,000	6,060
428	Rubber Manufacturing	33	126	60	526	771,000	5,100
406	Grain Mills Manufacturing	6	12	6	123	2,550,000	4,660
410	Textile Mills	16	68	8	300	244,000	3,710
461	Battery Manufacturing	4	31	32	83	58,100	3,150
434	Coal Mining	27	-	-	82	155,000	3,120
436	Mineral Mining and Processing	42	42	9	463	1,860,000	2,840
405	Dairy Products Processing	31	213	3	368	3,580,000	2,830
426	Glass Manufacturing	18	47	15	260	249,000	2,540
457	Explosives	10	2	2	40	2,980,000	2,280
411	Cement Manufacturing	25	4	1	339	3,190	2,030
417	Soaps and Detergents Manufacturing	3	83	5	209	125,000	1,750
435	Oil & Gas Extraction	-	-	1	1	210,000	700
458	Carbon Black Manufacturing	8	-	-	20	11	514
446	Paint Formulating	10	57	7	499	82,900	503
466	Porcelain Enameling	2	7	3	13	286,000	398
409	Sugar Processing	17	1	-	33	497,000	394
460	Hospital	1	-	-	3	750	382
422	Phosphate Manufacturing	14	1	-	32	82,700	300
438	Metal Products and Machinery	37	-	-	-	13,600	213

Table 4-12 (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	56	1	201	16,700	209
NA	Independent and Stand Alone Labs	2	1	-	6	71,100	177
408	Canned and Preserved Seafood	6	-	-	18	176,000	138
NA	Drinking Water Treatment	1	1	1	3	274	128
443	Paving and Roofing Materials (Tars and Asphalt)	3	8	1	256	1,350	104
447	Ink Formulating	1	9	-	89	21,600	94
465	Coil Coating	1	51	-	129	4,050	39
427	Asbestos Manufacturing	-	-	1	1	539	5.8

Source: *TRIReleases2002_v4.*
[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.

Table 4-13. *PCSLoads2002_v4* Category Rankings from the 2006 Screening-Level Review

40 CFR Part	Category	Major Dischargers	Minor Dischargers	Total Pounds	TWPE
454	Gum and Wood Chemicals	4	5	3,170,000	3,800,000
420	Iron and Steel Manufacturing	105	66	2,200,000,000	1,960,000
430	Pulp, Paper and Paperboard	349	58	4,330,000,000	1,540,000
418	Fertilizer Manufacturing	31	22	624,000,000	1,370,000
423	Steam Electric Power Generation	557	345	19,500,000,000	982,000
433	Metal Finishing	130	707	105,000,000	511,000
414.1[a]	Chlorine and Chlorinated Hydrocarbons	45	8	1,990,000,000	434,000
440	Ore Mining and Dressing	74	37	702,000,000	410,000
414	Organic Chemicals, Plastics and Synthetic Fibers	238	225	978,000,000	398,000
421	Nonferrous Metals Manufacturing	58	25	118,000,000	397,000
NA	Miscellaneous Foods and Beverages	13	110	162,000,000	337,000
419	Petroleum Refining	122	538	7,610,000,000	165,000
410	Textile Mills	99	46	77,500,000	123,000
415	Inorganic Chemicals	68	127	1,240,000,000	107,000
NA	Drinking Water Treatment	19	961	59,900,000	89,000
467	Aluminum Forming	15	25	13,500,000	61,500
445/444	Landfills/Waste Combustors	19	242	76,300,000	58,700
432	Meat and Poultry Products	47	133	76,800,000	52,200
436	Mineral Mining and Processing	39	531	999,000,000	50,500
455	Pesticide Chemicals Manufacturing	242	23	122,000,000	50,300
439	Pharmaceutical Manufacturing	34	43	114,000,000	48,600
422	Phosphate Manufacturing	12	9	87,700,000	44,300
463	Plastic Molding and Forming	9	116	28,000,000	20,700
413	Electroplating	30	40	5,250,000	19,100
409	Sugar Processing	24	7	110,000,000	17,100
464	Metal Molding and Casting (Foundries)	7	52	732,000	9,880

Table 4-13 (Continued)

40 CFR Part	Category	Major Dischargers	Minor Dischargers	Total Pounds	TWPE
457	Explosives	6	9	31,700,000	8,750
424	Ferroalloy Manufacturing	3	4	9,570,000	7,130
465	Coil Coating	1	6	6,340,000	6,390
471	Nonferrous Metals Forming and Metal Powders	16	28	2,560,000	5,750
469	Electrical and Electronic Components	6	10	7,770,000	5,130
407	Fruits and Vegetable Processing	14	59	10,900,000	4,350
468	Copper Forming	9	17	2,110,000	3,550
437	Centralized Waste Treaters	6	0	81,200,000	3,420
425	Leather Tanning and Finishing	7	1	736,000	3,260
428	Rubber Manufacturing	20	97	9,530,000	2,350
411	Cement Manufacturing	7	105	39,800,000	2,190
434	Coal Mining	14	94	24,000,000	1,910
NA	Printing & Publishing	3	15	3,800,000	1,680
426	Glass Manufacturing	5	48	623,000	1,410
NA	Airport Deicing	3	38	1,110,000	1,160
429	Timber Products Processing	8	141	11,700,000	1,100
406	Grain Mills Manufacturing	15	22	19,200,000	964
408	Canned And Preserved Seafood	7	68	286,000,000	867
438	Metal Products and Machinery	23	86	1,620,000	728
NA	Independent and Stand Alone Labs	7	32	1,640,000	610
443	Paving and Roofing Materials (Tars and Asphalt)	4	64	287,000	487
451	Aquatic Animal Production Industry	5	109	4,330,000	475
417	Soaps and Detergents Manufacturing	5	10	434,000	270
NA	Construction and Development	1	7	57,100	188
461	Battery Manufacturing	1	5	16,800	88
405	Dairy Products Processing	4	72	439,000	43
466	Porcelain Enameling	2	1	22,900	17

Table 4-13 (Continued)

40 CFR Part	Category	Major Dischargers	Minor Dischargers	Total Pounds	TWPE
460	Hospital	2	110	9,760	5
NA	Tobacco Products	1	2	129,000	2
435	Oil & Gas Extraction	2	91	1,440,000	1
412	Concentrated Animal Feeding Operations	1	72	229,000	-
459	Photographic	2	0	-	-
NA	Photo Processing	2	0	-	-

Source: *PCSLoads2002_v4*.
[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.

Table 4-14. *TRIReleases2003_v2* Category Rankings from the 2006 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[b]	Chlorine and Chlorinated Hydrocarbons	33	9	1	62	933,000	6,970,000
430	Pulp, Paper and Paperboard	191	82	10	491	21,100,000	2,880,000
423	Steam Electric Power Generation	353	17	19	709	3,350,000	1,060,000
414	Organic Chemicals, Plastics and Synthetic Fibers	230	471	62	2,109	37,900,000	1,020,000
419	Petroleum Refining	252	58	33	871	17,300,000	498,000
433	Metal Finishing	249	1,697	325	7,222	7,010,000	496,000
455	Pesticide Chemicals Manufacturing	29	29	4	113	1,930,000	485,000
429	Timber Products Processing	76	34	26	987	40,000	249,000
415	Inorganic Chemicals	75	90	36	465	8,830,000	182,000
420	Iron and Steel Manufacturing	117	68	50	366	35,800,000	155,000
445/444	Landfills/Waste Combustors	17	27	5	112	589,000	132,000
463	Plastic Molding and Forming	33	105	20	1,459	1,490,000	107,000
421	Nonferrous Metals Manufacturing	60	32	15	221	2,760,000	78,400
440	Ore Mining and Dressing	30	2	-	81	597,000	77,600
437	Centralized Waste Treaters	2	-	-	1	327,000	65,300
432	Meat and Poultry Products	90	75	17	297	68,700,000	55,700
424	Ferroalloy Manufacturing	3	2	1	15	438,000	24,500
464	Metal Molding and Casting (Foundries)	89	84	36	615	220,000	12,800
439	Pharmaceutical Manufacturing	15	101	8	220	2,110,000	12,100
471	Nonferrous Metals Forming and Metal Powders	60	98	53	500	1,280,000	10,600
418	Fertilizer Manufacturing	42	4	3	112	5,280,000	10,300
411	Cement Manufacturing	41	8	2	441	4,590	10,200
425	Leather Tanning and Finishing	3	22	1	33	368,000	9,250
454	Gum and Wood Chemicals	7	4	1	24	23,700	7,280

Table 4-14 (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	Fruits and Vegetable Processing	10	15	1	105	7,320,000	7,170
468	Copper Forming	34	56	43	249	172,000	6,720
469	Electrical and Electronic Components	5	78	10	175	3,780,000	6,630
NA	Tobacco Products	1	15	5	33	443,000	6,520
413	Electroplating	21	399	37	631	1,620,000	5,970
NA	Miscellaneous Foods and Beverages	15	133	10	330	5,560,000	5,440
426	Glass Manufacturing	14	46	18	251	253,000	4,650
461	Battery Manufacturing	3	32	31	85	38,500	4,510
428	Rubber Manufacturing	30	114	59	504	727,000	4,400
417	Soaps and Detergents Manufacturing	3	82	3	203	109,000	4,000
406	Grain Mills Manufacturing	7	12	7	123	1,810,000	3,800
405	Dairy Products Processing	33	211	4	365	4,640,000	3,620
467	Aluminum Forming	49	92	44	433	958,000	3,520
410	Textile Mills	15	68	9	305	451,000	3,450
436	Mineral Mining and Processing	45	40	7	471	2,180,000	2,890
434	Coal Mining	23	-	-	87	200,000	2,400
NA	Drinking Water Treatment	1	-	3	5	9,280	823
443	Paving and Roofing Materials (Tars and Asphalt)	7	8	2	264	737	518
446	Paint Formulating	9	52	8	482	88,600	514
458	Carbon Black Manufacturing	8	-	-	19	11	483
422	Phosphate Manufacturing	12	1	-	26	65,700	480
435	Oil & Gas Extraction	-	-	1	2	26,400	457
466	Porcelain Enameling	2	6	4	15	70,700	363
409	Sugar Processing	16	1	-	33	339,000	309
NA	Printing & Publishing	2	53	1	183	15,400	297
438	Metal Products and Machinery	29	-	-	-	13,900	231

Table 4-14 (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	Independent and Stand Alone Labs	2	1	-	4	80,100	202
408	Canned and Preserved Seafood	8	-	-	22	237,000	179
457	Explosives	8	3	2	42	27,400	47
465	Coil Coating	2	47	-	126	608	45
447	Ink Formulating	1	8	1	89	5,490	45
427	Asbestos Manufacturing	-	-	1	1	676	5.2

Source: *TRIReleases2003_v2*.
[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.

4.5.2 Data Quality Review of the *TRIReleases2002, TRIReleases2003,* and *PCSLoads2002* Databases

EPA's screening-level review involves the collection and use of existing environmental data for purposes other than those for which they were originally collected. This subsection describes some of the data quality issues identified during the 2006 screening-level review. Section 4.5.2.1 discusses quality issues identified for the TRI databases and Section 4.5.2.2 discusses quality issues identified for the PCS database.

4.5.2.1 TRI Data Quality Review

The primary purpose of the TRI is to collect annual data on storage, releases, and transfers of certain toxic chemicals from industrial facilities and make the data public to inform communities and citizens of chemical hazards in their areas. EPA's screening-level review uses the TRI data to estimate the mass of pollutants discharged by industrial categories and prioritize the categories for further review. Because this is not the intended purpose of the TRI, EPA reviewed the quality of the TRI data to verify the accuracy of reported discharges, especially those contributing the highest TWPE.

EPA reviewed the TRI 2002 data quality during the 2005 annual review, which is discussed in Section 6.3 of the *2005 Annual Screening-Level Analysis Report* (U.S. EPA, 2005b). During the 2006 annual review, EPA continued to review the TRI 2002 data quality and make corrections to the database (as described in Section 4.3). The remainder of this subsection describes the TRI 2003 data quality review and the pulp, paper, and paperboard data issues identified during the 2006 annual review.

TRI 2003 Quality Review

To review TRI 2003 data, EPA ranked TRI facilities by total TWPE released to surface waters to identify potential anomalous loads. For this analysis, EPA excluded facilities that manufacture chlorine and certain chlorinated hydrocarbons, because EPA will evaluate reported discharges from these facilities as part of the development of the Chlorine and Chlorinated Hydrocarbons (CCH) rulemaking. After removing these facilities, EPA identified seven facilities with unusually high chemical releases for their point source category. To verify the wastewater releases, EPA contacted the seven facilities and asked if the TRI data accurately reflected what they had reported. EPA also asked whether the reported release was based on sampling data and whether the pollutant was detected. Table 4-15 presents EPA's TRI facility review and any corrections made to the *TRIReleases2003* database.

Table 4-15. TRI Facility Review

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Facility's Response	Load Recommendations
ONYX Environmental Services LLC	Port Arthur, TX	Landfills/Waste Combustors	Toxaphene, Chlordane, Heptachlor, Benzidine, and Hexachlorobenzene	The facility analyzed its wastewater, but none of the chemicals were ever detected. The discharges were based on ½ the detection limit.	Change the toxaphene, chlordane, heptachlor, benzidine, and hexachlorobenzene releases to 0.0.
Domtar Industries Inc Ashdown Mill	Ashdown, AR	Pulp, Paper, and Paperboard	Dioxin and Dioxin-like Compounds	The facility analyzed its bleach plant monitoring location for dioxins in 2003. The measured concentrations were used to calculate the reported discharge.	Do not change the dioxin and dioxin-like compounds discharge; however, change the facility reported dioxin congener distribution.
Cemex Inc Dixon Cement Plant	Dixon, IL	Cement Manufacturing	Dioxin and Dioxin-like Compounds	The facility accidentally reported its dioxin and dioxin-like compounds air releases as water discharges.	Change the dioxin and dioxin-like compounds discharge to 0.0.
Vonroll America	East Liverpool, OH	Landfills/Waste Combustors	Benzidine	EPA contacted this facility about their 2002 discharges, which are the same as the 2003 discharges. The facility reports its benzidine release as range code 'B' (11-499). The actual value the facility calculated was 16.68 lbs. However, benzidine was never detected and the value is based on the detection limit.	Change the benzidine discharge to 0.0.
LNVA – North Regional Treatment Plant	Beaumont, TX	Centralized Waste Treaters	Polycyclic Aromatic Compounds	The facility has analyzed the effluent from the treatment plant for each of the PACs and none have ever been detected. The discharge is based on ½ the detection limit.	Change the polycyclic aromatic compounds discharge to 0.0.
Tower Automotive Products Co Inc.	Corydon, IN	Metal Finishing	Sodium Nitrite	The facility uses an additive that contains 40 to 50% sodium nitrite in its wastewater treatment process. The discharge is based on the amount of additive used during the year.	Do not change the sodium nitrite discharges from the facility.
Colfax Treating Co. LLC	Pineville, LA	Timber Products Processing	Dioxin and Dioxin-like Compounds, Polycyclic Aromatic Compounds, and Creosote	The facility estimates the dioxin and dioxin-like compounds discharge based on the pentachlorophenol concentrate that is discharged, which contains 981 ppm of dioxin and dioxin-like compounds. The creosote discharge is estimated as 1% of the total oil and grease discharge from the facility. The PACs discharge is estimated as 2.28% of the creosote discharge or 0.0228% of the total oil and grease discharge from the facility.	Do not change the discharge loads of dioxin and dioxin-like compounds, creosote, and PACs.

Source: Telephone conversation with Mona Rountree of ONYX Environmental Services LLC., Port Arthur, TX and TJ Finseth of Eastern Research Group, Inc. (Rountree, 2005); Telephone conservation with William Bertrand of Domtar, Ashdown, AR, and Bryan Lange of Eastern Research Group, Inc. (Bertrand, 2005); Telephone conservation with Lillian Deprimo of Cemex Inc., Dixon, IL, and Jessica Wolford of Eastern Research Group, Inc. (Deprimo, 2005); Telephone conservation with Becky Dalrymple of Vonroll VTI, East Liverpool, OH, and TJ Finseth of Eastern Research Group, Inc. (Dalrymple, 2005); Telephone conservation with Jesse Eastep of LNVA North Regional Treatment Plant, Beaumont, TX, and Jessica Wolford of Eastern Research Group, Inc. (Eastep, 2005); Telephone conversation with Roland Berg of Tower Automotive Products Co Inc., Corydon, IN, and Jessica Wolford of Eastern Research Group, Inc. (Berg, 2005); Telephone conversation with Karen Brignac of PPM Consulting and TJ Finseth of Eastern Research Group, Inc. (Brignac, 2005).

Pulp, Paper, and Paperboard Data Issues

During the Pulp, Paper, and Paperboard Point Source Category detailed study, EPA determined that the dioxin and dioxin-like compounds discharges reported to TRI did not reflect the actual quantity discharged. EPA determined that the majority of the estimated releases of dioxin and dioxin-like compounds reported to TRI were based on pollutant concentrations below the Method 1613B minimum levels (MLs), including the congener-specific measurement data that NCASI used to develop an emission factor for wastewater discharges. For more information about this issue, see chapter 5 of the *Final Report: Pulp, Paper, and Paperboard Detailed Study* (U.S. EPA, 2006b).

4.5.2.2 PCS Data Quality Review

PCS was designed to automate entry, updating, and retrieval of NPDES data and track permit issuance, permit limits and monitoring data, and other data pertaining to facilities regulated under NPDES. EPA's screening-level review uses PCS data to estimate the mass of pollutants discharged by industrial categories and prioritize the categories for further review. Because this is not the intended purpose of PCS data, EPA reviewed the quality of the PCS data to verify the accuracy of reported discharges, especially for those contributing the highest TWPE.

EPA reviewed the PCS 2002 data quality during the 2005 annual review, which is discussed in Section 6.2 of the *2005 Annual Screening-Level Analysis Report* (U.S. EPA, 2005b). During the 2006 annual review, EPA continued to review the PCS 2002 data quality and make corrections to the database (as described in Section 4.4). The remainder of this section describes the use of maximum values for load calculation and nutrient analysis data issues identified during the 2006 annual review.

Use of Maximum Values to Estimate PCS Loads

To create *PCSLoads2002*, EPA used the EDS system to calculate the annual pollutant loads using the PCS data. For a detailed discussion of how EPA calculates annual loads from the PCS data, see Section 2 of the *2005 Annual Screening-Level Analysis Report* (U.S. EPA, 2005b). EDS calculates pollutant loads using the following five measurement fields that facilities can report in their discharge monitoring data:

1) Average Quantity;
2) Maximum Quantity;
3) Average Concentration;
4) Maximum Concentration; and
5) Minimum Concentration.

EPA received comments regarding the use of maximum values in calculating annual loads. Commenters stated that maximum values overestimate discharges and should be adjusted accordingly. In generating *PCSLoads2002*, the EDS system used only maximum values when these represent the maximum of a set of average concentration data (i.e., it is the maximum value of the weekly average concentrations) or the average quantity or average concentration data are not reported by the facility (i.e., the maximum values are the best data available).

EPA analyzed a subset of the PCS data to determine how often maximum values are used in the annual load estimations. EPA determined that maximum concentration values were used to calculate loads for 42 percent of the TWPE, for the subset of data analyzed. Table 4-16 shows the total pounds discharged, the total TWPE discharged, and the percent of the total TWPE based on the different measurement fields for the subset of data analyzed. For more details on this analysis, see the memorandum entitled, *Response to Comments: Database Methodology Issues*, dated November 2006 (Bartram, 2006).

Table 4-16. Loadings and TWPE from Different Measurement Values for a Subset of PCS Data

Measurement Field	Pounds	TWPE	Percent of Total TWPE
Maximum Value (concentration or quantity)	110,000,000	137,000	42%
Other Value	73,500,000	189,000	58%
Total	**183,000,000**	**326,000**	

Source: Response to Comments: Database Methodology Issues (Bartram, 2006).

The use of the maximum values may overestimate discharged pollutant loads, and EPA acknowledges that a significant portion of its pollutant loads may be calculated using maximum values for flows and/or concentrations. However, EPA is using the best available data from PCS. EPA calculates annual loads primarily using average values. EPA only uses maximum values when average values are unavailable.

Nutrients Analysis Data Issues

EPA began an investigation of the nutrients (nitrogen and phosphorus) discharged by each point source category, estimating the total pounds of nitrogen (nitrate, nitrite, ammonia, total nitrogen) and phosphorus (phosphates). EPA requested additional information from industry to confirm the reported discharges of nutrients and discovered several complications in calculating the nutrient loads. These included difficulties in determining which outfall(s) to exclude to avoid double-counting effluent flows, assessing intake water pollutant loadings, and identifying which outfalls represented wastewaters from process operations. For example, some facilities monitor and report nutrient discharges from landfills and nonprocess-area stormwater run-off. Because of the data quality issues associated the nutrients data in the *PCSLoads2002_v4* database, EPA decided not to continue the analysis for the 2006 annual review. EPA intends to pursue means for improving the data review for nutrients discharges in future review cycles. Table 4-17 summarizes the data quality issues identified during the nutrients analysis and EPA's findings. For more details on this analysis see the memorandum entitled *Review of Nitrogen and Phosphorus Loads Calculated Using 2002 PCS Data*, dated November 2006 (Bicknell, 2006c).

Table 4-17. Nutrient Analysis Data Quality Issues

Data Quality Issue	Findings from Analysis
Internal Monitoring Points	EPA conducted a permit review of the top nutrient dischargers and determined that many of the nutrient loadings are overestimated due to double-counting of loads from internal monitoring points. EPA zeroed the double-counted loads, when identified.
Intake Water	EPA determined that for many of the large nutrient discharges, the majority of the load was due to the intake water and not from the industrial process.
Identification of Discharge Pipe	EPA determined that many of the nutrient discharges were from nonprocess wastewater such as landfill leachate, stormwater runoff, or other nonprocess areas.

Source: Review of Nitrogen and Phosphorus Loads Calculated Using 2002 PCS Data (Bicknell, 2006c).

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